

Experiencing smart working: a case study on workplace change management in Italy

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Abstract

Purpose – The purpose of this paper is to share the insights gained by a recent research and consultancy work performed by the authors accompanying an organization in workplace change management. The inception of the new ways of working may lead a company to rethink the office space toward downsizing, with the main objectives to shrink occupancy costs and enhance workers' productivity. The shift to a new office building and a smart working model needs to be well managed and verified ex-post. The application of a post-occupancy study can help fine-tune real and perceived quality with the enhancement of both space and people's performance.

Design/methodology/approach – The experience is presented as a case study. Data have been collected through the triangulation of different methodologies, both quantitative and qualitative. Walk-throughs, observations, questionnaires, interviews and focus groups have been conducted. Interpolation and interpretation of all the information obtained led to a critical synthesis that this paper aims at disclosing.

Findings – Inter-disciplinary collaboration between corporate real estate, facilities management and human resources departments, with employees' involvement, has been fundamental for gaining useful insights.

Research limitations/implications – It is necessary to extend the sample to obtain information at an epidemiological level.

Originality/value – The research can be considered one of the few Italian contributions to the field of post-occupancy studies. Moreover, it can give new indications about the evolution of workplace features in an Italian context.

Keywords Downsizing, Post occupancy evaluation, Corporate real estate, Smart working, Hot-desking, Workplace change management

Paper type Case study

Introduction

In recent years a tendency for downsizing characterizes the evolution of the office environment (Miller, 2013). Mobility, working remotely, differentiation of activities are the main trends affecting today's way of working. Thanks to these new habits, for some companies it is possible to optimize workspace efficiency. The 2008 global financial crisis has led companies to be more focused on the impacts that the office environment can have on their balance sheets. Given the introduction of new ways of working, since the beginning of the 2000s, one of the primary issues concerns space savings. Many companies (particularly ones where people often work at home or travel a lot) moved some of their business units, or all of them, to the so-called "hoteling" or "hot-desking" models, that means providing workstations on an "as

needed” basis. The “hoteling” allows the employees to book their desk in advance, while the “hot-desking” functions on a first-come-first-served basis (Knight and Haslam, 2010). These models, conveniently combined with teleworking (working from home using virtual technology), can save at least 15 per cent-18 per cent of space requirements[1], with an estimated 25 per cent increase in productivity (O’Mara, 1999). This can be advantageous not only in terms of economic return for the firm (fewer square meters occupied correspond to fewer costs), but also to increase environmental sustainability, benefitting cities and the whole world (reduction of land consumption), and human involvement from the worker’s perspective (better satisfaction, well-being and quality of life).

Space downsizing can be an occasion to rethink the company strategy toward a smart working model. This means undertaking a radical change of organizational culture, Human Resources (HR) systems, technologies and, last but not least, workspaces (Methodos *et al.*, 2015). Switching to a new way of working is a delicate matter that involves different stakeholders. When the transformation encompasses the work setting, the individual working experience totally changes (Maher and Courtney, 2005), e.g. from enclosed offices to open spaces, or even from traditional open spaces to a desk-sharing configuration, and it requires time to be internalized by the end-users. Workers need to understand the process underway, to get accustomed with the new office environment and familiarize themselves with its “affordances” (Gibson, 1979), that is to say, with the opportunities the environment offers to perform an action, which are caught unconsciously by the subject. That is why it is important to fine-tune occupant perceptions with the new workspace features to boost both space and worker’s productivity. Indeed, the economic impact of the workplace is composed of the value created by spaces and by people. Over the lifecycle of a building, the company’s cost is distributed between the following items:

- 82 per cent is used for employee wages and other benefits;
- 3 per cent is destined to operations and maintenance;
- 10 per cent to technology; and
- the last 5 per cent is for facilities, including design and construction of the building (Miller *et al.*, 2014).

This is evidence that any kind of intervention should be directed at enhancing employees’ experience and maximizing the effectiveness of HR.

Driving the workplace change and validating the results require intensive effort by organizations that are probably missing designated professionals for that purpose (Alker *et al.*, 2014). A good solution may be to appoint an impartial, third-party actor, devoted to supporting the process in due course and assessing the outcomes. This method considers the triangulation of different approaches and the interpolation of many disciplines, including corporate real estate (CRE) management, HR management, facilities management, architecture and sociology.

