Promises and lures of open creative space for innovative teams
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ABSTRACT

Like activity-based workspaces, innovative spaces are deemed to be efficient and flexible, but they are most often called upon to support collaborative and creative team work instead of individual who sometime will work in a team. Our research objective is to further explore the links between the project team and its space to identify advantages as well as drawbacks and to determine if the company benefits from the adoption of open creative space with diverse collaborative areas. A case study of one world class company with several teams and diverse spaces is in progress.

Our results suggest that communication and coordination are well served by open creative spaces without negative impact on employees autonomy but intimacy is jeopardized which, paired with background noise that never stop, can lead to stress at work. This research shows that several elements of open spaces are felt in the same way by a team or by department employees. But a team requires proximity that is essential to the exchange of information and coordination among the members while the lateral and hierarchical relationships are slightly redefine.

Building managers needs to understand the perceived message that the individual receives from his organization through the design and allocation of spaces devoted to him and his team: freedom of action, empowerment to innovate or alienation to an environment that he does not control and which reduces him to a means of production until he leaves exhausted? The relationships between the feeling evoked by ambient conditions and their impacts on the individual, his tasks, his colleagues and his team is stronger than we could think. The temperature, the lighting as well as the variety of meeting rooms and their equipment’s form a complex whole of which we do not yet know all the impacts on the worker and the teams. Indeed, the diversity of spaces and their equipment fits perfectly into the teams' activities, resulting in a positive synergy in terms of coordination, communication and creativity. Creative spaces deserve their name when it comes to teamwork.

Keywords: workplace creativity; innovation; team-based workspace; corporate property management; open space

INTRODUCTION

Real estate is often the second most important item of expenditure in an organization's budget (Hills & Levy, 2014; Haynes & Nunnington, 2010) and as such should be subject to strategic decision. Like activity-based workspaces, innovative spaces are deemed to be efficient and flexible, but they are most often called upon to support collaborative and creative team work instead of individual who sometime will work in a team. Their purpose is to provide a high-performance workspace that maximizes employee productivity and reduces long-term operating costs (GSA, 2006). Interest in the study of these spaces has been sustained for several years but the results are still few (Morrow et al., 2012; Appel-Meulenbroek, 2016). Currently, neither the academic research nor the consultants work makes it possible to affirm that a tangible gain is acquired. Our research objective is to further explore the links between the project team and its space to identify advantages as well as drawbacks and to determine if the company benefits from the adoption of open creative space with multiple diverse collaborative areas: « As leaders consider their workspace needs, they should be informed of workspace fads versus workspace intent » (Blakey, 2015, p. 107).

The article begins with a review of the literature on collaborative spaces as well as the development of new products by project teams. We present the methodology based on a case study with interviews and survey and then analysis of the preliminary results.

LITERATURE REVIEW

The concept of space is often associated with architecture and design. However, the design of workspaces and the optimization that can arise from the ways of organizing workstations are of particular interest to management sciences and even more to real estate management. The organization of large workspaces in office
Flexible and open spaces appeared in the 1970s (Cohen, 2007); they have evolved to contain fewer individual spaces, a greater density and more common spaces (Hills & Levy, 2014). There are three main lines of management research that focus on space: 1) in support of innovation performed by new product/service development team 2) the more general one that focuses on office workplaces in support of performance and well-being of employees; 3e) and a new trend that focuses on collaborative spaces outside the organization, whether they be originating from social economy or from business incubators. It is mainly space in support of innovation activities of an organization that this article focuses on.

McElroy and Morrow (2010) argue that several benefits can arise from changes in workplace layout, such as promoting lateral relationships between individuals of the same or of different teams, which in turn benefit innovation and raise creativity. It also makes it possible to crystallize a fierce will for change and to diminish the hierarchical culture that inhibits innovation. Other impacts are felt at the level of culture, tasks formalization, control given of the professional, flexibility, altruism, collaboration, satisfaction with employment and colleagues, emotional commitment to its organization, and the perception of organizational support (Waters & Roach, 1979). To sum up research has determined that productivity is linked to individual workspace preferences being met within the physical work environment (De Croon et al., 2005) whereas worker satisfaction reduce absenteeism and staff turnover (Waters & Roach, 1979) also reduce stress and health care costs meanwhile reinforces employee commitment (Haworth, 2015).

