

## Costs and benefits of workplace innovation

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## **Costs and benefits of workplace innovation**

*by Theo JM van der Voordt, Delft University of Technology (2001)*

### **Workplace innovation**

Under the influence of all kinds of social, organizational, technological and economic developments, office accommodation is in a state of flux. Flexible working and office innovation are key concepts. Modern information and communication technology (ICT) is making the way people work more and more flexible in terms of place and time. "Your office is where you are", say the office gurus. And it is a fact that teleworking, satellite offices and hotel offices are developing rapidly. New layouts with a high level of differentiation in workplaces - open workplaces for communication, individual offices for concentrated work, areas for informal and formal consultation, central document records - none of these is unusual any more. Sharing of workplaces, mainly prompted by low occupancy rates, is also an increasingly common occurrence. Attractive layout designs, modern and ergonomic furniture, sophisticated computer facilities and mobile telephones are meant to compensate for the lack of one's own space. Ambitious objectives underlie all these changes. Structuring and using offices differently (i.e. more efficiently and flexibly) is intended to result in more efficient and effective working practices, higher productivity, greater job satisfaction, the ability to attract and keep scarce personnel and, last but not least, reduce the cost of accommodation. Evaluations (1) of innovative offices show that users are in fact generally enthusiastic about the attractive layouts, the increased freedom of choice as regards the type of workplace and the favourable conditions for interaction and communication. The complaints are mainly about the lack of privacy and too much distraction, as a result of which people cannot concentrate on their work properly (2). So far, however, little is known about the effect of office innovation on costs. According to the literature (3), the cost of accommodation is reduced thanks to savings on the number of  $m^2$  (as a result of workplaces being shared), but little is ever said about the extent of the savings. Croon (4) concludes, on the basis of case studies at Interpolis and Arthur Andersen Consulting, that the reduction in costs through using alternating workplaces for each employee can be as high as 62%, depending on the cost of leasing the office building in question. Troost (5), on the other hand, states that the benefit due to the reduction in space is often cancelled out by the higher investment in advanced information and communication technology, more expensive furniture and fixtures, refurbishing costs and fees for consultants and project supervision. The break-even point at which the benefits outweigh the costs very much depends on the depreciation periods that are used and the level of rent. At a rent of 109 Euro (240 NLG) per  $m^2$  of lettable floor area (excluding VAT), and given current depreciation periods of ten years for fixtures and five years for loose furnishings, a reduction in space of at least 24% is needed in order to achieve a positive balance. Where rents are higher, the break-even point is reached at an earlier stage. At a rent of 320 Euro (730 NLG) per  $m^2$  lettable floor area, a reduction in space of just 9% is needed to compensate for the additional costs.

## Research

To sum up, we can conclude that there is not much insight at present into the financial consequences of office innovation. It is therefore not very easy to estimate the consequences in terms of costs of choices made at the planning and design stage and weigh up alternative concepts against each other in financial terms. For that reason the Real Estate and Project Management section, together with ABN AMRO bank (6) and a number of students working on their graduation project (7), initiated a study of the costs and benefits of office innovation. The results should help to make it possible to produce a rough estimate of the costs of office innovation at an early stage in the decision-making process, both as they stand and in comparison with more traditional accommodation concepts. In order to achieve this aim, there must be insight into the cost factors and the costs per factor, as well as the bandwidth in the level of various cost items and the variables that influence these. To this end, two different approaches were adopted:

Project analyses. A retrospective analysis of the costs of innovative and traditional office layouts offers insight into both the cost items and the costs per factor.

Theoretical exercises in the form of design studies. Calculating the consequences of a number of alternative layouts - both traditional and innovative - for a fictitious organization also provides insight into costs.

The intention is eventually to incorporate the findings into a costing model and to implement this in a Decision Support System for designers, facility managers and consultants.

## Cost classification

In order to be able to compare the costs of innovative and traditional concepts, a clear cost classification system is needed. A lot of work is currently being done in the Netherlands using the standards of the Netherlands Standardization Institute (NNI), namely NEN 2631 for investment costs and NEN 2632 for running costs. For a more detailed sub-division into building components, the NEN refers to the so-called 'NLSfb elements method', which is used a great deal to estimate building costs. This method is too detailed to make a comparison between the costs of innovative versus traditional concepts. Many cost items are not influenced by office concept, so excessively detailed cost classification is not advisable. Conversely, there are important categories of costs missing, such as services and resources, and information and communication technology. This is recognized by the NNI and has resulted in a new standard, NEN 2748 Facility Costs, which came out in November 2000. The system of cost classification used in our study is very much in line with this new standard. Furthermore, every effort has been made to achieve a 1:1 relationship between the classifications for investment costs and running costs. The number of sub-categories has been restricted in order to maintain overall clarity and also because more detailed information is often not available. The attached table shows the classification system from one of the graduation projects.

