

## **BELBIN AND THE FORMATION OF CONSTRUCTION PROJECT TEAMS**

STUART TENNANT

*Bell College of Technology, School of Science and Technology,  
Almada Street, Hamilton, South Lanarkshire, Scotland, ML3 0JB.*

---

### **ABSTRACT**

This research focuses on the industry procedure used for the selection of members to new construction project teams. To date, a great deal of theory and methodology has been written about how to organise and manage teams, the objective of this paper is to benchmark current industry awareness of team formation skills with specific association to the work of Dr. R. Meredith Belbin. Most project managers are likely to have some knowledge of team theory, but it still appears that many project teams fail to deliver the predicted outcomes. A Construction Industry Report from the DETR (1999) states that, "construction projects on average overrun by 9% on time and 1% on cost compared with tender figures". It may be that construction project managers work on the basis of implicit knowledge or are operating in an organisational structure of limited choices, defined demands and decision constraints. The implicit knowledge has been developed through experience, collating good and bad outcomes and aligning these via casual analysis of complex circumstances. The organisational and commercial pressures of a highly competitive industry create an environment that leaves little scope for team evaluation and selection. The team members' specific functional demands create the basis for recruitment rather than research and methodological appraisal. This is especially so when the review and audit phase is omitted and the turnover in the construction project teams is high. The next construction project may be viewed as new and unique but the promotion of team accrual skills may provide a basis for improved project team performance.

The work of Dr. R. Meredith Belbin offers an insight in to team dynamics, providing a framework for selection and possible performance enhancement. The aim of this study is to assess whether the guidelines suggested by Belbin's Team Role Theory is applied in the field of construction project management and to ascertain the potential for improvement within this management theme.

The research methodology concentrates on the formation of project teams within the contracting sector of the United Kingdom construction industry. The results are drawn from two separate, but inter-related studies. The first study is witness statements from senior managers (i.e. Project Directors) responsible for the management of human resources to construction projects; this has been obtained by means of a structured interview and addresses the issues related to project resource allocation. The second study assesses the response of practicing project / site managers to matters of management style and team philosophy by means of a postal questionnaire.

This paper provides commentary on the research findings, identifying opportunities and threats to the empowerment of project management teams. Interpretations of the responses provide a valuable insight in to the current awareness of Belbin's work within the construction industry and it's potential for change on team management philosophy. The results offer positive verification for further analysis in to the promotion of project team formation skills.

### **KEYWORDS:**

Teams; Belbin; Project Management; Construction Industry.

## INTRODUCTION

The application of teams and team working within the construction industry has experienced a renaissance over the last six years. In 1994 The Latham Report “Constructing the Team” acted as a catalyst for change within the construction industry and challenged the sector to explore innovative ways in which to carry out its business to the mutual benefit of the client, industry and private corporation. More recently the promotion of teams and the concept of team building was a principle feature of the Construction Industry Board’s (CIB) Constructing Success – the Construction Strategy Code of Practice, 1997 and was also identified as a key stimulus for change in Sir John Egan’s Rethinking Construction 1998. This has resulted in construction companies becoming more pro-active in their attempt to widen their business portfolio to include an element of alternative procurement contracts, such as joint ventures, consortia and partnering. “The industry must replace competitive tendering with long term relationships,” (Rethinking Construction, 1998). This year the Government reiterated the need for effective team working within construction through the DETR initiative Movement For Innovation (m4i) 2000.

The renewed momentum for high performance team working within the construction industry is beginning to be viewed as absolute and core to the ultimate success of the project, “sound teamwork is now widely regarded as crucial for the achievement of increasingly complex and interrelated social and economic goals,” (Fryer, 1997) and “effective teamwork leads to better results for the client and all in the supply chain,” (CIB, 1997). These observations focus primarily on the broader construction relationships involving the client, designers, contractor and sub-contractor. Essential to improving inter-professional relationships between the key project partners is the selection of suitably qualified construction personnel. Construction project teams require a balance of management expertise, organisational attributes and inter-personal skills to facilitate contemporary contractual arrangements such as partnering. The formation and team-building process of the construction project team may have grown in importance but the temporary nature and workload fluctuation of a project-based industry presents many barriers to the effective selection of suitable people combinations, “the selection of team members is critical to the success of the business and the project but, particularly in the case of the project, is often outside the control of the manager,” (Newcombe *et al*, 1990).

