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Predicting Normative Commitment in Construction Value Management

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ABSTRACT

Projects' goals expressed as time, cost and quality requirements are seldom disputed. However, it is not easy to ensure that the defined goals will be implemented by all parties in the implementation process, whilst goal commitment is one of key variables towards project success and participant satisfaction in construction projects. Value Management is a tool to enhance / ensure the commitment to project goals amongst professionals in construction projects. However, it is still a debate whether construction participants implement the project goals, which are set through the systematic decision process, in the real world. In order to improve the implementation of complex construction projects in Hong Kong, it is critical to investigate goal commitment amongst temporary project team members. The paper aims at identifying the antecedents leading to goal commitment and predicting the normative commitment amongst construction professionals in the industry. A questionnaire survey was conducted in the study. The results indicate that five behavioral variables are the essential antecedents to predict the normative commitment in the construction projects.

KEYWORDS

Antecedent, Behavior, Construction Project, Normative Commitment, Value Management

INTRODUCTION

A few years ago, the Premier of the People's Republic of China, Mr. R.J. Chu, criticized Hong Kong people with "no Volition after the Discussion; no Action after the Decision" (SCMP 9/2001). A lack of goal commitment does not only exist in construction-related governmental departments, but also spreads to private companies in HK due to the uncertain economic environment. Although the overall economic situation has been improved in Hong Kong, the unemployment rate of construction workers in the industry is still over 15% in Hong Kong in 2004 (Census & Statistics Department 2004). In recent years, Hong Kong government formed an ad hoc group to review the current construction practices. The formal report in 2001 emphasized the need for commitment in construction projects amongst the various stakeholders such as clients, professionals and suppliers in ensuring that the construction works meet the clients' dynamic expectations (Tang 2001). Value Management (VM) technique was suggested as a useful tool for the teamwork to enhance the commitment amongst construction professionals. Construction professionals should work with client and other stakeholders together in the VM workshop for clarifying project objectives, comparing design options and setting project goals. However, it is still difficult to ensure project participants implementing the specific project goals in the real world, especially during this economic recession and uncertain environment in the industry. The study aims at identifying the antecedents of commitments amongst construction professionals in the industry in order to predict

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the normative commitment of professionals in construction projects.

NORMATIVE COMMITMENT

Allen and Meyer (1990) suggested three distinguishable components of commitment in the psychological aspect namely, affective, normative and continuance commitments. Affective Commitment (AC) denotes identification with, emotional attachment to and involvement in the organization. Continuance Commitment (CC) denotes the perceived costs when staff leaves the organization. Normative Commitment (NC) reflects a perceived obligation to remain in the organization (Meyer et al. 2001). These three forms of commitment characterize an individual's relationship with the entity in question and have implication for the decision to remain involved with it.

Normative commitment (NC) reflects a perceived obligation to maintain membership in the organization. The underlying construct of NC is that commitment is the totality of internalized normative pressures to act in a way which meets organizational goals and interests (cf: Wiener, 1982). Such perceived feelings generally motivate individuals to behave appropriately and do what is right for the organization (Meyer and Allen 1991). Employees with a high level of NC remain in the organization because they feel that they 'ought to' do so (Allen and Meyer 1990, 1996).

ANTECEDENTS OF NORMATIVE COMMITMENT

Based on the extensive literature review, hundreds of studies examined the antecedents of commitment. The wide range of antecedents of commitment can be grouped into three categories: (i) personal characteristics, e.g., professional qualification, identification, acceptance, belongingness, internalization, etc.; (ii) Task-related characteristics, e.g., task nature, role difficulty and assessment; and (iii) organizational characteristics, e.g., senior supportiveness, centralization of authority and clarification (Mathieu and Zajac 1990). 26 hypothetical antecedents of commitment in the construction value management process are summarized in Table 1.

Due to the economic recession in Hong Kong, a lot of professionals stay in an organization with the CC rather than AC. In order to understand

Table 1 Hypothetical Antecedents of Commitment

Hypothetical Antecedents	
Factors	**Variables**
Personal	Relationship, Professional membership,Goal acceptance, Involvement, Belongingness, Goal specificity, Internalization, Resistant to change, Role specificity, and Participation
Task-related	Task nature, Task conflict, Task difficulty, and Assessment
Organisational	Authority, Senior supportiveness, Clarification, Equity, and Reward

the existing uncertain environment and improve the quality of construction projects, this study mainly investigated the antecedents of commitment in the construction projects, based on the identified behavioral variables.

A QUESTIONNAIRE SURVEY

A general questionnaire survey was conducted to the construction professionals in Hong Kong in 2002-03, including project managers, architects, civil / structural engineers, building services engineers, quantity surveyors, etc. Each set of questionnaire includes a four-page closed questionnaire. Out of 120 questionnaires, 75 were successfully returned in which 64 are valid for data analysis in the study. 11 respondents were returned with incomplete information and, thus, ignored in the data analysis stage.

Table 2 Pearson's Correlation of Normative Commitments and its Antecedents

Model	Variables	Unstandardized Coefficients (B)	t	Sig.	R^2	ΔR^2
1	(Constant)	10.644	10.653	.000	.229	.229
	v10 : Reward	0.976	4.288	.000		
2	(Constant)	6.217	3.372	.001	.317	.088
	v10 : Reward	0.836	3.767	.000		
	v15 : Equity	1.228	2.800	.007		
3	(Constant)	9.032	4.520	.000	.399	.082
	v10 : Reward	0.979	4.542	.000		
	v15 : Equity	1.505	3.537	.001		
	v08 : Goal acceptance	-1.004	-2.878	.006		
4	(Constant)	7.548	3.975	.000	.496	.097
	v10 : Reward	0.761	3.637	.001		
	v15 : Equity	1.309	3.294	.002		
	v08 : Goal acceptance	-1.287	-3.862	.000		
	v04 : Role specificity	0.986	3.358	.001		
5	(Constant)	2.184	0.780	.439	.545	.049
	v10 : Reward	0.679	3.339	.001		
	v15 : Equity	1.369	3.591	.001		
	v08 : Goal acceptance	-1.090	-3.319	.002		
	v04 : Role specificity	1.003	3.563	.001		
	V25 : Internalization	1.116	2.518	.015		
6	(Constant)	4.971	1.697	.095	.587	.042
	v10 : Reward	0.815	4.008	.000		
	v15 : Equity	1.266	3.432	.001		
	v08 : Goal acceptance	-1.075	-3.404	.001		
	v04 : Role specificity	0.801	2.828	.006		
	V25 : + Internalization	1.544	3.346	.001		
	V24 : – Internalization	-0.960	-2.408	.019		

Ordinary least squares forward stepwise multiple regression analysis was used to predict the normative commitment caused by behavioural antecedents during the management process (cf: Pallant 2001). Table 2 summarises the results, showing that 'reward' (v12) was entered into the equation at first, followed by 'equity' (v17), 'goal acceptance' (v09), 'role specificity' (v05) and two 'internalization' variables (v27 and 28). The result provides support for the prediction that 'reward' (v12) is predominantly associated with the level of normative commitment, while the 'role specificity' (v05), 'equity' (v17) and 'goal acceptance' (v09) are also substantially related to the normative commitment incurred in construction management process (around 8-10% of variances).

Being a useful technique in exploring the predictive ability of a set of independent variables (e.g. antecedents) on a continuous dependent measure, the results of regression analysis indicate that only v12, v17, v09, v05, v28 and v27 are the antecedents influencing the normative commitment of construction professionals. Other possible related antecedents such as professional membership, relationship, clarification, authority, peer influence, belongingness, task difficulty and motive are excluded from the equation (refer to Table 1).

DISCUSSION

Out of the 26 hypothetical antecedents, 6 antecedents including two variables in personal factors and two variables in organisational factors and three variables in personal-related factor are significantly related to the AC of construction professionals. This suggests that the NC of professionals is related to different types of behavioural variables in the management process.

Role specificity has been positively correlated to NC. Construction projects are normally complicated and involve various professionals within a limited period. A specific professional role induces feelings of obligation to maintain the project among professionals. Construction professionals thus believe that it is the 'right and moral' thing to do (Meyer and Allen 1991; Wiener 1982) and, will to make an extra effort in the project to achieve the project goal, since they feel they 'ought to do' so.

In goal setting theory, personal value and motive are the origins to stimulate individual's behaviour (Locke and Latham 1990). Normally, they contribute a positive influence to the individual behaviour and job performance, because *internalization* aims at congruent personal value with the team member's value systems (Becker et al. 1996). However, the study reveals that either positive or negative internalization can induce the NC among construction professionals. Professionals in the construction team will to attach to the project and devote their job if they involve the NC in the project.

VM workshop provides an opportunity to the participants in the decision process to identify the best value (project goal), but it is meaningless if the team members do not accept the common

Table 3 Antecedents of Normative Commitment in the Value Management Study

	Value Engineering Phases (SAVE 2004)	**Antecedents of Normative Commitment**
1.	Information	Role specificity *
2.	Function analysis	→ Equity +
3.	Creative	→ Equity +
4.	Evaluation	→ Equity +, Internalization *
5.	Development	→ Internalization *, Reward *, Goal acceptance *
6.	Presentation	→ Internalization *, Reward *, Goal acceptance *

*Note: + – Organizational factors; * – Personal factors*

goal and implement it according to the schedule. Hence, goal acceptance has to be established in the teamwork in order to ensure that the defined goal will be implemented in the actual process.

Apart from the personal-related variables, the equation also indicates two organizational variables (*equity and reward*) to predict the NC of construction professionals. To ensure that the outcome decided in the construction value management study workshop is implemented in the real world successful, the assessment method should be fair and just in the analysis and the evaluation phases of VM, as well as during the post-VM study, while some reward system (e.g., overtime payment, bounds, promotion, etc.) can be discussed and developed in the VM study. Of course, the whole team must ensure that all members accept the project goal at the end of workshop, as it will subsequently enhance the working performance during the implementation process. Antecedents of Normative Commitment are allocated throughout the Value Management study from the information phase to the presentation phase (see Table 3).

