International Journal of Managing Projects in Business, 2009, Volume 2, Issue 1, Pages 149-158

Reconciling Order and Chaos in Multi-Project Firms

Dr. Joana G. Geraldi
International Centre for Programme Management
Cranfield School of Management
joana.geraldi@cranfield.ac.uk

Purpose: The purpose of this paper is to present the key findings of a doctoral thesis aimed at exploring how multi-project companies reconcile order (efficiency, control, clarity) and chaos (creativity, trust, uncertainty, ambiguity).

Methodology: The research was focused on multi-project firms in general and CoPS (Complex Products and Systems) producers in particular (companies involved usually as main contractors in construction and engineering projects). It followed three phases: Exploratory phase (literature review and interviews), Conceptualisation phase (abductive elaboration of the model based on field and longitudinal studies in a multi-project firm), and Validation phase (deductive validation of the model through multi-case study).

Findings: The thesis proposes a model to map order and chaos of companies, departments, projects or people based on the complexity faced by the tasks and the flexibility of the organizational structure to deal with it. The analysis of how departments moved in this map led to several findings, such as in the case of mis-balance, higher flexibility is preferable to excessive control.

Practical implications: The model provides project practitioners with a tool to evaluate and make sense of the degree of necessary project flexibility, and how this can and should change across the project and disciplines.

Originality/Value: This paper assists practitioners and academics to reflect on organisational structures of multi-project companies, how these vary over time and how to avoid the bureaucratisation or the chaotification of structures.

Type: Research Paper

Keywords: Organisational Structure, Project Complexity and Flexibility, Bureaucratisation, Ambidextrousity

Electronic access URL is not available. The thesis was published and is available in amazon.de. Interested readers may also contact the author directly through email at joana.geraldi@cranfield.ac.uk

INTRODUCTION

Projects and multi-project companies emerged in the late 1990s as innovative organisational concepts to deal with global, uncertain, ambiguous and dynamic environments faced by many companies today. One of the key advantages (Miller, 1990, Pascale, 1990, Stacey et al., 2000, Tushman and O'Reilly, 1996), but still a challenge for these organisational concepts, lies in orchestrating a variety of contradictory demands, from a high uncertainty to a high structural complexity.

Projects tend to emerge as chaotic systems, in the sense of formless or disordered (OED, 2007) with a unique idea, undefined scope, unclear division of authority and responsibilities, etc. The following phases clearly demand higher levels of order. For example, in construction and engineering projects, procurement, production and assembly involve many companies and people; consequently clear scope, division of work and decentralisation of authority and responsibility are necessary to cope with the amount of work to be done on time (Geraldi and Adlbrecht, 2007). These differences have been stressed in several studies, such as (McCray et al., 2002, Lundin and Söderholm, 1995, Morris and Hough, 1987).

Thus, the management of projects faces different challenges and requires organisational structures with different degrees of flexibility − both mechanistic and organic, both ordered and chaotic. This paradox is especially pronounced in multi-project companies – companies that have projects as their main source of turnover, such as software development, engineering, consulting, and civil engineering. In these companies, this diversity is not only present between project phases, but also between projects in the company's portfolio, between the functions related to projects and supporting functions, between facilities, between relevant project partners, between different clients, etc.

In order to cope with this heterogeneity, multi-project firms should reconcile order and chaos in their organisational structures. However, studies suggest that multi-project firms are experiencing difficulties in staying at this position. The wish to avoid inefficiency and to overcome uncertainty exacerbates the pressure for higher levels of control and bureaucratises the project work (Hodgson, 2004, Raisanen and Linde, 2004, Styhre, 2006). Over 70% of project managers complain about the bureaucracy of project processes (Crawford et al., 2005). This changes the function of project managers from that of a manager of creativity, change and risk to a manager of paper and forms – from an organic organisational solution to a bureaucratic reality. However, other studies claim the opposite: companies have an ad hoc approach to the management of projects (KPMG, 2002-2003, NAO, 2005). These conflicting findings point to the necessity of further studies.

