Academic papers

Evaluating office environments using tenant organization perceptions

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Abstract

Operational property is increasingly recognized as an important asset capable of effective management. Indeed, premises can play a significant role by affecting organizational productivity and supporting corporate mission. Many organizations occupy leased properties owned by investment institutions which aim to benefit from their assets through capital appreciation and rental return. The achievement of these objectives can be related to the facilities value of an office building as determined by design/quality and tenant organization characteristics. Reports the results of a post-occupancy evaluation survey carried out in the City of London. The results illustrate the variability of tenant characteristics, their property requirements and their perceptions of functional performance. The use of building performance appraisal techniques within the investment management function is necessary for the creation of value for both parties. Suggests that facilities management professionals with expertise in the measurement and benchmarking of building performance are well placed for providing unbiased information to investment decision makers.

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Introduction

The design/quality characteristics of office buildings, combined with the specific nature of an organization's property requirements, typically determine facilities value for the occupier. This concept is relevant to all operational properties, whether they are held as freehold or leasehold assets. In this respect, the efficient management of all office properties, whether in operational or investment portfolios, is important and can be linked directly to the provision of suitable feedback information concerning the holistic performance of each building. Various techniques for building performance appraisal have been developed and typically evaluate the suitability of office building characteristics for organizations which occupy them.

This paper analyses results from a user-based building performance appraisal survey carried out using a sample of City of London investment office buildings which are leased to business organization occupiers. The perceptions of senior management regarding the provision of office accommodation design/quality characteristics are contrasted directly with specific property requirements in order to derive measurements of functional performance. Four distinct groups of tenant organization are identified within the sample and results from the analysis indicate that functional performance levels vary substantially with areas of general under-performance being easy to recognize. In this respect building performance appraisal techniques are identified as resources that can be used to provide information for investment decision support. A review of literature concerning the economic effects and management of office properties provides a suitable basis for exploring how value may be optimized for both the institutional owner and organizational users of office buildings.

Operational property and company strategy

The last decade can be described as problematic and even traumatic as companies attempt to adjust to varying economic circumstances. Firms have had to respond to a wide range of changes in their domestic and international markets with the globalization of production and technological advances. The fast-moving business environment is being paralleled with

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continuous change which is expected to accelerate in the future and organizations will thus have to make constant adjustments as commercial life in the 1990s is mainly about the business of change (Varcoe, 1991). The senior management of most companies cannot ignore an ever-changing business climate, indeed corporations globally are turning to more fluid organizational forms by aligning their business units with the company's core strengths (Drucker, 1988; Hammer, 1992; Joroff *et al.*, 1993). Dynamic organizational structures and profiles, combined with rapidly advancing technology, are profoundly altering work patterns (Harman-Vaughan, 1995), frequently resulting in a smaller but more skilled workforce who place a high value on their quality of life. Recent literature shows that corporate real estate or more generally operational property is increasingly being realized as the lynch pin to a company's strategy for proactive change (Arthur Andersen, 1995; Graham Bannock and Partners, 1994; Joroff *et al.*, 1993; Lloyd, 1992; Ward, 1993).

The increasing knowledge of the effects and influences that property has on business organizations has promoted the profession of facilities management on a global scale. Facilities management in its broadest interpretation can play a central role in the strategic asset management decisions of an organization. Continuous change undoubtedly means that an organization's supporting assets, and more specifically buildings, will consequently have to transform – a process which traditionally has been slow. The future business climate demands harsh performance from property which, for example, overnight may become too small, too large or of inappropriate quality. Powell (1991) states that no competitive organization can afford to be hampered by ill-fitting or unsuitable premises, their buildings must continuously adapt for everyday business requirements.

