Suvi Nenonen, Alpo Salmisto & Vitalija Danivska (eds.)

Proceedings of the 1st Transdisciplinary Workplace Research Conference
19–21 September 2018 in Tampere, Finland
Preface

TWR2018 conference aims to bring together work environment researchers from all relevant disciplines: architecture, corporate real estate management, business, diverse managerial approaches, psychology, and technological approaches. The work environments in practice and research require holistic and systematic approaches. It is all about people, teams, and organizations, the diversity of tasks, and their requirements for physical and digital platforms. The topic of wellbeing is a focus on many abstracts. This indicates the importance of holistic approach to deepen the knowledge around workplace as a system. There is always a huge interest to discuss about the research methods when researchers in different disciplines come together. The conference will provide a platform and opportunity also for getting insights of diversity of the methods within workplace research.

As the first organizer of the Transdisciplinary Workplace Research conference we are convinced that the time is right for getting a transdisciplinary crew on board. The tangible outcome of this initiative is this publication: Proceedings of TWR2018 including 39 abstracts from 57 submitted proposals. We want to thank all authors and reviewers for their contributions.

The first conference is supported by the transdisciplinary workplace research network. We thank the network for all the support and especially the leading force, Rianne Appel-Meulenbroek. She has been eager and successful in forming the international TWR-board to enhance the initiative. We wish the first conference is a begin for a series of TWR-conferences in the future taking place in the different countries. With the commitment of the TWR-board this will certainly happen.

We would like to honor the support of Tampere University of Technology and the great contribution of the local organizing team Virpi Multanen, Miia Eino, Vitalija Danivska (former Petrulaitiene) and Alpo Salmisto. We also owe our sponsors a debt of gratitude for their contributions.

We wish all participants lively, transdisciplinary discussions, interesting meetings among colleagues and a fruitful academic and social exchange!

Tampere 6.9.2018

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Session 1, Track 1: Workplace Performance
Workplace Performance in Italy: Key Indicators from Key Users

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ABSTRACT

**Purpose:** This paper aims to explore Italian practices on workplace performance measurement and management. Lately, also in Italy, many companies have been undergoing some offices restructuring, hence they have been paying more attention to measure and manage the impact of their workplaces on people and business. This paper proposes a first exploration in the Italian context by acknowledging, on one hand, key users in charge of managing workplace performance, and on the other, key indicators suitable to keep workplace performance under control.

**Design/methodology/approach:** A cross-case study analysis is performed through subsequent steps. First, eight interlocutors are selected in four different Italian companies, among users who concur to manage the workplace to various extents. Second, an in-depth observation of their job title within the organizational chart is undertaken. Last, they are interviewed on the implementation of key performance indicators in the respective companies.

**Findings:** Workplace users who manage workplace performance belong to different disciplinary areas, e.g. Company Services and Security, Real Estate and Property Management, Service Analytics, and Health, Safety and Environment Systems. A synergic collaboration of these areas is still far from being a routine. Performance measurement, when present, relies more on rating and certification tools, rather than on indicators for continuous monitoring. However, attention to specific themes to keep monitored through KPIs emerges, such as environmental issues and the way people use the workspace.

**Practical implications:** This paper represents a first attempt in acknowledging different company departments that are called to interact in workplace management, and a few performance indicators that is worth to cross-check regularly.

**Originality/value:** Workplace performance in Italy is underdeveloped in practice and underrepresented in scholarly contributions. This paper, on one hand, highlights flaws in current practices; on the other hand, supports integration of different disciplines and competences, by bringing concrete cases to the attention of the scientific community.

**Keywords:** Workplace, Performance Management, Users, Key Performance Indicators.

**Disciplines presented in the paper:** Facility Management, Corporate Real Estate Management, Business Management.
A Multi-Dimensional Approach to Evaluating Productivity within the Knowledge Worker Context

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ABSTRACT

Purpose: The impact of indoor environmental quality on human health and well-being has been widely documented, as has its impact on worker productivity in settings such as education, healthcare, and manufacturing. In the knowledge worker context, however, there is limited consensus on agreed metrics for productivity measurement. This has led to a paucity of research regarding the impact of specific real-workplace interventions on worker performance, hindering the evaluation of specific interventions such as office renovations or policy changes. A knowledge worker productivity measurement tool is under development and this paper presents the development of an initial prototype, which is evaluated using a series of preliminary field tests.

Design/methodology/approach: A prototype tool has been developed based on findings of a systematic literature review that identified the Key Performance Indicators (KPIs) most widely used for evaluating knowledge worker productivity. This tool consists of three elements: (1) a self-assessment questionnaire, (2) field measurements, and (3) organizational data. The questionnaire integrates key questions from productivity and performance measurement surveys related to the most broadly-adopted KPIs with additional questions to address emerging metrics. Field measurements collected during the field tests are used to quantify known factors affecting productivity such as temperature, noise, and office layout. Organizational data collected is informed partly by interviews conducted in the first phase of research regarding common productivity proxy measurements and is supplemented by centralized data regarding absenteeism and turnover.

Findings: The prototype tool evaluates five productivity dimensions (metrics): absenteeism, engagement, self-assessed productivity, organizational outputs and performance, and presenteeism. The questionnaire complements the field measurements and organizational data collection to provide a holistic assessment of productivity in the knowledge worker context. The evaluation of preliminary field test results demonstrates both the degree of internal consistency and reliability of the tool to engage with each dimension. Limitations of the tool as identified both within organizations and across the breadth of field tests are discussed and refinements to address these issues are proposed.
Practical implications: The evaluated tool provides a holistic means of assessing knowledge worker productivity and will support future research to evaluate and quantify the impact of specific interventions in workplace policy and environmental modifications.

Originality/value: This paper provides a significant development in the evaluation of knowledge worker productivity. Lessons learned from prototype tool development and initial field tests will inform the next generation multi-dimensional workplace productivity benchmarking and monitoring tool and its refinement.

Keywords: productivity benchmarking; performance measurement; worker productivity; knowledge worker; indoor environmental quality
Obstacles of Knowledge Work Performance
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ABSTRACT

Purpose: Drivers of knowledge worker performance are diverse. One way to discern and group various drivers is to divide them into physical, digital and socio-organizational work environment and working methods and habits. While academic research evidence concerning which of the drivers of knowledge worker performance are most critical is not unanimous, the subjective experiences and lay theories of knowledge workers about core drivers of performance are not well known. However, the core inhibitors of performance are not well known either. This paper sheds light into the subjective accounts knowledge workers make about the inhibitors of high performance in contemporary knowledge work.

Design/methodology/approach: The paper analyses based on both qualitative and quantitative analysis of written survey responses how Finnish governmental knowledge workers describe core inhibitors of their work performance. The empirical data consists of written surveys responses of over 5000 Finnish governmental knowledge workers from over 20 governmental work organizations collected during 2015-2017. In the analysis the inhibitors are categorized alongside the dimensions of physical, digital and socio-organizational work environment and working methods and habits.

Findings: Most often and vividly described inhibitors were related to socio-organizational work environment and to working methods and habits in the organizational level. Inhibitors related to the digital work environment were expressed more often than inhibitors related to physical work environment.

Practical implications: The biggest obstacles of knowledge worker performance enhancement relate to the unsatisfactory and underdeveloped ways of organizing shared, interconnected work in governmental work organisations. The paper gives advice how to focus work environment development efforts in knowledge work settings.

Originality/value: Identification and analysis of accounts of representative sample of governmental knowledge workers about key issues in their work performance.

Keywords: knowledge work, work environment, work design, performance inhibitors

Disciplines presented in the paper: Work design, work and organizational psychology, industrial engineering, workplace studies.
Healthy Offices: An Evidence-Based Trend in Facility Management?

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ABSTRACT

Purpose: The purpose of this paper is to analyse how the concept of 'healthy offices' features in Facility Management (FM) research and practice, and to what extent facility management journals contain academic (research) papers that show that FM can indeed make the office a healthier place to work.

Design/methodology/approach: This paper is based on a systematic literature review among Facilities, Journal of Facilities Management, and Journal of Corporate Real estate over the period 2007-2017. Findings are compared to the WELL-Building Standards and recent reports published by practitioners. The papers and reports are first scanned for relevance; relevant papers are analysed by three independent researchers, using content analysis. Findings are compared and synthesis is made.

Findings: Based on the literature study, we conclude that current literature primarily supports the absence of unhealthy aspects, like for example air quality and indoor environmental quality. Sustainability and plants are part of this topic. Furthermore, we ascertain that FM suppliers focus on office design that supports employees' health, and on influencing people’s behaviour, whereas academic papers hardly pay attention to these topics. The results of the analysis show a need for academic research on 'healthy offices'.

Practical implications: The research focuses on those elements of healthy offices that may be influenced by facility management.

Originality/value: Although the topic ‘healthy office’ is currently a trend, research on the topic is largely focussed on indoor air quality and indoor environmental quality, with a focus on the effects on productivity, not so much on health of employees.

Keywords: Facility management, healthy office, evidence-based, literature review.
Session 1, Track 2: Focus on user – we & me
Knowledge workers’ perceived importance of various workplace characteristics affecting productivity

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ABSTRACT

Purpose: Productive employees are of important value for organizations. Both in practice as in research, the importance of the workplace in affecting productivity of employees is accepted. However, the effect of the work environment on productivity is difficult to measure and therefore, difficult to improve. This study addresses the trade-off that knowledge workers make when choosing a space for different work activities. Specifically, the preferences of knowledge workers for different physical workspace characteristics that support productivity are measured and predicted.

