Restructuring of Building and Facilities management based on the influence of end user preferences, - preliminary results of a current research project -

Wim Pullen, Center for People and Buildings Delft
(phone +31-15-278 8833, or email: w.r.pullen@tudelft.nl)

Introduction

The research on building use and the feedback of building user experiences to planners and architects is extensive. Yet the consistent and longitudinal application of methods to create a database of case study datasets in order to develop evidence in the field of people, work and their workplace environment requires perseverance and continued funding. The Center for People and Buildings in the Netherlands developed methods to obtain consistent and intertemporal end user information in different case studies (Volker van der Voordt, 2005). The Workplace Diagnosis Instrument (WODI) Toolkit consists of four elements: the space utilization monitor SUM to measure occupancy rates, the Workplace Diagnosis Tool WODI, its later-derived quick scan version WODI-Light for measuring end user satisfaction and the Satisfaction Indicator which enables organizations to compare the satisfaction scores for their own building to the average of all other buildings measured using WODI light.

The WODI methods are being applied in the Netherlands and Canada in the period 2003-2008. The total number of respondents is (February 2008) 4000 in 30 cases. Data are stored allowing us to do cross case analysis producing numerous insights. Those vary from what end users consider important with respect to work and workplace satisfaction to the influence of the workplace for labor productivity (Batenburg, van der Voordt 2008, de Been 2008). Analysis of the case studies allow us to derive to a better understanding of knowledge about how end-user preferences supports the facility manager in his role as compared to general managers and HR managers

Assumptions and background

We assume that due to societal and organizational trends (e.g.horizontalization) different actors more than ever will raise their voices when it comes to development, use and maintenance of the workplace. Traditional institutions like unions – giving voice to the employee are replaced by direct democracy in the organization through Internet based employee questionnaires or panels. Many organizations are in the process of reinventing their workplace strategies. The reinvention process covers numerous topics: workplace learning, roles and responsibilities in HR, teleworking, communications etc. Many different actors are involved and managers are due to a shortage of knowledge workers increasingly aware of the necessity to deal with opinions and perceptions of employees. This understanding allows end users to participate in workplace development and decision making through surveys, questionnaires, focus groups and other participative methods.

We assume that a structured documentation of data will allow researchers to analyze and develop *reasoning and argumentation patterns* that are evidence based. It is therefore that we conduct case studies and apply different reasoning methods: (i) *deductive*, (ii) *inductive*, and (iii) *abductive*, (iv) *analogous* (Hanekamp, Volker Pullen 2007). In this article we will report some findings of a case study in one of the Dutch Universities dealing with the inductive approach. Here are our premises and initial conclusion.
1. End-user opinions about the workplace are becoming more and more explicit
2. If managers take their employees/end users serious, institutional changes are likely to happen
3. Managers are confronted with a structured presentation of end user opinions
4. Conclusion: institutional changes in the workplace domain are happening.
The context i.e. the institutional setting is described in the next section

Context for theory and practice

In the Center for People and Buildings we frame research questions in the domain of people, work and their workplace environment in two different ways (1) according to the interests of actors and (2) according to a theoretical approach framing theories or developing research tools and methods.

In the present case study of a University department we started the work assuming that there are four stakeholders: the university board, the concern controller, the end user department and the corporate real estate department. Assumed interests, information needs and key decisions of the actors are listed in table 1.

ACTOR	INTEREST	INFORMATION-needs	DECISIONS
University Board	Public Image of the university	Attraction of high performing researchers; attracting of students	How to play the role of the best employer
Concern control	Optimal allocation of budgets; Accountability	Financial performance of real estate; Market value of property	Make or Buy?
End user /Department: Employees, students	Functional, safe and healthy workplace environment	Ho to do our work the best we can. How to use the workplace -environment?	Where to work: at home, in the office?
CRE departement	Efficient and Effective Real estate portfolio which serves the interests of all stakeholders	How do buildings perform: technical, functional and economical?	How to provide workplaces for changing organizations

Table 1 Actors, interests, information needs and key decisions

The demand for research was framed by the maintenance manager within the CRE department: "How does knowledge of end user appreciation of the building influence the maintenance strategy?"

