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Co-creation of value outcomes: A client perspective on service provision in projects

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Abstract

Client organisations, as financiers, owners, and users, face the challenge of generating and delivering value outcomes for a wide range of stakeholders. However, research has demonstrated that projects constantly fall short of providing valuable outcomes in the medium- and long-term. The value outcomes start to appear in the latter stages of a project, yet, they have a link back to the project definition phase, where value outcomes can be purposely designed for the long-term. Value outcomes per se have been historically researched from a supplier and financial perspective. However, the research around the client perspective has been scarce, particularly the exploration of the co-creation of value outcomes for the long-term. To this end, the Service-Dominant Logic is an established framework to analyse the co-creation of value outcomes in the long-term from a client perspective. Thus, this framework is being used in this research to analyse six project case studies from two public sector client organisations in the United Kingdom. The results show eight managerial value interactions, which may enhance a set of five value outcomes from a client perspective in the medium- and long-term. Additionally, tensions around the co-creation process have been identified, which require management attention to secure and to defend the value outcomes. Overall, this study may prompt project practitioners to undertake a set of co-creation practices in order to formulate projects as service provision, as well as to avoid negative financial impacts to business models.

Keywords: Benefits; Business model; Co-creation; Outcomes, Service Dominant-Logic; Value

1. Introduction

1.1. Background

Client organisations face the challenge of creating and delivering value outcomes for a wide range of project stakeholders and, ultimately, to society at large. Thus, client organisations are particularly interested in what the project can do for them in the long-term (Smyth, 2015). It then becomes critical the conceptualisation of value in the early stages of a project. One of the challenges when conceptualising value is, for example, dealing with different perceptions of value. Multiple and conflicting perspectives of value may be found at an early stage of a project, yet value outcomes should be (theoretically) anchored to the client, as it is the main stakeholder that absorbs the implications of value outcomes in the medium- and long-term. Value outcomes tend to start emerging in the latter stages of a project, yet these have a direct link to the conception of a project (front-end stage), where most of the value can be created, designed and configured (Morris, 2013). Once the conceptualisation phase is closed, most of the value outcomes have been locked-up, including the main benefits or sacrifices for the client organisation.

The management of the value outcomes starts at the front-end stage and may continue along the project lifecycle through a series of management activities carried out by project stakeholders, such as suppliers, clients, sponsors, operators and users. These stakeholders may (theorithically) mobilise static and dynamic resources, such as skills, information and

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expertise, to collaborative co-create value. However, the management of the value outcomes is varied in practice. Research has shown that the current transactional way of managing value outcomes does not necessarily meet the mandatory client's goals and this ultimately affects end-users and other relevant project stakeholders (Aarikka-Stenroos and Jaakkola, 2012; Smyth, 2015).

Winter et al. (2006) point out that one of the main causes of this ineffective management of value outcomes for clients is due to a traditional supplier and production-oriented approach. This approach is particularly focused on the production of inputs and outputs of engineering systems. Artto et al. (2016, p. 267) argue that the "*traditional view of construction projects [is] producing mere physical facilities*". This type of engineering outputs has been narrowly considered as the main project value outcomes (cf. Shenhar and Dvir, 2007; Chih and Zwikael, 2015; PMBOK, 2017). In this article, we argue that value goes beyond engineering outputs and it is linked to the functionality and usefulness created by the project particularly for the client in the medium- and long-term. This form of functional value is referred to as value-in-use (see Grönroos and Voima, 2013; Grönroos and Gummerus, 2014). This functional perspective of value gives rise to the concept of considering projects as rendering a *service* (in singular) in the long-term.

Previous conceptualisation of *services* (in plural) (see Zeithaml et al., 1985) view service(s) as outputs or add-ons to the main production process, such as maintenance or customer service. In that view, services were outside the creation of value outcomes. However, an established paradigm in the marketing literature, Service-Dominant Logic (SDL), define service (in singular) as "*the application of competencies (knowledge and skills) for the benefit of another entity or the entity itself*" (Lusch and Vargo, 2014, p. 12). This suggests that the mobilisation and exchange of resources, particularly at an early stage of a project, may enhance the value outcomes for the client (Wetter-Edman et al., 2014) and its competitive advantage in the project business.

The core concept of SDL is value co-creation, which can be referred to as a functional and interactive process to enhance the client's value outcomes as the main goal (Grönroos, 2011, 2017). The co-creation of value revolves around value interactions across the project lifecycle, which create a platform where relevant actors may work together to improve the functionality of the value outcomes (Smyth, 2015). Although value interactions may take place in an early stage of a project, its implications can be experienced until the latter stages of a project (Artto et al., 2016).

In summary, Service Dominant Logic is an alternative theoretical perspective, which focuses on the improvement of value outcomes for the client. To do this, a mobilisation of resources may ensure that value outcomes are designed and delivered according to the client's needs (Smyth, 2015; cf. Vargo and Lusch, 2016; Grönroos, 2017). However, most of the research in the co-creation of value outcomes is based on a theoretical level. Empirical evidence and analysis are needed to understand to what extent it can be applied in project settings (Smyth et al., 2016). Thus, this article empirically explores different value interactions, such as co-learning with internal and external stakeholders, co-designing for service experience, co-solving problems and others. These value interactions may enhance a series of value outcomes in the long-term, such as operational, experiential, and social value outcomes. Overall, these value interactions may prompt practitioners to undertake a set of co-creation principles for formulating projects as service provision.

1.2. Research goal and questions

The main goal of this research was to identify key value interactions across different stages of a project that may directly impact a series of value outcomes in the medium- and long-term. The exploration was carried out using the co-creation lens from the SDL perspective. It is fair to state that although the co-creation lens is the departure point for this analysis (Grönroos, 2017; Vargo and Lusch, 2016), current co-creation assumptions are critically challenged in this research, due to the fact that few empirical research using these lenses have been published in project settings. To reach this goal, we researched two similar client organisations at the project level. In total, we examined six representative case studies from their project portfolio. While the focus was intentionally placed on the client organisations, suppliers and end-users perspectives have been examined in order to have an informed perspective on the client's value outcomes. The project setting explored is rooted in a Business-to-Business (B2B) context, where the main clients are Higher Education Institutions, such as universities; and the end-users are the people using the resources in the long-term, such as students, academics and professional services staff.

The main unit of analysis to explore the co-creation of value outcomes was the interaction between the main stakeholders in a B2B context (Actor-to-Actor approach), as suggested by Grönroos (2011, 2017). The client organisation in this research has been placed as the pivotal role in the co-creation process between suppliers and end users. We then posed the following research questions for our exploration:

1. *Which types of value interactions occur across the project development sequence from the client perspective?*
2. *To what extent do the value interactions contribute to achieving the client value outcomes in the medium- and long-term?*

Our findings show eight key value interactions, which may enhance a group of value outcomes in the medium- and long-term. In addition to this, several challenges to the concept of value co-creation have been set across the paper. Overall, this research aims to unpack the process of value co-creation for project settings.

This paper is organised as follows. First, we present a literature review with a focus on the value creation in projects, followed by an exploration of the SDL literature. Then, we present the methodology and methods undertaken in this study. Later, the result section shows eight value interactions that may

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enhance a set of value outcomes in the long-term. This is followed by a discussion section, where results have been critically analysed and compared with related literature. We end up this article by setting out the theoretical contributions, the implications for managers and the research limitations.

2. Literature review

2.1. Management perspectives on value

Value has been at the heart of management discussion, for many years, in order to maximise benefits for a wide range of stakeholders, including suppliers, shareholders, and clients. Due to the competing perspectives of the creation of value, value is yet a varied and ambiguous area across the management literature (Woodall, 2003). Traditionally, notions of the creation of value have been researched from a supplier perspective (cf. Porter, 1985; Barney, 1991; Davies, 2004). The focus in that perspective is to use the supplier's resources, capabilities, and their supply chains to produce valuable products and services. Increasingly, some authors (Aarikka-Stenroos and Jaakkola, 2012; Jaakkola and Hakanen, 2013) have provided evidence, which demonstrates that these types of approaches do not meet the mandatory client's goals and their envisioned value outcomes for the long-term. Other competing perspectives (e.g. Vargo and Lusch, 2004; Huemann and Zuchi, 2014) argue that clients have been historically treated as static instruments and are consequently positioned outside of the value-creating process.

A shift of the creation of value from a supplier orientation has been informed across the strategic and marketing literature (cf. Grönroos, 1984; Normann and Ramirez, 1993; Prahalad and Ramaswamy, 2004; Vargo and Lusch, 2004). This shift suggests that the creation of value, rather than being largely created solely by the supplier organisation, it may involve a collaborative process, among the relevant stakeholders, in order to co-create value for the benefit of all, but primarily for the client. Karpen et al. (2011) thus argue that this type of collaborative approach may ensure the effective management and delivery of value outcomes for the client in the long-term.

2.2. Value in the project context

Since the call from Winter et al. (2006) to address further aspects of the creation of value in the project settings, different perspectives have been discussed in project research. For example, the traditional project perspectives represented by the project management methodologies, such as the PMBOK by the Project Management Institute, largely focus on the creation of value until the execution and delivery phase. In contrast, other methodologies, such as the IPMA Eye Competence promote a strategic and value-oriented approach at the front-end of projects.

