Emergent Research Design Strategies in Collaborative Research: A Tale of Two Studies

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POMS 18th Annual Conference
Dallas, Texas, U.S.A.
May 4 to May 7, 2007

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Abstract

Collaborative research is rewarding but, compared to the dominant survey-based model of empirical research, very messy. We report on two case-study based projects, examining how the original research question and research design were adapted to take account of and take advantage of the emerging reality. The first study was originally intended to explore supply-chain flexibility in three sectors, aerospace, rail and truck manufacturing. However, we found that the chains were linked through common subcontractors, and unforeseen network-level and comparative analysis became possible. In the second study, on third-party logistics, the prime collaborator didn’t want us to work with any of their direct competitors. While this compromised the design somewhat, it also led to a much deeper relationship with the prime collaborator, and a more critical reflection on the rationale for the research design. We discuss the implications of this type of emergent research design for practitioners and academics.

Keywords: Case study; research method; logistics; supply chain
1. Introduction

When one of us (Spring) began doctoral research on manufacturing strategy in the early 1990s, he was surprised by what he found in the academic literature. As an ex-practitioner, it was instinctive for him, if he were to understand operations, to go and study them first-hand, in depth, using what he came to understand as the case study method. The surprising state of the operations management literature was exemplified by a *Journal of Operations Management* paper by Flynn et al. (1990), which suggested that ‘empirical research’ should be a new area of development for operations management. The empirical research advocated by Flynn et al. was based on questionnaire surveys, utilising methods derived from some areas of the social sciences.

This empirical research was a step forward from the modelling approaches hitherto adopted by the operations community. (They had served us well in addressing quite tightly-specified ‘hard’ problems of inventory management and cost optimisation, and continue to do so.) Nevertheless, it still meant that the researcher spent most of his or her time in the office; as one of our colleagues says of the survey-merchants: “the only fieldwork they do is going to the post-office”. And, more importantly to that novice researcher in the early 1990s, although buttressed by various statistical tests (Cronbach’s alpha, non-response bias and all the rest), it didn’t seem credible or very useful in practice. Would I run my factory based on the results of ‘empirical’ research published in *Management Science*? Probably not.

We have all moved on since then. Case study methods have been gradually accepted by some sections of the U.S. operations management community (e.g. Meredith, 1998), although are considered more mainstream in Europe. Motivation is
important: that novice researcher’s motivation was to understand how to make manufacturing more successful; some researchers’ motivation seems to be finding a use for a new modelling technique, regardless of the utility of the outcome, with publication in the ‘top’ journals in mind. A widely accepted view of what constitutes ‘acceptable’ or ‘scientific’ case research has emerged as the standard model, based on the approach of Robert Yin (1994) and elaborated upon by colleagues in the operations field. (Indeed, that novice researcher adopted it pretty wholeheartedly (Spring & Dalrymple, 2000)). Case study research is acceptable, but there is a new orthodoxy: is Robert K. Yin the new Lee J. Cronbach?

The tale recounted here is based on two field studies. In contrast, this tale reflects the messy yet productive reality of collaborative case study research. Our question is simple enough: just because it’s messy, is it bad research?

2. Study One: An Emergent Network Approach

The first study described is of flexibility in a supply chain context explored across a network of sixteen inter-related cases. Flexible supply chains are able to cope with change and adapt effectively, e.g., to disruptions in supply and changes in demand, whilst maintaining customer service levels. This may take the form of absorbing variation within the existing supply chain structure, or more drastically, may involve re-configuring the supply chain in response to, or anticipation of, change. The need to study flexibility in supply chains (a type of network), as well as at the firm-level, is now beginning to be recognised in the academic literature (e.g., Krajewski et al., 2005; Schmenner & Tatikonda, 2005; Slack, 2005). Empirical research is limited
despite calls for more empirical research into Operations Management and Supply Chain Management in general (e.g., Stuart et al., 2002) and into supply chain flexibility in particular (e.g., Aprile et al., 2005; Lummus et al., 2005).

