

CRITICIZING THE 'TECHNIQUES OF COMMUNICATION' APPROACH: A RESPONSE

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A response is provided to the critique by Wild (2001) of Moore and Dainty's research concerning teamworking in UK design and build (D&B) projects. The response covers two significant aspects of the critique. Firstly, a deconstruction of the concept of residual categories is presented. This is identified as a tool used in the study of problems within the field of economics, particularly macroeconomics. The application of such a tool to a problem of a socio-dynamic nature is critically questioned. Secondly, the suggested alternative emphasis on 'situations' is explored. This paper posits that a more appropriate perspective on the issue of the role and value of teams within projects can be found in a combination of D'Herbemont and Cesar's development of the concept that project stakeholders can be identified as antagonists or allies to the project, and the work of Wenger and others on communities of practice. The paper also seeks to develop further suggestions flowing from the initial research through a consideration of the emerging issue of sapiential authority endowed on what are referred to by Banner and Gagne as knowledge workers.

Keywords: residual categories, team, sapiential authority, allies and antagonists, communities of practice.

INTRODUCTION

In the 2001 ARCOM conference, Wild (2001) presented a critique of a study conducted by Moore and Dainty (see Moore and Dainty, 1999; 2000; Dainty and Moore, 2000. Also see: Moore and Dainty 2001) in which they explored intra-group communication within integrated D&B project teams. This paper deconstructs Wild's critique and questions some of the conceptual and philosophical underpinnings of his article.

Two characteristics that are frequently claimed for the UK construction industry are that it is a team industry and that it is project based. Both of these claims have been researched in some detail, with the team characteristic perhaps receiving the most explicit attention as evidenced by publications such as *Constructing The Team* (Latham, 1994). However, the team nature of the industry has also been linked to the problem of fragmentation and discontinuity, particularly with regard to the issue of professional 'tribes' and intra-professional boundaries. Wild (2001) views the literature on teams within the construction process as simply being an opportunity for '...a supply of team-building consultants to trundle their wares into the market as solutions, pre-packaged by economic necessity from internal projects.', as he notes from the work of Mumford. This negative perspective on the role of teams permeates

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Wild's critique and seems to flow from a perception of a politicisation of the structure of the construction industry ('..the political context of reports on construction..'). Given that government is a major client of the industry, combined with the generally acknowledged economic importance of it to the country, this perceived politicisation is perhaps inevitable. However, at no point in our work did we perceive the team to be in any form a political (or any other form) ideal. Rather, the team is viewed within our papers as being differentiated from the group. This is on the basis of their willingness to achieve what Katz and Kahn (1978) refer to as synergy through a recognition of sapiential authority (Banner and Gagne, 1995) in the context of knowledge and experience (posited as being examples of Miller and Rice's (1970) 'territory'). This perspective also links with the research on communities of practice, and the issue of teams is discussed further in the section covering such communities.

Wild (2001) criticises the use of the term boundaries, particularly in relation to the further term of interfaces, in the papers by Moore and Dainty (Moore and Dainty, 1999; 2000; Dainty and Moore, 2000). Wild particularly notes that 'The important tacit assumptions are those concerned with boundaries and interfaces; integration, groups and teams in projects' and asserts that '..these will not bear the interpretive significance set upon them.', regarding them as a terminal value thereby illustrating the fallacy of assuming the consequent. Such an interpretation takes a similar perspective to that of the Solow residual in that it assumes exogeneity in the operation of teams. This point is discussed in further detail in the section on residual categories (the issue of boundaries is also further discussed in the context of communities) and serves to refute the suggestion of assuming the consequent.

The project-based characteristic of the industry has perhaps been less explicitly researched than its team-based characteristic. If the standard definition of a project as being something with a start, middle and end is accepted, it is perhaps understandable that researching 'projects' has tended to be done by association. Typically this will include some aspect of performance, usually with regard to the so-called 'iron triangle' of time, cost and quality. Wild (2001) notes that the project discussed by Moore and Dainty was successful even though no teambuilding had been undertaken. This is on the basis that it met the time, cost and quality (TCQ) criteria stated. Unfortunately, the iron triangle is composed of essentially crude measures of performance. Taking the meeting of them as being evidence of success ignores the issue of performance improvement, particularly when a connection between project performance and the functioning of the project team is sought, as evidenced by:

Time and cost metrics for a given project are typically estimated on a relatively low level of information that is variable in its degree of certainty. The quality metric is also argued to be one that emerges over the duration of a project, and is therefore a reflection of individuals' attitudes and beliefs (Atkinson, 1999). These may well change over the lifetime of a project.