Ultimately, the success of the project may be determined by the level of commitment within the wider project team, elemental to that success is the level of team working within the “component” teams and in particular the construction team. This paper therefore seeks to investigate the mechanisms that senior construction personnel employ to select and shape the construction project team as well as benchmark current industry awareness of team formation skills with specific association to the work of Dr.R. Meredith Belbin.

### Research Rationale

The changing face of the construction industry from an adversarial nature to one of project collaboration and teamwork has been the principle motivation for the undertaking of this research programme. The UK construction industry is becoming progressively more client led, “there have been significant changes in the UK over the past decade and these are likely to continue, if not accelerate. The loss of heavy industry in recent decades and the more recent changes in our approach to commerce – changes in banking, e-commerce etc –mean that the construction industry will have to respond to new clients with changing needs,” (CIRIA, 1999). The formation of construction project teams and the successful application of modern co-operative procurement routes relies on trust and mutual respect as its principal constituents. For this to be effectively applied, the significant contribution of behavioural dynamics should not be under-estimated in pursuit of technical excellence, “there is no doubt that there are key group-person factors which will ensure the success of the project,” (Sommerville and Dalziel 1998). The attractiveness of long-term client-contractor relationship further advances the significance for well-balanced, well-constructed team compositions. The choice of Belbin’s Team Role Theory as a benchmark on which to measure industry awareness and application of team formation theories was, in the main, due to its prominent position within the

commercial and industrial sectors of the United Kingdom, “the best-known model of individual differences in the team context,” (Hardingham, 1997) and, “Belbin’s Team-Role Theory is extensively used as a counselling and team development tool by organizations and management consultancies in the UK,” (Prichard and Stanton, 1999).

## **GROUPS-to-TEAMS**

The benefits of effective team working are well documented, “increased productivity, efficiency and also the increased motivation of the members of a team,” (Adair, 1986) and “the primary and overwhelming organisational motive behind the use of teams is performance enhancement,” (Colenso, 1997). These statements promote the virtue of team performance but first it is important to clearly distinguish the difference between a group and a team. Within the practice of management the term group and team are often used synonymously, “team seems to be used loosely in industry, often being applied to individuals engaged in a common undertaking where their separate roles are ill-defined or non-existent. Team is often used benignly for a group,” (Belbin, 1997). The Oxford English Dictionary, (1970) defines a group as “a number of persons or things gathered or classified together,” whereas it defines a team as “a group of people working or playing together.” These vague definitions require further clarification in order that individuals can be unmistakably characterised as belonging to a group or a team. “A group is less formal than a team,” (Luck and Newcombe, 1996), introduces the concept of structure but requires further clarification with regard to direction and ambition. M. Woodcock and D. Francis (1995) define a team as “a group of people who must directly relate together to achieve shared objectives.” This implies a degree of structure while focusing on the need for shared objectives. Therefore, “the two factors which help distinguish teams from groups are: 1/ the level of dependency and 2/ the degree of commonality,” (Williams, 1996). Consequently, a group may be viewed as a disparate collection of individuals with no shared purpose, whereas the essence of a team is that the individuals share a common goal and where the actions of one member directly influences the chances of success for the other individuals and the team as a whole.

The process of group to teams requires management effort and time, “the conventional wisdom is that teams take at least six months to create,” (Gray and Suchocki, 1996). Within the construction industry many barriers exist which inhibit the promotion of constructive team formation and team building. Issues such as fluctuations in workload, availability of personnel and the temporary nature of project-based environment all contribute to a belief that effective team selection and team-building may be too difficult and short lived for the attainment of any real benefits, “the endemic characteristics of construction projects make the formation of a project team difficult,” (Luck and Newcombe, 1996).