It is interesting to note that NC can be not predicted by any task-related variable for construction professionals, though task difficulty was found as one of the predicted variables for the AC of construction professionals (Leung and Sham 2004). Value management has a beneficial to assist team members to understand, expose and solve the task difficulties among professionals in the workshop. Task difficult requires construction professionals work together for solving the problems well, but task-related variables (nature/conflict/difficult) has no effect to their obligation for the completion of task.

CONCLUSION

A comprehensive study on value management provides us with valuable information to enhance the goal commitment amongst project participants throughout the entire management process. Three forms of commitment have been identified in this paper based on literature in organizational behavior. NC concentrate the reason (ought) to do the project.

This paper indicates that, out of 26 hypothetical variables, 6 behavioral variables are found as antecedents of NC for construction professionals. It covers organization-related and personal-related variables in the value management workshop for construction projects. 'Reward', 'role specificity', 'equity', 'goal acceptance' and 'internalization' are critical antecedents to predict the NC of professionals. Hence, specific organizational system must be considered as a major problem in the VM workshop. Facilitators have to identify the role of professionals in the project in the beginning of VM workshop and set up an equity system among professionals in the analysis and evaluation processes. Since the professional will to devote their time and effort to finish the task in any situation, it is not necessary for facilitators to identify the personal and team values in the workshop. A fair and just analysis / evaluation approach and reward system should be adopted during and after the VM workshop, in order to ensure that the participants accepted the project goals normatively and will to implement it in the industry during the post-workshop stage.

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Comparative Study of Building Performance Assessment Schemes in Hong Kong

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ABSTRACT

Having access to information is essential when one needs to make a decision to buy property or renovate a building. However, information concerning the health, safety, and environmental performance of buildings is not always readily available. This creates a need for building performance assessment tools. This paper aims to compare the building performance assessment schemes available for use in Hong Kong, namely The Hong Kong Building Environment Assessment Method (HK-BEAM), The Intelligent Building Index (IBI), The Building Quality Index (BQI), and The Comprehensive Environmental Performance Assessment Scheme for Buildings (CEPAS). Their similarities and differences are pinpointed and discussed in detail. The findings of this study will serve as a guide for practitioners to decide on the schemes that best suit their purposes.

KEYWORDS

Building performance, Building labelling, Green buildings, Health and safety, Hong Kong

INTRODUCTION

Information is essential for making consumption and investment decisions related to property. For example, people want a comfortable, safe, and hygienic place to live. However, these aspects are not always revealed during pre-transaction property inspections. Some of the information is technical in nature and homebuyers may not fully understand the implications of certain building design and management features. In some cases, the cost of obtaining the information for purposes of comparison is too high. The aim of building performance assessment is to provide a path to channel the information to all interested parties. These assessments would be helpful towards revealing the quality of a building and facilitating the screening process in the pre-transaction stage.

At present, there are several building performance assessment schemes that have been developed based on Hong Kong's unique situation, and are now available for use locally. However, these schemes are often portrayed as rival approaches, and the emphasis tends to be placed on their differences rather than similarities. Against this background, there is a continuing need for comparative research that seeks to clarify interrelationships between alternative methods, thus helping practitioners choose the most suitable assessment scheme for addressing specific aspects. Indeed, we believe that this comparative study contributes significantly to the important goal of improving decision making for users, investors, and property and facility managers.

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AN OVERVIEW OF BUILDING PERFORMANCE ASSESSMENT SCHEMES IN HONG KONG

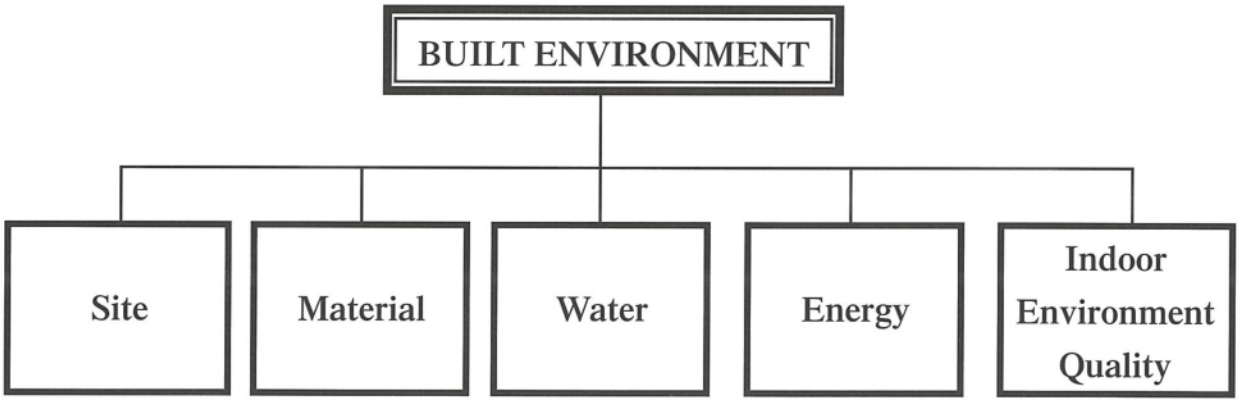
There have been several building performance assessment schemes developed or proposed for use in the local context. These schemes include the Hong Kong Building Environment Assessment Method (HK-BEAM), the Intelligent Building Index (IBI), the Building Quality Index (BQI), and the currently proposed Comprehensive Environmental Performance Assessment Scheme (CEPAS). An overview of these schemes is given below.

The Hong Kong Building Environment Assessment Method (HK-BEAM)

The HK-BEAM scheme was developed in 1996 by the Centre for Environmental Technology Limited (HK-BEAM Society, 2004a; 2004b), and is now owned and operated by the HK-BEAM Society. The approach and documentation in the HK-BEAM was initially an adaptation of the Building Research Establishment Environmental Assessment Method (BREEAM), which originated in the U.K.[1] The scheme was then updated and reviewed, the latest version of which was issued in December 2004.

The structure of the HK-BEAM is organized around 'inputs', as represented in Figure 1. The inputs are categorized into five performance aspects, namely *site, materials, energy, water*, and *indoor environment quality* (HK-BEAM Society, 2004a; 2004b). Under each category, there is a list of specified factors that would affect the quality of the respective input. For example, the efficient use of materials, sensible material selection, and waste minimization can contribute to better performance in the material input of the built environment.

Figure 1 The structure of the HK-BEAM



[1] *The BREEAM was developed by the Building Research Establishment in the U.K (Baldwin, et al., 1998). There are other building assessment schemes focusing on environmental issues available overseas, such as the Leadership in Energy and Environmental Design in the U.S. (US Green Building Council, 2001), Green Building Tool in Canada (Cole and Larsson, 2002), and the Comprehensive Assessment System for Building Environment Efficiency in Japan (Murakami, et al., 2004).*

The Intelligent Building Index (IBI)

The IBI was developed by the Asian Institute of Intelligent Buildings (AIIB) in 2001 to assess building intelligence (Asian Institute of Intelligent Buildings, 2005; Wong, *et al.*, 2001). At that time, it measured building performance in terms of nine quality environment modules, including *environmental friendliness, human comfort,* and *safety and security* measures (So and Wong, 2002). After the outbreak of Severe Acute Respiratory Syndrome (SARS) in 2003, an additional *health and sanitation* module was added to enhance the original framework. The IBI is essentially a design tool providing guidance to designers as to what constitutes an intelligent building, and acts as a platform for assessing an intelligent building objectively (So and Wong, 2002).

The Building Quality Index (BQI)

The outbreak of SARS in early 2003 and frequent fatal building-related accidents have highlighted concerns over the possible dire consequences of building neglect. In order to promote proper building maintenance and management of buildings through the use of market forces, the Faculty of Architecture of the University of Hong Kong developed a BQI to distinguish those poorly performed buildings from the good ones (Ho, *et al.*, 2004). At present, the BQI comprises two indices, namely the Building Health and Hygiene Index (BHHI) and the Building Safety and Conditions Index (BSCI). With assistance offered by local professional bodies and tertiary institutions, the Faculty developed the BHHI and BSCI assessment frameworks and carried out pilot schemes for a sample of multi-storey private residential buildings in Hong Kong during the summers of 2003 and 2004.

The hierarchy of the BHHI is presented in Figure 2. At the top is the objective (i.e., a healthy built environment). It is then divided into *Design* and *Management* on the second level. The *Design* aspect of a building represents the 'hardware' of a building, which is usually hard to change technically or economically once a building is put into use (Ho, *et al.*, 2004). On the other hand, the *Management* aspect of a building represents the 'software', which is dynamic and relatively easy to change even after a building is occupied. The classification of building factors into *Design* and *Management* has the advantage of dividing the factors into groups that are within and beyond the control of the owners. This helps owners identify the possible actions that could be taken to improve the health and hygiene standards of their buildings. The assessment scheme was designed after an intensive workshop was conducted with expert representatives from key professional bodies and other universities. The framework for the BSCI is very similar to that of the BHHI, except for its focus on building-associated risks and condition problems (Ho and Yau, 2004). The assessment framework of the BSCI is again classified into intrinsic *Design* and controllable *Management* aspects, as shown in Figure 3.

The Comprehensive Environmental Performance Assessment Scheme for Buildings (CEPAS)

In light of increasing public awareness of our deteriorating natural and built environment, the CEPAS was proposed as a standard yardstick for determining the environmental performance of buildings in Hong Kong (Hui, 2004). As a green building labelling scheme initiated under the 2001 Government Policy Objectives, the CEPAS endeavours to address both physical and human-related issues amongst the core aspects of sustainability. While placing much emphasis on traditional environmental performances, such as energy, indoor air quality, and the maintenance of building services installations, the CEPAS also considers other social-economic factors, such as impacts on surroundings,communal interactions, building economics, transportation, heritage conservation, etc.

