APPROPRIATE RESEARCH DESIGN FOR INVESTIGATING INNOVATION IN SMALL KNOWLEDGE-INTENSIVE PROFESSIONAL SERVICE FIRMS

S. Lu[1] and M.G. Sexton[2]

[1,2]*Research Institute for the Built and Human Environment, University of Salford, Salford, M7 1 NU, UK*

Performance improvement in the construction industry is significantly influenced by the innovation performance of small knowledge-intensive professional service firms. The importance of knowledge-based innovation as a critical source of sustainable competitive advantage in such firms has hitherto not been adequately appreciated or investigated. There is thus an urgent need to develop appropriate research design which enable us to better understand the nature and process of innovation in small knowledge-intensive professional service firms. This paper details a 'nested approach' which integrates an interpretative philosophy, case study- and action-research approaches and qualitative data collection and analysis techniques. The operationalisation of the 'nested approach' is then discussed by drawing upon ongoing collaborative research with a single case study company. The paper concludes with the identification of lessons learned from the research design aspects of the collaborative research and their methodological implications for future investigation into knowledge-based innovation in small knowledge-intensive professional service firms.

Keywords: Small Professional Service Firms, Innovation, Research Philosophy, Research design

1.0 INTRODUCTION

Performance improvement in the construction industry is significantly influenced by the innovation performance of small knowledge-intensive service firms. This increasingly recognised reality has stimulated a growing amount of research activity to better understand innovation in small construction firms (for example, see Sexton and Barrett, 2003a & b). It is widely accepted such research needs to use a research methodology which is both appropriate and relevant to the research area (McNeill, 1990); in other words the methodology needs to be designed to be sympathetic to 'the issue' being investigated: in effect to "….suit the method to the problem, and not the problem to the method" (Linstone, 1978:275). Existing approaches to conducting innovation research in small firms, however, often unreflectingly adopted research design and methodologies which were developed for the investigation of innovation in large firms (for example, see Rothwell and Dodgson, 1994). This forcing of 'large

[1] S.Lu@pgr.salford.ac.uk
[2] M.G.Sexton@salford.ac.uk

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firm research methodology' to explore small firm issues presents significant problems with respect to theory generation and testing. Storey (1994), for example, laments that researchers too often wrongly assume that the issues relevant to innovation in small firms are to be "scaled-down" version of those located within large firms.
The aim of this paper is to understand the key challenges faced by the researcher in small knowledge-intensive professional service firms (SKIPSFs) innovation research. This paper concentrates on the design and operation of the research methodology being used to investigate knowledge-based innovation (see Lu and Sexton, 2004a & b). The structure of this paper is as follows. First, key challenges for SKIPSFs research will be discussed. Second, the need for a 'nested' research methodology approach, which integrates the research philosophy, research approach and research techniques, will be identified. In the final section, conclusions will be drawn.

2.0 KEY CHALLENGES FOR SKIPSFs INNOVATION RESEARCH

This section seeks to examine a number of key challenges which need to be considered when designing and implementing research within SKIPSFs.

■ The role of the owner(s)
The owners of small construction firms have been found to have a pivotal role in triggering innovation compared to less agile bureaucracy of large firms (Sexton *et al.*, 2001; Miozzo and Ivory, 1998). This characteristic requires that researchers need to build a relationship with the owner (s) of a small firm if the required access to carrying out the firm is to be attained. This is in contrast to larger firms, where researchers can gain access into particular divisions or layers of the organisation, without having to directly gain the support of the senior management team.

■ Secondary company information
Many small firms lack clear formal structures and recording procedures and normally do not have paper- or computer-based records compared to large firms (for example, see Gurran and Blackburn, 2001). Innovation in small firms tends to come about in very fluid, informal ways. For example, one of the main ways of communicating innovation information is via informal face-to-face discussions between individuals which mean that there generally no printed copies. Thus the challenge for research within SKIPSFs is that the source of data must rely almost exclusively on staff. This means that well-supported access to a research site is necessary in this research.