Design/methodology/approach: After a literature study to identify relevant physical workspace characteristics, a stated choice experiment is conducted as part of a questionnaire among 251 knowledge workers from various types of companies. The experiment measured preferences for hypothetical workspaces described by their most relevant aspects. Multinomial logit models were estimated on the data collected to identify preferences for three types of activities, namely individual concentration work, informal interactions and formal interactions.

Findings: The top three of most preferred physical workspace aspects that affect perceived productivity are noise, level of workspace enclosure and lighting. For individual concentrated work and formal interactions the most preferred workspace is located in an enclosed environment with low noise levels, full control over the workspace, specialised ergonomic furniture and a pleasant lighting and temperature condition. For informal interactions the ideal environment would be a noise neutral, semi-enclosed environment with a pleasant lighting and temperature situation.

Practical implications: The results suggest that workplace managers should give priority to lighting, workspace enclosure and noise reduction, when choosing/renovating an office building. However, modern offices increasingly offer many workspaces in larger open settings, so it is important to manage both employee expectations towards noise and privacy and negative influences caused by possible consequences of this choice for open settings.
Otherwise productivity decreases might nullify the cost savings that the open (and increasingly shared) workspace environment intended to yield.

**Originality/value:** This study is innovative in presenting employees with controlled hypothetical work environments and therefore being able to predict preferences for work space characteristics that support productivity. This approach has shown to be successful in other fields of consumer choice behaviour, however, it is relatively new in the field of workplace studies.

**Keywords:** Stated choice experiment, Physical workplace, Knowledge workers, Productivity

**Disciplines presented in the paper:** corporate real estate management, psychology
Open plan office: The lived experience of employees’ emotions and paradoxes

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ABSTRACT

Purpose: We adopt a paradoxical lens to explore the paradoxical nature of the physical environment of work namely the open-plan office. We theorise on how the physical environment of work may trigger employees’ behaviours and attitudes. Furthermore, we argue that the physical environment elicits tension and contradictions in employees’ lived experience of emotions.

Design/methodology/approach: Using a grounded theory approach, a qualitative data from 27 in-depth interviews revealed the paradoxical nature of the open-plan office and employees’ territorial behaviours.

Findings: Our preliminary results indicate that not only do employees engage in behaviours of territoriality and infringement but also experience emotions in the open-plan office. The potential to engage in territoriality depends on the significance of objects, position of the work desk and overall climate in the environment. Altogether, we isolate the factors behind employees’ lived experience of territorial and infringement behaviours as well as emotions (e.g. emotional contagion) and the role of climate to buffer territoriality.

Practical implications: Existing research indicates that territoriality is a double-edged sword promoting and or depleting employees’ wellbeing. In practice, managers should promote positive climate to minimise the effect of the negative side of territoriality and negative emotions on employee wellbeing.

Originality/value: We found that a positive climate may buffer the tension in employees’ mixed experience of behaviours and emotions in the open-plan office and may assist in leveraging contradictory situations, emotions and behaviours in open-plan offices. This is a new and interesting finding.

Keywords: Open-plan office, Emotions, Paradoxes, Lived Experience

Disciplines presented in the paper: Organizational Behaviours (Management), Social Issues
ABSTRACT

The purpose of this paper is to explore findings regarding the interaction between humans and architectural settings. Based on a cross-disciplinary literature review the topic is discussed with an evolutionary perspective. The concept of the non-territorial office and how people react to it serves as an example. The conclusion is drawn that most observations are based on behaviour settings developed over thousands of years. These settings are cast into instincts and unconscious behaviour helping mankind in the past to mitigate risks of the environment. However sociology, psychology, brain research, medicine, acoustic research, anthropology, and ergonomics all draw the same conclusion: We are poorly adapted to the modern environment we live in. Our brain and body is perfectly equipped for our natural habitat, but our natural habitat is nature.

That has implication for the way we should design architecture.

Architecture was so far formed within a context of physical and economical constrains, functional considerations and aesthetic ambition. We now understand that we missed an important point. Space as a mental and physical stimulator was more or less ignored (an example is Marquardt C., Veitch J., Charles K. 2002)

It will be shown how a non-territorial office concept does not take in account important aspects of human nature. How space is organised and designed has a much greater influence on us than previously expected. To understand the impact space has on us is important. But it is also vital to discover how space should be designed in order to support our mental and physical needs.

This understanding is the first step towards a new approach to design and organise space.

Just as an increasing number of organisations react to new organisational requirements with the implementation of innovative workplace models it should be of great interest how to use space as a tool to improve peoples well-being and performance in order to support commercial objectives.

The paper should be seen, as an attempt to touch on the most important issues.

Keywords: Workplace, evolutionary behaviour, architectural psychology, productivity, well-being
From Activity-Based Towards Needs-Based Work Environments

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ABSTRACT

**Purpose:** Activity-Based Working (ABW) is supported by environments that combine hot-desking with a variety of settings, designed for different types of activities. While the advantages in terms of space and cost efficiency are undisputed, the effectiveness with respect to job performance and satisfaction is still under debate. Empirical findings have shown that satisfaction with ABW environments often falls short of expectations. Optimising satisfaction with the work environment is important for organisations, since it has been found to influence job satisfaction, commitment, intent to leave, and absenteeism. Hence, the purpose of the current research project is to analyse antecedents of dissatisfaction with ABW environments.

**Design/methodology/approach:** The current research project comprises four separate studies, employing different methodologies. The first study was based on survey data (18 locations; N = 3,189). A different set of survey data was used for the second study (7 locations; N = 581). Experience sampling and survey data collected through a tailor-made mobile application were used for the third study (2 locations; N = 92; 1,356 measurements). The fourth study was an experiment in which participants (N = 177) performed two different tasks in two different settings that were simulated in a virtual reality studio.

**Findings:** Our first study showed that workers’ switching behaviour was related to their satisfaction with the ABW environment. In our second study we identified several job characteristics (i.e., job autonomy, social interaction, internal mobility) and personal characteristics (i.e., need for privacy, age) that influence satisfaction with ABW environments. Our third study showed that perceived misfits between activity and settings (i.e., performing concentration-requiring activities in open plan settings) substantially lowered satisfaction, in particular among workers high in need for privacy. Similar results regarding perceived fit and satisfaction were found in our fourth study. With regard to task performance, our fourth study showed that better performance was achieved when complex tasks were carried out in a closed office setting compared to an open plan setting, whereas the opposite was true for simple tasks.
**Practical implications:** Our findings support the basic idea underlying the ABW concept, i.e. that a variety of settings may support a variety of activities, however they also uncover two crucial limitations: (1) in addition to activity-related needs, important person- and job-related needs should be fulfilled by the work environment as well, (2) only a small minority of workers is inclined to switch frequently between different activity settings. For enhancing satisfaction with ABW environments, it seems of eminent importance to increase experienced levels of privacy, especially for workers high in need for privacy and for older workers. Providing quiet back-up spaces may be part of the solution, however some workers need a quiet workstation on a (semi-) permanent basis.

**Originality/value:** The mixed-methods approach, including field and lab studies, objective and subjective measures, and innovative methodologies (i.e., experience sampling and virtual reality), produced rigorous and coherent findings on the antecedents of low satisfaction with ABW environments. These findings may contribute to interdisciplinary theory development regarding the complex relationships between workers, their activities, and their work environments.

**Keywords:** work environment, activity-based working, perceived fit, satisfaction, performance

**Disciplines presented in the paper:** organisational psychology, environmental psychology, workspace design, facilities management, corporate real estate management
Team Spatial Dynamics in the Workplace: How Team Location Affects Perceptions of Collaboration and Usefulness

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ABSTRACT

Purpose: The aim of this paper is to uncover the relationship between the location of the various teams in an office space and how that affects the perceptions of collaboration between them. This exploration focuses on two aspects of workplace collaboration, the amount of self-reported face-to-face interactions and the perception of usefulness of these interactions. Previous research has shown that perceptions of usefulness and collaboration between workers are related to the availability of these workers (for example when they are located in visible or integrated spaces). Our aim is to extend that hypothesis to a per-team level and show that centrally located teams attract more overall collaboration and that shorter distances between teams increase interactions between them.

Design/methodology/approach: We examine a large sample of office spaces in the UK with information about the location of each team and self-reported perceptions of collaboration and of usefulness by staff and team leaders. In the first level of analysis we study the location of each team in the office as expressed through various parameters such as its centrality, its distance from the entrance, and its distance from collaborative spaces for example meeting rooms, breakout spaces and social hubs. We examine how these parameters reflect the exposure to collaboration and perception of usefulness of that team on a company level. In the second part of the analysis we focus on the spatial and social dynamics between teams. The same social-network variables are explored in relation to the distances between teams.

Findings: Preliminary results highlight different effects across different teams and organisations and point to the difficulty of reaching generic conclusions of how spatial locations structure the opportunities for collaborative relations.

Practical implications: The main output of this research adds to the growing body of research driving evidence-based design, and specifically the need to gather more knowledge on how to design workplaces that foster collaborative behaviours. For example, the examined set of statistical tests can work as pieces of information to be taken into account when strategically placing teams in a new office space. They can be especially helpful to identify whether specific spatial configurations are likely to increase or decrease face-to-face collaborations, as well as how useful are these likely to be perceived as. More importantly they can shape decisions for
spatial configurations on a per-team basis, depending on the varying needs of every department in a company.

**Originality/value:** Given that a large dataset of existing office spaces is used, the analysis can be considered robust across different office spaces in different industries. The results thus point to generic and non-generic characteristics of office space and how they relate to the social characteristics of the company that occupies that space.