Background

The subject of the study is the Italian headquarters of an international company. The firm had recently moved to a brand-new campus. The space downsizing process

led to reducing the amount of square meters occupied and designing a radical re-layout.

Previously, before moving to one single headquarters, the business units were in ten different locations. In the former premises, the employees/desks ratio was more than 1:1, which means that each employee had a proprietary workstation and many of those were actually empty because of progressive staff cuts over the years. In the new premises, the application of a “hot-desking” model was embraced to reach the primary goal of space optimization. The number of required workstations was calculated to be 75 per cent of the total number of employees, keeping the functions and activities the same. Only 30 employees of around 1,000 can use an enclosed office; different business units are grouped in some open-space areas, which are dedicated generically to one organizational function, but nobody has an assigned workstation. A proportional number of meeting rooms (MR) with different capacities (from 4 to 25 seats) are equipped with projectors, screens, tele- and videoconference tools, etc. Concentration rooms and phone booths are located on each floor, where there is also some free space for informal meetings and breaks (Table I).

The company recruited a consulting group, composed of the authors of the present article and some external collaborators, with the goal of assessing people satisfaction after the move in and to verify the space usage. From the perspective of a corporate merger, the primary necessity was to verify the availability of space for hosting 200 people more than the actual number of employees.

The phase of data collection began six months after the move in, to allow the occupiers to start using the space and get accustomed with the new way of working. The previous workspace setting was arranged as a traditional open-plan, with fixed workstations and a very low density rate. Therefore, the working experience was radically transformed in the new building and some resistance to change emerged among employees.

Methodology

The consulting group developed the work using a combination of different investigation methods, taking into account the importance of approaching the problem from both a

Space type	(%) of the total no. of seats	(%) of the total space (NUA)
Open space	47	44
Enclosed offices	2	8
Meeting rooms	35	26
Focus room/project room (4-6 seats)		
Touch down (12 seats – 6 + 6)	10	9
Concentration room/phone booth (1-3 seats)		
Break areas + support spaces (storage, lockers, print and copy area)	6	14
Total	100	100

Table I.
Number of seats by
space type

Source: Processing on FM data

quantitative and a qualitative perspective. The questions to be answered, indeed, were about quantitative distribution of specific dynamics, but also qualitative explanation of those phenomena (i.e. why does this happen?). The survey method aims at referring to the “design process approach”, as suggested by Costa, (2014), which consists in involving all the stakeholders, merging several disciplines and applying different methodologies (observations, interviews and questionnaires) toward the full understanding of the observed situation.

First, a large number of documents was revised about the characteristics of the building. This exploratory phase was completed by a non-structured observation with the walk-through of two employees. Thanks to this first analysis, it was possible to cluster the spaces, following typological and functional criteria, to have some insight into how the people behave in the space and to generate the hypothesis to verify afterward.

Then, it was necessary to make a request for additional information to deepen the study. The company retains numerical data about the access of employees to the building (retained by the HR to register absenteeism and presence at work) and MR’ reservation (retained by the Facility Manager through an online tool which workers can use to directly book and manage spaces). Facility Management (FM) and HR departments pick up these data on a daily basis, but leave it at a raw stage of elaboration, so that it needed cleaning and preparing before use.

The numbers obtained from those sources were used to calculate periodical trends. To properly weigh and interpret them, some qualitative investigations have been added. This phase included interviews, further observations and a questionnaire.

Semi-structured interviews with the management team, including CRE, FM and HR managers, were conducted with the goal to bring together impressions, willingness and sentiment from the stakeholders responsible for fine-tuning real and perceived building performances.

Overviews of qualitative engagement required two days of structured observation to map and monitor the way people use spaces, according to the behavioral mapping approach typical of environmental psychology studies. Four researchers, grouped in two, walked through specific zones of the building, making sure to observe each space once per hour. On the whole, 62 per cent of the workstations and 87 per cent of the MR were observed. The observation took place on the most typical weekdays, given the firm’s characteristics and different business units’ habits, with the aim of representing the maximum peaks of space occupancy. Supported by a detailed checklist, the observers punctually registered the number of:

- employees sitting at the desk;
- personalized desks;
- employees occupying the MR;
- employees using concentration/phone booths; and
- people present in the break areas.

