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Analysing construction organizations

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When applied to construction organizations the extensive literature on organization theory can be confusing and conflicting. This paper provides a path through some of those theories of organization which have been found of value in understanding how construction organizations function. It suggests that although they may take quite different perspectives and be based on quite different assumptions there exists valuable linkages between some of the most well-known theories and their associated models of organization.

Keywords: Organization theory, economic theory, leadership, problem solving.

Introduction

In the late 1960s organization and management theory were at a crossroads. Increasingly, empirical research results were challenging much of the conventional wisdom of organization and management which had been handed down by three successive generations of management writers. Yet at that time the well-established and traditional theories of management, such as those of the classical and behavioural schools of thought, had retained much of their appeal for many managers. One of the reasons was that much modern management thought, even when supported by sound theory, was complicated and confusing and too often appeared to be inconsistent. The new theories lacked the appeal of their predecessors which often were developed from the insights of practitioners for consumption by other practitioners. Because of the essentially complex nature of the subject, organization theory was more prone to these problems than management theories relating to, say, motivation and styles of leadership.

A particular example of the confusion is given by the response to studies by the Aston school (Pugh, 1969) of many practitioners attending management development programmes in the early 1970s. Despite their appeal to researchers, practitioners felt these studies were confusing; they involved too many factors and too many dimensions. On the other hand the categorization of industrial organization developed by Woodward (1965) was viewed as too simple to handle the complexities of construction. Whilst the model proposed by Burns and Stalker (1961) and that developed by Lawrence and Lorsch (1967) were attractive they too were judged as not sufficiently comprehensive. Added to this situation was a lack of organizational research in construction. The notable exceptions were those studies carried out by the Tavistock Institute (1969) which were quite well known to practitioners and those by the Medical Research Council (Davies, 1948; Mace, 1950) and by Aston University (Birch and Williams, 1968) both of which had received very little acknowledgement. The most well-known commentary on organizational issues in construction, through empirical studies undertaken with an economics perspective, had been provided by Bowley (1966).

The paper reviews a long-term undertaking to identify those theories and models of organization and of management which are most useful for understanding the construction industry and its firms. This work was motivated by a need to simplify the complex nature of much organization thought and to delineate a path through the confusing mass of theory for the benefit of the manager. A further motivation was a view that much of the apparent conflict between the mainstream theories of organization could be reconciled. This process of harmonization would reveal that many theories differ largely because of the perspectives from which they have been developed rather than from the fundamental principles or the research which has supported the theories. As these theories are well documented in the references given in this paper no attempt is made to elaborate them in detail. Further, many of the argu-

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ments in the paper have been rehearsed in different guises in other fora, for example, Mintzberg (1983) and Donaldson (1985).

The programme of studies

The initial studies considered in this paper were prompted by the need to discover which of the new emerging theories were likely to be of greatest use to practitioners in the construction industry. In particular there was a concern to help those who were running medium-sized firms. Many of these firms were in a state of transition from family run to manager run and faced a diverse range of organizational and managerial issues, yet little advice was available to them. They did not have recourse to the advisers and consultants available to larger firms and usually they had not benefited from any form of management training through either higher education or post-experience management programmes. Exposure to the ideas promulgated through such programmes might well have provided the insights which were required.

The initial studies (Lansley *et al.*, 1974) were to be rooted in sound social science methodology, involving much data gathering and analysis and not just a review and discussion of new and prevailing theories. As experience and confidence in this approach grew so the emphasis shifted. Thus, the later studies focused on reviewing well-established mainstream theories and questioning their validity and potential application. This mixture of approaches might be regarded as a form of triangulation around the very complex summit of construction organization theory.

The paper comprises two main sections. The first is concerned with series of empirical studies of the organization and management of construction firms in two quite different economic periods. This introduces models of organization structure, management style and problem-solving skills which were refined during the studies and which were found to provide valuable insights into the performance of firms.

The second section surveys a number of popular theories and models, the transaction cost approach, codification–diffusion theory and theories of cultural differences, as well as making passing reference to other models. The aim of this section is to identify the differences between each of the models and theories and to highlight the similarities.

Whilst the studies considered in the first section have been reported previously the integration of these with the later studies has not. Thus, this paper reviews only briefly the initial studies before considering more recent work and providing an integration of these two themes.

The initial studies

The initial series of studies was carried out between 1970 and 1978 by the Ashridge Management Research Unit. It was the only major programme of research into the organizational effectiveness of the UK construction industry to be carried out in the 1970s. One aim of this work was to develop measures of organization structure and management style and to identify patterns of human and commercial performance associated with these measures. Thus, an essential feature of the study was the performance of the firm as a whole, its strategic development and those factors which influenced that development.