**Keywords:** Workplace, social network, space syntax, collaboration, configuration

**Disciplines presented in the paper:** Social Issues, Physical issues
Session 2, Track 1: Happy Employees
Working from home: Spatial strategies for communication
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ABSTRACT
Purpose: Communication is an essential base for work. Which spatial strategies for communication do people use, when they work from home? To answer this question it is necessary to define the relation of space and communication. Two aspects can be highlighted in this context:
1. Space shapes behaviour – Space can enable communication. Every activity takes place in a spatial environment. Which environment do homeworkers prefer for communication tasks?
2. Space reveals something about the owner – and about the observer. The space itself communicates status, family background, cultural context or private preferences. ‘Home’ is much more than a physical space. What is the subjective status for people working from? How much about the home-workplace is communicated?

Design/methodology/approach: The chosen method is a qualitative approach. Data collection is based on 24 guided interviews and observations at the home office workplace of people working from home.

Findings: People, who work from home try to take control of the image they produce, revealing more or less to clients, colleagues, neighbours, family and friends. They have different mindsets how to cope with work and privacy in everyday life ranging from strict separation to intermingle. Related to their mindset people show more or less of their workplace. The subjective status – the status, that people believe to have in their community- ranges from very low to high status.

Practical implications: The practical implication for people working from home is that there is not a right or a wrong way to deal with communication. Solutions depend on personal situation and mindset. To see, how other people deal with the situation, can help to find an own position.

Originality/value: recent research and field data on spatial arrangements in home offices is rare. This paper gives an insight in homeworkers spatial environment and shows different spatial strategies, how people deal with communication in the home office.

Keywords: Home-office, communication, workplace, spatial strategies, mobile work
The impact of Human Resource Management practices on employee wellbeing in financial institution

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ABSTRACT

Purpose: The aim of this paper is to analyze how human resource management practices (HRM) are associated with employee wellbeing in a major financial organisation. In addition, we analyze whether the possible well-being supporting effects of HR practices vary between employees that have less than a year’s experience in their current job and employees with longer experience. It is evident that digitalization and the changing needs of customers are shaping the field of finance, and because of that, employees may be required to change their jobs more often.

Building on the job demands-resources theory (JD-R), this paper assumes that HRM practices may serve as resources supporting employee well-being by fostering work engagement and buffering against emotional exhaustion. It has been argued that employee well-being should be taken into account when studying the impacts of HR practises (Guest 2017). In this paper, HRM practices are understood to consist of performance and reward, skills, cooperation among employees and openness/accessibility of leadership and participation (Bartel 2004).

Methodology: The data was collected from the Life Insurance Company and four units of Bank, which were distribution channel for the life insurance services. The response rate of the survey was 61 % (n=643). Quantitative methods were utilized to analyze the relationships between HRM practices and well-being at work. The data was analysed by using regression analysis while the relevant background information was controlled for.

Findings: This study confirms that HRM practices are associated with employee well-being in terms of both work engagement and emotional exhaustion. Our findings suggest that HRM practices may act as resources enhancing work engagement and preventing emotional
exhaustion. Especially, the study indicates that openness/accessibility of leadership is associated with higher levels of work engagement.

**Originality/value:** This study provides valuable understanding of how HRM practices can support well-being at work. Our preliminary findings also indicate that employees’ length of experience at their current job may be an important factor to take into account when supporting well-being at work at different stages of career.

**Practical implications:** The findings contribute to the practical development of HRM practices, which is relevant under changing working conditions in the financial sector.

**Keywords:** work engagement, exhaustion, human resource management practices, well-being at work, leadership

**Disciplines presented in the paper:** management sciences
Effects of office environments and workplace change management on mental health

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ABSTRACT

Purpose: The purpose of this study is to analyse the effects of office design (material, ambient environment and socio-spatial factors) and workplace change management on mental health and well-being and work engagement.

Design/methodology/approach: Six organisations with naturally occurring changes of the office environment participated in the study. Four organisations implemented activity-based working and two organisations moved and centralised to modern office buildings. In a longitudinal design with a control group in each of the organisations the effects of the office environments before and after the change were measured using surveys and expert assessments of the office designs. The change management process was documented and data on end-users’ experiences were collected through “pulse-checks” (short questionnaires that were used several times during the change process). A total of 1386 office users participated in the study; the longitudinal sample consists of 617 datasets.

Findings: Longitudinal comparisons of means show that the office environment change had different effects on employee wellbeing, health and work engagement in the different organisations. Longitudinal regression analyses show that office environment factors explain 1-8% of variance in different measures of mental wellbeing and about 4% of variance in work engagement. In each organization, different influencing factors in the office environment and of the workplace change management seem to be important. Further results showed that the evaluation of the office environment and the change process by experts does not correspond to the perception of the employees. Therefore, the objective evaluation of office environments and change processes seems not be suitable in order to infer from this well-being, health and satisfaction of the employees.

Practical implications: Results show that workplace changes may have positive or negative effects for mental wellbeing, depending highly on the context. Therefore, thorough pre-change analyses regarding employees’ needs, work activities and the organisational context are essential for the development of future office environments.

Originality/value: The originality of the study lies in the topic (deep analysis of mental wellbeing in relation to office environments and workplace change management) and the methodological approach with a longitudinal study of 6 office environment changes.
Keywords: health promoting offices, workplace change management, mental health

Disciplines presented in the paper: Work and organisational psychology, facilities management, workplace management
Plants Or Autonomy - What Makes Employees Happier?  
The Effects Of Design And Company Culture

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ABSTRACT

Purpose: The purpose of the study is to learn to what extent physical design elements as well as organisational policy and work culture contribute to the health and happiness of employees.

Design/methodology/approach: The case study to be presented is conducted as a before-after study with both quantitative and qualitative measures. As the independent variable the quality of the work environment is determined by an interior quality index, objectively evaluating a space along ten design criteria. The dependent variables (e.g. comfort, physical health, engagement, connectedness, productivity and teamwork) are assessed by an online questionnaire, interviews and observations. Confounding and moderating variables (demographic data, personal resources, job demands and organizational culture) are also measured via the online survey and interviews. The before study was conducted in May 2016 and the after study will be carried out in December 2017.

Findings: It is expected that the study will show that comfort, health, engagement, connectedness, productivity and teamwork are affected by the quality of the environment, but that the manner of how an environment is used, is greatly affected by organizational culture, that shapes behaviour and attitudes of people. It is therefore essential for an organization to set clear goals and to be aware of how achieving these goals will and should affect people’s mentality, working methods and behaviour. Against this background the physical environment should be seen as an important facilitator and stimulator of behavioural and cultural change, which should be experienced as a logical step in achieving the company goals. Involving employees in the company “game plan” as well as the design (co-creation) process is therefore substantial in diminishing resilience towards the new environment and instead creating positive employee support and feelings of ownership.

Practical implications: Human Resources and Facility Management should no longer be seen as two separate entities. Not only need they work together closely, but they also should involve employees in company processes, design decisions and in defining the company identity. Co-creation can be a powerful tool to create an optimal person-environment fit, which also includes the development of an organizational culture that offers the right conditions for the work environment to actually be used as intended.

Originality/value: The study is valuable because of its holistic approach, relating outcome variables like engagement and health not only to the design and the use of the physical environment but also to the involvement of users and to organizational culture and policy.

Keywords: Evidence-based design, Organizational culture, Behaviour, Engagement, Health

Disciplines presented in the paper: Environmental Psychology, Interior Design, Behavioral Sciences, Health, Work & Organizational Psychology
Session 2, Track 2: Places to learn
What is a Hub? Developing a tool for mapping out Hub concept

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ABSTRACT

Purpose: Shared workspaces create new workplace culture and community. It has stated that every office will be in the future some kind of Hub. By definition essential features for a hub include bringing the right people together in the right place at the right time. In this paper, we aim to identify the essential features that have been said to be found in hubs and that according to our conceptualization should be there when talking about a hub.

Design/methodology/approach: The approach is explorative and twofold. In the first phase we present a qualitative tool for identifying and classifying features that are found in spaces and places that are typically considered to be found in hubs. In the second face we focus on a case study, Kampus Areena, a campus hub under the administration of Finnish University Properties at Tampere University of Technology in Tampere, Finland.

Findings: The results describe the tool for evaluating hubs. Additionally we have been able to identify social, digital and physical features, which are typical for the hubs and has its consequences for designing and managing the hub in general. Hubs can be viewed as ecosystems of people and activities that are mutually interconnected. They provide benefit for all parties and they create something that would not be possible without the ecosystems’s different actors coming together also physically. Managing the hub needs support for creative collaboration as well as different spatial solutions.

Practical implications: This research can promote the hubs as a source for collaboration and its systemic transformation.

Originality/value: The thorough analysis of hub as social and spatial solution has its significance in the new ways of working.

Keywords: Hub, ecosystem, sharing, workplace

Disciplines presented in the paper: Psychology, ethnographics, facilities management
Research Laboratory Layout – Potentials, Affordances and Opportunities for Collaboration in the Francis Crick Institute

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ABSTRACT

Purpose: The Francis Crick Institute is a new biomedical research laboratory in London, dedicated to understanding the fundamental biology of health and disease and translating discoveries into new ways to prevent, diagnose and treat illnesses such as cancer. The Institute houses 1500 scientists and staff in a purpose-built laboratory building, designed in partnership by HOK and PLP. At the heart of the Crick Institute lies collaboration between scientists to achieve its mission. The building was deliberately designed to bring scientists together through its open plan laboratory layout, which this paper investigates.

