Projects as Creators of the Preconditions for Standardized and Routinized Operations in Use

Executive Summary

- The purpose of a project is to create the *preconditions* for other activities.
- Preconditions establish the context ability for these other activities to be standardized and routinized.
- A taxonomy of six categories of preconditions are proposed.
- Value realization in context and use is one important way to establish whether the project purpose is fulfilled.
- The value to be realized depends upon the project providers understanding and responding to the project purpose to create the preconditions, which is more than delivering the traditional requirements, specification as compliant outputs.
- Value outcomes can be viewed through a number of theoretical lenses, including service design and the service-dominant logic.

Abstract

The purpose of a project is to create the *preconditions* for other activities. Yet the main focus of project research and much of practice is on the project itself, namely project characteristics and the means to execute projects. This conceptual paper

addresses the purpose, and specifically creating the preconditions for other activities in use; an overlooked issue in research and practice. The delivery of valuable projects that fulfil their purpose is central to a thriving economy and society, and therefore creating the preconditions requires a great deal more attention.

Project provision cannot be compared with other standardized production and routinized service activities. Indeed, the standardization and routinization of other activities is made possible by the delivery and value realization of projects once put to use for sponsors, owners and end-users.

Preconditions come in several forms. An initial and indicative taxonomy of six categories of preconditions are proposed. The taxonomy provides a basis for understanding the preconditions as a first step for more detailed assessment of delivering projects with valuable outcomes. Such an approach links to other theoretical lenses, such as learning, service design and the service-dominant logic, to provide the conceptual means to evaluate creating the preconditions for other activities.

Keywords: Characteristics; Preconditions; Project Purpose; Routinization; Standardization; Value Realization

Introduction

What do we live for, if it is not to make life less difficult for each other?

George Eliot

This conceptual paper aims to address our understanding of the project. It is argued that the prime purpose of a project is to create the *preconditions* for other standardized and routinized activities. Therefore, projects cannot be subjected to the same criteria as many other types of provision, such as performance and productivity comparisons, and success measurements. This is precisely because other operations utilize the preconditions created by projects to establish standardized and routinized activities to ensure consistent and replicable performance and outcomes. *Preconditions* are defined here as establishing the optimal provision of value for realization in use and context where standardization and routinization do *not* currently exist. Activities is defined here as being the range of tasks and processes that are part of operations that engage with the projects post-completion. Routinization provides the means to articulate processes on the ground. If the processes are standard ones they are used time and again. The outcomes are easy to secure through replication where the routines support replication and replication renders the activities standardized ones. The operations in this context refers not to project management but to the application of the project post-delivery, that is, when it is put to use or is in use.

Building on the aim to improve our understanding of projects, the research looks at projects in terms of their future functioning (Bredillet, 2004a; Söderlund, 2004), indeed, embody the future in the sense of the purpose of the project and fulfilling that purpose (cf. van der Hoorn and Whitty, 2015). The paper specifically looks at the contribution projects make to society by creating the preconditions for other activities in use, which has largely been overlooked in research and project management practice. The delivery of valuable projects that fulfil their purpose is central to a thriving economy and society, and therefore creating the preconditions requires a

great deal more attention. Yet, drawing on prior research, the paper can be seen as an extension of and challenge to predominant positivist and linear paradigms of project management and theorization (e.g. Pollack, 2004; Cicmil and Hodgson 2006; Smyth and Morris, 2007). The understanding of projects and the activity of the management of projects remains a work in progress (Morris, 2013). Consideration of projects post-completion and linking this back to establishing the preconditions through execution, from which others subsequently benefit, is an unfinished research task.

Background and the recent historical context

Project and project management research has in the past paid particular attention to project execution and the management of projects (e.g. Morris, 1994; Shenhar and Dvir, 2007a; Turner, 2009). Part of that consideration has involved examining the *characteristics of the project* and its organization (e.g. Songer and Molenaar, 1997; Andersen, 2003; Andersen et al., 2009; Winch, 2010). The project is characterized as a unique and complex endeavour with high levels of uncertainty (e.g. Pich et al., 2002; Winch, 2010; Geraldi et al., 2011). The project is further characterized as a temporary activity, whereby execution takes place within a defined timeframe by a temporary organization (e.g. Lundin and Söderholm, 1995; Packendorff, 1995; Sydow et al., 2004; Bakker et al., 2016). The project team and broader coalition are mobilized accordingly and in the project's operational context. The project team typically comprises membership that is temporary in a multi-organizational configuration and in personnel (e.g. Cherns and Bryant, 1884; Winch, 2010).

The in-house or project-based firm's management allocates resources. The project management team mobilizes resources to configure the inputs to meet the

requirements and execution takes place against the iron triangle, which embodies the three main elements of a range of factors that can be termed the *management of means*. These means of execution do not directly address the organizational problem that the project is trying to solve for the client as owner and sponsor and for the end-users (e.g. Atkinson, 1999). These traditional criteria of requirements execution are, therefore, means and not the ends; they do not directly address the project purpose.