Eight performance categories were identified for the CEPAS, which are *Indoor Environmental Quality (IEQ), Building Amenities, Resources Use,*

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Figure 2 Hierarchy of the BHHI
Source: Ho, et al., 2004

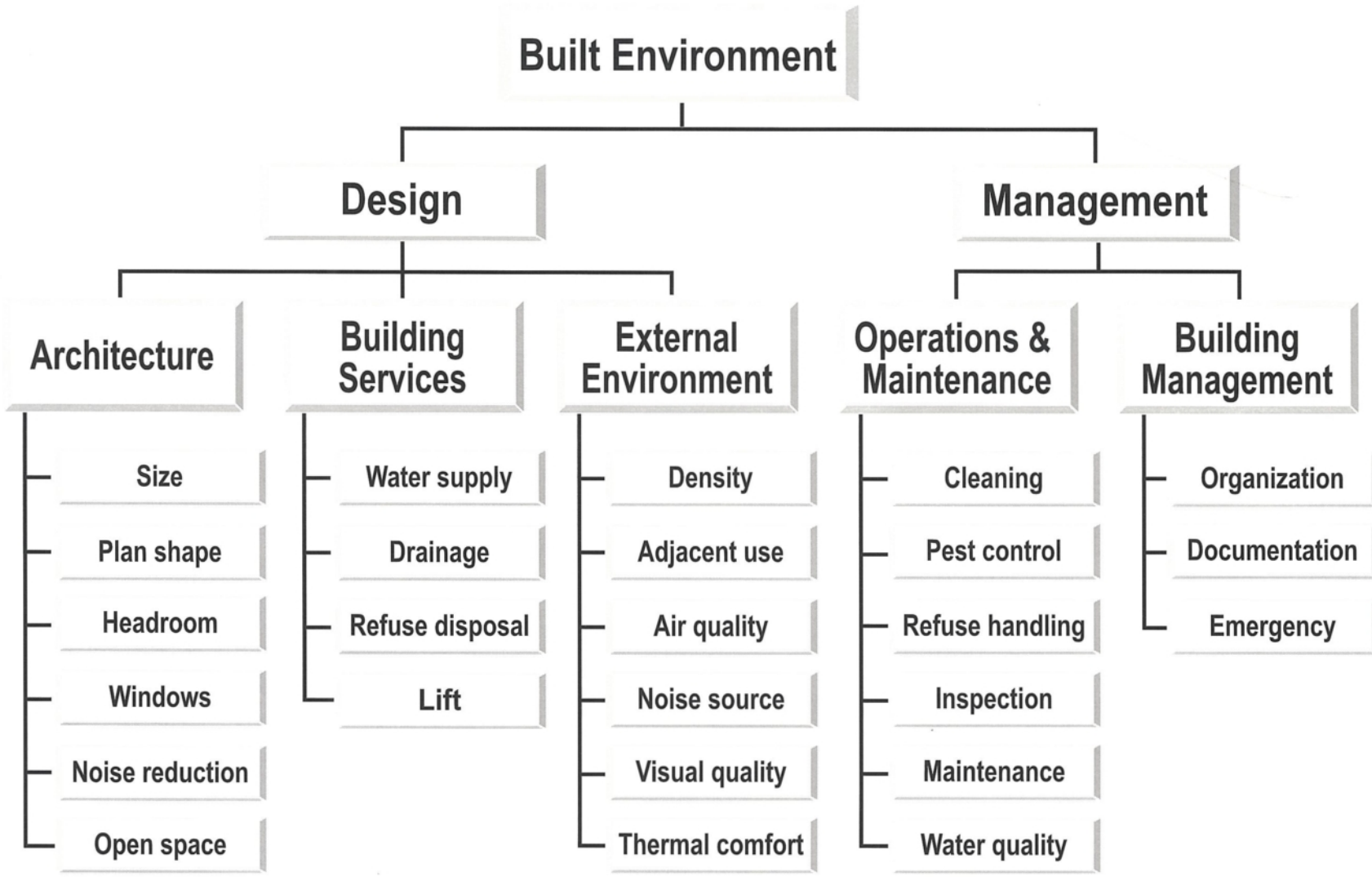
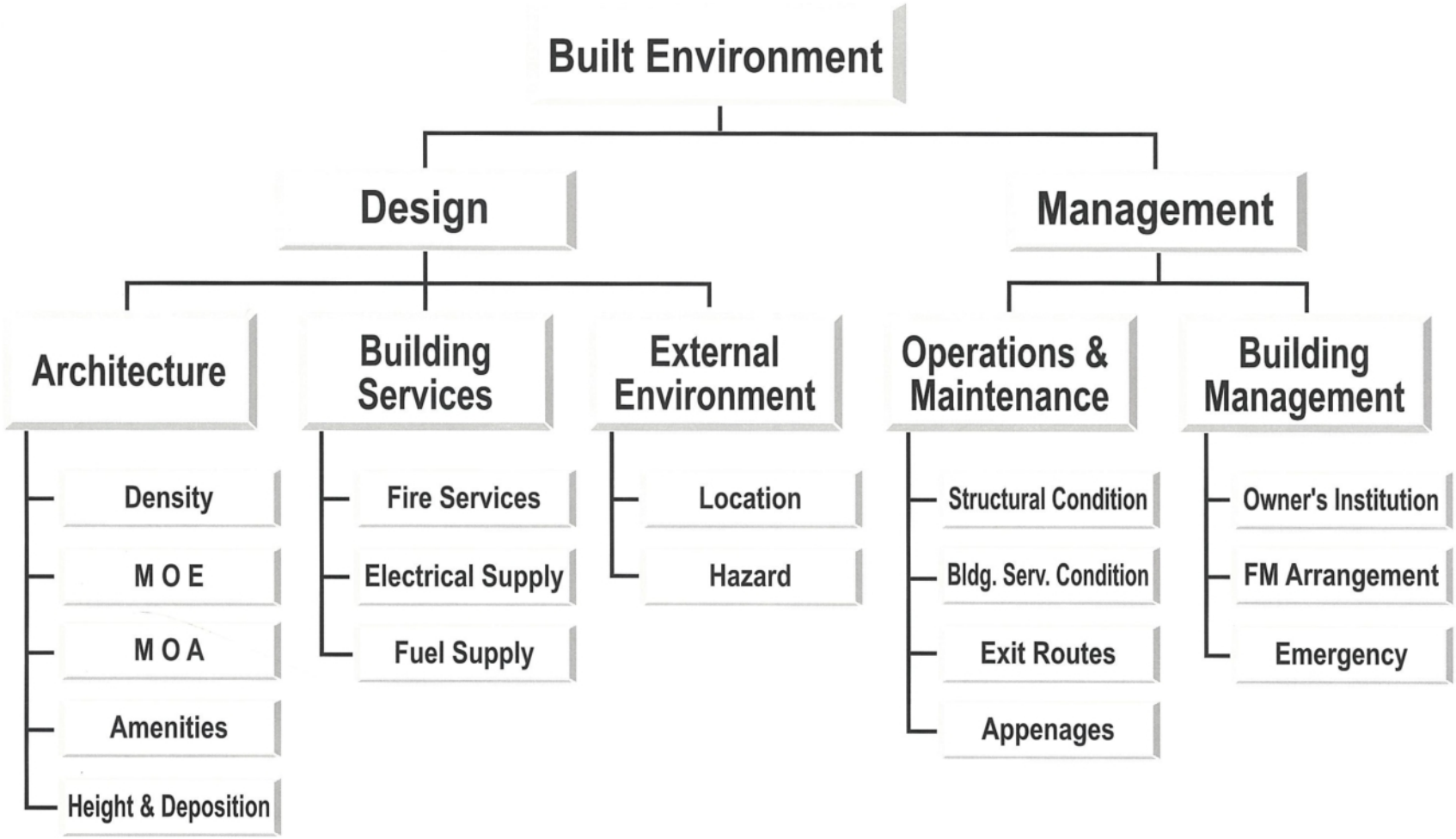


Figure 3 Hierarchy of the BSCI

Source: Ho and Yau, 2004



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Loadings, Site Amenities, Neighbourhood Amenities, Site Impacts, and Neighbourhood Impacts. Also, the major sustainability considerations at the building level were incorporated (Hui, 2004). The *IEQ, Building Amenities, Site Amenities*, and *Neighborhood Amenities* are mainly human-related factors, while the remaining categories are mainly physical factors. The relationship among these categories is illustrated in Figure 4.

COMPARISON OF DIFFERENT SCHEMES

As the objectives of these building performance assessment schemes diverge, they have different features to suit their purposes. In the following section, the four schemes reviewed above are compared and their similarities and differences are discussed. The comparison carried out is based on the nature, purpose, and scope of assessment, targeted building groups, stages of building life-cycle involved, assessment objectivity, performance rating, factor weighting, and the presentation of a final rating. A summary of the comparison is given in Table 1.