Becker (1990) and Veale (1987) have described the significant impact of the physical environment on both organizational productivity and corporate mission. Similarly Powell (1991), Leaman (1993) and Varcoe (1991) have emphasized that decisions regarding company premises will directly influence the employees who use these facilities for support in their everyday productive activities. The argument is emphasized by Varcoe (1991), stating that effective management of company facilities will result in disproportionate benefits to the organization from staff productivity. Facility quality is the crux of the matter, producing high productivity whether by high morale among workers or by the provision of a dedicated functional environment. This assertion is also inextricably connected to the investment performance of an office property, as building quality can be linked directly to the risk of depreciation caused by the processes of obsolescence (Baum, 1993).

Investment literature shows that there has been a revolution in the ownership of property in almost all large cities, with financial institutions expanding as the new urban landlords of offices, retail centres and industrial units (Baum and Schofield, 1991; McIntosh and Sykes, 1984). Indeed, the institutions are estimated to control around one-third of the commercial property market, after building up their portfolios during the 1970s and 1980s through a combination of investing, developing, funding developers and improving existing assets (Baum and Schofield, 1991). However, it must always be remembered that such building investments provide essential leasehold premises for many organizations whose core business is unrelated to property. Indeed, the effective management of such building investments ultimately will create value for both the owner and users of a building, a fact that warrants the adoption of an appropriate strategy by management towards each portfolio property. In this respect, information concerning individual buildings and tenant organizations is required by management for the purposes of problem finding and solving and, therefore, efficient decision support.

Comparative performance measurements

Performance monitoring, a term which is synonymous with built asset management, is seen as necessary for the measurement of efficiency and effectiveness of both property utilization and the personnel managing property (Avis *et al.*, 1989; Avis *et al.*, 1993). From a facilities management perspective, performance measurement and benchmarking should have due regard for the operation as a whole, that is, an appreciation of the wider organizational impact (Varcoe, 1993). According to Becker (1990), buildings have always been evaluated, but recently more

formal and systematic building appraisal methods have emerged. In the early 1960s the concept of building performance appraisal started to develop in the USA as architects searched for rational methods of predicting the outcome of building designs. Architects and social scientists developed the technique of post-occupancy evaluation which is built on the performance concept and aims to measure how well buildings meet their occupant needs. Preiser *et al.* (1988) state that post-occupancy evaluation methods are used to compare systematically and rigorously the actual performance of buildings with explicitly stated performance criteria. The difference between these is considered to be a measure of evaluation.

It must be recognized that user-based performance appraisal techniques have several limitations which principally concern the subjective nature of occupants' perceptions (whether individuals or groups within each organization). In addition the varied knowledge and experience of the person facilitating the evaluation can introduce biases through controlling the survey procedure and the subsequent reporting of the findings. Becker (1990) criticizes non-standardized post-occupancy evaluation techniques because they do not provide data in the form of easily conceptualized and communicated profiles or performance summaries. However, Prieser (1995) state that post-occupancy evaluation techniques have evolved from simple, one-of-a-kind studies to sophisticated, cross-sectional studies of building types with valid reproducible and generalizable results.

This paper concerns the results of standardized post-occupancy evaluation questionnaire surveys carried out using a sample of tenant organizations occupying investment class office buildings in the City of London, UK. The questionnaire was designed to cover a broad range of property attributes which were selected on the basis that they would apply to all office buildings in London and, therefore, provide a comparative basis on which to evaluate the perceptions of different groups of tenant organization. The demand and supply concept, which is inherent in several expert-based building appraisal methods (Davis and Ventre, 1990; Davis, Becker *et al.*, 1985; DEGW and Teknibank, 1992), is used similarly in the present user-based questionnaire document. Questions were worded in such a manner as to elicit perceptions in relation to the demand and supply of 39 previously identified building design/quality factors.

This particular methodology depends on the full co-operation of investment institutions to provide details of office buildings and tenant representatives for initial contact. Negotiations with landlords holding substantial property portfolios in the City area led to the identification of 270 tenant organizations that could be targeted in the survey. These organizations similarly had to be willing to assist with the research and in total 76 offices were sampled. Conduct of the survey focused specifically on the views of senior management within each tenant organization and, since accuracy of responses is an important issue, the data collection process was carried out under stringent control. Each respondent was asked to complete the survey form in advance of a formal meeting where the validity of each response was ascertained by direct questioning. The analysis presented in this paper aims to address whether there is any mismatch between demand and supply. This is examined by providing a comparative evaluation of functional performance characteristics across four principal tenant organization groups identified in the sample, namely from the banking, broking, insurance and legal sectors.

