

# SERVITIZATION IN CONSTRUCTION: TOWARDS A FOCUS ON TRANSITIONAL ROUTINES

William Robinson<sup>1</sup> and Paul Chan

<sup>1</sup> *School of Mechanical, Aerospace and Civil Engineering, The University of Manchester, Sackville Street, Manchester, M13 9PL, UK.*

Construction firms are increasingly compelled to take into account the through-life performance of the buildings they create. In this article, we examine these trends in relation to the Product-Service literature (commonly referred to as 'servitization') to explore the implications of new business models within the construction industry. It was found that while the range of promising opportunities and problems of greater servitization in the construction industry have been widely explored, there remains a limited understanding of the conditions and consequences of transitional practices involved in greater servitization. Therefore, through the review of the servitization literature, we identify the need to refocus research attention on organizational routines and practices as the unit of analysis to better understand how organisations can make the transition towards more servitized offerings. Rather than taking servitization as the starting point for overhauling existing routines, we argue for the need to study routines as they evolve, to see how a servitization culture is gradually incorporated in everyday management in construction. Thus, the contribution of this article is to propose a shift away from viewing servitization simply as the imposition of a new business model, but rather by mash-ups of existing, complementary and contradictory routines that organisations realise as they make sense of servitization in practice rather than in theory.

Keywords: organisational practices, product-service models, routine, transition.

## INTRODUCTION

The "*servitization of business*" (Vandermerve and Rada 1988) refers to the emerging trend in product manufacturers re-positioning their business towards offering supplementary through-life services with their products. These firms are managing to generate lucrative long-term revenues from their combined product-service offering because of their developing capability to address more effectively the needs of their customers. Customer spending patterns indicate that value increasingly lies in the provision of those services that ensure product availability and reliability through the product life-cycle rather than in the manufacture of the initial product. This trend has begun to challenge traditional views within other industries concerning the value of service activities and who should be responsible for the delivery of these service activities. In the context of construction, it is widely accepted that the operational costs of a building far outweighs the initial design and construction costs (see e.g. Ive, 2006). Therefore, with the proliferation of PFI/PPP, especially given demand for infrastructural development, there is growing acknowledgement that servitization

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<sup>1</sup> william.robinson-5@postgrad.manchester.ac.uk

matters too, where design and construction contractors are increasingly becoming involved in the operations and maintenance of the built assets.

In this article, the wider servitization literature is reviewed to ascertain what the main drivers and challenges are for design and construction contractors looking to play a more prominent role in the operational phases of the project life-cycle. However, the process by which this transition, from product-based operations towards greater service orientation, materialises has tended to be approached from a top-down perspective. Research within the field focuses heavily on the importance of strategic commitment towards greater servitization and how this is subsequently translated into operational reality. Servitization tends to be viewed as a business model used in stimulating organisational change towards greater service-orientation. However, contemporary literature on organisational change takes a more processual view, where transitional routines and practices are emergent rather than engineered. Organisations interact reciprocally between the micro and macro level; this organic evolution involves the ongoing mutual influence between micro-level behaviours and actions, and ever-changing macro-level structures. This evolving, processual approach is, it is argued, vital in understanding what servitization really means in practice. Yet, in treating servitization mainly as a business model that governs organisational routines and practices, just how organisations move towards greater service orientation through transitional routines and practices remains relatively under-explored. Therefore, it is argued in this article that research on servitization in construction should shift away from a strategic, business-model approach, and move towards treating organizational routines, made up of acts of patterning (ostensive) and doing (performative) (see e.g. Pentland and Feldman, 2003) as the unit of analysis to examine how construction organisations can change (and are changing) to become more service-oriented.