Figure 4 Matrix of Performance Criteria for the CEPAS
Source: Hui, 2004

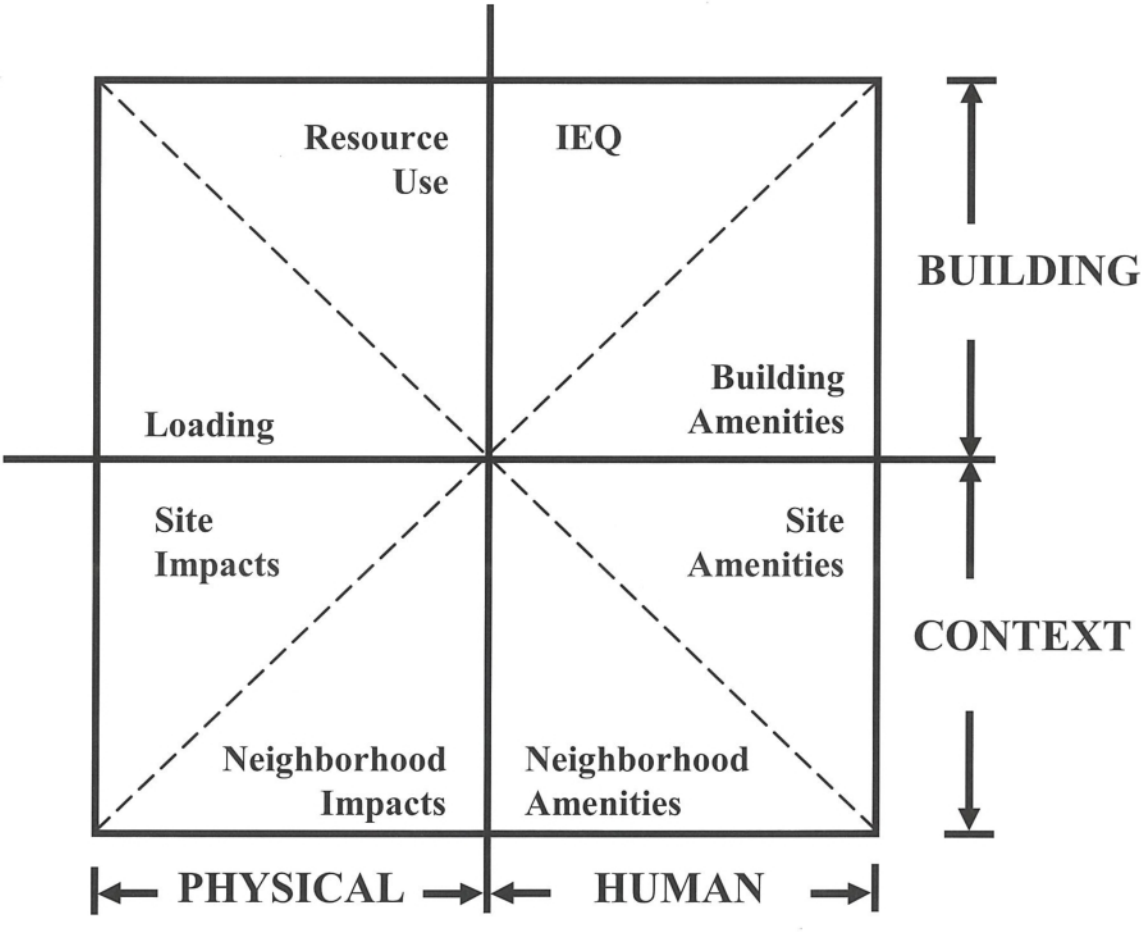

Table 1 Comparison of the features of different schemes

		HK-BEAM	IBI	BQI	CEPAS
Nature of Assessment	Voluntary	●	●	●	●
	Mandatory				
Purpose of Assessment	Building labelling	●			●
	Building rating		●	●	
Target Building Groups	Residential buildings	●	●	●	●
	Non-residential buildings	●	●		●
	New buildings	●	●	●	●
	Existing buildings	●		●	●
Scope of Assessment	Health and hygiene	⬤	●	●	⬤
	Safety	⬤	●	●	⬤
	Green issues	●	●		●
	Comfort	⬤	●		⬤
	Information technology	⬤	●		
Stages of Building Life-cycle Influenced	Planning	●			●
	Design	●	●	●	●
	Construction	●	●		●
	Operation	●		●	●
	Demolition	●			●
Assessment Objectivity	Objective judgement	●	●	●	●
	Subjective judgement	⬤	●	●	⬤
Nature of Factors	Prescriptive-based	●	●	●	●
	Performance-based	●	●	●	●
Rating Scale	Dichotomous scale	●	●	●	●
	Linear scale		●	●	
	Non-linear scale	●	●		●
Weighting of Factors	Equal weights	●			
	Preset different weights		●		
	Weighted by expert panel			●	●

Key: ⬤ = Applicable; ● = Marginally applicable

Nature and Purpose of Assessment

All four schemes are not mandatory in nature. While all of them are for benchmarking building performance in various aspects, they serve different purposes. The IBI and BQI are building rating systems, while the HK-BEAM and CEPAS are building labelling systems.[2] Moreover, unlike the other building performance assessment schemes, which aim for an in-depth assessment of building performance, the BQI aims to provide a low cost, objective, quick, and yet balanced assessment of building attributes on the health and safety of occupants. It is designed to cover as many buildings as possible with limited resources and within the shortest possible time.

Target Building Groups

The HK-BEAM and CEPAS cover all building types in Hong Kong, be they new or old. However, for both the HK-BEAM and CEPAS, only single-ownership buildings are eligible for assessment. Although the coverage of the IBI with respect to building types is as wide as that of the HK-BEAM and CEPAS, most of the parameters measured under the IBI cater to new developments only. It is noted that the objective of the IBI is to provide a design tool to give guidance to designers as to what constitutes an intelligent building. In contrast, the BQI is intended to classify the living environment of most people in Hong Kong regarding health and safety conditions. The BQI is tailored to multi-storey residential buildings with multiple dwelling units and co-owned common areas.

Scope of Assessment

Among the four schemes, the coverage of the IBI is the widest in terms of scope of assessment. It evenhandedly covers health and hygiene, safety, energy efficiency, comfort, and high-technology aspects. The HK-BEAM and CEPAS place their emphases on the first three and four aspects, respectively. The scope of the BQI is the most focused among others, assessing only health and safety issues.

Stages of the Building Life-cycle Assessed

As the HK-BEAM and CEPAS seek to measure and label the performance of buildings over the whole life cycle, the assessment spans from the planning stage, through the design, construction, commissioning, operation, maintenance, and management stages, and finally to deconstruction. In the BQI framework, assessment factors capture some important aspects affecting the design, as well as day-to-day maintenance and operations during the occupancy phase of a building. Thus, it has an influential impact on a project during its design and operation stages. As aforementioned, the IBI serves as a design tool, and its impact is confined to the design stage of a project. However, since there is a *Construction Process* and *Structure* module in the IBI assessment framework, the use of the scheme could be extended to the construction stage.

Objectivity of Assessment and the Nature of Assessment Factors

Objective criteria for assessment were emphasized in all the schemes under study. This provides a common platform on which assessment can be made easier and more straightforward, eliminating possible subjective judgement due to different assessors. For example, in the IBI, the ratio of life-cycle cost to rent is an objective judgement.

Objective criteria are commonly used in all schemes. Assessors' subjective judgement is also needed in both the IBI and BQI to rate the performance of certain aspects of a building during inspection. The major problem of incorporating subjective judgement is the inconsistency. In the BQI, inconsistency is reduced

[2] *According to the definitions provided by Larsson (2004), these two systems involve an assessment protocol for compiling an overall building performance score. The only difference lies in the fact that more elements, like the implementation of the protocol at the industry level by means of trained assessors, a training program for assessors, and a marketing program to publicize the system to the industry, are included in a building labelling system.*

by providing a "scoring manual" to assessors, in which scores could be assigned to a set of descriptions illustrated with photos. This helps an assessor rate the conditions of a building in a more consistent manner. As for the CEPAS and HK-BEAM, the use of subjective judgement is very limited. The only exception to the CEPAS and HK-BEAM is the assessment of innovative design, which can bring bonus points to certain assessment factor categories.

Another feature that distinguishes schemes from each other is the use of prescriptive, or performance-based, assessment factors. Factors that are prescriptive in nature dictate how and what should be assessed rather than only specifying the objective to be achieved. For instance, to minimize energy loss in a building, we can assess the overall thermal transfer value of the building (performance assessment) or check if a particular type of heat-insulated material has been used (prescriptive assessment). Both types of assessment factor are common to all the schemes studied.

Performance Rating

The purpose of a rating system is to convert the raw data into a score so that we know about the building performance for a particular area or how many credits should be given to the building factor being assessed. This is vital to all building assessment and labeling schemes. Dichotomous scale is common to all four schemes. In this scale, the building factors are rated basically in dichotomous yes-or-no answers. The benefit of such a rating scheme is a reduction of the time used for the assessment and a minimization of the degree of subjectivity in the assessment process.

In the IBI, HK-BEAM, and CEPAS, ratings for most factors are not scalar. A building either satisfies the requirement to receive credit or it fails to do so. The building will be awarded credit even if other criteria are substantially below par. The implication is that an *excellent* graded building can have several items that are substantially below average.

On the other hand, most factors in the BQI and a few factors in the IBI are rated on linear scales.[3] The use of linear scales can avoid the distortion of information during the scaling or transformation process. By and large, the use of linear scales allows for a finer differentiation of performance grading, and can provide a more complete picture of performance. In establishing the scales, industry norms or relevant statutory provisions are taken as reference points. In some circumstances, more than two discrete categories have to be allowed to give a finer differentiation to building performance. In the BQI, a five-point scale has been adopted – poor, below average, average, above average, and good. Such a scale helps ease subjective judgments on both quantitative and qualitative selection criteria, and it works well even for inexperienced assessors (Schniederjans, *et al.*, 1995 and Baird, *et al.*, 1996).

Weighting of Factors

Weightings represent the relative importance of a building factor towards the overall goal of the assessment. They affect the degree of influence by each building factor on the overall result. The factor weightings of the HK-BEAM are varied and inherent. Or put it another way, the weightings are determined by the maximum credits attainable for these factors (Todd, *et al.*, 2001). The weightings can be changed by adding or dropping factors under the assessment scheme or adjusting the credits allocated to the factor. Similarly, the relative importance of each factor with respect to the objective of each category is determined inherently in the IBI. In particular, however, different sets of predetermined weights for the ten quality environment modules are designated to buildings of different uses in the IBI. For instance, "life cycle costing" is weighted as 1 in residential buildings, but 5 in educational institutions; "image of high technology" is

[3] *In a linear scale, the score of the factor is calculated based on a linear projection from a predetermined reference point. For example, the raw rates, ranging from X_1 to X_{10}, can be transformed to a continuous linear scale ranging from 1 to 10, or mathematically, $[X_1, X_{10}] \rightarrow (1,10)$.*

weighted as 3 in residential buildings, but 6.5 in commercial (office) buildings. Therefore, by changing the weightings, the IBI can be configured to assess different building types.