Design/methodology/approach: According to space syntax theory, buildings can be understood as mechanisms of generating and constraining patterns of encounter and avoidance. Based on a floor plan analysis with space syntax methods, this paper will analyse the Crick Institute as a spatial configuration by exploring its potential movement paths and lines of sight as opportunities for scientific collaboration. This work will also draw on Gibson’s approach of affordances available through the structuring of the built environment. Spatially, two different types of opportunities to collaborate may arise: the building can support chance encounters and the likelihood of scientists meeting in unplanned ways; secondly, the building can foster planned collaborations. Both aspects are analysed.

Findings: The architectural open plan layout of the Francis Crick Institute poses both opportunities and challenges to planned and unplanned encounters between scientists. While the placement of open collaboration spaces in the centre of each floor as well as the overall high levels of visibility can be argued to increase chance encounters, the grid like structure may disperse movement paths and therefore potentially decrease those encounters. Planned collaborations may be eased by the compact layout of floor plates, but potentially decreased by the overall size of the institute and the nature of the multi-level structure. The institute also offers highly differentiated potentials for collaboration to scientists depending on their exact lab location in the building.
Practical implications: Open plan workplaces are often praised for enabling encounters and collaborations, yet at the same time are demonised by the press and critiqued by occupants likewise for their high levels of noise and disturbance. Results of the systematic study of opportunities and potentials emanating from design decisions made by architects are relevant for evidence-based design practices and contribute to the ongoing debate on the efficacy of open plan layouts.

Originality/value: In the context of increasing awareness of how architectural design matters for collaboration and against the background of open plan layouts as highly contested, this paper provides an analysis of the architectural layout to rigorously discuss and evaluate the contribution made by the spatial configuration to collaborative behaviours. An interesting issue arises from the size of the institute, which is larger than comparable other biomedical laboratories in Europe.

Keywords: Research Laboratory; Open Plan; Collaboration; Affordances; Space Syntax

Disciplines presented in the paper: Architecture; Social and Political Science
Ba in practice – Workplaces Supporting Knowledge Co-creation

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ABSTRACT

Purpose: In this paper, we put Ba in practice in order to identify how workplaces can support knowledge co-creation in different situations and with different players. When Ba is used as a framework, we can get a holistic view of how to understand the differences that academics and practitioners have as requirements. What are the similarities and differences in requirements for workplaces they have? The goal is to be able to use concept Ba in order to develop attractive campuses to support university–industry collaboration by developing places supporting knowledge co-creation.

Design/methodology/approach: The research approach is literature review.

Findings: We have identified a variety of factors that each effect which Ba different actors want to use in different situations. This helps to understand the diversity of requirements and thus to identify which Ba each player would prefer, who could use it together and in which situations. Using shared Ba increases the face-to-face interaction, which supports the development of trust needed, especially in the beginning of collaboration.

Practical implications: It is important to understand, which are the factors, that affect on requirements for different Ba’s for practitioners and academia. By understanding the similarities and differences of requirements, campus developers can develop places that can attract both parties of university-industry collaboration to use shared places in campuses. This can lead to more interaction, which is a prerequisite of development of trust. Trust is the lubricant of collaboration, so places can thus facilitate the interaction needed in the beginning of collaboration.

Originality/value: We present a novel way to analyse the similarities and differences that academics and practitioners have as requirements for Ba in order to identify possibilities for synergy and shared use of spaces.

Keywords: academic workplace, product development, collaboration, interaction, Ba

Disciplines presented in the paper: workplace management, campus development, concept development
Shared And Activity-based Learning Spaces In Higher Education

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ABSTRACT

Purpose: The contemporary knowledge work environments are increasingly based on activity-based offices which consist of a spectrum of spaces, each fulfilling different purpose in the knowledge workers’ activities and preferences. The university campuses as a whole can also be seen as activity-based environments that consist of the variety of spaces from large lecture theatres to library reading places.

In recent years, universities have invested in the development of spaces in order to provide for the learner-centred activities. This has created a rich variety of the spatial configurations, many of which can be interpreted as shared and activity-based learning environments. Although there is an understanding about the qualities of contemporary learning spaces, the focus is often on the spaces themselves, not on the types of spatial configurations the spaces create. Moreover, the knowledge work literature on the various typologies of activity-based environments is surprisingly scarce.

This article focuses on creating a framework and analysing shared and activity-based environments in higher education. Both the analysis framework and the formulated typology can contribute to the discussion about the activity-based work environments too.

Design/methodology/approach: A short review is conducted on relevant literature to create a qualitative analysis tool guided by theory. The research cases consist of a series of recent real estate retrofits (N=23) in several Finnish campuses outside the capital region. The materials are analyzed using the framework and first set of the typologies of shared and activity-based learning environments is created.

Findings: The analysis framework is based for instance on the concepts of sharing knowledge, sharing facilities for work and on the adaptability. The environments are seen as socio-spatial assemblages. Four main typologies with several sub-types where identified, the physical and the effect sizes ranging from micro and meso to macro.

In comparison to the activity-based offices, also the activity-based learning environments provide individual and social activities, and places for collaboration and co-creation, but also for concentration and co-quietness. The most obvious difference is in the zoning and access, as in the activity-based offices the semi-private to private spaces are usually closed from outsiders, whereas in campuses the access is allowed for in different manners and the zoning varies.

Practical implications: The formulated typologies will offer further guidelines for the design of learning spaces, but also contribute to the discussion about activity-based offices. They will also form a base for the analysis of physical learning environments as a network.
**Originality/value:** The research creates a connection between the discussions on activity-based offices and learning spaces. Moreover, the spatial configurations are interpreted as shared and activity-based environments.

**Keywords:** Shared, activity-based, learning spaces, typology, university

**Disciplines presented in the paper:** Architecture, learning pedagogy, Activity Based/New, Distributed workplaces, Work patterns and activities, Co-working spaces, Collaborative spaces
Session 3, Track 1: Health and wellbeing at offices
Impact of employee satisfaction with facilities on self-assessed productivity support – facilities matter!

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ABSTRACT

Purpose: This paper aims to explore whether the findings from the study of Batenburg and Van der Voordt (2008) on the relationship between satisfaction with buildings, facilities and services and self-assessed productivity support are similar in a repeat study with more recent data. This repeat study is interesting, since Batenburg and Van der Voordt conducted their research (“Do facilities matter?”) almost ten years ago. Since then, the database they used has increased more than tenfold and covers a period of almost 15 years instead of 5 years.

Design/methodology/approach: The current study is based on data collection using the so-called Work Environment Diagnosis Assessment tool WODI. Whereas the first study used a more extended version of this tool, the current study makes use of data from a WODI-Light version, with less questions but much more respondents. WODI-questions regard employee satisfaction with the organisation, working processes, the office concept and facilities, self-assessed productivity support by the physical work environment, and some personal and job-related characteristics. The current study uses the data of 25,947 respondents and 191 organisations, all collected since Batenburg and Van der Voordt (2008). The findings are compared with the findings from the first study and findings from a literature review.

Findings: 38% of the variation of office employees’ satisfaction with support of productivity can be explained by employee satisfaction with facilities, the organisation and current work
processes, and personal- and job-related characteristics. By far the most important predictor of self-assessed support of productivity is employee satisfaction with facilities. In particular psychological aspects i.e. opportunities to concentrate and to communicate, privacy, level of openness, and functionality, comfort and diversity of the workplaces are very important. These results confirm the findings of Batenburg and Van der Voordt (2008).

**Practical implications:** The outcomes are interesting from a theoretical perspective and from a managerial point of view. The findings confirm that facilities matter, in addition to other factors such as intrinsic motivation, labour circumstances and human resource management. The findings also confirm that a happy worker perceives himself also as a more productive worker.

**Originality/value:** This research provides a clear insight in the relation between employee satisfaction with facilities and the perceived support of productivity, based on survey data collected over almost 10 years in 191 organizations.

**Keywords:** Facility Management, employee satisfaction with facilities, self-assessed productivity support, WODI, office employees

**Disciplines presented in the paper:** facility management, corporate real estate management, human resource management, business administration
The impact of offices on employees’ health - A systematic review of the evidence

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ABSTRACT

Purpose: Burnouts are on the rise and now make up for over 50% of the long-term sickness leave in The Netherlands. Little is known about the job demands and resources regarding the physical work environment in offices. The aim of this paper is to study the impact of the physical work environment of offices on the employee’s health and wellbeing. More specific, to find out which elements of physical work environment do have a positive or negative impact on physical or mental health and wellbeing of office workers based on empirical evidence.

Design/methodology/approach: The study is based on systematic literature review including approx. 2600 papers published in international scientific journals across different disciplines from 1993 until today. The papers were reviewed through three scans. In the first and second scans, papers were included or excluded based on the title and abstract. In the third scan, the entire paper was read resulting approx. 200 papers to include for the final analysis.

Findings: The study expects to find the main elements of the physical work environment that impact on employees’ health and wellbeing based on the empirical evidence. The preliminary findings show that the past ten years the amount of research in this field has grown substantially. More studies seem to focus on indoor environment, especially indoor climate, than on elements of workplace design like layout, furnishing or greenery. Recently design to activate the employees has become a popular subject.

Practical implications: For practitioners, such as designers, HR professionals and facility managers, the systematically collected evidence about the health effects of the physical work environment inform and enhance workplace design and thereby contribute to a healthier work environment in offices. For researchers it shows which physical elements of the office environment are studied well and which elements may need further investigation related to physical or mental occupational health.

Originality/value: Scientific research about the impact of building features on health and wellbeing is often limited to healthcare facilities (healing environment). This study systematically collects the empirical evidence from the impact of office on health and wellbeing across different discipline.