## **THE EMERGING TREND OF “SERVITIZATION”**

Traditionally, construction contractors have focused their attention predominantly on the design and construction of tangible goods. Whilst they were normally involved to some extent in services related to the operation and maintenance of buildings, these service obligations were often subsidiary to their design and construction responsibilities. There was a tendency to view these service activities as mundane, reactive and routine; hence, organisations overlooked the potential value they could offer their business (Johnstone *et al.* 2009). Organisations would provide additional services (warranties etc.) free just to secure a product sale or deliver layers of services that did not actually address the customer’s needs (Anderson and Narus, 1995). Changing customer demands are increasingly forcing these organisations to re-evaluate their product-dominant practices. Supplementary service plays a critical role in ensuring products are aligned to the customer’s function, the performance of products and the reliability of products. Increasingly, customers see these aspects as at least as important as the products themselves; spending patterns of customers are moving in this direction (Wise and Baumgartner 1999). These changing mindsets towards product and service are encapsulated convincingly in Vargo and Lusch (2004)’s challenge to academics and practitioners to move towards a service-dominant logic, the premiss of the argument being that suppliers must co-create value through-life with their customers, with Prahalad and Ramansay (2004) asserting that this value co-creation process increasingly lies outside the suppliers’ organisational boundary, lying in the interactions between a network of internal and external actors.

The catalyst for this emerging logic has been a recent trend in product-orientated organisations moving from product delivery towards the provision of integrated combinations of products and services that deliver value-in-use (Baines *et al.* 2007). This process of product manufacturers moving towards holistic service provision was first acknowledged within the academic literature in the work of Vandermerve and Rada (1988) who coined the term “*servitization*”. Emerging trends of servitization have taken on particular importance within the construction industry as the continued proliferation of PFI projects challenges contractors to take a more holistic approach towards the design, construction, commissioning, operations, maintenance and post-occupancy of buildings (Leiringer *et al.* 2010). Success stories of firms moving towards more innovative and collaborative relationships with their clients through “*servitization*” are evident (see e.g. Windahl and Lakemond, 2006, and; Alonso-Rasgado *et al.*, 2006). For instance, within the aerospace sector, engine suppliers such as Rolls-Royce do not just manufacture engines, but also provide through-life maintenance for their engines and lease out the use of their engines through what is known as “*Power by the hour*” (Smith, 2013). Whilst the applicability of cross-industry innovation must be treated with caution (Enkel and Gassmann, 2010), the evolution of the Rolls-Royce TotalCare model, as well as similar innovations from other engine manufacturers within the aerospace sector, call into question whether the M&E supply chain in building construction can play a more effective role in the operation and maintenance of building systems.

### **“SERVITIZATION WITHIN CONSTRUCTION”**

Brady *et al.* (2005) introduced the idea of servitizing within the construction and infrastructure sector, as they observed increasing provision of “*integrated solutions*” which combine products and services to address a customer’s unique requirements over the life-cycle of the project. Case study research within the evolving “*integrated solutions*” literature focuses predominantly on the provision of PPP/PFI projects (Roerich and Caldwell, 2012, Johnstone *et al.*, 2009, and; Storbacka, 2011). Arguably, the process of servitizing and bundling products and services into one unique solution resonates quite clearly with the PPP/PFI framework where the emphasis is not only placed upon the delivery of the built assets but also the servicing of these assets over a 20-25 year period. The underwhelming performances of early PFI projects have been widely documented (see Akintoye *et al.*, 2003). Consequently, there have been reforms in the way PFI projects are commissioned in the construction industry, as seen in the development of the PF2 framework. Therefore, the challenge for construction contractors to adapt to the government's adoption of a more servitized framework for project delivery continues to be a key debate. In this section, the drivers and challenges of adopting a more service-oriented approach in construction are reviewed. It is noted, in this review, that there are two main camps in the literature on servitization; on the one hand, scholars have been seduced by the promises of added value in adopting more service-oriented offerings, whilst others have questioned the realities of the espoused values of the servitization business model on the other. Through this review, it is argued that what remains relatively under-explored are the transitional routines and practices that organisations go through in ongoing change as they make sense of what servitization means.