There have been efforts to go beyond these narrow criteria in order to consider benefits delivery (e.g. Shenhar et al., 1997; Shenhar and Dvir, 2007a; Morris, 2013), which is defined as coming from the outputs yet prior to the value realization from the project (Ashurst and Doherty, 2003; Ward et al., 2007) and project impact, which is both less tangible and sums up the result of value realization (e.g. Morris, 2013). Benefits delivery tends to assess the translation of inputs into outputs, thus, how effectively performance has met the requirements and client expectations. This in turn feeds into consideration of performance and the broader consideration of project success criteria (e.g. Shenhar et al., 1997; Cooke-Davies, 2002). This view holds that project success criteria are about inputs in order to seek certain outputs. Benchmarks and other indicators are generally confined to outputs, while cost-benefit analysis tends to focus more on outputs (value) in relation to resource inputs (costs). However, the project outcomes in use and context are seldom and sparsely addressed. The value realized from projects by the client and direct stakeholders as owner, sponsor and users are a largely unexplored area in terms of the usefulness of the projects over the long run; the extent to which they contribute directly and indirectly to well-being, wealth creation and profitability. Overlooking the value realized is common in research and practice.

Foreground and current developments

The strictures of the linear positivist epistemology have been discarded through a considerable body of academic research (e.g. Bredillet, 2004b; Cicmil and Hodgson, 2006;), in turn challenging the practitioner models and bodies of knowledge (e.g. Smyth and Morris, 2007).

Other approaches have emerged that embrace the project as a process and living experience (e.g. Cicmil et al., 2006; van der Hoorn and Whitty, 2015). Others considered project outcomes (e.g. Liu and Walker, 1998), in particular the co-created value in use by applying the theoretical lens of the service-dominant logic (e.g. Wikström et al., 2009; Kujala et al., 2011; Liu et al., 2013; Razmdoost and Mills, 2016). This perceptual and phenomenlogical approach has built on the seminal work of Vargo and Lusch (2004, 2016). Although there are considerable challenges regarding value outcomes for research and application in practice (e.g. Smyth et al., 2016), the service-dominant logic provides one theoretical lens to help show the extent to which the project purpose is met. There are multiple conceptualizations regarding value and projects even from the co-creation perspective (other examples to those cited above include: Artto et al., 2016; Peltokorpi et al., 2016; Keys and Huemann, 2017; Laursen, 2017). There are several other current lenses that are pointed to during the paper, namely learning and knowledge management and service design, as well as the service-dominant logic, however, there may be other current lenses and new ones should be expected as part of theory development that can be applied to understand better both the creation of appropriate preconditions and serving the project purpose. Purpose is defined through this lens in terms of the realized value

in use and context, however, value itself is variable and includes profit, cultural, policy and social outcomes that are both measurable and perceptual (Smyth et al., 2016).

There are other theoretical lenses, for example service design, which try to align the service produced to the needs of the procurer and users (e.g. Romme, 2003). This lens is important for envisioning the project in meeting its purpose (cf. Shostack, 1984) and then mapping the service to align provision with the vision (Kingman-Brundage et al., 1995). Learning and knowledge management offers a further contributory lens (cf. Koskinen et al., 2003) especially when applied to the front-end rather than execution. Such lenses potentially provide more balanced approaches compared to the production and input driven approaches for delivering the preconditions and the subsequent value realization in the operational context and use of the project.

Practice barriers

There is an assumption, or at least an acceptance in practice, that undertaking feasibility studies, scoping the project and recording the result in a set of requirements adequately articulates the needs and expectations. Following on is the assumption that providers will align the content to meet the needs and expectations, and hence, overall satisfy the project purpose. Such outcomes are not necessarily the case, indeed there are frequently shortcomings and disappointments, some of which are retrospectively seen as project failures by sponsors, owners, users and stakeholders (e.g. Flyvbjerg et al., 2003). Regardless of policy misrepresentation and bias, misalignments occur because requirements documentation, specifications and aspects raised in dialogue during negotiations are accepted and taken at face value. Implementation, specifically

delivery during execution may add to the shortfalls because the delivery as encapsulated in business models is mismatched with the stated and assumed requirements through poor service design by providers, low levels of integration, plus cultural and behavioural factors (e.g. Ruuska et al., 2011; Smyth et al., 2018).

The failure to fully articulate the project purpose and translate these into specific requirements is because projects are inherently unique and complex, temporal and uncertain. This poses challenges for sponsors and owners to translate the purpose into a set of articulated requirements, including via specialist representatives and agents. It also raises the challenge to providers at the front-end to help sponsors, owners and users to fully articulate what is expected, which is typically poorly conducted by business developers, bid managers and supply chain managers/procurers (e.g. Smyth et al., 2016). It therefore requires a unique combination of skills sets to bridge the gap between what the sponsor and users expect and need, and how those with the technical expertise understand what is needed in terms of design and specification (cf. Zomerdijk and Voss, 2010).

Combining theory and practice

Hence, there are two conceptual gaps. One is between the articulating the expectations to fulfil the project purpose on the demand side. The other is the mismatch and misalignment of the demand and supply sides. The two intersect in practice and contribute to the perennial problems of providing the information that is available in timely ways. The challenge of providing the information available is well-rehearsed (e.g. Winch, 2010). Bridging the gap of expectations and articulation is more challenging (e.g. Smyth, 2015a).

The constraints posed by managing the means and the challenges of bridging the gap to consider value in use to achieve the project purpose cannot be removed. They can be better addressed in both theory and practice. The starting point is to provide a greater focus upon creating the conditions for other more standardized and routinized activities in use. This will improve conceptual understanding and action on the ground at the front-end and during execution. The focus is potentially both productive and about provision of useful projects. This is necessary to avoid the purely abstract and development of findings that lead to the accusation of management research being irrelevant because it is not related to productive activity or provision (Koskela, 2017). This aspect of project ontology has yet to be fully examined.