Today, teams need to be creative and innovative. In fact, creativity is seen as a source of innovation (Woodman et al, 1993; Amabile, 1996). “Creativity is the individual’s use of knowledge and practical experience, and willingness to work with others – within the constraints of the environment and its resources – to solve problems” (Slocombe, 2000, p.167). Innovation can be seen as the translation of ideas into new products, services or processes that can be marketed or used by the organization (Mumford et al., 2002). For a company that is competitive in terms of new products, real property management and architectural design should imperatively support creativity, generating innovation and a fortiori potential benefits. This suggests that the innovative design of workspaces has the potential to positively or negatively influence organizational culture and creative processes (Kallio et al., 2015). The transdisciplinary and collaborative nature of the work of new products and services development teams requires spaces that support both dynamic interactions or intense and focused individual work (Hua et al., 2011) and the work in a community of practice mediated by the TICs that characterize the project teams (Harvey, 2014). The connectivity and the intelligence of the place have their source in the technological environment of which the emerging part can consist of systems with visual and auditory sensors which react to the persons by restoring from their computer memory the requirements and data of the last working session of the team (Oksanen & Ståhle, 2013).

Some characteristics stand out: the manoeuvrability or modularity of the elements constituting the meeting and individual workplace, the possibility of transforming the space according to the needs and the work style as well as its connectivity and intelligence. Indeed, the possibility of being able to move its space gives the feeling of empowerment, of autonomy in the accomplishment of the work (McElroy & Morrow, 2010). The density of the place and the proximity of the team colleagues, the intimacy and the control on its environment are other elements perceived by the employees in front of their place of work. Finally, we can also add the aesthetic, attractiveness and emotional, artistic or intellectual stimulation of the place (Oksanen & Ståhle, 2013). The place itself can generate a feeling of identification. Kristensen (2004) concludes that space affects the well-being of individuals, channels of communication, availability of knowledge tools and enhances coherence and continuity. Emotional commitment, professional and social interaction are highly positive, while distraction is their negative counterpart (Haynes, 2008). Recognition of the person by the organization translated into physical signs, psychological security and the comfort of recognizing oneself in a familiar place express other important elements of the physical environment. In this context, the question of the impact of workspaces on satisfaction, efficiency and well-being has long been of interest to companies and researchers (Moles, 1972; 1977; Fischer, 2004; Vischer 2008). At the level of comfort, one finds the ambient conditions and the spatial conditions at the level of the work station. Ambient conditions include brightness, noise, air quality, air movement, temperature and humidity (Sundstrom & Sundstrom, 1986). The spatial conditions of the workstation include the size of the individual workstation, furnishings and equipment, privacy, the degree of partitioning and personalization of the workstation. However, perceived comfort is a complex
phenomenon whose components can vary according to dimensions such as culture (Bluyssen et al., 2011) and whose interaction between components is not simply linear (Vischer, 2008). Vischer (2007) divides comfort into three categories: physical comfort, which includes safety, hygiene and accessibility; functional comfort, which refers to ergonomics in support of the performance of tasks and activities at work and; finally, psychological comfort which includes the sense of belonging, ownership and control over the workspace.

To remain competitive and ensure the realization of their strategy, the organizations must often manage several projects simultaneously (Morris & Jamieson, 2005; Bredillet, 2008). To manage the innovation effectively means to juggle with knowledge and resources (Hurmelina-Laukkanen, 2011). For this purpose, the organizations adopt information technologies more and more, including the social media with an aim of supporting the innovation (Marion et al., 2014).

One of the challenges of developing new products is to manage interdependencies while sharing the specialized resources (Pavlak, 2004; Yaghootkar & Gil, 2012). To this end, coordination is a process of managing interdependencies (Barni, 2003) embedded in project management processes and both are particularly well served by the use of management information systems. For example, project management software such as MsProject or Primavera are used to split the project into its thousands of tasks, to estimate, schedule, assign and follow them. These series of activities can be made shown to team members on the walls of their "war room", a dedicated room to a project team. In addition, communication is one of the most important factors in the success of projects (Södelund, 2011) and in this sense the project manager must master the art. It is also a dialogue tool with the stakeholders, which allows the «project scope» to be redefined on a regular basis in relationship with the objectives (Ziek & Anderson, 2015). Another relevant element in this issue is the variability of size in the projects according to their different phases in their life cycle. Coupled with the issue of proximity, this reality requires flexibility, planning and creativity on the part of managers of the real property function in order to create the appropriate spaces for each team.

