THE OBSOLESCENCE OF OFFICE PROPERTY: A NEW RESEARCH AGENDA

James Pinder and Sara J. Wilkinson

Sheffield Hallam University, School of Environment and Development, City Campus, Howard Street, Sheffield, S1 1WB, United Kingdom.

In recent decades increased rates of building obsolescence have served to reduce the average life spans of office buildings in the UK to below twenty-five years. This has had adverse implications for owners, occupiers and non-users as the utility of office property has become diminished sooner. However, recent studies have viewed building obsolescence as a purely economic phenomenon by focusing upon the costs to the property owner. As such, the measurement of building obsolescence remains unchallenged and there is a consequent lack of knowledge regarding its future incidence. This paper provides an overview of research that is seeking to address these problems by approaching building obsolescence from an occupier perspective. In doing so, this research aims to use building quality – or deficiencies in building quality - as a measure of building obsolescence. This paper suggests that deficiencies in building quality can be identified and measured by using gap analysis to gauge differences between the expectations and perceptions of occupants. The methodology underlying this research is discussed in detail. This paper also describes how results from the gap analysis will form the basis of a decision-support model for identifying approaching problems of building obsolescence in office property.

Keywords: quality, gap analysis, occupier, user-based appraisal, utility.

INTRODUCTION

The last century witnessed the rise of the office building in becoming a significant presence in modern society, both as a place of work and as a form of monetary investment. Consequently, office property has become the largest capital asset in the developed world (Brand, 1994). In the UK, however, the very same forces of social, technological and business change that drove the rapid expansion in the number of office buildings have also served to undermine the integrity of this property through an increased rate of building obsolescence. This trend has led countless office buildings to be demolished after only 20 to 30 years life (Khalid, 1993) and is considered by many to represent a 'widespread inefficiency in the use of physical resources' (Salway, 1986). The research presented in this paper is seeking to develop an alternative approach to this problem by examining the obsolescence of office property from the perspective of the building occupier.

In doing so, the research will focus upon exploring the gap between the changing requirements of the occupier and the perceived suitability of the building to cope with this change. The overall aim of this paper is to discuss the theoretical background to this work and explain how the empirical part of this research will be carried out. To begin with, this paper considers the meaning of obsolescence and the confusion that surrounds this concept in the literature. It then looks more closely at the impact of

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obsolescence upon the built environment and office property in particular. In addition, this paper examines the limitations of conventional approaches to building obsolescence and posits an alternative approach to this problem. The aims, objectives and methodology underlying this study are discussed in detail. Prior to concluding, this paper maps out the continuing programme of research.

THEORETICAL BACKGROUND

What is obsolescence?

Capital invested in the built environment undergoes a gradual process of devaluation or depreciation. As buildings age and decay they suffer from diminished utility or usefulness and therefore require a constant stream of capital investment (Bryson, 1997). This process of physical deterioration is an absolute form of decline in that it is related to use, the passage of time and the action of the elements (Baum, 1991). It is, on the whole, a continuous process that ends in structural or material failure. 'However, the usefulness of buildings may be impaired by factors quite separate from their physical condition. The action of such factors upon the usefulness of buildings which cannot be ascribed to physical wear and tear is spoken of as obsolescence' (Burton, 1933). In recent times 'obsolescence' has become synonymous with consumer products that are discarded, typically long before they have broken or worn out, simply because newer, more advanced, and presumably better replacements are available (BRB, 1993). The term entered the English language in the mid-sixteenth century and is used to describe the processes of 'becoming obsolete, going out of use or out of fashion' (OED, 1998). Obsolescence is therefore a measure concerning changing usefulness over time. Hence, whilst the word 'obsolete' defines the terminal state, 'obsolescence' describes the transition towards that state (Nutt *et al*, 1976). Such definitions relate to both tangible objects and intangible concepts or ideas.