The first of the series of studies (Lansley *et al.*, 1974) adopted a grounded theory approach (Glaser and Strauss, 1968) based on intense investigation of a limited range of case studies and a comparison between these cases. This approach enabled the discovery of theory and dimensions grounded in the data rather than the pursuit of a hypothetico-deductive approach based on theory testing. This demonstrated that measures could be developed which reflected some of the very qualitative factors associated with organization and management as described by theory. It also generated specific measures of dimensions of organization structure and management style which could be used to classify firms. These dimensions could then be used to explore differences in the performance of the firms.

Using organization theory which incorporated strong contingency arguments it was possible to predict the most appropriate form of organization for a firm. Subsequently these predictions were confirmed; those firms which conformed to the most appropriate organization as judged by theory performed better than those which did not. The key to the contingency argument was in defining the task of a firm. At the time of the research theorists had concerned themselves largely with technology but had found it difficult to conceptualize and measure technology in such a way that comparisons could be made across a wide range of types of organization. Although Child (1972) had questioned whether it was useful to direct attention upon technology and had suggested that there was a good case for focusing on differences in the nature of the work itself the approach taken was to consider the 'overall task' facing the enterprise – a concept which embraces not only the work itself but also the technology with which it is carried out and the environmental constraints which are typically present.

This approach enabled the differentiation of four quite different types of firm even though all were considered to be main contractors. The types were general contractors, specialized main contractors, small-works contractors and embryonic 'project management'

Table 1 The dimensions of organization structure

Dimension	Definition
Control	The extent to which the activities of individuals are laid down by higher authority and prescribed by procedural rules or are decentralized, less formal and left mainly to the discretion of the individual. Control may be achieved through such mechanisms as functional specialization, close supervision, the use of well-defined systems, procedures and performance standards (March and Simon, 1958; Burns and Stalker, 1961)
Integration	The extent to which the activities of individuals are closely coordinated in relation to the firm's objectives, for example, its markets or projects rather than its internal functions. Integration is facilitated by, for example, project groups and teams, effective formal channels of communication and through reliable and accessible information to staff about their jobs and the firm (March and Simon, 1958; Burns and Stalker, 1961; Lawrence and Lorsch, 1968; Galbraith, 1973)
Boundary Regulation	The extent to which the activities of the management system of the firm are concerned with managing its relationship with the environment or controlling the internal affairs of the organization. Boundary regulation is enhanced through differentiating between those tasks involved with the interface of the firm with its environment (e.g. marketing, industrial relations, buying, surveying, estimating) and, for example, through the use of planning systems which emphasize the 'adaptive' stages of planning rather that the 'efficiency generating' stages (Lawrence and Lorsch, 1968; Lorange, 1978)

contractors. As firms in each type had quite different tasks there were different prescriptions for what constituted an appropriate organization structure.

For this initial study the findings for management style relied much less on a contingency view for judging requirements of firms against environment and task characteristics. The pattern of results appeared to be consistent across the differing tasks of the firms. However, the styles of management which appeared to be most successful in construction differed from those in other sectors. There was a strong suggestion that success in construction relied on styles which were more authoritarian and task oriented than in other industries.

The findings from the study were powerful and persuasive. Indeed, it appeared that the difference between firms which had an 'appropriate' organization and management style and those which were 'inappropriate' was typically in the region of 5% profit on turnover a year. The difference in annual growth rates was nearly 10%. Similar differences in performance were found in the subsequent studies. These findings, which have been discussed in previous reports (Lansley *et al.*, 1974; Lansley and Quince, 1981; Lansley, 1987), were able to show clearly that organization models can be helpful to understanding how firms achieve their levels of performance. However, the nature of the models, which were eventually adopted by the study as providing the best fit between theory and practice, has tended to be overlooked in these earlier reports.

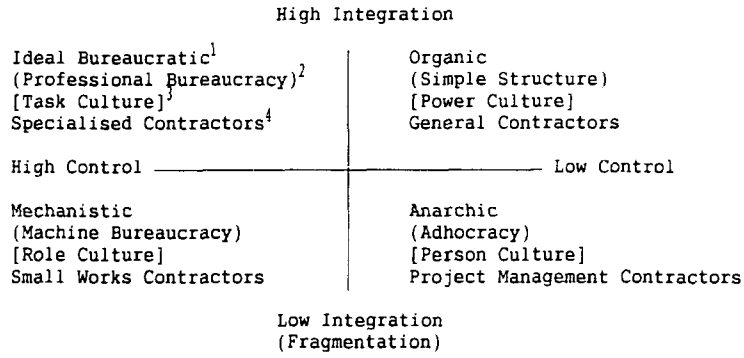
The second initial study, focused specifically on the effects of the mid-1970s recession on construction firms (Lansley *et al.*, 1979). It took as its starting point the models which had been developed during the first initial study. However, because it too was strongly data driven, this study was able to highlight shortcomings in these models. Whilst the structure model was seen to be very robust and easily applied and provided results which were consistent with those for the previous study, that for management style was not adequate. Also there appeared to be the need for a third model – of problem-solving skill. This had not been developed during the initial study, although the impact of differing levels of managerial skill on company performance had been noticed.

