UNLOCKING CREATIVITY WITH THE PHYSICAL WORKPLACE

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ABSTRACT

Today's businesses have to become more creative and innovative to deal with growing competition and globalization. The physical workplace can be of value for facilitating creativity. This paper reports on research conducted on the aspects that determine creativity and a case study which investigated the relations between creativity, creative work and creative work environment with a creative organisation. The paper proposes a model to position relations, elements and forces that determine the match of a creative workplace and its occupiers. The framework positions creativity, creative work and an appropriate work environment. It helps to unravel the complexity of facilitating creativity and creative work processes. The case study emphasizes the importance of clear definitions, and illustrates the meaning of lay-out, colour, light and space for presenting ones work.
The framework is a hypothesis. The application of the model still relies heavily on the insight and current knowledge of facility managers about their organisation and context. The paper offers guidelines and ideas for facilities managers to understand how creativity can be unlocked with the physical workplace.

Key words: creativity, creative work, workplace, workspace

INTRODUCTION

Company performance is becoming more and more dependant on an organization's ability to be creative. Businesses distinguish themselves through their capacity for continuous innovation (Nonaka and Takeuchi, 1995, DeGraff, 2002). Innovation can be seen as the successful introduction of new products and services. Creativity is necessary for innovation (Jacobs, 2005).
Office work is becoming less administrative and also less time and place dependent. At the same time work is becoming more complex, creative and knowledge intensive (Hazeveld, 2006, Kampschroer et al, 2007, Becker, 2007). Office space can contribute to company performance (Allen, 1997, Becker, 2001, Brill, 2001, Croon et al, 2003, Voordt, 2003) . Literature further suggests that the physical work environment can have a positive effect on the creativity of an organization (Nonaka, 2000, Worthington, 2000, Florida, 2002, Becker, 2007). However it stays unclear how and under what conditions this added value can be realised.

This paper aims to further conceptualize the creative potential of the physical work environment by identifying and exploring the various relationships between creativity, creative work processes, and the physical workplace. Furthermore it proposes a model to position the relations, as well as the elements and forces that determine the match of a creative workplace and its occupiers.

APPROACH

The knowledge and framework presented in this paper is based on the following three research projects undertaken by the Center for People and Buildings in the period 2005 to 2007.

1. *People, work en work environment in the IT-age*, is a research program which included five research projects focussing on the impact of ICT on office accommodation (Martens, Hazeveld, Achterberg, Pullen, 2005 and 2006)
2. Literature study on creativity and the physical workplace: Literature review, aiming to identify a theoretical framework for exploring the variables for unlocking the creative potential of the physical work environment. Method: exploratory, snowball sampling.
3. *Stimulating Creativity with StudioMingle*, a case study with a creative organization on the impact of the physical work environment on creativity (Gielen, 2006)

Towards a model for the creative work environment

In order to distinguish the variables between creativity, creative work processes and the physical work environment I have designed a research model based on two earlier models:

- a model for the quality of an office by Wentink (1999), and
- a conceptual framework on the relationship between office innovation and the performance of the organisation by Van der Voordt & Vos (1999).

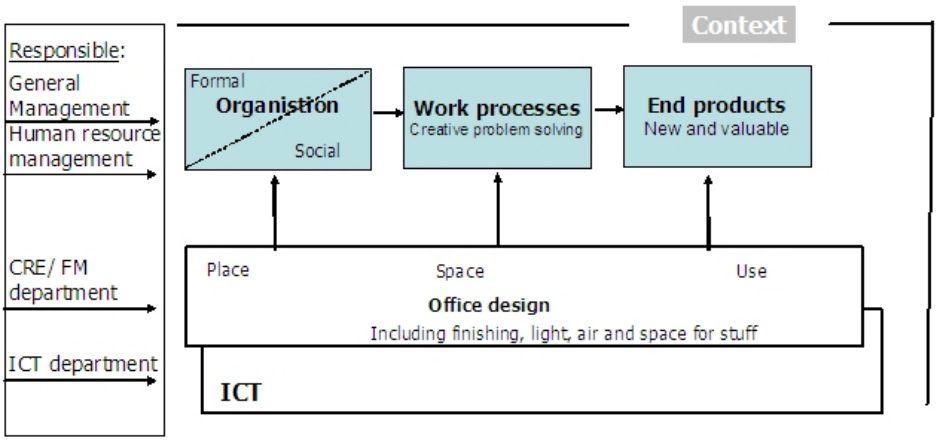

Figure 1. Framework: the contribution of the physical work environment for creativity and creative work processes