Differences in property requirements and building provision

Organizations included in the sample were hypothesized to have different characteristics in terms of size, structure, space use, work practices and information technology usage. This contention is discussed by considering some of the key issues emerging from the survey which are likely to influence property requirements. These are explained for each of the four functional groups within the survey.

Legal organizations were found to have lower levels of organizational complexity and, although tenants in this sector have a high usage of local area computer networks, cellular space arrangements generally are required with an increased provision for paper storage. The legal organizations within the sample occupy a wide variety of property types with a tendency for older buildings which attract less rent than those of other sectors. In contrast, the banking organizations occupy comparatively newer office buildings, exhibiting a

greater degree of open plan space. Furthermore, a higher proportion of staff work in dynamic groups which have the capacity to restructure and/or move to different workstations according to tasks. Broking tenants are more likely to have a greater degree of organizational complexity and occupy relatively older properties similar to the legal sector. The high level of connectivity afforded by wide area networks for dealing and the provision of real time information are distinct characteristics of broking organizations. By comparison, the insurance sector falls between the extremes of the other groups, although organizational characteristics tend to follow those of broking and banking organizations. In most instances, insurance organizations occupy proportionately newer properties than the other sectors and also pay greater levels of rent because of choice of central locations.

The tendency for organizations to have specific property requirements has been highlighted in the literature and in this respect the results from the survey clearly show that diversity exists in demand characteristics. This is highlighted by a comparison of ranked demand scores by organizational category (Table I). Furthermore, in order to compare the four tenant groups statistically, a multivariate technique is necessary to determine if their samples originate from identical or different populations. The Kruskal-Wallis non-parametric technique is a one-way analysis of variance using rank values computed using raw demand scores (from each tenant group sub-sample) across each individual building design/quality factor. When at least two sectors are found to have divergent requirements for a particular factor, the Kruskal-Wallis statistic indicates a significant difference. The results (Table I, factors in italics) indicate that property requirements differ most in connection with factors associated with the building shell/common space (factors 10-15), access and circulation (factors 16-26) and tenant amenities (factors 29-32).

Concerning supply, each tenant organization has a unique set of requirements which can be compared directly with specific perceptions of office building provision. Measurement of the divergence between perceived demand and supply scores enables the compilation of distributions for each design/quality factor to illustrate the performance of investment class buildings included in the sample (Figures 1-8). The degree of divergence is obtained by dividing raw supply scores by those for demand in order to identify differences in perceived performance between banking, broking, insurance and legal sector groupings. The resultant data typically ranges between 0 and 5, where 1 represents an exact balance between demand and supply, and values less than 1 represent perceived under-performance (where demand exceeds supply). Comparison of the charts (Figures 1-8) illustrates the distributions for data by showing the total range of scores (cross-hairs), the interquartile range (bar) and median values (middle line).

Interpretation of these data indicates that the legal, insurance and broking organizations have a requirement for buildings that are of good quality and are well presented on the exterior (Table I, factor 3). In addition, these three sectors demand a greater degree of prominence and identity from the main entrances of buildings, together with high quality reception facilities (factors 10 and 12). This suggests that these types of tenant have high corporate expectations or may have a higher level of exposure to clients because of front-end operations, unlike the banking organizations which are largely back offices. However, functional performance distributions (Figure 1) reveal that the insurance and legal sectors have a large proportion of organizations perceiving their offices' exterior presentation as under-performing. In addition banking organizations are identified as having the greatest densities of staff working in the available office space, which is reflected in Figure 1 by much lower functional performance scores for the amount of floor space design/quality factor.

