

Changing times and changing timescales: the servitization of manufacturing

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For many years, those in the operations management community have debated the boundaries between manufacturing and service, recognising that the distinctions between them are becoming increasingly blurred (Johnson, 1999). In business, this blurring is becoming more pronounced, especially with the emergence of new forms of contracting, often enabled by developments in information technology. Here, we can see trends to offer a complete product and a one-off service (as in design and build in construction), and the trend to design/develop/make and operate a product, facility or service through-life (as in “power by the hour” contracts in aerospace). In construction, procurement models such as private finance initiative (PFI) reduced the traditional divide between the role of the construction company and facilities management. Thus, providing additional services to accompany the sale of products is increasingly central to the strategies of many engineering and manufacturing companies, and this is reflected by a significant growth in research into the general trend away from a “pure product” orientation towards an integrated through-life “product-service” (P-S) offering. For P-S providers, the rationale is said to include, *inter alia*, lengthening customer relationships, locking out competitors, steadier income flows, capitalising on the installed base and response to changing customer demands (Johnstone *et al.*, 2008).

The phenomenon of integrating product and service offerings has been referred to in the recent literature as “product-service system”, “servitization” and “integrated solutions” (Baines *et al.*, 2007; Davies *et al.*, 2006; Johnstone *et al.*, 2008; Neely, 2008). However, a variety of other related terms include “servicisation” (Quinn *et al.*, 1990), “servitization” (Vandermerwe and Rada, 1988; van Looy *et al.*, 1998), “going downstream” (Wise and Baumgartner, 1999), “winning in the aftermarket” (Cohen *et al.*, 2006) and “new manufacturing” (Marceau *et al.*, 2002). What unites these definitions, however, is their focus on the provision of additional services to complement a tangible product offering in order to add value (Marceau *et al.*, 2002). Benefits of such strategies for the provider are said to include profitability (Anderson *et al.*, 1997; Cohen *et al.*, 2006; Gebauer *et al.*, 2005; Wise and Baumgartner, 1999), differentiation in competitive marketplaces (Heskett *et al.*, 1997; van Looy *et al.*, 1998) and as a potential lead to additional demand for products. A solutions focus means that that the creation of value must be understood through the eyes of the customer (Brady *et al.*, 2005). This reverses the traditional “product-forward” view of value creation (Slywotsky and Morrison, 1998). However, some have questioned the extent to which these ideas are actually new (Antonacopoulou and Konstantinou, 2009), or even whether “pure product” organisations ever existed. Thus, whether this

actually represents a new business paradigm, or a relabeling/evolution of an established concept, arguably remains contested ground.

One way of establishing the extent to which the integration of products and services represents a genuine redefinition of manufacturing/service boundary is to examine the implications for operations management. The literature suggests that P-S provision requires a significant transformation in the ways that firms are structured, towards an organisation based on units dedicated to “front end” and “back end” activities. Customer-facing front end units are established to engage directly with customers, from the point of first contact through bid preparation and project execution, to the provision of the required service. Traditional production and service divisions are transformed into back end units providing the product platforms and service portfolios to the front-end. They must be integrated by a strong centre to integrate client and capability requirements to provide tailored solutions (Davies *et al.*, 2006; Eisenstat *et al.*, 2001; Galbraith, 2002; Johnstone *et al.*, 2008, Miller *et al.*, 2002). Crucially, the literature also suggests that P-S requires a transformation in organisational processes, and the way firms operate and organise on a day-to-day basis (Brady *et al.*, 2005; Oliva and Kallenberg, 2003).

Despite the conceptual attractiveness of this approach, the ways in which these new forms of organisation are enacted remains vague. In particular, there is a paucity of studies which have revealed the experiences of organisations undertaking the “transition from product manufacturer to service provider” (Oliva and Kallenberg, 2003, p. 165) and the consequent implications for operations management. In this special issue we attempt to address this knowledge gap by assembling a range of empirical and theoretical contributions which span many sectors within which the P-S paradigm has become prevalent. In each of these papers the challenges inherent in operationalising the P-S construct are explored, and strategies for enacting the approach are identified or constructed. Given the multi-sector scope of this issue, and the different challenges inherent across different product and service markets, the array of approaches identified is similarly diverse. Thus, a nuanced and contingent set of strategies emerge from these contributions which are sensitive to localised contexts and supply chains. This stands in contrast to some of the more normative contributions on enacting P-S which can currently be found within much of the literature.

The papers

The paper by Schmenner explains why the historical integration of manufacturing with service was quickly seen as advantageous in some circumstances, but not so in others. The paper reviews the history of manufacturing companies in the USA during the last half of the nineteenth century, categorises them, and ties them to theory. It argues that the bundling of manufactured goods to downstream available services was led by companies with new products but with no great manufacturing strengths, as a way to establish barriers to entry. Companies with significant manufacturing capabilities were not as quick or as complete in their integration of manufacturing and service.

Spring and Araujo explore the ways in which product and service elements combine to provide service to customers, and the implications for operations strategy. They

examine alternative approaches to defining and conceptualising services from several literature streams and explore how the boundaries between firms and consumers can be considered. Through their literature synthesis they offer an agenda for research into a possible new form of operations strategy thinking which combines the analysis of alternative network structures, the effects of institutional and technological mechanisms for making transactions between firms, the interplay of alternative cost and revenue models within and between firms in a network, and the design and delivery of “offerings” using principles of modularity. Their paper is unusual in breaking away from IHIP as a basis for service definition which has interesting implications for operations strategy.