While both the HK-BEAM Society and Asian Institute of Intelligent Buildings have not mentioned how their factor weightings are determined, the BQI and CEPAS obtain the weightings from a group of external experts with different backgrounds. The experts' options are elicited because there is a general lack of objective empirical scientific evidence[4] for determining the relative importance of the effect of some aspects of a building on its occupants and the environment. In the CEPAS, each factor category is allocated with a predetermined weighting, which directly influences the cumulative performance scores. These weighting factors were developed from a consultation forum, held in July 2003, which solicited opinions from local building professionals, building user groups, and green groups on the relative importance of building performance issues.

In arriving at the final set of weightings in the CEPAS, the experts were asked to assign absolute weightings for each factor. Nonetheless, it was difficult, if not impossible, for the experts to provide a consistent weighting for each factor once the number of factors to be considered is large. Saaty (1980) stated that the intuitive and cognitive capacities of human beings restrict the maximum number of factors to be considered simultaneously in order to achieve a consistent result. In this regard, the weighting of each factor in the BQI is pre-determined by expert panels[5] using the Analytic Hierarchy Process (AHP), which was developed by Saaty (1980). The use of the AHP allows for more consistent and reliable results regarding the relative importance of the factors. This increases the public's acceptance of the results.

Assessment Procedures

The HK-BEAM requires building owners to assume the initiative to approach HK-BEAM assessors with their selected buildings for evaluation. Owners provide detailed information, at their own cost, for assessors to complete the checklist. Assessments rely on the accuracy of information supplied by owners. Assessors validate the data and appraise the project using HK-BEAM criteria. A Provisional Assessment Report is then produced listing those credits that have been achieved and potential performance areas that can be improved. Owners can take assessors' proposals and pursue further credits before submitting their buildings for final assessment. The validity of certification lasts for five years. The assessment and certification processes of the CEPAS are more or less the same as those of the HK-BEAM. The validity of assessment results for the operational stage of existing buildings in the CEPAS also lasts for five years.

As the aim of the BQI is to give a general appraisal of all residential buildings in Hong Kong, this cannot be achieved by solely relying on voluntary participation from building owners. Owners' input is viewed as necessary, but should not be the only input in the assessment procedure. Instead, most of the information is obtained from publicly available sources. For example, building design is assessed by gathering information from approved building plans kept by the Buildings Department.[6] In order to reveal actual conditions, a building survey will also be carried out. Inspection will be confined to common areas of the building so that it will not be necessary to seek consent from every individual owner. An appraisal of the performance of the building

[4] One example of obtaining weighting through scientific research is the calculation of the total energy embodied in the building material used.

[5] Several workshops were carried out between 2003 and 2005 to collect views from experts on the relative importance of different building factors to the health and safety performance of residential buildings.

[6] Acknowledgement has been made to the Buildings Department for facilitating the retrieval and copying of plans for the BQI Pilot Scheme conducted in 2003 and 2004.

management agent is also required, but it is limited to the information related to normal building operations such as incident records, as-built drawing, and post-occupancy surveys. Therefore, the costs to be borne by owners are trifling.

Applicants for a building performance assessment sometimes may disagree with the assessment results. Therefore, an appeal mechanism becomes essential to address the grievances of these applicants. Among the schemes, appeal processes are provided in the HK-BEAM, and have been proposed for the BQI and CEPAS. On the other hand, there are no explicit assessment, certification, and appeal procedures for the IBI.

APPLICATION OF THE SCHEMES

Every nation or city has its unique environmental, ecological, social, cultural, economical, and technological conditions. Given the importance of a building performance assessment scheme to a society, it is necessary to devise an assessment scheme that is pertinent to its specific purposes (e.g. sustainability and the health and safety of the built environment) and specifically adapted to deal with local conditions.

The IBI, HK-BEAM, and CEPAS consider a wide variety of factors, which are put into different categories. Yet, their comprehensiveness comes with high implementation costs. Therefore, it is more suitable as a design guide for developers and designers. The relatively low-cost and simple assessment procedures of the BQI make it the most advantageous for large-scale first 'screening' of building performance in health and safety aspects. The government or organizations managing a large portfolio of properties can make use of the BQI to classify multi-storey residential buildings according to their health and safety conditions. As for the HK-BEAM and CEPAS, they cover more or less the same factors with specific concentrations on green building issues, and their assessment methods are similar. They are apt for labelling buildings that excel in environmentally friendly performance. Unlike the other three schemes, the IBI takes a balanced view of different categories of building factors, and hence does not have a sharp focus. Therefore, the IBI best serves as a set of design guides for high-quality buildings in terms of various aspects.

The study revealed that the objectives, target groups, assessment procedures, and resources required differ among the four schemes. The comparison suggests that these schemes do not necessarily compete with, but rather complement, each other, with each scheme serving different purposes.

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中国国有建筑企业的文化特徵

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摘要

过去十年中，中国经济的飞速增长给中国建筑业带来巨大的发展机遇，然而与此同时，建筑业在迅速发展变化的经济环境中也面临著诸多挑战和不确定性。中国建筑业发展至今，因其行业整体表现欠佳以及在质量和收益率上的低效而被广泛批评。研究表明企业文化和工作表现之间存在紧密联系，本文在此基础上提出了一个企业文化－企业绩效模型，用于研究中国国有建筑企业。企业文化与企业绩效的关系 (即 C-E 关系，Culture-Effectiveness) 研究已经在组织研究领域中引起了广泛关注，但是在这种关系的存在性以及关系强度的研究上仍然存在较多未解决问题 。本文提出了一个用于研究中国建筑承包公司 C-E (Culture-Effectiveness) 关系的模型，并给出对中国建筑业企业文化特徵进行聚类分析的结果。

关键字

企业文化、企业绩效、中国承包商、国有企业

概述

过去十年中中国经济得到了高速增长，并给中国建筑业带来了巨大的发展机遇。1999 年全国固定资产投资达到 29880 亿元人民币，而在 1980 年这个数位仅为 910 亿元人民币 (国家统计局，2002a, b) 。然而与此同时，建筑业因为其行业表现欠佳以及在质量和收益率上的低效而受到广泛批评 (Yao, 1998 ， Sha & Lin, 2001)。因此研究如何提高中国承包商企业的企业绩效就成为一个十分重要的研究课题，而在这个课题中关于企业文化和企业绩效关系的研究更是研究的重点。

一些研究者认为，现实中存在大量承包商企业无法直接控制的影响承包商企业绩效的外部环境因素和专案因素。但是，只有那些企业自身能够控制并体现企业如何应对外部环境变化的特性才是决定企业绩效稳定性和企业最终生存的关键因素 (Adas, 1996)。一些学者指出，企业管理自身的能力和企业应对外部环境变化的能力都来自于企业文化。相关研究中的一些早期研究认为企业文化是无形的，而现在则认为它能够直接影响企业的竞争力、发展和最终生存 (Hu, 2001)。

企业文化与企业绩效：研究回顾

在过去二十年里学术界已经逐渐认识到：虽然表面上企业就其组织结构来说互相类似，但在企业表现和企业绩效方面差异很大。这种现象说明在企业中存在一种无形力量，这种力量能够渗透到企业生活中，并影响企业运作的方方

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面面。对企业文化的研究最初就来源于相关研究领域学者和企业管理者的这种认识。他们认为：如果我们能够更好的理解企业的模糊性和不确定性，那么我们就能通过调整企业的组织结构来极大的提高企业的表现和绩效 (Brown, 1998)。正如 Schein (1985：1）所指出的："企业文化这个概念也许能为组织研究这一复杂研究领域带来希望"。因此自从 20 世纪 80 年代早期起，对企业文化的研究在管理和组织相关研究领域中占据了突出地位。

研究企业文化的目的是多方面的，其主要目的则是研究企业文化通过作用于企业工作过程以影响企业绩效 (企业绩效是在讨论企业全局层次时最重要的变数之一) 的机制。这种企业文化－企业绩效的关系研究，大致可以分为以下几个阶段 (Vesson, 1993, Wilderom, Glunk & Maslowski, 2000)。

萌芽阶段

在组织研究领域中，企业文化－企业绩效的关系研究是随著上个世纪前半叶人际关系学派的建立而发展起来的，其中 Hawthorne 研究 (霍桑实验) 是该领域研究的先锋。虽然没有明确将企业文化作为研究课题，该研究却隐性指出了团队文化影响生产过程的机制。Jaques (1951, 1965) 将人们习惯和传统的思维、做事方法与员工的工作行为联系在一起。虽然他并没有对这种"人们思维、做事的方法"的影响效果进行直接研究，但是他的发现却表明：如果企业文化与其企业结构、外部环境不一致，那么企业文化将成为企业生产效率的严重阻碍。Pfiffner & Sherwood (1960) 曾经提出企业文化与企业绩效之间存在某种关系，但是他们没有对这种关系的性质进行进一步研究。Silverzweig & Allen (1976) 是最早明确研究企业文化对企业绩效影响的学者。他们的 8 个案例研究包括了不同的企业，这些企业在不同程度上都有亏损，并有提高工作绩效的意愿。研究发现其中六个企业在对企业文化进行调整后从根本上提高了工作绩效。根据这项研究结果，他们提出企业文化与企业绩效之间存在密切的实质联系。