These records have been intersected with:

- total number of accesses;
- total number of desks;

- capacity of the MR;
- number of phone booths; and
- number of break areas.

In addition, qualitative considerations about where and how workers performed several activities were annotated for future consideration.

Finally, three focus groups were organized to directly meet with the employees and listen to their thoughts. The HRs selected the fifty-people sample – divided into smaller groups. The sample represented overall almost all the business units inhabiting different zones of the building. A questionnaire was administered during the sessions, with the aim of systematically collecting some information and better organizing the meetings, since they involved a large number of employees. This covered several aspects and was composed of seven questions about workers' perception. Three of them in more detail regarded:

- (1) their presence at work during the “typical working week” (time spent in the office building);
- (2) their activities at work during the “typical working day” (time spent in different activities); and
- (3) their doubts or worries before the move, against their feelings after the move.

The questionnaire was used as a template for open discussion. After answering one question, the participants were invited to talk about the same topic and discuss between themselves. The interviewers wrote down several annotations during the conversation, suitable for further comments.

Finally, information gathered through the application of the methodologies above mentioned have been matched together. Useful insights have been obtained and some of the results concern specifically flex office, territoriality and management of the MR.

Results

Flex office

When workers were asked to appraise how many days per week they occupy a workstation in the office, almost all of them said they were present in the office building every day (Figure 1).

If people's perception reflected the truth, with the due proportions, it would mean that at least 90 per cent of the workstations should be always in use (i.e. the employee is working at the desk) or occupied (i.e. the worker can be temporarily busy somewhere else in the building, but he or she left traces of their presence at the desk). During the focus group, many people lamented the lack of workstations, particularly severe for specific business units (“on some days there is not enough room for everybody, teleworking does not fit in properly”). To verify this feeling, the information gathered through the questionnaire and the group discussion have been compared with quantitative data collected through:

- access monitoring at the entrance (badge registration);
- direct observations; and
- additional self-awareness question.

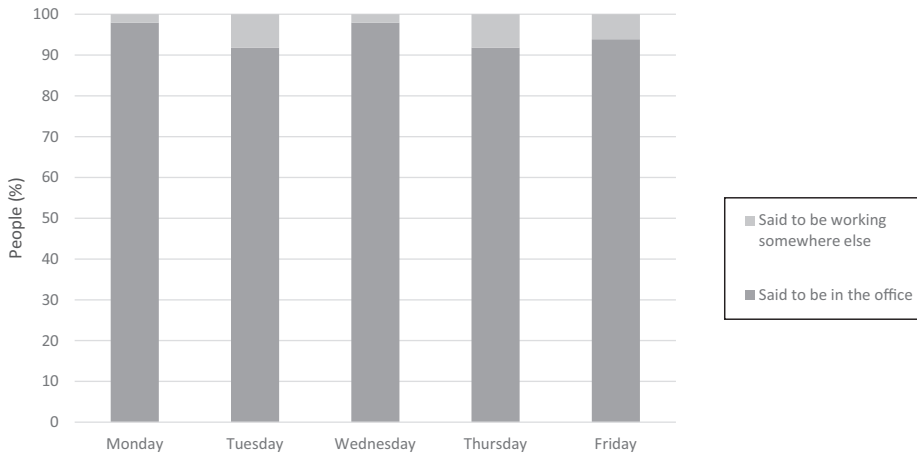


Figure 1.
Percentage of interviewees saying they work from the office or from somewhere else

Source: Questionnaire

Number of accesses monitored at the entrance reached a maximum peak of 81 per cent, but on average it is around 75 per cent, differing substantially from people's perception (Figure 2). In fact, according to employees (see Figure 1), the average number of accesses to the building should attest around 90 per cent of the presences.

This highlights that people's perception may be incorrect sometimes, or even that it may deviate from reality with the aim of demonstrating a better productivity (considering that the company does not monitor productivity and in Italy this concept is still seriously tied to the physical presence in the office, more than to a result-related basis).

