

THE PERFORMANCE OF THE PROJECT COALITION IN THE UK CONSTRUCTION INDUSTRY: A CONCEPTUAL OPTIMISATION MODEL

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ABSTRACT

The UK construction industry has long been criticised for engendering adversarial relationships among project participants. The nature of interrelationships ultimately determines overall project performance, in terms of finished product, and levels of performance and satisfaction for the participants. To investigate these interrelationships, the performance and satisfaction of each individual participant must be considered. Better understanding of the interrelationships should help reduce adversarialism and improve the performance and satisfaction of each participant. The possible interrelationships that may exist are discussed based on 'soft knowledge' approaches, i.e. psychology, organisational behaviour and sociology. It is concluded that the performance of each participant is interdependent and essential towards project performance. Two levels of satisfaction, which determine the quality of working relationships between participants, are postulated. The first level of satisfaction (i.e. satisfaction on achieving organisational objectives) is, to some extent, dependent on the second level of satisfaction (i.e. satisfaction on the performance of the other participants). Therefore, within the construction project coalition, each participant has to be satisfied with the performance of the other participants if harmonious working relationships are to be sustained. Based on these, a conceptual model for optimising the relationships between main participants of the project coalition is presented.

Keywords: Coalition participants, Interrelationships, Performance, Satisfaction

INTRODUCTION

The construction project coalition is a unique organisation. This uniqueness is characterised in the main by disintegration, i.e. separation of product design and production process [1, 2], temporariness of the organisation [3-7], and interdependence among participants [5, 8]. These characteristics influence how participants of the project coalition (PC) conduct their respective activities and interact with each other. This interrelationship ultimately determines overall project performance and individual participant performance.

Close coordination and good working relationships among project participants have been found to be the most important factors contributing to perceived project success [9].

Moreover, project performance can be enhanced by a high degree of co-operation between participants [10, 11]. In this context, success means that certain expectations for a given participant were met, whether this be the client, the contractor, or the designer [12]. However, 'good' relationships among these participants are rarely found [13]. Participants are often involved in protracted contractual disputes leading to costly settlement, arbitration or legal action. This adversarial nature is, of course, far from the expectation of participants. One of the main reasons why such evolves may be that each participant has their own 'agenda' for a particular project which can conflict with those of other participants [14]. Each participant may have goals (or success criteria) that are different from those of others [12, 15, 16]. In this case, clients' requirements often become paramount [17]. However, failure to appreciate other participants' goals and requirements can result in interorganizational conflicts and contractual disputes. To satisfy their own objectives and improve overall project performance, each participant should realize the importance of

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other participants' objectives. This may seem idealistic to some extent, but is a truism all the same.

To investigate the interrelationships between project participants, with respect to overall project performance, the performance and satisfaction of each individual participant must be focused upon. Within the context of the PC and the interdependence among its participants, this paper considers the relevance and the need for a conceptual optimisation model of performance and satisfaction; and the possible performance and satisfaction interrelationships that may exist based on 'soft knowledge' approaches, i.e. psychology, organisation behaviour and sociology. The conceptual model for optimising the relationships between main participants of the PC is also presented.

THE NEED FOR IMPROVEMENT

The construction industry has long been criticised for engendering adversarial relationships among project participants. Participants are known to focus on achieving their own objectives, with no, or little, regard for the objectives of others [18]. Sometimes, individual objectives are attained at the expense of others. A participant may gain short term benefits at the expense of long term benefits derived from harmonious working relationships. This 'short-sightedness' is synonymous with the construction industry. If this situation remains, participants will continue to suffer and clients will continue to be dissatisfied with the service provided by the industry.