发展阶段

上世纪 70 年代末，相关研究发展到对企业文化－企业绩效关系进行明确研究的阶段，其目的是通过这种研究来解释这一时期日本企业取得巨大成功的奥秘。Ouchi 是这一研究领域的杰出学者之一，他 (Ouchi & Jaeger, 1978，Ouchi & Johnson, 1978) 通过论证强调：企业的人文价值观对企业的经济表现有所贡献。这个发现使人们开始关注员工承诺和员工价值观一致性对企业成功的重要性；这些人文价值观包括对员工的关心、求同决策等，而这些价值观通常是日本企业的特徵。基于对超过 30 家日本公司与美国公司的调查，Pascale & Athos (1981) 通过论证"关注员工技能、行为风格和员工目标将带来高效的工作表现"而提出了一个近似的观点：日本企业的高效生产率归因于他们对人际关系的重视。Peters & Waterman (1982) 指出企业文化的强大与否是成功企业与不尽成功企业之间差异的根源，他通过论证研究指出：企业管理者只有从采用机械和理性的管理方法转变成为采用灵活和人性化的管理方法才能够实现企业的卓越表现。同年，Deal & Kennedy (1982) 也提出一个相似的观点：强大的企业文化既能够很好的与环境相适应，也能够适应环境的改变，从而提高企业表现。相关研究在这一时期的特点是："企业文化与企业绩效之间存在关系"这一观点获得了较为普遍的认同，但缺乏实质性的实证分析证据。

实证检验阶段

由于有关"企业文化－企业绩效存在关系"的观点被一些学者质疑 (Carroll, 1983, Hitt & Ireland, 1987)，甚至举出相矛盾的研究发现，所以从上世纪 80 年代开始至今，一些学者进行了大规模的实证研究以检验上述观点的正确性，进而探索和揭示企业中的文化现象。

其中主要相关研究者有：Barley，Meyer & Gash (1988)，Cooke & Rousseau (1988)，Dennison (1990)，Rousseau (1990)，Calori & Sarnin (1991)，Gordon & DiTamaso (1992)，Kotter & Heskett (1992)，Marcoulides & Heck (1993)，Petty et al (1995)，Dennison & Mishra (1995)，Wilderom & Van den Berg (1998)，以及 Sawner (2000)。这些研究的研究结果之间虽然在某种程度上存在差异，但都表明企业文化与企业绩效之间存在关系。但是，由于这些研究大部分都仅仅使用了检验相关关系的统计方法，因此这些研究并不能够确定关系的方向。尽管如此，这些研究所证实的企业文化和企业绩效之间的显著相关关系表明它们之间可能存在著一般因果关系，而这种因果关系需要进一步分析研究 (Wilderom, Glunk & Maslowski, 2000)。

在广义管理研究领域对企业文化研究越来越重视的同时，建设管理研究中关于企业文化的研究也越来越多。Maloney & Federle (1991, 1993) 引入了一个“竞争价值理论框架”(Competing Value Framework)，以作为他们分析研究美国建筑业企业文化的理论基础。Gale (1992) 认为文化是减少建设专案冲突的手段。Seymour & Rooke (1995) 提出了他们对建筑业文化以及相关学术研究文化的观点。Rowlinson & Root (1992) 提出文化对建设专案管理能够产生影响。Hall & Jaggar (1997) 肴意到国际工程项目中文化差异对专案进度能产生重要影响。Liu & Fellows (1999a,b) 特别提出了专案采购中的文化问题以及研究了文化对工程项目目标的影响。Liu (1999) 研究了文化变数的维度、强度与房地产业专业人员工作满意度之间的关系。

目前，关于企业文化研究的研究成果之间并不是十分一致，甚至有的彼此矛盾。出现这种现象是因为“企业文化”与“企业绩效”这两个概念本身十分复杂，并且内涵和外延十分广泛，同时在研究 C–E (Culture-Effectiveness，文化－绩效) 关系问题上也没有一个综合全面的理论框架作为基础。

文化 - 绩效 (C-E, CULTURE-EFFECTIVENESS) 关系理论框架

行为学派

企业文化研究多数强调处于企业生活中心地位的企业价值观和理念的重要性。但是，研究企业文化和企业绩效关系的一个重要问题是如何才能建立能够解释该假设关系的理论基础 (Wilderom, Glunk & Maslowski，2000)。在企业文化和企业绩效关系的研究中，多数理论都将企业的成功归因于企业价值、理念和实践。这些观点暗示了企业绩效是企业文化的应变数(即企业文化是引数，企业绩效是因变数)这样一个理论框架。

虽然这一理论框架说明了企业全局层次的两个变数——企业文化和企业绩效之间存在联系，但这一框架仍然比较肤浅，因为它并没有揭示企业文化影响企业绩效的过程机制，忽视了这个“能动过程”，而这个过程就如同“黑盒子”一般未被研究清楚。为了证实企业文化和企业绩效之间的假定关系，就需要深入探讨企业文化对组织行为的影响机制。

组织行为学的传统理论之一是 S-O-R (Stimulus-Organism-Response) 理论 (Naylor, Prichard, and Ilgen, 1980)，Liu & Walker (1998) 采用该理论对工程项目采购过程进行建模，提出了该过程的 B-P-O (Behavior-Performance-Outcome) 回圈理论。若将企业文化视为被企业成员共用的“思想软体”(Hofstede, 1991)，则企业文化会影响企业成员的认知、感知过程，引导他们的行为，整合企业内部流程以保证企业的生存和对环境的适应 (Parsons, 1951, Schein, 1985, Cooke & Rousseau, 1988, Denision, 1990, Denision and Mishra, 1995, Cameron and Quinn, 1999)。因此，我们可以将企业文化认为是企业员工行为的“原动力”。

认知图示理论

在对认知理论相关研究进行详细总结的基础上，Markus & Zajonc (1985) 提出认知图示理论是对认知机制进行解释的最适用且最深入的理论。对于认知图示，Marshall (1995：39) 给出的定义可能是最全面的："认知图式是一种记忆工具，这种记忆工具使得个体能够以系统的方式综合整理个体经验：即个体能认知与已获经验相类似的新经验；能区分不同的经验；能形成对相类似经验共性关键因素框架的判断和评估 (这些关键因素包括口头和非口头两种类型)；能做出推论和估计，建立目标，并能按照上述框架制定计划；当遇到与该框架相关的问题时，能采用所需的技能、流程及规则"。上述定义中，认知图示就像一种"心理地图"，它不仅使得个体能驾驭其自有的经验对过去和现在进行合理解释，而且能够对将来进行合理期望 (Harris, 1996)。Taylor & Crocker (1981) 对认知图示的功能进行了最全面的总结，如下：

- 提供认知经验的基础；
- 对记忆资讯的编码和处理进行指导；
- 影响资讯处理的效率和速度；
- 指导填补现有资讯的缺陷；
- 提供解决问题的模式和范例；
- 协助对经验进行评价；
- 协助预测未来、建立目标、制定计划和执行目标。

认知图示是动态的，当它包含的资讯越来越多时，认知图式会趋向复杂 (Lord & Foit, 1986, Bartunek & Moch, 1987, Fiske & Taylar 1991, Harris, 1996)。通过研究认知图示理论，我们就能深入理解企业文化对个体组织体验的影响机制。Rumelhart (1984) 认为任何外在因素的相关经验都可以通过认知图式表示，因此每个人可以拥有多个认知图式。Harris (1996) 认为个体的社群知识体验通常与一定的环境背景相关，因此与特定企业环境相关的认知图示对于理解企业文化最为重要。通常，研究文化的学者多从文化的视角来强调人的动力。但是，简单假定个体拥有众多需要并认为社会组织仅仅是为了满足不同个体需要，这样的观点是犯了抽象个人主义的错误；而假定企业文化绝对内在化则是"过分社会化"个体并且过分简化了个体积极利用群体共识的过程 (Kashima, 1997)。Strauss (1992) 认为，人的动力在广义上是"社会领域中的事件和物体与人类精神世界对于该事件和物体进行解释的相互作用为物"。

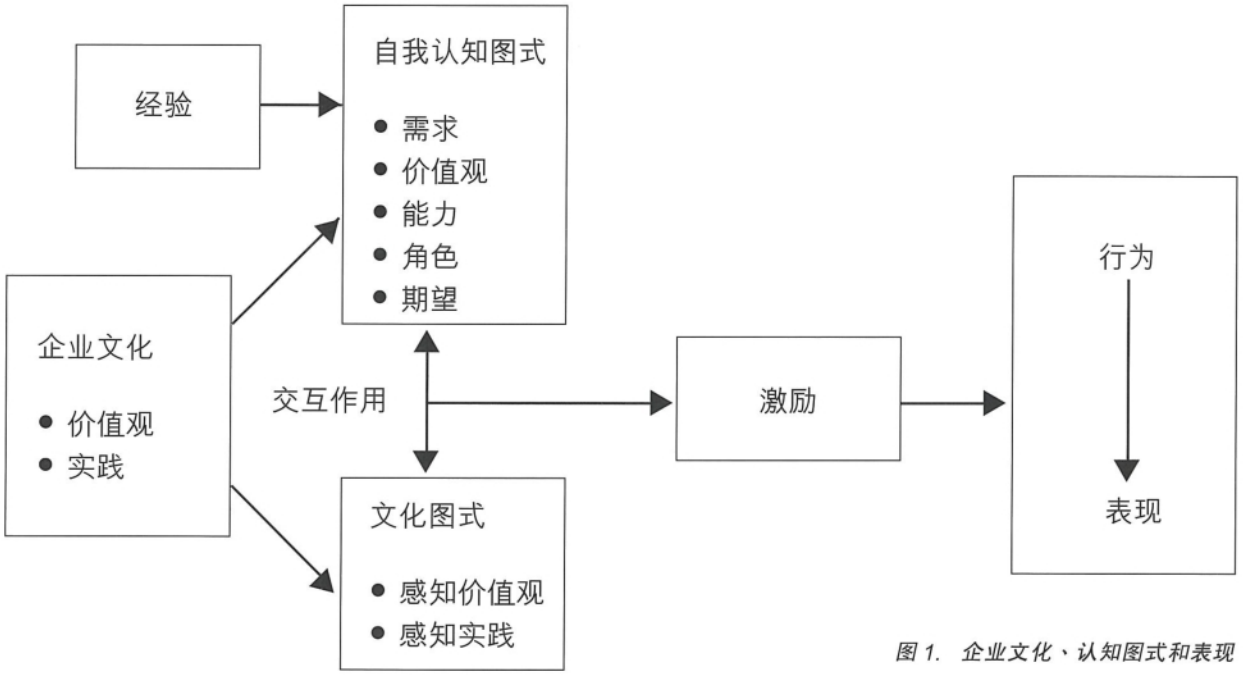

图 1. 企业文化、认知图式和表现

激励理论表明人的行为是为了满足自身的需求。假定人所有的意识行为都是由于为了满足需求和达到目标 (Newstorm & Davis)，则个体会按照目标的达到程度来评价自身的表现，而个体的需求满足感则由其自身对行为结果的评估来决定。这种评估是通过比较从企业获得的奖励 (由企业根据其行为和表现水平决定) 与其自身的期望来完成。在企业中，奖励分为两类：外在奖励和内在奖励 (Robbins, 1996)。与此同时，员工的满足感并不仅仅来源于目标达成和需要满足，按照公平理论 (Adams, 1965, Goodman, 1974)，满足感还来自奖励的公平性。所以，员工的满足感也受到员工的“横向”比较的结果，特别是与其同级同事的比较。

