

Service innovation through linking design, construction and asset management

Background

The service interface between the management of infrastructure projects and the subsequent management of assets requires greater attention (Kumaraswamy, 2011). While many companies in the construction and infrastructure markets have transitioned to service organisations, many remain focussed on the provision of goods. The construction industry has been quick to reinvent itself to reintegrate and disintegrate its supply chain (Cacciatori and Jacobides, 2005), and, to use mergers and acquisitions to broaden the service offering to include, for example, project management, facilities management and real estate management (Connaughton *et al.*, 2015). However, there remains a lack of depth in service design and a disconnection between the project delivery service, asset management service and support for end-user experience in using assets.

The disconnection may result in stifling opportunities for innovation and value maximisation (Brewer *et al.*, 2013). Academics have documented the transition from a transactional and product-oriented industry towards a relational and service-orientated one (e.g. Jacobsson and Roth, 2014; Jalkala *et al.*, 2010; Razmdoost and Mills, 2016) that responds to stakeholder values (Mills and Austin, 2014). However, some services may still be seen as value enhancing add-ons, such as aftersales services, rather than a fully integrated service to deliver greater innovation and value to the customer (e.g. Sivunen *et al.*, 2013).

Further, from a purely theoretical perspective, research is mirroring industry practice to present work that is “siloe”, where different disciplines and theories are not talking to each other and learning through sufficient interdisciplinary research. Therefore, despite overlaps, adjacent and interlocking disciplines within the “big picture” frequently neither seek to draw on the theoretical body of knowledge of other disciplines nor in some cases acknowledge the contributions made by the others (e.g. Kuura *et al.*, 2014; Davies *et al.*, 2018). For example, there is scant interdisciplinary connection and integration between marketing and business development on the one hand and service design theory on the other. Nor are innovation studies linked to marketing theorisation and service design (cf. Swan *et al.*, 2002). Within project and construction management there is a significant need for this pluralism, to follow the lead of those such as Karpen *et al.* (2017).

Focus of the special issue

For this special issue, service provides the focus from the theoretical and applied perspectives of marketing, service design and innovation. Service is distinct from the plural – services. Services, from a goods-dominant logic (GDL) viewpoint, addresses value in terms of the inputs. Service shifts the focus from physical natural resources, plant and built assets on balance sheets to open systems and buildings in use that create high value experiences and optimal operational processes. This links the production of the built environment with the use of the built environment. Marketing tries to satisfy clients and other stakeholders to provide value in use, service design tries to deliver in an optimal way as possible and innovation progresses the way in which this is achieved.

Service sees all parties as resource integrators: producers and providers, clients and customers, end-users and other stakeholders with direct interaction with the construction project in use. All are co-creators of value (Ahola *et al.*, 2008; Grönroos and Voima, 2013; Chang *et al.*, 2013). In this relationship, there is no using up or depreciation of value



as an output, but value becomes an input to a network of value co-creators that is beyond the event of dyadic exchange (Normann and Ramirez, 1993; Gummesson and Male, 2010; Jaakkola and Hakanen, 2013). Projects and assets as a good are still very important, but they are transmitters of service, value delivery processes and mechanisms. Projects, therefore, sit in a contextual ecology (Grabher and Ibert, 2012) that is affected by contingencies and multi-layered markets for service exchanges (Chandler and Vargo, 2011).

A traditional focus on the tangibility of asset and project management is understandable. Tangible production, manufacture, and construction have significant benefits in financial markets, to which numerical value can more easily be assigned while obscuring the purpose of the project which is to provide assets that embody the preconditions for other standardised and routinised activities (Smyth, 2018a). Thus accounting and other measures, including KPIs, look tangible, yet provide scant guidance to usefulness and potential efficiency and effectiveness to be derived from the assets in use. It is the intangible integration of project and asset management services by which goods are given value in use through the engagement of customers, users and wider stakeholders that must be given much greater attention. This provides the focus for this Special Issue, with innovation in design and construction, and innovation in service design and delivery offering further focus for authors.

Key issues and themes

Owners buy assets, not because asset management services are offered to them, but because of what those assets can do for their operations. As such, assets, although tangible, are valuable for their intangibility and experience in use. In this view, there is a long-term service and innovation exchange of specialised knowledge, skills and capabilities, rather than goods. Service-dominant logic (SDL) is proposed as a new scientific foundation for the integration of project and asset management in their institutional context where service is exchanged for service (Vargo and Lusch, 2016).