Therefore, the aim of this paper is to improve our understanding of projects theoretically and for practice by exploring the issue that projects create the *preconditions* for other standardized and routinized activities. The paper is derived from prior industry and research experience and knowledge to contribute to understanding the ontology of a project, hence the management of projects. The paper follows the following format. The next section briefly reviews the traditional ways in which projects are currently considered. First, the characteristics of projects, particularly uniqueness and uncertainty, complexity and their temporary form, are reviewed. Second, the main means by which projects are evaluated, namely time-cost-quality/scope, are reviewed. This provides an anchor for the next section, which considers projects having the purpose to set the preconditions of other standardized and routinized activities that are conducted in stable contexts and conditions that the project establishes. A summary of the outcome concludes the paper.

Reviewing Traditional Linear and Positivist Discourses

> *...projects are no longer perceived as standalone entities to deliver standalone products or services, but rather are parts of a larger whole or system in which they fulfill a clearly defined role, using clearly defined interfaces to their environment.* Konstantinou and Müller, 2016: 3).

There has been scant attention given to one of the prime generic purposes that projects serve. It has been asserted the purpose is not something that project managers should address and thus does not form part of the evaluation of project management (Sartorious, 1991). While it may not be in the control of project-based firms to determine whether to commission a project and the ethics of the purpose may not be considered the responsibility by some providers, yet the use of the project is, otherwise there is no reason to engage with the project apart from the profit motive – firms are there to serve their customers and clients and other stakeholders in order to survive long term.

Yet the project bodies of knowledge are largely influenced by the linear models rooted in positivism (Smyth and Morris, 2007). Although the research project management paradigm is shifting away from positivism, it still dominates (e.g. Smyth and Morris, 2007; Bredillet, 2010; van der Horn and Whitty, 2015). Some broader issues have received some attention. Benefits delivery (outputs) and impact (of the

outputs) have received limited attention (e.g. Shenhar et al., 1997; Shenhar and Dvir, 2007a; Morris, 2013).

One narrow definition of project purpose is provided by Baccarini: *the intended near-term effects on the users of the project as a result of utilizing the project's outputs* (1999: 26). It is narrow for two reasons. First, only the short-term is considered, and second, there is only an input-output conceptualization of value. The purpose is generically defined here as the economic and social outcomes derived from commissioning the project and putting it to good use. A nuanced definition of purpose may include the best use the project is able to be put to, which is dependent upon the way the project has been configured and executed, determining the maximum extent to which the project purpose is fulfilled. This also depends on how well the user puts it to use within those constraints. This invites the question as to the extent the positivist view frames any gap between the potentially good outcomes in use and the actuality of the outcomes.

Projects do have strong linear features, yet are not purely linear (Smyth and Morris, 2007). This is clearer once project execution is seen as part of a broader network, system or ecosystem (Gadde and Dubois, 2002; Kardes, et al., 20913; Badi, et al., 2017). Projects undertaken in a different social and sometimes locational space compared with most other provision. They tend to be occasional in demand and/or unique in content, requiring dedicated effort and specialist skill sets. Projects, therefore, are not typically part of mainstream ecosystem, and thus, ontologically become a subsystem (Luhmann, 1995). They are therefore managed offline or as a loosely coupled task (e.g. Weick, 1979; Dubois and Gadde, 2002; Orr and Scott,

2008). It is this loose coupling that tends to cause project-based firms and their managers to lose sight of the project purpose to the detriment of meeting client and societal needs.

The consequence of the overall features is that project research and action focuses upon immediate factors, especially those directly related to the challenges of execution. The first traditional discourse is around *project characteristics*, and the second is around the focus upon the *management of means* that is particularly encapsulated in the discourse on the iron triangle of meeting time-cost-quality/scope.

Project characteristics

There continues to be considerable attention given to the characteristics of projects and project teams. For example, Andersen et al. (2009) state a project is characterized as first embodying unique tasks, which follows from designs and specifications to attain a specific result that requires a variety of resources, and finally, is executed in a limited timeframe. Other researchers emphasize similar characteristics, especially (i) uniqueness, and include (ii) complexity, and (iii) temporality (e.g. Lundin and Söderholm, 1995; Winch, 2010; Bakker et al., 2016). These three characteristics are considered briefly in turn.

Uniqueness is an inherent characteristic (e.g. Andersen et al., 2009). It is a primary characteristic that differentiates projects (Shenhar and Dvir, 2004), and is thus part of project ontology. Uniqueness is a function of content and frequently in locational and social context. Uniqueness implicitly acknowledges the production of preconditions, yet this is this is not explicitly addressed. The client and end-user preconditions need

to be established off-line from other mainstream, core or regularized activities because they are unique and require expertise and skills sets outside the remit of their standardized and routinized activities. The project is therefore socially and physically located outside from the dominant system (cf. Luhmann, 1995). The location and social space of provision are usually part of the uniqueness, although the prime focus of this discourse is mainly around content.