All the aspects of the working environment can be decomposed according to the level of observation: the individual, the team or the organization and according to the three levels of comfort target: physical, functional or psychological. Table 1 shows this tentative framework with examples.

<table>
<thead>
<tr>
<th>Analysis level</th>
<th>Physical</th>
<th>Functional</th>
<th>Psychological</th>
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<tbody>
<tr>
<td></td>
<td>Basic health and safety; HACV; hygiene.</td>
<td>Ambient conditions supporting work tasks (e.g. lighting near computer screen)</td>
<td>Feedback through workspace; participation in workspace decisions. Intimacy, commitment, stress</td>
</tr>
<tr>
<td>Individual</td>
<td>Ambient conditions (noise, temperature, air quality, etc.) Workstation (equipment, size, location, etc.) Support environment (facilities, work area)</td>
<td>Sundstrom &amp; Sundstrom (1986); Veitch et al. (2003); Mulville et al. (2016) Sundstrom &amp; Sundstrom (1986); Hua et al. (2010) Sundstrom &amp; Sundstrom (1986)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Basic health and safety; HACV; hygiene.</td>
<td>Open space, varied meeting-space with collaborative tools , informal areas; team customized space</td>
<td>Team control of furnishing and tools layout in its workspace; territorial definition; team customized space.</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>Workstation environment (density, colleague proximity; location) Room layout (location relative to colleagues) Floor layout (open space, distance between workstation &amp; facilities)</td>
<td>Hua et al. (2010); Sundstrom et al. (1980) Sundstrom &amp; Sundstrom (1986)</td>
<td>Hua (2007)</td>
</tr>
<tr>
<td>relationship</td>
<td>Basic health and safety; HACV; hygiene.</td>
<td>Corporate values integrated in space; decisions about the workspace viewed as investment not cost</td>
<td>Workspace is linked to organizational effectiveness; environmental design of workspace responsive to operating procedures and business processes.</td>
</tr>
<tr>
<td>Organization</td>
<td>Building (work unit differentiation, general layout, aesthetics)</td>
<td>Sundstrom &amp; Sundstrom (1986); Kallio et al. (2015)</td>
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</tbody>
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Analysis level from Vischer (2007); input/output adapted from Sundstrom & Sundstrom (1986); examples adapted from Vischer (2007) and this study.

**METHOD**

We privileged the case study of a large innovative hi-tech company with a mixed strategy of data collection (semi-structured interview, observation, secondary data analysis and survey) mainly for the potential wealth of data and the opportunity of a quasi-experimental design because of teams installed in different environments. At the submission moment, the case is still undergoing.
RESULTS & INTERPRETATION

The data come from several sources within the case study, we will present them in sequence in this section to regroup then some notable results in the discussion.

THE CASE

The analyzed site of a big company comprises three buildings with teams divided on floors renovated in “open creative space”, or not. Each team size varies according to the project phase in progress. The industry of the company is worldwide and the competition is fierce. The industry being of high technology, the technological developments and the diversity of the platforms require a workforce at the cutting edge of technologies and being able to count on the most recent tools and work processes. The organization pressing challenges relate to innovation and productivity as well as the capacity to attract and keep top talent. In both cases, the organization’ response largely depends on the environment it places at the disposal of these workers and teams. Because indeed, a diktat in force in this endeavour is that the members of a team must be in close proximity to each other. The methodology imposed on all development teams is the stage-gate. At a finer level, each team is free to use what it deems appropriate or even follow no type of project management.