Obsolescence differs from physical deterioration in that it is a relative form of decline not directly related to use, the action of the elements or the passage of time (Baum, 1991). Obsolescence has been described as 'social deterioration' (Burton, 1933). It is often a matter of unfavourable comparisons with rival assets or procedures. The given asset may be 'as good as ever' from its own narrow standpoint; but other assets have become better still and so it suffers in comparison, and thus loses value (Baxter, 1971). Obsolescence occurs when there is a change in the requirements or expectations regarding the use of a particular object or idea. In most cases objects or concepts that are deemed to be obsolete continue to function but at levels below contemporary standards (BRB, 1993). Hence, the perception of obsolescence changes relative to a particular situation or condition, and varies according to the viewpoint or interest of the observer. It is therefore a function of human decision rather than a consequence of 'natural' forces (Cowan, 1970).

Obsolescence of the built environment

Whilst the basic definitions are relatively clear, defining 'obsolescence' in relation to the built environment is a far more complex matter. It has been argued that in 'our buildings and other facilities constructed to stand safely for decades, obsolescence is more difficult to comprehend' (BRB, 1993). Hence, there is considerable confusion in the literature concerning the obsolescence of buildings and much of the terminology surrounding the subject area is imprecise (Baum, 1991; Khalid, 1993). Moreover, describing what obsolescence is at any particular time can prove extremely

problematic since any given building can be found lacking in contemporary terms due to a variety of contributory factors (Lichfield *et al*, 1968).

Burton (1933) suggested that 'if it were possible to hold stationary the physical conditions of buildings, obsolescence could be segregated as the difference between the existing demand for the services of buildings and the demand which was anticipated when they were erected'. As durable assets, buildings are constructed in circumstances of high uncertainty concerning their future lives, the act of construction being a commitment to physical permanency and spatial fixity (Nutt *et al*, 1976). Buildings have therefore to function in changing economic, social, technological and political conditions (Ohemeng and Mole, 1996). Such changes are often embodied in the adoption of new standards, rising expectations of performance, technical innovation, shifts in functional requirements, organisational evolution, and changed aesthetic values (BRB, 1993). The result is that every building undergoes a spiralling process of obsolescence as it exhibits a diminishing capability to meet the varying needs of users through time (Bryson, 1997). This process begins at the point of construction and continues until the building is no longer able to accommodate the activities that it is called upon to support.

In the built environment, 'consideration of the many and interrelated causes of obsolescence indicates that two classes of these causes may be recognised' (Burton, 1933). The first of these is concerned with a building's location. Locational obsolescence takes place when buildings within a given geographical area suffer from either relative or absolute devaluation (Bryson, 1997). This kind of obsolescence is dependent upon extrinsic factors that influence a building's use (Khalid, 1993), such as infrastructure, essential communication linkages and local environmental conditions (Lichfield *et al*, 1968; Cowan, 1970). The other class of obsolescence affecting the built environment – and the focus of this paper - is known as building obsolescence. From a financial standpoint, building obsolescence is observable 'when a property's stream of rental payments bears little relationship to the rent usually obtained from that location' (Bryson, 1997). Building obsolescence is therefore a function of the relative advantages contained within a property and is concerned with the intrinsic attributes (Khalid, 1993) of design, specification and building quality.

Undoubtedly though, the concept of obsolescence carries with it a suggestion of change external to the asset (Baxter, 1971). In any given situation, the degree to which obsolescence can be attributed to external forces will have a considerable influence in determining whether the decline in utility is remediable. For locational obsolescence, the impact of external factors is absolute and, hence, it is rarely practicable for individual property owners to overcome such problems. Building obsolescence, on the other hand, is contingent upon a property's intrinsic attributes and their interaction with external forces. Whilst in some cases building obsolescence will be due primarily to internal conditions and in others it will result entirely from external conditions, in most situations a causal relationship will exist between the two (Burton, 1933). Because of this, it may be feasible for an individual property owner to remedy problems of building obsolescence by revaluing the built fabric through refurbishment of the property's intrinsic attributes (Bryson, 1997). The important point here is that for building obsolescence actions can be taken by the property owner to increase the usefulness of a building and, hence, reduce its relative obsolescence.