The on-field observation showed that typically only 50 per cent of the workstations are occupied and even fewer can be considered effectively in use (Figure 3). Then, it is

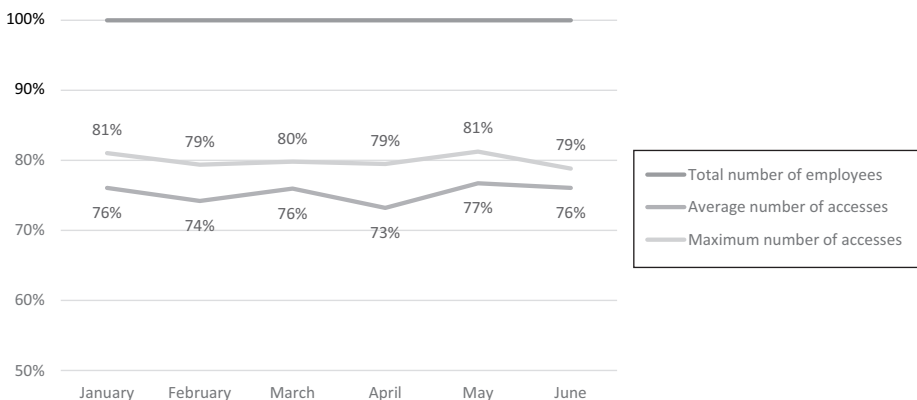
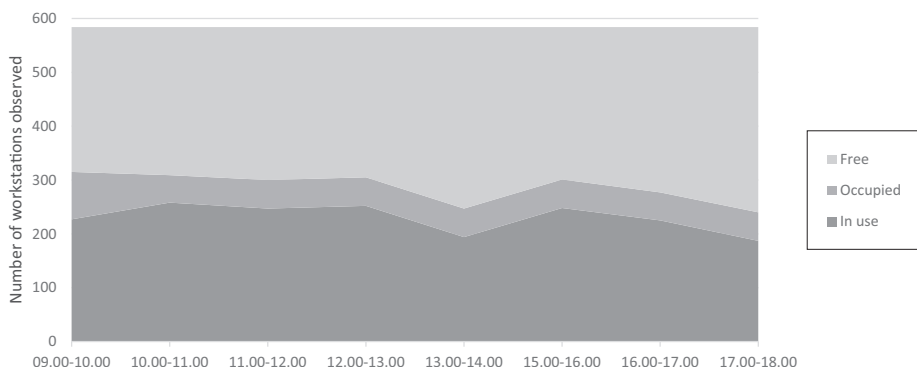


Figure 2.
Average and maximum number of accesses registered every day during the period January-June 2015 on the total number of people employed by the company

Source: Badge registration, HR

Figure 3.
Number of
workstations in use,
occupied and free



Source: Observation

important to remark that the observation was fixed on the weekdays that usually register the maximum turnout, and therefore should represent the highest occupancy trend. In fact, the badge validation at the entrance monitors the access, but the tool does not give any integrated information about the time spent by people in the building and their habits in the use of space available. Moreover, it was not possible to collect information about the employees exit time to understand how many people were inside the building at each moment of the observation.

The questionnaire confirmed the misalignment between worker's perception and reality. One of the multiple-choice questions was asked to define the actual workstation configuration. Here, 78 per cent of employees answered that they work in an open space, but quite surprisingly only 13 per cent specified also working at different, non-assigned workstations, which would correspond to the actual situation. This statement evidently demonstrates that the large majority of employees do not realize that they work in a flexible work setting, but are still influenced by the idea of what a traditional open plan office is, namely a collective space, shared with many colleagues, but where everybody sits at a "proprietary" desk.

Territoriality

This feeling also explains the tendency to "sedentism" and personalization that affects their behavior. During observation rounds, on average one workstation out of four was somehow marked with personal objects. This trend might compromise the flex office model ("flexibility is not fully exploited because work stations are personalised", "I feel out of place sitting at work stations that have been <<marked>> by other people"), but it is not equally distributed among all the functional areas. In fact, some business units tend to mark the space less strongly than others do. These correspond to those functions that are more suited to a flexible workstyle, for example the sales and marketing areas ("in the marketing area the work stations are always left tidy and uncluttered"). On the contrary, some business units are more settled as a vocation, such as finance, legal, procurement, quality and others. Not surprisingly, it is here that the most numerous territorial signs, e.g. identity-oriented markers (Brown, 2009), have been found. That suggests that somehow the differences concerning the type of work carried out by the functions should have been taken into consideration upfront, so that the space layout

could have been more related to the peculiarities of each function. It is also significant that almost 20 per cent of those desks not assigned to any business unit, i.e. theoretically free from personalization, presented some marks.