Service has been important as far back as Brunel (Marshall and Bresnen, 2013), however this special issue argues that perhaps the logic with which we view projects and assets is part of the problem. Specifically, both projects and assets are managed using a GDL that is focussed on the distribution and management of tangible units of output – to make and sell. Construction and infrastructure firms may have been focussed instead on maximising profits through the achievement of efficiencies and economies by quickly fixing on tangible outputs and isolating themselves from users and operators to minimise the cost of delivering a unique process and solution. While, commissioners of projects and assets may have also been fixated on buying outputs at the lowest price and vertically integrating supply chains, rather than driving more innovative arrangements. What is needed therefore is a fuller transition from goods to service and greater understanding of which service providers deliver greatest value and how this can be judged (Ikediashi *et al.*, 2015; Jumat *et al.*, 2012).

To address these issues, historical accounts to reconsider how value is realised in the use of construction projects is relevant. Studies of how construction and asset management, including innovation, can currently be viewed following the traditional academic line of investigating what is in the way predominantly envisaged by Vargo and Lusch (2004), but there is also scope for what could be or ought to be, which is theoretically informed normative and prescriptive analysis based upon the emphasis put forward by Prahalad and Ramaswamy (2004) for construction, asset management. This potentially links construction and asset management and connects SDL with innovation and service design to initiate improvement. Further there are changes in technology underway, such as building information modelling (BIM), artificial intelligence and digitalisation, which can be seen as inputs to be grafted into or onto existing practices or as providing more radical innovation to serve clients and society stakeholders by reconfiguring the service with such outcomes in mind.

Today, the complexity of technology and projects has driven the need for an interdisciplinary project team ecology (Morris, 2001) that must be more service-led and focussed on many more resource integrators than have previously been envisioned (Davies *et al.*, 2009). The resource integrator is the notion that organisations get resources through service exchanges from internal resource integrators, external market resource integrators as well as public resource integrators – infrastructure, policy makers and laws (Vargo and Lusch, 2008, 2016). The systems integrator, as the primary role of main contractors, involves integration across organisational boundaries (Davies *et al.*, 2007), including the stimulation and incorporation of innovation (Davies *et al.*, 2009). Within the systems integration literature the notion of changing boundaries of supply around innovation are well known (Bonaccorsi *et al.*, 1996) although the notion of resource integrators and value co-creators is new.

SDL has the normative capacity to reinvent the project and asset management market through innovative new models and platforms, rather than making and selling products. The foundations for this have already been established in the management literature. It has been conceptualised as the service ecosystem of service exchanges (Akaka *et al.*, 2013). A service ecosystem is “a relatively self-contained, self-adjusting system of resource-integrating actors connected by shared institutional arrangements and mutual value creation through service exchange” (Lusch and Vargo, 2014, p. 161). It includes the interaction of actors (e.g. project managers, key account managers, contractors, clients, government) as resource integrators with the environment (Mills and Razmdoost, 2016). Service ecosystem zooms out from an individual’s behaviour (i.e. individual-level) and dyadic relationships (i.e. micro-level) to include network, regional (i.e. meso-level), society and national (i.e. macro-level) actors and institutions (Vargo and Lusch, 2016). It builds upon and extends beyond the work in construction networks (e.g. Dubois and Gadde, 2000; Pryke, 2012), where a procurement emphasis has prevailed, whereas provision from customer and stakeholder perspectives is also part of the system in theory and practice and thus the service configuration to observe and develop balanced approaches to value provision and realisation.

To address these issues, the role of management innovation within firms and across organisational boundaries to integrate resources and design solutions that will improve the potential value derived from construction projects as assets in use is an important area to consider in further depth. The firm-project interface is also important, particularly for the development of service design and technical and technological developments that provide innovative value propositions and deliver technical capabilities for extracting asset value.

Therefore, in this special issue, we build on the existing project and asset management knowledge to incorporate a new scientific theoretical lens to those of economics that prevail. Value co-creation and service will provide insight into the innovative processes in the construction industry. This offers a considerable challenge.

Contents of the special issue

The challenge presented above is inevitably going to emerge as a work in progress. Practice cannot shift from a largely transactional business model to a more transformational one rapidly (Smyth, 2015). Industry in its different arrangements in general and at the level of the project or construction firm will incrementally change if it chooses to, which may also lead to certain organisational actors not choosing to do so and rendering themselves less relevant in a market that is requiring a considerable step change (Smyth, 2018b). Although the estimates should be treated as indicative, the need is highlighted in the McKinsey (2013) report, which excludes environmental needs arising from the impact of climate change on the planet.