Building obsolescence and its impact on office property

According to Brand (1994), buildings 'keep being pushed around by three irresistible forces - technology, money and fashion'. Indeed, it is the unpredictable nature of these forces that makes the problem of building obsolescence so difficult to control. The forecasting of building obsolescence concerns the prediction of uncertain events, such as changes in fashion and technology, and innovation in the design and use of buildings. However, the prediction of future events, some of which cannot even be imagined at the outset of a forecast, is fraught with problems (Ashworth, 1997). This has been a particular problem for office property, which in recent decades has felt the impact of increased rates of building obsolescence more than any other class of property (Khalid, 1993). In the UK, this trend has become discernable through the increasingly ephemeral life spans of modern office buildings. 'Office building life cycles have declined from 40-50 years in the 1950's and 1960's to 20-25 years in the 1980's. Since then they have continued to fall, boosting the potential stock of redundant office buildings' (Gann and Barlow, 1996). It is unsurprising that this decline has coincided with a period of rapid economic, social, technological and political change that has placed increased demands on the built environment.

Such pressures have led to shifts in the spatial patterns of demand for office property, changes to the way that buildings are procured, more ephemeral usage and therefore greater uncertainty, and new requirements for the physical configuration of office buildings (Lizieri, 1997). In recent decades both public and private organisations have become more dynamic, resulting in changing property requirements over time and a need for more responsive office facilities. However, office buildings and their infrastructures have remained stereotypical, designed with the assumption that the property needs of different organisations or of the same organisation do not differ significantly through time (Tu and Loftness, 1998). Moreover, the general trend seems to be inexorably towards an increasing pace of change such that office buildings in the future are likely to enjoy shorter useful lives as a result of early obsolescence (BWA, 1994). Clearly this will have important implications for the design and management of office buildings and for the allocation of financial resources (Ashworth, 1997). Indeed, though the consequences of this problem are often subtle, they do represent very real costs (BRB, 1993). Like any other commodity, these costs can be felt on two distinct, but related levels (Bryson, 1997).

On one hand, office property is an asset class that competes with cash and securities for the allocation of investment funds (Baum, 1991). Financial institutions regard office buildings as an investment medium that provides returns and benefits through the flow of rental income or capital appreciation (Bottom *et al*, 1999). It is also recognised that many owner-occupiers regard their buildings as investments (Nutt *et al*, 1976). Indeed, 'the physical reality of buildings is something which is generally regarded as of particularly significance in distinguishing real estate from other forms of investment. One can see precisely what one owns; it is there for all to see. Its mere presence lends to its owner an aura of security and stability' (Connaught, 1997). However, unlike other forms of investment, office property is subject to structural risk (Baum, 1991) and in recent decades increased rates of building obsolescence have amplified this risk. If the lifespan of an asset is shortened its exchange value depreciates. Building obsolescence therefore serves to undermine a property's ability to show rental and capital growth in the long term (Salway, 1986). Given that rates of building obsolescence are expected to increase, there is a very real danger that office

property will become less desirable against other forms of investment, its value base will become suspect and its worth to its owners diminished (Connaught, 1997).

As well as acting as a store of wealth, office property accommodates a range of organisational activities, many of which compete in uncertain, dynamic and turbulent environments where change pressures are continuous. New opportunities and threats appear at short notice and require a speedy response (Then, 1997). However, office buildings are frozen into forms appropriate to past conditions and can therefore provide a constraint to organisations when new conditions arise. Indeed, it has been suggested that the process of building obsolescence can be described and measured by the tightening over time of the constraints imposed on organisations by their office accommodation (Nutt *et al*, 1976). As these constraints increase, building obsolescence will manifest itself through 'lost productivity of people and activities housed and served by the facility, increased operating costs to overcome the mismatch of needs and facility capability, or increased worker absenteeism and health care costs related to on-the-job stress' (BRB, 1993). Clearly then, increased rates of building obsolescence represent a significant threat to the operational property objectives of occupiers as the use value derived from their office space diminishes over time.

BUILDING OBSOLESCENCE AND THE OCCUPIER

An economic perspective

Despite the fact that increased obsolescence is seen to affect both owners and occupiers, recent studies into this problem have been preoccupied with the financial consequences for the building owner (see Salway, 1986; Baum, 1989, Khalid, 1993). Hence, research into obsolescence has become dominated by what has been called the 'economic perspective' (Cowan, 1970) or the 'finance paradigm' (Diaz III, 1998). In effect these studies followed an established approach to property research, one that is theoretically underpinned by the rational man construct and the efficient market hypothesis, and that uses regression-based econometric techniques to analyse transaction artefacts (Diaz III, 1998). Research has therefore focused upon increasing returns to owners by lowering the risk associated with obsolescence. Moreover, because the consequences of obsolescence for owners are one-dimensional, research has resorted to developing purely financial measures of building obsolescence.

