"It worked for manufacturing…!"

Operations strategy in project-based operations

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Abstract

This paper describes the application of an Operations Strategy (OS) approach to project-based operations (PBOs), defined as low to medium volume and medium to high variety operations. The OS approach has been extensively and beneficially used in high and medium volume operations. By examining the development of OS from its genesis in manufacturing operations, we identify four aspects of the OS approach – strategic intent, focus, fit and resource configuration. These elevate the discussion of how to configure resources to gain competitive advantage from PBOs, to the level of business leaders. The four aspects are then analysed in greater detail, with a view to determining the adaptations required for application in a PBO.

The results of this engaged study indicate that the approach delivered significant new insight for the organisation involved in the study. The contributions of this paper are identified for both practice and theory. For practice we demonstrate an alternative to a reliance on standards and process compliance to an opportunity to gain competitive advantage from PBOs. For theory, we have extended OS into PBOs and provide a basis for future theory testing. We conclude that there is a significant opportunity for further practical and theory development through using an OS perspective.

Keywords

Operations, strategy, projects, project-based operations, strategic intent, focus, fit, resource configuration, theory extension

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1. Introduction

The genesis of this paper, and the work it describes, was a challenge in 2007 from the former CEO of a large global technology services firm. He wanted to know how his firm could gain competitive advantage from their programme and project management activities. This paper describes one line of enquiry that was pursued over a five-year period to address the challenge.

We started from the premise that programmes and projects represent operational activities within organisations. Operational activities and competitive advantage have been explicitly linked in the study of Operations Management and Operations Strategy (OM, OS). The resulting improvements in the performance of repetitive operations associated with the application of OM and OS are well documented (e.g. Tunälv, 1992). Contemporaneously, the academic subject area has grown from being the concern of production engineering departments, to a significant field within business and management. However, OM/OS has focused on repetitive, rather than project-based operations (projects and programmes). Our work therefore is based on a 'practitioner problem' (how to gain competitive advantage from project-based operations) that coincides with a gap in the literature.

The application of OS (defined in terms of 'a pattern of decisions') to project-based operations (PBOs – operations having low-medium volume and medium-high variety) appears to be novel. Some aspects of the approach were clearly evident in our case organisation (and others in our experience), but we were unable to find systematic and deliberate application of the approach in its entirety. This is the key difference with repetitive operations, where such cases are plentiful (e.g. as described in Slack and Lewis, 2008).

The purpose of this paper is theory extension, extending the approach of OS into PBOs. The objective was exploration of whether the OS approach would provide insight in PBOs. If the approach did yield insight (as was found), testing could follow to explore its efficacy. Extensive empirical work to first explore, then test the approach was carried out embedded within the organisation from which the original challenge came.

The following section is a literature review that deconstructs the elements of the OS approach, and demonstrates the gap in the literature that we have identified. It further identifies questions for the study. We then show how the questions are then dealt with through a multi-stage research approach, before the findings are described, and the conclusions, limitations and areas for further research are outlined.

2. Literature review

Our review of the extant literature comprises four elements. The first provides a review of the key developments in operations strategy (OS), and demonstrates the evolution of the subject, including identifying four interlinked aspects for study – strategic intent, focus, fit and configuration. The second considers projects as an operations process area – the PBO. The third is a systematic review of OS in PBOs, identifying a gap in the literature. The fourth element considers how the four identified aspects for study (intent, focus, fit and configuration) could work in practice in PBOs.

2.1 Operations Strategy

OS is *"…the total pattern of decisions which shape the long-term capabilities of any type of operations and their contribution to overall strategy, through the reconciliation of market requirements with operations resources."* (Slack and Lewis, 2008, p.18).

Following an OS perspective therefore means that our focus is on the decisions that determine the links (or absence of links) between organisational strategy and the operations of that organisation. A discussion of organisational strategy in general is therefore outside the scope of this paper. We develop further granularity in these links using this perspective by considering the development of the field. The aspects identified are then developed further for the context of PBOs in section 2.4.

Genesis of OS

There is general agreement in the OS literature that the seminal contribution of Skinner (1969) began the development of OS (Brown, Squire and Lewis, 2010). The potential strategic contribution of the operations function, a manufacturing plant, was identified. Indeed, the focus of OS in the original case and much of the OS literature subsequently has been on repetitive manufacturing. Rather than being the default constraint to the competitiveness of an organisation, Skinner showed how it could become a source of competitive advantage, by linking the strategic decisions of the organisation to those of the operations function. Later work reinforced this linkage (Skinner, 1974) and demonstrated how it could be operationalised. Two aspects were identified: competitiveness through focus, and operationalization of that focus. The first recognised that an operation could not be good at everything, for instance simultaneously delivering cheap **and** very high quality products. There were *trade-offs.* These trade-offs represented choices to be made by business leaders, and then deployed into decisions for the manufacturing function. Operationalising these decisions resulted in the development of *focused factories* – or *factories within a factory*, allowing each focused unit to concentrate on the delivery of a particular set of objectives (e.g. fast **OR** good **OR** cheap).

Various stages of strategic development of the operations function were identified, as shown in Table 1. Operations functions could consider their current position versus their aspiration in terms of competitiveness. The characteristics of organisations at each stage provided a 'rough guide' for managers, rather than a detailed manufacturing audit (e.g. Menda, 2004), the tools for which were developed later. Indeed, the very general nature of the approach is a remarkable feature of its early development, focusing on 'the conversations that it generated' rather than hard, objectifiable measures. Given our intent to extend the approach into PBOs, this discursive rather than objective quality will be prioritised at this stage.

Stage	Description	Characteristics
Stage 1	Minimize manufacturing's negative potential: **"internally neutral"**	Outside experts are called in to make decisions about strategic manufacturing issues. Internal detailed management control systems are the primary means for monitoring manufacturing performance. Manufacturing is kept flexible and reactive.
Stage 2	Achieve parity with competitors: **"externally neutral"**	Industry practice is followed. The planning horizon for manufacturing investment decisions is extended to incorporate a single business cycle. Capital investment is the primary means for catching up with competition or achieving a competitive advantage.
Stage 3	Provide credible support to the business strategy: **"internally supportive"**	Manufacturing investments are screened for consistency with the business strategy. A manufacturing strategy is formulated and pursued. Longer-tem manufacturing developments and trends are addressed systematically.
Stage 4	Pursue a manufacturing-based competitive advantage: **"externally supportive"**	Efforts are made to anticipate the manufacturing- potential of new manufacturing practices and technologies. Manufacturing is involved "up front" in major marketing and engineering decisions (and vice versa). Long-range programs are pursued in order to acquire capabilities in advance of needs.

Table 1: Stages in Manufacturing's Strategic Role (Wheelwright and Hayes, 1985)

As is evident from Table 1, a key feature of the OS approach that differentiates it from much of the project management literature is the level of analysis. An OS approach argues that strategic consideration of operational capability is essential because many of the challenges faced in delivery cannot be resolved at the level of the operation; they are organisational issues (e.g. concerning resourcing, priorities, technology, market, and crucially the 'capability' is involved in formulating organisational strategy).

The expansion of the language of 'focus' has become more nuanced too. Explicit mapping of focus provided a significant breakthrough as recognisable 'tools' for describing the priorities of markets. Mapping the gap between what the market requires and what the operation is delivering (Hayes and Wheelwright, 1984; Hill, 1994), as for strategic intent, provided a decision-support approach for managers.