Academic consensus has been reached that the front-end is a key stage to configure and design project value (Kim and Wilemon, 2002; Williams and Samset, 2010; Edkins et al., 2013). However, this consensus may not be reflected in practice. Papke-Shields et al. (2010) found that project practitioners *still* consider only short-term perspectives of project value and widely disregards the long-term implications of a project. Lepak et al., 2007 theoretically argue that the implications of a project may extend on an individual, organisational, and societal level. For example, Martinsuo and Killen (2014) discussed the social and environmental implications that a project may produce in the ecosystem in the long-term.

In project research, much of the work around the creation of value has a largely manufactured and production focus (Winter et al., 2006). While the work of Morris (2013) has extended beyond the short-term perspectives, Smyth et al. (2017) argue that Morris' work is around defining value as inputs: establishing the business case; capturing requirements; developing documentation for sanction; balancing trade-offs; and overall, in choosing the right projects. In a similar manner to Smyth's work, Zwikael and Smyrk (2012) argue that there is a flawed strategic definition of value for the long-term at the conception of a project, which impedes the connection between the project and the strategic value outcomes for the long-term.

Long-term perspectives of value have increasingly received attention in project research. For example, Artto et al. (2016) conceptually used a lens of system lifecycle to connect the planning stage of a project with the operations phase. Artto and his colleagues found four value enhancing mechanisms, which can be applied at the front-end to improve the multi-organisational long-term impact. Along the same line of thinking, Matinheikki et al. (2016) found specific network management activities, which may help to shape the long-term inter-organisational network. While the long-term implications have been lately addressed, there is a considerable gap in connecting the early stage of a project with its long-term implications (Laursen and Svejvig, 2016). To conceptually address this gap, an established paradigm in the literature of marketing: Service-Dominant Logic (Grönroos, 2017; Vargo and Lusch, 2016), is to date the most relevant framework to explore the design and configuration of value outcomes from an early stage of a project.

2.3. Projects as service provision

The theoretical constructs of SDL initially appeared in 2004 in a seminar paper by Vargo and Lusch, with further revisions in 2008 and 2016. In SDL, service revolves around the mobilisation and exchange of static and dynamic resources, such as people, processes, and technologies, to effectively achieve the client's value outcomes in the medium- and long-term (Spohrer et al., 2007; Vargo and Lusch, 2016). This service perspective creates a wider perspective on projects beyond the transactional and short-term offerings. Recent research on projects has, to some extent, started to explore these service perspectives. For example, Wikström et al. (2010) and Kujala et al. (2011) established business models for different delivery solutions. However, Smyth (2015) argues that their focus is mainly on the solution delivery and disregards the service experience produced by the project in

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the medium- and long-term. Applying the SDL perspective, Smyth (2015) established two distinct service experience phases in a project: (1) an emergent experience in execution and delivery; and (2) emergent experience through asset receipt and use, in post-completion and beyond. Following Smyth's phases, Fuentes (2019) found that the mismanagement of the service experience may not only destroy the experiential outcomes for clients and users, but it may also negatively affect the business model for the client organisations. Overall, while service perspectives have started to provide alternative and wider perspectives in project studies, *"it is not immediately obvious which aspects of the…service[s] literature are relevant* (Leiringer and Bröchner, 2010, p. 1124). Therefore, there is still a need to further explore and unpack aspects of this service related-literature, particularly its core concept: value co-creation.

2.4. Co-creation of value in projects

Value co-creation can be defined as a functional and interactive process to enhance the client's value outcomes as an ultimate goal (Grönroos, 2011, 2017). Value co-creation goes in line with the thinking that "*no project is an island*" (Engwall, 2003, p. 789), prompting organisations to use the project environment, including external actors, in order to enhance their value outcomes. In SDL, external stakeholders, such as end-users and suppliers, are useful resource integrators, which may exchange valuable (operant) resources, such as skills, information and expertise (Payne et al., 2008).

To date, there are two competing explanations of the concept of value co-creation. On one side, Vargo and Lusch (2004, 2016) argue that a value co-creation process is happening *always* across the entire project life cycle. On the other side, Grönroos (1984, 2017) argues that co-creation takes place only through direct actor interactions and not at all times. This study argues that Grönroos' (1984, 2017) perspective on co-creation may provide a better analytical lens to examine project relationships. Project per se are inherently relational and therefore embody interactions. However, it would be unrealistic that an entire project process needs a collaborative approach, as advocated by Vargo and Lusch (2016). So, if value co-creation is worthy only for specific situations, how can a project manager recognise those situations? Luotola et al. (2017) argue that a value co-creation process may be primarily undertaken to face complex and uncertain situations, rather than simple and previously known situations.

Co-creation has increasingly received attention in project research. However, the overall exploration of co-creation has taken divergent routes, such as exploring the micro-level, the macro-level, or the implications of the co-creation process in the long-term. For example, Cova and Salle (2008) focused upon the macro-level aspects of value co-creation. The authors identified a process to co-create value between the suppliers with the customer networks. Other researchers have focused on the micro-level processes and practices (cf. Aarikka-Stenroos and Jaakkola, 2012; Jacobsson and Roth, 2014; Hellström et al., 2016; Luotola et al., 2017). For example, Luotola et al's. (2017) findings show that the co-creation process plays a key role in reaching certainty, particularly for problem-solving negotiations that are handled at the early stage of a project. Other researchers have focused upon the implications of a value co-creation process (cf. Mills and Razmdoost, 2016; Fuentes and Smyth, 2016; Fuentes, 2019). For example, Mills and Razmdoost (2016) found that the mismanagement of relationships and expectations may negatively affect the project outcome and project resources in the long-term. But overall, most of the research in projects of the co-creation of value is still at a conceptual level and evidence provided has been limited (see Table 1). Therefore, there is a need to continue exploring the co-creation process to understand what aspects could be useful to project settings.

While the exploration of the value co-creation process have take divergent avenues, several authors (Leroy et al., 2013; Storbacka et al., 2016; Foss and Pedersen, 2016) argue that the micro-level foundations have been prematurely black-boxed by the SDL initiators: Vargo and Lusch. In fact, Grönroos' (2017:125) states: *"to develop a managerially relevant understanding of value and [co-] value creation, these phenomena must be analysed on a micro level".*

Therefore, this study explores the micro-level aspects of value co-creation in order to identify key value interactions (as key management activities) that may directly impact a set of value outcomes in the long-term. This apporach sounds logical in the project context, as specific management actions and activities that create value have been insufficiently specified in the relationship marketing, in the collaboration school of thought, and in the overall project management literature (cf. Prahalad and Ramaswamy, 2004; Ballantyne and Varey, 2006; Smyth and Pryke, 2008; Cova and Salle, 2008).

3. Research methodology and methods

3.1. Research context

The empirical context of this research is set in two UK public sector organisations: Higher Education Institutions (HEIs). Projects in this sector include the provision of new facilities, infrastructure, and other IT systems around the university services. The universities (as client organisations) play a pivotal role, within a Business-to-Business (B2B) setting, mediating and co-creating value between the supplier organisations and their end-user base, which includes students, academics and professional service staff. It is fair to state that this sector (context) may be considered exceptional, as projects in this sector are reasonably regarded as straightforward in comparison to others complex settings in the private sector. However, key aspects are found in this sector in relation to the provision of service. The client organisation is part of the user base; thus the client plays an important role in the conception and in the delivery of the value outcomes. In addition to this, the perception of value outcomes from their user base is critical, as it forms part of the brand of the client organisation, which in

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Table 1
Key empirical studies using a co-creation lens linked to project contexts.

Authors	Context	Methods	Discipline	Key empirical contribution
Cova and Salle (2008)	Application of a co-creation lens to understand the transition from products to service.	Qualitative research through two case studies.	Industrial Marketing Management	Identification of a process to co-create value between the supplier's networks with the customer's networks, linked through the value proposition in B2B strategies.
Aarikka-Stenroos and Jaakkola (2012)	Application of a co-creation lens to understand the activities and resource exchange between buyers and suppliers in co-problem solving situations.	Qualitative research through an intense interviewing process.	Industrial Marketing Management	Identification of specific roles assigned to suppliers and customers, as well as the critical resources they need to facilitate the co-problem solving process.
Chang et al. (2013)	Conceptualising projects as a process of value (co-)creation in the long-term.	Qualitative research through three case studies.	Infrastructure Project Management	Findings highlight the importance of stakeholder engagement to balance the needs and other contextual forces in the co-creation process. They also argue that project success needs broadening to consider the value created and captured.
Liu et al. (2014)	Application of a co-creation lens between the client and the contractor at the front-end of a project.	Qualitative research on a single case study.	Infrastructure Project Management	Findings indicate that external actors may exchange valuable resources e.g. knowledge and expertise at the front-end to provide common grounding in the decision-making process.
Jacobsson and Roth (2014)	Exploration of a partnering project to understand how a co-creation lens may influence the production focus.	Qualitative research on a single case study.	Construction Project Management	Findings show that interactions may create an engagement platform, which may enhance dialogue, access and risk assessments. However, a shift in the mindset of practitioners needs to occur to make this platform work.
Mills and Razmdoost (2016)	Application of a co-creation lens to explore the relationships and the value formation process.	Qualitative research on a longitudinal study.	Construction Project Management	Evidence highlights that value co-creation is highly linked with positive aspects. However, the mismanagement of the relationship and expectations may create a co-destruction of value, negatively affecting project resources.
Smyth et al. (2017)	Application of a co-creation lens to examine project value beyond the traditional input and output performance.	Single and interpretive case study based on secondary data.	Infrastructure Project Management	Findings indicate that long-term implications are overlooked in the decision-making process at the front-end, which is focused upon the traditional project success criteria: time-cost-quality/scope.
Luotola et al. (2017)	An exploration of a co-creation lens, combined with design thinking, in a selling process.	Action-research.	Industrial Marketing Management	Findings show that the co-creation process plays a key role in reaching certainty, particularly for problems during the negotiations handled at the front-end stage.
Fuentes (2019)	Application of a co-creation lens, combined with service design thinking (tools), to explore the destruction of experiential and financial outcomes.	Qualitative research on a single case study.	Construction Project Management	Findings show how the silos mismanagement of the service experience may destroy the experiential outcomes for users and in turn affect the financial outcomes for the client organisation.

turns to help to maintain, improve, or damage its market position. Thus, this research setting may be considered appropriate for exploring the generation of value outcomes and its implications in the long-term (Vargo and Lusch, 2016).

