

PROJECT MANAGER COMPETENCIES IN A KNOWLEDGE-BASED SOCIETY

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The construction phase of building projects is often a crucial influencing factor in success or failure of projects. Project managers are believed to play a significant role in firms' success and competitiveness. Therefore, it is important for firms to better understand the demands of managing projects and the competencies that project managers require for more effective project delivery.

In a survey of building project managers in the state of Queensland, Australia, it was found that management and information management system are the top ranking competencies required by effective project managers. Furthermore, a significant number of respondents identified the site manager, construction manager and client's representative as the three individuals whose close and regular contacts with project managers have the greatest influence on the project managers' performance. Based on these findings, an intra-project workgroups model is proposed to help project managers facilitate more effective management of people and information on building projects.

Keywords: Competency, information, productivity, project manager, team.

INTRODUCTION

The construction industry is a key industrial sector making a significant contribution to a nation's economic health and standard of living. It accounts for an average of 8% of GDP in 10 industrialised economies, ranging from 11% in Japan, 8% in Australia, and 5% in Singapore (Karpin 1995). It also employs a significant number of people which in Australia, for example, was 7.2% of total workforce in 1995 (BIE 1996). In addition, many industrial sectors and their employees, notably manufacturing and services, depend on investment and growth in construction industry. Given the factors that influence industry and a nation's competitiveness (Porter 1979 and 1990), the improved efficiency in key industries such as construction can make a significant contribution to the national wealth. Stoeckerl and Quirke's (1992) findings suggest that a 10% efficiency gain in the construction would add at least 2.5% to GDP.

In a world of rapid change, technological innovations and fierce competition, firms must search for and experiment with new approaches to gain competitive advantage over their competitors. These efforts have focused not only on utilisation of advanced technology in design processes and operations but also on applications of new management approaches and ways to improve worker's productivity. This has led to proliferation and application of many concepts such as process re-engineering, concurrent engineering, partnering and total quality management. The aim of these managerial tools is to develop synergies between products, processes and people (or 3P's) of internal activities which basically involves the use of soft or human skills to

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improve the efficiency of hard or technical skills in an organisation. It is managing *from the inside out*.

The activities of construction firms revolve around projects which are temporary in nature, depend heavily on subcontracting and are prone to conflicts and inconsistent levels of productivity. Despite the lower number of disputes and litigation in the recent years in Australia, industry's leaders and participants generally acknowledge the need for more consistent productivity improvement. However, the question is not whether firms should improve the productivity of their operations and people, but where to search for productivity improvement? Given the cost-driven competition in the construction markets, there is little that a firm can do to reduce its costs without increasing conflicts and disputes with other projects' participants and/or reducing the quality of finished products. Therefore, researchers and practitioners have directed their attention to improve the management of construction processes. They argue that since construction is essentially a project-based activity where the success is directly related in securing the commitment of all participants to work and cooperate as a team towards a common goal, effective management of the team is key to construction firms' competitiveness. On the other hand, the construction phase of a project often seems to have two key characteristics:

1. A significant portion of the total project cost is spent during the construction phase (PMBOK 1987),
2. Once a project is awarded to a firm, the project manager plays a central role in delivering the final product within the budget, time and quality specified by the contract.

This highlights the importance of construction phase of a project and suitability of construction project managers particularly in relation to the competencies they require to have in managing their project team.

RESEARCH AIMS AND FOCUS

The research finding in this paper is part of a research project jointly funded by the Australian Government and the construction industry. The paper addresses the project managers' competency issues concerning project team and workgroups. It proposes that an effective project manager must show leadership to bring together the key project stakeholders in order to facilitate information flow, teamwork and quality decision-making.

The geographical boundary of this research is the Queensland building construction sector, which after New South Wales and Victoria, is the third largest market in Australia. In 1996, the Queensland building sector was valued at \$A 5.8 billion (\$US 3.7B). Of this amount the non-residential building accounted for \$A 2.4B. which included \$A 1.6B of commercial and industrial building; and \$A 0.8B. of public investment mainly in education, health and entertainment and recreation (BIS 1997).

The Queensland Construction Industry (QCI) in a 1996 report identified two major constraints to growth in the Queensland Construction sector: (1) increasing scarcity of skills in managerial, traditional and non-traditional trade areas; and (2) lack of innovative project delivery methods. It also identified two pressing issues that needed to be addressed: (1) improving internal relationships; and (2) encouraging more effective training and development (QCI 1996).

PROJECT MANAGERS' COMPETENCIES

Klemp (1980) defines a competency as *an underlying characteristic of a person which results in effective and/or superior performance in a job*. Boyatzis (1982) elaborates on a person's underlying characteristics by suggesting that it may be a motive, trait, skill or aspect of one's image or social role, or body of knowledge he or she uses. Project managers' competencies are, therefore, a list of competencies that distinguishes superior project managers from average or poor project managers. This paper focuses on those key competency areas found to be critical in managing building projects.

