

The added value of office accommodation to organisational performance

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Abstract

Stiffening competition, caused by an increasingly turbulent contextual and transactional environment, forces many organisations to re-examine every way in which they can improve their performance. As a substantial part of the resources used during the transformation from input to output within office-based organisations, office accommodation can have a significant impact on organisational performance. This paper gives an overview of the performance criteria organisations should meet, and discusses the added value of office accommodation to organisational performance.

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Introduction

Currently, over 25 per cent of the civilian labour force of the USA – over 35 million people – is employed in office buildings (BLS, 2002a). The primary process in office-based companies consists of receiving (input), generating, interpreting, processing, editing, managing (transformation), and providing (output) information (Wentink and Zanders, 1985). In this process the actual transformation is established through co-ordinated interaction between the production factors: people and means (see Figure 1).

If an organisation is guided by profitability, the transformation process should be effective as well as efficient at the same time. If this is the case, we can speak of a fruitful or productive process. In order to anticipate possible future internal and/or external changes, the process should also be flexible. Finding the right balance between the mentioned criteria asks for certain creativity.

As a substantial part of the resources used during the transformation from input to output within an organisation, which is quantified in the corporate balance sheet, the accommodation can have a significant impact on the profitability or performance of an organisation.

Nowadays, there are two important approaches that contribute to organisational performance:

- (1) achieving greater efficiency by reducing the occupancy costs by reducing the amount of space per employee; and
- (2) achieving greater effectiveness by improving the productivity of the employees by providing a comfortable and satisfying working environment.

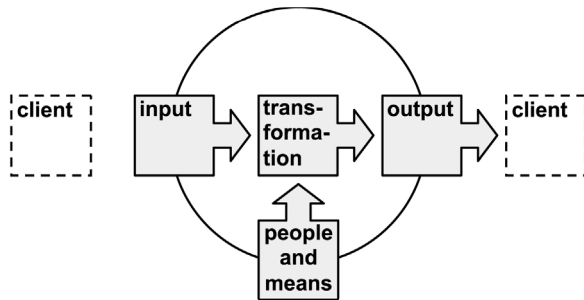
In order to maximise the cumulative impact of both approaches, and to avoid a negative impact of one approach on the other, a transparent decision support structure with clear definitions is desirable.

The performance criteria of an organisation

The profitability or performance of an organisation depends to a great extent on meeting the generic performance criteria: effectiveness, efficiency, productivity, flexibility, and creativity.



Figure 1 Transformation from input to output within an organisation



In order to really contribute to profitability, an organisation should strive to simultaneously meet all criteria sufficiently (Kohnstamm and Regterschot, 1994).

Organisational effectiveness

The classic criterion to evaluate the functioning of an organisation is effectiveness. Fulfilling the needs of the customer as effectively as possible is of overriding importance to the competitiveness between organisations (Douma, 1996). Effectiveness refers to what extent the actual result (output in quality and quantity) corresponds to the aimed result. It is expressed as the following equation (after Veld, 1998):

$$\frac{\text{actual result (output in quality and quantity)}}{\text{aimed result (output in quality and quantity)}}$$

Note that the closer the actual result approaches the beforehand-aimed result, the more the effectiveness of an organisation increases. If the actual result is better or more than the aimed result, the transformation process has a so-called "overshoot". If the actual result is worse or less than the aimed result, it has an "undershoot". In both cases the organisation is not optimally effective.

Organisational efficiency

In the first decades after World War II, efficiency became more and more important, if not the most important criterion to evaluate the functioning of an organisation. An efficient organisation produces products or services at the lowest possible resource use (people and means). Until the 1960s, this criterion was of overriding importance because raw materials and half-manufactures were scarce, and a relatively low price for the end product was very important for the average customer (Douma, 1996).

Efficiency refers to the ratio between the aimed resource use and the actual resource use,

in order to transform an input to an output. A formal definition is (after Veld, 1998):

$$\frac{\text{aimed resource use (input in people and means)}}{\text{actual resource use (input in people and means)}}$$

According to this definition, the efficiency of an organisation increases, as the actual resource use is lower than the aimed resource use. Therefore, to increase organisational efficiency, it is important to reduce the use of resources as much as possible.

Organisational productivity

Increasing prosperity, especially in the 1970s, led to a new criterion for organisational focus: productivity. Customers become more and more conscious of the value of service, quality, and other aspects. The price remains important, but the customer is also looking for good service, product quality and other product characteristics. The customer is actually asking for a better product or service at a lower price. In order to fulfil this need, the term productivity is introduced.