Current management and organisational models, such as Ambidextrous Organisation, suggest that successful organisations are those able to combine classical organisational trade-offs, such as differentiation and low-cost strategies (Porter, 1980), global integration and local responsiveness (Bartlett, 1989), incremental and radical innovation (O'Reilly and Tushman, 2004, Brookes et al, 2006), mechanistic and organic orientations (Duncan, 1976) or bureaucracy and adhocracy (Mintzberg, 1983), differentiation and integration (Lawrence and Scanlan, 2007), flexibility and efficiency (Adler et al., 1999, Thompson, 1967), function and project-oriented organisation (Geraldi et al 2008, Galbraith, 1973), among many others. Current study published in Harvard Business Re-

view (Takeuchi et al., 2008) and the overview of the subject published in the Journal of Management (Raisch and Birkinshaw, 2008) this year enforces the relevance and timeliness of the topic.

In the project management field, the existence and necessity of semi-structures was firstly identified and analysed by Brown and Eisenhardt (1997) in their studies of the organisation of R&D projects. However, the coexistence was not widely explored, solutions for the problem are still not available, and studies on Multi-Project Firms are still lacking. This study contributes to filling this gap.

The goal of the study was to understand how multi-project companies balance order and chaos present in their organisation and the consequences of this position for the strategic orientation of these firms in the long term, as well as the role(s) these companies may undertake in the value chain.

METHODOLOGY

The multi-project companies and their organisation were the research object of this study. I studied one archetypical type of multi-project company in depth – CoPS (Complex Products and Systems) producers, which are large, traditional, mainly based in German companies, undertaking complex engineering and construction projects.

Grounded on the juxtaposition of strategies proposed by (Ford et al., 1983) and (Martinez-Miguelez, 1994), the study commenced with an Exploratory Phase comprising a literature review and 12 in-depth interviews with people in different departments of a large CoPS producer (Company A) This combination guaranteed that the questions generated were not only in line with the demands of practice, but also contributed to a research gap in the literature.

The Conceptual Model was abductively designed based on a field study (three months observing Company A) and a longitudinal study during the next one year and four months in the same company – the Conceptualisation Phase. These methods were used because they provide in-depth understanding of company structures, processes, mechanisms, conditions, relationships and development (Eisenhardt, 1989). It also avoided the inflexibility of normal science (Kuhn, 1970) and kept this investigation as close to reality as possible. The method also has particular value in applied research for generating practical tools and improvements (Karvinen and Bennett, 2006). This is relevant for project management, as this research area is very practice-oriented (Blomqiust et al., 2006, Turner, 2006). Finally, it allows a cross-disciplinary approach to the research question, which is appropriate, as management is deemed to be eclectic (Easterby-Smith et al., 1999).

This Conceptual Model was subsequently deductively validated through a multi-case study conducted with seven multi-project firms. I have purposefully chosen these companies so that the sample embraced CoPS producers with different characteristics and focuses, as suggested by Eisenhardt (1989). This phase includes interviews with people in different departments, observations and secondary sources.

This combination of conceptualisation and validation through qualitative research is rather unusual, as the likelihood of validation of Phase 2 is high, because the process is so close to reality (Eisenhardt, 1989), and consequently a second validation would be redundant. However, as the first phase was based on observations of one company, the author considered it necessary to return to the reality after the "complete" elaboration of the Conceptual Model, and to test its validity for other companies and in a more structured form, establishing values for the various parameters defined in the previous phase.

MODEL

Based on the contingency premises (Donaldson, 2001), it can be argued that as projects deal with several contexts or challenges, they require organisational units with different organisational designs (Turner and Müller, 2006, Keegan and Turner, 2002, Morris and Hough, 1987, Engwall, 2003, Karlsen and Lereim, 2005). This research analyses the organisational response (order and chaos measured by flexibility of the companies) to project challenges (assessed by the complexity of the project and its context).

The Conceptual Model is composed of four parts. The first part assesses heterogeneity of organisational units (departments, types of projects, facilities, companies in macro organisation, etc) present in projects and multi-project companies based on the complexities faced by the project portfolio and the flexibility of the organisational structures used to manage these complexities.

The complexity was defined by complexity of faith (commercial and technological uniqueness and commercial and technological immaturity of projects) and complexity of fact (size, budget, number of contacts and impact of changes). This was based on a well-known and widely accepted distinction between structural complexity and uncertainty (or randomness) (Macheridis and Nilsson, 2004, Williams, 2002).

Flexibility has been widely discussed in the literature on manufacturing (Slack, 1987, Nilsson and Nordahl, 1995) and on strategy (Danneels, 2002, Teece et al., 1997). Despite the relevance of flexibility in projects and multi-project firms (Morris and Hough, 1987), there are relatively few studies on flexibility dedicated to this field. Olsson (Olsson, 2006) defines flexibility in projects according to the flexibility of the product and the process, that is, what to do and how to do it. Flexibility is defined by the range of possibilities that the organisation allows one to choose with regard to *what, how, who, when, how much* and *where* in projects.

