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Towards Design Principles for Governance of Complex Multi-sourcing in IT Services Ecosystem

Research-in-progress

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Abstract

Organisations outsource their digital transformation initiatives to access specialised expertise, expedite implementation, and optimise cost efficiency by choosing from multiple outsourcing models in IT services. One of such models is multi-sourcing that offers flexibility and efficient cost structures. However, the effective governance of multi-sourced IT services also poses significant challenges. In particular, the integration of governance mechanisms is complex in multi-sourcing and there is a notable gap in research regarding how organisations can effectively manage and monitor multiple suppliers to create a regime of cooptation between the vendors. This short paper highlights the need for effectively governing complex multi-sourcing in IT services ecosystem. Our research-in-progress aims to use Design Science Research methodology to develop design principles tailored to multi-sourcing contexts. This approach seeks to address the multifaceted factors and complexities involved in multi-sourcing, and thereby contributing to both academic literature and industry best practices in IT services ecosystem.

Keywords: IT Governance, IT service Management, Multi-sourcing, Digital Transformation, Design Principles

1 Introduction

Any organisation that wants to succeed in the new global business order must embrace Digital Transformation (DT) as a key business strategy. DT encapsulates a significant change in the way an organisation utilises processes, people, and technology to provide value in addressing ever-changing customer expectations of products and services (Seyedali Aghamiri 2022). However, organisations must focus on IT services that promote their core competencies and avoid expending time and resources towards developing in-house DT capabilities that are not central to their primary business activities. Thus, IT outsourcing strategy is critical for organisations to leverage the value of IT services to meet their corporate strategic objectives (Lee et al. 2019).

The strategic outsourcing of IT services has evolved as a result of the changing business environment (Latif et al. 2018). In the early stages of strategic IT outsourcing, it was common practice to outsource all IT services to a single (and usually large) vendor. Handley et al. (2022) stated that although using a single vendor when outsourcing IT services (i.e. single sourcing) is commonplace, splitting the IT service package among multiple vendors (i.e. multi-sourcing) is an increasingly popular strategy. Managing multi-sourcing requires robust IT service management (ITSM) capability (Fernandez-Vidal et al. 2022). Conversely, Angst (2017) contends that despite its advantages – such as increased flexibility and specialization – multi-sourcing introduces significant challenges given the need for managing and integrating services across multiple vendors.

1.1 IT Services Ecosystem

In the area of technology and innovation management, ecosystems is an important terminology. Tsujimoto et al. (2018, pp. 7, 9) state that the objective of an ecosystem is “to provide a product/service system, an historically self-organized or managerially designed multilayer social network consists of actors that have different attributes, decision principles, and beliefs”. Given the fundamental characteristics of an ecosystem, it can be argued that each actor will operate according to their own rationality and decision-making principles. A multi-supplier IT ecosystem comprises a range of actors, including both the client and various contracted IT vendors, who must collectively engage in a variety of technology and innovation activities (Tsujimoto et al. 2018).

Managing a multi-supplier IT services ecosystem involves complex coordination and governance issues. One theme that has been receiving increasing attention in IT Outsourcing (ITO) research is the idiosyncratic characteristics of multi-sourcing arrangements (Könning et al. 2019). These challenges include those related to technology integration, governance, communication, and coordination amongst the several service providers contracted to handle the outsourced IT job. Effective inter-organisational coordination is crucial for harnessing the benefits of multi-sourcing; however, the complexities of technology integration, governance, and communication among vendors can impede value generation (Mishra et al. 2020). A tragic example of these complexities occurred in 2019 when Boeing's 737 Max software failure led to two deadly aircraft crashes (Handley et al. 2022). The development, testing, and integration of this software with the cockpit systems were outsourced to three vendors in the following order of preference: HCL, Cyient, and Rockwell Collins. Interdependencies such as those between HCL, Cyient, and Rockwell Collins in this example, make failure investigation, root cause identification, and assignment of accountability substantially more complex (Bhardwaj and Ketokivi 2021).