Keywords: physical work environment, office, health, wellbeing, literature review

Disciplines presented in the paper: corporate real estate, environmental psychology, facilities management, human resources management, medicine
Healthy Workplaces: what we know and what else we need to know

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ABSTRACT
Purpose: This paper aims to explore the impact of buildings, facilities and services on the creation of healthy workplaces and end users’ physical and mental health and wellbeing. Due to the influence of other factors, such as work processes, organisational characteristics, personal characteristics and external factors, it is difficult to isolate the impact of the physical environment. The paper presents available evidence of the impact of workplace layout, interior design, indoor climate, and “green” offices. It ends with reflections on the main lessons learned, gaps in our current knowledge, and suggestions for further research.

Design/methodology/approach: A literature research has been conducted of all papers in four Corporate Real Estate Management (CREM) and Facilities Management (FM) oriented journals from 2008-2017 that discuss the impact of the built environment, facilities and services on health and wellbeing and related topics such as satisfaction, productivity and creativity.

Findings: A conceptual model to analyse impact factors for healthy workplaces covers the influence of many different variables. Most papers only discuss a particular influencing factor, mainly plants and indoor climate. Various papers show that the spatial layout, i.e. the level of openness and opportunities for communication, concentration and privacy, and interior design characteristics, have an important impact on user satisfaction, perceived productivity support and creativity. These factors may have a positive impact on healthy workplaces as well and, vice versa, can be benefits of healthy workplaces.

Practical implications: The paper identifies, which factors are important to consider for creating healthy workplaces and potential benefits of healthy workplaces.

Originality/value: This paper discusses the role of CREM and FM in creating healthy workplaces and reflects on the available knowledge, current omissions, and the need for transdisciplinary follow-up research.

Disciplines presented in the paper: The disciplines of FM and CREM are connected to ergonomics, business administration and (environmental) psychology.

Keywords: health, wellbeing, workplace, spatial layout, indoor climate
Workplace Related Predictors of Exhaustion Symptoms – Results from a Multi-Level Analysis of 26 Office Building

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ABSTRACT

Purpose: Many people spend a substantial share of their lifetime in office buildings. In this respect, office buildings influence employees’ health, work performance, and satisfaction for long periods of time. The research described in this article investigated the importance of office related aspects in relation to other aspects for understanding health, work performance, and job satisfaction of office building occupants. This paper focusses on one of the measured health outcomes (physical exhaustion symptoms) and mainly examines whether subjective evaluations (e.g. with regard to privacy or task variability) are better predictors than objective indoor environment quality indicators (e.g. noise levels, speech intelligibility, CO₂).

Design/methodology/approach: Between 2012 and 2014 more than 6000 occupants from 26 office buildings participated in a survey on their satisfaction with their office space, on their health and work performance and on several control variables. Simultaneously air, indoor environment and acoustic quality were measured (CO₂, air humidity and temperature, VOC, dust, noise levels and speech intelligibility) and building features were recorded (e.g. certification, automation, ventilation). Subsequently, data from different sources was analysed using multi-level modelling in order to identify the most important predictors of the focused outcomes (here: exhaustion symptoms). Physical exhaustion symptoms were measured using Andersons (1998) MM-questionnaire for work environments.

Findings: Dissatisfaction with aspects of the office space (perception of warm room temperature / bad air and of insufficient privacy / noise protection) are statistically significant predictors of physical exhaustion symptoms. Both office satisfaction aspects are stronger predictors of exhaustion symptoms than other statistically significant predictors relating to job characteristics (qualitative and quantitative workload, task variability, task identity). In addition, older and female occupants have a higher risk of experiencing exhaustion symptoms. Objectively measured factors such as building features and indoor environment quality parameters are not statistically significant predictors of exhaustion symptoms.

Practical implications: The results show that perceived opportunities for controlling one’s own level of privacy and an indoor climate that is considered adequate are a resource for preventing physical exhaustion symptoms in offices. Keeping indoor environment quality indicators within recommended ranges is one important strategy to achieve this. Nevertheless, workplace managers can realize additional workplace quality potentials if they try to not only manage the office space but also the related individual perceptions and evaluations of the occupants. Structured user needs analysis, carefully conducted change management, and continuous evaluation and optimization processes are tools that help to implement such a strategy.
Originality/value: This study is original mainly with regard to the two following aspects:

1. Method: Multi-level analysis using a very large sample including subjective questionnaire and objective measurement data and data on building features (26 office buildings, more than 6000 respondents and 700000 measured data points)
2. Research question rarely discussed in the literature: Are subjective evaluations of different office aspects more important predictors of exhaustion symptoms than objectively measurable office aspects / other subjective evaluations?

Keywords: Office Buildings, Workplace Management, Privacy, Exhaustion, Indoor Environmental Quality

Disciplines presented in the paper: Workplace Management, Work Psychology
Session 3, Track 2: Perspectives to workplace
New Workplace Trends – Space for Creative Thinking

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ABSTRACT

The world of work has changed for knowledge workers. Exchange and collaboration is important as well as concentrated work to generate new ideas and foster innovation. But often it is not so easy in the open spaces of the new office areas. On one side you have the advantage to sit together, see each other and be able to exchange your ideas and work easily together. On the other side there are a lot of challenges to deal with, like noise, visibility, lack of privacy, interruptions and so on.

There is another shift in the modern workplace – rejuvenation. Wellbeing and care have become very important, as being essential parts for the modern knowledge worker to be productive and healthy, in order to deliver creative and innovative solutions.

As algorithms and robots replace jobs once done by humans, companies look for ways to leverage the human brain to work on things the robots cannot do – like being creative in finding solutions to problems and in developing “innovations” in the form of new businesses, products, and services. The automation of mundane work activities unleashes tremendous opportunity for focusing workers creatively. Making it possible to work creatively and generate knowledge is one of the biggest challenges companies face. It calls for training and retraining. It demands new skills, not of the hands but of the mind. It has spurred rethinking about how work is organized and how it is valued.

The spaces in which we do anything have a significant influence on our wellbeing as humans, because space affects us emotionally. Space is linked to broadened thinking, attention, and repertoires of thought and action compared to negative effects, and positively related to a host of things that factor into working creatively on one’s own or with others: increased innovation; improved problem solving and decision making; more flexible, thorough, and efficient thinking on topics meaningful or interesting to the thinker; strategic thinking; constructive and cooperative bargaining; increased helpfulness and interpersonal understanding; constructive suggestions and improved self-knowledge.

Space and environment play a major role in human wellbeing. Psychologists James K. McNulty and Frank D. Fincham put forth the idea that wellbeing “is not determined solely by people’s psychological characteristics but instead is determined jointly by the interplay by those characteristics and qualities of people’s social environments.”

Keywords: creativity, wellbeing, innovation, workplace, rejuvenation.
Culture-Right Workplace Design

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ABSTRACT

Does our national culture influence the sorts of spaces where we work to our full potential? Neuroscientists have completed the research needed to show that it does and workplace designers can increase user wellbeing and performance by applying what these researchers have learned about culture and place-based experiences. The purpose of this project was to develop a model linking national culture, the form of the physical environment, and knowledge worker professional performance so that available neuroscience-derived knowledge can be readily used in practice and by researchers. Studies of national culture-appropriate design that are fundamental to the model generated are rooted in the parameters of national culture identified by Hofstede, Hofstede, and Minko (2010). Scientists have tied national culture to preferred physical environments and designing for preferences is important because when the space we are in aligns with our preferences, our mood is more likely to be positive, and that has desirable implications for problem solving, creativity, and pleasantly socialising with others, for example (Veitch, 2012). In addition, neuroscientists have linked neural function and national culture directly (Park and Huang, 2010; Chiao and Immordino-Yang, 2013). A culture-independent stream of research has identified design factors that make it more or less likely that people perform to their full potential professionally in an environment (Veitch, 2012). Integrating findings from these streams of research leads to the development of a comprehensive national culture-sensitive workplace design model that, when used in practice, can optimise workers’ professional performance. Specific design elements of workplaces best used by people from particular national cultures are identified. The model established can be used by workplace design practitioners to guide the development of culturally appropriate workplaces that boost wellbeing and professional performance and also by researchers doing more conceptual studies.

Keywords: national culture, neuroscience, performance, design, workplace
I nter c hange s or Re ality? F lexible S pace – F lexible P eople?

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A B S T R A C T

Flexibility is a central focus of office architecture. Flexible office concepts offer organisations the ability to adapt quickly to change, and provide users with possibilities to work flexibly. Ideas about flexible working shape the design concepts employed in office design, and have consequences for users’ everyday work practices. The concepts require users to be more flexible in their relationship to office space. But do ideas of flexible space make users more flexible? And are the concepts and the solutions supporting those ideas? There is a need for more knowledge about how design intentions in flexible office concepts affect office workers. Taking a socio-material perspective, this paper explores how strategies of flexibility in office architecture affect the everyday spatial practices of knowledge workers. The paper draws on data from a case study in a public organisation that had moved into new office building approximately a year before the study was conducted. The main source of data consists of interviews with architects, management and employees, but also includes observations and analysis of documents from the design process. The findings shows that strategies of flexibility lead to unintended effects in practice. The study suggests that flexible architecture on its own does not produce flexible workers. Rather, flexibility can be co-produced by users and architecture through emergent practices of appropriation and negotiation. By drawing on insights from architectural theory, facilities management research, and organisation studies, this paper provides new understandings of the effects of flexible office concepts. The originality of our study lies in applying a socio-material perspective to investigate the relationship between design and use of architecture. Our findings suggest that space that is designed to be flexible may have some characteristics that afford flexible user practices, but that users’ own agency is required to make flexible users. The originality of our study lies in applying a socio-material approach inspired by actor-network theory to investigate the relationship between the design and use of architecture. For practice, our findings suggest that if space is intended to enhance flexible working practices designers should be more sensitive to users’ ideas of flexibility. Enhancing flexible work for users requires an understanding of what flexibility entails in their particular context, and adjusting strategies to their needs over time. These strategies need to be open-ended enough for users to negotiate within them without causing design failures, and resilient enough to sustain both resistance and appropriation. Users should able to actively engage with and adapt architecture to their specific needs, which may require less standardisation in office design.

