PROJECT successes (or shortfalls) are often taken to be indicators of general construction industry success levels (or otherwise). This leads to a focus on improving project performance levels through project-specific endeavours. However, another longer-term approach to industry improvements is through Critical Success Factors (CSFs), which would incorporate issues vital to an organisation's current operating activities, as well as future success, and are based on both external and internal factors. This paper argues that construction organisations should constantly improve their internal CSFs, in order to harmoniously work with other parties in the project organisation and build required project cultures – both for short-term project success, as well as to remain competitive and survive in the future – for long-term organisational and industry improvements. The key requirements are the ‘flexible organisational cultures’ of the organisations involved, so that they can both contribute and adapt to the emerging project culture. This will, in turn, open up the organisations to absorbing back positive culture-building elements that will collectively feed into an enhanced performance-oriented construction industry culture. The proposition is developed on the basis of a literature survey and a cluster of interviews with industry experts.

**Keywords:** Change management, governance, industry development, organisational culture, organisational flexibility, performance improvement.

**ABSTRACT**

The construction industry appears to have mostly been borrowing and adapting innovative concepts and protocols from other industries in targeting improved efficiencies. This has been fostered by the worldwide calls, either explicitly or implicitly, for a major cultural shift in construction industries (Latham 1994, CII 1996, Egan 1998, C21C 1999, ISR 1999, CIRC 2001). Examples of such “borrowing and adapting” type developments include benchmarking, business process reengineering, concurrent engineering, lean production, logistics management, outsourcing, performance based contracting, total quality management, value management, and supply chain management (SCM). This is reflected in the recent research of Agapiou et al. (1998), Anumba and Evbuomwan (1997) and Love et al. (1998), for example. These basic theories and/or practices have been mainly borrowed from manufacturing industries and adapted for construction. But the ‘culture of manufacturing’ is seen to be largely derived from the respective organisation culture, whereas ‘the culture of construction’ is reflected in each ‘project culture’ (Riley and Brown 2001). This may be one of the reasons why concepts and protocols from ‘manufacturing’ cannot be directly transplanted in construction. While some of them may be adapted for one project, the same ‘adjusted formats’ cannot be used in other projects. This requires separate, if not unique, adjustments of various different ideas to suit project specific needs.

For example, the required adjustments for implementing SCM in construction can be traced back to the complex nature of relationships of various stakeholders that may overlap the multiple phases of construction supply chain activities (Edum-Fotwe et al. 1999), the existence of various possible procurement routes in construction (Palaneeswaran 2000), and the large number of stakeholders/trading members constituting a supply chain from one end to the other (Harland 1996, Maqsood and Akintoye 2002). Moreover, unlike the notion of continuous processes that exists within other industries, the idea of the “project” as a unique venture dominates the construction industry (Root et al. 2000). In fact, there is no standard approach based on collaboration or long-term supply chain integration, while an effective construction SCM requires an approach that is developed according to the circumstances facing the firm/organisation (Cox and Ireland 2002). This ‘organisation’ in construction is the organisation of the ‘project’. This may be the reason that performance improvement in construction is considered the performance improvement in projects.

Parfit and Sanvido (1992) noted that, “relative to each participant, it [i.e. success] is defined as the overall achievement of project goals and expectations”, although success criteria or a person’s definition of success often change from project to project, and project success is different for each participant. Moreover, they are subjective and not easily measurable qualities or quantities that can be compared between numerous construction projects. While this is the scenario in the construction industry, other industries emphasise management practices at a corporate level as an essential element of success (Abraham 2003). In addition, the future environment of a typical construction organisation is expected to be quite different due to technological and economic advancements. Therefore, a shift in emphasis from project success to corporate success is essential for construction organisations to compete in an ever-changing marketplace. Abraham (2003) proposed a Critical Success Factors (CSFs) method to measure and enhance corporate success of construction organisations.
This paper (a) briefly discusses the CSFs method and its application in construction, (b) revisits previous analysis and conceptualisation of ‘project culture’ (Kumaraswamy et al. 2001, 2002), (c) draws on building a culture of integrated project teams (Rahman et. al. 2003), and finally (d) fleshes out the proposition with relevant extracts from a cluster of interviews with industry experts. The paper argues that the practice of building integrated project teams necessitates various participating parties to be flexible enough to build the required project culture targeting the project success. Such practices will in turn build flexible organisational cultures of the respective firms/ organisations, and gradually feed into an enhanced performance-oriented construction industry culture.

