

The Multifaceted Impact of Open Space on Teams Members

1. INTRODUCTION

Real estate is often the second most important item of expenditure in an organization's budget (Hills and Levy, 2014; Haynes and Nunnington, 2010). As such, it should be subject to strategic decision-making. Especially open spaces that are increasingly popular, are they positive investments for the company and its employees? Do they really support the work of the teams? Can everyone work in these spaces without the negative impacts outweighing the benefits?

Like activity-based workspaces, also called open spaces, open innovative spaces are designed to be efficient and flexible. However, unlike activity-based spaces, collaborative or innovative spaces are most often geared towards collaborative and creative teamwork rather than individuals who sometimes work in teams. Indeed, companies often rely on a project-based organization in other words by team to increase their flexibility and thus adapt to environmental changes in technologies and markets (Kumari, 2017; Ross et al., 2008).

It was suggested that the effectiveness of the teams depends on the context and particularly on that of the organization and its vision of the work (Lohuis *et al.*, 2013). Therefore, the research objective is to further explore the relationship between multidisciplinary new development product (NPD) teams effectiveness and the perception of the workspace of different categories of team member: artistic, technological and management people.

2. LITERATURE REVIEW

Physical Spaces and their influence

Employees are affected by density, the proximity of team colleagues, privacy, and control over their own environment. Other elements include aesthetics, attractiveness, and the degree to which a space is emotionally, artistically, or intellectually stimulating (Oksanen and Ståhle, 2013). Comfort is determined by ambient and spatial conditions at the workstation level. Ambient conditions include lighting, noise, air quality, air movement, temperature, and humidity (Sundstrom and Sundstrom, 1986). A satisfactory physical environment includes a number of elements that determine the degree of comfort like: physical comfort (safety, hygiene, and accessibility), functional comfort (ergonomics that support the performance of work tasks and activities), and psychological comfort (a sense of belonging, ownership, and control over one's workspace) (Vischer, 2007). In sum, the indoor environment is the outcome of a number of dynamic interrelationships between thermal and comfort needs, physical factors, and chemical and biological factors. The quality of the indoor environment is therefore critical for health and well-being of individuals (Wood, 2003).

At the team level, impact of the working environment on the multidisciplinary project teams effectiveness has been the subject of very few studies: only 10% of management studies focus on spaces and the working environment 7% of studies in engineering / ergonomics (Appel-Meulenbroek, Clippard and Pfnur, 2018). Noteworthy, an element that stands out for team innovation is space variety (Lee, 2016; Blakey, 2015). According to Hua et al. (2010), meeting rooms of different sizes should be provided to accommodate the various types of meetings that the teams hold (Wood, 2003), and they should be located near the workstations. Also located

nearby service spaces where individuals can intersect should be designed to avoid spreading noise to the open space (Hua et al., 2010). This kind of design and proximity is generally viewed as a form of organizational support that, in itself, fosters collaboration.

Each team member is treated the same way even if there are 3 main categories of work: artistic like cinematic animator, character modeler and special effect artist; technological like generalist programmer, technical architect and tools programmer; management like production manager, project closer and executive director. The only difference is that most workstations are highly customized to each team member's tasks.

Team effectiveness is a complex, multifaceted concept, with important ramifications for overall organizational success (Andrews, 2012). It is a mix of team characteristics but also team members competencies and actions / reactions in an organizational context.

3. METHOD

We conducted a case study of a large, innovative hi-tech company. Our objectives were to obtain sufficient data and to address a quasi-experimental workplace design, where teams were working in different environments. We used a variety of data collection methods, including 40 semi-structured interviews, four months of active on-site observations and 11 months of collaboration, a secondary data analysis, and a survey.

Our first interviewees work in the CRE department and interior design team. We also interviewed individuals from the relocation department (working for CRE). As for the team interviews, we have conducted 24 interviews with the NPD teams including; 3 with R&D teams and 5 with persons from administrative services. The sampling provides a good representation across decision-making levels and functions: technological, artistic and management as defined by HRM.