This section outlines how this collaborative network-oriented approach emerged from ‘humble beginnings’ and the implications of this for the research design.

2.1 Original Intentions of the Study

Empirical research which explicitly addresses this topic has only recently begun to emerge. Given the relative infancy of this field, the research was deliberately exploratory in nature: the original intention of this study was to investigate the meaning and importance of this phenomenon in practice and to determine how best to explore this topic in greater detail in the future. The value of studying multiple cases when a new or unknown phenomena is being research is well documented in the academic literature (e.g., Voss et al., 2002). Furthermore, the multi-case method can augment external validity, guard against observer bias, aid triangulation and improve the generality of findings. This is supported by authors such as Handfield & Melnyk (1998) and Meredith (1998).

Existing research which explores flexibility in a supply chain context tends to focus on large manufacturing companies, neglecting the roles of Small and Medium sized Enterprises (SMEs) and service operations. Authors in the field of Operations Management have acknowledged the benefits to be gained by companies that treat the supply chain as a single entity, compete as a chain and focus on satisfying end-customer demand (e.g., Croom et al., 2000; Hill & Scudder, 2002), leading to the belief that the unit of analysis for researchers should be the supply chain or the
network (Harland et al., 1999; Frohlich & Westbrook, 2001; Van Hoek et al., 2001; Cousins, 2002), rather than, for example, the firm. Only a limited number of attempts have been made to go beyond the boundaries of the firm towards taking a more network-oriented perspective of flexibility but to date these have largely stretched only as far as first-tier supply chain relationships. These studies include those by Golden & Powell (1999) and Krajewski et al. (2005).

In light of the above, the aim of this study was to take a broader perspective of the topic. While from the beginning, the project team was aware of the value of taking a network or supply chain oriented approach to research design, for the initial exploratory study, it was considered likely that a less selective approach to choosing companies for interview would be required. Once collaborative relationships had been formed, a second study could develop more ambitious objectives. As a result, a diverse range of potential cases were initially contacted. Given, that few studies had truly gone beyond firm-level analysis, this seemed to be a reasonable assumption to make. In exchange for their time, interviewees were informed that by participating they could receive a report on the generalised findings of the study, providing a degree of joint benefits within the relationship.

Initial research questions for the study included:

(1) How should flexibility in the supply chain be best explored by researchers?

(2) What are the drivers behind maintaining flexible supply chains?

A contribution to both of these questions could be made by interviewing isolated cases or alternatively by interviewing inter-related cases. This meant that while inter-related cases were desirable, the original objectives of the research could
be achieved even if inter-related cases did not emerge: this provided a degree of flexibility for the study.

2.2 The Emerging Reality

The number of cases were built up and added over time; data collection and analysis occurred in parallel through an iterative process of moving back and forth between the empirical and theoretical worlds. Initial interviews took place with companies that belonged to aerospace, commercial vehicle (i.e., trucks) and rail supply chains. As cases were added, relationships between them started to emerge and the potential of this from a research perspective was identified. As a result, additional companies were then deliberately targeted based on their anticipated membership to one of these three chains, i.e., the selection process became bounded by the three chains, with other companies being deliberately ignored. Hence, although the research began with a broad frame, it developed focus as cases were added and relationships emerged.

Companies were identified as likely members of the chains through web searches, website content analysis, comments made in other interviews and through articles published in trade magazines. In addition, some interviewees aided this process by asking their customers and/or suppliers to participate. This group of companies emerged to form one network when the three supply chains overlapped through shared sources of supply. Cases were added to ensure multiple cases were studied in each supply chain and at each level or tier of the network, providing breadth and depth. This continued while cases provided additional insight, contributing to theory development, until recurring themes emerged and a point of theoretical saturation was reached (as described by Glaser & Strauss, 1967). In the end, interviews were conducted with senior personnel from sixteen companies: to the
best of our knowledge, this is the largest study of flexibility across a network of companies presented thus far in the literature.