Uniqueness gives rise to complexity as an inherent characteristic (e.g. Winch, 2010). Complexity is ill-defined because there are different sources and classifications (Geraldi, 2008). Complexity is also a function of content and context (Dubois and Gadde, 2002). Complexity is also related to the need to establish the preconditions for other activities, hence the need for a project. Not only do projects typically embody complexity, many projects are complexity-laden. Complex projects are variously defined (e.g. Aitken and Crawford, 2007), for example as having many varied, interrelated parts (Baccarini, 1996) and from the unknown variables and multiple interactions within a system (e.g. Williams et al., 2012). Technical complexities are characterized by the type of technology, processes or products used within projects, for example capital intensive engineering projects that are of a significant scale, long in duration, and require organizations to work across boundaries (e.g. Hobday, 2000; Davies and Hobday, 2005). Project management complexities also arise from the difficulty level in management due to the context, range and size of organizations involved, and due to the range and cohesion of stakeholders (e.g. Aitken and Crawford, 2007; Winch, 2010). Complexity has been classified according to structural and dynamic factors to aid the management of projects (Brady and Davies, 2014).

Uniqueness and complexity give rise to uncertainties and ambiguities and vice versa (e.g. Winch, 2010). Uncertainties and ambiguities are inherent project characteristics (e.g. Pich et al., 2002; Ward and Chapman, 2003; Atkinson et al., 2006; Cicmil et al., 2006). Winch (2010) has related uncertainties to the availability of information and the level of knowledge that is embedded in the project-based organizations and project teams (e.g. Kasvi et al., 2003; Anumba et al., 2005; Cooke-Davies, 2008). Knowledge and learning are not typically managed systematically among providers in programme and project management during execution in ways that embed the processes and practices into the formal and informal routines (e.g. Brady and Davies, 2004; Bredillet, 2004b; Carrillo, 2004). Learning to inform the visualizing the purpose front-end is weak or absent. A considerable amount of project management guidance and effort is geared to eliminating uncertainties as soon as practically possible. Delaying decisions by using, for example, agile project management methodologies allows flexibility prior to firming up decisions (e.g. Fitsilis, 2008), an can help by reducing disruption and enhancing value in use.

The temporal characteristic of the project and the associated temporary organization are characteristics that have received considerable attention (e.g. Lundin and Söderholm, 1995; Packendorff, 1995; Sydow et al., 2004; Bakker et al., 2016). The Project Management Institute (PMI) defines a project as a temporary endeavour, undertaken to create a unique product, service or result (PMI, 2017), which is in stark contrast to the management of mainstream manufacturing and service provision. The project team and broader coalition are also temporary, comprising multiple organizations that come together for the project (Cherns and Bryant, 1984), and membership may change during the project, inducing discontinuity of management

without adequate handovers (e.g. Fulford and Standing, 2014; Smyth, 2015b). The organization or function responsible for overall coordination, especially at technical and organizational interfaces is the systems integrator. The systems integrator does not directly control operational actions, hence, the need for high levels of soft skills (e.g. Azim et al., 2010) in order to integrate all elements that will improve value realization and satisfy the organizational and stakeholder needs.

The institutional context, plus the broader network and ecosystem in which projects are located (e.g. Håkansson and Snehota, 1995; Grabher, 2002; Engwall, 2003) questions how significant the temporary organization is. Multiple firms, which are represented in project teams, are more permanent and stable (Winch, 2014; Stjerne and Svejenova, 2016). Winch (2014) proposes three domains of project organizing, covering (i) project-based firms, (ii) projects and programmes, (iii) owners and operators. The interface between the domains, and between the temporary and the permanent organization is where stability is or should be established. Both the project team and the project-based firm are nested in a broader institutional context of the network or ecosystem to provide support. Projects are therefore also part of a relatively stable or permanent set of institutional arrangements. It is possible that too much significance has been ascribed to the temporal characteristic of the project and associated organizational forms.

Despite agility and the stable elements of the institutional network, project organization do not generally apply resources to reduce temporal instability where increased costs and lower productivity result (cf. Dubois and Gadde, 2003). The focus is on the factors that help meet the challenges of execution within the linear and task-

based frame of research and operational reference that is largely underpinned by the positivist cause-effect considerations.

The management of means and the iron triangle

The second discourse concerns the *management of means*. This includes routinized project management from choosing a project body of knowledge and project management methodology, for example PMBoK (PMI, 2017; cf. Hodgson and Cicmil, 2006). In particular, the means focuses at a detailed level around the traditional iron triangle criterion of time, cost and quality, plus scope. The iron triangle focuses upon the criteria against which to execute a project. Estimates around time, cost and establishing the quality/scope are used as measures to gauge efficient progress and success.

Olsen (1971) was one of the first in the modern era to propose time, cost and quality as central defining criteria for successful project execution. Time and cost cannot be known in advance. These criteria are "at best, only guesses" (Atkinson, 1999: 337). Experience and expertise can help frame guidance and assess unreasonable changes, yet the project characteristics cannot accurately be known in advance. Quality and scope have a more direct relationship with expectations and outcomes, even allowing for the gap between their articulation at the front-end and delivery, which can be increased through value-for-money, value management and engineering exercises that to tend emphasize cost over quality in practice (Smyth, 2015b). Benefits delivery focuses on outputs from the inputs, rather than extending this further into outcomes in context and use.