■ Resource limitations
The issue of resource limitations of small firms compared to large firms has been highlighted in the literature (for example, see Robinson and Pearce, 1984). They depict that small firms lack the necessary resources (such as finance, staff and time) to engage in strategic planning, and instead focus on operational aspects geared primarily to survival on a day-to-day basis. Implicit within this view the researcher facing the difficulty to convince the case study company of the value of his/her research. Any proposed research needs to offer immediate, tangible benefits to the small firm. This is in contrast to larger firms which are more likely to appreciate the medium- to long-term benefits of collaborative research. The implication of this is that the research objectives for research with small firms need to be more specific to their individual, short-term needs compared to larger firms.
This section has identified a number of key themes faced by the researcher in conducting innovation research in SKIPSFs. The next section will set out the

methodology which has been designed to take into account these, and other, issues in an investigation of innovation in SKIPSFs.

3.0 METHODOLOGY

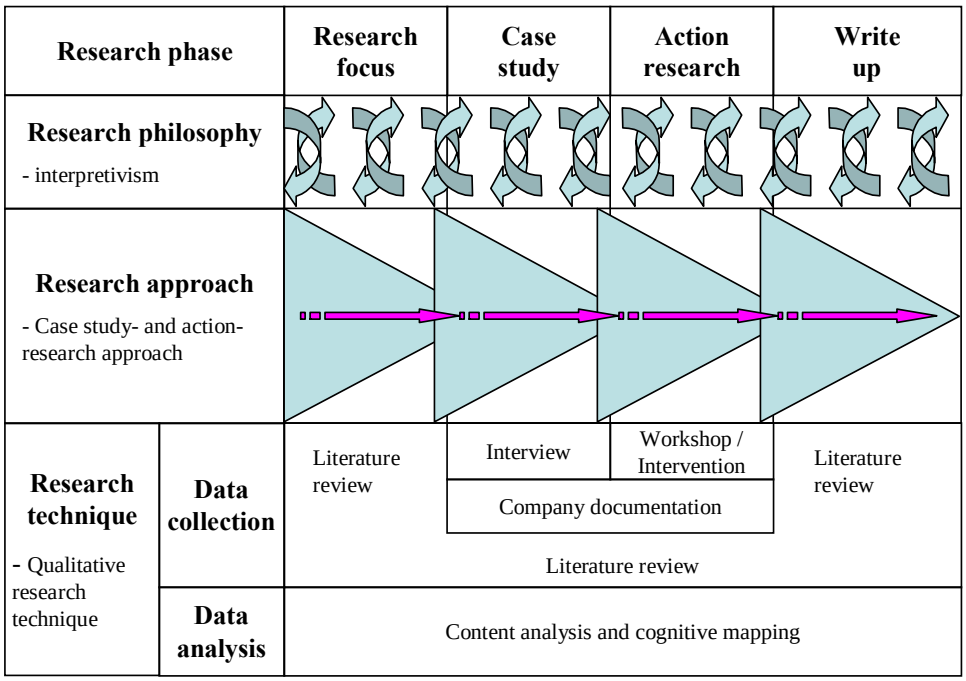
3.1 Research methodology: nested approach

To generate an appropriate alignment between objectives and the research methodology, a clear understanding of the constituent elements of research methodology, and their interaction, is required. This research adopts the 'nested approach' (Kagioglou *et al.*, 1998) to bring about this holistic and systemic approach.

This approach encompasses the research philosophy, research approach, and research technique. The research philosophy guides and energises the research approach and research technique. The research methodology provides the dominant approach to theory generation and testing method; whilst the research techniques identified the tools and techniques used for data collection and data analysis. The nesting of the model's elements generates a framework which provides any given research activity with appropriate direction and cohesion. Each of the elements of this model will be discussed and offered within the context of this research.

3.2 Research aims and overall research process

The overall research process used in this research is given in Figure 1.



∗The deliverable and understanding from each phase provided the focus for the next phase.