Focusing operations was demonstrated to be beneficial (Skinner, 1979, 1974). Where this was within a single low-scale operation, once focus was determined, its deployment was believed to be un-problematic. However, in larger-scale operations, gaining this deployment so that multiple parts of the operation were aligned in their priorities required more explicit consideration. Having determined focus, the operation therefore has to go through a process of gaining *strategic consensus,* ensuring that the strategy is both appropriate and communicated (Boyer and McDermott, 1999). Matching the requirements of the external environment determines the focus, but then it must be communicated so that the pattern of decisions throughout the organisation matches that focus. This is a multi-level view of the operation, and determines whether the strategy is reinforced or undermined. The theory is developed that appropriate strategy plus strategic consensus leads to superior performance. 'Fit' therefore occurs when there is a match between customer requirements and organisational assessments of requirements (external fit) and when the decisions at multiple levels in the PBO reflect those requirements (internal fit).

Gaining strategic consensus is a necessary but not sufficient condition. It may be communicated and agreed, but the enactment into resource configuration needs to follow. The original conceptualisation of configuration in OS was based on two resource decision areas: structural and infrastructural decisions (Boyer and McDermott, 1999). In the context of repetitive operations, the decision areas have been expanded to include the level of technology, the capacity adjustment strategy, supplier development, inventory, planning and control systems, failure prevention and improvement, and improvement process strategy (Slack, Chambers and Johnston, 2011). This progression is illustrated in Figure 1.

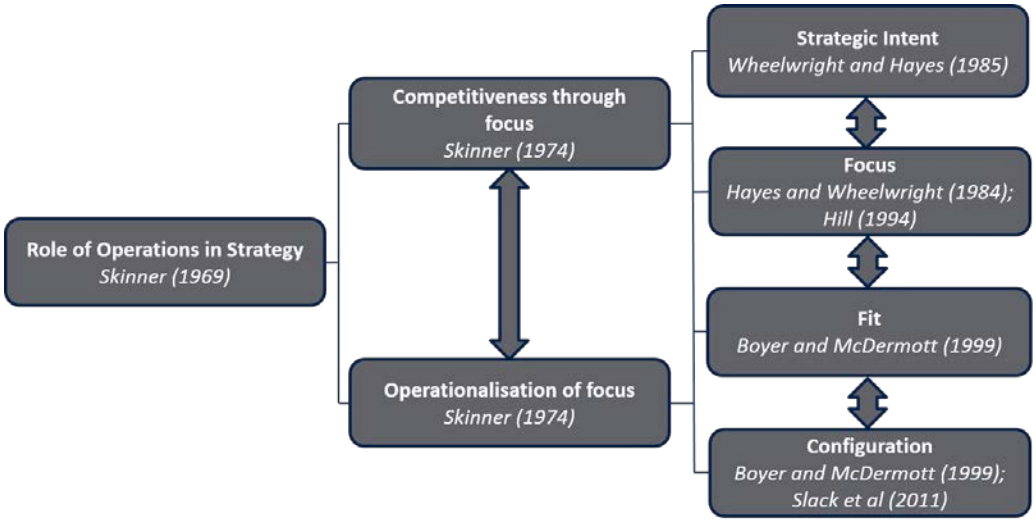


Figure 1: Evolution of OS

We synthesise these into an OS view of the PBO as comprising 4 main elements: strategic intent, focus, fit and configuration.

The OS approach is of interest for a number of reasons, including its success in promoting the role of operations (initially manufacturing operations) to board level in most major organisations. In contrast to the continued challenges of project performance, the performance of repetitive operations has been transformed by these organisations over the past 20 years. The academic credibility of the Operations Management (OM) area is also high, with the field having a number of top-rated journals (Journal of Operations Management and Production Operations Management). In addition, there are few OS studies that have taken place in PBOs and whilst the OS theorisation appears useful for understanding practice, and extendable into PBOs (Oltra, Maroto and Segura, 2005), we heed their call for further research to be carried out.

2.2 The PBO

OM focuses on transformation processes, specifically the transformation of inputs into outputs. Inputs can be materials (e.g. in a manufacturing process), information (e.g. in a design process), people (in a service) or an organisation or part thereof (e.g. in a change project). The nature of the process is described in a number of dimensions, including whether it is concerned with delivering a product, a service, or some combination of these, and its volume-variety characteristic.

Products and services

Projects can produce products, that is, tangible outputs where production of the product precedes its consumption e.g. the construction of a building. They can also be a means for the delivery of services, where the outcome is intangible and the service delivery is simultaneous with the project duration e.g., an organisational change. Whilst the roots of OM and OS are in manufacturing, the body of work on services and service management is now extensive.

The expansion of OM and OS to consider services began in earnest in the mid-1990s, and its growth has mirrored the growth of the service-based economy in general. In many instances, this growth has come through *servitization* (e.g. Baines, Lightfoot, Peppard, Johnson, Tiwari, Shehab, and Swink, 2009; Wikström , Hellström, Artto and Kujala, 2009). Servitization is where a product-centric offering

becomes a product and service offering. One of the most-used examples is of Rolls Royce Aero engines, transforming their business from one that sold engines (product offering) to one that today offers its customers the option to buy 'power by the hour.' This is summarised by the logic of Theodore Leavitt, *"People don't want to buy a quarter-inch drill. They want a quarter-inch hole!"* (Christensen, Cook and Hall, 2005: p76). Projects are usefully considered in this way too, indeed, we are seeing similar trends in projects. For instance, the organisation replacing its IT system is unlikely to be buying just the hardware and software of the implemented system. It is far more likely to be buying in both capability and change. This might be the capability to process orders more quickly than previously, and change to the new way of working for the operation. Amey, for example, recently changed its business category listing from 'construction company' to 'business service company.' Projects are no different from other operations in 'producing' products, services and combinations thereof, with the trend for an increased occurrence of services (Wikström et al., 2009).

Volume-Variety

The volume-variety characteristics of operations processes provide the other major dimension of interest for OM analysis, and this distinguishes project work from other operations types. We can describe the transformation process according to the volume of throughput, where high volume would be reflected in the use of a production line, for instance, or a service factory (e.g. a call centre). In such cases the variety of processes used is deliberately kept very low to allow resources to be configured to meet the needs of delivering the volume of throughput with the objective of maximum efficiency. Medium volume processes with medium variety would be handled by 'jobbing' systems, typically involving the use of more flexible technology, people and processes in the transformation. Indeed, there are many characteristics of these jobbing systems that would be recognised as projects (defined beginning and end, significant time-frames, each job having degrees of uniqueness). We therefore designate project-based operations processes, as shown in Figure 2 and describe them as being low-medium volume and medium-high variety.

2.3 OS and Projects

In addition to reviewing the main contributors to the development of OS, we carried out a systematic review (Tranfield, Denyer and Smart, 2003) using the combination in the database Scopus of the keywords 'Operations Strategy' and 'Project*' (to include *project*, *projects* and *project management*). Nine journal articles were identified. Of these nine, only one has PBOs (Oltra, Maroto and Segura, 2005) as its focus (though termed 'project process firms').