The research project: questions and method
The maintenance manager approached the managing director of a University department. The latter acted as the representative of the end user department and showed a keen interest in the project because from his point of view the outcome of the research could be of use in his negotiations with the CRE department and subsequently with the University Board. The reason was that a user satisfaction survey of the work environment had never taken place. The CRE department could not imagine what the outcomes should be and how these would affect the CRE strategy and the maintenance strategy in particular. An explorative research design was set up consisting of several steps.

The actual maintenance strategy was based on condition measurements and definition of priority measures according to the budgets available. It was as Vijverberg describes "A maintenance action plan is drawn up on the basis of inspection results. The starting point for this plan is often simply the technical need for maintenance, the assumption being made that the building will continue to be used for a great many years".

We found that this assumption proves to be false in the light of the CRE strategy of this university. There will be a planned change realizing a new campus in the year 2020. In the light of this long range plan some questions were important to answer: (1) given the changes of the new campus is it a logical assumption that this department keeps using this building, if yes how many years? And (2) what maintenance measures should be taken with respect to end user satisfaction and both technical an economical value?

The starting point of data collection is the WODI toolkit that consisting of (1) a user satisfaction survey, (2) measurement of occupancy rates, (3) and a student satisfaction survey.

To collect end user opinions we used the WODI light, an internet based questionnaire. Data of the case study are compared to outcomes of other case studies on the basis of average values for user satisfaction and user dissatisfaction for 19 variables varying from satisfaction with work, organization as well as variables linked to workplace features and supporting facilities.

For measuring occupancy rates we use the CfPB tool Space Utilization Monitor (SUM) including structured walkthrough each hour on 7 working days from 8.30 AM to 4.30 PM. A specific student's questionnaire was developed to obtain data on the use, preferences and satisfaction of students of their building.

A theoretical framework was developed trying to link maintenance data to end user satisfaction outcomes opening the debate on questions like the following:

- "What will be the effect on employee's concentration when a run out VAC system stops making noise?
- Will more employees return to the office under these new 'silent' circumstances to meet peers and students?
- Will improved energy performance of building installations cause more users to be satisfied with then building?
- Will high quality condition scores of building parts improve user satisfaction?"

One of the hypotheses was that there is a relationship between condition scores and user satisfaction rating. Three possibilities are given in figure 1. Maintenance measures are interventions with different possible outcomes.
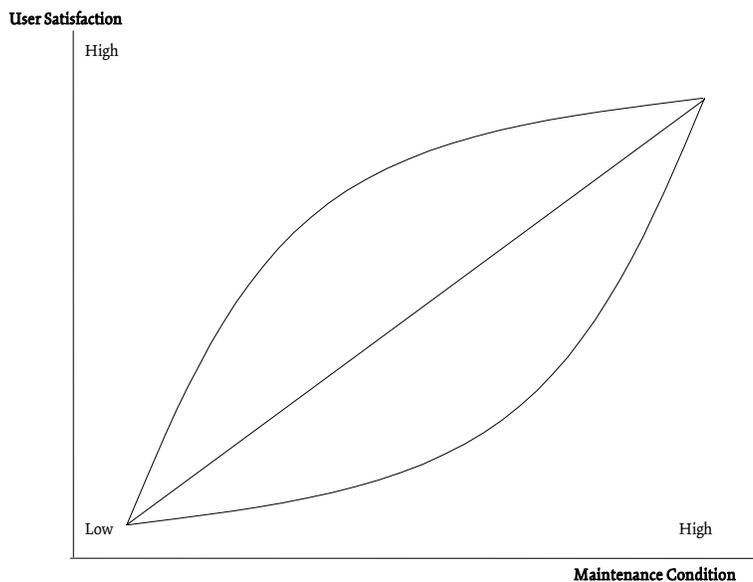

figure 1: Hypothetical relationship between condition scores and user satisfaction

At least they intend to improve the technical condition expressed in a higher condition score. They also create an effect on user satisfaction:

- Improved condition: no effect on user satisfaction
- Improved condition: equal improvement in user satisfaction

- Improved condition: lower user satisfaction

The starting point however was the actual situation of the building and the perceptions of end users expressed in satisfaction ratings. Here we present some of the outcomes