K e y w o r d s: F lexibility, w ork p ractices, o ffice concepts, u sers, s ociomateriality
IOT and Workplace Management: New Perspectives for Corporate Real Estate Management

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ABSTRACT

In these days, a single search on Google Scholar using the expression Internet of Things (IoT) brings almost 3,520,000 results. Since 1999, when Kevin Ashton used the expression Internet of Things for the first time as the title of a presentation he made at Procter & Gamble, it has received more and more attention from academics, IT experts, the popular press, and the companies in general. All this attention is due to the fact that the IoT technologies are transforming the way in which companies work and do business. Two of the promising domains of the IoT technology are intelligent building and workplace management. In these days, the workstation became the second companies’ largest expense just after the payroll. Therefore, the development and implementation of IoT technology contribute to the optimization of buildings (energy saving, temperature, and air conditioning control, etc.) and workplaces (occupation rates, etc.), and has the potential to change the major patterns of the corporate real estate. As a result, integrating IoT technology in the workplace management is a strategic challenge in order to create value for the company through supporting strategic decisions, investments and workers’ productivity. The purpose of this work is to review the literature dedicated to IoT and workplace management, in order to identify relevant issues and knowledge concerning the relationship between the IoT technologies (e.g., RFID, sensor, actuator, smart item) and a building on the optimization of the workplace and the productivity of its occupants. The literature review is the best approach to the appropriation of a subject once it allows using the ideas developed in the literature to justify a particular approach to the topic, the selection of methods and demonstration of the relevance and possible contributions (Hart, 1998). This work will also present a discussion of future research directions and the principal challenges related to the IoT and workplace productivity.

Purpose: A paper review of the literature on the subject “IoT and workspace management” from the last 15 years. Design/methodology/approach: We follow the approach proposed by Levy and Ellis (2006) to conduct an effective literature review.

Findings: The principal finding was the identification of previous works and measures correlating IoT technology and workspace productivity. In addition to this, we discuss future research directions and the principal challenges related to the IoT and workplace productivity.

Originality/value: Our study will help both researchers and managers interested in the relationship between IoT and workplace management.

Keywords: IoT, Corporate Real Estate Management (CREM), Smart offices, Intelligent buildings, Workplace productivity.
Session 4, Track 1: Design & use of workplaces
Investigating The Design And Use Of Technology-Enabled Physical Spaces For Co-located Meetings In The Workplace

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ABSTRACT

Purpose: Collaborative working is central to how organizations manage their operations, deliver projects, novel products and services. Such collaborative activities are often time-critical requiring the involvement of multiple domain experts who are increasingly geographically dispersed and rely on the use of digital technologies such as video conferencing, telepresence or immersive meeting rooms. This is particularly important in collaborative tasks where team members need to share and visualise information to make decisions, such as when developing a new product or design document reviews. Though technology considerations are typically prioritized, the physical space can also influence how users engage with the technology and other users in collaborative activities.

Existing research reveals a fragmented understanding of the design principles and methodologies to design and study the use of technology-enabled spaces. There is little empirical evidence to support and help better understand the relationship between the spatial and technological design characteristics which shape activities of the users of meeting spaces designed to support collaboration. There is also a need for more earnest integration of research methods and knowledge between researchers and professionals e.g. in the fields of built environment, social science, organisational behaviour, workplace design, and facility management as these disciplines are increasingly involved in shaping the design of workplaces and their use.

Design/methodology/approach: This research project involves ethnographic studies of the types of collaborative spaces designed for use by groups of people. It will investigate the design characteristics of these spaces (e.g. physical space design, types of technologies used to share and visualise documents) and carry out observations of how users interact with the spaces to support the tasks they undertake during co-located meetings. This will be achieved through in-situ field research studies in industry workplace settings along with semi-structured interviews of users and stakeholders involved in their design, adoption and use of collaborative spaces (e.g. IT, human resources, management, space planners, real estate and facilities).

Findings: The goal and findings are expected to enhance understanding of the relationship which might exist between space, people and digital technologies in supporting collaboration within the workplace.

Practical implications: The outcomes of the proposed field studies will identify the factors to consider in designing spaces for different types of collaborative activities. This can inform designers, space planners, managers and users of collaborative spaces as well as providing new insights for better management of the spaces during the lifecycle of their use.
Originality/value: This research study aims to leverage on the knowledge and research methods from different research domains to inform an integrated framework to better understand the relationship between space, people, technology and the activities carried out within spaces designed to support collaboration in the workplace. The findings and data from the field observations are expected to provide recommendations and distil elements of best practice for further transdisciplinary research studies of collaboration in the workplace.

Keywords: collaboration, team, space, technology, virtual, workplace

Disciplines presented in the paper: Computer Supported Cooperative Working, Human Computer Interaction, Built Environment, Environmental Psychology, Facilities Management
Current considerations and future expectations of office layouts (Workplace strategists’ and design firms’ perspectives)

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ABSTRACT

Purpose: Challenged by the effects of flexible workplace strategies, organisations are increasingly seeking flexibility and functional efficiency in their office space and its layouts. Motivations to change their work environment include increasing collaboration and engagement, reducing CRE costs, increasing employee productivity and efficiency, enhancing the brand, introducing new organisational cultures, introducing new technologies and attracting and retaining skilled employees. Once an organisation decides to change their office layouts, an office design firm or a workplace strategist can be employed to implement new workplace strategies. Understanding the client’s requirements, as well as constraints, are key to creating an efficient office environment for occupiers. Since office layout arrangements have a significant influence on many important aspects of the organisation, design firms need to liaise with the client to determine the most appropriate design process. Therefore this research explores the factors design firms consider when designing new office layouts and the nature of future offices from the design and workplace strategist firms’ perspectives.

Design/methodology/approach: A qualitative study comprising semi-structured, in-depth individual interviews with eight internationally renowned design firms and workplace strategy consultant firms, involved in award winning office designs in Australia, was undertaken. All interview participants were professionals with extensive experience within the field. Using NVivo software qualitative data, was analysed using a thematic approach, which adopted within case and across case analyses.

Findings: The results identified several major factors considered when identifying appropriate workplace strategies for large corporates. These included the existing and preferred culture of the organisation, the level of flexibility required, functionality and technology requirements, acoustic strategies, sense of community, the generation gap between employees, levels of brightness and colours of interiors and furniture choices. Participants believed future offices would be technology driven, community oriented, sustainability, health and wellbeing focused, smaller in size with satellite offices such as co-working and office spaces.

Practical implications: This research has implications for industry and academics since it provides in-depth understanding of workplace specialists’ and design firms’ perceptions of
clients’ contemporary and future requirements from office spaces and the challenges faced when implementing workplace changes. It demonstrates there is a need to consider how the office environment should match with the physical and psychological needs of the organisation and its employees. These findings are of practical application to professionals involved in human resource management and the design, management, development and valuation of office buildings.

**Originality/value:** The paper provides in-depth insights into how design firms and workplace strategists meet organisations’ changing demand for physical spaces, their main considerations in developing new workplace strategies, process followed and the challenges associated with the workplace design process.

**Keywords:** office layouts, organisations, design firms, requirements, future office layouts

**Disciplines presented in the paper:** Built environment
ABSTRACT

Purpose: In recent years, Green Building certification and rating systems have become internationally accepted and are commonly used in the planning and realisation of commercial office buildings. In general, these rating systems analyse and rate comparable parameters such as ecological, economical, and socio-cultural criteria. The latter term is often used to summarise parameters of health, wellbeing, and occupant satisfaction.

Tools like Life Cycle Assessment (LCA) and Life Cycle Costing (LCC) facilitate replicable and comparable assessments of ecological and economic criteria; whereas rating socio-cultural criteria is disproportionately more difficult, due to the complexity of psychological processes of occupants related to spatial conditions and the great number of further influencing factors to occupant’s satisfaction.

In terms of social aspects most rating systems try to ensure a high degree of health, comfort, and occupant satisfaction. Since comfort and health are reflected in occupant’s satisfaction, this research investigates whether existing Green Building certification and rating systems are an adequate tool to measure socio-cultural parameters of office buildings.

To discuss this, we are analysing DGNB (German Green Building Council), BREEAM, and LEED certification and rating systems and match this with quantitative research into office buildings' occupant satisfaction. The aim is to explore whether highly rated buildings are also perceived as excellent by users. Since Altonmonte and Schiavon (2013) were not able to measure significantly different occupant satisfaction in LEED certified Green Buildings and in non-Green Buildings, this research is focussing on the socio-cultural rating criteria within the DGNB system.

Design/methodology/approach: Against this backdrop a by DGNB certified office building is examined. An analysis of the building’s certificate and a participant observation establish a basis for an online questionnaire-based Post Occupancy Evaluation of two comparative groups. The gathered data is being used to compare the survey results and the rating levels of the building within the certificate. In addition, Space Syntax is used to enhance the understanding of social, spatial, and organisational processes within the building. The findings are also being discussed in a wider context by incorporating an external study.

Findings: This paper discloses the limitations of Green Building rating and certification systems with respect to socio-cultural criteria. It is shown that an excellent Green Building rating does not allow the prediction of high occupant satisfaction within a certified building.
**Practical implications:** Our research contributes to the ongoing debate on Green Building by making clear that a different approach of rating socio-cultural criteria may be needed and that today’s marketing of these criteria should be altered since it may be misleading.