The framework presented is an amended version of Van der Voordt & Vos (1999) model. The model (Van der Voordt & Vos (1999) portrays the interaction between facilities (Housing, ICT, other means and services), organisation and work processes within a business context. Adjustments in one of these variables will affect the quality of the end product.

Insight from literature and the experience with Wentinks model lead to modification. A distinction is made in the formal and social part of 'Organisation'. Literature point out that creativity within organisations is highly influenced by the social work environment.
Wentinks model makes a clear distinction between a social subsystem and an organisational subsystem, next to a spatial and technological subsystem. Wentink sees the office as an open

system with a structure of subsystems and relations. Three case studies and interactive sessions with participants from six different organizations, showed this model is useful in discussion with office end-user organisations as the subsystems are easy to translate to responsible departments: ICT, HRM, GM and CRE/FM. Both literature and the cases indicate that organizations awareness, alignment and integrated management on all four subsystems, are useful in order to fulfil organizations objectives. The adjustments in Voordt and Vos model emphasize the importance of the subsystems and will also help to communicate better.

Creativity, creative work processes and the creative workplace

Empirical research (Csikzentmihaly, 1996) shows that the right place and the right time are essential for creativity. Buildings and the configuration, design and management of space can both constrain and support the exchange of ideas and the flow of knowledge. The challenge for a firm to grow and prosper, is to have the ability to capture, share and innovate from that knowledge (Worthington, 2000).

Creativity, productivity and the work processes

Creativity is "the ability to create". Creativity can be defined as:

- "the imaginatively gifted recombination of known elements into something new "(Ciardi 1956)
- "The ability to fluently solve problems with original, innovative, novel and appropriate solutions (Guilford 1967)
- Creativity is doing new things with old things (Sutton, 2001)

Creativity is about breaking through existing patterns and realising new combinations. Csikszentmihaly (1996) discusses two terms which are important to indicate if something is creative: new and valuable. New means unusual, unique, new points of view, varied, original, breaking from existing patterns. Valuable means useful, effective, efficient and contributing to society.

Creative workplace

Literature (Andriopoulos, 2001) highlights five organisational factors that enhance creativity in a work environment: organisational climate, organisational culture, leadership style, resources and skills and structure and systems. Mathissen and Einarsen(2004) mention that creative and innovative behaviours at work seem to be promoted by a cognitive flexibility created by a combination of both personal qualities and work environment factors (West & Richards, 1999 in Mathisen and Einarsen, 2004). Work environment factors that promote creativity are: a feeling of shared, clearly-specified objectives, as well as a possibility to challenge them; exchange of opinions or ideas; constructive controversies; freedom; challenges at work; trust and safety; team participation and collaborative idea flow; and open relationships between colleagues, as well as between supervisor and subordinates. Most of these factors have demonstrated predictive value in relation to creativity and innovation (Mathissen and Einarsen, 2004).

Creative work processes

Creativity and innovation depend on the free flow of information, but also on the recombination of non-obvious knowledge in ways that trigger novel solutions to complex problems (Hargadon and Sutton 1997 in Becker 2007). Creative work is mainly project work

in circles with both intense and slower periods. Creative work requires enormous concentration, and people require flexibility so they can have some personal downtime even during the day (Florida, 2002).