We considered two client organisations with a focus on their project teams. Both client organisations are well positioned, nationally and internationally, in the HEI sector and, therefore, they face the challenge of creating and delivering well-perceived value outcomes. Both universities have recently undertaken a series of projects in order to meet their end-user demands (see Table 2). Overall, six case studies were explored at the project level, which specific details can be seen in Tables 2 and 3.

3.2. Research methodology and design

All projects are located in a social and open system (Konstantinou and Müller, 2016), in which the social reality

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Table 2
Overview of the two client organisations researched.

Item	UK public sector	Number of users (approx.)	Investment in a build and systems programme / Status	Sector ranking	User experience ranking, according to national surveys	Number of case studies carried out
Client organisation A	Higher education institution	25,000	£275 million / Completed	Top 10 Nationwide	Tier 1	1
Client organisation B	Higher education institution	50,000	£1.2 billion / Ongoing	Top 10 Worldwide	Tier 3	5

of these may be considered as multi-layered (Bhaskar, 2008). The multi-layered perspective means that while project events are observed and experienced in everyday practices, they are triggered by deeper casual generative processes, which are structured through enduring properties (Danermark et al., 2002). Thus, to explore the deeper reality of project events, we adopted a critical realism (CR) philosophy to understand the hierarchically ontological domains of the reality: the empirical, the actual and the real domain (Bhaskar, 2008). Researchers argue that CR produces stronger scientific explanations over a phenomenon because it looks at the root cause of the events (Wuisman, 2005; Isaksen, 2016; Smyth and Morris, 2007). Thus, we employed CR to explain the rationale, effects, and consequences of the co-creation of value outcomes in projects.

To explore the co-creation phenomenon, we adopted a qualitative approach using a multiple-case strategy of six case study projects (Denzin and Lincoln, 2000). The context of the six case studies can be seen in Table 4. Project case study 1 was set up as a prelude (exploratory) case within organisation A (Yin, 2017). This project case study represented a key investment within the project portfolio to achieve the IT mobility strategy within the university. The practices undertaken for this project might be a representation of practices in other key projects within organisation A. We then decided to explore and compare other key projects in organisation B, which provided exceptional access to examine five representative case studies from its project portfolio. This then allowed us to compare and contrast project practices of different organisations, but similar in nature. While the focus of this research was on the project case study level, the nested approach (Yin, 2017), taken in organisation B , allowed us to gain an in-depth understanding of both the historical and the organisational context (Engwall, 2003). The context of each project case study, including its key features, can be seen in Tables 3 and 4.

For all project case studies and according to CR (Bhaskar, 2008), we sought theoretical explanations addressing the context, the outcomes and its causalities (Smyth and Morris, 2007; Wynn Jr and Williams, 2012). Two streams were taken for this examination. Firstly, we explored project case studies, from case 1 to 5, in retrospective accounts. The main aim of this was to examine the value interactions across the complete project life cycle and to observe the emergent value outcomes in the medium- and long-term. Secondly, we explored project case study 6 in prospective accounts over a one-year period. The latter enabled us to reveal the dynamics of value co-creation in real time. Although we do not consider the engagement in the prospective study as ethnographic, this engagement did enable us to further understand the historical and the organisational context in organisation B.

3.3. Methods of data collection

The qualitative data collection was carried out through semi-structured interviews. In total, fifty-nine interviews were conducted across the six project case studies (see Table 3). Key participants from the formal structure of each project were initially selected. Then, we used a snowballing sampling to complement the initial set of actors. To ensure conformability in the study, we used the same question protocol across all interviews. The interview questions were structured in relation to the project stages, which practically facilitated the organisation of data. The core themes established in the interviews were:

- The exploration of the (actor-to-actor) value interactions from the client perspective during the: (1) pre-project stage, to understand how value propositions were initially configured and designed; (2) mid-project stage, to understand how value outcomes were finessed during execution; and (3) post-completion stage, to understand the value outcomes in the long-term.
- The implications of the value interactions in the long-term and the perception of the value outcomes from the client perspective.
- The organisational context to understand the enablers and the constraints, both of which influenced the value interactions and its implications.
- Lessons learned of each project to explore both positive and negative insights.

We made notes for each interview and observations. Additionally, we kept record of emergent ideas and the cognitive aspects during the engagements with the participants (Emerson et al., 2001).

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Table 3
Description of the six project case studies.

Description of case studies						
Project Characteristics	Case Study 1	Case Study 2	Case Study 3	Case Study 4	Case Study 5	Case Study 6
Organisation Type	UK Public Sector Organisation A	UK Public Sector Organisation B				
Project type	Wired/Wireless Internet Service.	Managed Printing Service	Building Refurbishment of a Residence Hall	High Performance Computing	IT Software System	Soft Managed Services: Waste Management
Start and completion date	Early 2012 – Summer 2014	Throughout 2013	Throughout 2015	Throughout 2015	Early 2014 - Late 2017	Early 2016–2018 (ongoing)
Contract Value	Approx. £2 m over a 4-year contract.	Contract based on service usage of approx. 600 managed devices.	Below £164 K	Approx. £1.2 m	Approx. £1 m	Approx. £50 million over a 5-year contract.
Evaluation at project level during	Front-End Execution Post-Completion	Front-End Execution Post-Completion	Front-End Execution Post-Completion	Front-End Execution Post-Completion	Front-End Execution Post-Completion	Front-End
Observing process	On retrospective accounts	On retrospective accounts	On retrospective accounts	On retrospective accounts	On retrospective accounts	In real time
Unit analysis	Actor-to-Actor interaction in the project level, with a focus on the client value outcomes.					
Method of analysis	Qualitative content analysis and application of retroduction (DREIC) model from Bhaskar (2008). Discussions of the analysis held with project participants and external researchers.					
Number of semi-structured interviews conducted	*Overall*: 17 *Breakdown*: a) Client reps: 12 b) Supplier reps: 3 c) User reps: 2	*Overall*: 7 *Breakdown*: a) Client reps: 6 b) Supplier reps: 0 c) User reps: 1	*Overall*: 6 *Breakdown*: a) Client reps: 4 b) Supplier reps: 0 c) User reps:2	*Overall*: 11 *Breakdown*: a) Client reps: 9 b) Supplier reps: 1 c) User reps: 1	*Overall*: 9 *Breakdown*: a) Client reps: 6 b) Supplier reps: 1 c) Users reps: 2	*Overall*: 9 *Breakdown*: a) Client reps: 9 b) Supplier reps: 0 c) Users reps: 0
Interviewees	Client reps: 1 Chief Information Officer 1 Head of Procurement 1 Project/Programme Manager 1 Project Manager (Operations Readiness) 1 Head of Networks 1 Legal Manager 1 Head of Service Delivery and Partnerships 1 Technical Lead LAN 1 Technical Lead Wi-Fi 1 Head of Buildings 1 Campus Services Manager 1 Residence Security Manager Supplier reps: 1 Supplier Commercial Manager 1 Supplier Marketing Director 1 Supplier Project Manager User reps: 2 End-User	Client reps: 1 Chief Information Officer 1 Head of Procurement 1 Senior Procurement Manager 1 Service Owner 1 Head of IT Asset and Supplier Management 1 Customer Relations Manager User reps: 1 End-user	Client reps: 1 Head of Procurement 1 Senior Procurement Manager 1 Procurement Officer 1 Residence Manager User reps: 2 End-users	Client reps: 1 Chief Information Officer 1 Project Board Chair 1 Head of Procurement 1 Director of IT Services 1 Senior Procurement Manager 1 Senior Project Manager 1 Project Manager 1 Technical Lead 1 Senior Network Engineer Supplier reps: 1 Supplier Business Development Manager User reps: 1 End-User	Client reps: 1 Chief Information Officer 1 Head of Procurement 1 Director of IT Services 1 Senior Procurement Manager 1 Senior Project Manager 1 Technical Lead Supplier reps: 1 Supplier Project Manager User reps: 2 End-users	Client reps: 1 Head of Procurement 1 × 2 Project Manager (Soft Services Manager) 1 × 2 Senior Procurement Manager 1 × 2 Technical Lead 1 × 2 Commercial Manager
Average time of interview	40 min	35 min	30 min	41 min	36 min	31 min
Secondary data	Complementary data including: project and procurement documentation, service complaints, organisations' websites, contracts, project agendas and minutes, service review minutes, emails, social networks, consultancy reports, newspapers and field notes.					

Table 4
Context of case studies.