1.2 Critical Role of IT Governance in Multi-sourcing

Plugge and Janssen (2020) assert that governance and effective communication is essential to prevent vendors from competing and instead collaborate to meet the needs of customers. However, the topic of understanding governance in multi-sourcing relationships has received scant attention in the IT outsourcing literature. Bapna et al. (2010) have argued that multi-sourcing is emerging as an important inter-organisational, collaborative form of value creation, and that little is known about the underlying theory and management principles that can make or break these arrangements. More recently, Krancher et al. (2021) argue that there is a lack of studies examining how formal governance strategies specific to multi-sourcing which include bilateral formal control (legally binding agreement between the customer and the vendor), collective formal control (outcomes that vendors are expected to jointly achieve), and conflict arbitration between vendors affect success dimensions relevant for multi-sourcing. Specifically, there is a gap in examining how vendors collaborate and influence both specific and collective service performance outcomes.

Herz et al. (2013) studied effective monitoring of IT application development and maintenance (ADM) in multisourced environments and argue that practitioner frameworks such as Control Objectives for IT (COBIT) and IT Infrastructure Library (ITIL) provide numerous KPIs but fail to recommend a specific

set of KPIs that should be adopted to monitor vendors. While these frameworks provide some metrics, they fall short of describing how can service consumers monitor IT vendors. We contend that existing governance mechanisms are largely grounded in the concept of single sourcing and therefore predominantly address the dyadic relationships inherent in IT outsourcing. Consequently, these frameworks often fall short in providing the empirical depth necessary for effective governance of complex multi-sourcing contexts (Krancher et al. 2022). In response to this identified gap, our research in progress seeks to investigate the governance challenges and propose design principles for organisations to successfully navigate a multisourced IT service environment. We adopt Design Science Research (DSR) methodology (Peppers et al. 2007) to build design principles as research artefacts that address the governance challenges in complex multi-sourcing in IT services ecosystem. In summary, this study is guided by the following research question:

RQ: What are the design principles to consider for effective governance of complex multi-sourcing in IT services ecosystem?

2 Literature Background

This short paper employs a narrative literature review to assess our hypothesis that governance frameworks designed for single vendor contexts inadequately address the complex interdependencies of multi-sourcing ecosystems. Our preliminary findings reveal significant gaps in the existing literature, bolstering our hypothesis. The next phase of our research will involve a systematic literature review (SLR) across Information Science, Innovation, and Management domains.

2.1 Governance challenges in multi-sourcing

Collaborative efficacy in multi-sourcing is contingent upon the implementation of robust mechanisms for evaluating both specific and collective service performance. These mechanisms must foster vendor cooperation, address inter-vendor conflicts, and manage dependencies effectively. A study by Huber et al. (2017) showed that a lack of collaboration prevents actors in a multi-sourcing arrangement from creating value together due to a lack of governance cost. Huber et al. (2017) further elucidates that variations in governance practices affect governance costs because different governance practices entail competing activities. Plugge and Janssen (2020) imply that sourcing vendors need to work together, for instance by means of sharing technical insights, while they also operate in a competitive environment at the same time. Hence managing the tension of collaboration and competitions requires strong governance mechanisms. Clear governance structures and mechanisms and an orchestrating entity are seen as critical in multi-sourcing relationships to support a client in applying a digital business strategy (Plugge and Janssen 2020). Auth and Nägele (2018) identified in their research that developing and establishing a comprehensive governance structure, including clear roles and responsibilities, is one of the Critical Success Factors (CSF) for integrating IT services sourced from multiple providers.

Governance challenges in multi-sourcing emerge due to the management of the resulting relationships both in contractual and technical context; difficulty in realising the original benefits of outsourcing in a multi-vendor setting; and increasing coordination, integration and management problems resulting from a growing number of external service providers (Auth and Nägele 2018). According to Lioliou et al. (2019), the significant practical challenges also include need to ensure coordination and cooperation among competing yet interdependent vendors; unanticipated scope and service gaps; vendor disputes and finger-pointing leading to service disruptions; lack of integration across vendors; and difficulty in detecting increased moral hazards.