Kristensen (2004) states that creative processes are mental processes. Creative thinking is hard to turn on and off (Florida, 2002:125): when people have the flow of their creative work interrupted it typically takes them 20 to 30 minutes to refocus.
Creative knowledge work is both highly cognitive and highly social (Heerwagen, 2004). Workers need time alone to think and develop ideas, drawing on their own memory, insight and analytical skills. "Creative moments exist by the sake of breaks" (Interview Prof. J. Buijs, 2007). They need 'hassle-free' time for non-conscious processing that aids creativity and imagination (Claxton, 2000 in Heerwagen, 2004). In order for ideas and concepts to become useful to an organization, they must be made available to others for examination and further development.
Wallas (1926 in Kristensen (2004)) recognises four phases in a creative process: 1) preparation (facilitating data and information for the process) 2) incubation (implicit cognitive process, primarily individual) 3) insight (a 'flash' that occurs when the wining concept cuts cross the barriers of consciousness) 4) elaboration and evaluation (comparing results to the goals of the preparation stage: are goals and values met?).
The creative process can be seen as a process with different stages with different activities. Generating ideas and coming to new and valuable insights, though important, are only a small part of the process. The whole process includes highly cognitive individual and collaborative tasks. In order to create, ordinary tasks which are less cognitive are required. The different stages could indicate that in modern organisations different people with different tasks and competencies are involved. Another possibility is that workers are involved in various creative processes which are in different stages. Different simultaneous projects would require them to be analytic at one moment and highly communicative a minute later. Facilitating creativity from a creative process and activities perspective could mean different workspaces for different activities, but also one workspace that supports all the entwined activities.

Creativity and the physical workspace

Creativity can take place everywhere. Archimedes was taking a bath when he yelled *eureka*. Technology provides creative office workers with the tools to work wherever one goes. Office work is done in different places (at home, on the road, or at the office) (See Vos at all , 1999) and knowledge workers need mobility and spend a lot of time out of their offices. They spend up to half of their time out of their offices, either in meetings, talking informally in other peoples' offices, or travelling (Davenport, 2005).
In the context of independence of time and place, knowledge workers don't want to consider their home office, or matter of transport to be their office(Van Meel and Vos, 2001). It is extremely important for workers to have a common space where they meet colleagues, learn, have small talks with their boss (if they have one) and catch up with all the new gossip.

New workspaces that accommodate creativity share a number of practical features (Florida, 2002, Worthington, 2002):

- Corporate real estate has to serve a statement and is used as a marketing vehicle.
- The workplace has an experimental component: creative workers like visual stimulations.

- The new workspace is productive in the sense of being adjusted to the flow of modern creative work. It provides diversity: a wider and richer range of work settings that can support creative and collaborative work.
- Sharing: increased amount of shared space, space that is not owned and can be used by different staff over time.

Creative interactions can just as well take place in individual offices. Grajewski (Grajewski, 1993 in Kornberger and Clegg, 2004) found that 64 percent of all interactions happened in individual offices, and not, as intended by the planners, in the multi-rooms, café shops, and meeting rooms. The major task becomes how to combine the protection of the solitary with the natural generation of more randomised with others. (Hillier 1996:265 in Kornberger and Clegg, 2004).

Stimulating Creativity with Studiolab

At the same time research was undertaken (Gielen, 2006) with our colleagues from the faculty of Industrial Design. Their workgroup StudioLab focuses on four research lines: Designing for the Senses, Design and Emotion, Inspiration Engineering, Intelligence in Products.

Studiolab had at that time four connected studio's, StudioSay, StudioMake, StudioDo and StudioMingle, with each their own goal: StudioSay is their meeting space. StudioMake and StudioDo is the space where prototypes are made and tested. StudioMingle is a collaborate space with individual workstations to provide researchers a workspace. This space was evaluated.

The basic idea about StudioMingle was as followed:
- Crosspollination through interaction and informing each other through speech and exposed work.
- Intensively used, over 30% of the desks should be occupied at all times.
- A protected environment for its users.