4. RESULTS & DISCUSSION

The company

The company operates worldwide, and it faces fierce competition. The industry, electronic entertainment, is high-technology-intensive and the products have a sophisticated, creative edge. Its diversity of platforms and sophisticated technology require a cutting-edge multidisciplinary workforce and up-to-date tools and work processes. The company is coping with pressing challenges related to innovation, productivity, and its ability to attract and retain top talent. Fast and frequent releases are at the very core of competitive stance. Its performance depends largely on the quality of the environment it provides for its workers and teams, who must operate in close collaboration to one other on site and abroad; each studied team is a mix of mainly co-located sub-teams and one or more co-development teams of the other sites of the company.

The space and the team members

Employees have to work on site, there is no work to be done from home and employees cannot go out for coffee with their work; secrecy surrounding projects is actively maintained. An open-space approach has been applied to all the spaces since the beginning of the activities of the company on this site, even if certain areas have not been yet renovated. Priority is given to

flexible design (team, supported by CREM can change space design according to the growth / decrease of teams and the creation of "temporary" sub-teams addressing specific issues. The characteristics of the furniture, the technology and the layout must very quickly follow the needs of the teams). Indeed, NPD team size varies greatly according to the project phase in progress. The project team is tasked to create the original products and update them regularly. Each core team remains attached to a particular brand for the duration of its market life cycle. The team is subdivided into several sub-teams according to the number of derivative products as well as the scope of the work. For each development phase, the size of the project can reach several hundred employees spread over two or more sites. It may happen that a small team from another site (sometimes up to 40 people) is moved from their country and accommodated for a few weeks at the site studied. The CREM manages the space for each team taking growth/decline cycles into account but the scale of these makes it impossible to reserve a few hundred stations while waiting for their occupants. Hence the frequent redesign and relocations.

Each location is organized to give the teams the largest amount of space and to provide a variety of meeting rooms (large or small, equipped or not, decorated or not, etc.). The floor layouts also include break areas and testing spaces (closed or semi-open laboratories, as appropriate). Plants, service islands, and personalized elements are arranged to provide a certain degree of privacy between sub-team. Most desks, chairs and filing cabinets are on wheels so that the teams can rearrange their spaces by themselves to accommodate new working configurations. On average, NPD employees move twice a year. Another very visible element is the variety of meeting rooms, relaxation areas or testing spaces and cafeterias. Several people from all trades speak about space personalization to strengthen project commitment in the same vein as Jaitli and Hua (2013). At first glance, it may sound somewhat trivial but it is an element taken really seriously.

We ask employees what fostered better performance, distinct elements were identified by the different trades but proximity was very important for everyone. Indeed, the proximity between the people with whom one works on a daily basis is central and participates in the smooth running of the project. We have also been able to confirm this need for proximity for local teams with another site. However, an overview reveals different needs. Artistic category staff tend to place isolation and functionality at the center; administrative staff consider coordination and confidentiality essential while technological staff place ergonomics and technology at the center.

Several *Artistic* types have difficulty isolating themselves and concentrating in an open space. Also they do not feel that the space allows them to belong to their team since frequent moves prevent a project from putting "its color's" in the temporarily allocated space. They would appreciate the means and space to affix their distinctive signs. This would be seen as a recognition of their work and achievements.

I believe a lot in lost spaces (informal areas, corridors), I think that the main negotiations happen in corridors and that meeting rooms have the advantage of sharing knowledge and decision-making, I think there is a lot of decision and design that is done on the side.

Brand Creative Director

Managers talk about values transmitted through spaces like professionalism and freedom to explore - which has been mentioned by many. The open area is seen as conducive to accessibility and visibility and thus to interaction which in turn increases communication and collaboration which in turn can increase creativity - leading to performance in the end. The open plan also makes it possible to erase hierarchical differences since everyone is there. Noise is omnipresent

in all interviews with managers. The consequence is a difficulty of concentration for themselves and for the employees. Managers all have tasks that require confidentiality, especially staff appraisal and they are uncomfortable to do it in front of everyone.

