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*Volume II*

## **Environmental Opportunities and challenges**

## **Constructing commitment and acknowledging human experiences**

Edited by

Matthijs Prins, Hans Wamelink, Bob Giddings, Kihong Ku and Manon  
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## **WBC16 Proceedings : Volume II**

Environmental Opportunities and challenges

Constructing Commitment and Acknowledging Human  
Experiences

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# Preface

The main theme of WBC16 is the cogent message that the built environment is an important enabler for the well-being of its citizens, the success of its companies and the competitiveness and coherence of the whole society. Special attention is given to the development of the built environment in different countries and continents, and the interplay of various stakeholders and experts at all scales of activities.

This is the second volume of five for the proceedings of the *2016 CIB World Building Congress "Intelligent Built Environment for Life"* (WBC16) held May 30 – June 3 2016 in Tampere Finland. This volume contains contributions, which were submitted to the themes 'Environmental Opportunities and Challenges; Regarding Nature and Outdoor Conditions' and 'Constructing commitment and acknowledging human experiences', and thus it is divided into two main parts. The first part (sections one and two) contains 16 papers, which were allocated to the theme 'Regarding nature and outdoor conditions'. The second part (sections three to six) contains 46 papers, which were allocated to the theme 'Constructing commitment and acknowledging human experiences'. In total, there are 156 authors from throughout the world.

## **Environmental Opportunities and Challenges; Regarding Nature and Outdoor Conditions**

This theme considers issues such as the interaction of the built and natural environment, sustainability indicators, environmental aspects, resilience, roles and responsibilities, and international cooperation. The assessment of sustainability issues, from life cycle impacts, to service life predictions and carbon emission measurements, appear as a distinctive collection of papers and are therefore grouped in *section 1* under the heading '*Sustainability Assessment*'. Papers about the effects of the natural environment and climate change on buildings, workers conditions, resilience and facades, are grouped in *section 2* under the heading '*Nature and Outdoor Conditions*'.

## **Constructing commitment and acknowledging human experiences**

The second part of this volume presents papers related to leadership, end users, decision making, human resource management, communication and behavioural studies. A significant proportion of the papers submitted to this theme investigate health and safety issues; with specific topics like national regulations, post-accident disputes, permits, SME safety policies and even workaholics on site. These are grouped in *section 3* under the title '*Health and Safety*'. Knowledge management, organisational characteristics, skills development, and communication are also vital issues, and these papers are grouped in *section 4*, titled '*Organisations, Knowledge and Communication*'. Papers exploring subjects such as contract management, project management, procurement and tendering, project organisation, project performance and productivity constitute *section 5* '*Projects, Procurement and Performance*'. A genre of papers about human experiences attracted contributions focused on learning behaviour, clients and stakeholders' experiences, as well as user satisfaction. Papers addressing these issues are grouped in *section 6* with the title '*Users, Clients and Stakeholder Engagement*'.

## **Acknowledgements**

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past years, which have resulted in the inspiring CIB World Building Congress 2016, of which this volume is one of the deliverables for future reference.

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# How to Manage Corporate Real Estate and End-Users Engagement into Smart Workplace Change Strategies: A Case Study

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## Abstract

Progressively, the spacial demand of workplaces is modifying, together with the habits of workers. How can companies react to the change of perspective that is affecting the traditional ways of working? What does 'Intelligent Built Environment' mean for corporations?

For several years at international level, it has diffused a new conception of the office: flexible spaces, shared desks and informal areas that can accommodate different activities as needed. Even in Italy this phenomenon is spreading rapidly: some firms have started to abandon cellular offices and open-plan offices, and to experiment with flexible work settings. A new demand is emerging with specific characteristics. The most significant drivers seem to be economic efforts (big and expensive buildings affected by low daily occupancy) and organizational reasons (teamwork, part-time work, teleworking, network strategies, etc.). Nevertheless, even external factors such as competition, globalization and corporate image can influence the motivation for change.

The authors have collected data on new ways of working and workplace change strategies in the brand new Italian headquarters of a company active in the technology hardware & equipment industry, with around 1,000 employees. The investigation involved both quantitative and qualitative research methodologies. By matching the results obtained, it has been possible to elaborate some considerations regarding benefits and risks of flexible workstations and the way of integrating smart working into corporate real estate strategies. What kind of data is valuable to retrieve about the use of workspaces? Which methodologies would be the most suitable for such a scope? When and how should consultants support their clients? And, most of all, to what extent can an 'intelligent building' support human activity in daily life?