The members of a project team face demands on modern projects that may well go beyond the project boundaries as determined by cost, time and quality metrics. The APM Project Management Body of Knowledge argues that project managers (as one member of the project team) actually develop a broad range of competencies and abilities that are both internally and externally focused (Patel and Morris, 1998).

Wild's argument in respect of teams and performance may result from his refutation of what he regards as being a '..key tacit assumption..' within the work of Moore and Dainty that construction is manageable (Wild, 2001). If construction is indeed not

manageable then we are back at the pre-industrial era situation of production being essentially accidental, in the manner that Wild regards team integration as occurring ‘fortuitously’. Nonetheless, the work of Moore and Dainty does not seek to constrain the construction process through the imposition of dogma such as that all activities can be managed. Such a contingency-based approach is increasingly irrelevant to the rate of change being faced by modern industries. However, this should not be taken as meaning that the appropriate use of management cannot contribute to an optimised production process. The event management approach discussed by D’Herbemont and Cesar (1998), and covered in the section dealing with allies and antagonists, is one example that rebuts such an interpretation.

It is against this background that Moore and Dainty’s papers on the nature of design and build project teams (Moore and Dainty, 1999; 2000; 2001; Dainty and Moore, 2000) have reported research findings with regard to the responses of such team members to unexpected change events (UCEs), and how success criteria were determined by them. Wild (2001) suggested that a more appropriate approach would be to consider an emphasis on ‘situations’. Within this paper we seek to critique Wild’s argument and also provide a further development of our earlier work.

RESIDUAL CATEGORIES.

Residual categories are essentially an attempt to quantify what is not known (also referred to as “..the measure of our ignorance..” (Gordon, 1993)) with regard to a particular dynamic, and flow from the early work by Solow on economic growth. Solow sought to identify what was referred to as an autonomous growth factor and proposed an equation by which the value of such a factor could be established:

Fig.1 The Solow Autonomous Growth Factor Calculation.

$$\alpha = (y-n) - b(k-n)$$

where α = autonomous growth factor, y = growth rate of output, n = labour input, b = elasticity, k = capital input. (Gordon, 1993).

A problem arose when it became apparent that approximately 88% of the growth in output per hour of work ($y-n$) over the period studied (1909-1957) was attributed by Solow to what he referred to as “technical change in the broadest sense” (including factors such as education, innovation and research). This resulted in critics referring to the equation as only superficially addressing the issues of economic growth and slowdown; knowing that a factor such as α contributes to the growth process should not be taken as meaning that the components of the factor are understood, as is suggested by referring to it as technological change. They preferred to refer to α as being the residual; everything that is left over after all the known contributors to growth have been deducted from the growth achieved (Gordon, 1993). Wild (2001) appears to adopt this same perspective by suggesting that there is a residual element to the proposal by Moore and Dainty (2000). This aspect of the argument is not contested, in that the research carried out in support of the paper was not intended to identify *all* possible factors within the responses by individuals (who congregate to form teams) to UCEs. It is therefore possible that the interpretation of the research findings does not identify all factors within the dynamic, and that a residual results. However, Wild states further that there are residual categories within the research, thereby suggesting that the previously unidentified factors can indeed be identified (in

the manner of the factors within Solow's technical change). This development appears to ignore three significant problems that have been identified by critics of Solow's model: exogeneity, incentives and non-convergence (Gordon, 1993).

The residual in Solow's model is argued to be exogenous in that it arrives unexplained and therefore gives no indication of how it can be managed. Its value is therefore diminished: it appears to be simply a matter of chance. Wild's (2001) assertion that the work of Moore and Dainty has significant residual categories with respect to interfaces, integration, team-building and communication is susceptible to the criticism of inherent exogeneity, particularly in connection with respect to teams. The assertion by Wild that effective teams were such all along (i.e. with no transition from ineffective to effective), itself tacitly assumes that they are instantly created as soon as their members are placed in conjunction. This is an interesting perspective but one that is demonstrably fallacious when considered in the light of the evidence for communities of practice. The Solow residual is also argued to take no account of the reasons why technological change may occur; what are the incentives to innovators, researchers, etc. to develop and implement such change? Finally, if α is indeed exogenous then every organisation should, in theory, have equal access to it and will therefore converge over time to the same level of performance. Similarly, all groups would have equal access to it and also converge to a similar level of performance. This is clearly not the case thus far. Perhaps then Solow's model was incorrect? Since the late 1980s research concerning what is referred to as "new endogenous growth theory" has sought to overcome the exogeneity problem in Solow's model.