Data and outcomes

Space measurement

The average occupancy rate of workplace never exceeded 31%, meaning that on average of the day 69% of the workplaces were unoccupied. Other places like meeting rooms, library had an average occupancy of 42%. Some results are given in figures 2 and 3.
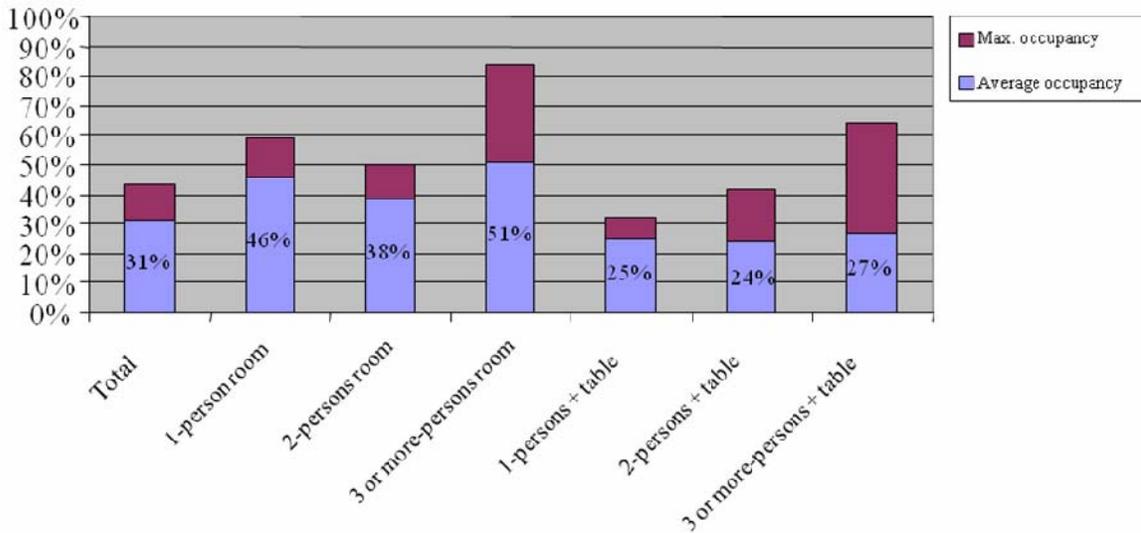

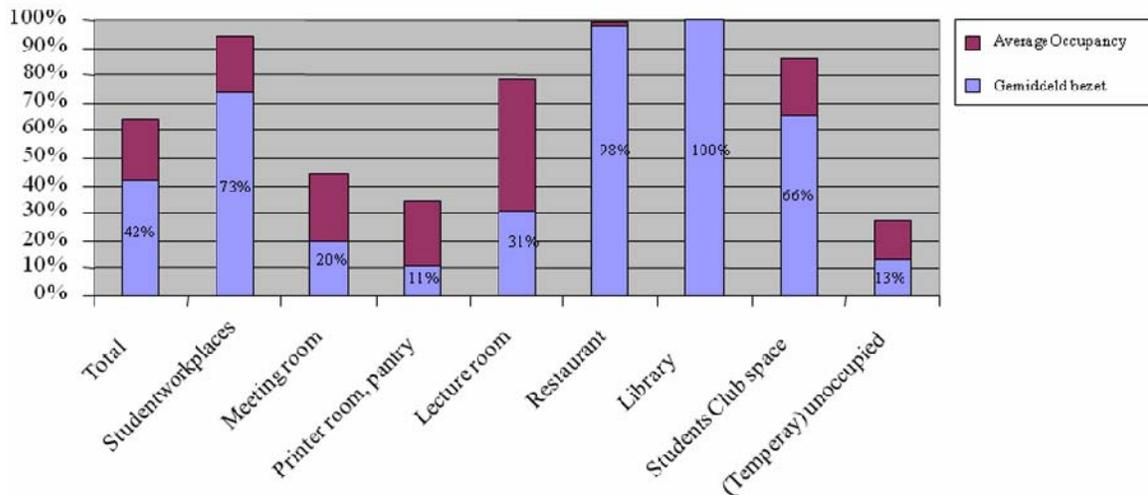Figure 2   Occupancy rates of workplaces

Figure 3   Occupancy rates of others spaces

Employee satisfaction measurement

The WODI measurement showed that people are very satisfied with their work (85%), the IT infrastructure and support (95%) and opportunities for communication with peers and students (80%). Yet there is low satisfaction on Indoor Climate (13%), Architecture and image of the building (20%) and quality of the interior design (32%). Dissatisfaction rates were consistent with the low satisfaction rates.