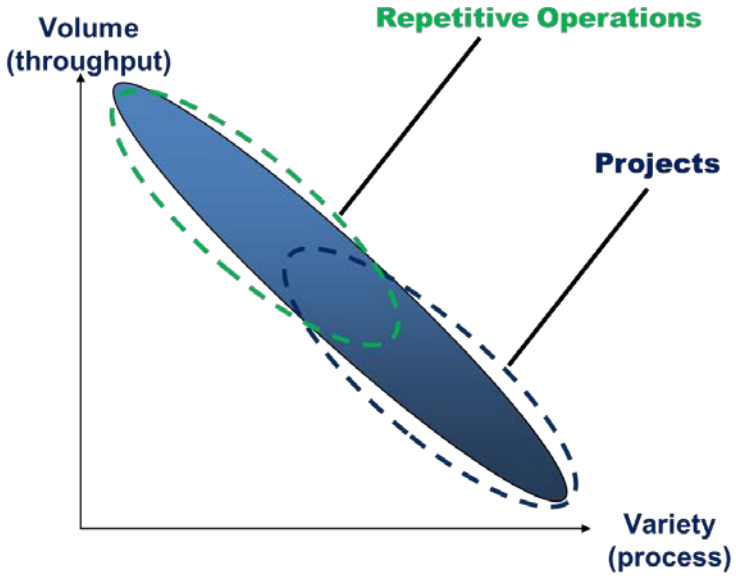


Figure 2: Volume / Variety Work Distinction

One further paper is concerned with national level competitiveness (Kruger, 2012), and the remaining papers (Affisco and Soliman, 2006; Alas, Kraus and Niglas, 2009; Kallio, Saarinen, Salo, Tinnila and Vepsalainen, 1999; Lewis and Boyer, 2002; Minarro-Viseras, Baines and Sweeney, 2005; Rytter, Boer and Koch, 2007; Schmidt and Portues, 2000) all consider 'projects' or 'project management' as one dimension of change resulting *from* an OS process e.g. to implement a new service strategy or advanced manufacturing technology, rather than as the focal operations process.

Such limited findings demonstrate that projects and project-based operations in particular are an under-explored process area within the OM canon.

2.4 Operationalising OS in PBOs: Intent, focus, fit and configurations

The 'pattern of decisions' in OS was developed into four aspects in section 2.1. The purpose of this section is to examine how these four aspects might be applied in PBOs.

Strategic Intent

The original work on strategic intent, identifying many of the issues in manufacturing operations at that time (particularly, poor levels of performance and reactive approaches to managing) is relevant to PBOs today. Wheelwright and Hayes stated:

> *"Manufacturing companies…are today facing intensified competition. For many, it is a case of simple survival. What makes this challenge so difficult is that the 'secret weapon' of their fiercest competitors is based not so much on better product design, marketing ingenuity or financial strength as on something much harder to duplicate: superior manufacturing capability. For a long time, however, many of these companies have systematically neglected their manufacturing organisations. Now, as the cost of that neglect grows ever clearer, they are not finding it easy to rebuild their lost excellence in production."*
> (Wheelwright and Hayes, 1985: p.99)

Superior *project* delivery capability is the opportunity that has likewise been neglected by so many organisations. The cost of neglect is becoming increasingly clear (PMI, 2012) and it will take time to (re)build excellence. However, a first step is to recognise the opportunity – the difference between the current achievement and the aspiration for the organisation. This represents the generation of the strategic intent. In use, a gap is identified between current performance and aspiration, with deficiencies (and occasionally excesses), providing the input to changing the necessary capabilities.

'Strategic intent' contrasts with the commonly used maturity approach to PM capability. Whilst maturity models are notable for focusing on the level of conformance to a given approach (see e.g. Cooke-Davies, 2005), an OS view considers the role that the PBO can play in providing competitive advantage to that organisation at that time. In terms of the model outlined in Table 1, 'maturity' is an approach to get to stage 2, whilst the OS view represents an aspiration for stage 3 or higher. For the purpose of this study therefore, the question that will be asked of any organisation taking such an approach is, 'What is our competitive aspiration?'

Focus

The organisation that focuses on a limited set of objectives will outperform the one that attempts a broader mission (Skinner, 1974; Hayes and Wheelwright, 1984). The next stage therefore, is to establish the particular focus that will lead to superior performance (Leong et al, 1990). Once established, the organisation can determine the configuration of their resources (termed 'decision areas') to meet that focus (Hayes and Wheelwright, 1984; Ward, McCreery, Ritzman and Sharma, 1998). Whilst it is beyond the scope of this paper to link to the wider strategy literature, this

approach is in line with Porter (1996) who argues that competitive advantage is about the entire system of organisational activities and choices.

Focus is operationalised into a set of *competitive priorities* reflecting the relative weighting of operational capabilities required in terms of cost, quality, flexibility and delivery. This framework has been refined (e.g. Platts and Gregory, 1990; Hill, 1994) by splitting delivery into delivery speed and delivery reliability, but there is little digression from the basic framework in the OS field (Boyer and Lewis, 2002).

Whilst there is considerable agreement on the content of the priorities, how to handle the relative importance of each has been the subject of much debate. Three schools of thought can be identified: the trade-off school, the cumulative school and the integrative school. Like the iron / golden triangle of time, cost and quality in PM, the trade-off school considers that one priority can only be achieved at the expense of another (Skinner, 1974) – put another way, *"you can have it good **or** Tuesday"* (Slack, 1991, pp.i).

The cumulative school argues that in a world where there are so many different ways of delivering operational capabilities (e.g. using automated verses manual systems), trade-offs were irrelevant (e.g. Nakane, 1986; Schonberger, 1990; Corbett and Van Wassenhowe, 1993; Noble, 1995). Based on studies of world-class manufacturing, it was evident that some firms were excellent across multiple priorities simultaneously (Womack, Jones and Roos, 1991). The sand cone model (Ferdows and De Meyer, 1990) is a good example of how this is theorised, with capability in quality as the base of the cone, enabling the development of higher order capabilities, delivery reliability, then low cost and then flexibility.

The integrative school (e.g. Hayes and Pisano, 1996; Schmenner and Swink, 1998) has attempted to reconcile the differences of the trade-off and cumulative schools and claim that rather than being competing approaches, both of the other schools can simultaneously provide insight. Whilst some priorities will compete for resource to develop their capability others will be mutually enabling. There is little empirically that would demonstrate the superiority of one school over the other (Boyer and Lewis, 2002) and, whilst still contested, the interaction of the three schools provides insight beyond the traditional PM conceptualisation of the iron / golden triangle. In addition, all the perspectives agree you need to prioritise first and subsequently explore the inter-relationships between the competitive priorities.

It is notable that the priority of *flexibility* has been largely absent from PM discussions of priorities, despite projects being located in a position in the volume-variety space which would indicate that flexibility (variety of process) was a fundamental descriptor (Oltra, Maroto and Segura, 2005). It will be important for our work to explore whether flexibility can be an important attribute for PBOs in practice.

Lastly, not only do the competitive priorities differ and interact, the nature of their contribution to competitiveness will differ. Hill (1994), in manufacturing strategy, conceptualised their contribution as being either *order qualifiers* or *order winners*. For instance, a certain level of quality may be needed to be able to qualify to receive any orders at all. Certification for ISO9000 is a pre-requisite for many markets – it is an order qualifier. However, improving quality systems beyond ISO9000 may not provide any further competitive contribution. Order winners may include delivery speed where the faster you can deliver, the more competitive you will be. Spring and Boaden (1997) noted both the intuitive appeal of this conceptualisation, but also a number of challenges with whether order winners could be enduring, and the role of marketing as a mediator of perceptions of capability.

In practice, this stage of OS is operationalized using strategic profiling (Platts and Gregory, 1990; Hill and Brown, 2007). For each market segment in which the organisation operates, it should identify both the market requirements and its current performance. As for the strategic intent, this analysis provides a gap that can be selectively targeted for change.

For a PBO, the above presents a number of opportunities and challenges. The first is the need to determine whether the core 4 or 5 competitive priorities are indeed a sufficient expansion of possible performance objectives, as part of a move beyond the classic iron triangle compliance of traditional projects. The second is whether the notion of gaps in strategic profiles will provide utility. The question for the organisation therefore is, 'What are our competitive priorities?'