Meetings are an integral part of project management and for this purpose the diversity of rooms and informal areas is very important. As they are the ones who in general, reserve rooms, they complain about their "perpetual unavailability" and that the reservation system is not easy. Also, unlike other trades, managers consider informal areas useful for getting away from the team and enjoying some privacy alone or with 2-3 people.

"When I want to present a follow-up or a decision, I go to a small auditorium-style room where people are in a more passive position. I'll repeat it to several groups but I don't use the very large rooms unless it is a closing because people feel less concerned in a large space if it's during the project".
Producer

The *technological* types we interviewed have a less complex relationship with physical space than other trades. In fact, they spend a lot more time at their workstation. In this sense, ergonomics for them appears as a major challenge: they must have a comfortable chair, a practical desk and a workstation big enough to have the number of screens they want (most of the time 2 or 3) and equipment. For them, open space is important as it promotes quick and easy exchange and access to colleagues and superiors. Also, they generally say they make little use of informal areas to relax or for informal meetings, since this usually happens close to their workstation. On the other hand, the electronic space is richer and more active for the *technological* types than for the others: they are permanently connected to their group (community of experts or sub-team) through the dedicated infrastructure.

The open spaces give access to what others are doing at the same time. You can immediately jump into a discussion!
Physics programmer

Other complaint of a lack of privacy, but they also note that team members need to occupy the same open area for the purposes of proximity, in order to cope with the growing complexity of projects. When they need to make personal phone calls, employees seek out private spaces, which are rather scarce. This need is been filled recently by providing a few small rooms – solo booth, called concentration workplaces by Appel-Meulenbroek *et al.* (2011) - for individual work (1 to 2 persons), which would also give managers the opportunity to withdraw from the team area from time to time. Also some employees brought up workstation and workplace ergonomics, requesting improvements to alleviate the stress of sitting for long periods of time.

Managers have mentioned to us an evolution in the complexity (more diversified and global clientele, more numerous technological platforms, more and varied potential security breaches, etc.) which they are trying to address by organizing team members from both a managerial and a spatial point of view. Many of their sub-teams are further divided into different pairs: usually a *technological* type and an *artistic* type working together for a better integrated product. This is reflected in layouts that seek to optimize the proximity of a binomial or trinomial structure, avoiding the setting "face to face" which does not work well because of the screens blocking the view. Layouts in Figure 1 are quite current, filing cabinets on wheels are usually put under the desk. They serve two purposes: carry personal items during a move and; allow a visitor to sit

down. Glass or slate surfaces on wheels and writable walls are everywhere. Each team member cannot change configuration without having first convinced his project manager and the sub-team. A CRE employee is usually consulted when it comes to a new configuration, in order to meet the security standards and capabilities of the computer network.