Functionality of the workplace indoor climate and possibilities to concentrated work were rated as the most important aspects of the building. Architecture and filing infrastructure were the least important. Creating two graphs (1) importance vs. satisfaction and (2) importance vs. dissatisfaction acted as eye-openers for the discussion with the stakeholders (figures 4, 5 and 6).
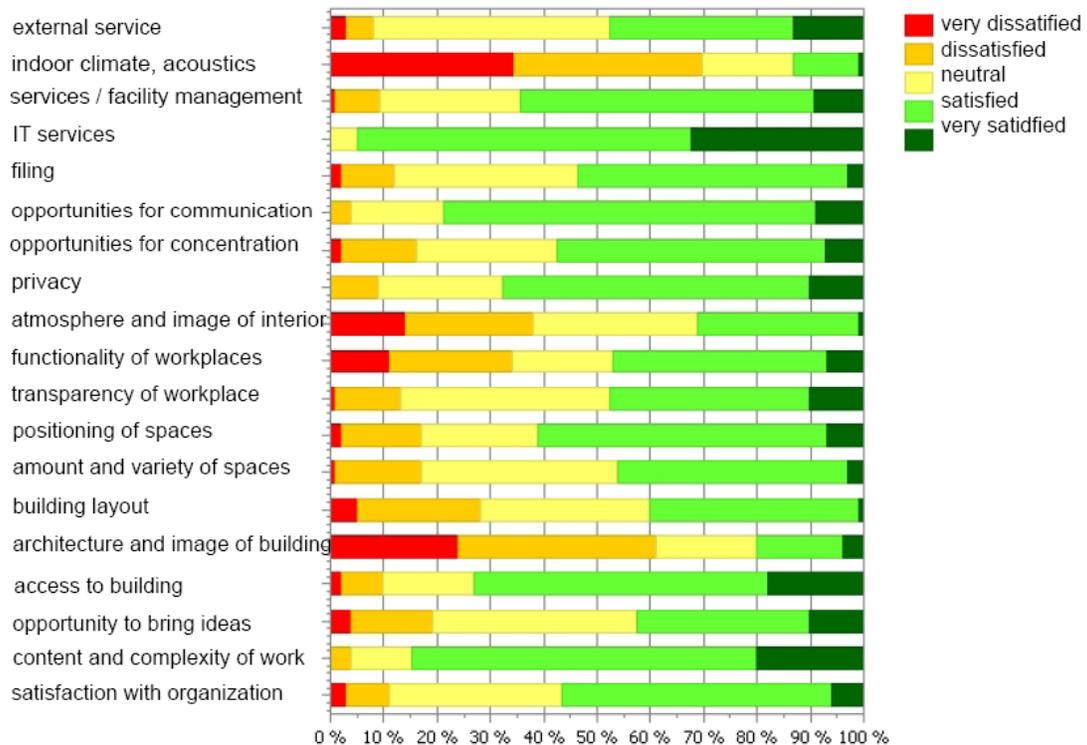