#### **The drivers**

Anonocopolou and Konstantinou (2008) reflect on the fact that servitized business models are increasingly being viewed as “*panacea*” business operations. The

academic coverage of servitization is typically optimistic and reflects an emerging mindset that the logic of the argument for firms to servitize is becoming more convincing. Cohen *et al.* (2006) offers one of the more emphatic calls for firms to servitize, proclaiming that “*This is the golden age of services, and to survive and prosper we’re told every company must transform itself into a service business*” (p. 129). Other authors adopt a more pragmatic approach; whilst they remain upbeat about the service opportunities available to product manufacturers, they insist that these organisations must position themselves carefully in their after-sales service markets by ensuring they select the right service strategies (Auguste *et al.* 2007). Research identifies (e.g. Baines *et al.*, 2011, and; Ulaga and Reinartz, 2011) this specifically as product-centric servitization where the supplementary services provided reflect the unique advantages product manufacturers possess with regard to competing in the aftermarket.

Smith (2013) utilises the successful servitization strategies of an engine supplier in the aerospace markets to highlight the role played by advances in digitization, product reliability, monitoring of real-time product system performance and technological intelligence in transforming existing dynamics in the market for maintenance activities. Technological advancements in product design and manufacture implies in some cases that the product supply chain is now better positioned to deliver supplementary maintenance than traditional maintenance and repair organisations. This is an emerging theme within the servitization literature and that is how the boundaries between product and service (Johnstone *et al.* 2009), as well as production and consumption (Mont 2000) are becoming increasingly blurred; the roles and responsibilities of organisations at these boundaries are changing, creating opportunities for organisations to radically transform their businesses. This is evident within industries that utilise compressed air for their production processes (Radgen 2014). The capacity to deliver operational savings in the delivery of compressed air increasingly lies with the manufacturers of air compressors. Particularly, within Germany this has led to changes in business models towards delivering units of compressed air rather than traditional business models geared solely towards product sales.

Stagnated product markets, more prolonged countercyclical service revenues (Wise and Baumgartner 1999), better connected, informed, empowered and active customers (Prahalad and Ramasmanay 2004), higher potential profit margins in after-sale service activities (Cohen *et al.* 2006) and the tendency for service capabilities to be less imitable for competitors (Mathieu 2001) are all well-documented drivers for product-based organisations moving towards more servitized modes of operating. The “*Product-Service Systems*” literature, a strand of literature that emanated from Scandinavia (Goedkoop *et al.*, 1999, and; Mont, 2000), features a similar concept to servitization but focuses more specifically on the environmental benefits of combining the delivery of products and services. This theme takes on particular importance within the construction industry because of the stringent focus on the energy performance of buildings, especially in PFI projects where the responsibility for this performance increasingly lies with the contractor. Servitization provides the opportunity for suppliers to drive end-user behaviour towards more sustainable patterns of consumption (Tukker and Tischner 2006). This notion builds upon the fundamental assumption that the long-term relationships engineered through servitization encourage suppliers and their clients to work in a more collaborative manner. One useful illustration of this is the energy performance contracts provided

by companies such as Honeywell. They no longer just provide more efficient conversion equipment within buildings but also utilise building automation and control solutions to change customer's energy consumption behaviour.

### **The challenges**

A series of quantitative studies (see e.g. Neely, 2008, and; Lay *et al.* 2010) investigating the performance of firms that were servitizing provide a sobering effect on the "hype" surrounding the process of servitization. The studies, albeit over a restricted sample, indicated that a significant number of servitizing firms were struggling to reap the financial rewards advertised by previous authors. This correlates with a discernible change in the recent tone of the servitization literature which tends to focus more heavily on the challenges associated with making the transition towards more servitized solutions. This aspect of the literature has particular relevance to the problems encountered under the PFI framework.