Productivity refers to the ratio between the actual result of the transformation process and the actual resource use – in fact productivity relates effectiveness to efficiency – and therefore it makes both criteria simultaneously controllable. A proper definition is (after Veld, 1998):

$$\frac{\text{actual result (output in quality and quantity)}}{\text{actual resource use (input in people and means)}}$$

Based on this definition, we can conclude that the organisational productivity is optimal when an organisation produces as great a result as possible at the lowest possible resource use. However a so-called "over-" or "undershoot" is still not desirable. So at the level of an organisation as a whole, we can optimise the productivity through steering at efficiency, thus by reducing the actual resource use as much as possible.

Organisational flexibility

At the beginning of the 1980s, a fourth criterion was added: flexibility. An organisation is flexible if it is able to respond quickly and adequately to unexpected problems and challenges. These unexpected developments appeared more and more at the beginning of the 1980s. For many products and services, growth in established markets was declining, while other (sometimes new) markets were growing very fast. These developments make organisations more

dependent on the preferences and the behaviour of their customers. Besides becoming more demanding concerning the price and the quality of a product or service, customers also demand faster and "on-time" delivery, and tailored products or services (Douma, 1996).

Flexibility refers to the ability to recognise and adapt to changing circumstances. An appropriate definition of flexibility is: the ability to recognise external and/or internal changes, opportunities and threats, and respond successfully (quickly and adequately) to them. Adequately responding means reviewing the aimed result (output in quality and quantity), and if necessary reorganising the transformation process and (re-)adjusting the aimed resource use (people and means) (derived from Veld, 1998; Wijnen, Weggeman and Kor, 1999). So, flexibility is in fact "built in" productivity; flexibility enables an organisation to stay effective, as well as efficient, for the future.

Organisational creativity

During the 1990s, a fifth criterion arose: creativity. Under the influence of several demographical, political, economical, technological, social, and ecological changes, the environment of organisations became very turbulent and increasingly competitive. These developments required a creative approach to handle the tension between effectiveness and efficiency and between efficiency and flexibility.

In Figure 2 we see the development of performance criteria that an organisation should meet. The development is cumulative, which indicates that organisations should meet more and more criteria simultaneously.

In summary, an organisation should be effective above all. Besides that, an organisation should be efficient. In order to prevent effectiveness and efficiency from becoming each other's enemy, the term concept of productivity is useful. Productivity

provides insight into the consequences of improving the effectiveness of an organisation over the efficiency and vice versa. Therefore it makes both criteria simultaneously controllable. Flexibility enables an organisation to stay productive towards the future. Finally, in order to meet all criteria sufficiently and simultaneously, certain creativity is needed.

The added value of office accommodation

Following the reasoning in the previous paragraph, the office accommodation of an organisation is part of the resource use; therefore it can influence organisational performance. Accommodation can contribute to organisational efficiency, for example by reducing the occupancy costs and/or by supporting the productivity of the individual employees of an organisation. The accommodation can also contribute to organisational flexibility, for example by providing the ability to extend the building or the possibility of re-arranging the office layout. Finally, the accommodation can also contribute to organisational creativity by providing an inspiring environment.

Note that the accommodation should not be considered separate from the other production factors. As stated before, the actual transformation from input to output is established through co-ordinated interaction between the production factors: people and means.

Accommodation can have a positive impact on all five performance criteria, especially by influencing the production factor "people" (Tapscott, 1982). By relating the accommodation to the performance criteria, we can tell something about its quality.

Effective accommodation

Given the fact that the main goal of accommodation is to support the productivity of the accommodated individuals, and that effectiveness refers to the ratio between actual and aimed result or output, a proper definition of effective accommodation is:

$$\frac{\text{actual contribution to individual productivity}}{\text{aimed contribution to individual productivity}}$$

Note that, contrary to organisational effectiveness, the effectiveness of the

Figure 2 Performance criteria organisations should meet

till 1950s effective	1960s effective efficient	1970s effective efficient productive	1980s effective efficient productive flexible	1990s effective efficient productive flexible creative
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Source: after Weggeman *et al.* (1992)

accommodation increases if the actual contribution to the individual productivity exceeds the aimed contribution. Although this is a so-called "overshoot", it is contributing to the organisational efficiency because the number of people needed in the transformation process from input to output could be reduced.

However, if the actual contribution turns out to be lower than the aimed contribution, we have to deal with an "undershoot", and the accommodation is not optimally effective. Besides that, it might turn out that more people are needed to feed the transformation process, which has a negative impact on organisational efficiency.

Increasing the effectiveness of the accommodation is possible through:

- Providing a varying working environment to support various tasks and activities.
- Including areas in the office layout, which stimulate interaction (e.g. oversized circulation spaces with an open character).
- Using supporting elements like meeting spaces, project rooms, libraries, and videoconference rooms.
- Providing informal spaces like coffee corners and casual meeting spaces.