The banking, insurance and legal sectors require higher levels of control over heating and ventilation services in their buildings contrasting with brokers (Table I, factor 5). In this respect it is not surprising that the latter sector is unique in having more functional performance values greater than 1 where supply exceeds demand (Figure 2). Further examination of the results reveals that these factors are perceived as being well supplied in many of the older buildings. Broking and legal organizations tend to occupy such properties but, since both have differences in requirement levels, functional performance distributions are visibly different (Figure 2). In this

Table I Demand ranks across organizational groupings

Factors	Organizational demand rankings			
	Banking	Broking	Insurance	Legal
1 Amount of floor space provided by the building	7	18	15	4
2 Typical floor to ceiling height throughout the building	23	30.5	38	36
3 *Quality and presentation of the exterior of the building*	*21*	*11.5*	*8.5*	*5.5*
4 *Location of lifts, stairs and corridors in the building*	*33*	*20.5*	*21*	*15*
5 Control of heating and cooling levels	4	23	8.5	9
6 Control of mechanical ventilation levels	6	29	10	3
7 Control of artificial lighting levels	15	28	17	31.5
8 Flexibility of power and IT connection points for changing use	3	7	2	7
9 Stability of power supply to the building	2	3	2	18
10 *Prominence/identity of main entrance*	*11*	*2*	*13.5*	*14*
11 Draught exclusion at main entrance doors/reception	30	39	31	38
12 Quality of reception facilities	17	16	6.5	10
13 Distance from entrance to lift or stairs	26	30.5	32	24
14 *Quality and presentation of finishes used in common space*	*10*	*5.5*	*13.5*	*11*
15 *Acoustic control measures in common space areas*	*13.5*	*8*	*26*	*25*
16 *Ease of use/quality of entrance doors for staff and visitors*	*24*	*14*	*27*	*35*
17 *Capacity of entrance doors for staff and visitors*	*35*	*15*	*25*	*33*
18 *Adequacy of disabled access and egress*	*38*	*37*	*33*	*37*
19 *Ease of disabled circulation*	*37*	*36*	*35*	*34*
20 *Capacity of lifts for the movement of staff/visitors*	*29*	*13*	*20*	*12*
21 *Capacity of stairs for the movement of staff/visitors*	*34*	*24.5*	*36*	*30*
22 Capacity of corridors for movement	27	32	29	28
23 *Adequacy of goods access and circulation features*	*31*	*20.5*	*30*	*26*
24 *Ease by which visitors can find directions between the main entrance and offices*	*28*	*24.5*	*22*	*19*
25 *Security provisions*	*5*	*1*	*4*	*13*
26 *Capacity of on-site car parking*	*39*	*37*	*39*	*39*
27 Position of the building relative to public transport facilities	1	17	11.5	2
28 Position of the building relative to public services, e.g. shops, banks, hotels	9	22	16	23
29 *Adequacy of sanitary facilities for numbers of staff and other personnel within the building*	*19*	*5.5*	*2*	*5.5*
30 *Adequacy of sanitary facilities for disabled staff and visitors*	*36*	*33*	*23*	*27*
31 *Quality of sanitary facilities for staff and visitors*	*18*	*10*	*11.5*	*20*
32 *Adequacy of catering and vending facilities*	*32*	*26*	*34*	*31.5*
33 Ease of staff movement between lifts/stairs and work areas	12	19	28	21
34 Adequacy of natural light reaching work places	22	27	18	16
35 Adequacy of measures to control solar radiation or heating effects	20	35	24	22
36 Adequacy of natural ventilation by means of opening windows	25	34	37	29
37 *Adequacy of artificial lighting above most work areas*	*16*	*9*	*5*	*17*
38 *Acoustic control measures within the office space*	*13.5*	*11.5*	*19*	*8*
39 *Quality and presentation of finishes used in office space*	*8*	*4*	*6.5*	*2*

Notes: Rank values range from 1 (highest demand) to 39 (lowest demand). The italics highlight distributions significantly different at the 0.05 confidence level (using Kruskal-Wallis test adjusted for ties)