There are significant contractual challenges associated with driving through the concept, put forward by a service-dominant logic (Vargo and Lusch, 2008), of value-in-use so that customer usage (Ng *et al.*, 2009), product performance, product availability and reliability all fall within the provider's responsibilities. This contractual arrangement is commonly referred to as performance-based-contracting and Caldwell and Settle (2011) utilise evidence from the defence sector to identify the need for pain-sharing and gain-sharing mechanisms to be built into these contracts so as to incentivise end- users and product-service providers to work collaboratively. This often necessitates a shift towards value-based pricing models rather than utilising traditional fixed and cost-plus pricing models (Bonnemerier *et al.* 2010). Whilst on the surface the PFI framework and the unitary charge paid from the government client to the SPV would seem to illustrate such an approach, it is apparent that within the interface agreement lie traditional agreements (Gruneberg and Hughes, 2011) for the separate stages of the project life-cycle which run counter to a servitized approach to asset delivery. The extent to which increased innovation in building energy performance regulatory structures will trigger servitized behaviour from construction contractors will be dependent on the attractiveness of the agreed payment mechanisms. Without construction contractors having total control of energy supply and use, finding a measurable output from which contractor performance can be accurately judged remains a key challenge.

Guo and Ng (2011) identify the limitations of contractual arrangements without the adequate support of relational governance. This can be seen within the wider challenge of trying to embed a service-orientated culture within traditionally product-based organisations (Olivia and Kallenborg, 2003). Martinez *et al.* (2010) discusses the pivotal role played by an "*internal alignment of performance metrics*" in attaining this cultural shift in mind-set towards product-service delivery.

Another challenge was touched upon earlier and that includes building new system integrative capabilities (Brady *et al.* 2005) that allow product-service providers to differentiate their service activities as opposed to those delivered by existing service providers. Ulaga and Reinartz (2011) interviewed 44 equipment manufacturers and from these discussions they identified what they believe these key capabilities are: service-related data processing and interpretation, execution risk assessment and mitigation, design-service capability, hybrid-offering deployment capability and hybrid-offering sales capability. Finally, building upon those system integrative capabilities there are challenges associated with aligning the product supply chain

towards the demands of the customer (Christopher and Ryals, 2014). Identifying critical components of the supply chain where additional incentives should be offered to suppliers (Hughes *et al.* 2007), as well as ensuring that knowledge is transferred effectively across the fragmented external supply chain, remain as key challenges in relation to stymying the adoption of servitisation in construction. Within the construction industry, the maturing BIM capabilities of contractors and the introduction of COBie offer opportunities for providers of PFI projects to address the latter issue more effectively.

### **The missing link: the transitions**

The fundamental assumption of the literature is that the existing management practices are rational (Antonocopoulou and Konstaninou, 2008) and therefore, organisations can overcome specific challenges (such as developing new service capabilities, supply chain integration, introducing a service culture, collaborating more effectively with the client and exploiting new technological innovations) and move to product-service delivery. Failure of traditionally product-orientated firms to move to this new and superior business model is attributed to an irrational tendency for firms to focus on the risks associated with changing their current product-dominant practices. The problem here is that the literature often adopts a traditional perspective of organisational change that views the transition as a series of predictable and rational steps that are systematically carried out (Graetz and Smith, 2010), assuming that they can move from one pre-planned state to another (Bamford and Forrester, 2003). However, more contemporary research into organisational change has viewed organisational change as an emergent process (Bamford and Forrester, 2003) where change is viewed as a continuous open-ended process where practices are continuously adapting to changing conditions. Observing servitization as an emergent process where existing routines continuously interact differently under changing conditions, rather than the process of overhauling existing routines (Vargo and Lusch, 2004) provides a more informed interpretation of how a service culture is gradually embedded into traditionally product-orientated organisations.

## **FRESH PERSPECTIVES ON SERVITIZATION: TOWARDS THE STUDY OF TRANSITIONAL ORGANISATIONAL ROUTINES AS A UNIT OF ANALYSIS**

By viewing the servitization transition through a processual lens (see e.g. Nayak, 2008) where organisational change is emergent rather than engineered, we can utilise organisational routines as a unit of analysis (Pentland and Feldman, 2005) to investigate how organisations adapt to more servitized modes of operating. Organisational routines are increasingly seen as generative, dynamic systems that are characterized by "*multiple actors and interdependent actions*" (Pentland and Feldman, 2005). By unpacking these routines and exploring their internal structure there is the opportunity to identify how separate parts of routines emerge alone and also interact with other parts of the routine (Feldman and Pentland, 2003). These parts have been labelled as ostensive (acts of patterning) and performative (acts of doing), and are recursively interdependent.