CRITICAL SUCCESS FACTORS

In management literature, critical success factor (CSF) methodology was first identified in the MIS industry (Abraham 2003). Rockart (1982) examined four existing approaches to identifying executive information needs in 1982, and CSF methodology was one of the methodologies studied. After close examination, it was concluded that the identification of CSFs for the MIS industry provided a much more useful analysis for executives running the organisation than any of the other three methodologies. Once identified, CSFs became a gauge by which the MIS executives could evaluate their organisations. CSFs allowed the executives to deploy standard organisational management strategies and skills to improve company performance. On this basis, Rockart (1982) advocated that a company and its industry should identify its CSFs, in order to ensure future success. CSFs thus are, for any business, the limited number of areas in which results, if they are satisfactory, will ensure competitive performance of the organisation (Rockart 1982). CSF methodology has been implemented in two additional project-oriented industries: computer software development and management of information systems (Sanvido et.al. 1982).

Based on the works of Rockart (1982) and Sanvido et.al. (1982), and results of interviews with construction organisation executives, Abraham (2003) identified eight CSFs for the construction industry. The intention of the list of these eight CSFs was to provide a guide that an organisation can continually review and utilise to improve the corporate culture in which it operates. The CSFs are:

1. **Structure of Industry**: the interactions, relationships, and operational characteristics established between multiple construction organisations in a particular market place
2. **Competitive Strategy**: market differentiations which the organisation cultivates to establish unique positioning and sets the organisation apart from others in a particular market niche
3. **Market Conditions**: the analysis of the marketplace in which an organisation operates or has interest in developing a position
4. **Political Environment**: the political forces influencing project decisions, community development and fiscal policy
5. **Organizational Structure**: the form in which an organisation is internally structured
6. **Technical Applications**: the use of technical applications for advancement of the company
7. **Employee Enhancements**: the life long learning process for employees tied to personal, professional, and cultural growth
8. **Process Benchmarking**: the identification of processes and procedures and their continual improvement

The first CSF represents the outcomes and interactions originating from the other seven CSFs. The next three are external issues, which affect success of an organisation through external influences or actions. These issues are based in the industry itself and cannot be addressed with internal organisational changes alone. The last four CSFs are internal issues, which affect success of an organisation that are organisation specific. In other words, these issues are internally based, within the organisation itself, and can be addressed through internal organisational or internal cultural changes (Abraham 2003).

Among the internal CSFs/ issues, the main emphasis of internal ‘organisational structure’ is to accommodate change, whether the change is driven by economic, political, or environmental factors. Apart from knowledge resources, ‘technical applications’ deal with the adaptability of technological advancement within the organisation for future use and/ or implementation. With a constantly changing marketplace, technology has moved to the forefront for providing advancement potential in the construction industry (Chinowsky 1999). The ‘organizational environment’ focuses on the need for continued cultural enhancement of the organisation through education for the employees, skills development, and other employee enhancement activities. A feedback/ evaluation system allows the organisation to evaluate internal and external issues to improve its cultural environment and organisational structure. Finally, ‘process benchmarking’ emphasises the continual improvement of internal processes and procedures in an organisation (Abraham 2003). All these would probably be effectively addressed by reshaping the ‘culture’ of the organisation itself, where training may provide an initial impetus, and also convert its employees into valuable ‘resources’.