Since the company foundation until the 2000s, the real property management aims at providing healthy basic working space mainly open since teams were asking for proximity. But the internal pressure coupled with trend setting Internet communication about creative space with Google as an exemplary leader push the real property director toward the concept of space flexibility as a measure of performance which leads him to hire a small team of designers and project managers to improve effectiveness of new workspace layouts when acquiring new spaces or during renovations. The team has begun transforming the spaces based on its knowledge and experience. They took the initiative of gathering the opinion of team members and leads and directors to improve their understanding of the requirements and increase the efficiency of the new spaces but after some years they decide to validate the results with external specialists from university.

What can be seen at first glance is the efficiency of the workstation installations that are done "overnight": for example a new employee coming from another division boxed his few personal effects including his keyboard and his mouse and finds it all at his new place up and running. The movement of the equipment or its replacement is a decision of the service which is specifically in charge of this function. This efficiency is supported by an adapted infrastructure that was installed as renovations took place. Another very visible element is that each floor is divided to give the largest areas to the teams as well as a variety of meeting rooms (large or small, equipped or not, decorated or not, etc.), relaxation areas or testing spaces (closed or semi-open laboratories as appropriate). Plants, islands of service, personalization elements are arranged in such a way as to create a certain intimacy. Most desks, chairs, filing cabinets are on wheels to allow teams to redeploy space according to a new working configuration.

There are still a few areas that are not renovated and the teams who find themselves there know that it is based on rational choices but cannot help thinking that they are "in punishment". It appears that the impact of new spaces is positive in terms of occupant satisfaction. However, management is wondering what could be the optimum threshold for investment in these spaces.

SURVEYS FROM INTERIOR DESIGN DEPARTMENT

For several years now, the Interior design department has been collecting the opinions of occupants and users of spaces and equipment installation. These are questionnaires distributed either (1) on the Intranet, (2) on tablets left in the areas, and (3) by e-mails after an equipment loan. There were also attendance surveys of the different spaces coupled with the reservations of the meeting rooms.

Overall the reviews of the various in-house surveys show that occupants respond willingly and directly - response rate at about 40%- . The elements considered non-functional or unpleasant are reported clearly. It shows that the building's basic performance (air quality, cleanliness, temperature and brightness) and equipment are satisfactory but could be improved. Individuals complain of excessive density and lack of privacy but require that all team members must reside in the same open area. They protest for the lack of free rooms (unavailable, too few or reserved) when they need them while rooms are sometime unoccupied. Some type of meeting room like small ones for 10-14 persons seems overbooked and rarely free. Next are the big ones that are regularly reserved. Regardless of
size, those who do not have big screens and white board are more often than not unoccupied. War rooms that are dedicated to a single team, vibrate with activities and the walls are covered with information. According to the respondents, there are no meeting rooms for 1 to 3 people and this is a big shortage. Another issue is the reservation system which is not convenient but also people don’t make the necessary to cancel a room when it is no longer needed. This appears to be widespread behavior (myseat, 2017).

INTERVIEW DATA & ANALYSIS

The first interviewed people were from the property management department and Interior design (5 persons). On the administrative side, we also saw a person from the communications department, a staffing person at strategic level, the IT director as well as his assistant responsible for the IT equipment installed in the different spaces. On the team side, the eleven interviews so far concern two multi-projects programs that well represent the decision-making levels and functions: technology, ideation/design and management.