In a survey of 28 building project managers in south east Queensland, we asked them to identify the key competencies they needed demonstrate to be effective project managers in terms of project performance criteria of cost, time and quality. A significant majority ranked people management (n=22) and information system (n=20) as the first and second competencies of superior or effective project managers respectively. Teamwork, leadership and technical expertise were ranked a distant third, fourth and fifth on the list. The frequency that people management and information management competencies appeared on the first or second position was 26 and 23 respectively. The following pages discuss the two key building project managers' competencies as identified in our survey.

PEOPLE MANAGEMENT

Many people think that management is about getting things done through people. Although, managers can count on their formal authority to get others to do things this approach has little place in managing today's employees particularly on construction projects where a majority of workers are subcontractors, leaving the project manager and his or her team with no formal authority or control over them (Stewart and Billingham 1993). This is one of the principal reasons that some suggest that project managers have the toughest job in construction projects and are therefore extremely valuable and important to team and project success (Chevin 1993).

There are others, however, who may argue that contractors and their project managers could use the legal contracts to enforce subcontractors to do their job to the letters of the law. However, such an approach may get the job done for fear of a legal battle, but it does not guarantee quality work, pleasant working conditions and relationships which are critical in any organised work. Most of all, it damages the firm's reputation in the market as being uncompromising and uncaring. Therefore, project managers must learn to manage in situations where they lack authority or control by understanding the complexity of the job and different kinds of information and relationships needed to do the work (Drucker 1993). He or she must have the ability to command respect and authority through gaining support of co-workers (Lovell 1993).

Subcontracting

Subcontracting is a fact of life in the construction industry. Its history goes much further back than in manufacturing where subcontracting work or outsourcing has risen in the last quarter of century mainly due to new competitive pressures and the guiding principles. For example, firms should stick to their knitting (what they do best) and subcontract the rest (Peters and Waterman 1982). This is not, however, a new principle. Early in the 19th century, David Ricardo theorised the concept of comparative advantage which basically states that countries should produce whatever

they have comparative advantages and trade the generated revenue for goods that they have comparative disadvantages (Robock and Simmonds 1989). Despite differences between international trade and inter-firms trade, firms state similar reasons for outsourcing or subcontracting. They argue that due to ever increasing size and complexity of manufacturing products, it is very difficult for a firm to produce hundreds or even thousands of parts of a final product by itself in an efficient and quality manner. Eccles (1981) adds another dimension to this argument by arguing that the construction process does not have the serial relationship that exist in manufacturing which exacerbates the uncertainty about resource requirements in the future. Therefore, the contractors use subcontracting to improve efficiency through reducing transaction and production costs and sharing project uncertainty and risk with subcontractors.

The benefits of subcontracting for contractors, however, should be seen in light of its potential shortcomings. The fact that a construction project manager should manage and deal with subordinates whose loyalty lies outside of the project manager's firm and whose self-interests and values may contradict the firm's interests ought to create difficult and problematic management issues (Mathur and McGeorge 1990). This situation is aggravated even further by the limited authority delegated to project managers to deal with conflicting interests and potential threats. It may be argued that empathy as a practical competency (Drucker 1993) plays a key role in the project manager's ability to respond to legitimate subcontractor concerns without compromising his or her firm's principal objectives. It has been found that positive internal feeling, feedback, task identity and personal control are correlated with effective performance (Fisher 1978).

Project culture

In addition, since there is often a geographical distance between the contractor's head office and the construction project site, the contractor's organisational culture and management style is often not felt and experienced by those working on the project. The nature of project work, unlike many other managerial situations where managers inherits an organisational culture, provides project managers with considerable influence as to the type of culture they promote and practise on their projects. Bennett (1993) believes that the most appropriate culture for a construction project is one that the work coordination is achieved through trust-based cooperation. In this respect, leadership is not only about strategic planning and conceptual thinking, but it is also about creating a working environment where the project manager gets the very best out of his or her staff, subcontractors and suppliers. Therefore, effective project managers, not only have to manage or as Bennis (1984) describes *do things right*, but also have to lead to *do the right things*.

INFORMATION MANAGEMENT

There are few management books that have not devoted at least a chapter on communication or information management systems. Similarly, very few, if any, management development models and programs that do not include effective communication or information management as a key skill for effective management. Yeo (1993) considers the process of communication through timely transmission of information is the key for effective coordination and control of the project. Gushgari et al (1997) in a survey of 500 engineering firms in US found that communication and listening ranked first and second respectively on the project managers' skills list. The

ability to communicate concisely, timely and adequately plays a crucial role in managing construction project effectively and efficiently. This is partly because of the project isolation and its distance from the centre of higher authority and decision-making, and partly because of the nature of construction work which involves individuals from a multitude of trades—often unknown to each other—as well as design, cost and time variations. Rilling (1990) estimates that 40% of building costs are either directly or indirectly related to flow and control of information.