The models

The models of organization structure and management style are based on those originally proposed by Sadler and Barry (1970). In turn their model of structure was a development of that developed by Burns and Stalker (1961). That for management style was based around a series of models which were essentially similar to and is best exemplified by the model used by Blake and Mouton (1964).

Organization structure

The Sadler and Barry (1970) model of organization provides a separation of those factors which in the Burns and Stalker (1961) model were viewed as being part of a single dimension, the extremes of which contrasted the organic with the mechanistic form of organization. The model comprises three dimensions, control, integration and boundary regulation, which are described in Table 1. Each of these dimensions could be found in the



Notes:
1 Organization types are those given by Sadler and Barry (1970)
2 Types in parentheses are those used by Mintzberg (1983)
3 Types in brackets are those used by Handy (1976)
4 Firm types are those identified during the initial study (Lansley *et al.*, 1974).

Figure 1 The control–integration configuration

(then) established organizational literature although often these dimensions were referred to under a range of quite different labels. The contribution of this model, however, was in identifying and bringing together all three dimensions. The four organization types described by the combination of the dimensions of control and integration (Fig. 1) represent four basic types of organization which occur frequently in the organization literature. The organic structure, which has be shown to be suited to unpredictable and changing conditions and the mechanistic structure, more suited to routine stable conditions, were studied in great detail by Burns and Stalker (1961). The ideal bureaucratic structure is that which many of the early theorists from the scientific school of management aspired to replicate in real life, the ideally eficient administrative apparatus based on military analogies. The anarchic structure has been the subject of descriptions of organizations in which there has been no common task amongst members who are largely equals, but in which there are opportunities to gain advantages through the use of power and politics.

An attractive aspect of this model to both practitioners and researchers has been that it is neither too complex to be confusing nor too simple to be dismissed as lacking in theoretical or practical reality. A further aspect is that it accommodates much of the work of later organization theorists. For example, despite differences in terminology there is a direct resemblance between the four organization types formed by the control-integration matrix and those provided by Handy (1976). Also, there is a close similarity with four of Mintzberg's (1983) basic categories of organization, that is, excluding the multidivisional firm. There is also close correspondence with Galbraith (1973), who proposes a number of coordination and information devices. Each of these can be viewed as representing either control mechanisms of different types (for example, the use of routine methods of working, specialization, higher authority, performance standards, use of discretion) or ways of achieving integration (for example, regrouping of activities, introduction of slack resources, improvement of communications, problem-solving meetings, managing boundaries). Other links can be made, for example with the work of Keidel (1984), who has used sporting metaphors to describe different types of organization. His baseball metaphor corresponds to the mechanistic organization, American football with the ideal bureaucratic and basketball with the organic. He does not offer a metaphor for an anarchic organization but it seems likely that this would be a sport where individuals set and pursue their own performance targets regardless of external influences or assessments – amateur golf perhaps.

Management style

The model for management style is more straightforward. It is a two-dimensional model which corresponds to those well-established models which clearly differentiate between people or relationships orientation, on the one hand and task or production orientation, on the other. A popular model is that proposed by Blake and Mouton (1964) in the managerial grid which is similar to that used by Reddin (1970) for management style training.

Such is the elegance of the work of Tannenbaum and Schmidt (1973) and Fiedler (1967) that the appeal of unidimensional models of management style remains strong. Yet repeatedly studies have shown how misleading these models can be by failing to distinguish styles of management which combine extreme levels of relationships and task orientation.

Table 2 The dimensions of management style

Orientation	Description
Task/production	The level of concern of managers for efficiency, productivity and systems of management control
People/ relationships	The extent to which managers give priority to the welfare, development and involvement of staff as compared to enhancing their own personal standing in the organization
Corporate	The extent to which managers are concerned with medium and long-term market-related organizational goals as compared to satisfying immediate relationships with existing clients and markets

Table 3 The dimensions of problem-solving skills

Skills	Description
Technical	Those skills which imply an understanding of and proficiency in a specific kind of activity, particularly one involving methods, processes, procedures or techniques
Human	Those skills which enable an individual to work effectively as a group member and to build cooperative effort within the team he/ she leads
Conceptual	Those skills which provide the ability to see the organization as a whole. It involves looking at the organization in terms of its interaction with the competitive, political, social and economic environments

Close observation of management styles in construction firms in the mid-1970s showed an increase in the concern of managers not only for the task in hand through a strong production orientation and for individual employees through a strong relationships orientation, but also a major concern for the future of the firm and the industry. This future orientation, eventually termed corporate orientation, was for the longer term (Table 2). When present in a manager's style it provided both an emphasis on the long-term goals of the firm and an articulation of how individual employees might fit into the firm in that longer term. Eventually, it was realized that corporate orientation observed in some firms was identical to that which other writers termed vision. However, the term vision has become so clouded by an expectation that the manager should possess some metaphysical inspirational quality that a more 'feet on the ground' terminology seems appropriate to the construction industry.