Fit

We used a conception of fit based on *external fit* – that is, the level of agreement between the focus of the PBO and its market. Well deployed, there should also be a consistency internally within the PBO. For the purposes of this study, it will be interesting to see whether the concept of 'fit' has any resonance with managers, and to examine if there is a discernible 'pattern of decisions. ' The question for the organisation using the approach is, 'How well are these (competitive) priorities aligned?'

Configuration

Configuration in this context is a challenging term – not least because of the association in PM with 'configuration management.' However, we will retain the term and will be exploring it from an OS perspective, so the comparison can be grounded between repetitive operations and PBOs. The question for the organisation is, 'How can resources be configured to meet the competitive priorities?'

Summary of literature review.

We have described four sequential but interdependent aspects. This provides the focus for our investigation, of the content of the four aspects and the nature of their interactions. Our synthesised working framework is shown in Figure3.

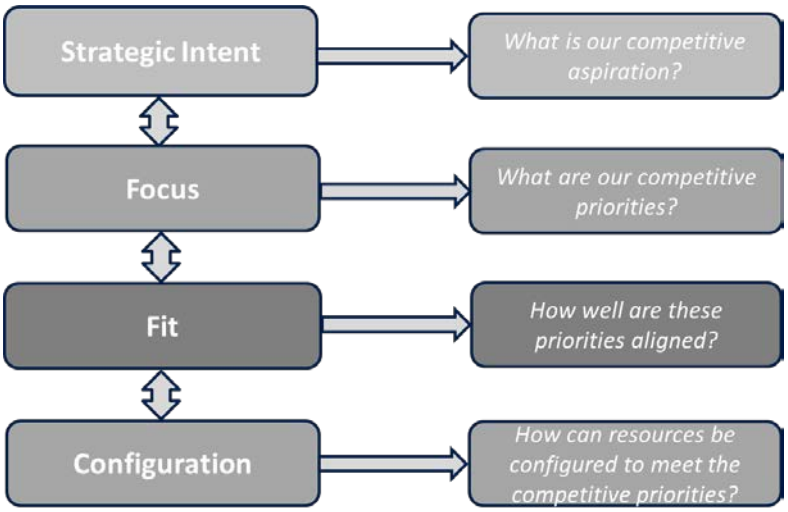


Figure 3: Working framework for OS in PBOs

3 Research Design

Our purpose is two-fold. Firstly we have to answer the practical challenge of how to create competitive advantage for the organisation. Secondly, having chosen OS as the lens and approach

for this, to extend theory into the context of PBOs. Our overarching question is whether the frameworks and approaches of OS are applicable with benefit to PBOs (i.e. they yield insight) and what changes are needed to make them work. In order to ascertain this, each of the aspects of the framework shown in Figure 3, has its own sub-question:

1. What is our competitive aspiration (and the gap with current performance)?
2. What are our competitive priorities (and the gaps with current performance)?
3. How well are these priorities aligned (externally and internally)?
4. How can organisational resources be configured to meet the competitive priorities?

3.1 Research Approach

The approach was a form of engaged scholarship (Van der Ven, 2007, p. ix) undertaken as *"a participative form of research for obtaining the advice and perspectives of key stakeholders (researchers, users, clients, sponsors and practitioners)"*. The approach fits best with the action research category of engaged scholarship, as it took *"a clinical intervention approach to diagnose and treat a problem of a specific client."* (Van der Ven, 2007, p. 281). 'The problem' was that the CEO perceived his firm as not getting competitive advantage from its PBOs. Our intervention was the application of OS to the PBOs.

The characteristics of engaged research relevant to this study are:

1. We sought to meet the twin objectives of enlightening practice *and* advancing our field (as Simon, 1976).
2. The work was collaborative and participative. It sought to gain multiple perspectives on the complex challenges relevant to the core problem.
3. It is research *with* practice, not research *for* practice (e.g. Winter, Smith, Morris and Cicmil, 2006).
4. It requires a shift in how you define your relationship with the communities in which you operate, both academic and practitioner.
5. It takes time and is iterative.

Each of these is a potential strength of engaged research, but will be shown in our reflections on the research approach to provide non-trivial risks for the research team (see Conclusions).

The research team were embedded with the subject organisation (a major technology services provider described in the following section) on a programme of research projects focused on improving organisational performance in PBOs. This was carried out through formal agreement from 2007-2012. This project represents one part of that work and took place in multiple phases.

Research practice

Our practice was to follow a four-stage process for the research (Van der Ven, 2007) in each phase:

- Research design – how is that particular phase to be carried out?
- Theory building / extending – how can the OS approach be extended to the PBO in principle?
- Problem formulation – how is the approach likely to work in practice?
- Problem solving – use approach, gather results, negotiate findings.

Each phase iterated through this cycle until no further new insights were being uncovered. The phases and main groups involved in each phase, are shown in Figure 4.

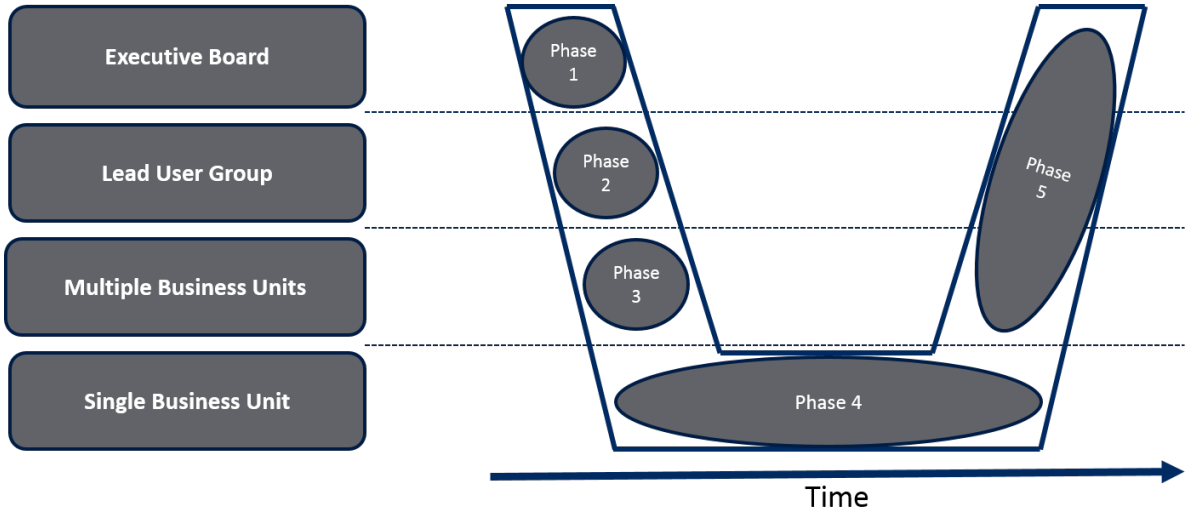


Figure 4: Research phases

In Phase 1, executive workshops established the purpose of the research. Business leaders were briefed on OS. Phase 2 established principles by which this could be implemented in the organisation. We used a gated process, working with 6 senior business leaders (the lead user group) and refining this in 8 workshops over 2 years. In Phase 3 we researched and trialled the concepts into core business processes, involving 14 workshops over 6 months in multiple business units. Phase 4 was a major trial in one large business unit, including 3 workshops and 12 interviews with representatives of both sides of the client / provider dyad. Phase 5 represented internal publication and handover of the concepts, with subsequent follow-up by the research team and supporting other business units' understanding of the ideas, through workshops, seminars and training courses.