It is therefore not surprising that research will incrementally shift to accommodate a service perspective for project delivery and valuable outcomes, using SDL and theories on innovation and service design. The selection of papers presented here are a reflection of that and pursue particular topics within the remit. Some are more centrally engaged with this project than others. A summary of the papers is presented below.

Hedley Smyth *et al.* take an interpretative view of the construction sector. They explore the tactical service design practices of ten construction contractors and challenge how they are applying project-marketing and business development expertise to enhance services value. They find the construction solutions only partially address client and wider societal needs.

Marcos Fuentes shows the devastating effect of not co-creating experiential value with end users. A retrospective case study shows how project managers can inadvertently destroy value and how they must build capabilities in service design so that they can deliver assets with positive experiential outcomes.

Meri Duryan *et al.* shows how construction supply chains must share knowledge if they are to deliver value. Cognitive mapping is used to explore how transactional attitudes and a focus on lowest cost are preventing the design of high performing services that maximise client satisfaction through routinely learning between projects.

Martina Murphy *et al.* take a broader national policy look at how construction organisations are applying socially responsible procurement as a service innovation and how it is generating social value from employment. They find that a significant shift has been made, but that traditional one-size fits all contractor service may be prohibiting full system value and wider social benefits.

Maude Brunet *et al.* analyse the opportunities presented by BIM to deliver advanced public assets that have been specifically designed for their whole service-life (from inception to decommissioning). Empirical case studies show significant promise in enabling co-creation and exciting new asset design ecosystems that will in the future be truly responsive to service innovations.

Conclusion

How the field as a whole or the domains within it that set out here develop remains to be seen, but the papers here present progress and build upon a growing amount of empirical work (e.g. Liu *et al.*, 2014; Razmdoost and Mills, 2016; Smyth *et al.*, 2018c). The lack of empirical work had hitherto been lacking (Smyth *et al.*, 2016), however, more is required to explore and examine the issues as well as evaluate the theory. Further there is power asymmetry in the interactions across multiple roles, in particular between the construction and asset management organisations, which leads to how value outcomes are distributed, especially financial returns.

Under SDL value co-creation necessarily involves interactions to influence service design at the project front-end, yet providers have to have generic templates for consistency purposes that are linked to organisational capabilities that are not co-created to the extent that these exist and providers do not invent them in terms of input project-by-project (cf. Romme, 2003). To the extent that generic service design templates do not exist and the service is not tailored in a client-centric fashion, then the risk of the co-destruction of value emerges due to the unintended consequences, especially in service design (cf. Echeverri and Skälén, 2011).

These are some of the areas warranting examination in the future based around key questions that remained unanswered. For example, how has and does innovation occur in service exchanges across design, construction and asset management phases to deliver value and what is the potential for increasing value in practice? How do different actors (e.g. clients, users, providers, government) influence innovation in service integration, particularly between construction and asset management. How does and might the integration of a construction and asset management service disrupt existing market and

non-integrated services? To what extent does the theoretical integration of a construction project, asset management and/or maintenance/operation service contribute to the whole life value and sustainability imperatives? To what extent is this working out in practice and what improvements can be made? How could gaps in service provision between parties at the institutional, firm, project and user interfaces impact project and asset management value delivery? How are leading organisations reinventing themselves to (dis)integrate supply chains to increase value delivery? What is the relationship between value co-creation and service innovation? Which actors are influential in service innovation ecosystems and how do networks of service exchanges evolve? To what extent is this changing and might change further through normative and prescriptive measures informed by SDL? What is the role of individual actors (e.g. project managers, key account managers, functional managers) in service innovative to increase value? What is the role of technology in value co-creation and service innovation? To what extent does SDL contribute at the macro-level development and management of the built environment, the generation of smart cities and their management? To what extent can SDL and service design be criticised, first in order to develop concepts appropriate to project environments, to understand micro-level co-creation activities, and second as a theoretical lens that has limited value to enhance understanding and application in practice?

Hedley Smyth

*The Bartlett School of Construction and Project Management,
University College London, London, UK*

Kamran Razmdoost

ESCP Europe, Paris, France, and

Grant R.W. Mills

*The Bartlett School of Construction and Project Management,
University College London, London, UK*

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