**Originality/value:** Since the relation of rating levels of socio-cultural criteria and occupant satisfaction in Green Buildings has not been studied in detail yet this paper offers new insights and data which provide a basis for further research.

**Keywords:** Office Building, Green Building, Socio-Cultural Sustainability, Rating Systems, Occupant Satisfaction

**Disciplines:** Architecture, Sociology, Space Syntax

Coworking spaces as a new type of investment in property market. Case Finland

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ABSTRACT

Purpose: Increasing phenomenon of flexible work and coworking spaces has created a buzz around office property market. Eventually, it attracted attention from investors. Despite the common discussion that coworking spaces are risky and not profitable, in Finland, we notice a phenomenon where large institutional investors run coworking spaces. With this study we aim at understanding why investors choose to enter the market by becoming operators of coworking spaces. Here we improve our awareness on coworking space market from investors’ point of view.

Design/methodology/approach: The study takes a qualitative approach. First, literature review presents current research on coworking spaces and real estate investment context. Then, data is collected through semi-structured interviews with specialists from 4 institutional property investors and analysed by using content analysis.

Findings: The study builds up the understanding of coworking space market from investors’ perspective. Investors see coworking spaces as a fraction in their stock and investment portfolios but having high potential due to different cost structure and a possibility to oversell the theoretical capacity of space compared to traditional office spaces. Main difficulties relate to relatively new concept, lack of space operators and valuation issues.

Practical implications: The paper provides an insight on investors’ perspective towards coworking spaces seeing it as a potential game changer in traditional office leasing. Their justification and point of view can be beneficial for all players by bringing in some certainty regarding this trend.

Originality/value: This is the first (up to authors’ knowledge) attempt to understand real estate investor’s perspective on coworking spaces. The concept of coworking is changing property market and creates new opportunities for traditional players such as investors, construction companies and similar, as well as provides possibilities for new players to enter the market.

Keywords: coworking, new ways of working, office hotels, investors, operators
Holistic Workspace Change Project Evaluation – Concept
And First Empirical Test

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ABSTRACT

Purpose: Workspace change projects are complex, not only in their design and preparation, but also in their implementation and steering towards their objectives. Starting with goal definition and KPIs, an accompanying evaluation needs to be established and continuously applied. A concept for such a workspace project evaluation has been developed and its application to a real case is described in the paper. The results for the real case are checked and discussed, as well as the general applicability of such an evaluation concept.

Design/methodology/approach: The overall research, published in multiple parts, discusses success factors as well as potential pitfalls regarding the contents and processes of designing and implementing modern office work environments in Germany. A framework to effectively do so has been developed and published as part 1. Part 2, regarding the evaluation of workspace change projects, mixes marketing research tools with controlling system components to develop an evaluation concept that is then applied in a first empirical test to a German bank. The time frame spans from preparing the change over moving into the new office environment until 14 months thereafter. It uses a mixed methods approach with document research, several series of mostly half structured interviews, weekly web surveys and corresponding project team meetings. A comprehensive final survey covers the contents as well as the change management processes of the workspace project. The results of the evaluation are presented and discussed in a workshop. With the integration of this information, the concept and the evaluation approach are adapted, resulting in a framework that can be used as a guideline to performance-oriented design, implementation, and evaluation of new work environments.

Findings: The evaluation concept covers two areas: The major dimensions of workspace design including involved actors and performance parameters, and the processes of implementation the change management aspects. The interaction of these areas was also considered. It showed that designing an effective evaluation concept is like designing a controlling system, only with workspace-specific aspects and KPIs: It starts with collecting relevant information to identify gaps between an intended situation and the status quo, analyses this information, supports decision making, provides management with current information under way, suggests steering measures when identifying unintended moves of the project, and finally controls the results in regards to the old and/or new goals. Then the process starts again. Which KPIs are useful and where pitfalls are hidden regarding such projects and their processes can be shown through the first empirics of the real case.
**Practical implications:** An evaluation concept supports those responsible for the workspace project to keep on track by deducting and tracking relevant KPIs, offering tools and methods for group and team processes regarding the change project and providing those.

**Originality/value:** To combine design and change management of workspace projects in one evaluation concept and provide a structured list of possible instruments/methods for evaluation over the different phases of such a project.

**Keywords:** workspace change; workspace controlling concept; mixed-methods change instruments

**Disciplines presented in the paper:** Design, management, sociology
Session 4, Track 2: Sense of wellbeing
Flourishing Workplaces: A Multisensory Approach to Design and POE

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ABSTRACT

How can we design workplaces which occupants thrive in, which are functional but are also expressive? Drawing on research about the senses and office related studies this paper demonstrates how buildings can be designed to allow for positive multi-sensory experiences. In order to design a creative and productive workplace, it is essential to consider how the environment is making us feel, behave and act within it. As the workplace continues to evolve, the case is made for a sensory palette framework to drive a systems approach to building environmental design enabling the integration of the multi-modal sensory relationship of people’s reactions within various environmental settings. Technological advances, in the form of wearables that monitor our physiological and stress responses offer the opportunity to capture empirical data, further enabling the investigation to see how a diverse range of environmental settings affect our physical, mental and social wellbeing. The paper goes on to develop the established conceptual theories of ‘Flourish’ proposing a move beyond comfort when designing the interiors and the mechanics of facility controls towards a sensory impacts framework that considers a whole life costing approach using the Flourish Model sets the basis for a design and post-occupancy evaluation toolkit.

Purpose: To model a way of making health and wellbeing a primary aim at the initial and POE stages of design

Design/methodology/approach: Using the results of research and practice via social surveys and physiological measurements.

Findings: Built environment affects people physically, mentally and socially.

Practical implications: Use as an early design tool to identify strengths and weaknesses in the given project intentions and to use as a post-occupancy evaluation tool.

Originality/value: New approach using flourish rather than comfort as a health and wellbeing indicator.

Keywords: Workplace Design, Multisensory, Flourish Model, Health, Wellbeing.

Disciplines presented in the paper: Environmental psychology, Architectural engineering, Planning and design
Worker’s Well-Being. Evidence from the Supply Chain in Mexico

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ABSTRACT

Purpose: There is a growing body of research about the influence companies have on employee health. However, we argue that companies may influence not only health but also employee well-being. Conversely, we also claim that a high level of employee well-being would translate to improvements in human performance and productivity. In other words, if workers are flourishing—so too will the business, a relationship rather novel in research as well-being in working setting has been usually perceived through the lenses of disease and disability or human rights only, not human well-being in general. This paper presents the findings of the project aiming at the identification of connections between (1) job resources/work conditions, (2) worker well-being and (3) business outcomes in the Mexican supply chain apparel factories.

Design/methodology/approach: Analysis builds on the first wave of the Well-Being Survey (WBS) conducted in February 2017 in three factories of the Levi Strauss & Co.’s supply chain in Mexico. The cross-sectional data of about 2200 Mexican workers on well-being, work performance and job resources are used. Applying structural equation modelling, controlling for a rich set of demographic, socio-economic and job-related variables we examine the relationships between working conditions and job resources and workers’ well-being and performance.
Findings: The results of our analyses confirm two research hypotheses: Work-related factors contribute not only to work performance but also to worker well-being. The influence of work-related factors on well-being can be indirect – through work performance.

Practical implications: Findings of the study provide evidence on the systemic connections between drivers and outcomes of worker well-being and business progress that can serve as the bedrock for an optimization system driven by apparel manufacturers, which is beyond the pass/fail system of compliance management.

Originality/value: The novelty of the paper results from the data source, operationalization of worker well-being and methods. Well-being in working setting has been usually perceived through the lenses of health outcomes. In this study, a well-being measure reflecting human flourishing is applied. This measure embraces a broad range of states and outcomes, including mental and physical health, but also encompassing such domains as happiness and life satisfaction, meaning and purpose, character and virtue, and close social relationships. This implies that worker well-being is operationalized using general, not work related only, metrics.

Keywords: Worker well-being, productivity, working conditions, job resources, apparel industry, garment industry, supply chain
Narratives Empowering Users of the Office

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ABSTRACT

Background: The field of design has a long history of using narrative metaphorically—that is, creating designs that tell a story. However, the involvement of user in spatial narratives in workplace development is not so much investigated. One can state that it is our perception and experiences of a space that give it life. Significance of interior design has been mentioned in many research as a empowering element for employees using the work environment. The research about restorative environment emphasizes the same thing. However there is also evidence that the ways how to use the workplaces increases the satisfaction especially if the employees have joined to the process of agreeing the shared mutual office etiquettes.

Aim: This paper aims to analyze co-created narratives and their expression as pieces of art empowering the users of the workplace. The question answered is how visual elements can be used as the narratives expressing the jointly agreed office etiquettes in the activity based work environment.

Approach: The study is qualitative by its nature and based on case-study method. The case is less than 10-year-old company in real estate sector. The data includes an analysis of documents during four different workplace solutions co-created with users. The symbols and narratives used in diverse solutions are analyzed as means of teaching the more intangible, human-centered issues in the workplace development.

Results: The results indicate that art is a strong tool to enrich the office and empower the social element of shared office. The narratives are easy way to transfer the agreements and also discuss about them.

Practical implications: One can follow the narrative design in order to empower spaces. Space is understood as our experience and the meaning which is given to it.

Value: There has been less emphasis on the potential of narrative as a tool for expressing shared ideas and understanding how the space is used.