The knowledge acquired can be useful to companies, both for managing the functioning of existing buildings and for orienting future projects towards the objective of becoming more 'intelligent'.

**Keywords:** Smart Working, Employees' Satisfaction, Workplace Change Management, Corporate Real Estate, Intelligent Office Building

# 1. Introduction

More than 30 years ago, Ronald Goodrich (1982) was considering that “now, as a result of the growing importance of office work, the introduction of office automation, the changing character of work, and the economics of office buildings, the office environment is becoming more intimately linked to the psychological needs, performance, and well-being of its users.” The same consideration, with the due differences, seems to be valid today as well. The importance of office work has now partially been revised, office automation is evolving everyday, new ways of working are rising, office buildings are changing their form and function, and the office environment requires being linked more than ever before ‘to the psychological needs, performance, and well-being of its users’. New working activities, new technologies with which we do them, new organizational structures and new ways people work together generate new requirements from the users’ side, that reflect on the space, the building and the built environment.

The opportunities, offered by a world that is more technology-driven everyday, lead to new ways of communicating, informing and networking affecting life and work style (Corso, 2005). Due to the advancements in the Information-Communication Technology field, some main consequences are emerging: a) new ways of communicating and expressing likes/dislikes are diffusing; b) new ways of working are developing; c) new data is available and suitable to create value. These aspects converge in the workspace that should, therefore, change and evolve taking into account people expectations. This probably means that, along with the workplace features, configuration and layout, even the methodologies currently used to assess the workplace quality might be adapted. As the most recent RIBA ‘Plan of Work 2013’ suggests, the fine-tuning of building quality against users’ requirements, expectations and opinions is recognized as a fundamental part of the construction process and the users are important stakeholders within it (RIBA, 2013). But, despite the many Post-Occupancy Evaluations that have been conducted worldwide, it seems there is still the need to find a way to transfer that process into a form that can be meaningfully put into everyday practice (Mallory-Hill, et al., 2012). Moreover, it is fundamental to make the user-centered approach (Vischer, 2008) more widely diffused – e.g., in Italy there is still lacking circulation in the academia and a shortage of applications in the professional sector.

For these reasons, there is growing interest in studying the interactions between the working environment and users’ perception. What features should characterize the workspace according to the new ways of working? How can we assess them? How is it possible to fine-tune the quality of the workplace? These questions affect all the stakeholders taking part in the process. Among them, Corporate Real Estate departments are particularly interested in those issues, since they are in charge of workplace change management, together with the Human Resources and Facility Management. Companies are taking up new ways of working in order to attract and retain talent, be competitive and successful in the globalized world (Heather, 2003). Architecture and built environment can be the enabler for the competitiveness of regions and cities, the success of companies and the well-being of workers and citizens. How is it possible

for an office building to take the role of enabler? What is an ‘intelligent office building’ meant to be?

## **2. Background**

Corporations that need new buildings should pay attention to creating solutions that correspond to real requirements, in order to obtain major cost savings with the best quality. Moreover, it is important to fine-tune building performances continuously, according not only to corporate strategies, but also to pragmatic human experiences. By involving the end-users of office buildings, in fact, it is possible to build an effective decision making process. For these reasons, an integrated approach to the design, delivery and management of buildings and built environments is necessary nowadays. The objective is to reach the best results in terms of employee commitment, satisfaction and productivity (Miller, et al., 2014).

To this end, an international company was interested in conducting a post-occupancy study on their brand-new Italian headquarters. The firm had recently invested in the construction of new premises. The initiative entailed a radical re-layout of the work settings, according to the smart working approach (Methodos, et al., 2015) and looking at the ‘Intelligent Building’ model – i.e. high-tech building with flexible office space and advanced control technology (Preiser & Schramm, 2002). The application of a hot-desking solution (Knight & Haslam, 2010) was embraced in order to optimize space utilization and encourage employees’ interaction. Only 30 employees out of almost 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, varied for capacity (from 4 to 25 seats) and equipment (projectors, screens, teleconference and videoconference tools, etc.), concentration rooms and phone booths are located on each floor, beside some free space for informal meetings, breaks etc.

The study began 6 months after the move in, in order 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 radically transformed in the new building and some resistance to change emerged among employees. The objective of the management, including Corporate Real Estate (CRE), Human Resources (HR) and Facility Management (FM) departments, was to accompany the employees through the workplace transformation, to verify the pre/post-transfer impacts and to harmonize the new spaces with their requirements.