The Latham report [19] encouraged 'win-win solutions' to modern-day construction problems. All participants should strive to improve their performance and acquire goal attainment leading to satisfaction. This will derive long term mutual benefits for participants. Enhanced client satisfaction will encourage more clients to employ the industry in the future. Other participants will benefit from the increased possibility of gaining such work. Ultimately, the construction industry and the UK economy as a whole will benefit through a greater workload, improved quality, improved satisfaction, less waste, etc., i.e. continuous improvement. The recent Egan report [11] revealed that many clients are still dissatisfied with contractors' and consultants' performance. The construction industry is also continuously criticised due to its failure to meet its own needs and the needs of

its clients. Therefore, there is a need to investigate the interrelationships between participants of the construction PC (that is, in terms of their performance and satisfaction) with the ultimate aim being to help reduce adversarialism and improve the performance and satisfaction of each participant. Reducing the current adversarial culture would help improve the performance and satisfaction of each participant. If the performance of each participant is improved, total project performance will be enhanced. Better total project performance should bring higher client satisfaction since client objectives may manifest in project objectives.

BASIC CONCEPTS UNDERLYING THE MODEL

Definition of Project Coalition (PC)

The PC is a temporary multiorganisation [3-6] that undertake construction projects for client organisations. Traditionally, main participants of the PC are the client, the contractor and the architect. These participants appoint persons/teams to represent their organisations in the PC.

Interrelationships between Main Participants of the PC

The interrelationships between participants of the PC contribute significantly to overall project performance. Performance is most effectively measured by levels of satisfaction. Each participant has to be satisfied with the performance of the other participants if good working relationships and suitable levels of cooperation are to be sustained. Here, performance is defined in terms of roles within the PC, while satisfaction is defined in terms of roles in the process. The performance and associated satisfaction levels of other participants (e.g. suppliers, subcontractors) is outside the scope of this paper.

Interdependence among Participants: A View of Organisational Sociology

While relationships among participants are temporary, they are highly interdependent in nature [5, 8]. Coalition participants require certain actions to be undertaken by others in order to enable them to perform their own respective tasks. This is defined by Bates [20] as a reciprocal relationship. Hence the performance of a participant depends to some extent on the

performance of others. The relationship between participants can also be partly described as a conjunctive relationship. That is, for a participant to perform their function or accomplish their goal they must conduct their task in conjunction with another [20]. Bates argued that the difference between reciprocal and conjunctive relationships is in terms of goal orientation. In the former, all participants have a common goal. However, in the latter each participant has an individual goal which can be distinguished from other participants' goals. Thus, it can be demonstrated that participants of the PC each have their own goals, but also share the common goal of delivering the final product, i.e. the project under construction, to the client satisfaction.

According to basic organisational theory, a particular organisation is composed of interdependent parts [21, 22]. Thompson [21] discovered the types of interdependence and coordination between such parts. The nature of interdependence and coordination between participants of the PC can be categorised as reciprocal interdependence and coordination by mutual adjustment.

Reciprocal interdependence is where the outputs of a participant become the inputs of others and vice-versa. Thompson [21] argued that if an organisation is involved in reciprocal interdependence then it will also include pooled and sequential interdependence (considered as lower level types of interdependency). Pooled interdependence occurs when each part of an organisation is least dependent on other parts; but each part discretely contributes to the whole organisation and is supported by the whole. Sequential interdependence (which is less dependent than reciprocal interdependence but more dependent than pooled interdependence) is where an outcome of one part of the organisation becomes an input for another part; but the output of the latter does not become the input for the former.

Each type of interdependency requires a specific type of coordination. Pooled interdependence requires coordination by standardisation. Sequential interdependence needs coordination by planning. Coordination by mutual adjustment, which is required by reciprocal interdependence, involves effective communication of new information and decisions during the action (i.e. construction processes). Moreover, the more variable and unpredictable the situation, the greater the reliance on coordination by mutual

adjustment [21]. It may be concluded that the more complex the interdependency, the more complex the interactions and the interrelationships between parts of an organisation become. An example in the construction project environment would be where the contractor requires drawings from the architect; who in order to keep up to date with conditions on site, requires certain information from the contractor which can then be incorporated into drawings. This example illustrates the reciprocal interdependence and the coordination by mutual adjustment which requires appropriate communication and decision making.