The value of the studies was not just in developing a more complete model of management style but in showing just how in the face of changing economic conditions management priorities also had to change. By the mid-1970s a strongly people-oriented and corporate-oriented style seemed to underlie the success of many firms. This compared markedly with the strong task orientation which characterized the successful firms in the 1960s.

Problem-solving skills

Initially the third model was more difficult to determine. It was clear that the way in which individual groups and firms solved problems had a bearing on the effectiveness of those firms. The probem lay in developing a model which avoided difficulties in conceptualization and in measurement. Ideally a model which could draw on data from profiles of individuals in firms was needed but obtaining largely psychological or quasi-psychological data from individuals was impossible. Eventually the model proposed by Katz (1955) which distinguishes between technical, human and conceptual problem-solving skills was adopted to very good effect (Table 3). This enabled crude measures of problem-solving skills to be developed and applied at a total organization level, although at times for practical reasons it was necessary to combine the second and third dimensions into what was termed organizational problem-solving skills.

The analysis of problem-solving skills data was to suggest that during the stable 1960s technical problem-solving skill was a key to achieving efficiency and competitive advantage. However, this was a minor dimension in distinguishing between successful firms and unsuccessful firms during the 1970s' recession. Rather, human and conceptual skill had a much greater part to play in helping firms understand the new business environment in which they had to operate and in building teams to solve the new problems which arose from the need to adapt to that environment.

Review

The end result of the second study was to expand and define the models developed in the first study. This resulted in three models each comprising three dimensions. These models were used extensively during the second study and retrospectively on data for the first study, where they were shown to have a good degree of power in discriminating between good and poor performing firms.

An important aspect of the development of the models

Table 4 The three models

Theme	Structure	Style	Skills
Production	Control	Task	Technical
Relationships	Integration	People	Human
Environment	Boundary regulation	Corporate	Conceptual

was in presenting them to practitioners attending management courses and through consultancy assignments. It was through these activities that the models were found to have a high degree of intuitive appeal to practitioners and value when analysing organizations. In turn, this encouraged their further development. The findings from the second study were used extensively within the context of consultancy assignments focused on strategy formulation and development in the late 1970s. Organizational analysis, strategy building and organizational change programmes, often were based around developing a stronger corporate orientation amongst senior managers, enhancing the ability of an organization to regulate its boundaries through sensing the environment and responding rapidly to changes in it and developing the levels of organizational and conceptual skill.

This appeal was strengthened further by what appeared to be a strong consistency between the three models. For example, not only does each have three dimensions but each dimension on any one model can be linked to one dimension on each of the other models (Table 4). Despite these conceptual links, however, statistical studies have shown them to be quite independent, thus reinforcing the view that they do relate to different aspects of organization and managerial life.

The dimensions of control, task orientation and technical skills form a consistent group of dimensions focused on production-related issues; integration, people orientation, human skills have a focus on relationship issues, whilst boundary regulation, corporate orientation and conceptual skills are concerned with issues relating to the environment. This leads to the notion of three parallel models representing three quite different sets of characteristics.

Subsequent studies

The initial studies were carried out within the perspective of conventional organization theory as characterized by the work of such writers as Burns and Stalker (1961), Lawrence and Lorsch (1967) and Galbraith (1973). However, at the time of these studies other attractive and exciting models were being proposed. These provided quite different perspectives on how construction organizations operate. Whereas the conventional perspectives were largely focused on the internal organizational arrangements, others were, for example, explicitly concerned with the interaction between the environment and the organization. Some perspectives took an information processing viewpoint, whilst others considered organization culture.

Transaction cost

The construction firm, above all else, is a 'market trader'. It acts as a broker of opportunities for projects and as an intermediary acquiring materials, human resources, equipment and finance to undertake those projects. The relationships between the firm and the environment are close, many and varied. A range of perspectives are required in order to capture the subtlety and all-pervading nature of the link between the firm and its environment especially when considering such fundamental issues as subcontracting, project procurement systems, horizontal integration and vertical differentiation (that is, the extent to which firms organize themselves into autonomous business units through a sequence of levels such as divisions, departments and regions). Often the starting point for considering these issues is economic rather than organizational. This leads quite naturally to considering some of the most important theoretical developments of the past 20 years, the blending of organizational theory with economic theory using the transaction cost approach proposed by Williamson (1975).