## **3. Research Methodology**

The investigation involved both quantitative and qualitative research methodologies, in line with the approach suggested by Jick (1979) and referring to Post-Occupancy Evaluation techniques, as recommended by Costa (2014). The first methodology implied processing on quantitative data provided by the company and a questionnaire administration. The qualitative approach

consisted of a field observation campaign, some semi-structured interviews with the management team and a few focus groups with employees.

As the exploratory phase began, a large documentation was revised about the characteristics of the building, completed by a non-structured observation with the walk-through of one of the HR managers. In addition, numerical data concerning the accesses of employees to the building and meeting rooms' reservation was analyzed. Actually, FM and HR departments pick up this data on a daily basis, but leave it at a raw stage of elaboration, so it needed cleaning and preparing before use.

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

The structured observation was carried out on 2 different workdays, considered representative of the standard ones, given the firm's characteristics and different business units' habits. This methodology was applied to map and monitor the way people use spaces, according to the behavioral mapping approach typical of environmental psychology studies. In addition, qualitative considerations about where and how workers performed several activities were annotated and later compared with workers' perception. Four researchers, in two groups, walked through specific zones of the building (selected as a representative sample of the whole premises), making sure to observe each space once per hour. Overall, 62% of the workstations and 87% of the meeting rooms were observed. Supported by a detailed checklist, the observers punctually registered the number of:

- employees seating at desks;
- personalized desks;
- employees occupying the meeting rooms;
- employees using concentration/phone booths;
- people present in the break areas.

These records have been intersected with:

- total number of accesses;
- total number of desks;
- capacity of the meeting rooms;
- number of phone booths;
- number of break areas.

In the end, 3 focus groups were organized to directly meet with the employees and listen to their thoughts. The HRs selected the 50 people sample – divided into smaller groups. The sample represented overall almost all the business units inhabiting different zones of the premises. 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, four of which, more in detail, regarded – see Appendix (Survey questionnaire):

1. their doubts or worries before the move compared to their feelings after the move;
2. their presence at work during the 'typical working week' (time spent in the office building);
3. their activities at work during the 'typical working day' (time spent on different activities and in different areas of the building);
4. the level of importance and relative satisfaction they attribute to some factors that affect work quality and effectiveness (on a typical Likert scale from 1 to 5).

The questionnaire was used as a template for open discussion. After answering one question, the people were invited to talk about the same topic and discuss between each other. 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.

## **4. Findings**

Useful findings have been built up thanks to the integration of several methodologies, none of which can bring trustworthy results if taken in isolation. Quantitative data retrieved about the use of the workspace (e.g. number of accesses per day, employees sitting at the desk, personalized desks, employees occupying the meeting rooms, employees using concentration/phone booths, people present in the break areas) need to be verified against qualitative information. Only through this integration, is it possible to get 'what' is happening and explain the reasons 'why' this is going on and, therefore, find a strategy to correct eventual mismatches.

The chapter will summarize the main insights obtained on flex office implementation, workspace management and employees' satisfaction, with respect to the move in process and the brand new office layout.

### **4.1 Pre/post Transfer Impact**

With regard to the employees' issues about moving to the new premises, most of the focus group participants found their worries were ill-founded. Out of 49 interviewed employees, between 60 and 70% confessed they:

- were afraid of wasting time while they were looking for a free work station;
- were concerned there could be problems in working relationships with colleagues;
- suspected they would lose their normal efficiency in their daily work activities.

Overall, they found that these matters were not a problem. Respectively, 100% of them were satisfied with finding a free workstation, 85% of them were fine with working relationships and 78% had no problem with work efficiency. In more detail, during the open discussion, specific reasons for concern in work efficiency emerged, which lowered the employees' level of

satisfaction. Among these reasons, the main ones were associated with noise and distractions in an open space setting, sense of privacy, and climatic discomfort. Regarding these problems, a deeper understanding has been provided thanks to the field observations and the further points faced in the focus groups, where additional issues connected to the quality and effectiveness of the daily work came to light.