Efficient accommodation

As stated before, efficiency is the ratio between the aimed resource use and the actual resource used, in order to transform an input to an output. From this point of view we can consider the accommodation as a part of the total resource use. A formal definition is:

$$\frac{\text{aimed occupancy cost}}{\text{actual occupancy cost}}$$

As in the definition of organisational efficiency, the efficiency of the accommodation increases if the actual occupancy costs are lower than the aimed occupancy costs. So the actual occupancy costs should be reduced as much as possible to create optimal efficiency.

Increasing the efficiency of the accommodation is possible through:

- Paying attention to a favourable gross/net ratio within an office building.
- Designing an efficient office layout by avoiding oversized spaces and by reducing unusable spaces.

- Trying to reduce churn cost by providing uniform workplaces in a varying working environment.
- Reducing the amount of space per person, which leads to occupancy cost reduction.
- Reducing the number of workspaces (e.g. by allowing alternative workplace locations).
- Intensifying the office space (e.g. by allowing workplace sharing or hot-desking).

The problem is that, especially with regard to the last three examples, increasing the efficiency of the accommodation can harm the effectiveness of it. By approaching the accommodation from a productive point of view, we can prevent this.

Productive accommodation

As stated before, productivity refers to the ratio between effectiveness and efficiency. According to the definitions of effective and efficient accommodation, we can define productive accommodation as:

$$\frac{\text{actual contribution to individual productivity}}{\text{actual occupancy cost}}$$

Based on this definition we can state that accommodation becomes optimally productive when the contribution to the individual productivity is as high as possible at the lowest possible occupancy costs. Its productivity also increases when the individual productivity increases with the same occupancy costs, or when the occupancy costs decrease at the same level of individual productivity. More important, by approaching the accommodation from a productive point of view, we gain insight into the impact of efficiency on effectiveness and vice versa, thus making it controllable.

Flexible accommodation

Flexibility has to do with the ability to recognise and adapt to changing circumstances. Due to the faster changing environment in which organisations must operate, the need for flexibility is increasing. The problem however is, that in most cases, adding more flexibility to an office has a negative impact on the efficiency of the accommodation.

Flexibility and accommodation have a very strong relationship. There are multiple examples in which an inflexible office building

keeps an organisation from being able to anticipate changing circumstances. In those cases, the accommodation is not effective anymore.

The way in which accommodation can contribute to organisational flexibility depends on the organisational level that we consider:

- At a whole organisation level, expanding or downsizing the total accommodation might be desirable. A detailed master plan based on various growth scenarios to gain insight into possible changing spatial needs is needed.
- At departmental levels, space dividing, assigning and rearranging might be desirable to meet the needs of changes in size and composition. Careful attention should be given to office grids and building depths.
- At an individual level, uniformity of furniture and communication tools is helpful, in order to increase the exchangeability of workplaces.

Creative accommodation

The last criterion organisations have to meet in order to increase profitability is creativity. The expectation is that this criterion will become more and more important in the next few years. In an era of rapid IT development and a society with more critical customers, creativity becomes the effective factor for the future. Departments of organisations that have to deliver creative outputs should not be disabled through a rigid working environment.

Accommodation can stimulate creativity; architectural and advertising firms are good examples. An interior design can substantially contribute to the desired creativity through layout, furnishings and colour. Also an active artwork policy that is supported by the employees can fulfil a vital role. Note that the overall atmosphere is also based on the image of the surrounding area and its facilities.

Accommodation can have a substantial influence on the performance of an organisation, especially on its efficiency. An overview of some examples is given in Figure 3.

From theory to practice

In accordance with the given definitions, the accommodation is most effective if it supports

Figure 3 The performance criteria of accommodation

Effective accommodation

Provide a varying working environment.
Provide interactive-stimulating areas in the office layout.
Apply collective, supporting elements.
Provide informal spaces.

Efficient accommodation

Establish a favorable gross/net ratio within an office building.
Try to prevent churn by providing uniform workplaces.
Reduce the amount of space per person.
Reduce the number of workspaces.

Productive accommodation

Look for opportunities to apply both approaches above at the same time equally.
Find the right balance between both approaches through cost-benefit calculations.

Flexible accommodation

Realize possibilities for extending or downsizing.
Look for possibilities to divide, reassign and rearrange spaces.
Provide uniformity of furnishing and communication tools.

Creative accommodation

Pay attention to interior design.
Pay attention to furnishing, dressing and colour.

individual productivity optimally.

Furthermore, accommodation is most efficient at the lowest possible occupancy costs. In order to meet both criteria at the same time, the accommodation should be productive, which means optimally supporting individual productivity at the lowest occupancy costs possible.