### **Dr. R. Meredith Belbin**

Dr. R. Meredith Belbin is one of the world’s leading authorities on the formation and performance of teams and has conducted extensive research in to management teams and why they succeed or fail. Dr. R.M. Belbin’s concept of Team Role Theory was the result of nine years research carried out at Henley Management College, England. By utilising a number of psychometric tests it became possible to predict team performance and further illustrated that various combinations of personnel would result in varying degrees of success. As the research progressed patterns emerged that could be identified and more importantly related to the typical contributions that individuals brought to a team. After further research Dr. R.M. Belbin identified nine distinct Team Role categories as worthwhile to have in team formations. They were labelled as follows:

*Plant, Resource Investigator, Co-ordinator, Shaper, Monitor Evaluator, Team Worker, Implementer, Completer and Specialist.*

Each category incorporates formulaic behavioural patterns that carry strengths in addition to weaknesses (acceptable and unacceptable). The application of Team Role Theory therefore offers an insight in to team dynamics, providing a framework for team selection and a prediction on the level of team synergy likely to be attained.

## METHODOLOGY

The research methodology for this study concentrates solely on the formation of construction project teams within the contracting sector of the United Kingdom construction industry. Two separate, but inter-related approaches were developed as a method of collecting data from (1) a corporate perspective and (2) a project-based perspective. The first approach employed a structured interview technique to draw together opinions and witness statements from senior managers responsible for the management and allocation of human resources to construction projects. The questions, although linked, were presented in a manner that endeavoured to promote a more relaxed, open and candid dialogue, encouraging anecdotal evidence as a means of illustrating the practice and procedures associated with human resource project planning. It was recognised that in an interview situation, either consciously or subconsciously, the interviewee may respond in a manner they perceive to be appropriate, presupposing the objectives of the interviewer. P. McNeill (1990) stated that the rapport between interviewer and interviewee required careful deliberation otherwise “respondents try hard to please.” The interview comprised of fifteen questions, prearranged under the four main headings, (see Table 1).

Table 1:

<u>HEADING</u>	<u>INTERVIEW THEME</u>
The Industry:	The significance of Latham, procurement choice, performance, partnering and client involvement.
The Project Team (Team Formation):	Project details, complexity, availability, skills, experience, personalities and membership criteria.
Team Training:	Corporate training, project specific team training (workshops), Belbin’s Team Role Theory and psychometric testing.
Other Considerations:	Key issues.

All interviews were recorded, with the permission of the interviewee, and later transcribed, identifying key responses to the fifteen questions posed.

For the second study a questionnaire was posted to practicing project / site managers. The proposal was to gather data relating to construction team issues from a site perspective and to collate the findings with the information gathered from the structured interviews. The matching of data would then permit a degree of information corroboration and provide a useful insight in to corporate aspirations and project reality. The postal questionnaire contained twenty separate questions relating to four main headings, (see Table 2).

Table 2:

<u>HEADING</u>	<u>THEME</u>
Personal & Project Details:	Basic information with regard to job title, age, gender and project duration, value and contract type.
Corporate Management Style:	Required responses to management, leadership and decision-making styles.
Team Working:	Questions relating to current team composition and team training.
Team Theory and Belbin:	Specific to Belbin's team role concept and the significance of team role.

### **Limitations of this Study**

There are a number of limitations associated with this research programme. The gathering of data (interviews and questionnaires) was conducted over a six-week period in July and August 2000 and involved the co-operation of eight construction companies and one construction consultancy group. The selection of construction companies was carried-out by means of formal business contacts and "cold-calling". All participating companies are national / international contractors. Based on turnover, seven of the eight contractors are in the UK top one hundred construction companies. Measuring only contracting turnover, six of the eight companies are in the top fifty, (Building 2000). A senior manager for each of the companies was interviewed plus one construction consultant, specialising in partnering procurement methods. A total of forty questionnaires were posted to project / site managers working for the eight contractors co-operating with this study, with a resultant response rate of forty five percent. Although the numbers involved are small the author believes that the information collected is noteworthy and reflects current team formation awareness and practices within the UK contracting sector.