## 4.2 Adaptation to flex office

Even though the majority of the people who were afraid of wasting time while looking for a free workstation admitted to having no problem in this instance, some complaints about contract conditions arose. Against expectations, indeed, contracts require most of the employees to work in the office (“*I thought flexible space meant a more flexible management of work. I thought I would really be able to work from home, but this is not happening now*”). The ratio of people who have a telework contract and employees with a traditional contract is very low (“*about 1:9*”) and in some cases has been further reduced compared to the previous situation (“*many colleagues had a 3-days-at-home-2-days-in-the-office contract. Now contracts are renewed in the opposite sense*”). As a result, the risk of overcrowded spaces increases proportionally with the rigidity of contracts. Besides, there is the threat this company policy is upsetting employees, who perceive a considerable lack of alignment between architectural/layout choices (“*it is all in flexible logic*”), on the one side – which aims at establishing a model of flexibility in settling and working, and contract conditions, on the other – which are perceived as working against that model. In this regard, it is noted that a good workplace strategy should be managed with the full involvement of the human resources and real estate functions, that should work in an integrated manner (Martin & Black, 2006).

In addition to this consideration, the questionnaire shows that most of the interviewed employees can represent their working hours in a ‘typical working week’, where over 90% of them say their daily work is performed in the office. Only a very small minority believes their activity does not follow a regular pattern and admits they are often away from their work desk. This minority includes employees of those business units that are typically more mobile, such as the customer service unit and the marketing department in particular.

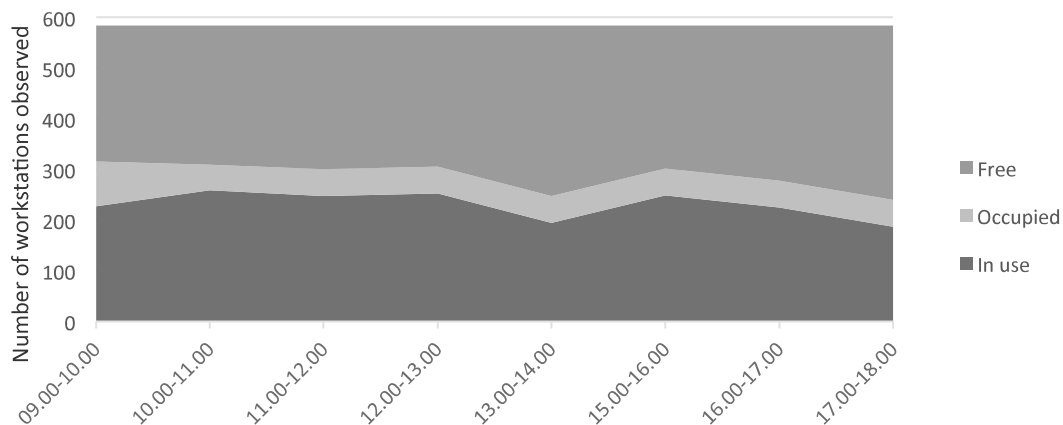


Figure 1. Number of workstations in use, occupied and free (source: observation)



Comparing the issues that emerged during the focus groups and the questionnaire answers with the numerical records retained by the HRs and the field observations, it is possible to correctly weigh the accuracy of the statements reported by some workers. According to them, in certain conditions it is difficult to find a free desk (*“on some days there is not enough room for everybody, teleworking does not fit in properly”*). The quantitative data obtained from monitoring badge swipes at the entry turnstiles, during the period January-June 2015, reveals that the average attendance level of the total number of employees is around 75%, reaching 81% as its highest value. Therefore, employees’ perception about their daily presence in the office doesn’t correspond to real data. Moreover, field observations reveal that the percentage of attendance at the workstations is even lower (Figure 1). Only around 40% of workstations were in use (an employee was physically present at the desk), on average, and 15% of them were occupied by an employee being not physically present (he/she could be involved in a meeting, conference call or other activity). Therefore, almost 50% of the workstations resulted in being effectively free.

This kind of count is actually more accurate than the mechanical count performed by turnstiles activated by badge swiping, because it detects the continuous presence of an individual in a building. However, a margin of error is possible because of eventual misinterpretation of traces on the workstation at the time of observation. Although, numbers make it evident that it is unlikely for employees to encounter real difficulties in finding a free seat.