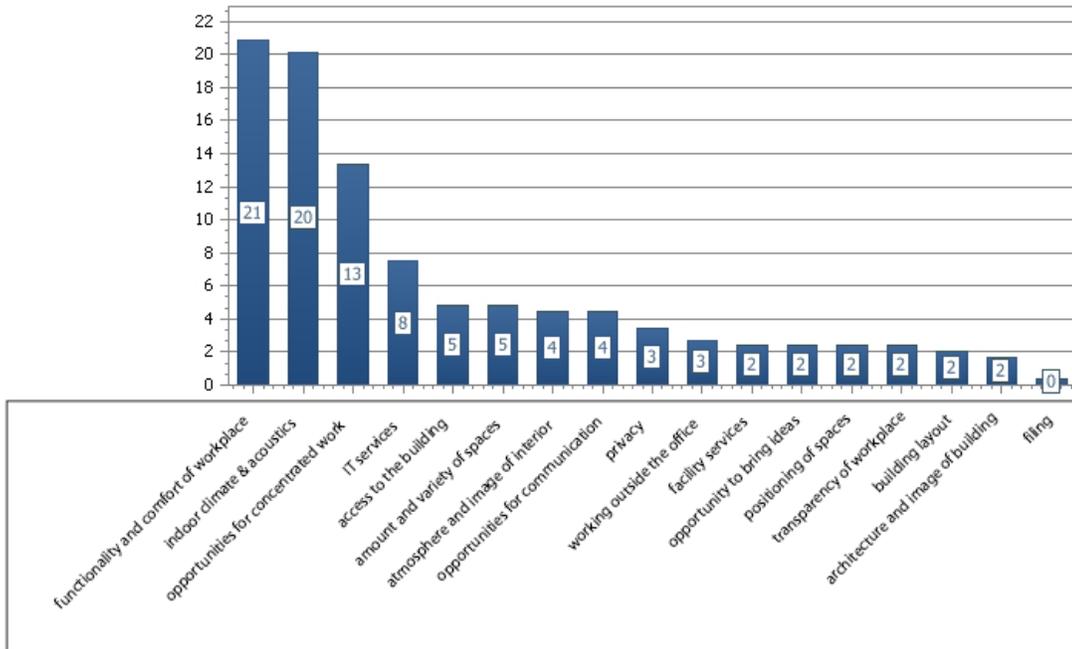Figure 4   Employee satisfaction in percentages, n=100

Figure 5 — Importance of different variables of workplace (chart)

Bar chart values (left to right): 21, 20, 13, 8, 5, 5, 4, 4, 3, 3, 2, 2, 2, 2, 2, 2, 0

Categories: functionality and comfort of workplace; indoor climate & acoustics; opportunities for concentrated work; iT services; access to the building; amount and variety of spaces; atmosphere and image of interior; opportunities for communication; privacy; working outside the office; facility services; opportunity to bring ideas; positioning of spaces; transparency of workplace; building layout; architecture and image of building; filing

Figure 5   Importance of different variables of workplace

Figure 6 — Importance vs satisfaction (scatter plot)

Satisfaction (%) axis 0–100; Importance (count) axis 0–25

Labels: ICT en ondersteunende diensten en voorzieningen; Communicatiemogelijkheden; Bereikbaarheid van het gebouw; Ligging van de ruimten; Dienstverlening en; Privacy; Het archief en de opslagmogelijkheden; Concentratiemogelijkheden; Openheid en transparantie van de werkomgeving; Externe; Hoeveelheid, diversiteit en functionaliteit van de; Inhreng in de werkomgeving; Indeling van het gebouw; De sfeer en uitstraling van het interieur; Architectuur en uitstraling
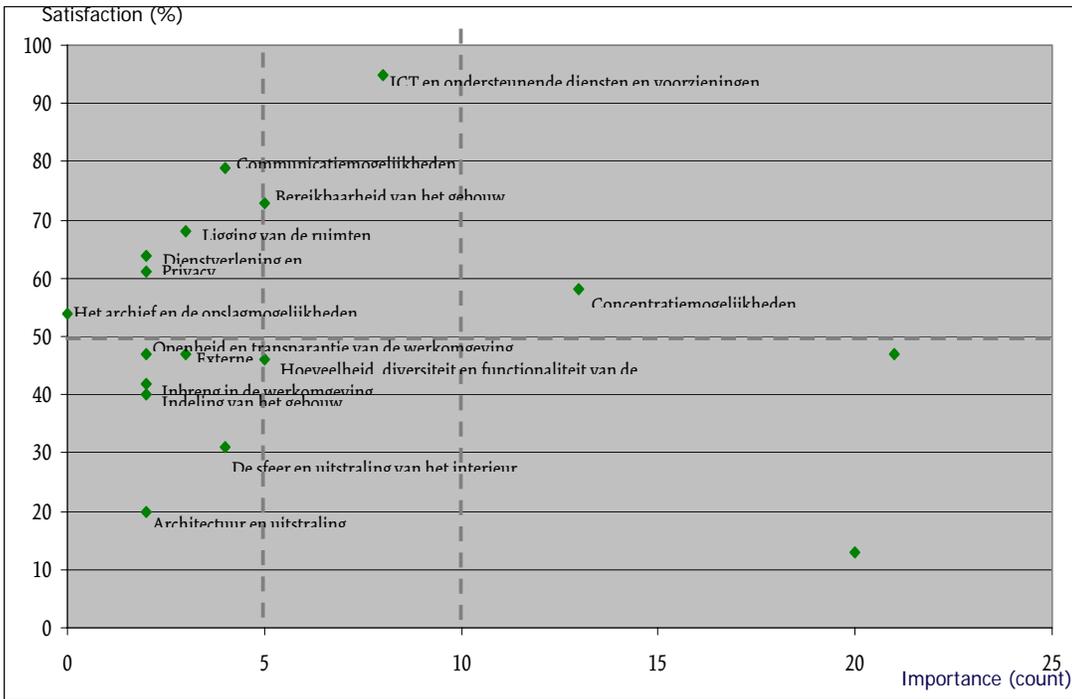
Figure 6   Importance vs satisfaction (partly in Dutch)