Koo et al. (2017) further cautions that drawbacks such as control load balance and coordination overhead need to be carefully contemplated when the multi-vendor approach is adopted. The multi-sourcing model itself increases the complexity of the client organisation, by elevating the effort required for vendor management activities from a dyadic dimension to polyadic relationships. Therefore, we conclude that multi-sourcing is a complex strategy that involves significant coordination and governance challenges compared to single-sourcing (Handley et al. 2022).

2.2 Research Gap

Multi-sourcing often deals with two formal governance mechanisms for achieving individual and joint service performance. Bilateral governance addresses the relationship between the client and one vendor at a time thus focusing on the individual service performance. An example of this could be monitoring the commercial and contractual performance like Service Level Agreements. On the other hand, collective governance addresses the relationship between vendors, thus focusing on the vendors' joint performance in a multisourced ecosystem (Naicker and Mafaiti 2019). The integration of these

governance mechanisms is complex in practice, and there is a notable gap in research regarding how organisations can effectively manage and monitor multiple suppliers to create a regime of cooptation between the vendors (Lioliou et al. 2019).

(Goldberg and Satzger 2016) identify notable deficiencies in existing research regarding the comparison with the single vendor approach, relational structure between the customer and multiple vendors, and importance of organisational learning in multi-sourcing. (Koo et al. 2017) also highlighted these issue. Based on these findings, we contend that the existing research gap in multi-sourcing can be addressed by developing empirically sound design principles for the governance of multi-sourcing.

Plugge (2018) summarises four major challenges in a multi-sourcing arrangement based on a review of a European retailer as outlined below:

- The absence of a strategic framework to manage vendor interactions, coupled with a lack of inter-dependency agreements, led to a tendency for a “blame-game” when changes occurred.
- The deficiencies in inter-organisational agreements between the client and vendors, as well as among the vendors themselves, resulted in excessive time spent by the client on detailed technical specifications and their financial implications.
- The lack of supporting agreements in areas such as architecture, portfolio management, service integration, and governance led to disputes and miscommunications among vendors.
- The contracts between the customer and its vendors lacked formal collaborative agreements, which, in conjunction with the customer's financial pressures, exacerbated confrontations and diminished the level of cooperation between vendors.

A study by Huber et al. (2017) showed that a lack of collaboration prevents actors (in this scenario, vendors) from creating value together due to a lack of governance costs. This observation highlights the necessity for an IT governance framework comprising design principles to effectively address the associated challenges. Specifically, these design principles can include:

- **Contractual Agreements:** Frameworks must address dyadic contractual arrangements, which establish the foundational terms and conditions between parties involved (Dorst and Agutter 2021; Lioliou et al. 2019; Plugge 2018; Plugge and Janssen 2020; Vlachos and Dyra 2020).
- **Collaboration Agreements:** The framework should incorporate mechanisms to facilitate and manage collaborative agreements among multiple vendors, ensuring alignment and cooperation (Agutter 2021; Dorst and Agutter 2021; Plugge 2018; Plugge and Janssen 2020) .
- **Governance Forums and Mechanisms:** Effective governance requires the establishment of forums and mechanisms (for example, Committee and meeting structure) designed to resolve disputes and address communication issues, thereby maintaining operational efficacy and mitigating conflicts (Agutter 2021; Dorst and Agutter 2021; Goldberg and Satzger 2016; Plugge 2018; Plugge and Janssen 2020).

2.2.1 Significance of complexity theory

As the number of interacting components (in this case, vendors) increases, the complexity of managing and coordinating these components also increases. We can analyse these statements through the lens of theory of complexity in organisational change (Burnes 2005). In their paper "Rethinking Organisational Performance Management: A Complexity Theory Perspective", Pavlov and Micheli (2023, p. 3) state that "Complexity theory is a broader term, which draws on multiple disciplines to identify the fundamental principles governing the emergence and functioning of complex patterns in the natural and social world." Pavlov and Micheli (2023) further states that the presence of number of independent entities or actors; their diversity; a set of connections between them; a dynamic interaction between them, which can lead to changes in connections and the entities themselves, and the notion of openness, i.e. the possibility of entities joining or leaving these interactions are all can be attributed to assumptions of complexity theory. We contend that all these factors or components are both pragmatically and theoretically present within a multi-supplier IT ecosystem. Subsequently example of complexity setting is where cities, characterised by their multitude of diverse elements — such as individuals, infrastructure, and technology — are systems wherein these components continuously interact and exert mutual influence. We propose that a multi-supplier IT ecosystem similarly comprises these elements — people, infrastructure, and technology.