The framework resulting from the juxtaposition of these variables (Part II) comprises four organisational archetypes: the creative-reflective, mechanic-structured, 'chaotification of order' and 'bureaucratisation of chaos' (see Figure 1). Companies managing to place their organisational units in different positions in the lighter area of the figure are those at the edge of chaos, as the companies manage the tension between bureaucracy and chaos when facing many challenges.

Figure 1: Fit between Complexity and Flexibility

The third part explores the dynamic of organisational units, i.e. how these change positions in this framework by opening and closing, separating and merging, moving, expanding and contracting the area occupied, and creating factitious positions in different places on the framework. Apart from these movements, the part also suggests the existence of three patterns: isomorphism, misfits leading to misfits and dynamics of the framework *per se* (new challenges arrive expanding the framework towards higher degrees of complexity of faith and flexibility, but current challenges are transformed into complexity of fact and managed through lower flexibilities).

The last part relates to the link between the previous parts and the core competence of the organisation. Three types of core competences were defined: core competence on reliability (*"we focus on reliability"*) on technological innovation (*"we create your future"*), and on interaction (*"we make your ideas come true"*).

CONTEXT OF THE THESIS

This research was undertaken in the project management group (Management internationale Projekte, MIP) in the mechanical engineering department in the University of Siegen, Germany.

A doctorate in Germany is idiosyncratic and therefore it is difficult to approach in general terms; different people and different supervisors would organise it in different ways. I will focus on my experience. A good source of general information about doctoral studies in Germany is the DAAD (German research council, see http://www.daad.de/deutschland/studienangebote/promotion/06546.en.html). There are mainly two non-exclusive types of doctorate in Germany: through a doctorate programme and while working as "wissenschaftler Mitarbeiter".

I was employed fulltime as what they term “wissenschaftler Mitarbeiter” (similar to research associate). My tasks as “wissenschaftler Mitarbeiter” were similar to those of a lecturer in the UK Universities: I gave lectures, supervised several Studienarbeiten (equivalent to Bachelors Thesis) and Diplomarbeiten (equivalent to Masters Thesis), organised and participated in conferences and workshops events, created and managed cooperation with other universities and companies, executed other studies mainly within my research interests and adjacent to the thesis topic itself, etc.

Unlike other countries, I was not enrolled in a structured doctorate programme, and so there are no methodology courses or fixed stage-gates such as a yearly review of the thesis. However, the system also provides the flexibility to search for the courses, workshop and conferences. It takes some time to understand this flexibility and be able to use it, but as soon as I did, I took advantage of it and enrolled in methodology courses and PhD workshops in different universities as well as participating in several conferences.

I was working with a group that had a very strong relationship with mechanical engineering firms, especially because almost all Diplomarbeiten (Masters thesis) were undertaken in companies focused on the solution of a practical problem but from an academic perspective. Consequently, I was confronted with different problems in projects and project-based companies in different industries and contexts and had the opportunity to discuss those issues in depth with practitioners. We were also a very international group, and had contacts with companies in all continents. This strong link with the practice was useful to understand and reflect on company’s problems and feasibility of solutions proposed in the academy; it also provided me with good access to empirical data that enabled the methodology used in this study in the first place.

Looking back, it became clear to me that the journey followed similar patterns than those I was exploring in multi-project firms. In moments dominated by ‘complexity of faith’, I defined what I would be doing (my research topic and question), how I would like to do (methodology), my timeframe, etc; in moments of ‘complexity of fact’, the plan was detailed, defining what I need to and actually doing it.

In some of these moments, I felt myself in ‘chaotification of order’, when I indeed had too much freedom. These moments made me grow, and construct my own “inflexibilities” and even more challenging, to obey them. ‘Bureaucratisation of chaos’ was also part of my journey, when I had to follow very systematic methods to unfold concepts that were still unclear. I am very thankful to my supervisor, Prof. Dr. G. Adlbrecht, for giving me guidance, but still the possibility to navigate between order and chaos during this process.

One of the key processes at the end of the journey was to reduce complexity of faith and fact, simplify the findings and identify the contributions of my study. These are briefly discussed in the next section.

FINDINGS

In general, the Conceptual Model supports companies to orchestrate this heterogeneity by making sense (qualitatively) and assessing (quantitatively) their current ability to manage

the tensions between order and chaos. Specifically, I would like to draw attention to key contributions of the research.