On the other hand, since there are significant differences in background in education, experience and socio-economic status between different parties working on the same project, both clarity of information and the medium and manner they are disseminated to relevant parties on the project are important for effective communication. In construction, Love *et al.* (1996) believe that one of the main sources for reducing waste is to synchronise the flow of information and resources. Drucker (1993), on managing post-capitalist companies, links information, knowledge and power. He suggests that in the post-capitalism era, information is power that will eventually replace authority. In contrast to capitalism in which information was hidden to protect knowledge and retain power, power in the future will come from transmitting information to make it productive.

Technology

With rapid advancing information technology, there seems to be a greater utilisation of new technologies in managing and disseminating information on projects. Galbraith's central theory (1977) that deals with coping with uncertainty is particularly relevant to managing construction projects. The greater the uncertainty the more information is required to manage multiple tasks. He proposes five strategies to cope with uncertainty: 1) environment management, 2) creation of slack resources, c) creation of self-contained tasks, 4) investment in vertical information systems, and 5) creation of lateral reactions. From this point of view, information disseminating tools such as the Internet and intranet can play important roles in reducing uncertainty and ambiguity in construction processes. Mead (1997) gives an example of a US management consultant which has developed an intranet Web Site to provide the construction team with the up-to-date information relating scheduling, contract drawings and change orders. Billson (1998) supports the project Web Site by pointing out that communication between project participants is the most important element contributing to the success of a project and therefore a centrally located information management system which can gather, record and exchange information is cost effective and therefore worth considering. He refers to a Florida-based firm, MP Interactive, which has reportedly reduced, on average, projects' budget and schedule by 2.2% and 8% respectively. This use of advanced information technology is indicative of business community efforts to connect its external and internal customers to respond quickly to changes in the market and also to predict the likely chain of effects in its markets.

The two management skills described above are used differently depending on the context and situation. For example, an effective people manager is able to communicate effectively the information he has with other project team members. He or she should use the appropriate channel, medium and style of communicating ideas when directing others or discussing an issue with his or her superior. Information and people management, therefore, requires a sense of appropriateness of action for the situation, the relationships with others, and the task involved.

PROJECT MANAGEMENT ORGANISATION

A competitive construction firm of the future is one that adopts the strategies and processes that ultimately aims at pleasing its customers. Since customer *delight* is determined by the extent to which collaboration among many people, particularly in a construction team, the project manager primary roles and skills should be the creation of a learning environment where teamwork and cooperation are facilitated through effective information flow and people management. However, such a working environment, particularly at the time of significant change and uncertainty cannot be created by applying traditional forms of organisations. Nicholas (1990) sees the drawbacks of hierarchical and functional-oriented organisational forms in their inability to respond quickly and efficiently to unanticipated problems. He argues for project organisations to be organic, horizontal and integrative where project managers are the integrator, communicator, motivator, evangelist, decision-maker, entrepreneur and change agent.

To create such a working environment, construction firms and their project managers need to unlearn the traditional hierarchical structure of the past and learn new way of organising projects. The emergent organisation requires a mindset where there is understanding and responsibility (Drucker 1993). Bennis (1984) stresses that leadership requires the ability to manage trust that is mainly determined by reliability or constancy. The model that best fit these descriptions of organisation and managerial leadership is a cooperative model of organisation or what Ouchi (1980) describes as the *clan mode* of control. Mayo (1945), Barnard (1968), Kanter (1972), Galbraith (1973) are among management writers who favour a cooperative form of organising activities under condition of uncertainty and ambiguity whereby control mechanisms of bureaucracy (rules) and market (prices) produce conflict, poor decisions and high transaction costs.

Strategic alliances and partnering are the two most common forms of cooperative agreements. However, while the strategic alliance may be a legal agreement between two or more firms to combine their resources to add value to their individual strengths as well as reduce their cost, partnering which is not normally a legal contract (Stevens 1993) has been used in the construction industry to promote teamwork, open communication, commitment and trusting relationship among project participants (Shirazi 1995). In spite of initial promise and success particularly on major projects, partnering seems to have lost its attraction to improve internal project processes. It may be argued that its guiding principles were not moulded around specific functions and steps within the value chain.