Time and cost are socially constructed artifacts to help guide action. Researchers, indeed many practitioners, tend to adopt them as absolute benchmarks to assess progress. For example, Flyvbjerg and his colleagues do so in their research to assess time and cost decisions (e.g. Flyvbjerg et al., 2003; Flyvbjerg, 2009; Flyvbjerg and Stewart, 2012). Once a time and cost has been stated, they become enshrined in status, tending to be treated as immutable natural laws, from which departure cannot be tolerated. The focus upon time-cost-quality/scope is important and necessary, yet it is insufficient in itself for execution, and for adequate consideration of front-end and tail-end activities (Atkinson, 1999; Shenhar and Dvir, 2007a; Morris, 2013). As Atkinson states:

> *Why has project management been so reluctant to adopt other criteria in addition to the Iron Triangle.* (Atkinson, 1999: 337)

The extent to which the iron triangle becomes a pre-occupation forecloses consideration of post-completion stages. Yet, compromises around quality to meet time and cost can have long-term implications for the project in use. The capital cost of projects is small compared to operational costs, where, for example, measures have been estimated to be along the lines of 1:1.5:15 for capital, facility/asset management and operational costs for construction projects (Ive, 2006). Therefore, a reduction in quality that has the effect of increasing operational costs, which are therefore significant compared to project capital costs. These on-costs may not be economic long-term in relation to the policy and market conditions in which the final operations are located. Further, the compromise around capital cost may add cost to operations in use. For example, adding costs to production may be small per unit or per annum, yet

over the lifetime of the project being used, the profits and competitiveness of the user is curtailed. Directly or indirectly adding $1 to the cost of a car coming off a production line for a plant producing 250,000 cars per annum over 25 years, incurs a gross cost of $6,250,000. Multiply that outcome by a number of compromises and the inability to translate expectations into specifications for a value proposition, there is a considerable effect upon competitiveness. The preconditions will have been insufficiently met.

Towards Research and Management Practice Incorporating the Preconditions Concept

No one is an artist unless he carries his picture in his head before painting it, and is sure of his method and composition. Claude Monet

The project is like a camera, taking a snapshot in anticipation of a good picture that captures both the concept in the photographer's mind and the reality seen. The fusion of the two is captured in time for the future – for the long-term benefit of viewers and onlookers. The project though is unlike the photograph in one sense; the photograph captures what was. The project envisages what is to come, which is more like an artist doing a painting. The project is not a simple linear process of inputs automatically causing certain types of outputs. There is always an interplay across time to anticipate the future (cf. Dreyfus, 1991). Some have travelled this journey from the linear cause-effect model of critical theory and interpretive analysis whereby the project is a process (e.g. Cicmil, 2014) and a lived experience (e.g. van der Hoorn and Whitty,

2015). Such approaches can leave behind the focus on provision (Koskela, 2017), but also the purpose for which the project is commissioned. While the linear approach of positivism is insufficient it is important not to 'throw the baby out with the bathwater'. Smyth and Morris (2007) point towards the abductive approach of critical realism for research and as guidance for practice. Having the project purpose in mind is a case in point of this interplay.

Yet the project's vision for the future is hard to articulate and hard to execute. The artist may have an image or a vision, but may find it difficult to realize or may go with the flow of emergent creativity as the painting, sculpture or installation unfolds. Works of art in the making are indeed projects of their own. The issue is that the artist is the person executing. With projects, it is the client with the vision, strategy and goals, yet the project management team does not hold the vision in their heads. They need to – that is the point. The vision is needed to inform their decisions and actions in ways that the requirements documentation and designs do not fully do and the service should be configured accordingly (cf. Romme, 2003). Beginning to fully articulate the vision client side and embed it in the supply conceptually commences at the front of the front-end with the sales of 'business development' function and is transferred through bid management, indeed to all those involved over the project lifecycle (Smyth, 2015a). This is currently a missing piece of the management of projects. There is also a need for systematic learning to help support this process at the front-end as well as during execution (e.g. Polanyi, 1966; cf. Koskinen et al., 2003).

The concept of the project, and what it will do is in the minds of the organization as sponsor, is difficult to accurately articulate in words. Articulating the vision to fulfil the project purpose between the sponsor, their end users and the delivery organization is one of the two gaps previously identified, the other being providing information that is available, particularly along the entire project lifecycle from the front-end, through execution and into operational use (cf. Davies et al., 2007; Shenhar and Dvir, 2007a; Winch, 2010; Morris, 2013). This second gap is inter-related with the first in terms of communicating the vision along the project lifecycle to inform action.

Indeed, projects conceptually cannot be subjected to the same criteria for performance as many other types of provision, precisely because these other operations benefit from the preconditions created by projects. As noted, *preconditions* are defined here as establishing the optimal provision of value for realization in use and context where standardization and routinization do *not* currently exist. This definition contrasts with establishing the conditions for optimal provision of value for realization in use and context where standardization and routinization are currently established, for example manufacturing an automated or digitized lathe to be used on another production line or cars for users to drive. Establishing the preconditions involves projects to provide the facilities, forum or infrastructure for the activities, such as a factory for production, an haute couture fashion show for promoting and selling high-end designs or IT systems for healthcare or supermarket food retail operations.

The preceding review of project characteristics and the means of management serves to anchor the consideration of projects as preconditions for other activities as an important characteristic, which is central towards satisfying the project purpose.

Establishing the preconditions for other standardized and routinized activities depends upon the extent to which value for realization in use and context is optimally identified at the front-end, embedded in the value proposition and delivered during execution. Starting to scope what needs to be considered and mobilized is the focus for this section.