However, there are limitations to this approach. First of all, office buildings by their very nature serve multiple interests and so occupiers and non-users also feel the impact of obsolescence. The fact that each of these groups has it's own notion of utility means that there is a multiplicity of measures for determining the usefulness of buildings. So whilst an owner may come to assess the value of an office building in purely financial terms, occupiers, owner-occupiers and non-users may value the same building along numerous dimensions. However, 'costs' experienced along these dimensions are often considered 'less tangible' and therefore less significant. Hence they are not accounted for in existing measures of obsolescence in which the process of waning utility is treated as an essentially economic phenomenon. To all intents and purposes then, the measurement of building obsolescence in office property remains unchallenged (Bottom *et al*, 1999). Add to this the fact that there have been increasing calls for more to be done to improve the identification of impending problems of obsolescence in office property (Cohen, 1997) and the fundamental weaknesses of the economic perspective become clear.

An alternative approach

In addressing these limitations, this research aims to develop an alternative approach to the problem of building obsolescence; one that focuses upon the interface between office buildings and the organisations that they contain and support. This approach will be based upon what Cowan (1970) called the 'behavioural perspective'. This perspective recognises the central role that changing user expectations (BRB, 1993) and changing user perceptions (Cowan, 1970) have in determining the process of obsolescence. Hence, the underlying premise of this research is that it is possible to gauge collective opinions concerning the process of obsolescence in office property through some statistical account of the decision making behaviour of building occupants (Nutt *et al*, 1976). In this context, building obsolescence is taken to represent the growing gap between the expected and perceived utility of an office property, a concept that is illustrated in Figure 1. It therefore describes the relative degree of uselessness or disutility as defined by the building occupants themselves (Cowan, 1970). This study aims to develop a user-based appraisal for examining divergence between expected and perceived utility of office buildings – the building obsolescence gap - and determine a rigorous means of measuring it through time.