Clearly, the emerging reality was part by chance; however, once it became clear that relationships between the entities existed, a networked-oriented approach became more of a deliberate strategy. Being able to take advantage of this relied on an adaptable research design.

2.3 Research Design Implications

The emergence of the network approach meant that the initial research questions that the study set out to contribute towards could be supplemented with more in-depth questions which took advantage of the relationships between the network members and which could not have been explored if these linkages had not emerged. Initial interviews had to focus on dyadic relationships with customers and suppliers or general questions about flexibility in a supply chain context in general. Towards the end, as the network formed, it was possible to ask respondents more in-depth questions about the wider network, to develop a more network-oriented perspective, and to conduct both detailed within-case and cross-case analysis.

The initial research questions for the study were supplemented with questions which included:

(3) What key components of flexibility in the supply chain can be identified?
(4) How does the importance of flexibility vary across the supply chain?
(5) How is re-configuration of the supply chain co-ordinated?
(6) Which companies are particularly important to the flexibility of the supply chain?
2.4 Reflections on the Project

Few studies of flexibility have taken a network approach although, in a broader context, the value of case research to exploring networks is widely acknowledged (see Dubois & Gadde, 2002). This may be because taking a network approach involves additional risk with no guarantee of success, making it difficult to plan the approach to take and difficult to convince research councils to fund the study. In this case, the research project began with an interest in exploring flexibility beyond the boundaries of the firm with no guarantees that this would be possible. The research began with broad questions that could then be followed up over time in future studies, reducing the amount of risk initially taken in the project. When it became clear that there were in fact relationships emerging between the companies collaborating in the study, it was important to use this opportunity to the advantage of the research and adapt the design of the study. As a result, the focus of the study became narrower and only companies with membership to the network were targeted.

By relying on a mix of luck and opportunism, this approach to conducting research is difficult to justify from a traditional scientific perspective; however, the reality that emerges from this ‘messy’ approach meant that a richer insight into supply chain flexibility could be gained (than from either a non-case based method or from collection of unrelated cases) and cross-case comparisons were made possible. Hence, the emerging reality created added-value and provided results that would not have otherwise been possible through other research methodologies that do not seek to link one firm to another. For example, one finding of the research was that supply chains which are both flexible and relatively stable are likely to feature flexibility at
certain points and rigidity at others. It would be difficult to state this with confidence unless observations had been made at multiple points of the same chain.

Upon reflection, beyond being opportunistic and maintaining a flexible research design, the practical reasons why the research was able to take a network-oriented approach include: (1) the cases include SMEs, these often compete by being flexible and therefore have a presence in many different supply chains: it was SMEs that, by operating in two or even all three markets, led to the three supply chains overlapping; (2) many of the companies targeted were based in the North West of the UK: clusters of companies that operate in the same geographical location often trade or have indirect links with one another, creating connectivity between the firms; (3) the three industries involved in the network have a history of working in the North West of the UK: three OEMs were involved which have several hundred suppliers, this improved the likelihood of network effects emerging within the research frame; and, (4) the research was cross-sectional, rather than longitudinal, meaning that participation on the part of the industrial collaborator was not extensive: this made it possible to exercise greater control over the ‘choice’ of cases.

3. Study Two: “Designing” Collaborative Research

The aim of this section is to tell the story of how a PhD research project was planned and managed in collaboration with an industrial partner, who is a global logistics service provider and is referred to as LSPCo hereafter. The study, focusing on the third party logistics (3PL) sector, aimed at gaining a better understanding of the
service specification and design process i.e. how service offerings are defined and developed in logistics provider-user relationships, given recent market developments.