The research investigated the perceived contribution of the office space to creativity. A literature study primarily based on McCoy and Evans (2002) narrowed the aspects of the physical environment to be investigated to lay-out, furniture, colour, finishing and light.
A questionnaire was set out under all workers within StudioMingle. They were asked about their accommodation needs in relationship to creativity, their satisfaction on these points and the required adjustments. Both open and enclosed questions were asked. Additional interviews and observations were undertaken to enrich the data and elucidate findings. Nineteen of twenty-one end-users responded to the questionnaire. Fifteen questionnaires were eventually suitable for analyses.

StudioMingle is open plan workspace measuring 10 by 18 meters. The details are as follows:
<u>Lay-out</u>
- 18 workstations, a small break-out couch and table and a little kitchen.
- total of 180 m2 for 18 workstations
- Workstations are 4 m2 with 1.5m2 of desk space.
- 40% percent of the floor area is covered with furniture.
- Visual contact is possible from 12 of 18 workstations.
- 6 workstations are positioned towards a wall or filing cabinet

- The main route leads right through the centre of the office. The printer is on one end, and the water tank on the other.
- All workstations are personal but (temporarily) unoccupied workstations can also be used by other researchers.

Furniture

The furniture in StudioMingle is limited to desks, chairs, filling cabinets and one couch. The higher filling cabinets (approximately 2m) are placed against the wall so the whole room remains visible. Smaller filling cabinets of 1,30 meter high, are situated next to the workstations.

Colour

The used colour within StudioMingle is mainly white and grey. All walls, pillars and ceilings are white, all filing cabinets are grey, as is the floor and the frames of the desks. Thirty percent of the room is filled with colour: mainly in the break out and small personal belongings

Finishing

Variables	**Percentage of total area space**	**Finishing in StudioMingle**
Natural materials	15%	Desks, plants, homemade bamboo furniture
Stone based Materials	25%	Walls
Transparent materials	10%	Windows
Synthetic	38%	Linoleum floor and personal belongings
Metals	9%	Frames of desks, rolling cabinet, trash cans
Cloth	3%	Break out: couch and carpet

Light:

Light comes from a natural source through 26 m2 of window, artificial lighting is provided by TL (Tube Light) and 18 small desk lamps adding a maximum of 80 lux.

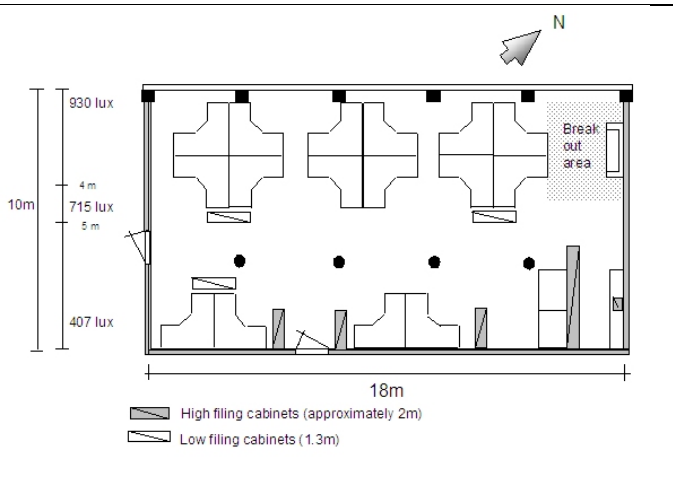

Figure 2 Floorplan StudioMingle

Figure 3 Interior of StudioMingle

Organisation

StudioMingle is occupied by a diverse group of researcher. The fifteen responding users consisted of students (3), PhD-students (5), a researcher (1), guest researchers (2), a teacher (1), teacher and researcher (2) and a teacher and support staff (1). Most of them work les than one year (7) at StudioMingle and four work longer than five years. Ten users are between 21 and 30 years old, three were between 31-40, one between 41-51, and one user was over 61 years old.

Five employees work 40 hours per week at StudioMingle, all other researchers work less hours at StudioMingle: 3, 8, 18, 20 (=2persons), 23, 24, 30, and 36 hours. So five workers work permanently in StudioMingle, the others together 20 hours average. At StudioMingle they primarily do 'working with the computer, reading and writing' (66% of the time). Ten percent of the time is spend on informal meetings. No information was collected and no questions were asked and about the social work environment.