上述分析是个体层面 (微观层面) 的企业绩效分析。因为企业的整体表现很大程度上取决于个体表现的集合 (同时也受到外在环境的影响)，企业成员的表现很大程度决定了企业的整体绩效。在企业文化的研究中，企业整体层次的绩效概念是多维度的，通常包括：客户服务质量、市场占有率、资本回报率、对市场环境的适应性和最终生存。图 2 表明了企业表现和企业绩效的关系。

研究目标

在讨论了企业文化和企业绩效关系的基础上，本文的研究目标如下：

检验企业文化和企业绩效之间是否存在相互关系；研究确定将企业文化视为“资产”或者“负债”(取决于企业文化对企业绩效的正面影响或者负面影响)。

研究计划

本研究包括三个阶段：

(1) 第一阶段的工作包括对选定的几家中国建筑企业进行案例研究，目的是检验学术界提出的两种企业文化度量工具的适用性，即 OCI (Organization Culture Inventory) －企业文化清单 (Cooke & Szumal, 1993, 2000) 和 OCAI (Organization Culture Assessment Instrument) – 企业文化评测工具 (Cameron & Quinn, 1999)。它们在学术界都得到了广泛使用，都能可靠的度量企业文化。我们从中国建设部出版的《中国建筑企业名录》(中国建设部，1989) 中选取了 5 家建筑企业作为研究样本，他们分别来自中国的北方 (如北京和天津) 和南方 (如广东省汕头市)。此阶段的研究结果

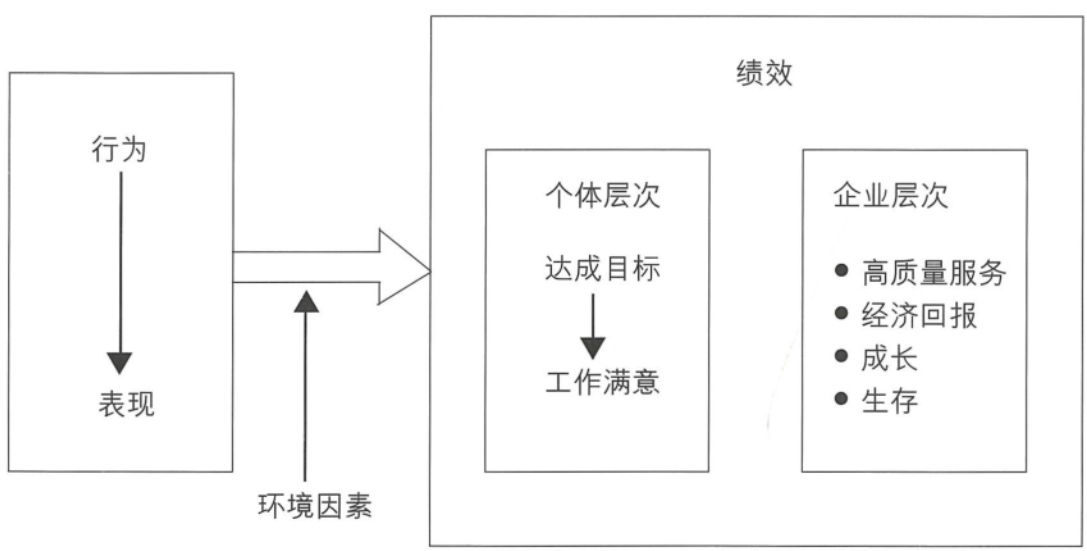

图 2. 表现和绩效

在本文研究结果部分给出。我们对这五家公司的反馈资讯进行了分析，并计算克隆巴赫α系数 (Cronbach Alpha coefficient)，结果表明，对于度量中国建筑企业的企业文化 OCAI 在有效性和可靠性上表现更好，因此更适合在本研究中使用。

(2) (a) 第二阶段的工作包括使用 OCAI 对中国国有建筑企业进行企业文化抽样调查，对抽样结果进行聚类分析，用于将研究样本归类。

(2) (b) 同时，我们设计了一个用于度量企业绩效的问卷，对 2(a) 阶段所选取的样本建筑企业进行这项调查。我们将企业文化和企业绩效调查的结果进行了相关分析，以便分析企业文化是否是影响企业绩效的变数。

(3) 第三阶段的研究使用案例研究方法，在第二阶段的研究样本中选出一部分企业进行定性分析，以便确定特定环境下影响企业绩效的主要文化因素，为将来进行企业文化变化研究指明方向。

实证分析结果

本节将给出研究阶段 1 和 2a 的资料分析结果：即对 5 家选定的中国建筑企业进行案例研究以确定适用的企业文化度量工具；以及对中国建筑企业进行企业文化调查的结果，在 2a 阶段使用了聚类分析方法以反映中国建筑企业的文化特徵。

两种企业文化度量工具－ OCA I和 OCI 都能度量企业文化的不同层次，如惯例、组织成员认同的规范和规则、文化现象等等。在这些方面，中国建筑企业之间很可能存在差异。研究发现， OCI 被认为过于冗馀 (120 个问题)；对于中国特定的文化背景来说，OCI 问卷的问题显得不甚明确，对 OCI 的反馈率仅有 8.2%，而对OCAI的反馈率则有 40% 左右。资料分析结果显示，OCI 文化类型的克隆巴赫α系数很低 (12种文化类型中有 8 个的克隆巴赫α系数小于 0.79 ，最低的仅有 0.22)，而 OCAI 文化种类的最低克隆巴赫α系数为 0.79 。因此我们认为，采用 OCAI 进行第二阶段的研究更为合适。

企业文化量度工具－ OCAI

OCAI 和它的理论基础——竞争价值理论，以及对其所归纳的四种文化类型 (和谐文化 clan culture、创新文化 adhocracy culture、秩序文化 hierarchy culture 和竞争文化 market culture) 的解释，在 Cameron & Quinn (1999) 以及 Quinn & Rohrbaugh (1983) 的相关研究中有非常详尽的阐述。每种文化类型用 6 个问题来进行描述，所以在 OCAI 中一共有 24 个问题，用于度量企业的不同侧面：包括企业主要特徵、企业领导、企业员工管理、企业纽带、企业战略重点和企业成功标准。在对这六个不同侧面进行度量的基础上，可以将企业文化分为四类，即和谐文化、创新文化、秩序文化和竞争文化。这四类文化并存于每个企业中，只是程度有所不同。通过对这六类问题反馈资讯的分析研究，可以分析被研究企业自身企业文化和所归纳的这四种文化类型的相对相似性。和谐文化指这类型的企业文化更注重维持内部灵活性、关注“人”、对客户需求敏感；创新文化指这类型企业文化注重外在定位，强调灵活性和个性；秩序文化指这类型企业文化注重内部稳定性和控制；竞争文化指这类型企业文化强调外在的稳定和控制 (Cameron & Quinn, 1999：123)。

资料收集

我们基于下面的考虑选择了5家建筑企业作为研究物件：(a) 它们属于建设部认可的一级资质建筑企业 1；(b) 主要从事房屋建筑工程，企业大小相当；(c) 研究物件为企业中具有较高职位者。各家企业的研究反馈资讯如表1。

第 2a 阶段，对所有 552 家一级资质国有建筑企业中进行分层取样以进行调查。根据 1996 年建设部未正式发行的《中国一级资质建筑企业名录》2，总共有 2127 家批准认可

企业 / 文化类型	北京	廊坊	天津	葛洲坝	汕头	平均值	样本数	克隆巴赫α系数
和谐	2.8326	2.9717	3.0240	3.2614	2.3952	2.9391	182	0.79
创新	2.0088	1.8468	1.7070	1.7100	2.8590	1.9462	185	0.86
竞争	3.2280	3.0319	2.1667	2.2105	3.4102	2.7084	171	0.88
秩序	3.5746	3.4667	3.5323	3.0738	2.3513	3.3441	178	0.84
样本数 (N)	38	35	56	38	26			
反馈率 %	37.6	39.3	47.5	37.2	48.1			

表 1. 阶段 1 研究样本文化类型分析结果

的建筑企业，其中 725 家中建筑工程企业。在这 725 家中，14 家具有军队性质，属于军队系统管理；159 家属于集体所有或个人所有；其他 552 家属于国有建筑企业 (非军队系统管辖)。因此本研究对这 552 家国有建筑企业进行分层随机抽样，以 5 作为基数，抽取能够整除5的企业作为研究的样本，这样样本大小为 110 —— 这个样本大小对于企业层次的研究属于正常范围。我们要求每一家企业提供 20 份调查问卷反馈 (资料收集于2003年早期完成)。本研究的样本大小与之前其他学者所做的相关研究的研究样本相当或者更大，如 Denison(1990)，Hofstede, Neuijen，Ohayv & Sanders(1990) 及 Adas (1996) 的研究。

资料分析

第一阶段的资料结果在表 1 中给出。对所取得的资料进行了方差分析 (ANOVA)，结果表明所有的 5 家企业在与四种文化类别相关的 OCAI 问题上存在显著的统计差异性。表1中的粗体数位表示这 5 家企业的主导文化类型。总体来说秩序文化是主导文化 (均值为 3.3441)，然而汕头这家企业是例外，它的主导文化是竞争文化。