In recent years there has been growing complexity and uncertainty in the market for contract logistics services, with service providers moving from commodity services to more complex and bundled solutions (e.g. consulting and IT services) due to the higher margins associated with such integrated offerings (Lieb & Bentz, 2005). The evolution of the industry indicates that players with different business backgrounds and capability sets have entered the market (Berglund et al., 1999; Hertz & Alfredsson, 2003). New service concepts such as fourth party logistics (4PL) have also been introduced; however, these are ill-defined and thus interpreted and used in various ways (Bedeman & Gattorna, 2003). In this market context, buyers are often left confused about the meaning and actual content of 3PL/4PL services. The above market developments present implications regarding the nature of the logistics service procurement process. Existing 3PL purchasing frameworks depict a linear and rather simplistic process of service specification and development. They largely ignore the role of the service supplier in the process and dynamic aspects of service offering definition (temporal dependencies between service exchanges in long-term relationships).

3.1 Original Intentions of the Study

From the very beginning of the research there was an intention to approach and study a large logistics company in order to better understand its role in the definition and development of service offerings during the purchasing process. Driven mainly by market observations and (less so) by a review of the 3PL literature, we could sense a changing (more significant) role of logistics companies within their clients’ supply
chains. What was traditionally thought of as logistics services (i.e. transport and warehousing) has now been expanded to include more complex, value-added solutions e.g. IT systems, product repairs and even customer service. Such solutions are often difficult for the buyer to define and evaluate ex-ante and the input of the service provider in “shaping” the offering is significant.

In line with this initial approach, a list of approximately 90 logistics companies, all operating in the UK, was created and introductory letters were sent out to them with the purpose of explaining the research project and exploring potential collaboration opportunities. Based on our objective, the case study method was chosen as the most appropriate to pursue the research agenda. Case studies are particularly suitable when the aim is to build an in-depth understanding of the phenomena under study (Voss et al., 2002; Meredith, 1998; Eisenhardt, 1989). Case study appeared to be a sensible strategy for studying the process (how) of service specification and design in 3PL relationships because cases are able to capture the complexity and context of inter-organisational phenomena. According to Ford et al. (2003), inter-firm relationships are complex and require an in-depth understanding of their history and context within which they form and develop (in this case, a specific service exchange and contract should be studied in the broader context and history of past exchanges between the parties).

The intention at that stage was to select 4-6 cases of contractual relationships. However, there were no clearly specified selection criteria at this stage; perhaps apart from the belief that we should choose cases from different buyer industries (e.g. automotive buyers would indeed have different logistic requirements from chemical manufacturers). The result of this first “cold-calling” exercise was that one company (LSPCo) agreed to participate in the research. It should be noted that these initial
access discussions with practitioners helped us to refine scope of the project. For instance, it became clear that we should focus on a specific segment of the logistics industry (contract logistics) and exclude others such as shipping lines, air-liners and post-offices.

3.2 The Emerging Reality

The first case study kicked off soon after completing discussions with the LSPCo primary contact. To reciprocate access to data, it was agreed that we would undertake some market research on behalf of LSPCo, by conducting interviews with buyers of logistics services in specific sectors (e.g. hi-tech). Although the possibility of signing a confidentiality agreement was discussed, it was quickly put aside as both parties focused on research practicalities (e.g. arranging interviews). There was no well-specified plan in terms of the duration of the project. At that stage, the LSPCo contact was aware of our contacts with a smaller logistics operator. It is important to note that at the same period LSPCo was undergoing change of ownership. This was clearly a high-risk situation e.g. what would happen if the LSPCo project champion left the company as a result of the organisational change? That event created uncertainty regarding the continuity of the project and led to a more active search for alternative access opportunities in order to spread the risk.

From discussions with LSPCo at that stage, it became clear that dealing with competitors would not be acceptable. The primary contact as well as the senior management were not comfortable with such a possibility and expressed their concerns in relation to that matter. Because of such concerns, the project was temporarily put on hold and a lengthy confidentiality agreement document was suddenly presented to us; it was basically ruling out any contacts with LSPCo.
competitors and it went that far as to contain (as an appendix) a list of 35 major logistics companies that we would not be able to approach for the next five years!