Our philosophical stance is pragmatism, which puts this particular 'human problem' at the centre of our consideration and uses multiple ways of knowing to access solutions to that problem. Given the exploratory (theory extension) rather than theory testing mode of our research, this is consistent.

Primary data were collected from interviews, surveys, observed meetings and workshops. Secondary data were gathered from websites, reports and performance databases, in addition to soliciting the views of executives with experience of those organisations and their historical dealings. Data from interviews and workshops was recorded where possible but this was limited by the extreme level of confidentiality required for access. Findings were presented back to management boards both for verification and for their benefit, and used in the process of developing the approach.

3.2 The case organisation

Within the firm, business units were concerned with the provision of dedicated services to their clients (major public- and private-sector organisations), using resources leveraged from globally controlled functions. The business units who participated were strategically selected based on their need to generate competitive advantage in an increasingly transactional market for outsourced technology services. Some were excluded because they had sole-supplier status, others because they were only small players or supplied a limited range of services to a particular client. Further business units were excluded where there were 'relationship issues' with clients and the presence of the research team was considered to be commercially inappropriate.

The business was split into its project-based operations (termed '*change*') and its repetitive operations ('*run*'). Forty per cent of the value of contracts held by the firm was for change work. Consistent with the rest of the industry, this type of work had the greatest risk of losing both money

and clients. The run work was considered to be the more stable and more profitable. However, to get good run business, change operations had to be conducted successfully.

4. Findings

The following presents the results of trials and workshops of the synthesised OS approach based around the four elements of intent, focus, fit and configuration, predominantly focusing on the outputs from Phase 4 as disseminated and tested in the wider organisation (and later beyond) in Phase 5.

Over a number of years, it had become apparent to the case organisation's senior management that isolated performance improvements were not sufficient to generate competitive advantage. They collectively recognised the need to shift their focus from the traditional technology-based *'what will we deliver?'* to consider *'how will we deliver it?'* This had to be tailored to the requirements of the client whilst retaining agreed technical performance levels. Trade-offs and choices existed as to how to perform the service that were not necessarily specified in contracts and had not previously been discussed between client and provider.

From our early interviews, it was apparent that both the organisation and their clients recognised the difficulty presented by trade-off decisions, yet neither party had the power, opportunity or language to surface the issue for open debate. In addition, it became clear that 'simple' conceptions of capability and performance were unwarranted. Specifically, the case organisation had an extensive set of processes in place to enable large projects to be 'executed in a controlled manner'. Some tailoring of the processes could be undertaken appropriate for the particular piece of work, but managers interviewed regarding the effectiveness of their projects' activities readily admitted that these systems allowed only limited flexibility to accommodate their clients' needs. The opportunity for a wider discussion of how to gain competitive advantage from their PBOs was broadly welcomed.

4.1 Intent

We found that whilst the original 4-box model of Wheelwright and Hayes (1985) provided some insight, it didn't have the resonance of the original. It was modified following trials with the firm and their customers in a number of respects, including:

1. They were used to dealing with 5-box maturity models (e.g. from CMMI), so the original was split to provide this.
2. The language was amended to that of a PBO.
3. The role of process in PBO was so pervasive in the organisation as the 'solution' to all the problems of the PBO that its limits in terms of strategic contribution were added.

Figure 5 shows.

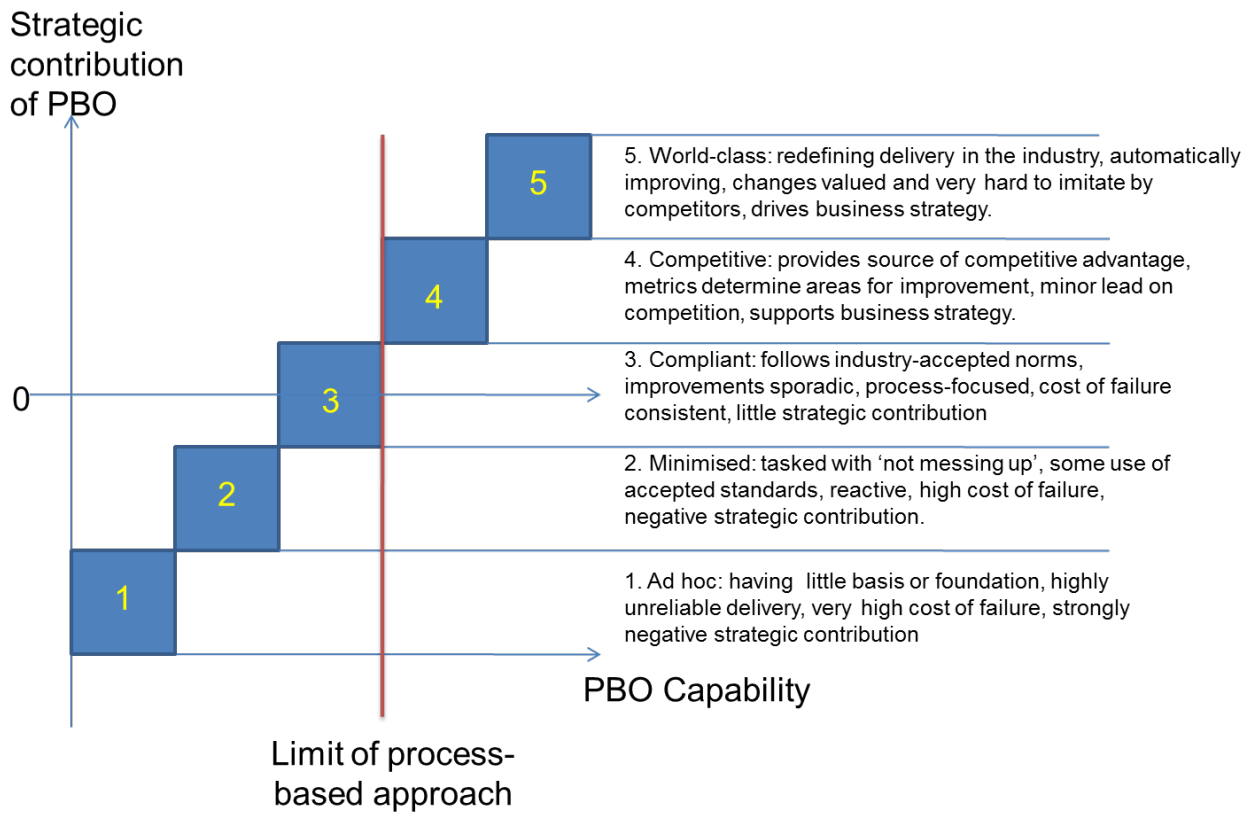


Figure 5: Competitiveness-based 'maturity' model

During workshops with both clients and providers (our case organisation), we were able to demonstrate the competitive gaps for the organisation. Initially, we assessed the aspiration of the provider, then the performance as rated by their clients. Lastly, a third variant was identified, the achievement as rated by the provider. These three assessments alone provided considerable insight, not least because providers generally rated the service provision as 1-2 levels above the rating of their customers, which was in turn 1-2 levels below the provider's aspiration. Such recognition created the opening for discussions in the provider about competitiveness and the impact that their PBO was having on the business.

Our second insight showed a commonly held belief on the part of business leaders. They believed that projects should be delivered with the reliability of modern manufacturing operations, yet without any of the subsequent consideration of what might be considered necessary OS elements (focus, fit and appropriately configured resources) being in place and aligned with this expectation. Instead, it was widely held that process or procedure was a useful proxy for this. For instance, this firm was consistent with its competitors in this market in focusing on conforming to the same approach (CMMI level 4/5). From an OS perspective, it was clear that achieving this would not yield competitive advantage as it was simply what was being pursued by all of the competitors in their markets.