Student satisfaction measurement
Student rated their separate spaces between 6,4 and 7,1 (on a 1-10 scale, 1 is low 10 is high). Yet their overall judgment on the building as a whole was 5,9.

Discussion of outcomes
Facts and figures understood
Facts and figures were presented by the researchers in an interactive workshop with stakeholders: CRE department and the managing director of the department. The following the questions were asked: (1) What did we find, (2) what does it mean, (3) do we understand and (4) can we explain the outcomes? All stakeholders recognized the results:

- Low occupancy rates are explained through an active HR policy allowing faculty to work at home. Faculty came in to teach classes, to meet with students. Formal staff meetings turned out to be unpopular (low rates of meeting rooms).
- High satisfaction rates with work were explained through highly motivated staff having autonomy to create their own outcomes and work arrangements.
- High IT satisfaction was explained as the result of one of the policy to attract staff, not because of the great building but because of the great IT infrastructure and support.
- Low satisfaction on climate and architecture are explained by the building type. The building consists of semi permanent housing, of over 40 years old. Although the environment is very green the interior looks desolate and is depressing.

In search for meaning
During the workshop a couple of interesting things happened.
The question turned up what to do about the outcomes. The managing director of the department, accountable to the University Board for efficient occupation of the building, raised the question whether the low occupancy in his building was representative for all university departments. His fear was that once the university controller became aware of the occupancy figures, a cost cutting target (space reduction) was given to him. This would force him to go back to his faculty and staff telling that a new workplace strategy should be put in place. That was not a good moment while the department was undergoing a major restructuring. He also noticed that satisfaction rates with the building would not go up when the technical condition of the indoor climate system was raised: employees would never give working from home, and an investment in the climate installations would be qualified as a poor and expensive investment in a rundown building.

The CRE department agreed that the measurement of other buildings would be necessary to make a more consistent proposal to the University board with respect to space usage. Measurements will take place in three other buildings in spring of 2008. When it came to prioritize maintenance measures the matrices (1) importance vs. satisfaction and (2) importance vs. dissatisfaction helped quite a lot. No major climate works were carried out, just some works to keep installations going.

Final remarks
All participants found that the measurements helped in creating a meaningful debate and to rethink roles in the CRE arena. The CRE department understood the end user, was able to make a good maintenance plan and develops a roadmap for reviewing is University CRE strategy on the basis of the measurements that will be carried out. In the Dutch interuniversity CRE platform this university is in the forefront of creating an integrated approach. The managing director was helped in framing his tasks and timing: how to develop demand for workplaces form a true HR an educational perspective.

Literature

De Been, I. (2008) *Aging in workplace, a cross case statistical analysis of 26 WODI cases,* Center for People and Buildings, Delft (to be published)

De Bruyne, E. And W.R. Pullen (2007), *Onderzoek: gebruikswaarde en tevredenheidnorm van het Paviljoen,* Center for People and Buildings, Delft

Hanekamp, J.C., L.Volker and W.R. Pullen (2007) *Probing Procedures: Strategies in (Scientific) Research and Research into (Management) Strategies - (Scientific) Methodologies and Research into the Interactions between Humans, their Work, and Workplace Environments*,

Vijverberg, G. (2000) *'Basing maintenance needs on accommodation policy'*, Building Research & Information, 28:1, 18 – 30

Batenburg, R., Voordt, D. J.M. van der (2007), *Invloed van facilitybeleving op arbeidsproductiviteit (2)*, Facility Management Magazine, december 2007