This approach is comonly referred to as 'markets and hierarchies'. This considers the total cost of achieving some goal, say a purchase of a good or service to be the sum total of the cost of production and the cost of the transaction involved in securing the production and, hence, achieving the purchase. Subsequently, it considers how different types of organizational arrangement can affect the costs of both production and transaction. One particularly powerful illustration of the approach is given by consideration of subcontracting practices. The issue is at what stage does it make sense for an organization to subcontract work (that is, to use the market to provide the service) rather than to undertake that work directly (that is, to undertake the work within a single hierarchy or organization). The answer will depend on the priorities and perspectives of those who are asked the question. The senior manager of a contractor might favour a high level of subcontracting as a general policy for his firm so as to shift fixed costs to variable costs and to minimize the transaction costs incurred through employing labour which, at times, may be unproductive. Such a perspective implies a different view of risk sharing, economies of scale and the consequences of a project being delayed than would be

offered by, say, a site manager. The latter might be expected to have a stronger preference for the direct control of labour and a different approach to managing uncertainties in production levels.

Two key dimensions emerge from the discussion of markets and hierarchies. First, there is the level of uncertainty in judging performance of the service offered by the subcontractor. Second, there is the extent to which the subcontractor and the client, that is, the parties to a transaction, share compatible objectives. Using these dimensions it can be shown that market relationships appear to be appropriate where performance ambiguity is low. In these cases it is not important for objectives to be coincident since each party to the transaction can judge whether or not the other party is performing in an agreed way. For example, in a market there is competitive bidding for, say, the services of an engineer. The individual and his employer will know the true value of their services and products according the terms which the market sets.

In situations where performance ambiguity is high and objectives are not compatible then a hierarchical approach seems to be required, where a single administrative entity spans the transaction and where some subordination prevails such as in the conventional business organization. In the hierarchy, workers lack any clear sense of value of their services. Bidding does not set salaries. Since each job is unique the individual relies on the hierarchy to evaluate performance and to estimate the worth of the work of the individual. The hierarchy succeeds only to the extent that it can be trusted to provide equitable outcomes, just as the market place succeeds because individuals grant legitimacy to it.

Other authors have considered situations where the objectives of the parties are coincident but where the evaluation of performance may be highly ambiguous. Ouchi (1980) suggests that in these situations the appropriate organization is that of the clan. This is where objectives are achieved through mutual understanding and through mediating differences and disagreements. These succeed when team-work and change render individual performance almost totally ambiguous. At these times long-term commitment supported by agreement on goals and operating methods is necessary to achieve an equitable balance. Individual performance and reward can be judged only over a period of years. Thus, relationships must be long-term and trust high. Clans exist where there is a union of objectives between their members which stems from a sense of dependence on each other. The basic mechanisms of control are embodied in a philosophy of management – an implicit theory of the firm which describes the objectives.

When presented with descriptions of the three types of organization, market, hierarchy and clan, those with extensive experience of construction often remark that the parties of the typical building project come together through the processes of the market, are expected to operate according to the rules of the hierarchy but, in order to achieve a successful project, have to adopt the characteristics of a clan!

Further consideration of the organization types suggest that the key dimensions of performance ambiguity and congruence of objectives are implicit in the dimensions of control and integration presented earlier. For example, high control becomes imperative where objectives are likely to conflict, thus requiring the development of systems, procedures and standards to ensure that work is undertaken in the desired manner. Also, as performance ambiguity increases so integration of activities becomes essential, so that mutual adjustment of activities can take place to ensure successful outcomes. It is stressed, however, that the dimensions are not the same. Rather, they parallel each other and produce descriptions of organizations which are essentially similar.

The appeal of the approach is that its two key dimensions, performance ambiguity and compatibility of objectives relate directly to everyday issues in the life of the industry. Thus, it is not surprising that there have been many successful applications of the approach to construction (for example, Gunnarson and Levitt, 1982; Reve and Levitt, 1984; Stinchcombe and Heimer, 1985; Winch, 1989). In addition to considering subcontracting practices they have applied the approach to issues such as the relationship between professional practices, joint ventures in construction, the hierarchical nature of contract documents and the internal structuring of multidivisional companies.

Codification–diffusion theory

Organizational theory and economic theory can provide important starting points for understanding the behaviour of organizations. However, with the rapid development of information technology as an influence on the design of organizations, a theory of information also has an important part to play. Whilst the information-processing perspective on organizational design proposed by Galbraith (1973) has proved to be of great value, it is an approach which is set firmly within the tradition of conventional organizational theory. A novel, distinctive and valuable approach for the present information technology age is exemplified by codification–diffusion theory as described by Boisot (1987).