At a workshop in Phase 6, we asked managers in the firm about their views on the utility of these concepts. Of 130 managers (74% response rate), 70% thought that the firm did not gain competitive advantage from their PM capability at that time. In terms of the levels in Figure 5, the results were varied. Responses were: level 1, 4%; level 2, 22%; level 3, 58%; level 4, 15%; and level 5, 1%. This

concentration of achievement at or below level 3, is consistent with the finding concerning the reliance of the organisation on process.

One immediate insight from discussing Figure 5 was that managers recognised that high performance on the model would be both desirable and achievable (89% thought that competitive advantage could indeed be gained), but that what might be more significant for the business would be the firm's perception in the eyes of the client. A strong reputation for delivery may mask the occasional failure, as a poor reputation could take many years to rebuild even with high performance. In use, and consistent with this last observation, we found that Figure 5 provided a fertile basis for discussions and these worked best when this was considered in both quantitative (key metrics) and qualitative (subjective, reputational) terms.

4.2 Focus

The findings from Phase 3 demonstrated that there was no comparable approach to the winning and delivering of business that followed the OS view. For instance, a process designed to 'win' bids was examined. This was because a number of managers had dismissed any consideration of OS because *'we have a process for that.'* Process-focused thinking precluded wider consideration of competitiveness. On examination however, that process required the development of a business case focusing on products and benefits, rather than any aspects of how the product and service process was to be delivered in terms of its competitive priorities. Whilst necessary, it provided only one view of how the firm won and delivered business.

Our approach began using a more grounded approach to determine the categories of competitive priorities for this organisation. We started with the original 4 (quality, cost, speed and flexibility) from Wheelwright and Hayes (1984). Following focus groups and trials held in Phase 3, delivery speed and delivery reliability were separated, as were product and service quality. The item 'relationship' was also added. We trialled these ideas with managers from different business units and they reported finding it useful in terms of making clear which were the priorities they should be focusing on, and to understand which, if any, they were currently implicitly or explicitly favouring. For the 130 managers polled above, their perception of their prime competitive objectives were delivery reliability (32%), price / cost (24%) and delivery speed (20%). Flexibility was the prime competitive objective for 9% of managers, justifying its inclusion in future lists of possible competitive objectives. This initial poll demonstrated the heterogeneity of objectives across the business and therefore was worth exploring further. The implication of such heterogeneity in the business was that local configuration as opposed to corporate configuration of resources would be appropriate.

Focus was subsequently explored in one business unit in detail as part of Phase 4. As 'neutral' researchers, we could question the desired focus for the organisation's clients, and gain their perspectives. This allowed a comparison of views from both sides of the dyad. We generally found a range of opinions from the individuals interviewed, i.e. the lack of a unified view over which aspects to prioritise. Figure 6 shows the dissonance encountered when the performance of one business unit was examined against the requirements of the customer. Firstly, we met with managers and attempted to derive a consensus view of performance. This is shown by the solid line in Figure 6 indicating that they believed price was their strongest performance area. Then we carried out a similar process with managers on the client side, and their priorities are indicated by the dotted line. The significance of delivery reliability, not price, is in marked contrast and highlights a fundamental misalignment of objectives.

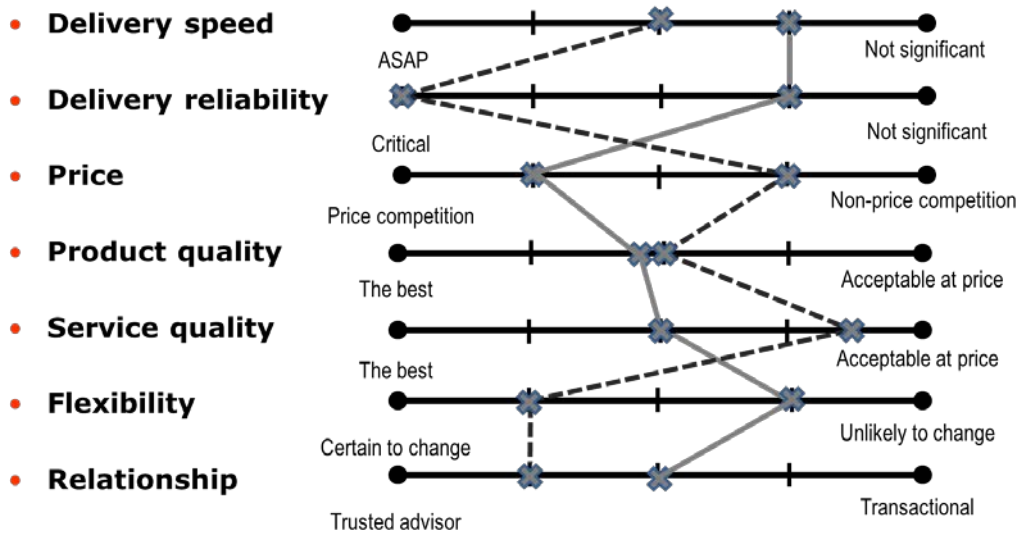


Figure 6: Competitive objectives as delivered by provider (——) and required by client (- -)

An advantage of this straightforward analysis was that it provided a clear visual indication of which objectives should have the most importance, and to allow this to be shared relatively easily around the firm. This had resonance with one manager from the client who commented, *"All of the subtle messages about how we would chose the solution and what we were going to do with it never filtered down. So there were things that we needed to happen that they didn't understand and by the time they understood it, it was too late."*

4.3 Fit

As part of the research interviewing senior managers and project delivery teams on both the client and provider side, we examined whether the alignments identified by the literature (Boyer and McDermott, 1999) could be identified in practice. It was clear from the work on focus that there was little chance of *external* fit being achieved. We were interested to see what happened when no consensus process had been run (it hadn't) and whether consensus leading to *internal fit* would occur naturally. We found two contrasting situations.

One PBO worked on 'urgent operational requirements' (UORs). The prime objective was clear for all concerned. *"UORs – that's where speed and mobilisation of resources is key and can be critical."* This, or a similar phrase, was identified from all participants and managers, in both client and provider. The nature of the project (often relatively short in duration) was time-critical for the client, and additional cost could be traded for delivery speed given the urgent need. This resulted in both internal and external fit, with clear guidance for decision-makers as to where the priority lay.

Another PBO, however, showed extreme dissonance. A selection of interview comments highlighted the lack of consensus on either side of the client-provider dyad regarding which were the most important objectives. From the provider senior management, we heard comments including: *"For the client – it's always about price"*, *"The client relationship is absolutely key. A strong and positive client relationship,"* and *"The most important is that we deliver value rather than low cost*". From the provider project managers, *"So if you put a quote in they'll always go for the lowest"*, "*From the client perspective whatever price we can meet they will expect top-line quality"*, *"For the client - cost and quality, probably"* and *"The clients judge us on cost and on-time delivery"*. Interestingly, the

client senior management had different views: "*An organisation that fundamentally understands the service delivery requirement"* and "*It's a product on time, actually. Not too much cost, but product on time with reasonable cost."* Client project managers' comments included: *"I'm actually adamant that we won't compromise on quality and that therefore there will be a trade off with cost and time."*

Our analysis showed the following understanding of the competitive priorities (Table 2):

Table 2: Competitive Priority Analysis from Interview Data.