Creativity and creative work

Users had different opinions about what creativity is. Some feel it is a mental state: feeling sparked, bending existing rules or just sensing. Others considered it a process of thinking and building, communicating towards novel, useful and creative outcomes or thinking and shaping old things into new things.

Creative work was also perceived divergently. The users perceived they were creative in StudioLab by 'thinking of new products, ways of working etc', 'meeting with others' and 'having a different view of something that already exists'. Designing by making drawings and sketches was mentioned as well. Although the users in StudioMingle spend most of there time on reading, writing and working with the computer, this was not seen as 'being creative'.

User perceptions

Users of StudioMingle think that 'light' and 'lay-out and the way it facilitates contact with colleagues' were most important for the stimulation of their creativity. In the lay-out the openness was especially appreciated as it provided physical space for thought: "creativity needs a horizon".

The contribution of colour seems relevant to creativity, but can be seen from different perspectives. Almost all of them would like some more warm colours, as it would be nice and could affect their mood. It could be of value for creativity, as the current colours were perceived as boring and not a comfortable atmosphere. Four respondents explicitly mentioned colours to have an effect on the creative potential of the physical work environment.

A physical aspect that hindered their creativity most were the lack of wall space to present their work. Users responded ambiguous to noise and the many objects and stuff in the room. Most of the users think that the objects are stimulating; some think the mess hinders their creativity.

Some workers thought it was too noisy in StudioMingle, one thought it was to quiet.

Recommendations from users for improving creativity with(in) StudioMingle were:

- More space (walls) to present their work;
- Better informed about colleagues' work;
- More colour;
- Fresh air.

Current status

The work environment has been subject to few changes over de last 2 years. Several industrial designers feel responsible for making this environment work. The lay-out remained the same but more colours on the walls and columns have been added to the room as well as presenting space on whiteboards and panels. The two researchers spoken with state an important change has been the use of the space. With two 'loud' colleagues, who perceived creativity with music and noise leaving it has become more quite. Showcase products have been moved away from the workspace, which reduced the number of interruptions by visitors.

We did not carry out a new evaluation, but responses in informal discussions indicate more satisfied users on the changes. Still they state that as with the organisation, the work environment is never finished neither perfect.

DISCUSSION

The case illustrates that the office space can be of value for an organisations creativity. Among workers there seems general agreement that, a more colourful environment, with some fresh air and space for presenting personal work can contribute to the end-users well-being and creativity.

Crosspollination is marginally fulfilled. Researchers would still like to be better informed about one another's work. This would indicate that situating everyone in one room is not yet a recipe for crosspollination. More space for presenting their work was mentioned as a solution, which can lead to more awareness and discussion about one another's work. This would take in account that most workers work part-time. But the problem could well be that there is no direct need for discussing one another's work. Maybe it is the open work environment that has a negative effect on communicating or as two researchers indicate they lack time to inform themselves on each others work when there's no direct (perceived) need.

The case also pleads for clear definitions, especially when using questionnaires. Creativity, being creative and stimulating creativity are ambiguous terms and have different meaning to respondents. The definitions mentioned in this paper can be of value for further research. For further explanation of the framework clear definitions of different space types are also required.

Finally it is apparent that the physical work environment can contribute in different ways to creative organisations:

- Express creativity to outsiders and its users: by using colourful materials, unusual furniture and presenting physical representations of the organisations work (models, posters, artefacts). An appearance which reflects the identity of its users can also lead to higher satisfaction and a greater sense of belonging
- Stimulate the mental process of creativity: by providing comfort and well being for individual creativity, and spaces for objects and presentations to be inspired by these artefacts and the work of colleagues.
- Facilitate creativity, by designing dedicated spaces which support the number of users, the required noise level (enclosed/ open) and stimulate the senses (relaxed or triggered and inspired).

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