Figure 1: Overall project research methodology (based on Sexton and Barrett, 2003b:624)

There are four main research phases: research focus, case study, action research, and write up phase. Each phase provided progressive focus for the next phase. First, the research focus phase was carried out to develop hypotheses and models based on identified variables that appear to be key variables to successfully innovate through

the literature review: interaction environment; knowledge ba; relationship capital; human capital; structural capital; and, knowledge capital (see Lu and Sexon, 2004a & b). Second, the case study phase was carried out to identify variables that appear to be key to successful/unsuccessful innovation. Third, key findings from the case study were fed into the company workshop which had senior management representation. This workshop produced a number of company-driven initiatives for the action research phase. Finally, the completed results of this ongoing research will be written up.

3.3 Research philosophy: interpretative approach

The research approach and research technique should not operate in a philosophical vacuum, as this would render the methodology and the technique devoid of any philosophical context; indeed, "…..a methodology is more than merely a collection of these things. It is usually based on some philosophical view, otherwise it is merely a method, like a recipe" (Avison and Fitzgerald, 1994: 64). This philosophical view which provides direction for the appropriate design of all phases of a research study. A number of paradigms or bundles of presuppositions can be discussed which can be considered along several dimensions as shown in Figure 2 (Sexton, 2003). Each approach captures different ontological, epistemological, and axiological assumptions and approaches.

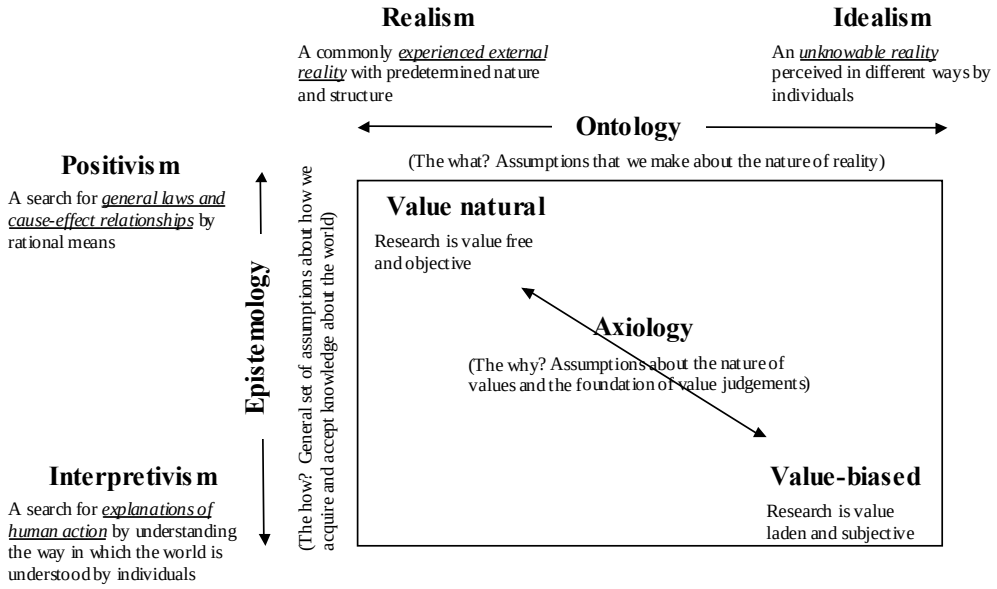


Figure 2: Dimensions of research philosophy

On the axiological assumption, the aim of this research is to investigate dynamic innovation capabilities in SKIPFs. These are multiple realities constructed by the case study firm staff and the researcher involved in this research. Consequently, the research is value-laden. From different actor perspectives, on the ontological assumption, this research seeks to prove hypothesises to evaluate and validity this concept of knowledge-based innovation model. For this reason, the reality is largely unknown and constructed by the individuals involved in the research situation. On the epistemological assumption, this research is concerned with understanding meaning and causality of the motivations and actions of knowledge workers, in the interaction activities. Because 'interaction activities' is predominantly within the

organisational behaviour, it is strongly linked to the social aspects of individual and organisational thought and action (behaviour). Therefore, the interpretative approach was considered the most appropriate for this research as it acknowledges the intersubjective, but extremely close-knit nature of knowledge workers within a small firm setting.