Competitive priority	**Provider**	**Client**
Senior managers	Cost / price Relationship	Delivery reliability Service quality Relationship
Project managers	Cost / price Product quality Delivery reliability Service quality	Product quality Delivery reliability

The internal and external dissonance in this second case, rather than consensus, was clear. This PBO had neither a clear focus, nor fit in its operations. Indeed, the patterns of decisions were inevitably going to clash. The common perception by the provider that price was the most important element for winning business was not mirrored by the client and in particular by the senior managers who made the buying decisions. Instead, the focus on price caused particular issues. Notably, managers worked to minimise price through minimising headcount, with considerable impact on the ability of the projects to deliver. This was at odds with *all* of the client requirements; in none of the client interviews was price mentioned as a priority in deciding who was awarded business.

In contrast, the previous UOR example showed an area of the business where the nature of the business priorities was clear and there was consensus (consistent with Boyer and McDermott, 1999). Coincidentally, this was also the area where the PBO demonstrated the greatest performance, had the highest customer satisfaction, and was also commercially successful.

The impact of this analysis was the opportunity for the organisation to develop a common language for assessing their strategic priorities. This had not been in place previously. The language of OS was broadly perceived as useful, once it had been demonstrated that there was considerable dissonance. Further, whilst not proven, the contrast between these two PBOs was so stark that the notion of fit deserves further exploration to determine whether there is a positive link with performance.

4.4 Configuration

We initially used the categories for resources from Slack et al. (2011) (including the level of technology, the capacity adjustment strategy, supplier development, inventory, planning and control systems, failure prevention and improvement, and improvement process strategy), as these have been extensively used elsewhere. However, their relevance always required explanation and as a result of workshops and our grounding interviews, were replaced with capability, capacity, process, support and governance, and outsourcing. We have subsequently tested this (via workshops) in a range of other industries outside IT (including automotive, transport infrastructure, telecoms delivery and scientific development) and its utility was verified with no further amendments recommended.

Table 3 shows an example of how these were used in a business improvement plan when put up against the competitive objectives for that PBO. The priority was agreed with the client to be delivery reliability, followed by flexibility and then delivery speed. The management team were able

to agree the actions across the 5 decision areas that would lead to improved performance in their priorities.

Table 3: Generation of an improvement plan based on competitive priorities

Objective	Capability	Capacity	Process	Support & governance	Outsourcing
Delivery reliability	Reward 'safe' delivery over 'rescue.'	Allocate defined capacity to work in this segment, with commitment of staff for project durations	Improve use of look-ahead and problem prevention elements of the toolset	Allocate central PMO resource up-front in work as a matter of routine	Embed staff within outsourced team
Flexibility	Cross-train staff to allow multi-disciplined response to changes	Prioritise access to key staff on other projects if necessary.	Promote use of more flexible toolsets (e.g. agile)	Governance to support change rather than conformance	Revisit contracts to ensure rigidities not built-in
Delivery speed	Develop rapid-deployment teams	Have capacity partially under-utilised to allow opportunity for quick deployment	Focus on constraint analysis and continually improving speed	Pre-approve as much work as possible. Gates and checkpoints must not slow down work	Have teams doing development and improvement activities between projects

It was also evident that in addition to these decision areas, there was a feature of the PBOs in this study that distinguished them from repetitive manufacturing operations. That was the role of relationships in the operation. We saw that this was frequently used as a compensator for a complete lack of strategic consideration. As one senior manager on the client side admitted, *"Personally I'm quite pragmatic about it and I'm less concerned by what the contract says than by what I get out of it at the end of the day. But it takes two to tango and therefore it can only happen if you really, really trust the other party".* Future theory testing could investigate the potential moderating effects of relationships between the objective statement of how resources are configured and the achievement of performance.

Lastly, whilst configuration in the OS process was important, it is how it works with the other aspects that will determine whether competitive benefit is gained from the approach. In one business unit (in Phase 5), we saw that business leaders were able to identify their intent, begin to segment their (large) market in terms of different competitive objectives, integrate multiple performance measures with 'voice of the customer' feedback in each segment, and then begin the process of reconfiguring the PBO to create better internal and external fit. Most beneficial in this process was

the identification of significant misalignments that hadn't been exposed previously particularly in terms of the how the performance of internal operations was assessed.

5 Conclusions

The objective of this paper is to apply OS to PBOs for the purposes of both enlightening a practical problem and potentially extending OM theory. For OS, the PBO is a relatively little-explored context. OS is a well-established approach in repetitive operations and one that, despite its many positive attributes, has received little attention in the PM literature. For PM, the application invokes a conversation around competitiveness, not limited to aspects of process and compliance. For practice, the approach has yielded considerable insights into the competitiveness of the organisation in its project-based operations, the nature of focus, trade-offs, the alignment of priorities (fit) and the configuration of resources required to deliver strategic priorities.

We perceive the dominant view of PBOs as being one where conformance to process and adherence to the iron / golden triangle are the goals, yet reported performance is often still poor. This is not through lack of investment by public and private sector organisations alike, since training and process development have been extensive. Here we have proposed a different approach, in that the application of OS to PBOs may be beneficial and replace this dominant view. OS focuses on gaining an understanding of the trade-offs that can be made (Skinner, 1974), and the implementation of an explicit pattern of managerial choices (Slack and Lewis, 2008) to prioritise the most important factors through resource configuration. We saw in the findings on 'fit' that such explicit and consistent choice-making does not happen serendipitously, but only when there is deliberate agency (consistent with Boyer and McDermott, 1999).

At this stage, there is insufficient evidence to demonstrate that this is a superior approach, but there is considerable evidence that in this context, the four adapted OS aspects did provide superior conversations for the organisations concerned. There is clear evidence that enabling a more 'mature' discourse provides considerable insight for the individuals and organisations involved, as OS did early in its development (c.f. Wheelwright and Hayes, 1984). Indeed, in our extensive discussions with managers and business leaders in Phase 5 of the study and beyond, the concepts have gained resonance with organisations who saw the OS approach as adding a valuable perspective to their consideration of how to improve the performance of PBOs.

The discussion of intent, focus (identification of priorities), fit (alignment both internally and externally) and the appropriate configuration of resources, offers another perspective for managers. However, this cannot be just another 'process' to follow, it requires significant managerial judgement, and buy-in both internally and externally to the organisation. It may well require considerable relationship building in order to build the trust and openness which would allow such an approach to be attempted. To pull these aspects together and maintain the necessary strategic focus, may, as has become the norm for repetitive operations, be encouraged by the appointment of c-suite executive, a Chief Projects Officer, for instance.

Reflections on the process

In the Research Approach section, we set out five characteristics of action research as a type of engaged scholarship. The research team were deeply committed to the joint objective of this kind of research, to advance both practice *and* the academic field through our work. We left the project concerned that we had fallen between two stools, being neither sufficiently prescriptive for busy, time-limited executives, nor sufficiently theoretical for the academy. The research process itself is challenging. It relies on participation, which could be withdrawn at a moment's notice, and frequently was. Similarly, research *with* practice is great if 'practice' doesn't think they are simply buying a consultancy solution to their problems. Our changed relationship with the academy brought challenges, as this kind of work is not typical and therefore more difficult to judge alongside

more traditional studies. Lastly, taking time and iterating are an anathema to corporate cultures focused on 'quick wins'. However, our commitment to engaged scholarship remains although we recognise the level of effort, risk and (in some cases) incompatibility with the modern academy (see Söderlund and Maylor, 2013) and business requirements.

Areas for further research

Areas for further research include the testing of the model as a whole and whether organisations which follow such an approach do, as was found in repetitive operations, perform any better than those that don't. In addition, each of the elements and its interactions could be unpacked, expanded and tested. For instance, whilst our investigation focused on the client-provider dyad future research can also look at the role of focus in supply chains. Alignment of priorities (gaining fit) should be beneficial. For example, if all parties are focused clearly on delivery reliability, this is more likely to be achieved than if some are more concerned with making the lowest price the priority. In addition, understanding the nature of competitive priorities (which 'school' (trade-off, cumulative or integrative) would be most appropriate for what kind of PBO), and the nature of the configuration possibilities and their impact, could improve the value of the approach.