Comparing standardized and non-standardized activities and the role of establishing preconditions

Projects are unique and activities undertaken under often high levels of uncertainty, particularly at the front-end and during early stages of execution. Most manufacturing and many other service activities are both known and repeatable at a detailed level of operations during their provision. Projects are therefore different in comparison to mainstream sectors or productive activity (e.g. Morris, 2013). Projects are incomparable because they provide the preconditions for the more stable and routinized activities. Preconditions were previously defined as establishing the optimal provision of value for realization in use and context where standardization and routinization are *not* currently established. This contrast is the main reason why mainstream production and service provision takes place in standardized and routinized conditions. For example, manufacturing automated or digitized equipment, such as a scanning equipment for retail or a lathe for other production activity is undertaken under regularized activities in a way a project or the majority of projects cannot be (e.g. Hopkinson et al., 2006). Producing cars is undertaken under established conditions, yet driving, while standardized and routinized to a great extent, can only occur once a project has established the preconditions, that is the infrastructure for driving. The difference between manufacturing cars and delivering

projects became clear after the UK Egan Report (1998), whereby the principles imported from mainstream car manufacturing were not completely transferable in theory and practice to projects (e.g. Smyth, 2010; Green, 2011). Establishing the preconditions involves projects to provide the factory or infrastructure for the production activities. Robotic and digitized driverless cars will further standardize driving but the project still remains necessary for driving, and indeed may become more complex to provide these new preconditions (e.g. Waldrop, 2015). Hence, driverless cars may place additional requirements on future infrastructure projects and induce upgrade projects, adding to complexity and possibly uncertainties.

Projects are not therefore conducted under stable conditions in benign environments unlike many mainstream manufacturing and a great deal of other service provision (e.g. Turner, 2009; Winch, 2010), one further reason why projects are institutionally taken offline into a project team, and are typically loosely coupled from other standardized and routinized activities in-house or through outsourcing to specialist providers (cf. Weick, 1979; Dubois and Gadde, 2003; Orr and Scott, 2008).

This does not mean that projects do not have any conditions for conducting their activities; they have many conditions and a great deal of variance occurs with these and in creating them (cf. Morris, 2013). The main conditions arise from management in two ways. The first is the institutional setting, where firm strategies, investment and capabilities, such as knowledge transfer between projects at programme management level, attempt to bring some stability, although the uncertainties and types of project limit repeatability (cf. Davies and Brady, 2000). Indeed, stability and repeatability can be severely disrupted by the multi-organizational composition of

project coalitions and teams, rendering it difficult to agree or impose a single management strategy and set of routines (Winch, 2010). The second is the project management bodies of knowledge, project management methodologies, and project management theories (e.g. Smyth and Morris, 2007; Pasian, 2011; PMI, 2017); they each potentially contribute to providing conditions for undertaking projects in more standardized and routinized ways, although adherence is frequently weak and the domain is still developing (Morris, 2013).

Some projects do have strong repeatable elements, for example a play production that is touring theatre venues or volume housebuilding. If you are building ten houses, the first is probably unique, with some complexity and uncertainties. As each house is built, there is less uniqueness and associated complexity. Yet the tenth house is still a project due to the spatial location and site conditions. The same is the case of some or many IT installation projects or retail security scanning systems that are installed as projects across supermarkets and other stores.

What is evident is that projects are different. The uniqueness of projects has already been cited (e.g. Pich et al., 2002; Anderson et al., 2009; Winch, 2010), but at a more general or abstract level, projects can be grouped into types or categories. Shenhar and Dvir (2007a) have tried to generically classify the types of projects. They identify three types of projects, namely assembly projects, system projects and array projects. This typology is set out in Table 1. Added to this in terms of establishing the preconditions is presented in the third column on the project purpose.

Insert Table 1. about here

Projects as preconditions for other purposeful activities

Despite the growth of asset management, facilities management and whole life costing, little is still known about how useful projects prove to be in function and operational use (e.g. Roper and Payant, 2014), regardless of their use, for example oil and gas, retail security scanning projects or IT projects. There are perhaps more direct means of assessment for media and arts projects, such as attendance and income generation, whether in the form of films, exhibitions or plays. However, the perceptual dimensions and cultural impact are hard to assess (cf. Vargo and Lusch, 2016).

What is needed is more information on how projects have fared in meeting the preconditions effectively; the extent to which the purpose has been fully met.
This consideration reframes value propositions at the front-end and changes the type of inputs for execution (cf. Smyth, 2015a). The type of transformational inputs as illustrated in Figure 1. These are indicative pointers and not absolute categories. It would be possible to develop this paper around existing theories alone, such as service design, the service-dominant logic and the co-creation of value in use and context, however, the argument presented here may stimulate new theory development and conceptual linkages to other existing theories not hitherto explored.

Insert Figure 1. about here

Towards classifying outcomes by activity and use

It would be prudent to also collect more data on a range of different outcomes in use. First it is necessary to be able to scope the preconditions. The project purpose is to realize certain outcomes. The operational activity the project serves and outcomes in terms of the value realized in context and use provides one way of classifying the preconditions is by use. Figure 2 sets out a classification by generic type of activity and durability of use. It provides example of projects for each classification. Olympics as a programme and projects provide new facilities, many of which have a lasting use. The London 2012 Olympics specifically placed the legacy in the bid to help secure the games. Change management projects have a short-term use in general, indeed, a reducing timescale of usefulness give the rate at which organizations restructure, undergo change and transformation.