Franco-Santos and Otley (2018) examine the unintended implications of organisational complexity in the reporting and management of organisational performance. Considering that a multi-supplier ecosystem may demonstrate a comparable phenomenon of insularity in its cohesive performance, we assert that complexity theory elucidates the specific design principles necessary for developing end-to-end KPIs and Critical Success Factors to validate the value creation of multi-sourcing. An illustrative example of this is the fulfillment of a Service Request that entails several technical activities, necessitating the involvement of multiple providers. Although each vendor can report their success based on task fulfillment, the value created for the customer will be determined by the overall end-to-end time taken to complete the service request from start. This activity necessitates the development of multiple interrelated KPIs, inter-organizational agreements, and measurement techniques that contribute to a complex reporting architecture. Consequently, we hypothesise that the principles of complexity theory are relevant, and the governance frameworks designed for single-vendor contexts are not well-equipped to address the interdependencies within multi-supplier ecosystems. This research gap necessitates the development of specialised design principles for governance models.

2.2.2 Shortfalls in widely used IT governance frameworks

Existing research often focuses on single-vendor environments or generic governance frameworks like ITIL and COBIT, which may not fully address the intricacies of multi-supplier ecosystems (Bapna et al. 2023). Despite ongoing efforts to develop and advocate for practitioner-driven methodologies such as the Service Integration and Management (SIAM) framework, these initiatives lack sufficient support from rigorous academic research. Goldberg and Satzger (2016)'s literature review shows that existing research does not provide sufficient guidance on service integration capabilities. In addition to this, Auth and Nägele (2018) contend that although SIAM is closely related to widely accepted ITSM frameworks like ITIL or ISO 20000, it can be considered much less mature in terms of a common standard, documented best practices and professional training. Schallmo state that current IT governance frameworks, such as ITIL and COBIT primarily serve as guidelines rather than comprehensive models for managing complex multi-supplier environments. Tambo and Filtenborg (2019) argue that these "soft" governance frameworks often fail to address the nuanced challenges of provider performance, service distribution, and alignment with business objectives in a multisourced context. Furthermore, the lack of formal collaborative agreements and interorganisational agreements exacerbates these issues, leading to potential conflicts and inefficiencies (Olubajo et al. 2022).

Given these challenges, there is a critical need for empirical research focused on developing more rigorous and practical IT governance methodologies. Such research should aim to:

- **Identify Best Practices:** Determine effective strategies for managing interorganisational relationships and governance in multisourced IT environments.
- **Address Framework gaps:** Identify the gaps in existing frameworks and develop design principles that integrate both bilateral and collective governance mechanisms tailored to multi-supplier contexts.
- **Evaluate Service Performance:** Assess the impact of various governance approaches on service quality, cost-efficiency, and alignment with organisational goals.

3 Methodology

This research will use Design Science Research (DSR) methodology to create artifacts or solutions as design principles that address the research gap discussed in the earlier section. According to Peffers et al. (2007), the framework for DSR comprises six steps. However, it is important to note that steps 2 to 6 exhibit an iterative nature due to the inherent characteristics of design, which involve an iterative and incremental approach. Specifically, the evaluation phase plays a crucial role by providing valuable feedback to the construction phase, thereby enhancing the overall quality of the design process and the resultant artifact (Hevner et al. 2004). A DSR approach with amalgamation of behavioural science in Stage 3 & 5 is depicted in Figure 1. As previously mentioned in this short paper, an increase in the number of interacting components – such as vendors – leads to a corresponding rise in the complexity associated with their management and coordination. Therefore, we argue that application of behavioural science with DSR methodology offers a robust framework for addressing the increasing complexity of managing and coordinating multiple interacting components, such as vendors and their personnel.