Aragón-Sánchez et.al. (2003) observe in their study that companies with higher investments in employees’ training obtain better results in terms of both effectiveness and profitability than those with lower investments; training in cooperation with other companies positively affects benefits and profitability, since a company benefits from others’ experience; and on-the-job training given by in-house trainers has the highest positive influence on effectiveness. However, the condition is that the training must be planned to be successful. This leads to the requirement for an analysis from the perspective of a ‘project culture’, in order to plan the appropriate training programmes and to form an integrated project team.
THE ISSUE OF CULTURE

‘Culture’ has been defined in various ways. For example: “... patterned ways of thinking, feeling and reacting, acquired and transmitted mainly by symbols, constituting the distinctive achievements of human groups, ...” (Joynt 1985); “what we are and what we do as a society” (Barthorpe et al. 2000); “It is about the way people understand their world and make sense of it” (Hoecklin 1995); and “It is about the ‘characteristics of the industry, approaches to construction, competence of craftsmen and people’ who work in industry. And, it is also about ‘goals, values, and strategies of organisations’ they work in” (Abeysekera and Lata 2002). Hofstede (1980) described culture as the “collective programming of the mind” that distinguishes the members of one human group from another, and is usually applied to societies or nations or to ethnic or regional groups, and other human collectivities or categories: an organisation, a profession, or a family. Abeysekera and Lata (2002) explored the issue of culture in the context of the two triologies: (1) what people do, the material products they produce, and what they think (Bodley 1994), and (2) technological (concerned with materials, tools, techniques, machines), sociological (relationships into which people enter), and ideological (beliefs, rituals, ethics, religious practices, myths) (Lewis 1982).

On the other hand, the CIB Working Group on ‘Construction in Developing Countries’ identified the following four aspects: (1) industry level culture; (2) professional culture; (3) company culture; and (4) project culture. These concepts were later expanded and described further by Ofori (2001). In construction project scenarios, Mackay (1993) described culture as the culture of the project team comprising different contracting parties in the supply chain and also including company-wide inter-departmental members and others who contribute in some way to the final product or service to be delivered. A project culture is thus built up from a number of sources - national, ownership, sectoral and style differences. At the project level, there are also other issues that affect the culture of the project. These arise from key variables flowing in from multiple organisational cultures, individualistic subcultures, professional subcultures and operational subcultures (Kumaraswamy et al. 2001, 2002). Drawing on such insights, Figure 1 was developed to show how a composite project culture is generated from a number of sources.

Since a project team is multi-organisational, the input from each organisation is important, in addition to their interactions and resultant collective inputs that may be dominated by few organisations. Therefore, the training programme, as mentioned above, has to include such appropriate modules and protocols to facilitate learning, providing effective inputs into the project team. To start with, these organisations have their own sub-cultures and the sub-cultures come from a whole series of intervening variables, such as the organisational style of the participant organisations, the sector of the industry from which the organisation originates, the nature of the ownership of the organisation and its historical background. In addition, each organisation carries its own national culture and brings with it unique features (Kumaraswamy et al. 2001, 2002).

A similar dissection/ analysis of professional cultures, operational subcultures and individualistic subcultures will lead to identifying the potential shortfalls and design appropriate improvement measures through training programmes. For example, manifestations of the sentient differences between the professions (e.g. ego) may transcend organisational cultures, but do not necessarily supersede them (Kumaraswamy et al. 2002). ‘Operational subcultures’ are conceptualised when advocating a type of new culture, e.g. ‘safety culture’ or ‘quality culture’. These are invariably collaborative cultures and may also combine with a local culture to develop a national culture, e.g. Swedish construction culture, which has been developed on the basis of quality management and collaborative practice, in a construction society of low power distance between contracting parties, loose control and low uncertainty avoidance (Bröchner et. al. 2002). ‘Individualistic’ subcultures are considered to be influenced by ethnic, educational, religious and social status issues, of course among other contributors.