Insert Figure 2. about here

The project is not typically the only contributor to realizing value. For example, retail security scanning projects are also dependent upon staff vigilance and observation, and the competitiveness of car manufacture is dependent upon a range of other strategic and tactical issues than the premises in which it is located. Other use and operational factors therefore contribute. User perceptions also play a role (cf. Vargo and Lusch, 2016). The Sydney Opera House is a good example of value in context and use. Value in terms of the traditional inputs and outputs have proved insufficient to appreciate the outcomes (e.g. Shenhar and Dvir, 2007b). This project has far exceeded the value in input terms. It has far exceeded the immediate use value as a cultural centre for opera and as a tourist destination (Bertelsen and Emmitt, 2005). Yet, it was a failure against the iron triangle criteria, especially time and cost. This

demonstrates the potential folly and fallacy of only using traditional means of measurement for assessment. This is generally acknowledged, but action has yet to fully follow through in research and practice (e.g. Atkinson, 1999). This is particularly so among providers, which tend to react to the data provided rather than collect its own and engage through interactions to tease out a richer understanding for all parties than is currently the case; they do not try to capture and understand the vision for the project. Designers and design teams are somewhat passive, preferring instead their vision, yet are among the strongest on the supply side, but the remainder of the supply chain tends to be reactive (e.g. Smyth, 2015a).

Activities, even putting on an opera and managing the tourist experience, are typically more routinized in their conduct and standardized in terms of their content and outputs than the complexity of the projects in conception and execution, for example a cultural centre, software project or simple factory to help regulate management and production tasks. The cultural centre and factory act as a container, while the software projects provide or frame a routine, for example in video technology applications (Pelli, 1997). This type of standardization and routinization of other activities cannot take place without the project.

A project does not always create the preconditions for subsequent routinized activities. There are exceptions, which create the preconditions for other non-routine activities. For example, the construction of the Mulberry Harbours in the Second World War (Kohan, 1952) created the preconditions for the invasion of Nazi occupied Europe (Figure 2). Such projects are defining the context and physical parameters for non-routinized activities.

Another financial activity is the growing rentier economy (Epstein and Jayadev, 2005). Here, projects establish preconditions to seek and extract rents (Smyth et al., 2016). Rents arise from use value rather than productive activities of goods or services per se. The demand for standard and stable preconditions to realize rent places considerable emphasis upon a greater level of benefits derived directly from the project (although it might mean lower levels of impact long-term for the social and economic well-being of society as rental income is not strictly or directly wealth creating). Property development for investment purposes is the mainstream example, although increasingly some manufacturers and service providers extract considerable profits from rents. For example, some software development projects yield rents where the generated income bears little relation to the cost of development and production; where the mark up or rate of return is far above these costs. However, routinized manufacturing and service provision remain the prime reason for commissioning projects.

The project is set up off-line from core activities in the sponsor and/or owner organization; a type of loose coupling (Weick, 1976; Dubois and Gadde, 2003; Orr and Scott, 2008) because, as discussed, projects comprise of activities that embody processes, episodes and events that are non-core and non-routine for the client and user organizations. If a project is undertaken in-house the loose coupling does not sever the interdependencies. This type of loose coupling aids the in-house providers capturing the vision for the project, although this is far from automatic, and monitoring is more direct for monitoring alignment, hence a potentially reduced gap between the vison and provision. The coupling is even looser where the client

outsources. If outsourced, the project is almost totally decoupled except for activities of strategic control and tactical monitoring. The project is also loosely coupled from the project-based firm as projects tend to be managed on a semi-autonomous basis. The relationships are more distant and interactions weaker unless considerable effort is made to overcome this, capture the vision and configure the service accordingly (Smyth, 2015a).

The systems integrators largely fail to integrate the vision that embodies the purpose for which the project is commissioned, hence run considerable risk of compromise the provision of optimal preconditions for the activity involved (cf. Davies et al., 2007). However, outsourcing facilitates the mobilization of specialist resources to create the preconditions where this is clearly understood and acted upon.

Categorizing projects can provide a general basis to create the *preconditions* for future repetitive and more predictable regularized activities. However, a detailed basis will help further.

An indicative and guiding taxonomy of preconditions

Can a range of preconditions be identified? A fine grain of analysis is needed to support future understanding and inform action. The list below is an initial attempt to begin to scope the range of preconditions according to their function in use. It is indicative and inductively generated from observation and past evidence; it is expected that understanding will develop further from future analysis of preconditions. It provides a starting point about the types of precondition. Each of the types, is supported by a list of the types of operational activity in use and supported

by an illustration or example. In this initial and inductive attempt, there are six types of precondition. They are not to be viewed as mutually exclusive and some projects will span more than one category. The taxonomy is presented in Table 2.

Insert Table 2 about here

Developing the project service to induce the required preconditions needs a fine grain of analysis. Three aspects begin to drill down to the next stage, but these are used as illustrative rather than exclusive:

- Understanding preconditions at the front-end and building these into value propositions during bidding by providers;
- Taking the understanding and value proposition into project management during the execution phase in order to optimize value realization in use as outcomes, that is, equally emphasizing ends criteria as well as means criteria on the one hand, and thus giving a more balanced approach away from the current emphasis upon inputs, towards more upon outputs, and especially upon outcomes in use;
- Management post-completion by the client, users and direct stakeholders, and, monitored for feedback into value propositions and execution by providers based upon greater knowledge and understanding about outcomes in use.