### **DATA ANALYSIS**

#### **Data Analysis – The Structured Interview**

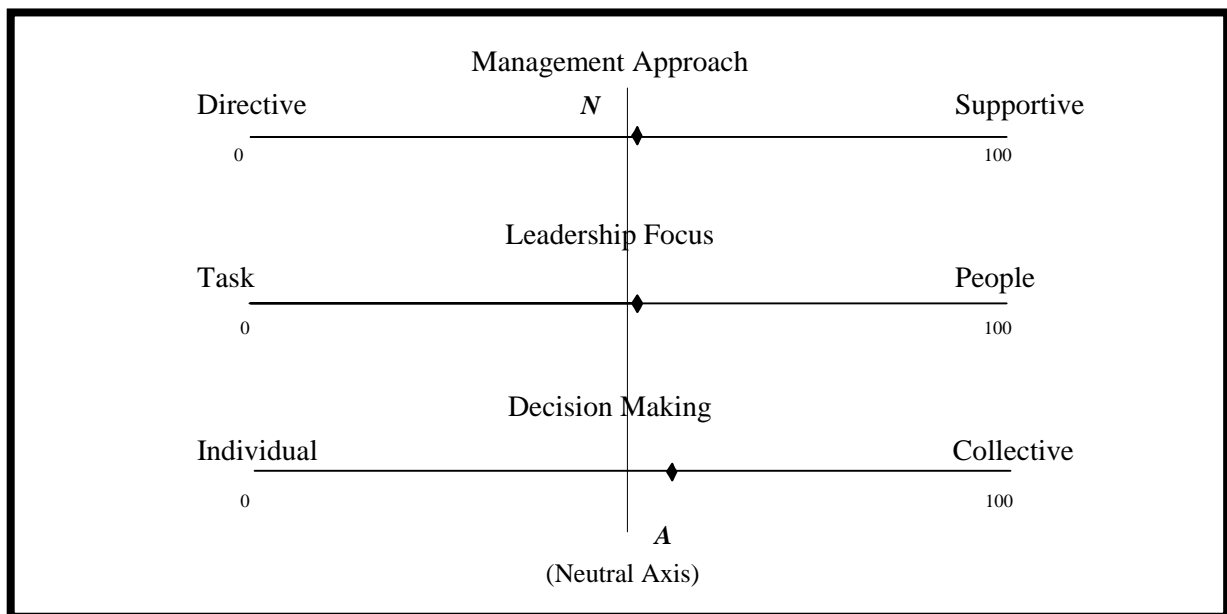
The structured interview consisted of fifteen questions covering four main topics: The Industry; The Project Team; Team Training and Other Considerations. *The Industry:* Five of the eight interviewee's stated that Latham and subsequent Government initiatives had made a significant contribution to the way their company carries out its business, three of the five indicated that central to the change in work practices was the increased level of client involvement. Six companies have or are at present, involved in partnering "style" arrangements; this ranges from 20% - 35% of the corporate portfolio. A noted result of increased client participation was the earlier involvement of the construction team, although this appears to be restricted to enlightened/"smart" and/or repeat business clients. *The Project Team:* All eight of the organisations select their construction teams based on the complexity and value of the project matched against the experience and skill of the personnel available. This approach was generally coined as "horses for courses" although two companies emphasised the need to consider the client organisation when forming the construction team. Five of the companies said that they built the team around one or two key individuals, i.e. a team leader, two companies considered all individuals equally and one company stated that team selection was solely a matter of availability. Two companies acknowledged that partnering partially addressed this problem by giving the company an order book for work "36 - 48 months in advance, providing stability and an

opportunity to plan”. Five companies commented that teams would stay together from one contract to another if possible. The other three stated that they would probably introduce new members in a conscious effort to train and development employee skills and augment workplace experience. Five interviewees’ considered an individual’s personality as a key factor in the success of the team whilst three stated that although important, skill and experience must remain the priority. *Team Training:* Four companies are actively involved in formal company training programmes, three of these companies also organise project-based “workshops”. Six companies felt that team training was necessary, those already participating in project “workshops” spoke enthusiastically about the benefits, while two managers felt that it was the project leaders responsibility to “recognise ability” and “drive the team”. Five interviewees’ had heard of Belbin’s Team Role Theory, three were positive that they had “at sometime” completed Belbin’s Team Role Self Perception Inventory, (BTRSPI); none of the participants were conversant in its meaning or application. The majority of organisations co-operating with this study did not carry out any psychometric profiling of its staff. *Other Considerations:* This section highlighted the management frustration with regard to workload fluctuations, availability and the combination of the two – timing.