The objects found on the desks may affect more or less significantly the image and functionality of the workstations. Among them:

- toys, photographs and posters;
- calendars, post-its, reminders;
- plants;
- pen holders; and
- documents.

Coherently with the trend registered, 44 per cent of interviewees answered the questionnaire saying that they would appreciate the possibility to personalize their desk to feel more comfortable at work.

Here a combination of effects can be seen. On one side, the actual large availability of space allows people to occupy a workstation and use it as a proprietary desk (“I was worried I would not be able to personalise but in the end I had no problems doing so”), which induces scarce mobility, personalization and therefore the feeling of working in a traditional open plan layout. On the other side, the Italian culture is still attached to the idea of having a personal and private space (“In the end we always use our same work station”), in the office as in life (this explains also the high rates of home ownership). Going to the same workstation every day and decorating it are ways to claim that space as personal (“we are all creatures of habit. I leave a lot of stuff on the desk so that other people generally avoid taking my place”). Therefore, it seems extremely difficult to eradicate this habit and workers try to keep it, avoiding the embrace of the flexible policy unless it is strongly necessary.

Meeting rooms

For what concerns the availability and use of MR, during the focus group employees signaled a general lack of rooms, in particular of medium-sized and large rooms (“halls for 12 people are often the most crowded”) and in specific zones of the building (“the MRs in the Welcome Area are not used much because they are in an inconvenient location if you are in the work desk area”). Figure 4 represents MRs’ reservations in relation with the capacity (number of seats) of the rooms available in the whole building and the total number of each type of room. The column’s height represents the number of rooms existing in the whole building grouped by capacity. The line’s height shows the average number of hours reserved on a monthly basis in the whole building per each type of meeting room.

The graph gives evidence that there is a very small number of large rooms (Figure 4, see columns’ height), since we can count only one room for 16, 21, 22 and 25 people and very few for 12 and 14 people, while most of the rooms are small or medium sized (Figure 4, see columns’ height). Through the analysis of quantitative data, it is clear that the rooms capable of holding 16 and 25 people are the most frequently reserved (Figure 4, see line’s height). In fact, the average amount of bookings per month reaches, respectively, more than 600 hours and almost 450 hours, even if in the building there is only one room for 16 people and one for 25. On the contrary, MR for eight people are

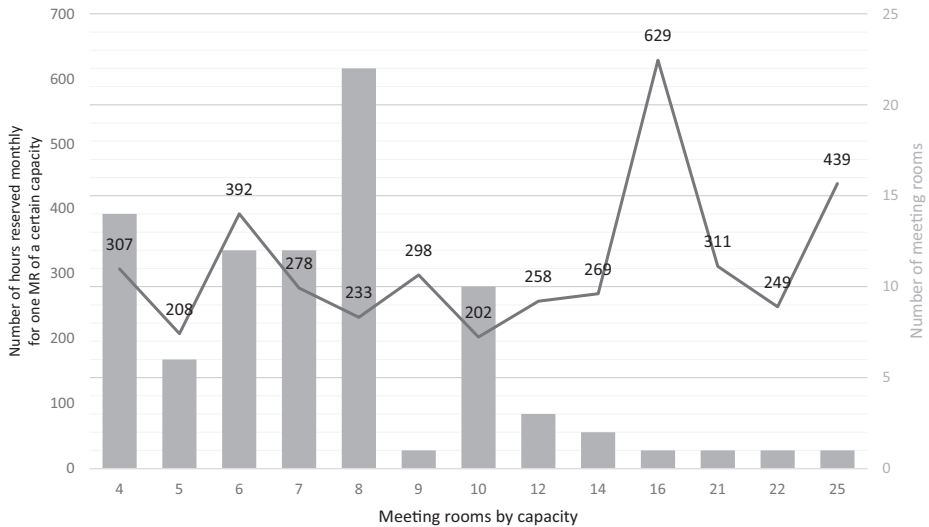


Figure 4.
Weighted average of hours reserved per month on the number of meeting rooms by capacity

Source: Meeting rooms' reservations, FM

numerous (there are 22 of them in the building), but in comparison reservations for that type are infrequent (around 200 hours, that is one third of the bookings for the room capable to host 16 people).