Furthermore, with regard to the multiple-choice question “Which of the following statements best describes your work station in your company?”, most employees answered that they worked in an open space setting, whereas only 13% specified they worked in different, non-assigned work stations. This means that most employees do not perceive they are hot-desking. They still have a more traditional concept of open space, which they conceive as a collective space shared with colleagues, in which everyone has the exclusive use of one workstation. This feeling explains also the tendency to ‘sedentism’ and personalization that affects their behavior. During observation rounds, on average 1 workstation out of 4 was marked in some way with personal objects. This trend might compromise the flex office model, 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 areas. On the contrary, some business units are more settled as a vocation, such as finance, legal, procurement, quality and others. Not surprisingly, it is exactly here that the most numerous territorial signs, e.g. identity-oriented markers (Brown, 2009), have been found. It is also significant that almost 20% of those desks not assigned to any business unit, i.e. theoretically free from personalization, presented some marks. The objects typically found on the desks may affect more or less significantly the image and functionality of the workstations. Among them it is worth mentioning: toys, photographs and posters; calendars, post-its, reminders; plants; pen holders; documents. Coherently with the trend registered, according to the questionnaire, 44% of interviewees would appreciate the possibility to personalize the desk in order to feel more comfortable at work.

### **4.3 Work Activities and Spaces**

Beside more traditional activities such as ‘PC, reading, writing’ and ‘talking/meeting’, that employees estimate can take up, respectively, around 45% and 15% of their typical working day, other activities such as ‘phone’ and ‘conference call’ seem to be very significant, as revealed by the questionnaire, occupying 27% of the typical working day. This is coherent with recent research saying that thinking, talking and brainstorming create the most value for an organization (Colpaert, et al., 2014). Today, the time spent at work in some type of conversation is up to 50-80% of the overall working day. It is common belief that by talking together, people come up with new solutions in the shortest time that probably neither single person could have developed alone. The key activities in today’s work are both concentrated (solo) and collaborative (together). On one side, concentration, observation, research, imagination, testing and planning require concentration. On the other hand, brainstorming, interviews, workshops, co-creation, debate and delivery require collaboration. These attitudes impact the traditional features of the workspace and how people perceive it.

Referring specifically to the employees’ assessment, the activities performed in a typical working day can be carried out collectively or individually in the following proportion:

- collectively or in groups, 40%;
- individually, 47%;
- both collectively and individually, 13%.

It is therefore possible to claim that the distribution of the workstations in the new headquarters is correctly planned; in fact, the number of open space workstations and the number of workstations in meeting rooms is almost the same.

When considering the above, it is necessary to bear in mind the importance of the spaces and technological facilities used to manage meetings and calls. It is crucial to implement the appropriate measures to disturb as little as possible other employees who are involved in activities that require particularly high levels of concentration (e.g., PC, reading, writing).

### **4.4 Strengths and Weaknesses**

Focus group participants were asked to express their opinion on the importance of, and satisfaction with, a number of factors that can affect the quality and effectiveness of their work (on a scale from 1 – not at all important/very dissatisfied, to 5 – very important/very satisfied), regarding physical (Roelofsens, 2002) and psychological (Alker, et al., 2014) issues (Figure 2)

It is interesting to read the weight of the difference between the level of importance given to one factor and the corresponding level of satisfaction. In this way, it is possible to become aware of the most critical issues and establish intervention priorities accordingly.



Figure 2. Level of importance/satisfaction regarding the factors that affect work quality and effectiveness (source: questionnaire)

The factors that received the highest score ( $\geq 4$  points) for importance include: opportunities to relate with colleagues; control of light; privacy.

With regard to satisfaction, the highest ranking factors (score  $\geq 4$ ) include: impact/quality of the welcome area; relaxation areas; opportunities to relate with colleagues; sense of personal safety; being able to see outside.

It is important to note that for some of the listed factors the level of satisfaction is equal to or exceeds the given level of importance. These factors can be considered ‘strengths’ (Table 1). On the contrary, in some cases, there is a significant deviation regarding the level of satisfaction ( $< 3$  points), so these factors must be interpreted as ‘weaknesses’ (Table 1), which require urgent intervention measures.