**Data Analysis – The Postal Questionnaire**

The postal questionnaire consisted of twenty questions covering four main subject areas: Personal and Project Details; Corporate Management Style; Team Working and Team Theory and Belbin. *Personal and Project Details:* All respondents to the postal questionnaire were male. The majority (94%) were over the age of 30 yrs. with 70% employed as Project Managers and 30% as Site Managers. Project value was split, 40% less than £5m and 60% greater than £5m, 17% of the projects had durations greater than 2yrs. with 78% of projects procured via Traditional or Design and Build contract procedures. *Corporate Management Style:* With regard to management style a neutral pattern emerged, with the following averages being recorded, based on a cardinal scale of zero-to-one hundred, (see Figure 1).

Figure 1: Management Style:



*Team Working:* In response to the question, “how many of the current project team have you worked with before?” 50% of the team formations had no previous experience of working together. The structure of the construction teams ranged between 3-to-25 members, the average team size was 10 members with a team structure embracing all construction professionals. Over 80% of the project / site managers have received no formal team training and a corresponding percentage stated that the

current construction team members had not participated in any organised team building exercises. Teams that had previous experience of work-related team exercises identified project-based workshops as the only method encountered. A slight majority of 56% said they were aware of the reasons behind their particular team composition, quoting previous experience and availability as the principle motive although one manager stated that the client organisation had requested him. *Team Theory and Belbin*: A significant 94% were unaware of Belbin's Team Role Theory and 100% stated that they had never completed a BTRSPI; 67% acknowledged that they may compromise team function (i.e. skill and experience) in pursuit of a more suitable team balance (i.e. personality and values), whilst 84% believe that construction teams would benefit from the application of team building concepts.

## DISCUSSION

The results of the two research methodologies clearly demonstrates that the work of Dr. R.M. Belbin and his concept of Team Role Theory is in the main unknown and untried within the UK construction sector. The utilisation of expert management tools available for supporting team formation has largely gone unnoticed. The questionnaire survey discloses a sizeable number of site personnel that have received no formal team training nor participated in any project specific team exercises. This information is surprising due to the positive witness statements drawn together from the interviews. All interviewees' demonstrated an understanding of team dynamics and the genuine need to consider inter-personal relationships when reflecting upon team formations. Further examination of the results support the initial hypothesis that team selection is primarily based on the subjective judgement of management, developing their team formation skills via causal assessment of personal experience and the application of implicit knowledge. This viewpoint endorses the research observations of Rowings and Federie, (1996), "the analysis of objective data rely upon the evaluator's 'gut-feeling' for who would best fit the situation." A supportive, collective and people oriented management ethos may have been expected from an industry that is labour intensive and heavily dependant on the co-ordination and co-operation of others for a successful outcome. Examination of management style data illustrates a neutral position, suggesting an industry culture that is traditionalist in attitude and conformist in practice.

Exactly 50% of the construction managers participating in the questionnaire survey were members of new team formations. Closer analyses of the results reveal that 75% of the teams, with previous experience, were formed around two or three key individuals. Only one in four teams (25%) could be classified as well-established, i.e. over 50% of the current team membership had previous work experience with the present project / site manager. Availability was a re-occurring theme. The majority of senior managers interviewed freely admitted to resource difficulties directly related to the combination of people and projects. The nature and complexity of the construction environment undoubtedly inhibits the "ideal" formation and composition of human resources and as a consequence impedes the future development of high performance teams. Although, the high percentage (75%) of new and predominately new construction team formations may also indicate an element of management acquiescence to commercial / corporate pressures at the expense of project team unity and stability.

The dilemma of personnel availability and short-term project horizons provide management with the opportunity to apply Belbin's Team Role Theory. Working within the restrictive parameters of the construction industry, managers could ascertain the "best-fit-suitably-balanced" team from the remaining employee pool. This may well promote the efficient and effective deployment of staff, matching project placement with the necessary experience, skills and personalities. Conversely, increased partnering is promoting enhanced workload projections. This may provide progressive companies with the confidence to adopt and facilitate modern team management values. A successful partnering scheme requires cultured group cohesion, "encouraging clients and contractors to transgress the conflicting interests that lie at the heart of their exchange relationship," (Bresnen and Marshall, 2000). This is likely to heighten the level of awareness associated with team formation

skills and the necessity to employ “soft” skills to cultivate a non-adversarial client-industry relationship. Based on information from the interviews and literature research, it is evident that partnering, in its various guises, is increasing in popularity, “traditional procurement systems remain the most frequently used in practice however, in recent years there has been a significant shift towards alternative strategies,” (Ashworth and Hogg, 2000). As a result, project collaboration may well raise the intellectual capacity required for selecting and constructing well-balanced teams. Contemporary procurement procedures may promote contemporary management philosophies, only then is it likely that Belbin and/or other team management specialists will begin to influence the formation and selection of construction project teams.