The main results are presented in the same format as table 1 which allows to organize the conceptualization of the influences of spaces on the individuals, the teams and the organization.
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<tr>
<td>Individual</td>
<td>Cleanliness is associated with respect by management, this sensitivity is exacerbated by other initiatives that promote health such as baskets of fruit placed in work areas and available for all as well as access to the gym created especially for employees. The brightness conditions are variable but mostly adequate to the needs of the various team trades almost everywhere.</td>
<td>Ergonomics is not optimal but most workstations can be moved and file folders &quot;seat&quot; are present almost everywhere to allow a colleague to sit next to a worker. IT environment &amp; space equipment’s are tailored to each trades and team but there is no personalization accepted. Some people say they do not have everything they need to do their job well.</td>
<td>Despite frequent surveys and suggestion boxes, employees do not feel they are being consulted/listened to. The space design reinforces the company culture which allows freedom to the individuals and the teams. Indeed, the floor layout allows a lot of different way to work alone or on various team size. Employees believe that this freedom very positively influences their creativity. No control on any ambient conditions like temperature. There are not enough places to isolate themselves when they have to phone or think. Some feel neglected and affected while they notice the level of housekeeping and maintenance.</td>
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<tr>
<td>Interpersonal relationship</td>
<td>Open spaces reinforce the behavior of directors to participate in all formal and informal meetings, so they must work before and after the usual hours to complete their tasks. Long hours have become the norm for all those who supervise teams.</td>
<td>Employees appreciate the fact that whiteboards and writable walls are everywhere. This enables them to improvise a discussion anywhere. Moreover, these devices promote the clarity of the communication and the ease of memorization. Guerillas sometimes burst between team leads around the allocation of spaces: everyone believe proximity is paramount. Yet they also complain about the lack of privacy and the impossibility of pondering for productive individual work.</td>
<td>Team are free to personalize their space but due to so frequent relocations few do it. Employees often make small improvised meetings of 2-3 around a workstation but they feel disrespectful of others around du to noise and distraction they generate.</td>
</tr>
<tr>
<td>Organization</td>
<td>The employees isolate themselves from the ambient noise with headphones. It is a behavior adopted by all. There are not enough locker rooms to leave boots and coats which can amplify the problem of moisture and odor in areas as well as spread of colds. Healthy behaviors are promoted by fruit baskets and the gym created for employees.</td>
<td>Since supervisors are always on the side, each employee is free to carry out his duties as he sees fit, provided he quickly reports problems. Communication and coordination are well served without negative impact on employees autonomy but intimacy is greatly jeopardized. Proximity makes conversations very easy, but not only those that are useful. Directors and managers, who are also in open spaces, lack privacy for certain tasks such as staff assessment.</td>
<td>The arrangement of spaces reinforces the feeling of belonging to his team and that the company is an important player in the industry. Trust is thus increased. Plants are placed everywhere and fruit baskets are added almost every morning, which contributes to well-being and the feeling of being well-treated. The dress code is simple: you do what you want. The sense of freedom and control is reinforced.</td>
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At the physical and individual levels, layout improvements can lead to expectations of comfort and well-being. Indeed if management looks at things that appears essential but less fundamental than those that affect health, it is normal to assume that the basic functions, in parallel, are mastered. The studied company leases the buildings, which can complicate its control. Nonetheless, a small proportion of employees interviewed noted and were offended by the lack of cleanliness or air quality deficiencies in their areas: they feel neglected and affected. Few people complain that brightness hinders work on the screen but some lack energy in areas without much natural light and the majority work with earphones to mitigate ambient noise and be able to concentrate. On the other hand, when it is necessary to call for personal reasons, employees look for isolated places, which is rather rare. The need could be filled by a few small rooms for individual work, which would also allow managers to withdraw from the team area from time to time.

At the functional level, the ergonomics of workstation and workplace is also discussed by some. They ask to improve comfort for lightening the constraint of the sitting position for long hours. They would like also a more open design allowing for impromptu meetings of 2 or 5 people with spare stools left in reserve without disturbing
neighbors whom are very close. Informal areas that are still within sight or cafeteria are considered a less attractive choice. The proximity of the entire team is truly integrated into thinking patterns and reflexes. This paradigm seems characteristic of teamwork on complex and highly integrated projects. At the same time, filling this need for proximity seems to be sufficiently worth for the company that this is not questioned.

A difficulty that is not present for the teams concerns the appropriation of a place and the tendency to make it own despite the policy of vagrancy - take the first place available, they are all similar (Hoendervanger et al., 2016). This is not the norm for teams for two reasons: 1) inside the team most workstations are highly customized to the occupant tasks and sub-teams are intentionally placed for better communication within and between sub-teams (McElroy and Morrow, 2010) and 2) different teams don’t mix since their project have different objectives and sometime fight for the same resources (Hurmelinna-Laukkonen, 2011). The battle for space climbs one or two steps in the hierarchy and is settled far from team members. It is present in this company in part because space is seen as an encrypted message from the management according to its appreciation of the work of the team or the individual (Waters & Roach, 1979). In addition, as the size of the team is subject to variability during the project, project management tries to continually optimize the space based on the addition of resources that need to be briefed on progress and issues, and what better way to do this than to have them all together.