Keywords: narrative design, activity based work environment, visual artefacts, office etiquette

Disciplines: arts, environmental psychology, organizational behaviour
Don’t patronise: provoke instead, the state of the art of vitality in the physical work environment

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ABSTRACT

Purpose: Increasingly, office organisations enhance vitality aspects in the physical work environment. This paper aims to explore the alignment of vitality measures in the work environment and the intended organisational outcomes with corporate vitality policies and programs.

Theory: The study builds on a theoretical framework which hypothesizes that organisations implement vitality measures based on a vitality program and an underlying vitality policy. The implementation of these measures and the execution of the vitality program will lead to a healthy physical work environment. This vital physical work environment will in turn influence organisational outcomes.

Methodology: The theoretical framework is empirically explored, based on ten semi-structured face-to-face interviews with HR or Facility Managers of Dutch organisations with large office buildings.

Findings: The findings show that organisations implement measures in the physical work environment, which are hardly based on a vitality policy, but are part of a vitality program. A common finding is that all organisations emphasize their aim is to seduce employees to pay attention to vitality and not to patronize them. The measures implemented in the physical work environment vary enormously, from small workplace adjustments to renovations in- and outside the building. More importantly, organisational outcomes of investments in a vital physical work environment are still quite unknown.

Originality: The results of this study help to make practitioners aware of the importance of and the possibilities for implementing vitality in the physical work environment and show the importance of an integral approach for FM and HR in research into the work environment.

Keywords: Facility Management, vitality, physical work environment, organisational outcomes
Session 5, Track 1: Space, place and interaction
Analysing knowledge sharing behaviour in business centres: A Mixed Multinomial Logit Model

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ABSTRACT

Previous studies have identified physical characteristics within a single-tenant office building (i.e. facilities and spaces) and personal characteristics that influence face-to-face interaction patterns and knowledge sharing between employees within large organizations. However, knowledge about the choice whether and which type of knowledge is shared in business centres, where organizations share spaces, facilities and services, is still limited. This paper addresses this research gap by looking at the influence of the physical work environment on knowledge sharing behaviour within and between different users of business centres, controlling for personal- and face-to-face interaction characteristics.

Data was collected among 100 users of seven business centres in the Netherlands, by means of a questionnaire on personal- and work related characteristics and characteristics of the physical work environment in the business centre. In addition, an Experience Sampling Method (ESM) was used to collect data on face-to-face interaction characteristics. Respondents were prompted at three random times during 10 workdays to participate in a short web-based survey. They were asked to report characteristics of their face-to-face interactions that took place 60 minutes prior to the prompt, including their knowledge sharing behaviour and which people they met. A mixed multinomial logit model was used to analyse the influence of personal-, work related-, work environment- and interaction characteristics on user’s knowledge sharing behaviour (i.e. whether and which type of knowledge was shared during an interaction).

The results showed a limited amount of significant effects of the physical work environment. Only a cellular office was found to have a negative effect on sharing tacit knowledge during an interaction, compared to other office concepts. Furthermore, the results indicate that knowledge that is also available in a documented form is less frequently shared by freelancers/self-employed workers, than by people working for a larger organization. In addition, during a pre-planned interaction the propensity that people share knowledge that is also available in a documented form or by other people is higher than during unplanned interactions. Finally, the propensity that tacit knowledge is shared is higher during the activities: discussions/debates, meetings and when receiving or giving information.

Based on these results, property managers of business centres need to make a shift of their emphasis from the building to the people. They need to make interventions based on the
preferences and needs of their users to create more attractive work environments that stimulate unplanned face-to-face interactions and specific knowledge sharing activities. Results of this study also provide organizations more insight in their knowledge sharing behaviour, which could help them to increase their creativity and innovation processes.

**Keywords:** Business centre, Face-to-face interaction, Knowledge sharing behaviour, Experience Sampling Method (ESM), Mixed multinomial logit model
Exploring interdependencies between perceived visions of change and adoption of Activity-based Flexible Offices

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ABSTRACT

Purpose: The purpose of this paper was: (i) to identify office users’ perception of the organisational motives and visions behind relocating to Activity-based Flexible Offices (A-FOs), and (ii) explore whether the users’ perception of change visions may relate to adoption of A-FOs as office innovations and/or to underlying causes of satisfaction or dissatisfaction with the office solution.

Design/methodology/approach: A case study approach was chosen to enable the understanding of users’ perception of change motives and its relationship with adoption of A-FOs and satisfaction or dissatisfaction with these office solutions. The case organisation was a Pharmaceutical company that had relocated a total of 160 employees to two floors of the same building. All of the employees were invited to partake in the study. The employees in floor A were relocated two years prior to the study, while the employees in floor B were relocated two months prior to the study. The data collection involved (i) semi-structured interviews with 22 employees and one process manager from the facility development group, (ii) collecting documentations regarding planning process, the solution, and earlier evaluations of the concept, and (iii) observations regarding actual use of the premises.

Findings: The documentations and the interview with the process manager revealed that the organisations’ motives behind relocating to A-FOs was (i) to allow for organisational flexibility and facilitate collaboration, especially since they had a need for collocating different departments, (ii) cost-reductions by eliminating costs of moving groups and departments, and (iii) optimising use of spaces and resources. According to the majority of the interviewees (10/12) from floor A, the organisations’ motives behind relocation were to improve and facilitate collaboration and as a result achieve a more effective way to deliver their products. Their perception of organisational motives behind relocation was in line with the actual intentions. Interviewees from floor A were satisfied with the premises and felt that the A-FO solution supported their activities. On the other hand, according to all of the interviewees from floor B (two months after relocation), the motive behind relocation was to reduce costs. Their perception of change motives deviated from actual intentions. They were dissatisfied with the A-FO concept and felt that it impeded their work. While all interviewees from the first group adopted the office solution, half of the interviewees from the second group rejected the desk-sharing concept and did not switch workstations as intended.

Practical implications: It is important to clearly communicate and motivate the reasons, motives and visions behind relocation to A-FOs during the implementation process. Furthermore, attention should be paid to the adoption and appropriation of A-FOs as office innovations, as this study showed that the employees who had used the A-FO for two years were more satisfied with the solution.

Originality/value: This study shows that (i) employees’ perceptions of organisational motives behind relocation has relevance for satisfaction with A-FOs and compliance with desk-sharing
rules, and (ii) whether time for appropriation and adoption has relevance for satisfaction with A-FOs.

**Keywords:** Activity-based Working, Change motives, Adoption and Appropriation of Innovation

**Disciplines presented in the paper:** Work environment, Work Life Studies, User-centred design Adoption of Innovation, Implementation and design Process
Efficacy of Office Work Environments – Results from an empirical study

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ABSTRACT

This paper is based on a very recently (December 31, 2017) completed online-survey of 1,067 workplace experts in Germany (97%).

Office work environments are designed to be efficient and/or effective – however from different perspectives, e.g. that of real estate investors or that of users. Very often, these perspectives differ although they all too often claim to address to the very same goals of – what we call – the user organization. This paper focuses on the efficacy of office work environments, where efficacy is defined as the power to produce an effect in the sense a support function for the user organization. This effect is implicitly meant to be positive, i.e. contribute in a positive manner to the goals of the user organization.

Among the key findings that will be presented in this paper are the following:

1. Office environments are meant to be supportive a whole range of goals. Among these are the support of the corporate culture, work processes, employer attractiveness, sustainability and others. The results of the online-survey imply that office work environments differ in their efficacy to support these goals.

2. Offering a wide range of spatial options (e.g. in the form of so-called multi-space office environments) has a statistically highly significant positive effect on the efficacy of work environments, especially when compared to single office structures or all other types of offices.

3. Particular effects of a wide range of spatial options in office environments are statistically significant higher levels of “practiced collaboration” in those office environments, “practiced autonomy” by the users, or “employer attractiveness”.

4. Interestingly, the data shows that top management has a significantly more positive assessment of the work environment efficacy compared to lower ranks and employees.

5. The findings suggest, that the respondents of the survey should be clustered into three different categories since they partly differ statistically highly significant in their responses: experts on the offering side (architecture, real estate, design: 37%), consultants (9%) and experts on the demand side (originating from “user organizations”: 54%).

6. The data shows no particular effects due to age or gender.

As an implication of these findings, the paper will present levers to increase the efficacy of office work environments.
The semiotics of space awareness - Moral character and entanglements of power

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ABSTRACT

Purpose: Space is not irrelevant. Space creates meanings, it signifies, and it shapes us. Over the years, space has been approached by philosophers, psychologists, architects, engineers, facilities managers and educationalists, to name but a few. In this paper, we apply a humanistic approach that takes into consideration the making-of-space or taking-space as a social semiotics entangled with power and affect /emotions and (d)emasculating.

Research design: We discuss how human (inter)action in space can be theorized and elaborated further through what we term space awareness applying semiotic methods. By space awareness, we refer to how people are aware of their socio-physical surroundings, how they position themselves in relation to other people and also, artefacts, and how this positioning or relationship to others is an act of signification and signs in action. Because it is always a moral choice how we position ourselves in spaces and in relation to others, space awareness can be said to be a reflection of moral character.

Results: After considering space awareness, power entanglements and moral character, we present the semiotic apparatus. The semiotization entails the typification of different stances that applying the semiotic approach found for people, in space awareness and their relation to each other. We discuss our approach by a synthesis of moral character and power in the semiotics of space awareness.

Contribution: This initial framework for a semiotics of space awareness leaves several interesting questions for further studies. How, for instance, are individual space awareness features related to community-level or cultural space awareness? What is the role of positional power in people's possibilities to act in a space and how power emerges in space awareness as signification?

Keywords: Semiotics analysis, Signs, Space Awareness, Workplace, Power