### **Future Research**

This research has identified a gap in the current practice of construction project team management. To date the contribution of Dr. R.M. Belbin’s Team Role Theory on the formation of construction project teams remain conceptualised and unproven. Further investigation is therefore required to evaluate the potential impact of Team Role Theory in construction.

### **CONCLUSION**

For an industry profoundly reliant on high performance teamwork it is surprising to conclude that the criteria for team selection remains deficient in its formal appraisal of humanistic skills. “Industries, other than construction, for example, petro-chemical, pharmaceuticals, have long undertaken psychometric testing of team members in order to establish, and build upon, the particular strengths of the individuals,” (Sommerville and Dalziel, 1998). Reluctant to employ psychometric profiling, hesitant to become pro-active in formal team training and cautious of textbook theory, a mainstream management “mind-set” may well be a less tangible characteristic of the construction industry. An unwillingness to adopt and adapt contemporary management team philosophy may result in a missed opportunity to create and coach high-performance construction teams capable of satisfying the modern day demands of Government and clients.

### **ACKNOWLEDGEMENTS**

The author would like to thank the construction companies for their support and co-operation with both the interview and questionnaire surveys.

### **REFERENCES**

- Adair, J., 1986. “Effective Teamwork”. Gower Publishing Company Limited, Hants.
- Ashworth, A. and Hogg, K., 2000. “Added Value in Design and Construction”. Pearson Education Limited, Essex, England.
- Belbin, M., 1997. “Team Roles at Work”. Butterworth-Heinemann, Oxford.
- Bresnen, M. and Marshall, N., 2000. “Partnering in Construction: a critical review of issues, problems and dilemmas”. Construction Management and Economics, No.18, pp. 229-237.
- CIRIA, 1999. “Adopting Foresight in Construction”. HMSO, London.
- Colenso, M., 1997. “High Performing Teams...in brief”. Butterworth-Heinemann, Oxford.
- Construction Best Practice Programme, 1997. “Construction Project Pact”. Construction Industry Board, London.
- Egan, J. 1998. “Rethinking Construction” HMSO, London.



Fryer, B. 1997. "The Practice of Construction Management". Blackwell Science Ltd. London.

Gray, C. and Suchocki, M.V., 1996. "Rapid Integration to Overcome the Construction Industry's Fragmentation". CIB W65, The Organisation and Management of Construction, E & FN Spon, London.

Hardingham, A., 1997. "Working in Teams". Institute of Personnel and Development, London.

Luck, R.A.C. and Newcombe, R., 1996. "The Case For The Integration Of The Project Participants' Activities Within A Construction Project Environment". CIB W65, The Organisation and Management of Construction, E & FN Spon, London.

McNeill, P., 1990. "Research Methods". Routledge, London.

Newcombe, N., Langford, D. and Fellows, R., 1990. "Construction Management 1". The Mitchell Publishing Company, London.

Prichard, J.S. and Stanton, N.A., 1999. "Testing Belbin's Team Role Theory of Effective Groups". The Journal of Management Development, Vol 18, No. 18, pp. 652 - 665

Rowings, J.E.Jr. and Federie, M.O., 1996. "People and Projects – Building Successful Combinations". CIB W65, The Organisation and Management of Construction, E & FN Spon, London.

Sommerville, J and Dalziel, S., 1998. "Project teambuilding – the applicability of Belbin's team-role self-perception inventory". International Journal of Project Management, Vol. 16, No. 3. pp 165 - 171.

The Oxford English Dictionary, 1970. Oxford University Press.

Williams, H. 1996. "The Essence of Managing Groups and Teams". Prentice Hall, Hertfordshire.

Woodcock, M. and Francis, D., 1995. "Teambuilding Strategy". Gower Publishing Company Limited, Hants.