3.4 Research approach: case study- and action-research approach

The case study- and action-research approaches were justified for the following reasons. This research is fundamentally concerned with the underlying interaction within and between individuals in their 'real-life' context in SKIPSFs. This means there is no a need to explore the motivational and capability aspects of knowledge workers, rather than treat people as a 'black box' in the innovation process. This is in contrast to 'large firm' research which often approaches innovation from a more generic 'human resource' level. The case study approach believed is useful in the research of human affairs (Yin, 1994). Eisenhardt (1989) further explains that the case study is useful for allowing a particular issue to be studied in detail and in the context of its relationship with the real world. Significant efforts were made by the researcher to build up a relationship with the senior management and owners of the firm. This process centred on identifying and communicating the value of the proposed research as framed by the firm itself (rather than by the researcher's personal interests) , and developing trust between the staff and the researcher. Finally, in order to bring value-add activity into the case study company, and action- research approach was adopted (for example, see Susman, 1983). Action research approach is essentially practical, problem-solving nature in real-world organisations in real-time situation. The following section will cover the data collection research techniques themselves.

3.5 Research techniques

The data collection techniques for this research consisted of reviewing company documentation, carrying out interviews, undertaking workshops and designing and executing action research interventions. Each of the tools are discussed below.

■ Interviews

The aim of the interviews were to obtain an overall picture of the company and its innovation activity (drivers, enablers and barriers for SKIPSFs to successfully innovate). First, the focus and content of the interviews were co-developed with a senior member of the firm – buy in and shared ownership of the interview process by the owners of the firm were essential to the freeing up of staff to undertake the interviews. Senior management were asked to recommend one to two key respondents in, senior, middle, and junior, three different management levels. When agreement to cooperate was received, the semi-structure interview protocol was sent to these key respondents. This was to allow them to prepare themselves for the interviews. The interviews were between one and two hours in length, and were carried out by face-to-face interview which offered the researcher to better access and understand individual worldviews and tacit knowledge.

All interviews were recorded by combined making notes and using a tape recorder and then were transcribed verbatim into the word-processed documents. Then the transcripts were sent to each interviewee to check for accuracy.

■ Company documentation

In addition to the interviews, further dimensions of data were obtained through the analysis of company documents. However, it was found that there was little, and in many cases no, documentation. This highlights the very informal nature of

codification in small firms; but, from a research methodology perspective, prevents triangulation of interviewee accounts with company documentation.

■ Company workshop

The workshop was focussed on the presentation and discussion of the findings from interviews, and the development of an action plan. The workshop was structured around a number of main questions, which were informed in the company finding report, namely: what is the current position?; what are the potential problems?; why manage knowledge?; and what are potential improvement areas to sustain current growth?; and what are the immediate innovations which the firm should progress?. Additionally relevant questions arising from this workshop were discussed within the firm.

The workshop was videotaped. The idea was to identify different versions what have happened at the workshop and to track specific incidents that are suspected of causing misunderstandings. In addition, in order to maximise consensus and the commitment of the participant, the minutes of the workshop were sent to the firm for confirmation that the data had been interpreted correctly.

■ Action research intervention

The company workshop identified the development and implementation of project phase and post project reviews as the focus for the action research phase. A task group has been set up to steer and co-ordinate the innovation, and is made up of firm staff, client representation and the researcher. This phase is ongoing.

4.0 CONCLUSIONS

The departure point of this paper was that there is a tendency to employ 'large firm' research methodology to investigate innovation in small firms, and that this practice does not recognise the unique characteristics and needs of small firms. The pivotal role of the owners, the absence of company documentation and the lack of organisational resources were identified as key and distinctive characteristics of small construction firms which need to be considered in the design of the research methodology.