It appears that the size and capacity of the MR need to be carefully calculated, to meet end user's requirements more effectively. This suggests the favorable application of flexible solutions also for this type of space. For example, movable walls, that would allow assembling or separating the spaces according to contingent necessities, can be very useful; two rooms for eight people could be merged to obtain one for 16.

Nevertheless, on the basis of additional analysis, considering the overall reservations registered in the period January-June 2015, it is clear there is a gap between theoretical availability of spaces and effective need. Reservations exhausted the supply of MR on only a few occasions, while many rooms remained unreserved most of the time. Consequently, large space is still available in case there is a need to host more employees; for example, after a company merger.

It is also worth underlining that there is not univocal correspondence between reservations and effective use of the MR. Indeed, often some MR that have been reserved do not host any meetings. On the contrary, it can happen that some meetings spontaneously occur while the room has not been booked via the online tool. Because of that reason, it was convenient to verify MR' occupancy rate through observation, in absence of other technological devices fit for gathering this information.

The real occupancy rate of the MR does not exceed the 25 per cent peak, calculated against the overall capacity (Figure 5). On average, the MR reach only the 15 per cent of their theoretical overall capacity.

The observation confirms that lots of space remain unused and could be used for other needs. This might imply also that many meetings happen in informal ways, maybe by talking in spaces not specifically dedicated to that activity. For instance,

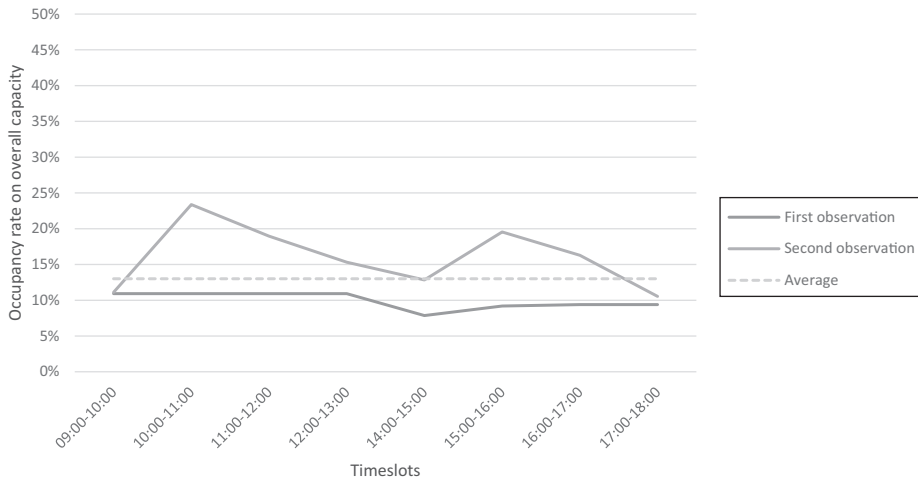


Figure 5.
Occupancy rate of
meeting rooms on the
overall capacity

Source: Observation

taking into consideration the utilization rate of break areas some interesting points can be fixed. Researchers passing by counted someone present in the break areas in almost 50 per cent of the timeslots observed. Here people were often busy in several activities, not only having coffees and pausing, but also talking or speaking on the phone. Indeed, “affordability” of a place is up to users. To this extent, it can be important to maximize flexibility of spaces and equipment adaptability (such as foldable walls, movable tables and chairs and writable surfaces) to ease the change and facilitate the interactions between people and spaces. In a broader prospect, it can be worthwhile providing the building with fewer enclosed MR and more informal areas, equipped to host also unconventional types of meetings.

Conclusions

Lessons learned

Concerning the specific objective of the consultancy, results can confirm the viability of welcoming the 200 people expected. In fact, the occupancy and utilization rate of both flexible workstations and MR allow for hosting a large number of people and is very far from saturation point. Moreover, considering the results from the observation, we can say that the downsizing was quite careful, if we look at the habit of internal and external mobility generally registered. This is, for sure, due to an Italian habit, according to which the changes always need to be made carefully. But it probably also depends on a lack of refined studies on the company attitudes that should have been carried out before the project.