By adopting the lens of organisational routines, and by interrogating the recursive interrelationships between the ostensive and performative parts of routines as organisations go through on-going change towards more service-orientation, we would be in a better position to understand just how servitization is not only aspirational, but that the strategic intent can translate to operational reality.

Furthermore, by opening up the study of organisational routines as the unit of analysis, one can ground the study of servitization in the realities of practices by social actors, both within and across organisations. Feldman and Pentland (2003) suggested that the exploration of the contested nature of organisational routines opens up the possibility to understand organisational change. Organisational change literature separates the two types of change organisations can experience. First-order change (Watzlawick, 1974) refers to the times of organisational equilibrium where change is slow, steady, continuous and incremental, whereas second-order change relates to periods of disequilibrium where change can be transformative, radical and divergent. Feldman and Pentland (2003) indicate that analysis of organisational routines can prove increasingly useful to study the latter whilst case study research (Caldwell *et al.* 2011) identifies the shift towards more servitized operations on PFI projects tends to be more closely related to second-order change on a macro-level. Storbacka *et al.* (2012) assessed the fact that the value co-creation process that underpins the servitization concept is increasingly located within routines that are enacted at organisational boundaries between different actors. Understanding routines as truces (Nelson and Winter, 1982), where inter-organisational conflicts are acted out and resolved, will allow us to explore how value is co-created when roles and responsibilities for the design, construction, commissioning and operation of buildings become more blurred under more servitized contractual frameworks as in PFI projects. The political conditions at play within the complex network of actors stand to jeopardise the delivery of assets on PFI projects; by appreciating organisational routines as a lens for understanding this conflict, there can be a greater understanding of the interests and expectations of different stakeholders (Antonocopoulou and Konstantinou, 2008).

The "*integrated solutions*" literature focuses heavily on the role played by strategic management in integrating a servitized approach at an operational level. Case studies focusing on the successful delivery of integrated solutions certainly emphasise the importance of commitment towards servitization at a strategic level (Windahl and Lakemond, 2006). There remains little research though into the process of translating strategic intent into operational reality. Organisational change literature explores in depth the problems associated with receptivity towards change from the overall workforce (Antonocopoulou and Konstantinou, 2008). However, in this paper, we argue that the servitization literature focuses too heavily on the transition towards servitization as a top-down process. We draw upon findings within the organisational change literature that argue second-order organisational change at the macro-level can be the consequence of first-order organisational change at the micro-level (Anderson, 1999). In turn the macro-structure of this complex eco-system of interacting actors then influences individuals, "*and the evolutionary process moves constantly between micro behaviours and emergent structures, each influencing and recreating each other*" (Mitleton-Kelly, 2003). Combining bottom-up and top-down perspectives of organisational change illustrates the role played by the changing organisational routines at an operational level in shaping the sort of radical change incurred by servitization at the mezo-level and macro-level. Therefore, this paper proposes we use organisational routines as the lens for observing how these incremental changes at a micro-economic level manifest themselves in the mash-ups of existing complementary and contradictory routines (Feldman and Pentland 2003).

## CONCLUSIONS

The paper has utilised the servitization literature to comprehensively assess the challenges and drivers for design and construction contractors who are seeking to play a more prominent role in the operation and maintenance of buildings. This becomes increasingly important in the context of PFI projects where contractors are increasingly being encouraged to take a more holistic approach to asset delivery and maintenance. However, whilst useful in demonstrating general trends and the context of servitization, it fails to illustrate how transitions towards servitized modes of operating materialise. This paper highlights the need for a better understanding of how the interactions between the micro-level and macro-level stimulate organisational change in the context of emergent servitized behaviour. It proposes that organizational routines at the interface of design, construction and maintenance must be examined to establish how these affect the process of wider transition towards servitization.

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