A nested research methodology approach was presented which is being used in ongoing research into innovation in small knowledge-intensive professional service firms. The proposed approach has four principal phases: research focus, case study, action research and writing up. The key features of the approach is the way it facilitates and encourages the necessity of building up of a 'whole firm' relationship with the researcher, and the collaborative aspect of the action research phase to deliver immediate, tangible 'whole firm' value to the case study firm.

Small construction firms are unique in the way they innovate compared to large firms. There is thus a need for research methodology designed to investigate innovation in small construction firms to be corresponding unique if it is to produce meaningful results.

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REFERENCES

Avison, K. and Fitzgerald, L. (1994), **Methodological Concepts and Approaches**, Free Press: New York.

Eisenhardt, K. M. (1989), "Building Theories from Case Study Research", **Academy of Management Review**, 14/4, pp. 532-440.

Gurran, J. and Blackburn, R. A. (2001), **Researching the Small Enterprise**, 1st ed, Sage Publications: London.

Kagioglou, M., Cooper, R., Aouad, G., Hinks, J., Sexton, M. G. and Sheath, D. M. (1998), **A Generic Guide to the Design and Construction Process Protocol**, University of Salford: Salford.

Linstone, H. A. (1978), "The Delphi Technique", in Fowles, J. (Eds.), **Handbook of Futures Research**, Greenwood Press: London.

Lu, S. and Sexton, M.G. (2004a), "How Do Small Knowledge-intensive Professional Service Firms Develop Their Sustainable Competitive Advantage Through Innovation", **Proceedings of the International Conference on Construction IT**, Langkawi, Malaysia: 18th – 21st February, pp. 683-694.

Lu, S. and Sexton, M.G. (2004b), "Knowledge-Based Innovation In Small Knowledge-Intensive Professional Service Firms: An Under Developed Research Area?", **Proceedings of the 4th International Postgraduate Research Conference in the Built and Human Environment**, Salford, UK: 1st- 2ndApril, pp. 486-496.

McNeill, P. (1990), **Research Methods**, Routledge: London.

Robinson, R. and Pearce, J. (1984), "Research thrusts in small firm strategic planning", **Academy of Management Review**, 9, pp. 128-137.

Rothwell, R. and Dodgson, M. (1994), "Innovation and Firm Size", in Dodgson, M. and Rothwell, R. (Eds.), **The Handbook of Industrial Innovation**, Edward Elgar: Aldershot Hants.

Miozzo, M. and Ivory, C., (1998), **Innovation in Construction: A Case Study of Small and Medium-sized Construction Firms in the North West of England**, Manchester School of Management, UMIST: Manchester, UK.

Sexton, M.G., Barrett, P., Miozzo, M., Wharton, A. & Leho, E., (2001), "Innovation in Small Construction Firms: Is it Just a Frame of Mind?", **Proceedings of the 7th Annual ARCOM conference**, Salford: 5th – 7th September.

Sexton, M. G. (2003), "A supple approach to exposing and challenging assumptions and path dependencies in research", **Keynote Speech of the 3rd International Postgraduate Research Conference**, Lisbon, April 2003 – www.scpm.salford.ac.uk/bf2003/sexton_keynote.pdf

Sexton, M.G. and Barrett, P.S. (2003a), "A Literature Synthesis of Innovation in Small Construction Firms: Insights, Ambiguities and Questions", **Construction Management and Economics: Special Issue on Innovation in Construction,** 21, September, pp. 613-622.

Sexton, M.G. and Barrett, P.S. (2003b), "Appropriate Innovation in Small Construction Firms", **Construction Management and Economics: Special Issue on Innovation in Construction,** 21, September, pp. 623-633.

Storey, D. J. (1994), **Understanding the Small Business Sector**, Routledge: London.

Susman, G.I., (1983), "Action Research: A Sociotechnical Systems Perspective" in G. Morgan (Ed), **Beyond Method: Strategies for Social Science Research**, London: Sage Publications: 95-113.

Yin, R. K. (1994), **Case Study Research: Design and Methods, Applied Social Research Methods Series**, 5, 2nd ed, Sage: Newbury Park, CA.