The codification–diffusion perspective considers the extent to which organizations can codify information and diffuse that information. Some information is

amenable to codification and can be expressed easily in quantitative terms, for example, the performance characteristics of copper tubing used for domestic heating installations. Other information is less amenable to codification such as perceptual information. An example might be the initial brief received by an architect from an inexperienced client. Similarly some information can be diffused quite easily, say, to a large audience of receivers, for example, through 'trade' brochures. However, other information can require a high level of expertise to both encode and decode and is accessible to a limited audience, for example, the characteristics of a new type of CAD workstation.

With its focus on information, rather than other factors which can influence organization design, this approach has proved valuable in describing the information-processing differences inherent in the structures of major UK contractors, contrasting the structures of the contractors and highlighting the characteristics of the competitive advantages derived from the different structures, in information-processing terms. A strong emphasis on information processing rather than on other organizational characteristics has helped to focus the attention of those firms on those policies which are needed to ensure that the firms adopt competitive IT strategies.

One particular example arises from the after-effects of extensive decentralization and regionalization in the 1980s of a national building firm. This developed a management system between regions and head office which relied on a high degree of codification. The system worked well for as long as most of the information which needed to be exchanged concerned financial performance and simple market information. Also, this was information which did not need to be diffused to any great extent in the organization, although it could have been. The recession of the early 1990s found the system lacking. With good profits turning to losses within a short period of time the health and future viability of a regional business could not be captured in purely financial terms; the signals from the market were less clear and required continual attention. Whilst more information had to be exchanged, much of it could not be codified. What is more, the subtlety and complexity of the data limited the extent to which it could be diffused, except amongst experts. In the event organizational systems had to be developed to provide opportunities for closer and regular personal interaction between regional and head-office personnel. It should be noted however that this was because of the demands arising from information processing requirements, not from those factors which are traditionally associated with centralization, such as power or production technology or a direct concern for closer control from the head office.

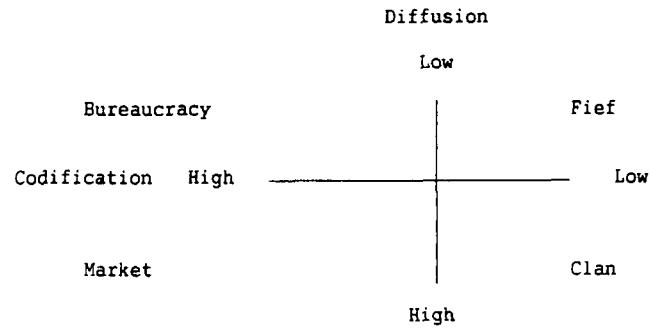


Figure 2 Codification and diffusion

Using codification and diffusion as separate dimensions, and considering the types of organization required to operate effectively in different settings four stereotypical organizations have been derived (Fig. 2). These organizations have labels which are similar to those used earlier in the discussion of the transaction cost approach. However, there are two key differences. Boisot (1987) uses the term bureaucracy to describe the hierarchy. Also, the organization that Ouchi (1980) views as a clan is termed a fief by Boisot (1987), who uses the term clan to describe a somewhat different type of organization. This is characterized by individuals working in smaller groups, often alone, so that self-control is more important than mutual adjustment. In turn because the work is more self-contained they appear to pursue their work in their own preferred way. Clans are small club-like organizations with restricted entry, with boundaries to acceptable behaviour rather than rules to cement together activities. Fiefs tend to rely more on socialization and an acceptance of legitimate authority to mediate.

The link between the dimensions is as follows. A high level of codification enables the development of clear expectations and standards of performance and this reduces conflict due to incongruent goals and systems of organization. In turn these features can be associated with high control. Where codification is not possible the opposite is the case.

Similarly where it is feasible to diffuse information so there is an opportunity to operate a fragmented organization and to disseminate information on expected levels of performance through the organization. Where diffusion is not possible, performance criteria may be more difficult to specify. Indeed, this may be resolved only through a high degree of mutual interaction and integration. Another link is provided through the similarity of the descriptions of the organization types. Bureaucracy, market, fief and clan correspond to ideal bureaucratic, mechanistic, organic and anarchic.

Cultural theory

The final model to be considered is quite different to those considered so far. It is a model generated by Hofstede (1980) from a comprehensive study of how individuals from different cultures perceive organizations and what they seek from an organization, indeed, what they regard as desirable.