Context of case studies	
Case Study #1	The client organisation was struggling to meet the IT demands from the student's community, particularly at the residence halls. Thus, the university decided to upgrade the current IT infrastructure to accommodate Wi-Fi service demands in the halls. This project was key to meet the IT strategy mobility programme within the university. The university, as the client organisation, decided outsourced the implementation, management, and support of a pervasive wired/wireless network of all its student residences. This project case study was relevant for exploration due to the multiple value interactions between the client, the supplier and the users across the project stages. The interactions enabled shaping the specification during the procurement stage. However, during the operations phase the end-users reported a poor service in the halls.
Case study #2	The client organisation had an urgency to consolidate a fragmented printing service across its faculties. Thus, the client organisation decided to carry out a project to outsource and consolidate a sustainable management plan for this service. This project is relevant for exploration due to the multiple value interactions during a nine-month period of procurement negotiation. However, during the operations phase, the user base complained about the poor printing service. The mismanagement of the service continued throughout the life of the contract to the point that the client organisation decided to terminate the contract and re-tender it.
Case study #3	Due to a natural damage caused by a storm day, a residence hall owned by the client organisation urgently needed a building refurbishment. Thus, the client organisation decided to carry out a project to refurbish it. The initial planning stage carried out by the project team was made without the involvement of the end-users. These were relevant stakeholders as they were living in the residence. Overall, the project team failed to realise the social and living experience of the end-users and it resulted in a poor living experience during the refurbishment for the end-users. As part of the outcomes, the student community took an action strike, which resulted in a financial compensation of £300,000 and a considerable delay of the project completion. This project was key to understand the aspects around the co-destruction of value.
Cas study #4	The client organisation had to replace aging capacity and end-of-life support of a high performance computing system. Thus, an urgent project was set-up to find a suitable supplier to implement a new system for the client organisation. This case study is relevant for exploration and the project presented value interactions before the start of the procurement between the client organisation and the potential suppliers. These interactions helped to shape the project specification and resulted in positive implications during the operations phase.
Case sudy #5	The client organisation had the urgency to keep control of research project resources (approx. £150 m) across the academic faculties. Thus, a project was set-up to co-develop and implement a Software as-a-Service system to manage the portfolio of research projects. This case study is relevant due to multiple interactions that the client organisation held with the supplier and end-users to co-develop the system. While the project reported a good functionality of the system, an unexpected business change in the organisation was reported. This ultimately affected the service experience of the end-users.
Case study #6	Due to the constant expansion of the university, it was struggling to manage the soft facilities management e.g. waste management, of a disparate set of sites, including academic buildings, laboratories, and halls of residence. Thus, a project was set-up to outsource an unified management of the soft facilities management. In contrast to the project case studies from 1 to 5, which were explored in retrospective accounts, this case study was explored in real-time. This enabled the explorations of the dynamics of value co-creation in real time, which could not be perceived in the other five case studies.

3.4. Data analysis

To analyse the data and following Grönroos' (2017) suggestions, we used Actor-to-Actor (A2A) approach at the project level with a particular focus on the client organisations'. As part of the initial stage of analysis, we familiarised ourselves with our primary and secondary data by: (a) re-listening all the audio-recordings; (b) re-reading all the audio-transcripts; and (c) reviewing the additional secondary documentation.

We mainly analysed the data using the following four steps. First and in line with critical realism (Bhaskar, 2008), we explored the data deductively using the following sensitising categories (Van de Ven and Poole, 2005) coming from the main concepts of value co-creation: (1) direct interactions; (2) outcomes; (3) value; (4) service; (5) impact (6) context; (7) benefits. As a second step, we introduced openness in the exploration by inductively extracting other relevant data in relation to the research questions. The extraction of these data was in relation to the challenging aspects of co-creation, including project sacrifices, destruction practices, disconnection of interactions, and a wider set of outcomes beyond the experiential nature strongly advocated by Vargo and Lusch (2016). This extraction was in line with other researchers' perceptions (Echeverri and Skålén, 2011; Leroy et al., 2013; Storbacka et al., 2016; Mills and Razmdoost, 2016), which argue that much of the work in relation to value co-creation is rooted in a positive tone, that, in turn, limits the critical analysis of this phenomena. We then organised all these data in a database to create initial patterns from the empirical level.

The initial interpretation of this set of data resulted in three main blocks: (1) the context of the value interactions; (2) a number of value interactions across the project life cycle; (3) the implications of the value interactions in the long-term. However, according to Bhaskar's (2008) ontology, all this initial interpretation formed part of the empirical level of the reality. Therefore, as a third step, we moved from the empirical level to the real level by applying retroduction (Danermark et al., 2002). As a final step, we synthesised the overall results from the retroduction analysis in a similar fashion to Gioia et al. (2013), which can be seen in Appendix A. Lastly, we conducted a cross-case comparison of the emergent insights from the analysis (Eisenhardt and Graebner, 2007).

3.5. Data quality

In general, qualitative studies present a number of limitations, such as bias, subjectivity, and methods of data collection (Denzin and Lincoln, 2000). To overcome these limitations, this study undertook the following actions to enhance the validity, reliability, and credibility of this research. Firstly, to enhance the research validity, we used a collection and triangulation of different sources, including primary and secondary data, such as project documentation, service complaints and websites. This helped us to examine the reality of each case study to the best approximation (Yin, 2017). In addition to this, this research provides sufficient background information about the six project case studies. Furthermore, we used a consistent protocol of interview questions for all participants during the data collection process. Secondly, to enhance the research reliability, we audio-recorded the interviews. Transcriptions were then carried out and organised in a database. Finally, to enhance the research credibility, we engaged with participants from Organisations A and B in a post-analysis to discuss findings. Feedback was gathered and incorporated into the results. This helped us to create the most accurate representation of the reality for each case study (Lincoln and Guba, 1985). In addition to this, peer scrutiny of this project was carried out through direct discussions with seven Finnish researchers from both the project management and marketing school, including Prof. Wikström, Prof. Artto, and Prof. Grönroos. Lastly, we compared and constrasted previous literature in relation to our findings in order to understand the comparability, the transferability, and the limitations of our results.

4. Results

This section focuses particularly on the value interactions that may enhance the value outcomes in the long-term. The value interactions have been grouped in four phases (see Fig. 1), which might provide an indication of a process by which value outcomes could be managed. In Phase 1, value interactions are meant to identify and envision strategic value outcomes . In Phase 2, value interactions are meant to design and configure value propositions for the medium- and long-term. In Phase 3, value interactions are meant to refine and deliver the value outcomes during the execution and delivery phase. Lastly, in Phase 4, value interactions are meant to manage and realise emergent value outcomes after project completion. The result section is then structured as follows. First, the perception of value outcomes in projects is explored. Then, eight key value interactions are presented within the four phases of the management of value outcomes. The section ends with a cross-tabulation of the value interaction themes against the project case studies.

4.1. Lack of thinking about value outcomes

It became clear in the analysis that project stakeholders had a lack of thinking about the value outcomes in the long-term. One participant in organisation B summarised the overall perception of value as:

"There is a large and disturbing ignorance around [the organisation], as to what is meant by value, if you go to any professional service…they have a different conception of it".

(Head of Procurement – Case Study 2)

The evidence shows project stakeholders have disparate perceptions of value, which may complicate the project's definition. For example, some actors considered the tangible output, such as an IT system, as the main project value outcome. This suggests that project teams underplay the perception of value in the long-term. Across the six projects case studies, including the analysis of the business cases, the examination demonstrates project practitioners place a strong

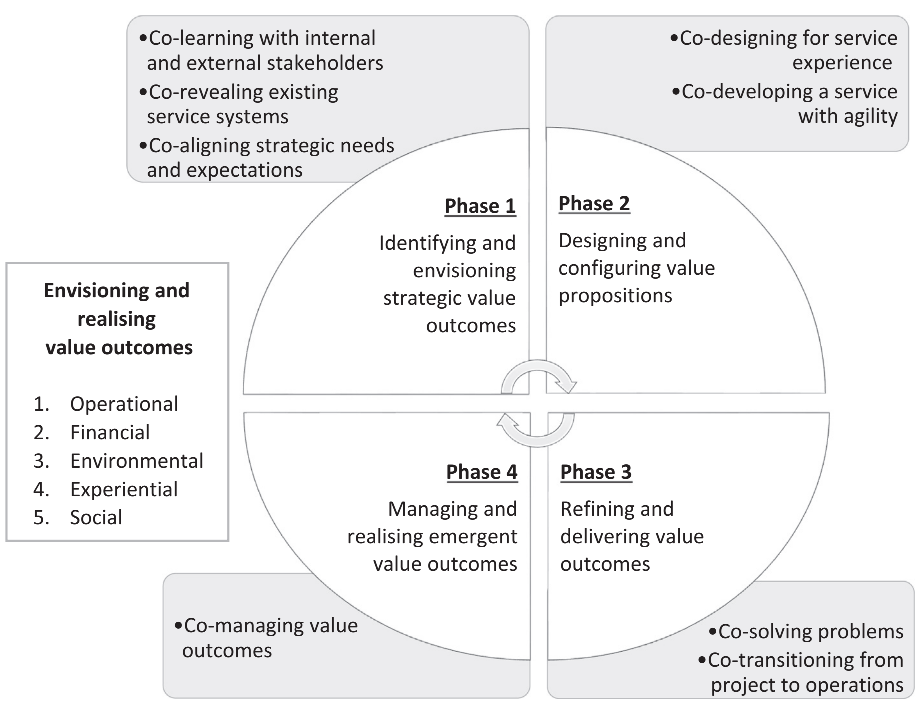

Fig. 1. Process of the co-creation of value outcomes in project settings (Authors' own).