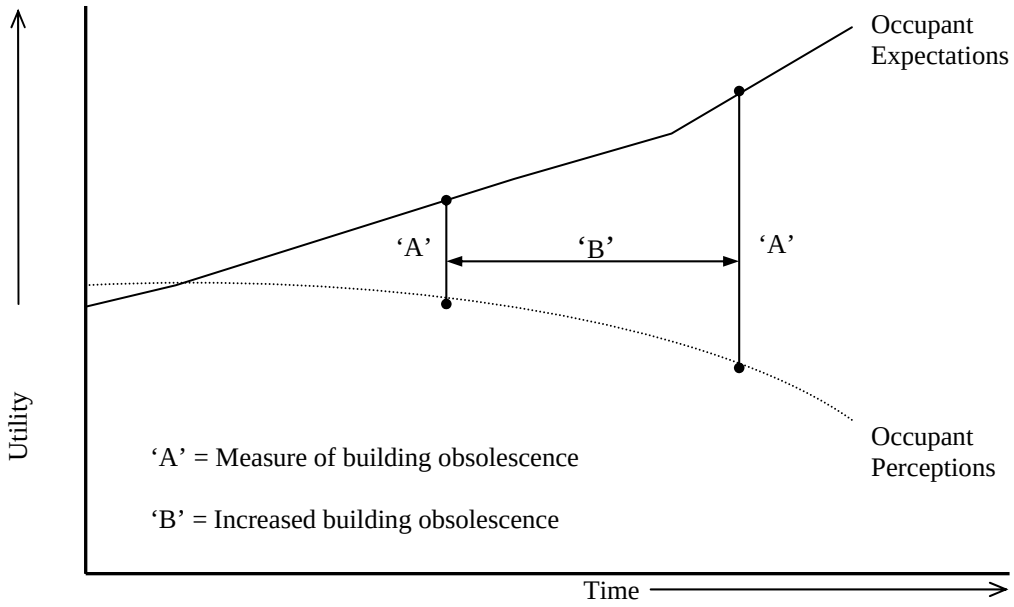

Figure 1: Conceptual view of building obsolescence

However, there are drawbacks to this approach. First of all, 'many causes of obsolescence are subtle and difficult of ascertainment; other causes are quite apparent, but still present difficulties of measurement' (Burton, 1993). This is because there is no objective measure of utility for office property since every building is unique in some aspects and it is therefore difficult to establish a unique set of evaluation criteria (Salway, 1986). Besides, the utility of an office building is dependent as much on the viewpoint of the decision maker as on the peculiarities of the property in question (Ohemeng and Mole, 1996). This subjectivity gives rise to the problem, common in the social sciences, of distinguishing between preference and habit. Advantages and disadvantages that are voiced may derive from prejudice and past conditioning (Nutt *et al*, 1976). This situation is further complicated by the fact that some of the criteria on which the evaluation of building utility is based defy universal measurement and those that can be measured are often done so using incommensurable units (Ohemeng

and Mole, 1996). This study will seek to overcome these problems by using *building quality* as a proxy for building utility and, hence, building obsolescence.

Using building quality as a measure of obsolescence

Research by Baum (1989) showed building quality – or more specifically the degree to which building quality falls short of current standards - to be the major determinant of building obsolescence in office property. Hence, it is the aim of this research to use building quality as a means of measuring through time changes in the level of building obsolescence in office property. This relationship between building obsolescence and building quality is also allowed for elsewhere in the literature. For instance, Bryson (1997) argued that whilst locational obsolescence depends upon the quality of location, building obsolescence is a function of the quality of a property. Likewise, BWA (1994) and Bottom *et al* (1999) both suggest that the utility of a building is dependent upon its quality. In this respect, building quality refers to a building's intrinsic attributes: its design, specification, respectability and prestige (Bryson, 1997). It has been argued that building quality naturally breaks down into further sub-factors, and that by analysing these sub-factors it is possible to assess a building's susceptibility to obsolescence (Baum, 1991). For example, in Baum's (1989) study, building quality was seen to consist of configuration, internal specification, external appearance and durability of materials. It has been argued, however, that this classification is neither finite nor beyond debate and that building quality could be broken down further for more detailed analysis (Baum, 1991).

Nevertheless, quality is itself an elusive and indistinct construct and its requirements are not easily articulated. Defining and measuring building quality therefore presents problems (Parasuraman *et al*, 1985; Baum, 1991). This study aims to overcome these problems by using *gap analysis*, a technique that was developed in the field of marketing by Parasuraman *et al* (1985) as a rigorous means of identifying and measuring quality gaps in the provision of services. It consists of two key elements: the gap analysis model and the gap analysis methodology. The gap model of service quality describes five gaps that are considered to exist in service provision. Of concern to this study is gap 5, otherwise known as the *service quality gap*. This gap describes how users perceive actual service performance or utility in the context of what they expect. The service quality gap has two important attributes. First, it is the user that defines the quality of service. Second, users 'make a judgement on the quality of any service by comparing the service they receive with the service they expect' (Bland, 1994). It is important to clarify that in this context, 'expectations' define the users' view of ideal service as opposed to their predictions about some desired future state. These expectations are influenced by word of mouth communications, personal needs and personal experience. The decision framework underlying the service quality gap is therefore analogous to the one that determines the process of building obsolescence. Hence, a derivative of the gap model of service quality has been applied to show how differences between occupant expectations and perceptions of building quality will be used in this study to identify and measure building obsolescence. This *gap model of building quality* is illustrated in Figure 2.