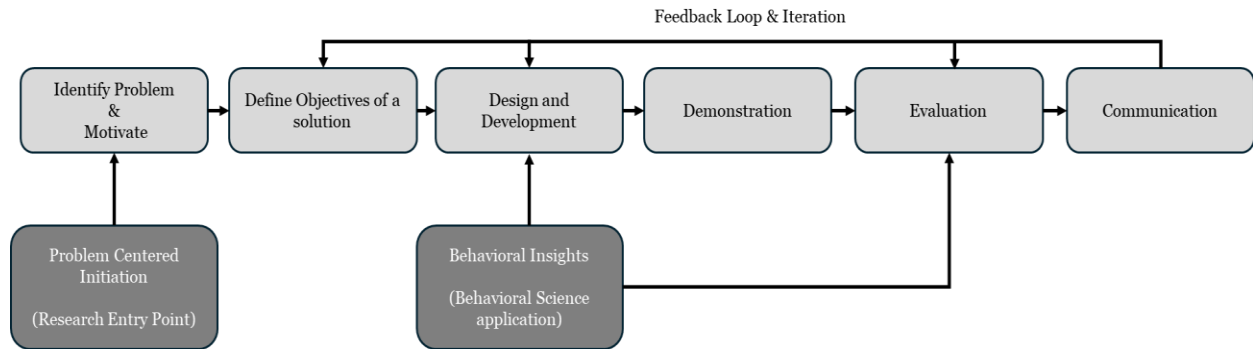


Figure 1: DSR approach for the Research

In line with the DSR approach, research work will be undertaken in the following areas:

STEP 1: Identify Problem and Motivation: Undertaking comprehensive research utilising available literature from academic journals, conference proceedings, practitioner Body of Knowledge (BoKs), and surveys targeting ITSM professionals especially exposed to multi-sourcing scenarios to identify problem from a theoretical as well as practical standpoint.

STEP 2: Define Objectives of a Solution: Applying this researchers' practical IT consulting experience and thought leadership to critically examine the current methodologies employed in the field of multi-sourcing and determine key objectives for an effective solution.

STEP 3: Design and Development: Gathering empirical data and valuable insights on IT governance implementation experiences will include running focus groups with key professionals who have successfully implemented IT Governance methodologies in multi-sourcing scenarios.

STEP 4: Demonstration: The research will include demonstrating the effectiveness of design principles to a global panel of multi-supplier IT governance experts. We also intend to disseminate our findings and design principles to the academic community through conferences and peer-reviewed journal articles, facilitating feedback that will enable us to iteratively enhance the practicality and applicability of these principles. Additionally, we are exploring collaborative opportunities with itSMF Australia to obtain insights and feedback from Subject Matter Experts, thereby leveraging the iterative nature of Design Science Research (DSR). Furthermore, we plan to engage at least one target organisation to conduct a pilot study of the design principles, allowing us to evaluate their practical applicability in real-world contexts.

STEP 5: Evaluation: The outcomes of the above phase will be used for facilitating further interviews of participants from a list of global subject matter experts with practitioner experience in the field of multi-sourcing and IT governance to evaluate and fine tune the design principles.

STEP 6: Communication: This includes publishing our research findings in academic journals and present findings in academic and practitioner conferences. We aim to influence the practitioner community to enhance existing frameworks and best practices relevant to multi-sourcing scenarios by integrating our design principles.

4 Conclusion

Despite the growing prevalence of multi-sourcing arrangements, there is a notable lack of academic research exploring IT governance beyond dyadic relationships between customers and vendors. Traditional frameworks such as ITIL and COBIT, while useful, often do not address the specific needs of multi-supplier environments. Our initial literature review reveals that managing a multi-supplier IT services ecosystem involves complex coordination and governance challenges that can impede value creation for customers. Our research aims to apply the principles of DSR to develop design principles tailored to multi-sourcing contexts. This approach seeks to address the multifaceted factors and complexities involved, contributing to both academic literature and industry best practices in ITSM. In the future, we plan to engage the academic community through peer-reviewed publications and conference presentations to validate and enhance our findings. This engagement will strengthen our research and promote broader discussions on effective governance strategies in multi-sourcing within IT services ecosystems.

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