Moreover, Mohsini [5] argued that interdependence can be symmetrical or asymmetrical (i.e. both or only one of the two concerned organizations has incentive to co-ordinate), and it can range from high to low. Symmetrical interdependence is where both participants comply to each others requirements. In contrast, asymmetrical interdependence occurs where one participant has to comply to another participant, but the latter does not have to comply to the former. Symmetrical interdependence between organizations may promote collaboration while asymmetrical interdependence may lead to conflict.

Relationships between Performance and Satisfaction: A View of Psychology and Organisational Behaviour

Back in the late 1960s, Locke established the theory of task performance and satisfaction in the field of organisational behaviour and psychology [23-25]. The theory argues that performance is most effectively determined by the achievement of goals, while satisfaction is a function of the discrepancy between performance achieved and performance targeted. In other words, satisfaction is a function of comparison between an individual's perception of an outcome and their expectation for that outcome [26].

Furthermore, Locke [27] reported that the emotional responses (i.e. feelings of satisfaction and dissatisfaction) are also dependent on value importance; that is how an individual deems a certain aspect of the task in their value hierarchy. Leading from this, the implications for participants of the PC are now considered. That is, how one participant of the PC values a certain task undertaken by another participant; and how this impacts their own performance and levels of satisfaction.

The extent to which the performance of other coalition participants impacts upon the performance of another will determine that participant's perceived importance of the others performance. This is because the satisfactory performance of 'other' coalition participants enables another participant to achieve their own goals and to perform better. From this discussion, two levels of satisfaction are postulated. First, the satisfaction of a coalition participant upon achieving the goals of their own organisation, and secondly, the satisfaction of a participant derived from the performance of other participants.

In construction, performance is an individual's (client, architect, contractor) contribution to the execution of the task required to complete the project [28]. Therefore, it can be said that the performance of each participant contributes to overall project performance. The performance of one participant does not necessarily directly bring satisfaction to other participant(s); the linkage is far more complicated. The performance achieved by one participant affects the goal attainment of other participants. The attainment of goals may bring satisfaction to those participants affected by such attainment. Therefore, goal attainment is considered as a first level outcome whereas satisfaction is considered as a second level outcome [28].

Concerning the second level of satisfaction, each participant sets the expected goal levels of others. For instance, the client desires certain levels of performance (goal levels) from the architect and contractor, which affect attainment of the client's goal. If the performance of the architect and contractor exceed the goal level expected, then the client perceives that they have succeeded the tasks assigned to them. This will provide a feeling of satisfaction to the client. However, the client's levels of satisfaction may vary based on how much the goal levels have been exceeded. Therefore, criteria or other quantitative measures are needed for comparing goal levels against the performance levels thus giving a goal/performance discrepancy index to show the degree to which the goals have or have not been achieved. Evaluation outcomes represent success or failure and/or subsequent feelings of satisfaction or dissatisfaction [28].

The Relationship between the Performance of PC Participants

The performance of one participant is, to a certain degree, affected by the performance of

another. This is described by Hamner and Harnett [29] as a cooperative-interdependent task, i.e. where the performance of an individual is partly determined by how well another perform their tasks. Arge [30] for example, indicated that architectural quality is determined by client performance. A qualified client is instrumental in securing good architecture [30]. Kometa et al. [31] argued that certain attributes associated with client organization also affect the consultant's performance and, hence, construction project performance. Moreover, Tam and Harris [32] identified external factors affecting contractor performance consisting of other participants' performance, i.e. architects and clients. These factors included architect/engineer drawings, architect's or client's supervision and control of the quality of work, control of work progress, and punctuality of payment by the client.

A CONCEPTUAL MODEL FOR OPTIMISING THE RELATIONSHIPS BETWEEN MAIN PARTICIPANTS OF THE CONSTRUCTION PC

Figure 1 shows the performance model for individual organisations (in this case contractor) of the PC. Performance within the PC is a manifestation of the performance attributes (i.e. characteristics of that organisation, such as past experience, turnover, references, etc.), and is driven by performance objectives. In sum, it is shown that the performance of each participant contributes to overall project performance.