第二阶段，从 98 家一级国有建筑工程企业中收回了 407 份调查问卷，反馈率是 21%。有效问卷为 66 家企业的 363 份问卷，结果表明，秩序文化的均值为 3.9364 从而成为主导文化 (见图 3)。

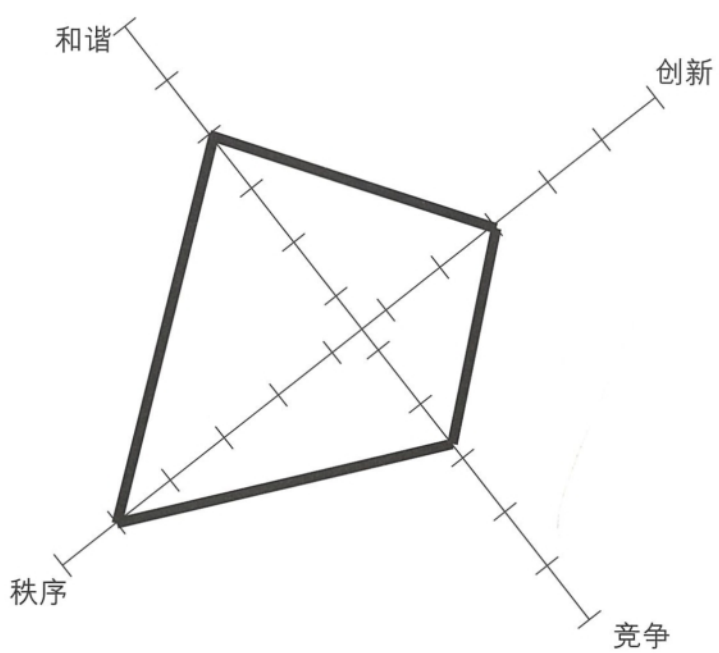

图 3.中国建筑企业典型的企业文化特徵

在进行聚类分析 (即按照样本企业文化特徵类型的相似性对样本企业进行归类) 之前还必须完成一项工作，即必须将个体的问卷打分数值进行汇总以得到企业层次的相关数值。许多组织研究领域的学者 (如 Howe, 1986, Cooke & Rousseau, 1988, Zammuto & Krakower, 1991 等) 都指出，使用个体资料汇毂以用于组织整体层面分析的前提条件是：变数的组内方差 (within-group variation) 比较小，即个体对于变数的打分基本一致。所以在将个体资料汇毂以进行企业层面分析之前，必须提供这样的实证分析支援。因此，我们对资料进行了统计分析，计算了 η 2 统计量 (见表2)，这个统计量能够量度组内资料的一致性。结果表明，在本研究的样本建筑企业内部，个体员工对于文化变数的看法基本一致。

对于本研究来说，我们采用非层次聚类方法 (non hierarchical clustering procedure) 进行分析，首先从 2 类开始分析，最终分析 6 类的可能性。对每次指定类别大小的分析，我们都进行了多轮次的分析，以达到比较稳定的结果。对于最后的类别选择标准，我们遵循以下考虑：组内方差较小 (即同类别的企业的企业文化特徵模式比较相似)，而组间方差尽可能大。F 值，即组内方差和组间方差的比率，可以作为选取最优类别数目的标准，同时所计算的显著性水平必须符合要求 ($p<0.05$)。

在进行聚类分析的过程中，我们发现 3 类，4 类，5 类，6 类的显著性水平都符合要求 ($p<0.05$)，但 5 类是最优结果，因为在 5 类时所计算的F值最优。所以我们选择 5 类作为进行聚类分析的最优结果。表 3 列出了在 5 类和 6 类情况下的统计分析结果，分别列出了这两种情况下每一类企业的数量。

文化类型	平均值	克隆巴赫 α 系数	η 2	F 值	显著性水平
和谐	2.9974	0.88	0.791	17.312	0.000
创新	1.9062	0.80	0.761	14.564	0.000
竞争	2.4448	0.89	0.849	25.696	0.000
秩序	3.9364	0.87	0.629	7.734	0.000
个体 N = 363; 企业 N = 66					

表 2. 阶段 2 资料统计结果

类别 文化类型	1 N=18	2 N=5	3 N=22	4 N=8	5 N=13		类平均值	自由度	标准误差	自由度	F 值	显著性水平
和谐	3.8037	4.0643	2.9768	2.3239	1.9435		8.867	4	.038	61	232.476	.000
创新	1.5153	3.2968	2.1224	2.2267	1.4488		4.241	4	.044	61	97.383	.000
竞争	1.9387	4.1056	2.7011	3.8214	1.6607		10.629	4	.029	61	370.397	.000
秩序	4.1412	4.1821	3.6983	2.9339	4.4321		3.371	4	.044	61	76.652	.000
	6 类											
	1	2	3	4	5	6						
和谐	3.0374	2.9040	4.0643	2.3239	1.9435	3.8037	7.113	5	.037	60	191.424	.000
创新	1.9934	2.2772	3.2968	2.2267	1.4488	1.5153	3.481	5	.037	60	94.183	.000
竞争	2.7253	2.6720	4.1056	3.8214	1.6607	1.9387	8.506	5	.029	60	294.165	.000
秩序	3.8802	3.4801	4.1821	2.9339	4.4321	4.1412	2.871	5	.030	60	95.208	.000

表 3. 方差分析结果 (5 类情况和 6 类情况)

讨论

将个体企业的企业文化认为是决然不同的四种类型，这样的观点是错误的。Cameron & Quinn (1999) 提出的四种文化类型给我们提供了一个在企业层面系统研究企业文化变数的基础，但他们提出的四种文化类型模型并不能涵盖所有文化现象－特别是在国家民族文化层次。四种文化类型的理论框架提供了一个平台，在这个平台上我们能够进一步去解释那些能够促使企业变化和改善的关键企业文化元素，即一个能够提供“直观上有说服力而且易于解释和实施的改善企业文化”的框架。

第一阶段的研究发现表明：

- 企业文化差异确实存在于中国建筑企业的企业整体层面上；
- 在四种企业文化类型中，秩序文化类型与和谐文化类型相比竞争性文化类型和创新文化类型更具有主导性。

这说明企业文化虽然在企业整体层次上存在差异，但是仍然在很大程度上受到了中国传统文化的影响，其特徵是千年累积的儒家思想；而近几十年高度统一的政治意识形态和计划经济体制加深这种影响。然而与此同时，中国近年来的改革开放政策已经对当前的企业文化产生了影响，这种影响在本研究第 5 家企业的一些文化特徵中得到了反映 (第 5 家企业位于中国南部的汕头，而中国的南部地区比北部地区受到更多西方市场经济影响)。本研究的结果反映了中国目前整体社会的一般状况，即在政治上、社会上和经济上都具有混合性，而且都在不断变化之中。

通过 2 (a) 阶段的研究和进行聚类分析发现，按照不同的文化特徵组合，可以将中国的建筑企业中分为 5 类。在表3所示的所有的 66 家企业中，33% (22 家) 属于第 3 类，这类型企业秩序文化占主导；27% (18 家) 属于第1类，这类型企业秩序文化和和谐文化占主导，而竞争文化和创新文化处在弱势地位；20% (13家) 属于第 5 类，这类型企业秩序文化占绝对主导，其他三类文化都处于弱势；12% (8 家) 属于第 4 类，这类型企业竞争文化占主导，其他三类文化处于中等状态；8% (5 家) 属于第 2 类，这类型企业各种类型文化都比较强大且处于平衡状态，即这类企业的文化类型均值从创新文化的 3.2968 到秩序文化的 4.1821。

结论

本文给出了一个用于研究中国建筑企业文化和企业绩效的理论框架。同时，本文从相关的研究出发，提出了研究假设，并给出了从中国建筑企业收集实证资料进行假设验证的研究方法。案例研究结果表明，OCAI 工具能够用来度量中国企业的文化特徵，而且不同地区企业之间存在企业文化差异 (特别是那些开放得较早，西方市场经济影响较大的地区)，但秩序文化和和谐文化仍然占主导地位。

企业文化研究领域学者在影响企业文化的重要因素上取得了三点共识，归纳如下 (Brown, 1998)：

- 企业所处国家或地区的社会文化和国家文化；
- 企业创始人或其他有重大影响力的领导的的远见卓识、管理风格和人格；
- 企业所从事的行业以及行业环境。

考虑到传统中国文化和中国建筑业的情况，本研究所得出的中国建筑业企业的文化特徵与中国的整体环境是一致的。秩序文化仍然处于主导地位，反映了 40 年计划经济的影响，在中国过去的计划经济中，所有企业都具有归属于某个行业系统，而且计划经济强调的是“秩序”，而这最终导致了被广泛批评的官僚作风和各种不必要的呆板程式。第二位的主导文化是和谐文化，这反映了传统的中国文化，即强调“和谐和关系”以及“以人为本”。随著近 20 年的经济改革，中国建筑业的竞争开始加剧，进而形成了一些企业的竞争文化。在整个研究中，创新文化始终得分很低，反映了在整体上，中国建筑企业的创新和承担风险的精神仍然十分缺乏。

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注释

1. 根据《建筑企业资质管理规定》(建设部，1989)，建筑业企业分为四级：一级、二级、三级、四级。在一级企业中又分为29 类，如房屋建筑工程 (工业民用建筑)、化工石油工程、水利水电工程、交通工程等，其中房屋建筑工程是最大类别。
2. 新颁布的《建筑企业资质管理规定》(建设部，2001) 对建筑企业资质进行了重新分级。新分级中，“特级”与前一版本规定中“一级”大致相当。因为新的规定刚刚实施 (本研究于 2001 年开始)，故为了取得更可靠的资料，本研究的调查仍然按照旧的分级方法。

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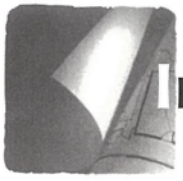

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