One reason for using this model is that it has provided a solution to the problem of needing to reconcile the quite different views of what constitutes 'good organization' expressed by managers from different parts of the world, from developed and developing countries and the need to harmonize these views with conventional management theory. For example, it is not necessary to travel too far from the UK to find countries in which many managers have difficulties accepting the basic concepts which underlie project management but which are widely accepted in, say, the UK and USA. In particular, issues such as motivation and methods of organization are open to a variety of analyses and prescriptions, many of which appear to be culturally based. If organization analysis and organization theory are to have any part to play in the education of the future manager of construction then these differences have to be handled and used constructively as a basis for a broader view on what determines good organization. In this respect Hofstede's (1980) work is extremely useful as it provides a number of simple maps, each of which locates the typical preferences of managers from a large number of cultures (which are generally presented as countries). Second, it provides a method for mapping the different theories of, for example, motivation, leadership and organization, which have developed in different cultures.

Hofstede (1980) identified four dimensions which help differentiate between different cultural perspectives on organization; these are power distance, uncertainty avoidance, individualism and masculinity. Although each of these has a strong bearing on organization design, it is the first two which differentiate most strongly between the organization structures preferred by managers from different cultures. Power distance indicates the extent to which a society accepts the fact that power in institutions is distributed unequally. Uncertainty avoidance indicates the extent to which a society feels threatened by uncertain and ambiguous situations and tries to avoid these situations.

Managers in cultures which have a preference for high power distances (for example, India, Brazil and France) feel most comfortable with a high degree of centralization, often focused around individuals. Those with a preference for low power distance (for example, Denmark and Sweden), seek organizations with a greater degree of fragmentation. Those in high uncertainty-avoidance cultures (for example, Japan and France) prefer well-developed control systems as a means of handling uncertainty and insulating the individual from those uncertainties. In low uncertainty-avoidance cultures (for example, Denmark, Ireland and UK) there is a preference for loosely defined systems, because in these cultures individuals are more prepared to handle uncertain situations as they arise. Hofstede (1980) suggests that the four quadrants formed by these two dimensions generate four types of organization (Fig. 3). His descriptions are close to those introduced earlier via the other models. For example, taking four countries his description of the organization preferred by most French managers is for a pyramid structure (centralized and formalized), for most German managers, a well-oiled machine (formalized, not centralized), for most British managers, a village market (neither formalized nor centralized) and, for most Indian managers, the family (centralized but not formalized).

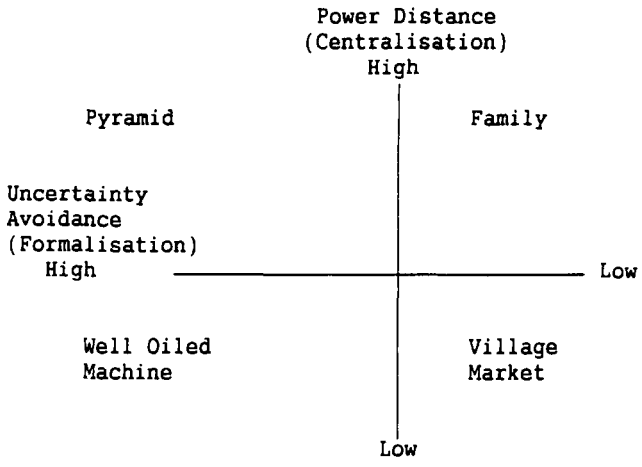


Figure 3 Cultural models from Hofstede (1980)

The suggestion is that uncertainty avoidance tends to underlie considerations of control. For example, high control organizations will attempt to minimize uncertainty through systems and procedures whilst low control organizations will accommodate uncertainty and expect this to be handled throughout the organization. Also, there is a clear correspondence between low power distance and fragmentation. Even the descriptions chosen by Hofstede (1980) fit neatly with those used for the other models. Pyramid, well-oiled machine, family, village market closely resemble ideal bureaucratic, mechanistic, organic, anarchic.

Whilst the challenge of managing construction in unusual cultural settings is widely appreciated the importance of this model lies with the graphic illustration which it provides and indications of ways of managing those challenges. Although Hofstede (1980) and others have suggested that project management is a

Table 5 Some parallel dimensions

Set 1		Set 2	
Dimension	Direction	Dimension	Direction
Control	High–Low	Integration	High–Low
Goal congruence	Low–High	Performance ambiguity	High–Low
Codification	High–Low	Diffusion	Low–High
Uncertainty avoidance	High–Low	Power distance	High–Low

concept which is largely alien to many cultures and this can be seen to be such from the maps, there are many other implications which arise from consideration of the model which are no less dramatic. Whilst the model has had a major impact on cross-cultural research some of the most valuable applications in construction are largely undocumented especially where they have been applied directly into management practice. Three recent examples to come to the notice of the author are the design of an international contractor's IT strategies, the development of client relations practices in the Middle East and the impact of computers on Hong Kong Chinese building firms.

Conclusion

This paper has reviewed a wide range of models and theories, some which have been tempered by strong empirical evidence, others by their intrinsic appeal and popularity with mainstream management theorists. Yet those models which have been referred to are just a few of many which are available to help our understanding of how organizations operate.