In this paper we have described the application of an OS approach to PBOs. This generated insights for the organisation in its search for competitive advantage. Further, despite the differences between repetitive and project-based operations, the OS approach can be amended to fit this context. On this basis, we believe the application of OS in PBOs to be a fruitful area for both further academic research and for organisations seeking competitive advantage through their project-based operations. The approach clearly worked for manufacturing.

References

Affisco J.F., Soliman K.S., 2006. E-government: A strategic operations management framework for service delivery. Business Process Management Journal 12 (1 SI), 13-21.

Alas R., Kraus A., Niglas K., 2009. Manufacturing strategies and choices in cultural contexts. Journal of Business Economics and Management 10 (4), 279-289.

Baines, T., Lightfoot, H., Peppard, J., Johnson, M., Tiwari, A., Shehab, E., Swink, M., 2009. Towards an operations strategy for product-centric servitization. International Journal of Operations & Production Management 29 (5), 494 – 519.

Boyer, K. K., Lewis, M.A., 2002. Competitive Priorities: Investigating the Need for Trade-Offs in Operations Strategy. Production and Operations Management 11 (1), 9-21.

Boyer, K. K., McDermott, C., 1999. Strategic consensus in operations strategy. Journal of Operations Management 17 (3), 289–305.

Brown, S., Squire, B., and Lewis, M.A., 2010. The impact of inclusive and fragmented operations strategy processes on operational performance. International Journal of Production Research, 48 (14), 4179-4198.

Christensen, C., Cook, S., Hall, T., 2005. Marketing malpractice: the cause and the cure. Harvard Business Review 83(12), 74-83.

Cooke-Davies, T., 2005. Measurement of Organizational Maturity: Questions for Future Research. Project Management Institute, Newtown Square, PA.

Corbett, C., Van Wassenhowe, L., 1993. Trade-offs? What trade-offs? Competence and competitiveness in manufacturing strategy. California Management Review, Summer, 107–122.

Ferdows, K., De Meyer, A., 1990. Lasting improvements in manufacturing performance: In search of a new theory. Journal of Operations Management 9 (2), 168–184.

Hayes, R. H., Pisano, G.P., 1996. Manufacturing strategy at the intersection of two paradigm shifts. Production and Operations Management 5 (1), 25–41.

Hayes, R. H.,Wheelwright, S.C., 1984. Restoring Our Competitive Edge: Competing Through Manufacturing. John Wiley and Sons, New York.

Hill, A., Brown, S., 2007. Strategic profiling. International Journal of Operations and Production Management 27(12), 1333-1361.

Hill, T. J., 1994. Manufacturing Strategy: Text and Cases, 2nd ed. Irwin, Burr Ridge, IL.

Kallio J., Saarinen T., Salo S., Tinnila M., Vepsalainen A.P.J., 1999. Drivers and tracers of business process changes. Journal of Strategic Information Systems 8 (2), 125-142.

Kruger, L.P., 2012. Developing operations strategies - reassessing the strength and importance of competitive operations priorities for South African businesses. South African Journal of Business Management 43 (3), 13-28.

Leong, G. K., Snyder, D., Ward, P., 1990. Research in the process and content of manufacturing strategy. Omega 18 (2), 109–122.

Lewis M.W., Boyer K.K., 2002. Factors impacting AMT implementation: An integrative and controlled study. Journal of Engineering and Technology Management, 19 (2), 111-130.

Menda, R., 2004. The role of a manufacturing audit in crafting the production system. International Journal of Operations & Production Management, 24 (9), 929 – 943.

Minarro-Viseras E., Baines T., Sweeney M., 2005. Key success factors when implementing strategic manufacturing initiatives. International Journal of Operations and Production Management, 25 (2), 151-179.

Nakane, J., 1986. Manufacturing Futures Survey in Japan, A Comparative Survey 1983–1986. Waseda University, Systems Science Institute, Tokyo, Japan.

Noble, M. A., 1995. Manufacturing strategy: testing the cumulative model in a multiple country context. Decision Sciences 26 (5), 693–721.

Oltra M.J., Maroto C., Segura B., 2005. Operations strategy configurations in project process firms. International Journal of Operations and Production Management, 25 (5), 429-448.

Porter M., 1996. What is Strategy? Harvard Business Review 74 (6) 61-79
Platts, K., Gregory, M., 1990. Manufacturing audit in the process of strategy formulation. International Journal of Operations and Production Management 10 (9), 5–26.
PMI, 2012. Voice of the Profession Survey. Available from www.pmi.org.
Rytter N.G., Boer H., Koch C., 2007. Conceptualizing operations strategy processes. International Journal of Operations and Production Management 27 (10), 1093-1114.
Schmenner, R. W., Swink, M.L., 1998. On theory in operations management. Journal of Operations Management 17 (1), 97–113.
Schmidt G.M., Porteus E.L., 2000. The impact of an integrated marketing and manufacturing innovation. Manufacturing and Service Operations Management 2 (4), 317-336.
Schonberger, R. J., 1990. Building a Chain of Customers. Free Press, New York.
Simon, H., 1976. The business school: a problem in organizational design, in H.A. Simon (ed), Administrative Behavior: a study of decision-making processes in administrative organization, New York: Free Press, 335-356.
Skinner, W., 1969. Manufacturing – the missing link in corporate strategy. Harvard Business Review. 47 (3), 136-146.
Skinner, W., 1974. The Focused Factory. Harvard Business Review, May-June, 113-119.
Slack, N., 1991. The Manufacturing Advantage. Mercury Business Books, London.
Slack, N., Lewis, M., 2008. Operations Strategy. Pearson, Harlow, UK.
Slack, N., Chambers, S., Johnston R., 2011. Operations Management, 6th Edition. Pearson Education, Harlow, UK.
Söderlund, J., Maylor, H., 2012. Project management scholarship: Relevance, impact and five integrative challenges for business and management schools. International Journal of Project Management, 30 (6), 686–696.
Spring, M., Boaden, R., 1997. One more time: how do you win orders? A critical reappraisal of the Hill manufacturing strategy framework. International Journal of Operations and Production Management 17 (8), 757-779.
Tranfield, D., Denyer, D., Smart, P., 2003. Towards a methodology for developing evidence-informed management knowledge by means of systematic review. British Journal of Management 14 (3), 207-222.
Tünalv, C. 1992. Manufacturing strategy – plans and business performance. International Journal of Operations and Production Management, 12 (3), 4-24.
Van der Ven, A., 2007. Engaged Scholarship: A guide for organizational and social research. OUP, Oxford.
Ward, P. T., McCreery, L.P., Ritzman, L.P., Sharma, D. 1998. Competitive priorities in operations management. Decision Sciences 29 (4), 1035–1046.
Wheelwright, S., Hayes, R., 1985. Competing through manufacturing. Harvard Business Review, Jan-Feb, 99-109.
Wikström, K., Hellström, M., Artto, K., Kujala, J., Kujala, S., 2009. Services in project-based firms – four types of business logic. International Journal of Project Management 27 (2), 113-122.
Winter, M., Smith, C., Morris, P. and Cicmil, S., 2006. Directions for future research in project management: the main findings of a UK government-funded research network. International Journal of Project Management, 24 (8), 638-649.
Womack, J. P., Jones, D. T., Roos, D., 1990. The Machine that changed the World.: Macmillan, New York.