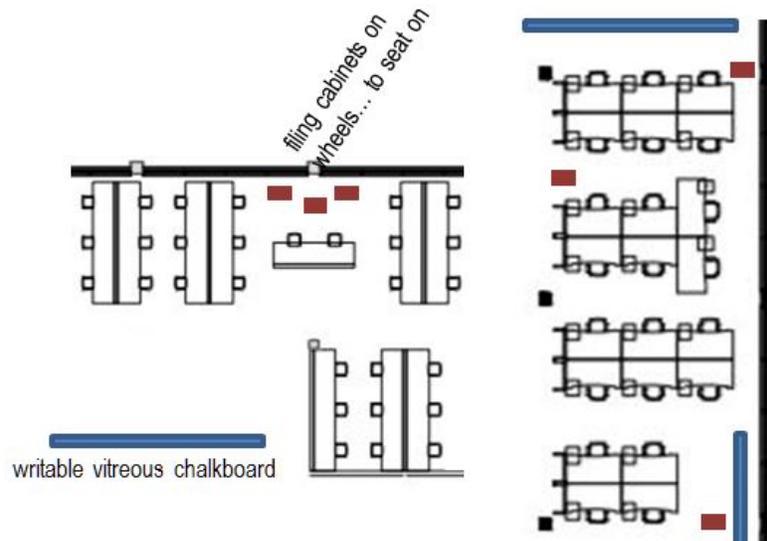


Figure 1. Two current layouts of open space

When technology or product become more complex, pairs become trinomials with two *technological* types and one *artistic* type or vice versa. In some project phases, sub-teams become more complex (more complex interactions between pairs, trinomials or small cells) and space changes accordingly (Fig 2).

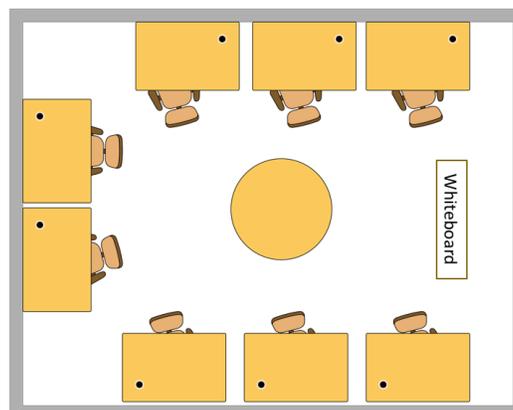


Fig 2. Sub-team layout example

Healthy behaviors are promoted with baskets of fruit and an employee gym. Employees appreciate the fact that whiteboards and writable walls are available everywhere.

The writing wall (or whiteboard) is my work buddy. When you start drawing in front of people, suddenly they see the order in which things happen, they almost have a production dynamic.
Artistic director

This allows workers to have spontaneous discussions anywhere and to keep a record of the discussion's visualization through one click of his portable phone. Moreover, these tools promote clear communication and facilitate memorization. When present the arrangement of space reinforces employees' sense of belonging to their team. Employees see the current approach to workspace design as evidence of a corporate culture that values freedom, self-expression and exploration, which reflects the findings of Kallio *et al.* (2015).

If we had to summarize in a few words the results of the interviews with the various categories of workers as to their preferences, it would go like this:

Artistic types prefer being able to **isolate** themselves for better concentration and also to get away from noise (for those who work on editing soundtracks and motion capture). They favor the **functionality** of the spaces and the **proximity** of their colleagues.

Employees in the technology category are concerned about **ergonomics** and technological **functionality**. Moreover, they favor **proximity** for its beneficial effect on **communication**.

Managers rely on **coordination to cope with the increasing complexity** of projects. They need **confidentiality** for certain tasks and they also favor **proximity**.

Proximity to his team is therefore an element common to all and considered essential. One wonders whether CREM has promoted awareness of this need by initiating the open layout from the beginning of the company at this location or if it has been previously considered?

5. CONCLUSIONS

Our objective was to assess the influence of work spaces on project teams members. To do so, we conducted a case study. This company is an instructive case in which to conduct a study since employee are denied the possibility to work at home which could alleviate somewhat the stress of the open space and further, multidisciplinary teams are located in different space.

The analysis indicates that the three main job categories (artistic, technological and managerial) have similar needs in terms of proximity but differ in terms of the level of tolerance to the potential for distraction associated with an open area, and the subsequent need to withdraw from that open area, with respect to the functionalities of workstation layout, technology or ergonomics. Managers also seek to adapt spaces and configurations according to their team's operating characteristics and the requirements generated by the complexity of projects in this sector of activity.

It is clear that even before reorganizing, it would be pertinent to question the homogeneity of staff needs with respect to their requirements and expectations in terms of work spaces. As Elsbach and Bechky (2007) explain one size does not fit all.

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