Despite their diversity it has been shown that there are strong links between each model. There is a correspondence between each relevant dimension and between the descriptions of the organizations formed by the combination of dimensions (see Tables 5 and 6). In short it has been possible to show that despite their different perspectives and objectives, the models and theories can be reconciled and harmonized. Whilst it is not suggested that the models are close equivalents it is suggested that their characteristics do parallel each other. For any dimension or classification formed by the dimensions there is an equivalence despite some differences or even conflicts between some of their prime characteristics.

This finding is important for an applied area such as construction where the need is to apply theory to assist thinking about organizational issues rather than to develop basic theories or to test them. The existence of some commonality between models and theories is helpful insofar as it provides a meeting point for those who have studied organizations from quite different perspectives and a bridge between one perspective and another. Rather than one theoretical perspective being superior to another, it is suggested that a range of perspectives enriches insights into organizations whilst providing the facility of being able to return to two sets of equivalent dimensions and four basic organization types which are common to the models presented in this paper.

Each of the perspectives provides different opportunities to the practising manager and organizational analyst.

Because they were undertaken within the context of construction and have their roots in conventional organizational theory the models derived from the initial studies provide a straightforward approach to analysing, describing and characterizing an organization. Such activities can be directed towards the total organization or suborganization. However, whilst the research through which the models have been developed has concerned strategic performance, the nature of the analyses and the insights which they provide tend to be focused on operational issues, those ingredients which contribute to success. Essentially the perspective is from the inside of the organization looking outwards.

A more strategic perspective is offered by the transaction cost approach. Although this can be applied at the micro-organizational level, this principally focuses on the relationship between the organization and its environment. As a tool for detailed analysis it can be quite cumbersome. As a device for providing insight and direction to organizational strategy it can be illuminating. For example, it has been found to provide a useful perspective in discussing the need for market-led organizations with managers of construction in Eastern Europe and for designing appropriate organizations. But it has been less useful in determining the organizational requirements of their firms. For this task the conventional approaches have been more valuable. Above all else, the transaction cost approach provides a powerful conceptual shorthand for describing and discussing fundamental organizational issues.

Although condification–diffusion theory might be used in the same manner, conceptually it is not well developed. However, it can guide the design of information systems and provide insights into why organiza-

Table 6 Some parallel categories of organization

Set	Name	Reference
1	Ideal bureaucracy	Sadler and Barry (1970)
	Professional bureaucracy	Mintzberg (1983)
	Task culture	Handy (1976)
	'Football'	Keidel (1984)
	Hierarchies	Williamson (1975)
	Bureaucracy	Boisot (1987)
	Pyramid	Hofstede (1980)
2	Organic	Burns and Stalker (1961)
	Simple structure	Mintzberg (1983)
	Power structure	Handy (1976)
	'Basketball'	Keidel (1984)
	Clan	Ouchi (1980)
	Fief	Boisot (1987)
	Family	Hofstede (1980)
3	Mechanistic	Burns and Stalker (1961)
	Machine bureaucracy	Mintzberg (1983)
	Role culture	Handy (1976)
	'Baseball'	Keidel (1984)
	Market	Williamson (1975)
	Market	Boisot (1987)
	Well-oiled machine	Hofstede (1980)
4	Anarchic	Sadler and Barry (1970)
	Adhocracy	Mintzberg (1983)
	Person culture	Handy (1976)
	Clan	Boisot (1987)
	Village market	Hofstede (1980)

tional systems succeed or fail. Principally it is to be valued for its ability to describe how organizations operate and how information flows into and around them.

The cultural theory model provides insights into those factors which managers from different cultures view as the elements of effective organization. Its value lies with consideration of situations where a manager might be confronted with the prospect of managing in a new cultural context or developing relationships with those who are more used to operating in a different cultural context. Of all the models it is the most straightforward to apply and, therefore, to use as a starting point for understanding a new cultural situation. Where such an analysis might lead will depend, however, on the extent to which other models might be used to expand the initial level of understanding. Another appealing feature of this model is that of all the models presented in this paper it has the most memorable labels to its dimensions; labels which can be used in settings other than those with a cultural context. On this issue, Hofstede's (1980) choice of labels, which reflects innately human traits to describe national cultures, illustrates the importance of the manner of the presentation of a model to its eventual acceptability, which in this case has been very high.

Organization research has moved a long way since the commencement of the initial studies. However, unlike the situation 25 years ago when much theory was under suspicion, the models which provided the basis for the initial studies have retained their value. This is confirmed by the continual use of the models in construction management research. The value of the models is supported further by the existence of an equivalence between these earlier theories and by more recent developments. However, this equivalence and the four classes of structure provide but a starting point for organization studies. Each has a mode of elaboration that goes much deeper.

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