On a construction project, project manager's activities typically involve coordination and control of construction work processes that are carried out by specialist subcontractors. Chan (1993) argues that project managers' responsibilities are affected, in descending order by these factors: 1) client's priority, 2) composition of project team, 3) nature of the project and 4) the personal characteristics of the project managers. To meet these responsibilities, the project manager is assisted by his or her site staff particularly the site manager who is closely involved with coordination and control of subcontractors' work. Project managers, particularly on large construction projects, are more involved in getting suppliers to deliver goods on time and getting paid within a reasonable time, discussing project issues with the construction manager, and informing the client's representative and consultants when needed. To perform all these activities and to keep amicable relationships with these diverse

individuals and groups is a delicate matter which require time, tact, compromises and political sensitivity. In effect, a project manager acts more as a strategist than he or she often realises or the job descriptions suggests (Uyterhoeven 1972). To ensure cost efficient processes (organisational responsibility) and quality products (client's requirements), project managers should have the ability to manage their craftsmen effectively, since they are the ones who influence the quality of the final product. Therefore, project manager's organisational responsibility requires him or her to adopt a tight strategy around the firm's core competence and customer's requirements, but a loose one in his or her relationships with co-workers where flexibility and risk-taking are needed to get the job done.

A PROPOSED WORKGROUP MODEL

We asked the 28 senior project managers in our survey to rank those individuals who work closely with them and whose performance affects their job performance the most. A significant number of the respondents choose three individuals occupying the same position within their project organisation. They are:

- 1) site manager or administrator (n=16),
- 2) construction manager (n=7), and
- 3) client or client's representative (n=3).

Although other individuals including consultants, design engineers, foremen, managing directors and others were mentioned as key or the most important people to the project manager, there was no consensus on any of these individuals. The frequency with which the three individuals were mentioned by our respondents as the top three key individuals was 26, 23 and 16 respectively. Each of these individuals are responsible for decisions or processes related to their own organisation and sphere of authority but all influence the project manager's job and performance one way or another.

An effective project manager has the ability to work cooperatively with these individuals and their respective organisations and to balance his or her organisational responsibility and the demands of other key project participants. However, given the complexity of project processes and diverse individual and organisational priorities and objectives of project participants, project managers should have the conceptual ability to not only see progress of different project activities and processes but also the interface between them and how they all come together to provide an overall picture of the project progress. The best way to achieve this is by forming workgroups or, as Ayas (1996) calls them, self-managed teams, to create a suitable setting for information sharing and continuous learning. Given the importance of site managers, construction manager and client's representative in the project manager's performance, the intra-project workgroup model shown in Figure 1 illustrates the central role that project managers play in coordinating and disseminating information among project participants.

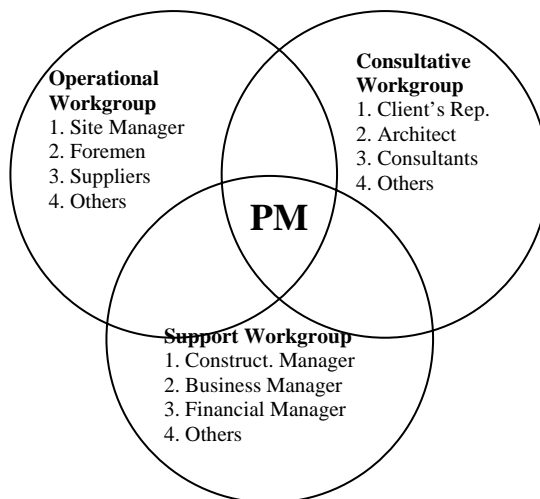


Figure 1: Intra-project workgroup model

The workgroup members may or may not change over life of the project. For example, members of a support workgroup normally belong to a project manager's organisation and therefore stay together unless a member leaves the organisation or is shifted to another position, but members of the operational workgroup change throughout the project life as subcontractors and suppliers finish or commence their tasks on the project. Throughout the life of a project, there may be times when other individuals may attend one or more workgroup meetings. They may include specialists, lawyers or other senior managers representing either the contractor or client organisation or other external organisations, for example, government agencies or citizen groups. The frequency of workgroup meetings varies and changes according to the nature of workgroup responsibilities and roles and the urgency of meetings.

CONCLUSIONS

Project managers who participated in our survey identified management of people and information as the top two competencies they need to deliver their projects successfully. This supports the view that since project managers have little direct authority and control over their subcontractors and suppliers, the only way that they can secure commitment and cooperation of project team members in working towards a desirable outcome is to treat them with respect and dignity. We all strive to find meaning in our life through our work and personal relationships. We want to feel that our work is valued and appreciated. If these are our psychological and social needs, then project cultures and organisations ought to reflect these intangible but important individual and group values and needs.

The intra-project workgroups model proposed here is founded on the principle of a cooperative organisation that allows the fulfilment of human needs in exchange for individual energy and commitment to achieve the desired organisational objectives. The model is also an attempt to assist project managers to secure the support and cooperation of key project members in forums which have clear goals, provide participants with necessary information and feedback they need to do their job and establish rapport and working relationships with key members of other organisations involved in the project. The next stage of our joint research is to include the key

individuals identified in this paper in a more extensive survey which aims to identify the competencies effective project managers will require into the 21st century.

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