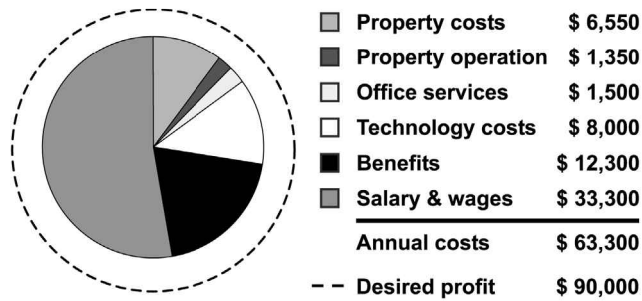
Given the fact that the labour costs are generally higher than occupancy costs, it is interesting to explore the relationship between the benefits of increased individual productivity and the costs of occupancy. Even over-investing in the accommodation can often be cost-justified through increased productivity.

A theoretical example

The occupancy costs, including operation and maintenance costs, are approximately \$9,400 per year on average. The yearly costs of labour, including benefits, are around \$45,600 per individual. Together with the technology costs (\$8,000), the total annual cost of an employee is around \$63,000. If an organisation is guided by profitability, an employee should bring in at least 1.5 times his or her annual costs, which equals over \$90,000 (see Figure 4).

Based on Figure 4, the accommodation of an organisation can be made more efficient by looking for possibilities to reduce the \$9,400 a year spent on occupancy costs. Making the accommodation more effective means

Figure 4 The annual costs and the desired profit of an average white-collar employee



Source: after BLS (2002b) and Johnson Controls (2002)

optimally supporting the productivity of the individual employees, which corresponds with increasing the \$90,000 desired profit per employee. The problem, however, is that focusing on the efficiency might have a negative impact on the effectiveness of the accommodation and vice versa. Therefore, the focus should be on establishing productive accommodation.

Due to the fact that the \$90,000 corresponding to the desired profit is much higher than the \$9,400 spent on occupancy costs, the most intelligent way to make the accommodation more productive is to focus on doing more with a proportionately smaller increase in resources consumed. Following this reasoning, an over-investment of 10 per cent on occupancy cost, which equals \$940, will already be cost-justified if the individual productivity increases just 1 per cent. Similarly, it is possible to ask questions such as: "Is an over-investment of 10 per cent on the \$1,000 spent on the indoor climate system cost-justified if the individual productivity increases as little as 0.1 per cent?"

The biggest contribution to total organisational performance can be made if we are able to make the accommodation more efficient and effective at the same time.

Practical examples

In a cross-sectional study of 170 working environments, the Occupational Safety and Health Administration identified the following (OSHA, 1999):

- Providing data entry operators at video display units with adjustable keyboard platforms to eliminate musculo-skeletal disorder (MSD) hazard caused by awkward postures, results in 5 per cent increased output (given the fact that they

spend 100 per cent of the time at their video display unit). The costs of this intervention were just \$250 per employee.

- Providing legal secretaries typing at video display units with ergonomic chairs to eliminate awkward postures, results in 4.4 per cent increased output (given the fact that they spend 87.5 per cent of their time typing at a video display unit). The costs of this intervention were estimated at \$400 per employee.
- Providing office workers working on personal computers with ergonomic chairs, wrist rests for keyboard and mouse, adjustable keyboards and mouse platforms, and phone cradle devices, to eliminate awkward postures and repetitive motions, results in 6.3 per cent increased output (given the fact that they spend 62.5 per cent of their time working on a personal computer). The total costs of this intervention, given in the study, were \$700 per employee.

Based on a modest assumption that an average office worker spends 25 per cent of his or her time working on a personal computer, and a desired output around \$90,000, these findings result in outstanding returns on investments and high net present values (see Figure 5).

All this is additional to a reduction of MSD costs through reduced compensation claims, which varied from \$248 to \$311 per employee per year. This cost reduction itself leads to lower annual costs of an employee.

Conclusions

As a substantial part of the resources used during the transformation from input to

Figure 5 ROI and NPV of various ergonomic interventions^a

Physical change	Cost increase	Yearly benefit	ROI	NPV
Adjustable keyboard	\$ 250	\$ 1,070	428%	\$ 3,810
Ergonomic chair	\$ 400	\$ 1,070	268%	\$ 3,660
Chair and keyboard	\$ 700	\$ 2,045	292%	\$ 7,050

Note: ^abased on a depreciation period of 5 years and an interest rate of 10%

output within office-based organisations, the accommodation can have a positive impact on organisational performance.

The biggest contribution to the performance of an organisation can be reached if a reduction in occupancy costs (efficient accommodation) leads to increased productivity of the employees (effective accommodation). Increased efficiency, however, often has a negative impact on the effectiveness and vice versa. By providing insight into the impact of one approach on the other we can prevent this.

Given the fact that the costs relating to human labour are much higher than occupancy costs, the most intelligent way to contribute to the organisational performance through accommodation is to support the productivity of the employees above reducing the occupancy cost.

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