It would only be possible to develop a project that fits the real needs of a company on the basis of a precise knowledge of how that company works and its evolution trends. With a more accurate pre-design phase, the space would probably have been organized differently. For example, taking into consideration the differences characterizing the business units could have led to calculating variable hot-desking rates corresponding to the mobility trends. Also, some other aspects such as gender, preferences and work

management habits could have been acknowledged with favorable outcomes related to employees' productivity or the number and capacity of the MR. Among the others, even employees' ages can be important elements for driving the design of office spaces and facilities (Erllich and Bichard, 2008).

These conclusions can be considered reliable thanks to the application of an integrative approach. This led to correctly interpreting the misleading inferences that can occur by taking into consideration only one source of information. Through crosschecking quantitative and qualitative methodologies, on the contrary, it has been possible to carefully weigh the data retrieved by different sources (e.g. numerical registration by the HRs and analysis by the FM) and therefore obtain consistent information.

Managing the new ways of working

Moreover, it is interesting to sum up some considerations valuable for generalizing the discourse around new ways of working and new features of office buildings.

Most of the perplexities collected among employees about the new workplace depend on behavioral attitudes, that are likely to adapt spontaneously after a while. For particular aspects, instead, a better communication strategy could benefit both the management and the end-users satisfaction.

First of all, territorial behavior, given its spontaneity depending on individual habits and characteristics (Goodrich, 1982), needs to be carefully taken into account, especially in the case of shared-desk settings. Personalization has the potential to both positively and negatively affect the individual experience of work and connection to the company (Brown, 2009). Territoriality may be important for concentrating and creating an identity within the company, but at the same time it may interfere with other employees' inclination to use what should be a shared organizational resource. On the one hand, territoriality should be discouraged by the management (e.g. with cleaning desks initiatives), to allow all the employees to take their place every day at a different workstation. On the other hand, it could be even endorsed to boost concentration, well-being and productivity. Here some non-traditional solutions might help to make it acceptable and reduce the discomfort caused to other people. For example, thanks to the introduction of new technologies workers could personalize their desktops or change some workspace settings according to their preferences (e.g. light intensity, color and so on) by simply connecting their portable devices to the information and communication technologies (ICT) or building management systems (BMS) system. These solutions can be compatible also with hot-desking set up.

Moreover, people lamenting lack of space for meetings do not really verify the general availability of space but tend to look only at the next room. Instead, encouraging people to move inside the building from one part to another one would have two immediate benefits, one for the business and one for the health. First of all, employees would have more occasions for accidental encounters in the corridors, elevators, stairs and common areas, getting to know each other better in a creative and stimulating atmosphere (Waber *et al.*, 2014). Second, sedentary work can be broken by pauses and brief walks around the building that are good in terms both of physical and mental health, according to active design philosophy (Alker *et al.*, 2014). The importance of moving around on foot during the working day can be encouraged by the management. This would be a benefit, in the short term, by reducing complaints about the lack of MR,

and even, in the long term, by enhancing workers well-being and productivity. The use of wearable technologies, such as fit-bit and so on, could be worthwhile to stimulate mobility and companies looking for investments should consider it. Since some privacy concerns might occur among employees, the application of trackers and portable devices needs to be carefully evaluated (e.g. anonymity is important to protect, to some extent). However, it can potentially bring many benefits to them and support building and facilities management.

About post-occupancy studies

Then, it seems important to remark that during the observations surveyors have been frequently interrupted by employees asking who they were, why they were there and what they were doing. This is one of the most typical biases that may occur during observational activities, which is known as “Hawthorne effect” (Landsberger, 1958) and explains the different behavior of people when they know they are under observation. In fact, the awareness of being inspected, especially if it is an occasional event, is very likely to affect people’s attitudes and therefore modify the research results. Primarily, there was the fear of being caught while not being present at the desk (even if not assigned). This has to do, once again, with the traditional concept of productivity as strongly related with the necessity of working at the desk in the office. But, the attempt to take the chance to point out some discomforts, such as the lack of desks available per business unit or other concerns about environmental comfort, was prevailing as well.

About the first concern, privacy issues are to be taken into consideration – about both information and stimuli control (Congdon *et al.*, 2014). Similar kinds of post-occupancy surveys may apparently violate workers’ privacy, even if all the data are collected anonymously. Then, of course, strangers walking around the building attract curiosity, may distract employees from their normal activities and affect their productivity. In this sense, new technologies, such as portable devices, can be invisible and more respectful of privacy.