Table 1: Strengths and weaknesses

<i>Strengths</i>	<i>Weaknesses</i>
<ul style="list-style-type: none"> <li>- <i>impact/quality of the welcome area</i></li> <li>- <i>relaxation areas</i></li> <li>- <i>being able to keep personal items</i></li> <li>- <i>feeling of equality</i></li> <li>- <i>sense of personal safety</i></li> <li>- <i>being able to see outside</i></li> <li>- <i>informal and relaxing atmosphere</i></li> </ul>	<ul style="list-style-type: none"> <li>- <i>privacy</i></li> <li>- <i>control of light</i></li> <li>- <i>being able to personally control the temperature</i></li> <li>- <i>disturbance caused by the use of mobile phones</i></li> <li>- <i>disturbance caused by people moving around</i></li> </ul>

Lastly, there are some aspects that have a slightly negative difference but the related level of satisfaction is good or excellent ( $\geq 3$  points), e.g., personal and non-shared workspace. In this case, it is reasonable to suppose that the changes in working conditions have had a certain impact on employees, who have yet to absorb it all. It is likely that over time the level of satisfaction may increase, even without making significant changes to the surroundings, simply as a result of people becoming used to the new conditions.

From the direct discussion about factors listed above it is possible to claim that the general sentiment seems to be very positive (“*I like it here*”, “*it is a 100 million times better than in the past*”, “*everything is much more efficient*”). In most cases, the expectations regarding the new open space layout are positively satisfied (“*before joining this company I worked in an open space setting. In the old premises I felt I had taken a step back, now I feel things are normal again*”), and in some cases they have actually exceeded improvement expectations. About one third of interviewed employees have switched from a closed office to an open space layout with a generally favourable attitude (“*I had a closed office but I have grown used to it - now there is more contact with colleagues*”). It is clear that the opportunities for social interaction, for exchange and for establishing new relations have increased (Blakstad, et al., 2009), which everybody considers a positive aspect (“*we know each other better, we have met new colleagues*”). Among other things, this element was considered the most important factor (score of 4.3) that can affect the quality and efficiency of work (“*The new layout improves interaction among colleagues and helps us feel more part of a team*”).

The outward image of the premises is considered one of the best factors. The architectural features employees are most satisfied by are the equipment in the meeting rooms, common areas for guests (“*the company image has gained a lot*”, “*I always receive compliments from guests*”) and quality of light (not be confused with ‘control of light’, which is related to the quantity of light and being able to manually adjust its intensity). On the contrary, the inward image seems to have some issues, especially regarding the feeling of equality (“*we were told we were going to the new premises so we would all be equal, ‘Break down the barriers, no more status quo!’ , then it turns out not to be true*”). Some employees complain about disparity caused by closed offices assigned to people who do not actually need them (“*there is a problem of equality,*

*actually there are closed offices for colleagues who could integrate with everybody else*”). However, these considerations can be rated as ‘overcome’ by the answers recorded in the questionnaire completed by the focus group participants, who on the whole gave the feeling of equality a positive assessment in terms of satisfaction (3.5), which actually exceeded the expectations compared to the given level of importance (2.9).

## 5. Discussion

The study has demonstrated the success of the project in terms of overall employees’ commitment, satisfaction and productivity, as declared by themselves. The new workspace features have been introduced in order to react to the change of perspective that is affecting the traditional ways of working. The update of the office setting according to the new trends – including hot-desking, encountered the favor of building occupants, despite initial doubts. Thanks to occupants’ consultation, it was possible to assess the appropriateness of the new configuration and to fine-tune the quality of the intervention. The users gave warnings of discomfort during the focus groups, so that some technical problems emerged, such as the control of light and temperature. These were reported to the management who planned a prompt intervention. About work efficiency, most of the concerns could be attributed to incorrect or improper habits on the users’ side (disturbance caused by the use of mobile phones, disturbance caused by people moving around and privacy related issues). These are likely to be resolved simply as a result of people becoming used to the new conditions and thanks to a good communication and education strategy implemented by the HRs.

Particularly crucial to this extent was the phase of reporting findings. At a first stage, a written report was delivered to the management, providing all the details about research methodologies, conclusions and possible actions to implement with indications for prioritization, in order to support the decision-making process. Afterwards a presentation was organized, inviting all the employees who took part in the focus groups. Here the main outcomes of the research were explained in an understandable way, trying to focus on those behavioral aspects that could positively affect the working experience. Moreover, the real estate and facilities managers introduced the actions they were going to undertake in light of consultants’ recommendations. Involvement of employees in decision-making is likely to foster a sense of common identity and to promote motivation and commitment. In this phase the evaluator assumed the role of mediator, helping communication and negotiation of consensus (Preiser & Schramm, 2002).