On the other hand, much of the success of Relational Contracting (RC) type approaches (Rahman 2003, Rahman et. al. 2003) has been attributed to national cultures, which are supposed to have evolved over centuries, if not millennia, e.g. in Japanese construction (Bennett et al. 1987) and automotive industries (Womack et al. 1990). However, any one culture or subculture may dominate in a particular scenario, e.g. the organisational culture may contribute more significantly in any multi-disciplinary transaction or multi-national joint ventures. At the same time, there may be some overlaps between cultures or subcultures, e.g. national and individualistic cultures. However, the particular impacts of each of the above four subcultures in shaping a given project culture, in turn, depend on the specific organisations, professions and key individuals mobilised, their relative importance on the project, the sequence of mobilisation and similar factors. Based on these, appropriate training programmes may be developed and planned within construction organisations, targeting an integrated project team. The combined ‘mind-set’ of the project team may need continuous and cooperative learning, in a direction that recognises project requirements, as well as changes in customer demands and expectations as seen in ordinary day to day business activities. Such collective ‘culture acquisition’ (or transformation) also depends on the ‘real event’ in all its complexity of place, people, atmosphere, and interactive responses that is derived from ‘a set of relations’ (Pitman et al. 1989). While such ‘flexible’ project-specific targets will hone construction organisations primarily to harvest project-specific successes through improvement in internal CSFs discussed in the previous section, the practice of achieving such successes will build a ‘flexible’ corporate culture for them in a set of given external CSFs. In the long run, all these in turn will form the first CSF, the ‘structure of the industry’, in the form of a Relationally Integrated Supply Chain (RISC) (Rahman 2003, Rahman et. al. 2003) as shown in Figure 2 and targeting implementation of RC. Construction companies can then simultaneously maintain close relationships among themselves, compete with each other, and adjust themselves for their future survival – and for overall construction industry development.
Figure 1. Potential sources of a typical construction project culture

Essentially, the above-mentioned RISC in construction has to be built for each and every project (McCaffer 2000), since the main thrust for improvement lies in the construction projects themselves. Information of, and relationships with, different ‘partners’ should preferably be maintained in a ‘focal network’ - the set of most important relationships for a particular organisation at a given time (Edum-Fotwe et al. 1999); and with a multiple, but reduced set (numbers) of suppliers (i.e. different constructing parties) for particular products and services (Chase et al. 1998, McCaffer 2000). However, this change in culture needs to be driven from some source. It is being argued in this paper that, while
construction organisations may themselves target project specific successes in general; clients should, in addition, simultaneously play a major role in selecting appropriate procurement routes and the various team members. This will be conducive for building an integrated project team; in terms of both the approaches to a ‘flexible corporate culture’ and in targeting overall industry development.

BREAKING DOWN THE BARRIER OF PROCUREMENT

Whether it is considered in a systems approach or a contingency approach, the literature provides that there exist at least two common key assumptions when considering the framework of ‘procurement’: a process (involving strategy, method and/ or framework), and it requires choices by the client (or it’s advisors) on the process type. The ‘project process’ extends through the whole life cycle (Rowlinson 1999), involving a multitude of large-scale and complex activities, which differ from project to project and can be carried out through many different ‘procurement’ options available in the industry. Each procurement route has its advantages and disadvantages over the others, and not every procurement system is suitable for all projects. But public sector clients seem to continue to practice their tried and trusted ways, based on the design-bid-build procurement route, which are not adaptable to changing project requirements (Miles and Ballard 1997). On the other hand, while selecting the appropriate procurement route improves the chances of meeting the project objectives (Masterman 1992, Kumaraswamy and Dissanayaka 1996 & 2001), procurement routes of successful projects do not usually match with any commonly accepted procurement routes. In order to address the ever-changing project environment, the ‘contracts’ are usually amended to a point that they do not adhere to the type of structure that the industry would normally distinguish as any one of the standard procurement routes (Tookey et al. 2001).

In addition to the above, risk management is considered as an integral part of effective procurement, where the procurement arrangements are decided after considering the risk profile of a project (Godfrey 1996). This is because the objectives of risk management are also among the project objectives (PMBOK 2000). Thus, the project success can be considered as the success in effectively managing its risks, which calls for a tailor-made contract strategy suitable for active management of risk by all parties (Thompson and Perry 1992). Risk management is therefore suggested to be an integral part of the planning, management processes and general culture of the organisation (AS/NZS 4360 1999). This is invariably a dynamic process and may also require early mobilisation of other contracting parties (and at least the main contractor) to effectively identify and plan for (Cox and Townsend 1998), and proactively manage all risks with the efforts of the project team comprising major contracting parties, and through the entire contract execution period (Rahman 2003, Rahman et. al. 2003). Clearly, the traditional procurement systems do not accommodate this dynamic risk management. Those are characterised by strong confrontational interactions (Cheung et al. 2002), and inappropriateness for teamworking based collaborative working arrangements that are required for such dynamic risk management.