Clearly a decision had to be made from our side whether we would accept the emerging situation or terminate the relationship with LSPCo and go for alternative access opportunities. Mainly due to time restrictions (PhD research timescales are tight!), it was eventually decided to continue with the LSPCo project. In addition, there was the risk of other organisations having similar confidentiality concerns, since I had already been involved with LSPCo. Certain parts of the proposed non-disclosure agreement were rejected from our part, but we had to succumb to the main requirement not to talk to competition. It was obvious that we had to renegotiate with LSPCo regarding the scope and the exact content of the project. We were then seeking a firm commitment on behalf of the industrial collaborator to give more time and access to information, as it seemed that we would need to conduct multiple case studies within LSPCo. That, in turn, meant that we had to revise the research design in order to take account of the emerging situation.

3.3 Research Design Implications

The decision to move forward with the LSPCo project meant that the research had to be revisited as the original design, i.e. selecting four independent cases of service provider-client relationships (dyads), was no longer viable. That led to a comprehensive review of the research project as a whole; it urged a critical reflection on the rationale for the original research design.

Empirical evidence gathered through the first LSPCo case study and the 3PL buyer interviews proved to offer important insights with regard to this review exercise. Some critical dimensions of the logistics service specification and
development process were fleshed out during initial interviews. For instance, it became pretty evident early in the research that the process of service definition and design is rather different in cases of repeated exchanges (contract renewals in long-term relationships) in comparison to situations of newly-established contractual relationships, where buyer uncertainty is high and the service supplier’s knowledge regarding the customer’s requirements is limited. That also meant that the research objective could be further elaborated to take into account dynamic (i.e. temporal dependencies between service exchanges) and contractual (the role of the contract agreement) aspects of the service specification/design process.

More crucially though it was realised that such aspects and dimensions could be actually tackled with an alternative research design. For example, we could study service specification and design within the contracting process by choosing a long-term, established client relationship and then comparing that to a newly-formed contractual relationship, with both cases concerning the same service provider. We worked closely with the LSPCo primary contact to identify and select suitable client relationships, mainly on the basis of the length of contractual relationships and the degree of service complexity. Two additional cases were chosen for in-depth examination. It was also then possible to classify the early case study in accordance with our refined selection criteria (i.e. case of contract renewal with high service complexity).

It was also evident at the time that insights gained from buyer interviews were proving useful for both parties; they provided valuable market research information for LSPCo business development managers and from our point of view, they helped gaining a broader understanding of logistics outsourcing behaviour as well as the procurement process itself. It was jointly decided to continue those interviews. For
each case study, it was agreed that LSPCo would facilitate interview meetings with the client in order to take into account their views on the research topic. Contacts with logistics, purchasing or customer service managers of the client were established through the respective LSPCo account director or business development manager. Developing this “deeper” relationship with LSPCo managers also meant that we had access to relevant (and in some instances crucial) documentary evidence. Access to project files, databases, email exchanges, ITT documents, service proposals and (in some cases) contracts allowed us not only to triangulate interview data, but also to reconstruct (through email exchanges, minutes of meetings etc) the series of important events during the contracting process. Hence, one could argue that in many senses, the adapted research design took advantage of the emerging reality.

We also discussed with the industrial partner the possibilities of approaching smaller, non-competitor logistics companies. A list of “approved” organisations was developed and these companies were subsequently contacted to explore potential collaboration. LSPCo managers assisted in this process by making use of their contacts within these organisations, some of which acted as sub-contractors of LSPCo. As a result of this process, a fourth case study was initiated in collaboration with a logistics operator specialising in the transportation and warehousing of bulk products/raw materials. It should be noted though that this specific contact was not facilitated by LSPCo; rather, it was the result of our continuous efforts to add suitable cases in accordance with our refined selection criteria.