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emphasis: (1) upon the successful *delivery* of manufactured goods; and (2) upon increasing transactional efficiency through cost reduction. To exemplify this, in project case study 1, the procurement team, who tendered the project, was granted the *best value-for-money award*, within Organisation A, for the outstanding cost-saving negotiation. Yet, end-users complained about the usefulness of the service only a year after delivery. One client representative reflected on the short-term approach undertaken by the team during the procurement stage as follows: *"[The] service was cr*p…I am talking about Wi-Fi and about the whole package…the project was about the cheap" (Technical Lead – Case Study 1).* This indicates that project stakeholders often reward projects for short-term value outcomes, which are usually about financials. Teams often undervalue the long-term perspectives of value. In contrast to this short-term perspective, the following sections explore key value interactions that may enhance value outcomes in the long-term.

4.2. Phase 1: identifying and envisioning strategic value outcomes

The evidence suggests that strategic value outcomes need identification by backcasting the desirable value outcomes, from the future (operations) to the present (front-end stage). This phase aids in the understanding and envisioning of the overall goals, the expectations and the needs around the future service. We found three key value interactions that may enhance the client value outcomes in the long-term: (1) co-learning with internal and external stakeholders; (2) co-revealing existing service systems; and (3) co-aligning strategic needs and expectations. These value interactions are explored in the following sub-sections.

4.2.1. Co-learning with internal and external stakeholders

The evidence indicates that client project teams used this value interaction as a form of an absorptive learning process, with internal and external stakeholders, such as suppliers and end-users. This interaction was found useful by project teams during complex and uncertain situations, particularly during the front-end stage. For example, in project case study 4, the project team recognised elements of uncertainty in the technical design. The team decided to learn lessons from a previous project undertaken by another client in the same sector. The perception of this learning interaction was as follows:

> *"He [another client] had run a tender himself, and he came down to the meetings [with the potential suppliers], and had a look at our tender documents and suggested some improvements and some alterations…but, sometimes we had to say no to him, he was a bit pushy sometimes."*
>
> (Project Manager – Case Study 4)

The analysis shows the client organisation was able to learn in an implicit form and explicit form from the external actor. Firstly, the project team received implicit knowledge from the other client as his experience was considered useful during the development of the specification. In an explicit form, the other client made available previous tender documentation and provided written feedback on the initial specification. While this interaction demonstrates that external actors in the ecosystem may be a source of value, in the form of information, expertise, and knowledge. However, this interaction may have a tipping point, in which the interaction would need to be stopped. For example, during this interaction, the other client was inclined towards other set of project requirements for the initial tender. However, the external actor did not understand the project team's contextual contingencies. Thus, the client senior project manager decided to enforce an immediate halt in this learning interaction to secure the client value outcomes. This suggests that providing full empowerment to co-creators may be dangerous and may lead to co-destruct value instead.

In contrast to the usefulness of this interaction presented in project case study 4, in project case study 6, the Commercial Manager reflected on the lack of this type interaction during the project: *"One of the lessons here, is I don't think our team have picked the good lessons from other universities, there was a need to look wider and not looking inside and in what [the client representatives] know, because [the client representatives] are not the keepers of all the knowledge*". Particularly in that contract, there were uncertain elements in the *environmental outcomes*, such as waste collection and sustainability practices. The client, therefore, could have learned from other client organisations, who had already completed a similar project (as noted in project case study 4). This might have helped the project team to avoid erroneous management practices.

4.2.2. Co-revealing existing service systems

The evidence indicates that this type of interaction was used when the client organisation was dealing with uncertainty about an existing service system, including its processes and service functionality. For example, in project case study 1, the project sponsor wanted to explore the delivery capability of the suppliers, which was claimed in their tender responses. Thus, the client carried out site visits to explore their existing systems. The exploration was possible because the supplier used a repeatable solution across a variety of clients. Thus, *operational* outcomes were observable as they were already functioning for other similar clients. In this co-revealing process, client representatives were able to look at the tangible and intangible aspects of a service during the operations phase. For example, from a tangible perspective, the client representatives were able to "*look at how [the supplier] performed their [internal] processes and how they standardised them"* (*Head of Networks – Case Study 1)*. From an intangible perspective, one representative stated:

> *"It was good to see the staff if they were approachable, it was a good feeling, you can't score on that but you understand the culture of the company*".
>
> (Programme Manager IT - Case Study 1).

As a result of this interaction, the client organised reduced project uncertainty about the existing service system as they

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were able to reveal the delivery capability (tangible aspects), as well as to experience some of the intangible aspects, such as the organisational culture.

4.2.3. Co-aligning strategic needs and expectations

The evidence indicates that client organisations used this type of interaction to explore a specific product or service in the market or to match the client's strategic needs and expectations, particularly with the suppliers. It was found that management activities, such as early engagement sessions, market consultations, supplier briefings, supplier demonstrations and user workshops, may help to align the needs and expectations of the client from an early stage of a project. These forms of interactions have been undertaken in the project business for a number of years, however we particularly found one key challenge during this old type of interaction. For example, in project case study 1, the client organised early engagement sessions with *all the* pre-qualified suppliers in a single session. However, the interaction was not perceived as useful by the client nor the suppliers. One supplier's Commercial Manager stated,

"We could not talk [during the session] and give our [technical and commercial] ideas on how we deliver our service because that would be unique to us".

(Supplier Commercial Manager – Case Study 1)

This suggests that clients and suppliers are not willing to co-create when commercial risks are taken during the process of co-creation, as it might endanger their market position and their business models.

4.3. Phase 2: designing and configuring value propositions

According to the evidence, once the strategic value propositions have been identified and agreed by senior stakeholders, project teams could then design and configure value propositions. In this phase, we found two key value interactions across our cases that may enhance the value outcomes in the long-term: (1) co-designing for service experience; and (2) co-developing a service with agility, which are explored in the following sections.

4.3.1. Co-designing for service experience

This value interaction may enable a project team to design: (1) the service experienced during execution; and (2) the service rendered during post-completion. To illustrate the service experienced during execution, in project case study 3, the client organisation (university) decided to carry out a refurbishment in a hall of residence. However, the client failed to anticipate the service experience that this project would cause to students during the project execution. The students who, were living at the residence, were preparing for exams at the time of the refurbishment. They found the construction works disrupting their main activities. This project then "*caused mental and physical discomfort*" (End-User – Case Study 3). This poor service experience resulted in student strike action, which ended with a compensation of £300,000 to the students (Times Higher Education, 2015; The Guardian, 2017). This demonstrates how functional silos when designing a service experience are insufficient. In contrast, boundary-spanning interactions are important to co-create value.

To illustrate the service rendered during post-completion, the evidence shows that projects create pre-conditions to influence routines and processes in the operations phase. For example, in project case study 5, when the client organisation delivered a new software system, it flipped an organisational process. This result was reflected by one participant as follows:

"We did not spend a lot of time looking at the services team, they struggle [now] internally with their own business change, which is a point for the lesson learned. We did not spend much time with them and only now we are getting on top of that".

(Senior Project Manager – Case Study 5)

This new but desynchronised process led to ineffective service, disappointing the user stakeholders. It is being until now (operations phase) that the service design, including the system functionality, is being created by the project team. Overall, evidence across the six case studies shows an absence of this value interaction, which not only results in destroying a service experience during execution and post-completion, but also results in affected business model and organisational routines.

4.3.2. Co-developing a service with agility

According to the data, this type of interaction refers to developing a service, including its tangible and intangible elements, with agility across the project phases. For example, in the case study 5, a new IT system had to be developed from scratch as no solutions were available in the market. Thus, the client decided to award a contract in order to co-develop a software-as-a-service. During the front-end of the project, the client and supplier acknowledged technical uncertainty to develop this system. To reduce uncertainty, the supplier, the client and the end-users worked together. The Senior Project Manager from the client organisation reported workshops were carried out with twenty end-users, where system functionality scenarios were explored and discussed. Then, the initial set of requirements were agreed among the key stakeholders. However, as the project was progressing *"[some of] the requirements changed because we were able to know if the supplier could do something or not"* (Senior Procurement Manager Case Study 5). While requirements changed, they were agreed monthly through sprint sessions. One participant summarises these sessions:

"The sprint sessions helped us to set out a very clear directive on what we were doing and on what we were focusing… so at the beginning of every month, we had a sprint kick-off workshop [with the relevant stakeholders] and part of it was about what was done in the last sprint, we learned from each sprint, and we made sure the change list was signed off, and also [helped] to plan what would be done for the next 4 weeks."

(Senior Project Manager - Case Study 5)

These collaborative sessions between the relevant stakeholders, always including the end-users, help to re-plan the functionality of the service across the development sequence. However, due to the intense and iterative planning interactions across the development sequence, evidence across cases shows that this agile approach consumed more resources in terms of time and human capital. For example, surprisingly, it was reported that the project board chair in this project attended to the monthly co-development sessions to accelerate the process of changes. This contrasts with other project case studies, in which project board chairs only acted as a gatekeeper in programme and portfolio level meetings rather than in the project level meetings. Thus, this value interaction needs a more dynamic and flexible mobilisation of resources, which may require not only a different project culture but also more project resources.