Therefore, procurement systems, in general, should be (1) hybrids using various features from distinct procurement routes, and (2) flexible enough to address the changing environments of the project. This points to the mobilisation of RC principles for building and maintaining a harmonious relationship among the project participants in the industry level as shown in Figure 2, who can work in a cooperative and collaborative manner in such a hybrid and adaptive project organisation, in complex and changing construction scenarios for a win-win outcome for all parties. RC-type approaches (e.g. partnering, alliancing) provide the means to sustain ongoing relations in long and complex contracts by adjustment processes of a more thoroughly transaction-specific, ongoing administrative kind (Williamson 1987). Rahman and Kumaraswamy (2002) argue that RC approaches are expected to work in almost any environment if applied properly. This requires transforming traditional relationships towards a shared culture that transcends organisational boundaries (CII 1996) where the motivation and attitude of the project participants are also critical, and thus relates well to the cultural issues that can be developed through the improvement of the internal CSFs discussed previously. An example of a drive towards such an approach can be seen in the government of the State of Queensland, Australia. In a recent project brief, CRCCI (2003), it was described that: “… project addresses the identified needs … to changing project delivery systems and the need to be accountable to the public/stakeholders. … further development in terms of their own organisation culture and attitudes in implementing the novel approaches embodied in relationship contracts. … The change must be directed towards developing attitudes and a culture that are supportive of relationship contracting. The major objective is … for dealing with project culture on relationship style projects. … changing the culture within the client organisation in order to facilitate the running of relationship contracts and encouraging the move away from the old, adversarial approaches to contract administration.”

OVERCOMING THE SHORTFALLS OF PROCUREMENT

In order to mine experiential knowledge on how to overcome the above-discussed barriers of procurement, and to provide the means for active management of risks through mobilisation of the team efforts of all major contracting parties, a cluster of interviews were conducted in Hong Kong (Rahman 2003). Most of the 25 interviewees were holding corporate level positions during the time of interviews. The semi-structured interviews of local industry experts from consultants, contractors and clients provided a huge amount of experiential knowledge. The following paragraphs extract the relevant suggestions/ inputs in appropriate cases, in order to enhance practices towards targets of more congenial project environments, improved internal CSFs in a given set of external CSFs, and overall industry improvement.
Selecting and mobilising the team

The “lowest-price” bid evaluation often causes problems on the project itself and does not help industry development. Contractors should be selected on the basis of their capacity or capability, in terms of both technical and financial resources; technological capability; safety records; records of claims and disputes; recognition in the industry; approach towards negotiation; managerial and operational capabilities; motivation and commitment for teamworking; and joint problem solving. These were mentioned by all the contractor and consultant interviewees, and echoed by most of the client interviewees. Most of these suggested factors are, in fact, related to the internal CSFs mentioned before, and expected to be improved by both internal, external and on-the-job training and mutual learning. What is needed is a change in clients’ attitude. Contractors will then be forced to train themselves to win contracts and survive – not only on the basis of price.

Some of the projects may be completely designed with exhaustive and fair risk management provisions and are thus better suited to design-bid-build procurement route. Some other projects may need inputs from contractors on various aspects, such as buildability, construction methods, and risk management at the earlier stage of projects. Despite their potentially valuable ideas on these issues, contractors do not get any opportunity to utilise those ideas. In such cases, interviewees asserted bringing contractors into the project team before contract award and to work with consultants/ client’s team, in order to enhance well informed decision-making, minimise change, and decrease project cost and time. Instead of relying on any particular procurement route for such mobilisation, interviewees stressed the necessity for changing the mind-set of clients to consider any flexible and workable options in possible procurement routes, in order to accommodate such arrangements, and benefit all parties. This points to the requirement of ‘knowing’ the contractors well before the inception of the project, and justifies the need for an RISC, as mentioned above.

However, public sector officials are restricted by preset rules and procedures, which are needed to maintain uniformity among their day-to-day activities. Therefore, the existing rules and procedures need to be adjusted, in order to accommodate the required flexibility and new initiatives. This relates both to the calls by the industry reports worldwide, and the need of some mechanisms to educate/train the ‘conservative’ officials and to aid the ‘enlightened’ officials, in other words, to improve internal CSFs and to aid the external CSFs for overall performance improvements in the industry. Such initiatives, however, are not uncommon. For example, a public sector organisation has executed some of its contracts under ‘pain share/gain share’ arrangement, including even those that were originally awarded under the traditional procurement system (Bayliss 2002).