Pawar, Beltagui and Riedel examine designing product, service and organisation to create value aims to advance the understanding of product-service systems (PSS). They use a road-mapping analysis, an investigation of industrial challenges for collaborating enterprises, a multidisciplinary literature review of PSS concepts and analysis of two cases to synthesise a framework for the understanding and investigation of PSS. They demonstrate the need to consider the network of firms involved in delivering value through the PSS which they term the product-service-organisation (PSO). They argue that the resultant classification of PSS related literature, drawing on a broad review of research in marketing, design and operations management related to service and PSS, provides a framework to help researchers understand the organisational challenges of PSS. It highlights the challenges inherent in creating and delivering value through a collaborative network conceptualised in the PSO triangle.

Baines, Lightfoot, Peppard, Johnson, Tiwari, Shehab and Swink examine an operations strategy for a product-centric servitization. They argue that with a product-centric servitized offering, the business focus is likely to blend transactional activities with a customer management function that is configured to deliver the core product and the services related to supporting the use of the product. Using both literature derived insights and empirical data they propose a framework to enable manufacturing firms to configure their internal production and support operations. This captures a set of operations, principles, structures and processes to guide manufacturers in the delivery of a product-centric servitised offering. Baines *et al.* contrast these against operations that deliver purely product (production operations) and those which deliver purely services (services operations). They argue that their framework bridges the gap between models and classifications that focus on either pure product or pure service operations and provides a basis for the development of guidance for practitioners seeking to move their organisations up the value chain with a servitized offering.

The paper by Johnstone, Dainty and Wilkinson explores the evolution of P-S strategies in the aerospace sector. The paper offers fresh empirical evidence into the development of P-S in an organisation drawn from a sector often flagged as an exemplar of P-S provision, and provides insights into the complex realities of P-S implementation and delivery. Notably, it highlights the challenge of attempting to embed an organisation-wide “service culture” in pursuit of integrated P-S delivery. Whilst, their analysis shows how problematic the integration of product and service business units can be, their study also provides an indication of the types of strategies which can help to enable a seamless value offering to be delivered to customers.

Nonetheless, their findings question the nostrums and overly simplistic models which pervade the current integrated solutions discourse.

Brax and Jonsson adopt a case study approach to analyse two manufacturing firms entering condition-based maintenance businesses. By examining both manufacturer and customer perspectives, their paper reveals the complex nature of establishing integrated solutions within this environment. They contend that, in integrated solutions, value is created incrementally through the customer-provider co-production process. Thus, successfully delivering integrated solutions is predicated on the effective management of the interdependence of the solution components – both within the provider company and the offering, and between the provider and the client. The paper's primary contribution is to propose a revised definition for integrated solution offerings which questions the view of solutions development as a straight-forward implementation process. Their perspective switches perspective from the manufacturer to the business of the client as the main system of delivery.

Conclusion

The common theme underpinning all of the contributions within this special issue is their focus on the implications of product service modes of working for operations management research and practice. Key to these are the need to revisit traditional operations management tools, techniques and frameworks, many of which were developed on the basis of evidence and experience drawn from traditional manufacturing firms. Clearly as these traditional manufacturing firms servitize, the models used by the operations management community may need to be modified and enhanced. Of particular importance is the changing timescale of service delivery and support. It is arguable that in the past the operations community adopted a fairly cross-sectional view of organisational capabilities. Much of the work undertaken by operations management scholars explored the capability of firms today (and in some cases questioned whether that capability was fit for tomorrow). Discussions about inventory management, supply chains and networks, production technologies, product design, capacity planning and management, even operations strategy itself rarely strayed beyond a three to five year time horizon. Yet as manufacturing firms servitize and in some cases move towards offering long-term services and support (decades in the defence and construction industries), then our traditional operations management models fall short. Where are the frameworks for thinking about the implications of today's product design for service and support that has to be delivered over the next thirty years? To what extent do supply chain researchers consider the implications of today's policies for very long-term contracts and relationships? Do those formulating manufacturing strategies have good frameworks for thinking through the implications of their policy decisions for the firm given its current (and likely future) service and support contracts? This issue of timescale is something that the operations management community will have to pay significant attention to if they are to impact the world of practice.

Methodologically, it is also worth noting that within the empirical contributions there is an attendant focus on case studies across many of the contributions presented here. Together, these offer rich insights into the challenges of delivering within the P-S paradigm and question some of the assumptions inherent within the extant literature which often portray a straight-forward transition from product or service centric

offerings to sophisticated PSS. Also of note is the range of different sectors traversed by this collection of papers. This reveals a degree of both commonality and difference across different production environments and provides a more nuanced set of contributions than elsewhere within this literature. A final significant contribution of this collection of papers is in the frameworks and models that seek to provide a theoretical basis from which operations strategies can be developed. These offer a point of departure for practitioners seeking to understand the operations implications of the integration of products and services and the many challenges to which they must attend. We therefore commend these papers as an engaging collection of contributions to this growing area of enquiry.

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Further Reading

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Loughborough University, Loughborough, UK
AIM Research, London, UK