4.4. Phase 3: refining and delivering value outcomes

The evidence shows that refinements to the initial value propositions in the execution phase are required to successfully deliver a service. In this phase, we found two value interactions that may contribute to the refinement and delivery of value outcomes: (1) co-solving problems; and (2) co-transitioning from project to operations. These value interactions are explored in the following sections.

4.4.1. Co-solving problems

The evidence shows that problems in projects are inevitable and often arise during the project execution. Common grounding between the relevant stakeholders is required to secure and defend the delivery of value outcomes. To show a specific problem, in project case study 3, the client organisation decided to carry out a refurbishment without the concern of the main user stakeholders. The users and client representatives engaged until the project execution to discuss the service problems, such as uninformed construction works during exams times and misconduct of the construction workers towards the end-users during delivery. The end-users decided to arrange a dialogue session with the client representatives to discuss and solve these and other problems. However, during the problem-solving sessions, one user stated:

"The politeness from the institution was quite poor…we had one meeting with the manager to discuss the problems, the guy was responsible for the change, but we had that meeting, and nothing was nothing happening…he was so angry [with us] at that meeting".

(End-User– Case Study 3)

During this problem-solving session, students were simply defending the (broken) promises about the conditions of their living experience. However, as evidenced, the attitude from the client representative created more problems (most notably, a student strike), which derived in negative financial consequences to the client organisation. This demonstrates that stakeholders, who that are engaged in problem-solving situations required emotional intelligence skills to adequately manage these interactions, otherwise, it may result in a destruction of value as presented in project case study 3.

4.4.2. Co-transitioning from project to operations

The evidence suggests that the project need to be properly transferred from the project to the operations phase in order to secure the value outcomes. According to the data, project activities, such as service validation, system testing, and training may ensure that the value propositions, shaped in the early stages, are ultimately transferred to the operations. For example, in project case study 5, end-users who were helping to shape the value propositions in the early stages of the project, formed part of the acceptance testing activities during delivery as described below:

"We tested as went along with the system and at the end of that process, we signed a user acceptance testing and we invited much of the end-users that we had in procurement and they came back and had a look at the system again with all the changes that we made".

(Senior Project Manager – Case Study 5)

The integration of the end-users at the front- with the back-end of project created continuity and consistency of the value outcomes. In addition to this, in this case study, the project team co-developed the service with agility, meaning that mini-projects were developed and delivered in batches across the development sequence. This enabled the project team to test the new systems as going along across the development sequence. Overall, this value interaction may properly transfer value propositions from the conception to the project delivery.

4.5. Phase 4: managing and realising emergent value outcomes

According to the evidence, once emergent value outcomes appear in the post-completion phase, they still need to be controlled and monitored so user stakeholders can effectively make use of them. For this phase, we found one value interaction that may ensure that value outcomes are managed during their service life.

4.5.1. Co-managing value outcomes

The data across the examined project studies suggest that client organisations often overlook managing the emergent value outcomes during the operations phase. For example, in project case study 2, one participant stated:

"We don't have a dedicated manager doing contract management to make sure the SLA [service level agreements] are met and at the moment they are not".

(Head of IT Asset and Supplier Management – Case Study 2)

This suggests a disconnection between the project and operational level. Evidence demonstrates that clients do not invest in people, processes, and systems for managing contracts and their suppliers. This creates space for suppliers to behave unethically. For example, in the same project case study as above, the supplier was charging different prices as agreed in the initial contract. The client was not aware of this as no resources were allocated to oversee the contract. In addition to this, operational and service level agreement fell short of expectations as neither the supplier nor client manage to realise the envisioned value outcomes. In this project, the mismanagement of the value outcomes led to terminate the contract with the supplier organisation. This resulted in overspending financial resources to the client organisation. Overall, the data shows that clients often disregard the management of value outcomes post-completion.

4.6. Cross-tabulation of the co-creation themes vs. the case projects

While a lot of results presented in the above sections may stem from a specific project case study, a cross-tabulation of the eight value interactions, across the six case studies, is presented in this section (see Table 5). This cross-tabulation, which is represented in relative terms, shows that value interactions are not uniformly employed across all case studies. Four major observations from this cross-tabulation were found. Firstly, the more value interactions carried out by the client organisation, the better the value outcome was perceived by the end-users. For example, in project case study 4, value interactions were uniformly applied across this project. As a result, the value outcomes were perceived as successful by the end-users. This perception contrasts with other projects, such as case study 2 and 3, where there was a lack of value interactions and, as a consequence, outcomes were perceived as unsuccessful. Secondly, evidence across the cross-tabulation suggests that lack of value interactions in some projects produced negative financial implications. For example, in case study 3, the client ended-up paying concessions, which amounted to £300,000 in total, due to the lack of the involvement with the key stakeholders during the initial stage of the project. This suggests that the creation of value outcomes is highly connected with the capture or leakage of financial value.

Thirdly, the cross-tabulation shows that while some projects may have carried out value interactions during the early stages of a project (see case study 1), this does not ensure that value outcomes are realised during the operations phase. This suggests that value interactions need to be uniformly applied across the project development sequence in order to ensure value outcomes are transferred from the front- to back-end of a project. Lastly, the cross-tabulation suggests that projects do not have to carry out the eight value interactions at any opportunity. Instead, value interactions are mainly triggered by elements of uncertainty and complexity. Overall, the eight value interactions may be considered as a mini-portfolio of management actions and activities, which may lead not only to reduce complexity and uncertainty matters, but also to ensure value outcomes in the long-term.

5. Discussion

The goal of this research was to identify and explore practical value interactions that may impact the client's value outcomes in the medium- and long-term. To discuss the findings, this section is divided into two main parts according to our research questions: (1) a discussion of the value interactions across project stages; (2) a discussion of the implications of the value interactions in medium- and long-term. To facilitate the discussion, Fig. 1 has been developed to show the set of value interactions across the management of value outcomes and the set of value outcomes that appear in the long-term.

5.1. Value interactions across project stages

The results identified eight key value interactions (see Fig. 1), which may enhance the value outcomes in the medium- and long-term. The eight interactions can be seen as an alternative perspective to overcome uncertainty and complexity challenges in projects. For example, in project case study 4, the client was uncertain in the technical system design. Thus, the client carried out a co-learning interaction with an external actor, who had previously undertaken a similar project. This helped to overcome this uncertainty, and as a result, the client managed to enhance the value outcome. This functionality of value co-creation, particularly to overcome complex situations, is in line with previous research findings from industrial solutions studies (cf. Luotola et al., 2017).

One originality of this study is to have identified and explored practical value interactions from the ground. This is due to the fact that previous studies in project management and marketing have not comprehensively specified value interactions in the micro-level or have provided evidence-based challenges to the concept of value co-creation (cf. Vargo and Lusch, 2004; Prahalad and Ramaswamy, 2004; Smyth and Pryke, 2008). For example, the usefulness of the co-learning interaction has been previously explored in project settings (cf. Davies and Hobday, 2005; Chesbrough, 2011; Davies et al., 2016). However, our exploration in the micro-level suggests that full empowerment to external actors in a co-learning process may be counterproductive. In particular, in project case study 4, client representatives had to stop the learning interaction to defend the value outcomes as the external stakeholder was not aware of the client's organisational context. This could have led to destructive management decisions for the client instead. This finding contrasts with Karpen et al. (2011), who theoretically suggest to fully empower stakeholders in the co-creation process. In a similar challenging manner, the co-solving problems interaction has been previously explored in project settings (cf. Pryke, 2017). However, our evidence suggests that stakeholders need to hold emotional intelligence skills to manage problematic interactions, otherwise they may destroy value. For example, in project case study 3, the lack of emotional intelligence skills from the client

Table 5
Cross-tabulation of the co-creation themes vs. the case projects.