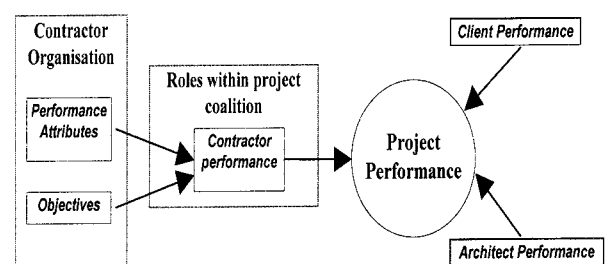
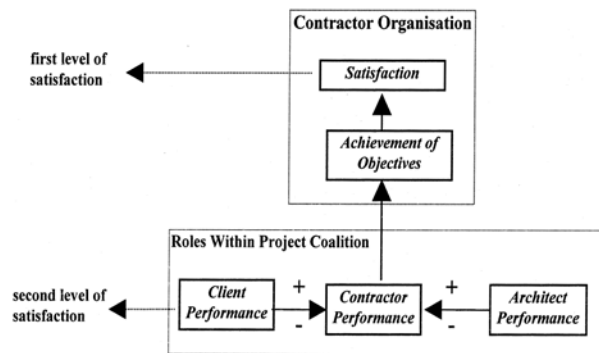


Figure 1. Performance model for contractor

Figure 2 illustrates the performance and satisfaction model for individual organisations (e.g. contractor) of the PC. It shows how performance brings satisfaction for one participant (in this case the contractor) through the achievement of their objectives. With regard to the first level of satisfaction, achievement of objectives will bring satisfaction within the (e.g. contractor) organisation. However, objective achievement may depend on the satisfactory

performance of the other two participants, if and only if, in order to perform well, the contractor needs a certain level of performance from them. It also depicts the interrelationship between the performance of participants. The performance of one participant is not solely dependent on their own performance, but also on the performance of other participants. The performance of other participants when evaluated will create feelings of satisfaction or dissatisfaction for that participant. This is the second level of satisfaction. The horizontal links shown in Figure 2 indicate how each participant evaluates the performance of other participants.



Note: + : satisfactory performance evaluation,
 - : unsatisfactory performance evaluation

Figure 2. Performance and Satisfaction Model for Contractor

Figure 3 shows as a whole, the relationships and interrelationships between performance, satisfaction, attributes and objectives of all participants in the PC. It is worth noting that the second level of satisfaction, which is derived from the outcome of the evaluation of others' performance, may explicitly bring good working relationships between participants of the PC since a participant performance directly impacts project performance and the performance of others. Here, each participant has to be satisfied with the performance of the other participants if harmonious working relationships are to be sustained. However, the first level of satisfaction, which is within the individual organisation, is derived from the achievement of organisational objectives. The performance of other participants may enable a participant to perform certain actions which could lead to the achievement of these objectives. This is at the core of satisfaction/dissatisfaction feelings which, at certain levels, may implicitly bring good working relationships between participants of the PC. That is, the achievement of organisational objectives may indirectly impact project performance and the performance of

others, and ultimately derive satisfaction/dissatisfaction feelings in undertaking a particular project.