Endogeneity

This suggests that technological change actually arises through the existence of incentives. Much of the work carried out in this area is deeply mathematical in nature. However, there does appear to be some support for Wild's (2001) suggestion of categories (team-building, for example) within the residual. Mohnen and ten Raa (2000) for example discuss the decomposition of the aggregate Solow residual (SR) into sectoral and group-sectoral SRs. However, one aspect of potential relevance in the context of this paper relates to a factor added by one of the key endogeneity researchers. Lucas (1988) suggested the addition of "human capital" which was regarded as being the sum of a nation's (or equally validly it would seem, an organisation's) human knowledge. The suggestion being that an organisation that is impoverished (in terms of human capital) cannot grow simply by adding physical capital (business equipment, etc.). It has long been argued that knowledge, particularly for organisations functioning in uncertain environments, is a valuable resource (Penrose, 1959). More recently, an argument that knowledge is an organisation's most valuable resource has developed (Spender, 1996). This suggestion resonates with Moore and Dainty's (2000) research findings with regard to the importance of the human element in a project's response(s) to UCEs. However, this resonance lies outside of the Solow model's single residual in that endogeneity suggests a relationship between improved performance and factors that change over time. The change process involved in groups becoming teams is suggested here as being endogenous rather than exogenous in nature.

The existence of endogeneity does not automatically mean that the concept of a residual is no longer of relevance, as will be discussed in the section on situations. However, it does indicate that the interpretation of the concept should be approached with some caution. A further consideration in this regard is the issue of scale. The

Solow residual is essentially a macroeconomic tool hence one of the difficulties in precisely defining it is that it is functioning at the macro scale. Moore and Moore (1997) suggested that projects operate at the meso scale, whilst individuals within projects may operate at the micro scale. The application of a macro level tool to analysis at the micro scale (where individuals determine their responses to UCEs) would seem not to be entirely appropriate. One possible example of this is suggested as being that the extent of ignorance (the residual categories) when considered at a macro scale may be artificial due to the existence of communities of practice. In such communities, the extent of knowledge is not explicit due to their transparent nature. Knowledge may well exist at the micro level without being 'visible', as per trying to locate all the matter that the universe should contain according to various physicist's models but some of which seems to be missing. The issue of knowledge is also relevant to the consideration of sapiential authority as a response to the situations suggestion of Wild (2001).

SITUATIONS.

Wild (2001) has attempted a re-interpretation of the papers by Moore and Dainty so as to provide a 'commonsense meaning'. This is essentially in the context of Wild's question of 'If no team building or team integration was undertaken (even though the project met the T.C.Q criteria) does this not indicate that such activities are neither necessary nor sufficient conditions of project success?' There are two problems regarding this question. Firstly, commonsense is only commonsensical because it is sense held in common. Wenger (1998) asserts that communities of practice are the prime context in which individuals can work out common sense through engagement. Commonsense itself can therefore be argued to result from one form of teamwork.

The second problem is that the question essentially answers itself, in that in determining project criteria (certainly with regard to time and cost) on the basis of past performance (an industry standard in the context of estimating), the level at which 'success' is achieved reflects past inefficiencies. Therefore team building / integration (or any other intervention that may improve performance) is not required as previous performance did not depend upon it. This appears to be the essence of Crichton's (1966) argument cited by Wild. This can be developed further by suggesting that only when an external influence demands that existing performance levels are too low and should be raised does the process need to consider new ways of working. The rise in D&B as a procurement route may well be one result of such an environment coming into existence. Wild however, focuses on establishing the characteristics of a situation (complexity, instability, uncertainty, uniqueness and value conflict) within the environment of the project discussed by Moore and Dainty.