Phases	Value interactions	Case study 1: Wi-Fi service	Case study 2: Printing service	Case study 3: Refurbishment	Case study 4: Computing	Case study 5: Software service	Case study 6: Soft service
Phase 1	Co-learning with internal and external stakeholders	*Moderately;* the client learned from other clients in the same sector.	*Null;* the client did not manage to learn from existing and similar client settings.	*Null;* the client did not learn from other clients, probably due to the low complexity presented in this project.	*Strongly;* the client learned from other clients. Invited another client to join procurement sessions.	*Null;* this was a unique service so, there were no other settings to learn from.	*Null;* but the client recognised this type of interaction was required at the project conception.
	Co-revealing existing service systems	*Strongly;* the client directly explored existing supplier's service system.	*Null;* the client did not manage to explore other existing and similar settings.	*Null;* this project was a unique service, this type of interaction was not required.	*Strongly;* the client explored the supplier's system in other similar settings.	*Strongly;* the client directly explored the supplier's system.	*Strongly;* the client directly explored the supplier systems.
	Co-aligning strategic needs and expectations	*Moderately;* the client only engaged with the supplier but not with users to understand the needs and expectations.	*Moderately;* the client only engaged with the supplier but not with users to understand the needs and expectations.	*Null;* the client did not carry out any sort of early engagement with supplier and fully ignored end-users.	*Strongly;* the client fully engaged with the supplier and users.	*Strongly;* the client engaged with the supplier and users.	*Null;* however client reps recognised this type of interaction was required at the project conception.
Phase 2	Co-designing for service experience	*Moderately;* the client and supplier used design tools to synchronise different channels of communication.	*Null;* but the client recognised this type of interaction was required, as the operations team ended-up designing the service.	*Null;* the client did not apply this type of interaction.	*Moderately;* the client and supplier carried out engagements sessions to design the user experience with the end-users.	*Moderately;* the client carried out engagements sessions to design the user experience.	*Null;* but the client recognised this type of interaction was required at the project conception to design value outcomes.
	Co-developing a service with agility	*Moderately;* the client and supplier worked on closely on, not in developing a system, but in the delivery.	*Weakly;* the contract was co-developed, but it was it did not meet the client's needs.	*Null;* but the client could have clearly co-developed protocols of communications.	*Weakly;* only in the delivery, as the IT system was already fully developed by the supplier.	*Strongly;* the client worked alongside with the supplier and users to develop a product.	Not applicable as the project is yet at the procurement stage.
Phase 3	Co-solving problems	*Moderately;* the client work alongside the supplier and users.	*Weakly;* lack of engagement from the supplier to solve issues.	*Null;* the client reps engaged with users but, an ineffective client dialogue management worse the problem.	*Strongly;* the client, supplier and users worked together in the execution at project/board level.	*Strongly;* the client, supplier and users worked together at project/ board level.	Not applicable as the project is yet at the procurement stage.
	Co-transitioning from project to operations	*Weakly;* the client lost the relationship with the supplier at this stage.	*Weakly;* the client lost the relationship with the supplier at this stage.	*Weakly;* the client lost the relationship with the supplier at this stage.	*Moderately;* the transition was carried in one single phase from the project level to operations.	*Strongly;* the client and supplier deliver this project in multiple delivery phases.	Not applicable as the project is yet at the procurement stage.
Phase 4	Co-managing value outcomes	*Weakly;* service review interactions in place but without improvements in the service.	*Weakly;* a few service review interactions and improvements across the contract, except when the contract was being terminated.	*Null;* the client manages its own building facilities so no interactions was carried out.	*Strongly;* service review interactions in place with service improvements.	*Moderately;* service review meetings, with relatively some improvements to the service.	Not applicable as the project is yet at the procurement stage.
	Perception of the value outcomes (perceived by the interviewees)	*Relatively unsuccessful:* the client considered this project as successful due to a cheap contract, however, users experienced poor operational and experiential outcomes.	*Unsuccessful:* the client perceived operational and financial outcomes as unsatisfactory. Thus, contract was terminated.	*Unsuccessful:* the client and users experienced poor experiential, financial and social outcomes. Users, in particular, felt mistreated during the project execution.	*Successful:* Operational outcomes are well regarded by the users, with a good capacity for future demands.	*Relatively successful:* while the new system is functioning for purpose, a business change was negatively perceived during the operations phase by the end-users.	Not applicable as the project is yet at the procurement stage.

Note: This table is a cross-tabulation of the co-creation themes vs. the case projects from the client perspective (how strongly to weakly each theme appeared per case, in relative terms).

representatives derived in a confrontation with the students, who decided to organise themselves and defend their value outcomes through strike action.

As an original contribution, this study found that the interaction: co-revealing existing service systems, allows one organisation to explore the tangible and intangible aspects of an existing service system from an early stage of a project. For example, in project case study 1, the client was able to perceive the supplier organisational culture by observing existing processes, operations and service actors. While this value interaction may be less useful for extremely unique projects, such as in construction undertakings, IT projects, which are based on repeatable hardware solutions (see Davies and Hobday, 2005), can reap benefits out of this interaction.

Some other value interactions found in this study, they form part of the new wave of adaptive project management. For example, in the interaction co-developing a service with agility, particularly in project case study 5, the project team used a flexible approach to develop a project. The team carried out multiple re-planning interactions to modify initial requirements according to the evolving needs. This contrasts with the traditional rigid planning, where projects freeze the initial planning stage (Serrador and Pinto, 2015). However, evidence suggests that a new culture and investment in the form of new processes, systems, and training, is needed to carry out this iterative value interaction. In addition to this, this study found that this interaction, as well as the co-designing for service experience, are scarcely applied in project practice. The analysis suggests that it may result in negative financial consequences. For example, in project case study 3, the project team did not engage with the users to co-design the service experiences. This resulted in £300,000 of compensations to users, as they complained about the functionality of the service experiences. To bridge theory with practice, service design tools, such as the blueprinting technique (Shostack, 1984), user design (Redström, 2006), customer journey (Zomerdijk and Voss, 2009) and multi-level design (Patrício et al., 2011; Teixeira et al., 2012), may be used to design service experiences.

This study confirms the importance of previously explored interactions in projects, such as co-aligning needs and expectations (cf. Brady et al., 2005; Morris, 2013); co-transitioning projects to operations (cf. Zerjav et al., 2015; Zerjav et al., 2018); and co-managing and realising emergent value outcomes (cf. Cova et al., 2002). Furthermore, this study confirms that while the strategic front-end is critical to configure value outcomes (Morris, 2013), projects need to expand their scope beyond the transactional and short-term perspectives in order to connect effectively the front- with the back-end of a project (Artto et al., 2016).

In summary, the first research question has been covered in this section, by founding eight key value interactions across the project lifecycle, which may not only enhance the value outcomes in the long-term but also can help to deal with uncertain and complex situations. Overall, this list is not meant to be inclusive, but it may provide initial overaching exposure of current co-creation practices. One can argue that these value interactions might not be relevant to all markets or projects, particularly as the interactions have been identified from a public sector organisation. Thus, projects in the private sector may carry out other types of interactions.

5.2. Implications of the value interactions in medium- and long-term

While the evidence demonstrates project actors endorse and focus on short-term value outcomes, particularly financial ones, value interactions may definitely have either positive or negative implications in the medium- and long-term. For example, according to our analysis (see Fig. 1), the application of value interactions across the project lifecycle resulted in five different types of value outcomes in the long-term: (1) Operational; (2) Financial; (3) Experiential; (4) Environmental and (5) Social. This integrated and connected set of value outcomes, produced by value interactions, is an original contribution to the literature of projects. This is due to the fact that the literature in benefits management has considered benefits as a measurement of the delivery of tangible outputs (cf. Morris, 2013). Yet, the value realisation of tangible and intangible aspects, which together render a service in a project, have been overlooked. In addition to this, benefits have been considered like a homogeneous mass, as if all benefits (value outcomes) had the same properties and characteristics. In contrast, our analysis shows five dimensions of strategic value outcomes. This categorisation could be potentially used in the strategic business cases for initial configuration of value outcomes. According to our analysis of the six business cases, the configuration of value outcomes is weak at the early of a project, however they need to be strategically agreed and worked upon. For example, in project case study 1, the benefits section in the business case was completely overlooked. This suggests that client organisations barely configure value outocomes (or pursue other hidden agendas), which compromise the project value outcomes, particularly for the end-users and other relevant stakeholders.

This integrated set of value outcomes resemble previous individual exploration of value outcomes. For example, social and environmental outcomes have been previously discussed in Martinsuo and Killen (2014); operational outcomes in Zerjav et al. (2018); financial outcomes in Smyth et al. (2017); and experiential outcomes in Fuentes (2019). Another originality in this study is to show how these value outcomes could be interconnected. For example, in project case study 3, the client did not co-design the service experience with the end-users, which ultimately affected the financial outcomes upstream to the client organisation and the experiential outcomes downstream to the end-users during the execution phase of a project. In addition to this, extrapolating the service perspective from Vargo and Lusch (2016), we argue that value outcomes can emerge both during the execution phase (as in project case study 3) and during the operations phase.

Another originality is to empirically show that although value outcomes emerge in the medium- and long-term, they have a link back to the early project stage. To manage value outcomes from the early stages of a project, this study has identified a process comprised of four phases (see Fig. 1), by which value outcomes can be managed across the project life cycle. Traditionally, project life cycles rely upon new product development sequence (NPD), particularly in construction projects (see Morris, 2013). In contrast to the rigid NPD approaches, which are product-oriented, the four phases allow the identification, design, refinement, and delivery of value outcomes in a project as a provision of service. Furthermore, these four phases are in line with modern adaptive project management (Levitt, 2011; Serrador and Pinto, 2015).

In summary, the second research question has been covered in this section, by exploring the implications of the value interactions in the long-term. The results show a set of value outcomes, which may appear in the medium and long-term. In addition to this, our analysis demonstrates that while the value outcomes appear in the long-term, they have a link back to the early stage of a project. As a management process, the results show four phases, which can be used to manage the value outcome across a project life cycle.

6. Conclusion and implications

To date, research on the strategic pre-project stage has ensured a better definition of projects (Morris, 2013). However, research on the value outcomes in the medium- and long-term has been scarcely addressed in the project literature. In addition to this, previous studies on value have emphasised the supplier perspective (see Davies, 2004). The management and the perception of value outcomes from the client perspective have been widely disregarded. Thus, the overarching originality of this study comes from the examination of Service Dominant-Logic in the project context, which aims to ensure value outcomes for the client organisation in the medium- and long-term through value interactions.

6.1. Theoretical contribution

This research contributes to knowledge in three main streams:

Firstly, this research empirically identified eight key value interactions (see Fig. 1), which may be used as management actions not only to enhance value outcomes in the long-term but also to deal with complex and uncertain situations at present. Previous research in projects, such as relationship marketing, has addressed collaborative relationships. However, value interactions have not been sufficiently specified as management actions, as this study does (cf. Vargo and Lusch, 2004; Prahalad and Ramaswamy, 2004; Smyth and Pryke, 2008).