“The space in which we are is scrap. We have delivered an excellent product in the latest project and we are still here without planning for any renovations. Everyone perceives it as a punishment even if it is just a rational decision.” Creative project director

People in charge of the teams or of critical aspects such as quality monitoring are affected. Indeed, the close proximity of all allows them to remain constantly on the lookout for problems but it disrupts their ability to cut off the flow of activity to concentrate on tasks that are not of an interacting nature. The result is that they all work long hours. For example, two of them mentioned taking long voluntarily walks between their homes and the office to take advantage of these moments of reflection. Others say they get back to work once the children are in bed - the remote connection being much appreciated. Some arrived very early but are often surprised by colleagues. Many work at least one weekend day. Some burden could be relieved by several small rooms as discussed earlier.

“A workspace well situated for me? Right in the middle of my team's area, I have to be accessible. My people must not make any effort to join me. I moved myself from the last place - too far from my people." Project manager

Another paradox concerns the perception of not being consulted when there are several means actively implemented to get their opinion. The history of in-house surveys and interviews lead us to argue that employees do not always associate changes in their environment with the responsive action of the layout design department. The results of the consultations could be communicated. It is likely that an internal marketing effort would pay off.

The personalization of the spaces of each team is not very widespread mainly because of the fear of being relocated soon. On the other hand, most affirm that it would be a good thing even if, already, the feeling of belonging to the team is very strong (Brown & Zhu, 2016). In fact, it is more perceived as a reward from top management and a way to stand out from other teams. To this end, the teams want the workspace design department to offer its services and tools to make this customization easier and partially standardized in the spirit of the company. Already the space design is perceived as a nice proof of the company support toward freedom to explore personal and team own track which connot the findings of Kallio et al. (2015).

The interior design department took the initiative to set up a gym, add plants and provide fresh fruit baskets regularly. The main result is to relax the atmosphere by allowing people to believe themselves a little "like home". One can notice, moreover, they are several to wear a t-shirt bearing the effigy of the company (McElroy & Morrow, 2010).

CONCLUSION

The objective of this study was to trace the impact of creative spaces on the dynamics of new product development teams. To do so, we conducted a case study with observations and secondary data. We also studied two large teams of the high-tech company using data obtained by the department of interior desing in a few surveys as well as interviews that we conducted with sixteen people.
Most physical components of open creative spaces influence teams in the same way as individuals in "activity-based" spaces. Everyone appreciates conditions favorable to physical and mental health (Veitch et al., 2007) and large open spaces that often allow greater brightness and more direct access to colleagues. However when the target is functional, we can put forward that team members are no longer satisfied with a few spaces but require a wide range of choices. With the possible exception of supervisors who tend to stay closer to their team to prevent problems (as they have the opportunity), team members do not change so much their behavior. They change a lot of emails for live discussions above their desktop. A paradox can be seen that is difficult to solve: one that opposes proximity to intimacy which can then lessen the positive influence of these “tools” yet well suited to teamwork. We have observed that they are satisfied with the level of communication and coordination due to proximity to all. They also consider that freedom and autonomy are widely granted which allows for greater creativity as Kallio et al. (2015) find it. But they all report that privacy is diminished, which leads certain to feel stress and eventually leave even when they feel close to the values of the company. When the message is well adapted to the functional and psychological level, this leads in our view to greater appropriation of space.

Building managers needs to understand the perceived message that the individual receives from his organization through the design and allocation of spaces devoted to him and his team: freedom of action, empowerment to innovate or alienation to an environment that he does not control and which reduces him to a means of production until he leaves exhausted? The relationships between the feeling evoked by ambient conditions and their impacts on the individual, his tasks, his colleagues and his team is stronger than we could think. The temperature, the lighting as well as the variety of meeting rooms and their equipment's form a complex whole of which we do not yet know all the impacts on the worker and the teams. Indeed, the diversity of spaces and their equipment fits perfectly into the teams' activities, resulting in a positive synergy in terms of coordination, communication and creativity. Creative spaces deserve their name when it comes to teamwork.

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