The existence of such characteristics within the information concerning the project is not questioned. Rather, the question relates to the appropriateness of the interpretation Wild places upon them. One example is the assertion that 'The third project manager...was able to find, take and make his role...without explicit teambuilding activities.' Whilst it is true that the project manager did not bring in teambuilding consultants, this is not equivalent to a lack of engagement in teambuilding activities. An important aspect of a project manager's role is the provision of leadership behaviours within the context of a project team. Cheung *et al.* (2001) note that the design of a construction project is a collective effort involving a team of specialists in which contractual relationships may not be direct and result in a subtle line of authority. Their research indicates that 'charismatic' leadership behaviour results in

an increased pride of membership by team members. This begs the question of whether or not charismatic leadership behaviours constitute teambuilding? A further perspective on this issue is the work of Li and Zhang (2001), who explored the relationship between the factors of: each (team) member's importance in production, the effectiveness of monitoring and the degree of teamwork. Of particular interest in this context is their conclusion that incentive structures (as per the earlier discussion of exogeneity and incentives in the Solow residual) change as principalship moves between members of a team. Movement of principalship is a scenario that resonates with the concept of sapiential authority.

SAPIENTIAL AUTHORITY

Any number of what Mohnen and ten Raa (2000) refer to as sectoral and subsectoral Solow residuals (treated here as residual categories) can be postulated as being possible, but then we find ourselves in a similar situation to that regarding the issue of multiple universes; a range of multi-dimensional universes can be postulated (up to 10 dimensions seem theoretically possible) but only in a three dimensional universe is the evolution of life which is sufficiently intelligent to ask the question "why does the universe have three dimensions?" possible (Hawking, 2001). So, in what combination of residual categories is the environment able to produce the question "what am I going to do in response to this UCE?" rather than the statement "this is what I have been told to do." In seeking an answer to such a question it is possible to implement detailed analysis to try and instil endogeneity into a single Solow factor. However, it can be argued that in the context of the micro level operation of human capital within a project environment, such a deterministic approach is insufficiently flexible. A more appropriate approach would be to consider the implications of sapiential authority, particularly when combined with the allies and antagonists research of D'Herbemont and Cesar (2000).

Banner and Gagne (1995) posited that organisations are involved in a process of evolving from industrial era transactional structures in which authority is dependent upon position within a hierarchy, to post-industrial era transformational structures in which authority is dependent upon the recognition of an individual's (the knowledge worker) knowledge and experience. This latter form is referred to as sapiential authority. An important implication of sapiential authority is that it does not require a specific and continuous organisation structure to support it. Consequently, the project team will seek to find a structure that is most suitable to any given sets of environmental factors requiring a 'solution' as they occur throughout the project duration. Authority therefore transits to the individual having the knowledge most appropriate to finding a solution to a particular environmental set (problem). The location of authority within a project may therefore move rapidly in response to both expected and unexpected change. Because unexpected change is precisely that, seeking to include it in a mathematical representation of authority movements would seem to return us to the original problem of the Solow model; a large amount of growth (or change) being caused by one broadly defined factor (technological change in Solow's case, and situations in Wild's case). Any attempts to further define the components of such a factor can be argued to be an example of the contingency approach to management (Moore and Moore, 1997), which is itself seen to be a characteristic of transactional organisation structures (Moore, 2002). One possible exception to this argument is the definition of the human capital in terms of allegiance or antagonism to the project or organisation. This is particularly relevant in that it is

concerned with the release of energy within the project environment, and seeking to ensure it is released in a manner that supports (as in the case of teams?), rather than resists, the planned change.

Allies and Antagonists

Sengupta (1998) suggests that endogenous growth theory recognises the importance of knowledge diffusion and learning by doing within human capital's contribution to economic growth. It is particularly noted that the Solow model assumes a static production environment with inputs and outputs having zero cointegration, whereas a model which is transitionally dynamic (this paper posits that such a situation is more typical of construction projects) and possessing a greater level of cointegration, will produce statistically more reliable results. Again, however, the problem remains one of the analysis level being macro rather than micro. At the micro level, the level of contingency within models such as Sengupta's is unwarranted in that the knowledge diffusion aspect can be assessed in a more flexible manner through the level of willingness of the human resource to facilitate the use of its capital. In essence, diffusion is more probable in environments where the human resource is predominantly composed of project allies rather than project antagonists.

D'Herbement and Cesar (1998) proposed a means of assessing the levels of antagonism and alliance (or synergy) to project objectives by project players. Considering the issue of synergy, this can be measured on the basis of behaviours graded on a scale of +1 to +4. The +1 level is characterised by behaviours evidencing an unwillingness to follow any initiative, while the +4 level involves behaviours evidencing unqualified support. Levels +3 and +4 represent players willing to take the initiative (capacity to act in favour of the project without being asked), but a +3 player will need encouragement to continue taking the initiative whereas a +4 player will not. In the context of leadership and teambuilding, charismatic leadership behaviours (Cheung *et al.*, 2001) may be a factor in continued initiative taking by +3 players, thereby increasing the level of synergy in the project. Initiative taking can be argued to be an action by the human resource to use its capital in the achievement of project objectives. It can also be argued to represent evidence of sapiential, rather than hierarchical, authority. Synergy and sapiential authority are argued to be linked factors in the development and success of teams, particularly in complex projects.