The empirical data confirmed that multi-project firms have and demand both order and chaos. *Order and chaos coexisted* among and within project phases, projects, departments. They were also present in project context – in client, governmental institutions, banks, etc.

However, *companies tend to avoid the coexistence of order and chaos*. A high degree of one parameter of complexity is compensated for with a lower degree of another. This avoided excessive risk. Similarly, flexibility bottlenecks were not observed as expected in the theory, but rather different patterns of flexibility in which the values of the parameters were heterogeneous. There was also a limited overlapping of complexity of faith and fact in the course of a project.

This raises the question of how to reduce complexity of faith and enhance fact along the project life cycle. The Conceptual Model points out that project managers should not only not only consider the speed in which one should move from creative-reflective to mechanic-structured environment (see Figure 1) but also on the trajectory along which the project moves in the framework, avoiding the wish to reduce uncertainty by reducing the flexibility of project organisation leading projects towards bureaucratisation of chaos, but also avoiding the excessive flexibility leading to re-work and unnecessary "chaos".

Another interesting finding was the compensation between the flexibility constrained by the company and by the external stakeholders. Two strategies were identified:

- Type A: Company needs flexible structures in order to adapt to the inflexible wishes of the stakeholders
- Type B: Companies build internal inflexibilities to compensate for external 'chaos' (Key Finding 4)

The multi-project firms studied usually featured a flexible organisation. This flexibility was used to adapt to client's inflexibility, i.e. a set of different constraints desired by each client, such as local content, procedures and reporting, documentation, standards, etc. Thus, multi-project company tends not to develop a unified process and product range, as these are customised to each client. Thus, successful companies create 'chaotic structures' to compensate for 'ordered' external demands. This partly explains the tension between the rhetoric of an organic organisation and a bureaucratised reality.

Companies in 'chaotic' environments, which deal with high complexity of faith and execute projects with rather intangible outputs tend to create their own 'order' (Company A). As internal inflexibilities tended to be less respected than external, type B strategies were more likely to succeed if the internal order is accepted as an 'Act of God'.

Even though 'order' is deemed as fundamental to successful companies, the results showed that *bureaucratisation of chaos (excess of order) is more harmful than chaotification of order (excess of chaos).*

As companies and project managers do not decide alone their degree of fit and misfit, ideal situations are not always possible. One solution companies and individuals found to deal with non-ideal situations was the creation of what I termed *'factitious positions'*. The

creation of factitious positions refers to organisational units producing an image that they are in a different place than they in reality are, and consequently increasing the acceptance of their position. This supported several common situations in business, such as in attending to unrealistic demands of the client, or in overcoming barriers to the execution of something unique and by this means keeping the dynamic of the organisation.

Finally, more than the measurements and the contributions described above, the main contribution of this work is to assist people understand the phenomena of 'bureaucratisation of chaos' and 'chaotification of order', and to avoid these when delegating tasks, promoting changes in the organisational structure, negotiating conditions with clients and suppliers, etc.

CONCLUSIONS

Summarising, this research explores the ability of traditional multi-project firms to orchestrate the plurality of contradictory challenges they face; an ability necessary not only for multi-project firms but also for organisations facing a world of uncertainties treated as certainties, mass customisation, regional globalisation, flexible efficiency, creative reliable solutions, etc, i.e. organisations facing the "real world". This work provided companies with a map to make sense of these contradictions and promote reconciliation.

In the analysis, I identified that companies tend to compensate rather than reconcile conflicting demands. Consequently, future research questions should be related to the understanding of this phenomenon, and, as the study was constrained to one sector and mainly one country, to the search of multi-project companies in other sectors and in other countries are more successful in keeping the balance between order and chaos. As mentioned in the introduction, this issue is not only present in multi-project firms, but is deemed to be a central paradox of management, and the current publications in the area of ambidexterity are evidence that this is a relevant and current subject (Raisch and Birkinshaw, 2008, Takeuchi et al., 2008). Therefore, future research would benefit from a cross-fertilisation of the studies on multi-project firms and other non-project oriented businesses, as such studies are still lacking. The phenomenon could also be related to different cultures, and consequently, future research would profit from a larger and more international sample would. Finally, the model was only applied to departments, it would be relevant to see if similar patterns would also be identified in micro level and macro level - where the objects of analysis are people and companies, respectively.

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