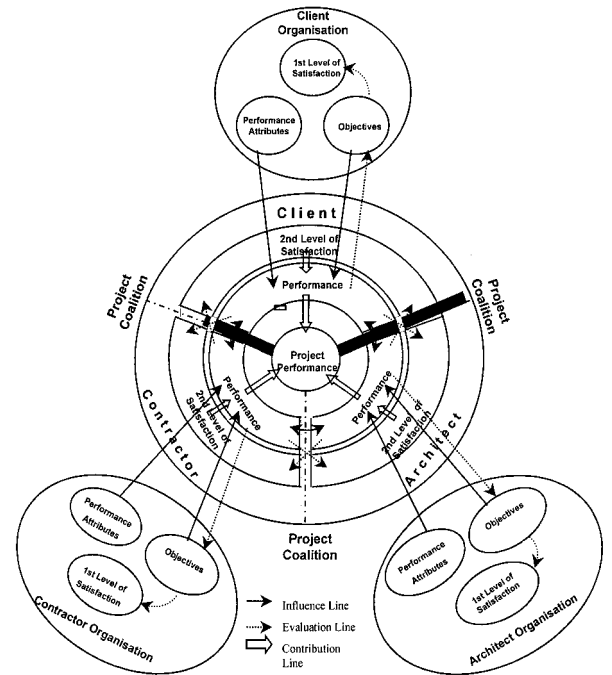


Figure 3. Performance and Satisfaction Model for Main Participants of PC

CONCLUSION

Even though good working relationships and cooperation between participants have been recognised as prerequisites for project success and good project performance, the adversarial relationships among project participants still exist. This is partly influenced by the unique nature of the construction PC. However, to reduce adversarialism through investigation of PC interrelationships, the performance and satisfaction of each participant must be considered. In this paper, the possible performance and satisfaction interrelationships between participants have been discussed. This is because to achieve harmonious working relationships and to enhance performance and satisfaction, human factors should be focused upon.

The paper has highlighted the need for improved performance and satisfaction of each participant and reduced adversarialism. As a general hypothesis, if the performance of each participant is improved, total project performance will be enhanced. To help achieve this, a conceptual model for optimising the relation-

ships between main participants of the construction PC has been presented.

Several key points underlying the development of the model are as follows:

- The performance of each participant within the construction PC is a manifestation of the performance attributes and is driven by performance objectives. The performance of each participant is essential towards overall project performance.
- The performance of main participants of the PC is interdependent. The performance of a participant impacts the performance of others. Therefore, the performance of a participant will influence the satisfaction levels of other participants.
- Two levels of satisfaction determine the quality of the relationships between participants. First, the satisfaction of a participant upon achieving the goals of their organisation, and secondly, the satisfaction of a participant derived from the performance of other participants. The first level of satisfaction is, to some extent, dependent on the second level of satisfaction. Therefore, within the construction PC, each participant has to be satisfied with the performance of the other participants if harmonious working relationships are to be sustained.

REFERENCES

1. Nam, C.H. and Tatum, C.B., Noncontractual methods of integration on construction projects, *Journal of Construction Engineering and Management, ASCE*, 1992, vol. 118(2), pp. 385-398.
2. Puddicombe, M.S., Designers and contractors: impediments to integration, *Journal of Construction Engineering and Management, ASCE*, 1997, vol. 123(3), pp. 245-252.
3. Cherns, A.B. and Bryant, D.T., Studying the client's role in construction management, *Construction Management and Economics*, 1984, vol. 2, pp. 177-184.
4. Reve, T. and Levitt, R.E., Organization and governance in construction, *Project Management*, 1984, vol. 2(1), pp. 17-25.
5. Mohsini, R.A., Performance and building: problems of evaluation, *Journal of Performance of Constructed Facilities, ASCE*, 1989, vol. 3(4), pp. 235-242.
6. Mohsini, R.A. and Davidson, C.H., Determinants of performance in the traditional building process, *Construction Management and Economics*, 1992, vol. 10, pp. 343-359.
7. Munns, A.K., Measuring mutual confidence in UK construction projects, *Journal of Management in Engineering, ASCE*, 1996, vol. 12(1), pp. 26-33.
8. Higgin, G. and Jessop, N., *Communications in the building industry: the report of a pilot study*, Tavistock Publications Limited, London, 1965.
9. Baker, B.N, Murphy, D.C. and Fisher, D., Factors affecting project success, in: *Project Management Handbook*, 2nd edition, Cleland, D.I. and King, W.R. (eds.), Van Nostrand Reinhold, New York, 1988.
10. Smith, A. and Wilkins, B., Team relationships and related critical factors in the successful procurement of health care facilities, *Journal of Construction Procurement*, 1996, vol. 2(1), pp. 30-40.
11. Egan, J., Rethinking construction, *The report of the Construction Task Force on the scope for improving quality and efficiency in UK construction*, Department of the Environment, Transport and the Regions, London, 1998.
12. Sanvido, V., Grobler, F., Parfitt, K., Guvenis, M. and Coyle, M., Critical success factors for construction projects, *Journal of Construction Engineering and Management, ASCE*, 1992, vol. 118(1), pp. 94-111.
13. Smith, J., Jackson, N. and Wyatt, R., Strategic needs analysis: searching for viable solutions, in: *Proceedings of Construction and Building Research (COBRA) Conference*, Keeping, M. and Shiers, D. (eds.), The Royal Institution of Chartered Surveyors and Oxford Brookes University, Oxford, 1998, vol. 1, pp. 7-21.
14. Gardiner, P.D. and Simmons, J.E.L., Analysis of conflict and change in construction projects, *Construction Management and Economics*, 1992, vol. 10, pp. 459-478.
15. Cyert, R.M. and March, J.G., *A behavioral theory of the firm*, 2nd edition, Blackwell Publishers, Cambridge, Massachusetts, 1992.