The postcontingency approach to management recognises the irrelevance of seeking to define and accurately model the intricacies of sapiential authority as a component (or residual category) of the project growth factor. Rather, it seeks to provide the environment in which the project team are free to organise themselves as they see most appropriate during the life of the organisation (or project) (Banner, Gagne, 1995). Such an approach can be argued to be simply an acceptance of what actually happens behind the scenes, even in transactional organisations, as evidenced by communities of practice. This is not to say that there is no recognisably formal management being practised within such scenarios. There is, for example, evidence for the practice of event management (D'Herbement, Cesar, 1998). Event management involves an awareness of differing perceptions of the project by individual players. Most players will view the project as an 'event' and this will be composed of a number of micro-events (facts attached to dates) that are of limited scope, of relevance to only some players, and concern the project itself.

The first act of management is the decision regarding which micro-events to react to as a project manager; some will be predictable, others will not. Similarly some will

have a strong association with the project while others will not. An important part of this decision-making process is the existence of communication channels of various forms through which the nature of the micro-event is communicated to the project manager and their reaction (usually a modification of the original plan) is communicated to the affected players. The reactive communication, however, must be perceived in the 'correct' manner if it is to meet the desires and needs of the relevant players (D'Herbemont and Cesar, 1998). This perception may well be affected by the project manager's leadership behaviours (as with the issue of charismatic leadership) but there are also other factors to consider as evidenced by the nature of communities of practice.

COMMUNITIES OF PRACTICE

Wenger (1998) posited that communities of practice are defined in terms of what they develop in order to achieve objectives and to also enjoy a satisfying experience. This concept of practice is claimed to include both the tacit and the explicit (what is said and what is assumed) through the inclusion of factors such as language, tools, images, criteria, underlying assumptions, shared world view, subtle cues, untold rules of thumb and embodied understandings, etc. Many of these factors also figure in the identification of teams rather than groups. One such feature is the existence of a life cycle. Communities therefore do not exist exogenously: they develop over time and may persist long after an official group has been disbanded. Consequently, it can become difficult to establish both their existence (they can be highly transparent) and their beginning and end. However, their social structure is defined by their learning (they therefore contribute to human capital and have a value in such terms) and continue to evolve as the community members participate in the open process of negotiating meaning. Again, this bears comparison to D'Herbemot and Cesar's (1998) process of communication regarding 'correct' perspectives in the process of (micro)event management.

A further feature is the high level of allegiance between members of communities. As such it is arguable that members should be regarded as being allies (rather than antagonists) to the community's objectives. Wasko and Faraj (2000), for example, noted that members of electronic communities of practice tend to participate in their communities out of pro-social behaviour, generalised reciprocity and community interest. The extent of this interest may be defined in terms of boundaries. Boundaries were previously characterised as being formed by the willingness to achieve synergy through recognition of sapiential authority in the context of knowledge and experience. This characterisation has a similarity with Wenger's (1998) assertion that a boundary is an object (encoded information, building, terms, concepts, etc.) that serves to co-ordinate the perspectives of various constituencies for some purpose. However, the boundary object can also serve to define reification in the form of barriers (that may be implicit or explicit) to participation. The jargon of a professional group, for example, may work as an effective reification device. Effective event management will require the ability to communicate across the reification devices of the various communities within the project environment.

CONCLUSIONS

Wild's critique of our earlier papers centred on claims of tacit assumptions of teams as being superior within an environment that he argues to be essentially non-manageable, and inappropriate interpretation of research information insofar as it was not focused

on the issue of situations. Notwithstanding our general concerns over superimposing macroeconomic theory on the analysis of team socio-dynamics, our response has refuted that the project environment is non-manageable through an examination of sapiential authority, project allies and antagonists, communities of practice and endogeneity. Similarly, an interpretation in terms of situations has been argued as being inappropriate itself, in that, while the characteristics of a situation may be present in the information, the resultant emphasis on a lack of teambuilding is fallacious. Evidence for teambuilding (in terms of event management and leadership behaviours) has been demonstrated. It is therefore suggested that a richer discourse on the input of human capital and its impact on project performance can be achieved by approaches other than those posited by Wild.

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