Second, the need to express face-to-face some order of warnings can invite the responsible management to rethink the way to accomplish communication, both in feedback and feedforward direction. How workers feel about the office environment is still underutilized information (Alker *et al.*, 2014). Instead, feedback can be vital to keep people tied up and to catch some useful suggestions from their everyday experience, while feedforward can be convenient for promoting virtuous conduct. For example, with the goal of connecting people, getting a flow of ideas and pushing innovation, many companies are introducing online social tools (Aurik, 2015). This method of involvement keeps the employees up to speed, leads them to a better understanding of the problems and enhances their engagement (Miller *et al.*, 2014). Since their opinion is required, they feel part of the team and more responsible of the company performance. This is likely to happen not only in the strategic and organizational field, but also in the real estate management sector, if such tools were introduced.

Finally, workplace transformation impacts the value creation process in terms of productivity, efficiency, absenteeism, staff retention, talent attraction and so on. Therefore, it is fundamental to carefully measure and monitor these indicators. In fact, taking care of the workplace change process towards smart working involves all its four key-components, i.e. organizational culture, HR systems, technologies and workspaces

(Methodos *et al.*, 2015). A post-occupancy study can be a fruitful methodology for assessing the results and supporting the fine-tuning of real and perceived performances.

Limits and obstacles encountered

The research development has faced a few limits, some of them in technical-methodological matter, but also in a more general respect. From a more specific to a broader perspective, they are discussed above.

Among the techniques applied for reaching the required level of knowledge, the observation technique may fail to some extent. While it is necessary for collecting qualitative information that only human researchers can bring, thanks to their individual expertise and sensitiveness, it is not the most appropriate method for accounting for people's presence or activities in the building. In this case, new technologies today available on the market can monitor employees' actions, movements and permanence in different building zones – sensors and cameras can send data to the BMS, which intersects those with many other information (for example, Tririga Software by IBM). Obtaining reliable information on people's behavior and use of space might help the facility managers' job. This can be done also via unobtrusive methodologies and guaranteeing the respect of privacy issues. There are several examples of technologies able to catch anonymous data on room occupancy, temperature, humidity and so on and to interface with the building systems to manage lighting, heating, ventilation, IT, etc. (Brister, 2015)[2].

A huge effort was required especially for elaborating raw data that are collected across several management departments. Indeed, at present they are not meant to be used for real estate management purposes, so they appear rough and unpolished. The lack of methods and tools valuable for obtaining well-refined data makes the process time-consuming and expensive (Blakstad *et al.*, 2008). While to some extent a human role is unique, to some others it could be profitably replaced by technology and automatic monitoring. In addition, it has to be considered that the time required to collect most of the data could have been spent, for example, conducting deeper observations or other surveys, where the human presence is really necessary. For instance, a covered observation could have been used to track people's interactions between each other and with the spaces, more detailed investigations could have been conducted about productivity before and after the move, and so on. While "observing for counting" is a mechanical activity, "observing for disclosing", which is possible through a non-structured observation, requires a different approach (Costa, 2014). Here, human sensitivity, experience and knowledge are needed to gain qualitative insights.

Last but not least, one of the most restrictive obstacles encountered is the availability of narrow resources (time and money) dedicated to post-occupancy studies. It is not a matter of chance that post occupancy evaluations (POEs) are still not considered as important efforts to be systematically deployed. In the Italian context, the present research can be considered as a pioneering achievement. Hopefully, it will contribute to a shift in mindset that is necessary to boost and advertise the importance of such studies.

Further research opportunities

After the collection of a proper number of case studies, i.e. extending the sample, it will be possible to build benchmarks on new workspace features and perfect the research methodology.

Consequently, the study may provide companies with useful indications on methods and tools for data collection toward workspace management. The opportunity to apply new analytic tools for gathering some kind of information needs to be further investigated.

Notes

1. This percentage of space saving is confirmed by some case studies analyzed by the Politecnico di Milano, Italy.
2. For example, the CrowdComfort trialled at Boston University is an app that provides the facilities managers with information about real-time, site-specific comfort levels and maintenance issues directly reported by building occupants. Arup and Philips are developing similar technologies that allow workers to interact with the building and vice versa.

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