While these eight value interactions may create value in the long-term, one can argue that, *for* known situations, independent and transactional management is enough, particularly when expertise has been reached by the lessons of previous projects. This contrasts with the proposition from Vargo and Lusch (2016), who argue that a value co-creation process *must* happen across an entire project life cycle. However, results show that an all-encompassing collaborative process might become counterproductive or destructive for project settings due to the multiple interactions (cf. Mills and Razmdoost (2016), resulting: a) in overspending of resources (cf. Hamel and Prahalad, 1994); b) in creating conflicts or scope creep (cf. Mele, 2011); c) in adding complexity to the project. In addition to this, results show practitioners may need to stop the co-creation process with an external co-creator in order to defend the outcomes. This finding is in contrast to Karpen et al. (2011), who theoretically suggest to fully empower external stakeholders during the co-creation process.

Secondly, this research empirically created a categorisation of five different types of value outcomes, from a client perspective, which appears in the medium and long-term. This set of tangible and intangible value outcomes contrasts previous work on benefits management (see Chih and Zwikael, 2015), which considered benefits as a homogenous entity. Furthermore, while previous project research has explored some forms of value outcomes (Morgan et al., 2008; Martinsuo and Killen, 2014; Zerjav et al., 2018; Smyth et al., 2017; Fuentes, 2019), this study shows the how these set of value outcomes might be interconnected, rather than being treated as isolated entities. In addition to this, previous research on projects considered that outcomes appear in the long-term (Shenhar and Dvir, 2007). However, this research empirically demonstrated that execution embodies service interactions and is part of the service experience, hence conceptually value outcomes are also experienced during execution (cf. Smyth, 2015).

Thirdly, this research found that allocation of the value outcomes is highly affected by power asymmetry among the relevant actors in the co-creation process, which, in turn, may result in negative consequences for another party. For example, the client organisations pursuing (hidden) agendas, which compromised the outcomes for other stakeholders. This contribution may be linked with previous stakeholder management findings (see Mitchell et al., 1997), which argue that actors with specific attributes, such as power, urgency, and legitimacy, may have a strong influence in a collaborative relationship. These actors may ultimately decide the fate of the value outcomes. In addition to this, our results indicate that unethical behaviour between actors is quite common, particularly suppliers, which are financially driven organisations. For example, in project case study 2, the supplier took advantage that the client was not properly managing the contract. As a result, the supplier was unethicallycharging different prices as agreed in the initial contract. This finding contrasts the theoretical propositions from Akaka et al. (2013), who highly advocates that the whole actors in the ecosystem are willing to collaborate for the benefit of the client and end-users.

Overall, this research adds to existing knowledge by continuing to unpack the process and implications of the co-

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creation of value outcomes. This research is original because it has moved forward the concept of the co-creation of value using empirical evidence. Previous research on co-creation has been criticised for being largely conceptual, normative, perspective (Wright and Russell, 2012) and rooted in positive terms (Mele, 2011). In contrast, this research provides eight value interactions, which may be considered as key management actions to enhance five types of value outcomes. In addition to this, several challenges have been brought forward to the concept and adequacy of value co-creation in projects. These challenges may require management attention to ensure and defend the value outcomes from a client perspective.

6.2. Managerial implications and recommendations

This study has identified four main implications and recommendations for project practitioners. Firstly, the identification of the eight value interactions (see Fig. 1) might serve as specific management actions for project practitioners. These can be used to initially identified, designed, delivered and managed value outcomes across the development sequence, particularly when complexity and uncertainty aspects are at stake. From a practical point of view, if any of the proposed interactions are carried out, we recommend practitioners to scope the co-creation task to clearly identify what needs to be co-created. Secondly, while value co-creation process may create benefits, practitioners need to assess when to avoid or to stop a co-creation process. This is due to the fact that value interactions may result in counterproductive and destructive practices, reflected as conflicts or overspending of resources. Thus, project practitioners need to discuss the advantages and disadvantages of a co-creation process. Thirdly, from the analysis of the six project business cases, value outcomes (usually referred as to benefits) are poorly treated at the planning stage. Thus, the categorisation of the five types of value outcomes proposed in this study (see Fig. 1), might help practitioners in the initial development of value outcomes. We recommend practitioners to make use of workshops in the planning stage in order to discuss strategic value outcomes for the long-term, which could later inform the traditional inputs-based project specification. Lastly, moving into a management of value outcomes is not a straightforward process. This requires investment in terms of creating new processes, activities, resources, and personnel training as modern forms of agile management are required. However, according to our analysis, this investment may help in avoiding negative implications vis-a-vis their business models in the long-term.

6.3. Limitations and directions for further research

Two main limitations have been identified in this study. Firstly, the limited empirical studies on co-creation in project settings led us to select a focal firm context to understand the phenomena within the same contextual contingencies. While this allowed us to understand in-depth the organisational context, the history of the projects, and the value outcomes from one specific organisation, this might indicate that some findings might not be relevant or applicable to other organisations and project markets. It is fair to state that, our specific research goal was not focused per in seeking generalisable results, but instead in developing causal explanations. Secondly, while the number of interviews is substantial, the main perception of the value outcomes is coming from the two client organisations rather than from the supplier organisations. Thus, this might have created a bias in the analysis of the value outcomes.

This research has found five main avenues for future research:

(1) process and techniques could be developed to identify and categorise different types and roles of co-creators. A complex project with multiple actors in the co-creation process could be helpful to map the different roles of co-creators. This may also provide an indication of the type of skills and knowledge required for this collaborative process (see Mitchell et al., 1997; Aaltonen et al., 2015).
(2) the number of tensions found in this study might indicate that co-creation practices in the micro-level have not yet been fully explored (see Storbacka et al., 2016). Thus, further exploration of the micro-levels aspects of co-creation of value is required across the portfolio, programme and project level, both from the client and supplier perspective.
(3) contextual factors seem to influence the co-creation process, from the institutional to the project level, thus a full exploration of the contextual arrangements around the process of co-creation is required (Edvardsson et al., 2011).
(4) service design practices need to be further explored to understand how projects practitioners are designing service experiences. At present, designing for service experiences have been scantly explored in practice and theory. Thus, there is a clear route of exploration around this in project settings (see Shostack, 1984; Redström, 2006; Zomerdijk and Voss, 2009; Patrício et al., 2011; Teixeira et al., 2012).
(5) to date, research on co-creation is in isolation with wider organisational aspects, such as the business model, particularly the financial aspects, and the organisational strategy (cf. DaSilva and Trkman, 2014). This research uncovered links and signals the need for further integrative research across the management research silos of co-creation.

Conflict of interest

There is no conflict of interest.

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Appendix A. Synthesis of the results

1st order of synthesis	2nd order of synthesis	Aggregated synthesis / Value interactions	Phase of Value outcomes
Learning from other projects and actors to solve technical, commercial and other service wrap	Absorbing explicit knowledge	Co-learning with internal and external stakeholders	Phase 1: Identifying and envisioning value outcomes
Through the dialogue meetings, clients are able to refine and share other resources, such as project documentation, to absorb lessons learned			
Learning from the experience of others and applying lessons learnt to the benefit of the client	Absorbing implicit knowledge		
Ethical engagement to provide valuable sources of information	Interaction awareness due to contextual factors		
Win-win situations for parties engaged in the co-creation, yet power may influence the interaction			
Observing the physical environment, operations and other routines during real-time service delivery settings	Understanding tangible aspects of the service system	Co-revealing existing service systems	
Corroborating project documentation with existing operations, systems and processes			
Interacting with employees and existing processes to understand their organisational context, such as culture and the employees' service ability.	Understanding intangible aspects of the service system		
Early discussion of contracts and projects in the form of market engagements, supplier briefings and consultations. Commercial awareness was needed during these discussions.	Exploring needs and expectations from relevant actors	Co-aligning strategic needs and expectations	
Late design in the process during the actual execution and operations phase	Engagement with actors in execution and operations	Co-designing for service experience	Phase 2: Designing and configuring value propositions
Lack of engagement with roles from the operations phase with the front-end			
Lack of tools and processes to map and backcast the value outcomes	Investment to carry out this interaction through formal processes		
Investment is required to change the process and culture			
Changes in the dynamics of the people within the organisation	Changes in the routines		
Changes in the system could cause problems for the established routines			
Iterations across the development sequence	Flexibility in the process	Co-developing a service with agility	
Use of development and sprint sessions to re-plan and deliver			
Culture change in the way of working	Development of organisational attributes		
Consuming more resources than planned and in comparison to other projects	Dynamics in the financial resources		
Financial rewards when applying co-development			
Changes in the plan and project scope need to be agreed with different project actors	Processes to track and solve problems	Co-solving problems	Phase 3: Refining and delivering value outcomes
A process in place to keep control of the changes and problems			
Challenging situations need to be properly addressed by relevant stakeholders	Soft skills to address and solve problem		
The transition from projects to operation is not planned by the PMO	Formal process to transfer projects to operations	Co-transitioning from project to operations	
Project resources limited to the project lifecycle	Allocation of project resources to the operations		

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(*continued*)

1st order of synthesis	2nd order of synthesis	Aggregated synthesis / Value interactions	Phase of Value outcomes
Systems not connected with the overall service system	Synchronisation of systems in the operations		
Disconnection of the relationship during the contract lifecycle	Formal contract management procedures	Co-managing value outcomes	Phase 4: Managing and realising emergent value outcomes
Clients need to allocate resources to keep control of the suppliers	Dialogue to address performance and service improvement		
Creating dialogue between the client and relevant actors to discuss the value outcomes			

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