In the end, it was confirmed that the most important worries troubling the employees before the move were mostly inconsistent. No waste of time while looking for a free workstation, no problems in relations with colleagues, and no loss in normal work efficiency was seriously detected. In fact, many free desks are always available and enhanced relationships with colleagues are reported as one of the most satisfactory factors. The risks of implementing flexible workstations with open-space and hot-desking were positively faced and brought benefits in terms of interactions, feeling of equality and informal working atmosphere. All these aspects characterize the new ways of working and should be endorsed by the office environment. This is the extent to which an ‘intelligent office building’ can have a meaning for

corporations. It should be able to adapt every time to the changing necessities of the company that it hosts and to provide the occupants with the right backing for their multiple activities. Then, of course, an office building is not intelligent by itself, just for its architectural configuration and technical infrastructure, but it is primarily the way it is managed that makes the difference.

## 6. Conclusions

The present research should be considered one of the few efforts in the post-occupancy studies conducted in Italy. Therefore, it represents one of the actual best practices in workplace change management in an Italian context, which will contribute to building a cross-cultural framework of evaluation data on building types like intelligent office buildings. Moreover, hopefully it will encourage the evaluative stance throughout the building delivery process. The implementation of a post-occupancy study is important both for verifying the results of a project after its completion, which is needed in building management, and for gathering data suitable for further interventions. Particularly, the phase of reporting findings to the end-users brings the immediate outcome of making them feel important stakeholders within the office building and to keep them well-informed about the objectives of the project and its results. This process itself enhances engagement and satisfaction among workers. In addition, it is an important occasion for communicating messages able to turn behaviors into positive attitudes and good habits. The related consequences will be visible after some months, when, for that reason, it will be important to perform further surveys.

With regard to this specific case study, the main objectives to accompany the workers through the workplace transformation and to verify the pre/post-transfer impacts towards the harmonization of the new spaces with their requirements were met.

An external consultant's job can be important for helping companies switch from a traditional way of working to a smart working model and conveniently match the workspace with the organization's new objectives and values. Ideally, this accompanying function should last from the very beginning of the project until the delivery of the building, and even afterwards with a continuous monitoring activity. Through the whole duration of that period, it is possible to understand the initial intents and to verify them against the everyday operation of the workspace. This long and complex process is the only means to fine-tune the quality of office buildings. Most of the time, because of a lack of resources or motivation, it is not possible to carry on this preferential relation with the company. Nevertheless, it would be useful, at least, to retrieve some data about the use of the workspaces, since they are suitable for keeping the building value under control. Going into more detail, it seems valuable to monitor space occupancy rates, employees' habits concerning their ways of working (presence during the week and activities during the day) and occupants' perception on how the workplace affects work quality and effectiveness. These are the main variables that reflect if an office building is working properly or not. Some professionals should be in charge of collecting them and to promptly adopt the best measures for adjusting the space features according to these changing variables. Today, thanks to sensors and portable devices it is not difficult to gather some of

them. Nevertheless, some room for innovation exists especially where occupants' involvement is required – in light of the new ways of sharing likes and dislikes – and in assembling qualitative shades with quantitative assumptions. More research would be interesting to understand how to combine this information in everyday practice.

In fact, on the basis of our experience, while relying on only one source of information could have produced misleading results, matching both quantitative and qualitative data through the triangulation of different methodologies helped obtain consistent outputs. On one side, it is important to remark that the role of a consultant needs to be supported by internal sectors. On the other, it is evident how different skills (the consultants' know-how, with the CRE, HR and FM experience) have collaborated to generate key insights valuable for driving the management of the new premises and for informing eventual future corporate projects. This case study also suggests the necessity of complementing real estate and facility management with human resources policies and underlines the importance of devoting proper attention to internal communication. May it be necessary to appoint a new professional who is able to apply an integrative approach as such?

An 'intelligent office building' is one that successfully relates to its occupiers, being able to adapt according to the changing needs of its users. That is the extent to which an 'intelligent building' can support human activity in daily life at work. This can depend, on one hand, on the technological devices installed with advanced control technology and the architectural features characterizing the work setting, as a flexible office space. But, on the other hand, it depends on the organizational structure and managerial intentions. The work conducted demonstrates how not only the result of a post-occupancy evaluation is important, but the process itself is very helpful. Using a user-centred approach, employees feel more engaged, know they are part of the stakeholders and, consequently, become more conscious and responsible for their behaviour. Their contribution can make buildings function better. Only through this kind of attitude, can it be possible that an office building takes the role of enabler for the well-being of workers, the success of companies, and the competitiveness of regions and countries.

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