16. Naoum, S.G., Relationship between the building team, procurement methods and project performance, *Journal of Construction Procurement*, 1995, vol. 1(1), pp. 50-63.
17. Barnes, M., Construction project management, *International Journal of Project Management*, 1988, vol. 6(2), pp. 69-79.
18. Thompson, P.J. and Sanders, S.R., Partnering continuum, *Journal of Management in Engineering, ASCE*, 1998, vol. 14(5), pp. 73-78.
19. Latham, M., Constructing the team, *Final report of the government/industry review of procurement and contractual arrangements in the United Kingdom construction industry*, HMSO, Department of Environment, London, 1994.
20. Bates, F.L., Institutions, organizations, and communities: a general theory of complex structures, *Pacific Sociological Review*, 1960, vol. 3(2), pp. 59-70.
21. Thompson, J.D., *Organizations in action: social science bases of administrative theory*, McGraw Hill Inc., New York, 1967.
22. Silverman, D., *The theory of organisations: a sociological framework*, Gower Publishing Company Limited, Hants, England, 1970.
23. Locke, E.A., Job satisfaction and job performance: a theoretical analysis, *Organizational Behavior and Human Performance*, 1970, vol. 5, pp. 484-500.
24. Locke, E.A., Cartledge, N. and Knerr, C.S., Studies of the relationship between satisfaction, goal setting, and performance, *Organizational Behavior and Human Performance*, 1970, vol. 5, pp. 135-158.
25. Locke, E.A. and Latham, G.P. (1990), *A theory of goal setting and task performance*, Prentice Hall, New Jersey, 1990.
26. Ilgen, D.R. and Hamstra, B.W., Performance satisfaction as a function of the difference between expected and reported performance at five levels of reported performance, *Organizational Behavior and Human Performance*, 1972, vol. 7, pp. 359-370.
27. Locke, E.A., What is job satisfaction? *Organizational Behavior and Human Performance*, 1969, vol. 4, pp. 309-336.
28. Liu, A.M.M. and Walker, A., Evaluation of project outcomes, *Construction Management and Economics*, 1998, vol. 16, pp. 209-219.
29. Hamner, W.C. and Harnett, D.L., Goal setting, performance and satisfaction in an interdependent task, *Organizational Behavior and Human Performance*, 1974, vol. 12, pp. 217-230.
30. Arge, K., Architectural quality, *Building Research and Information*, 1995, vol. 23(4), pp. 234-236.
31. Kometa, S.T., Olomolaiye, P.O. and Harris, F.C., Attributes of UK construction clients influencing project consultants' performance, *Construction Management and Economics*, 1994, vol. 12, pp. 433-443.
32. Tam, C.M. and Harris, F.C., Model for assessing building contractors' project performance, *Engineering, Construction and Architectural Management*, 1996, vol. 3(3), pp. 187-203.