Figure 1 Structure and enclosure

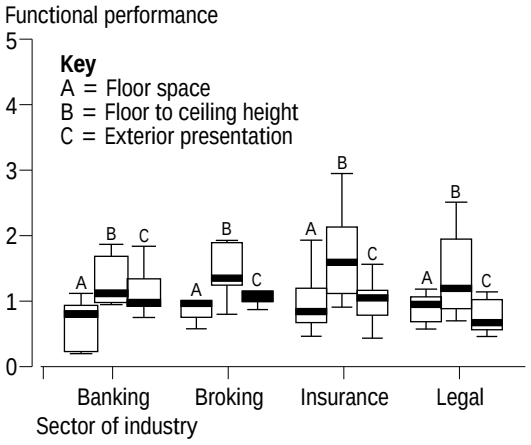
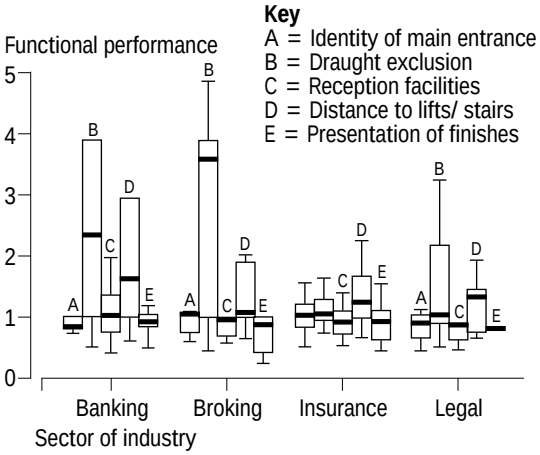


Figure 3 Building shell and common areas



respect legal tenants exhibit a similar degree of under-performance to the banking and insurance sectors which occupy predominantly newer premises. All groups have a requirement for flexible IT connection points and stable power supplies to the building (Table I, factors 8 and 9) although, in the latter case, legal organizations show less pronounced demand. Broking organizations provide some of the highest perceived supply scores exceeding those of demand and resulting in certain functional performance scores which have a value greater than one (Figure 2).

As expected, all organizations require high quality and well presented finishes throughout the common parts of office buildings (Table I, factor 14). However, the perceived supply is lower and consequently functional performance values show that demand exceeds supply in most cases (Figure 3). Further examination of supply scores reveals that the broking sector organizations are more likely to perceive their buildings as having high quality finishes. Concerning access and circulation factors (Figures 4 and 5), it is particularly interesting that insurance and legal tenant organizations appear to be more wary about disabled access and circulation features, resulting in comparatively lower supply scores and, hence, functional performance distributions are less variable than the remaining sectors. Such a pattern is likely to be a result of buildings having to support front-end business operations and the increased likelihood of having to accommodate disabled visitors.

Features relating to goods access and delivery are in greater demand by broking and legal organizations (Table I, factor 23), although perceptions of supply are lower, resulting in reduced levels of functional performance (Figure 5). In terms of location, the banking and legal sectors require greater proximity to public transport (Table I, factor 27), although the latter group of organizations under-perform with respect to this factor (Figure 6). In contrast, broking tenants have a less pronounced requirement and supply is