Focusing upon roles, for example in the engineering disciplines and architecture, is important for helping clients and end-users articulate the outcomes and translate these into the inputs to shape value propositions and decision-making during execution. Similarly, service design is also important for configuring value propositions and

delivering against these. It involves taking the vision from which *the intangible service* is generated by creating a *blueprint* or flow-chart for configuring the service (Shostack 1984), and *mapping processes and logistics to create* a detailed activity breakdown (Kingman-Brundage 1992). From this a *service configuration* aligns the means of delivery, relationship management, assessment and evaluation criteria (Romme 2003). Service design should link to the role of business development managers, key account management, bid management, procurement, and commercial and project management (Wikström et al., 2010). The role of configuring resources and integration for productive execution, the systems integrator role and other provider roles, should not be underestimated. In these roles, there is a considerable way to go. It involves a range of factors, which are not about forecasting provision, but *backcasting* from the current service to the vision (Smyth, 2015a). This critically includes listening, understanding and interpreting what clients and end users want in order to further scope of the problem the project is solving, and, in order to shape the project so as to align and deliver the resources and outputs. Solicited detailed listening, deep understanding and rich interpretation help move towards maximizing the opportunity to realize valuable outcomes.

If current project failure assessments at the end of execution provide evidence to go by, then, design and resource configurations are issues that are a factor in failures and thus a focus on preconditions in theory and for practice can make an important contribution to improving outcomes. In the IT sector this would appear to be especially acute where firms tend to align the closest product or standard service solution to the client requirements with insufficient understanding of the client needs on their own terms rather than filtered through IT language, expertise and availability

of standard solutions or practices (Smyth and Konstantinou, 2015). As argued throughout, the traditional and current focus is predominantly upon inputs; these are typically informed by the domains and disciplines of technical expertise, whereas the successful establishment of preconditions to meet the project purpose requires a balanced approach that includes a deep understanding of client, end user and stakeholder needs from their vision of the operational perspective. This offers a systematic approach along the entire project lifecycle from the front of the front-end into post-completion that embodies understanding and aligned action to deliver valuable project outcomes.

Conclusion

> *…future research on project management needs to extend its temporal scope, analyzing how project practices evolve through history over prior, present, and future projects, as well as its organizational scope, analyzing how project practices relate to long-term institutions as well as simultaneous activities in its environment.* (Engwall, 2003: 789)

Engwall's comments are still highly pertinent to the consideration of projects, in this context to systematically provide the preconditions for other standardized and routinized activities. The comments continue to challenge the narrow and linear thinking in terms of inputs, silos and other islandic factors, including the exclusion of realizing valuable outcomes in use by effectively establishing the preconditions to satisfy the purpose for which projects are commissioned. Projects provide the

potential solution and the realized value is dependent upon how well the projects are conceived, scoped and delivered with the outcomes in mind and with aligned action through capturing the vision, aligned action to configure the service and co-create value to provide valuable projects. Certainly, the co-creation of value, and indeed other value perspectives in relation to creating effective preconditions for other activities provide fruitful areas for further research. However, existing lenses, such as learning, service design and the service-dominant logic may be insufficient, hence the paper has not dwelt on these in detail, preferring to open the door for future developments.

Hence, as a recommendation for future research, there is a strategic need to further examine establishing the preconditions through projects through different conceptual lenses. This includes the service-dominant logic, service design and learning. Similarly, there is a need for research that links preconditions to other substantive issues, such as value creation, types and processes of knowledge application, as well as other capabilities and routines for project management that facilitate and support the success and learning from projects in use post-completion. This leads onto another strategic research issue which is that project management is increasingly recognized as not being a linear activity as set out in positivist research and the dominant project management bodies of knowledge (cf. Smyth and Morris, 2007). Project management is necessarily an interactive and iterative, which in the context of establishing the preconditions for other activities requires strategic research into the extent to which actors cast forward to the use of the completed project in formulating value propositions in the bid process and defend these during execution. There is conceptually a normative aspect to this so that theory helps prescriptively improve

practices in this regard. It raises the research need to identify the qualitative and measurable data required to effectively improve practice, how this may be collected and applied as learning. This further raises a general issue of managing projects in transformational rather than predominantly transactional ways.

Projects are not the core business for many organizations. Hence, the decision to loosely couple the activity and frequently outsource. Projects are outsourced to project-based firms, such as systems integrators, subcontractors and other specialist providers. Many projects cannot be delivered with in-house skill sets, under the established routines. They are inherently risky and specialist services reside with other providers. However, outsourced projects carry the greatest risk of misalignment between the project purpose and the delivered project, unless systems integration is systematically thorough and holistic. Therefore, project requirements, expressed through briefs, request for proposals and other documentation describe the content or specification. They are insufficient to align the execution with project purpose.

In sum, there has been scant attention on the prime generic purpose to provide the preconditions for other economic and social activity. Yet management theory has been moving in a helpful direction in this respect, for example with the advent of service design (e.g. Romme, 2003) and the service-dominant logic (Vargo and Lusch, 2016). Further, disruptive technologies in the form of digitization and AI, which will dramatically transform service environments in the coming decade and beyond, are likely to make alignment more critical. Inducing valuable outcomes involves visualization, listening, creativity, problem solving and adaptive skills to inform service design and interactions to co-create value. The convergence of thinking, sense

making, learning and action is still necessary, yet the implication is that it is broader and more open-ended than traditional execution and front-end foci. These are areas for more detailed exploration and examination.

Refocusing upon the project purpose and specifically establishing the preconditions for other largely stable activities is a productive and complementary way forward. Learning, knowledge management, the service-dominant logic and service design provide lenses for deeper analysis. Other lenses may be available and ones that address the growing importance of projects in the economy, especially in relation to AI in context and use. Overall, those delivering projects need to place the consideration of the preconditions as a key focus for the future. Research efforts need to support this effort to improve our understanding and delivery of projects to help stimulate a sustainable economy and society in the future.

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