3.4 Reflections on the Project

Upon reflection, it seems that compromises in collaborative research cannot be avoided and this is mainly due to the fact that interests, motivations and expectations
of researchers and practitioners cannot be easily aligned (at least not from the outset). The research process is rather messy and one could question the extent to which such projects can be designed ex ante. As this case has hopefully illustrated, researchers could benefit from adopting a flexible approach to research design in order to accommodate practitioner interests and, at the same time, take advantage of the emerging reality. The case study method appears to be well-suited to consider such flexibility considerations (see Dubois & Gadde, 2002).

In this case, what was initially perceived as a direct intervention from the industrial collaborator to compromise the research design, turned out to be beneficial in many respects. It resulted in gaining in-depth knowledge and generating insights about several unforeseen aspects (i.e. dynamic and contractual and relational) of the service specification and development process. We were able to elaborate upon the initial research question and produce findings which would not have been generated if we hadn’t have access to detailed documentary evidence such as service proposals, review meetings and contracts. Informal discussions with relevant managers also provided an important source of information about improvement projects and other on-going initiatives in terms of customer relationship management. Also, the resulting research design (for each case collecting data from both contracting parties) meant that we could better understand the buyer’s perspective and the logistics service purchasing process overall.

The case also presents some broader implications regarding the process of negotiating access and managing the relationship with the industrial collaborator. This project provides support for the view that there are multiple levels of access within an organisation (Buchanan et al., 1988). Securing access in a formal sense and maintaining the relationship with the primary contact are important considerations,
but researchers also have to think about how to convince interviewees, on an on-going basis, to offer their time and information. In this particular case, business development managers were offered strong incentives to participate in the project because of the market research interviews. Thus, they were willing to buy into the research project more easily. Those middle managers acted as “links” (Buchanan et al., 1988) in the sense that they allowed access to important documents, suggested suitable people to talk to and assisted in sorting out interview practicalities. Spending a long time within an organisation and developing a close relationship with managers and other employees also meant that it was easier to get back to revisit previous cases and collect information that was either missed or not considered important previously.

4. Discussion and Conclusions

In either of these studies, the researcher’s reaction to the unfolding of events might well have been to run away, once the neat rationale for the original ‘theoretical sampling’ had been undermined. Alternatively, it might have been tempting to neglect to report the inconvenient facts of the emerging design, and present a much neater account of the messy reality. But in both studies, unforeseen riches of insight were uncovered: isn’t this what research is all about?

Of course, it is accepted that the researcher should not be blown with the wind, following every detail regardless of relevance or source. But this is the essence of theoretically-informed research – skilled researchers work with organisations, utilising and, where they judge it appropriate, adapting their theoretical frames to help them explain and understand what they find (Dubois & Gadde, 2002; Ahrens, 2004).
This is not number-crunching, nor data-crunching, pure and simple: thinking is allowed. Skilled researchers have a deep and supple theoretical resource upon which they draw, in order to evaluate and understand what they find.

In the first part of the tale, it became possible to extend insights from the firm, and firm-to-firm level, to the network and chain. This is very difficult to achieve by design: here, it was achieved to some extent accidentally. In the second part of the tale, the constraints became resources: concentration on one firm’s relationships allowed an unanticipated depth of access, analysis and understanding.

And the message to our industrial collaborators – our raison d’être, let’s not forget – is what, exactly? Well, we do bring to you a frame of reference for understanding and explaining the world of operations management that you may not have thought of, so let us have our say, give us a little latitude, and don’t expect immediate pay-offs. But, at the same time, we understand the pressures and problems of operations – many of us have been where you are now, or somewhere similar – and we are surprisingly adaptable and responsive people. Ivory towers\(^1\) can be brittle, but we came down from ours a long time ago.

\(^1\)There are citations of the term in French in the 19th century but the earliest work in English that specifically refers to the current meaning of the phrase is a collaborative work of Frederick Rothwell and the splendidly named Cloudesley Shovell Henry Brereton -H. L. Bergson's Laughter, 1911:

"Each member [of society] must be ever attentive to his social surroundings - he must avoid shutting himself up in his own peculiar character as a philosopher in his ivory tower."

http://www.phrases.org.uk/meanings/210800.html
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