Figure 2 Building services

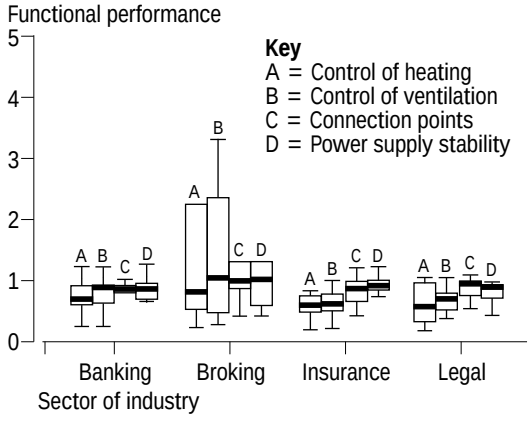


Figure 4 Access and circulation

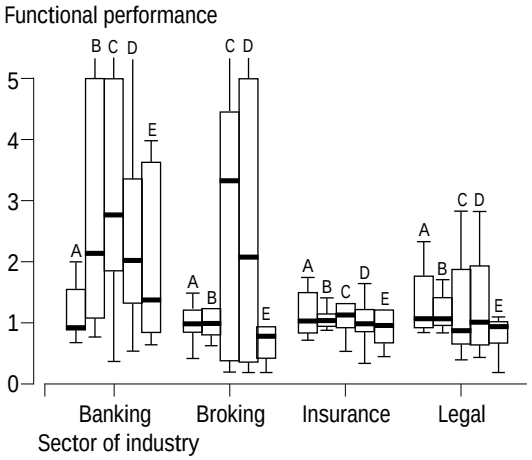
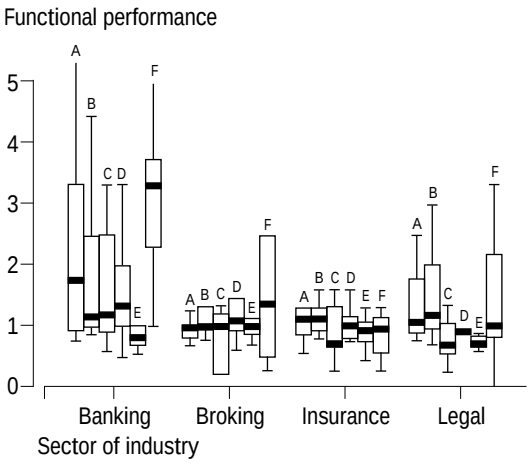


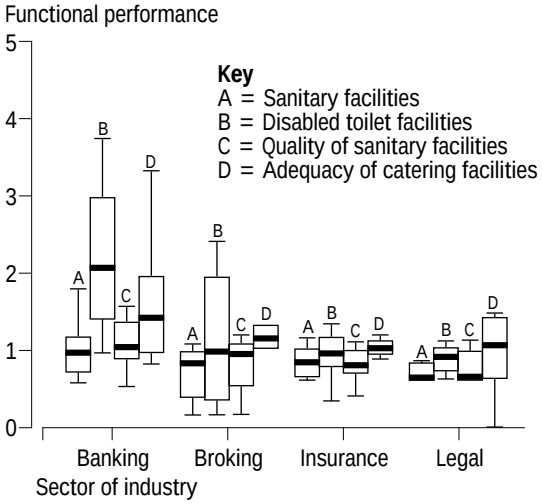
Figure 5 Access and circulation (continued)



perceived higher, resulting in all functional performance scores being above the value 1 threshold. Clearly these results are interesting given that broking organizations generally occupy older properties and pay less rent for such locational performance, contrasting directly with the insurance sector.

The provision of adequate and high quality sanitary facilities are important factors to the front-end businesses (broking, insurance and legal sectors; Table I, factors 29 and 31) and in many cases these tenants perceive their offices as under-supplied (Figure 7). Disabled toilets (factor 30) are a greater requirement of the insurance and legal sectors, although these types of tenant are not fully satisfied

Figure 7 Amenities



with levels of provision, resulting in reduced functional performance. This corresponds with the similar pattern shown in relation to disabled access and circulation factors (Figure 4). The tenants' work environment is important to all of the sectors and this results in many significant differences in functional performance distributions across the four tenant groups. The importance of workspace factors results in an increased likelihood of demand exceeding the supply in many cases. This can be observed in Figure 8, although the broking sector is less concerned with such issues as control of solar radiation (factor 35), natural lighting (factor 34) and natural ventilation (factor 36).