## Project analyses

One situation that often arises is that flexible working is introduced in order to absorb the growth of an organization within the existing accommodation. This usually means that the existing layout has to be rearranged and workplaces have to be shared. One interesting question in that case is how the cost of rearrangement and altering the layout compares with the more traditional option of leasing extra m<sup>2</sup> or relocating to larger premises. In order to be able to answer this question, three actual projects and a fictitious case have been subjected to cost analyses in the cost study that is currently being conducted. Since the cost analysis of the innovative ABN AMRO project has not yet been completed, we shall confine ourselves here to the cost analyses from the graduation project of Meike Negen. Table 1 gives an overview of the investment costs and running costs that are payable by the lessee, both in absolute terms and in characteristic numbers. We shall discuss case 1 here by way of an illustration. This case concerns a small software company that will soon be moving to

different premises. A lease is taken on 704 m<sup>2</sup> of gross floor area. The building is delivered turnkey, including floor coverings, flexible partition walls, ceiling systems, skirting for cabling, kitchenette and sunshades. The property developer himself is investing in cabling for Internet applications. The space is sufficient to accommodate 25 employees in an office building with individual offices (traditional 0). In time the company may grow to 50 employees. Under investigation is what the cost consequences are of absorbing this growth within the available 704 m<sup>2</sup> through the introduction of an innovative concept (Innovative 1), as against absorbing the growth while maintaining fixed workplaces in a cellular office structure (Traditional 1). In that case extra m<sup>2</sup> will need to be leased. The principle underlying the innovative variant is that six employees will still have a fixed workplace because of the job they do, and the other 44 employees will collectively share 30 workplaces. The investment costs are based on actual costs and quotations that have been requested. The depreciation periods are derived from a reference project. The lease costs are taken from the lease contract. The recurring annual costs of the infrastructure are based on quotations from a telecom company.

The figures show that the investment costs of Innovative 1, in total and per employee, amount to 12% less than the costs of Traditional 1, both in absolute terms and when calculated per employee. This is mainly because in a traditional concept significantly more workplaces and m<sup>2</sup> will be needed. For each workplace, however, the costs in Innovative 1 are 38% higher than in the traditional variant. For each m<sup>2</sup> of gross floor area the difference is actually 70%. The main explanation for this is that the innovative variant involves additional costs because of the relocation of interior walls, the ICT infrastructure and fees for supervising the project. These costs are also divided between a smaller number of workplaces or a smaller number of m<sup>2</sup>. The total running costs work out 32% lower for the innovative variant than for the traditional variant with extra m<sup>2</sup> to be leased. Per workplace and per m<sup>2</sup>, however, there is an increase in running costs.

The figures for the other two projects that were analysed reveal a completely different picture. The investment costs for the innovative variant in case 2 are no less than 72% higher in comparison with the traditional variant. The running costs also increase, albeit to a lesser extent (10%). The extremely large rise in costs is partly accounted for by the fact that a different installation was used for the innovative variant. Mistakes were made in this that resulted in costs turning out much higher. If the 'normal' installation costs are taken into account, the rise in costs would have been limited to +32% for the investment costs and +2% for the running costs. In the third case study - a design study for a fictitious organization - there was also significant extra investment needed for the innovative variant (+37%). The running costs, however, work out lower for the innovative variant than for the traditional variant (-13%).

### **Reliable and robust**

The enormous bandwidth in cost differences between innovative and traditional raises the question of how reliable the figures are. Gathering cost data has been found to be a particularly difficult and labour-intensive process. The figures originate from many different sources. During the research process new information frequently turned up, which meant that cost analyses regularly had to be updated. Due to the thoroughness and care with which the material was collected, however, we can say that the final analyses are based on the best possible information and are sufficiently reliable. A more plausible explanation for the different outcomes is the effect of the different choices that were made and the assumptions that were made in the research methodology. In the example discussed above, a clever or careless choice of installations gave rise to a difference in investment costs between traditional and innovative, with the figure dropping from +72% to +32%, which is less than half as much. Other variables that were found to significantly influence the costs and benefits of office innovation include:

- The reduction in space. The possibility of sharing workplaces very much depends on the percentage of part-timers and the mobility of the workforce (whether they are out of the office a lot or only a little).
- The level of rent. When rents are higher the benefit of reducing space is more significant and flexible working tends to work out cheaper.
- The quality of the layout. Often the loss of one's own workplace is compensated for by beautiful and ergonomically attractive furniture, aesthetically pleasing floor coverings, etc. Other companies choose not to do this, which results in a more favourable cost/benefit ratio between innovative and traditional.
- The depreciation periods used. When rapid depreciation is chosen, the extra cost of, for example, more expensive furniture results in higher running costs.
- The development and implementation costs. Due to unfamiliarity with innovative workplace concepts and resistance to giving up one's own space, the preparation and implementation of flexible workplaces requires extra time and attention. The costs associated with this can vary considerably. In many cases new procedures and tools have to be developed. The cost of these also varies significantly. Since more and more experience is being gained with innovative projects, development costs are expected to fall substantially in future.
- Service costs. In those cases where no information was available, it has been assumed that the service costs do not differ between the innovative variant and the traditional variant. If different assumptions are made (e.g. additional costs due to more glass and extra maintenance of expensive floor coverings), the costs work out differently.
- The vision, corporate culture and nature of the organization. Some organizations, for example, attach a great deal of importance to the welfare of their employees and the accommodation they provide goes well beyond the usual health and safety standards. Other organizations, however, use the minimum standards prescribed by the government as a basis.