Prioritise the relationships

Another area of importance the interviewees highlighted is the relationships among contracting parties. They emphasised incorporation of ‘some mechanism’ in the selection process, to identify a contractor with whom a harmonious relationship could be maintained during the contract execution. It will then be extended to other contracting parties, who directly or indirectly contribute to the project. The subcontractor issue is another one the interviewees spotlighted, particularly on multi-layered subletting. They also carry out major parts of works, and thereby influence work quality and project performances. But clients do not have any contractual relations with them. Interviewees recommended clients to have some kind of ‘control’ over them, at least to some degree. The above-mentioned RISC may potentially offer a solution to this – contractors will appoint subcontractors but with the approval of clients. Interviewees also mentioned similar concerns about suppliers: materials of poor quality will lead to poor quality works, and failure to supply a particular material in time may have a considerable impact on the whole project. Therefore, supplier ‘reliability’ is essential. This cannot be established without a successful and harmonious trading relationship. This in turn points to the above-mentioned RISC that can eventually be built through improvements of internal CSFs of both the construction companies and cliental organisations for an efficient construction industry.

Building the team

While the common recommendation of the interviewees was to establish and maintain ‘good relationships’ among the parties for any RC-based teambuilding exercise, they prioritised to focus upon it on a project basis. This aligns with existing literature on SCM (McCaffer 2000) and the proposed RISC (Figure 2). However, this will not work unless all other contracting parties have the same perceptions and attitudes towards such approaches. Therefore, improving the internal CSFs of various construction organisations are important. In addition, most of the interviewees suggested to bring all major contracting parties, and at least the three main contracting parties (client, consultant and contractor), under some ‘mechanism’ like pain-share/gain-share or target cost arrangements. The form of contract should also suit the nature of teamworking, and the project. Ensuring knowledgeable clients, fairer risk allocation, risk sharing, and checks on whether the parties are properly paid – were some of the specific recommendations by the interviewees. All these are, in fact, related to the improvement of internal CSFs, and to lubricate any transactional conflicts and harvest the project success in a win-win scenario.

The basic requirements for the above win-win scenario and the consequent industry performance improvements are the flexible organisational cultures of the organisations involved, so that they can both contribute and adapt to the emerging project culture. Ideally, the project culture will then be expected to align towards project targets, while overcoming specific constraints. Meanwhile, the interactions with developing such performance-oriented project cultures will rejuvenate the respective organisational cultures. Having already ‘loosened’ what may have previously been rigid organisational cultures, in order to enhance project performance as above, the companies are then better positioned to absorb back positive culture-building elements (e.g. relationship development and motivational tools). This will in turn boost the longer-term development of their own organisations. Such developments can be expected to collectively feed into an enhanced performance-oriented construction industry culture.
CONCLUSIONS
There is growing evidence of concerns about sluggish construction industry performance improvements. The initial emphasis was evidently on project success and therefore the major thrust is to improve the efficiency of the project team, which is invariably multi-organisational with people of various origins, backgrounds, egos and ethos. Re-aligning and streamlining all these toward a convergent ‘project culture’ is not easy. However, initiatives through various RC-type approaches and team building exercises, as have been recommended by industry reports, have met with some initial objectives. Harvesting the full benefits of RC-type approaches still hinges on the effectiveness of building the integrated project team. This will become much easier if construction organisations, which are in fact joining the project team, improve their own efficiencies and competitiveness for building such an integrated project team. The underlying requirement is to build and maintain a flexible corporate culture by various organisations, in order to streamline, improve and maintain their (human) resources for such integrated project teams. The targeted flexible culture of building integrated project teams is expected to contribute considerably to building a positive project culture and thereby to project success. It will spread benefits to all related construction organisations, in terms of their profitability and effectiveness, and thereby improve competitiveness and future success. This will, in turn, boost the longer-term development of their organisations. Such developments can be expected to collectively feed into an improved performance-oriented construction industry culture.

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