Conclusion

The discussion of results reinforces the views expressed in literature regarding the different

Figure 6 Location

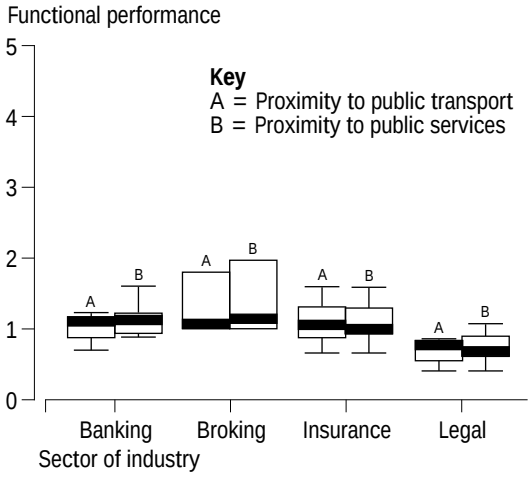
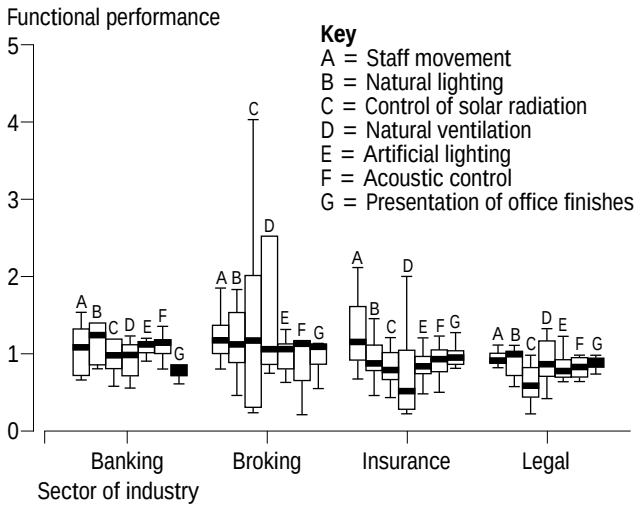


Figure 8 Work environment



characteristics and work practices of organizations and the consequent effect that this will have on property requirements and perceptions of design/quality provision. The results show that tenant organizations within City of London investment office buildings vary in terms of perceived functional performance levels. This is an issue of relevance to investment institutions, particularly in the light of problems associated with building obsolescence, namely the risk of depreciation which has traditionally been difficult to measure and manage.

Measurement and reporting of functional performance information should form an essential part of the investment portfolio management process. The procedure of benchmarking data relating to a specific property against single or collective measurements drawn from other buildings is clearly beneficial. Such comparisons enable management attention to be focused or prioritized in relation to areas of potential obsolescence. Performance measurements recorded over time would also allow rates of obsolescence to be determined for individual design/quality factors and, therefore, management is able to establish proactive strategies for combating sources of obsolescence, thereby reducing the risk of depreciation. In addition, problems associated with the design/quality characteristics of an office building can be assessed if they are economically curable through such processes involved in modernization. Equally the exposure of a property portfolio to incurable obsolescence may lead management to develop strategies for restructuring their assets through disposing of problem buildings and/or acquiring others which exhibit higher levels of functional performance.

The characteristics of organizations within a property portfolio also provide management with information which can be used for identifying those tenants who are likely to be most demanding and therefore require greater attention. The exposure of an investment property portfolio to such dynamic tenant organizations may also be considered an element of risk which will be heightened if a particular office building design is deemed to be less "serviceable" than others. Literature establishes that organizations are changing continually and are likely to be developing according to pre-definable patterns. It follows that organizations which are currently well suited to their buildings may not be well supported in the future, a scenario that may be identified by the analysis of the characteristics of tenants within a property portfolio. Indeed, this argument would support the development of statistical modelling techniques which allow management to carry out prospective appraisals of office buildings using user-based performance information.

The active management of investment buildings should be linked clearly to the needs of individual tenant organizations in order to benefit both owners and users alike. The adoption of a proactive strategy towards operational property is an important consideration within the facilities management process and this philosophy is also essential within investment management. The use of a variety of building performance assessment techniques, whether user or expert-based, should be recognized as an important and effective way of providing management feedback. Facilities management professionals who have been at the forefront of developing and using building appraisal techniques are in a suitable position to provide extremely valuable and unbiased information to investment decision makers charged with the active management of property portfolios.

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