### **In conclusion**

The various case studies have provided more insight into the financial costs and benefits of innovative office concepts. Due to the significant differentiation in outcomes, the research urgently needs to be expanded to include more project analyses. There is also a great need for more detailed sensitivity analyses, in order to identify the effects of different values and assumptions on the many variables, both individually and in conjunction with one another. As a final recommendation for further research we should mention the development of databases based on a clear and uniform format and the development of a computerized costing model. Both of these are important ingredients in a Decision Support System. Hence there is still a great deal for researchers and final-year students to do.

### Notes:

(1) At the request of third parties and also within the context of supervision of graduation projects, the Real Estate and Project Management section has evaluated various innovative office environments, including the Dynamisch kantoor Haarlem (Paul Vos), the Bleijenburg hotel offices in The Hague and the office of the Tax Department in Den Bosch (Michel Beunder and Peter Jan Bakker), and the regional branch offices of ABN AMRO in Breda (Anouk van den Brink)

(2) Voordt, D.J.M. van der, Meel, J. van, 'Lessons from innovations', Successful Corporate Real Estate Strategies (G. Dewulf, P. Krumm, H. de Jonge), Nieuwegein, Arko Publishers 2000, pp 51-64

(3) Beckers, R., Kantoorinnovatie: 'Place predicts productivity', Bussum, Faculty Management Magazine, September 1977. Vrey, M.M.H. de, Nog veel obstakels bij invoering van wisselwerkplekken, Twijnstra Gudde, Utrecht, Facility Management Magazine, March 1997

(4) Croon, Th., Huisvestingslasten, Graduation Project, Faculty of Economics, University of Amsterdam 1998

(5) Troost, K., '(Werkplek)Kosten van kantoorinnovatie', Facility Management Magazine, February 1998

(6) Loman, R., Flexido: de kosten in kaart, ABN AMRO and BMVB, Delft University of Technology, Faculty of Architecture 2000

(7) Molen, K.H.J. van der (1999), De kosten consequenties van kantoorinnovatie. Negen, M. (2000), Kostenconsequenties van kantoorconcept omschakeling. Duin, P. van (2001), Model ter ondersteuning van besluitvorming over werkplekconcepten. Veneman, G. (2001), Financiële consequenties van kantoorinnovatie

Table 1: Cost classification

<b>Accommodation</b>
Structure
Infill components
<u>Partition wall system</u>
Finishing work
Fixtures
<u>Computer floor</u>
Installations (not ICT or telephony)
<u>Cooling system filling area</u>
<b>Services and resources</b>
Relocation
Transport services
<b>Information and communication</b>
External infrastructure
Internal infrastructure
<b>Implementation</b>
Fees and consultation
Courses and activities
<b>Total</b>

Table 1: Cost comparison of three cases

<u>Starting situation</u>	<u>Traditional 1</u>	<u>Innovative 1</u>	<u>Cost difference</u> <u>Innovative - Traditional</u>
<b>Case 1</b>			
25 employees 25 workplaces 704 m <sup>2</sup> gross floor area Traditional cellular office	50 employees 50 workplaces 1350 m <sup>2</sup> gross floor area Traditional cellular office	50 employees 32 workplaces 704 m <sup>2</sup> gross floor area Innovative cocoon office	<b><u>Investment costs:</u></b> Per employee - 12% Per workplace + 38% Per m <sup>2</sup> gross floor area + 70% <b><u>Running costs</u></b> Per employee - 32% Per workplace + 6% Per m <sup>2</sup> gross floor area + 29%
<b>Case 2</b>			
60 employees 60 workplaces 1327 m <sup>2</sup> gross floor area Traditional cellular office	80 employees 80 workplaces 1770 m <sup>2</sup> gross floor area Traditional cellular office	80 employees 70 workplaces 1327 m <sup>2</sup> gross floor area Innovative cocoon office	<b><u>Investment costs:</u></b> Per employee + 72% Per workplace + 97% Per m <sup>2</sup> gross floor area + 130% <b><u>Running costs</u></b> Per employee + 10% Per workplace + 25% Per m <sup>2</sup> gross floor area + 46%
<b>Case 3 (design study for a fictitious organization)</b>			
	54 employees 54 workplaces 825 m <sup>2</sup> gross floor area Traditional individual office	54 employees 35 workplaces 516 m <sup>2</sup> gross floor area Innovative cocoon office	<b><u>Investment costs:</u></b> Per employee + 37% Per workplace + 100% Per m <sup>2</sup> gross floor area + 119% <b><u>Running costs</u></b> Per employee - 13% Per workplace + 27% Per m <sup>2</sup> gross floor area + 39%

Source:

Graduation project Meike Negen (2000), Cost consequences of rearranging offices.

Case 1: Growth absorbed in an innovative concept

*Below: old situation = 25 fixed workplaces for 25 employees*

*Above: new situation = 32 flexible workplaces (desk sharing) for 50 employees + 4 provisional workplaces in the library and meeting room:*