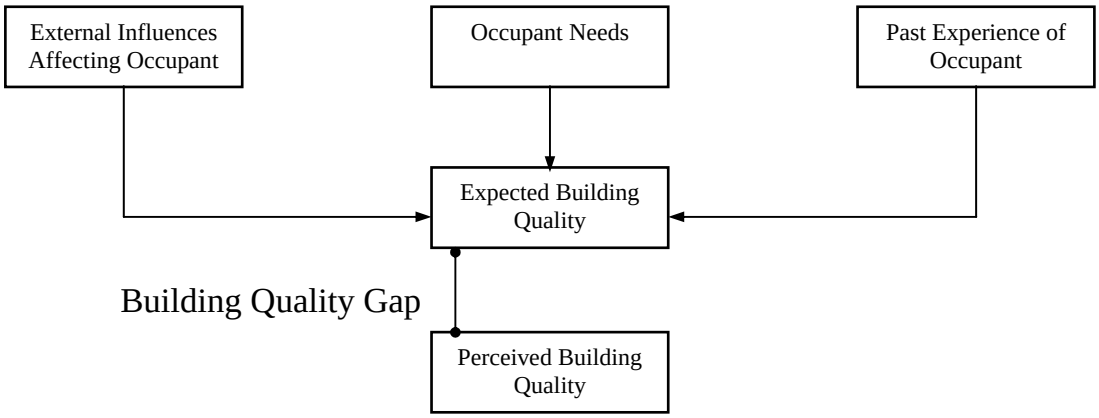

Figure 2: Gap model of building quality (adapted from Parasuraman *et al,* 1985)

The application of gap analysis in future work

The theoretical application of the gap analysis model to this research suggests that the gap analysis methodology will lend itself to the development of a user-based appraisal of building quality. Essentially, the methodology that will be used in this study is the same as that developed by Parasuraman *et al* (1985), the stages of which are summarised in Table 1. The methodology will be applied using case studies. Each case study will comprise of two distinct parts: one qualitative, the other quantitative. Standard social research techniques will be employed in both parts (Bland, 1997). The qualitative part of the gap analysis (stages 2 and 3) will entail the use of focus groups or interviews with occupants to identify dimensions of building quality for office property. These dimensions will then be subjected to the quantitative stage of the analysis (stages 4 and 5), which involves the use of a questionnaire consisting of elements for each dimension. The occupant indicates how important each element is to them and then the actual level of quality for each element. The difference between the two scores will provide a measure of the quality gap for that particular element (Bland, 1997). All of the responses will then be aggregated to form the quality gap for each dimension and an index or scale showing overall building quality. A negative score for any given element, dimension or building indicates that it is suffering from a quality deficiency and, hence, building obsolescence. The remainder of the methodology (stages 6-11) will serve to refine and validate this building quality scale.

Empirical results from the gap analysis will then be used to develop a decision-support model for identifying impending problems of building obsolescence in office property. This will allow building owners, occupiers, owner-occupiers or facilities managers to identify, measure and track problems of building obsolescence over time. For instance, it would be possible to evaluate the intrinsic attributes of an office building with the view to determining whether it has building quality characteristics that are currently - or prospectively - not meeting the requirements of occupants, enabling the establishment of proactive ‘gap closure’ strategies for combating sources of building obsolescence (Bottom *et al*, 1999). Research is currently focused on developing appropriate criteria for the selection of case studies. It is intended that these criteria be based upon both organisational and property characteristics. What is

more, a pilot study is currently being undertaken with a view to testing the applicability of the gap analysis technique prior to the main round of case studies. Results from this pilot study will soon be forthcoming.

Table 1: Proposed gap analysis methodology (adapted from Parasuraman *et al*, 1985)

Stage	Description
1	Provide definition of building quality
2	Identify dimensions of building quality construct
3	Generate elements to represent each dimension
4	Collect expectations and perceptions data from building occupants
5	Scale purification to refine dimensions and elements
6	Identify elements representing each dimension
7	Use refined scale to collect further expectations and perceptions data
8	Scale purification to refine dimensions and elements
9	Identify dimensions and elements of the refined scale
10	Evaluate scale reliability using data from stage 4
11	Assess validity of the building quality scale

CONCLUSIONS

In recent decades office property in the UK has experienced increased rates of obsolescence, the costs of which have been felt by owners, occupiers and non-users. However, current one-dimensional measures of building obsolescence focus solely upon the financial impact for the property owner. As such, the measurement of building obsolescence has remained unchallenged and there is a consequent lack of knowledge regarding its future incidence. Research presented in this paper aims to address these problems by adopting an occupier-orientated approach to building obsolescence. This will involve the use of gap analysis to identify and measure building quality gaps in office property, as perceived by building occupants. Results of this analysis will then form the basis of a decision-support model for highlighting approaching problems of building obsolescence in office property.

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