SYNCING ACROSS SILOS

THE INTERPLAY BETWEEN MANAGEMENT CONTROL SYSTEMS AND TRADING ZONES IN COORDINATING THE FRAGMENTED INNOVATION PROCESS

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Abstract

This thesis explores how management control systems (MCS) are designed and used to facilitate coordination of innovation across subunits. Using a qualitative single case study of a multinational corporation in the midst of an innovation process, we adapt Galison's (1997) concept of Trading Zones, extended by Collins et al. (2007), and Simons' (1995) Levers of Control to examine how diagnostic and interactive control systems interplay with trading zones. Three contributions are made. First, we find that the innovation process unfolds through ongoing cross-functional coordination and interaction, yet remains fragmented due to differing subcultural perspectives on innovation. Second, MCS can coordinate divergent views on innovation across organizational subunits by highly emphasizing diagnostic and interactive control systems. Further, a conceptual framework is developed to advance the understanding of the suggested recursive dynamic between diagnostic and interactive controls and trading zones.

Keywords:
Accounting and Innovation, Management Control Systems, Levers of Control, Trading Zones, Cross-functional Coordination

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1. Introduction

> The Sales unit wants to sell what the customer demands today. The R&D unit wants to invent what the customer does not yet know they need. The Product and Portfolio Management tries to mediate these conflicting perspectives, while also ensuring a balanced product portfolio. These divergent perspectives are exactly what fuel tensions in our innovation process. (PPM 1)

This quote captures a tension that is likely recurring in many multinational corporations (MNCs) driving innovation. As innovation depends on cross-functional collaboration in many organizations, conflicting perspectives of different organizational subunits can create tensions. Furthermore, the role of accounting in innovation has emerged as a topic of growing interest in the field of management control (e.g., Abernethy & Brownell, 1997; Bisbe & Otley, 2004; Jørgensen & Messner, 2009). Accounting is increasingly recognized as a potential enabler of innovation by facilitating coordination, managing strategic uncertainty, and supporting the alignment of innovation efforts through the design and use of management control systems (MCS; Simons, 1995; Bedford, 2015). Interactive control use, for example, can support knowledge sharing, organizational learning, and responsiveness, thereby helping firms manage strategic uncertainty and coordinate across boundaries (Simons, 1995; Widener, 2007). Furthermore, Bisbe and Otley (2004) emphasize that the interactive use of MSC can favor innovation depending on a firm's level of innovativeness. Additional studies also highlight the role of accounting in structuring communication and fostering cross-functional collaboration. Nixon (1998) demonstrates how financial appraisal methods can, for example, facilitate collaboration in an innovation setting, while Jørgensen and Messner (2009) highlight the need for informal communication mechanisms and transparency. Håkansson and Lind (2004) further illustrate how accounting can serve as a bridging mechanism, enabling coordination across units with overlapping responsibilities and divergent goals without enforcing uniformity. More contemporary research has shifted the focus from examining whether accounting influences innovation to exploring how accounting actively shapes product development processes (e.g., Revellino & Mouritsen, 2009, 2015; Christner & Strömsten, 2015).

Despite this growing body of accounting and innovation research, several aspects of *how* accounting supports innovation are to be further explored. First, much of the literature continues to treat innovation as a cohesive, firm-level process, a perspective that tends to black-box innovation by overlooking how it is embedded in and shaped by the interactions among diverse organizational subunits. As a result, the mutual efforts and interdependencies that underpin innovation in firms are being disregarded. Second, while accounting has been acknowledged as a mechanism for enabling coordination, little attention has been paid to how MCS are used to coordinate divergent views on innovation across organizational subunits. Viewing innovation as the result of cross-functional collaboration highlights the role of interaction in coordinating diverse perspectives,

further underscoring the significance of organizational forums as spaces for coordination. Finally, while Simons' (1995) Levers of Control (LOC) framework has provided a valuable foundation for understanding how firms manage strategic tensions, limited attention has been paid to how diagnostic and interactive controls are designed to support innovation processes in large MNCs. These literature gaps highlight the need for a more situated understanding of how accounting operates across organizational subunits in the context of innovation.

To address these gaps, we build on the more contemporary accounting and innovation literature view (e.g., Revellino & Mouritsen, 2009, 2015; Christner & Strömsten, 2015) by examining how MCS operate as a coordinating mechanism in the innovation process. More specifically, this study examines how MCS are used to coordinate perspectives on innovation across the subunits Research and Development (R&D), Sales, and Product and Portfolio Management (PPM), within a large MNC (SupplyCo). Choosing an MNC for the research setting was beneficial due to its organizational complexity and scale, which highlights the need for coordination across subunits in the innovation process. Additionally, by approaching innovation as a fragmented, cross-functional process rather than a unified organizational effort, we aim to understand how the innovation process unfolds through the mutual efforts and interdependencies among different subunits. Further, we investigate how MCS are used to coordinate divergent perspectives on innovation. Additionally, we seek to explore how diagnostic and interactive control systems can be designed to support the innovation process within a large MNC. To frame our analysis, we draw on Galison's (1997) concept of trading zones, extended by Collins et al. (2007), which enables us to conceptualize R&D, Sales, and PPM as distinct subcultures. Combined with Simons' (1995) LOC, this lens allows us to examine how innovation processes are shaped by the design of diagnostic and interactive control systems and the different subunit perspectives on innovation. In doing so, the framework contributes to a more contextual understanding of the use of MCS by exploring their relationship with varying levels of collaboration and homogeneity, answering the research question; *How are MCS designed and used to facilitate coordination of innovation across subunits in an MNC?*

The remainder of this study is organized as follows: Section 2 examines the existing literature on accounting and innovation and introduces the method theory that forms the basis of our theoretical framework for analyzing the empirical material. Section 3 outlines the research methodology, followed by the empirical findings presented in Section 4. In Section 5, these are analyzed through the developed theoretical lens and discussed in relation to previous literature. The final section presents the study's conclusions, discusses its limitations, and offers suggestions for future research.

2. Literature Review

In this section, we provide the theoretical foundation for our study on accounting and innovation in SupplyCo. Section 2.1 reviews and examines existing literature on the intersection of accounting and innovation. The method theory is outlined in Section 2.2, followed by the theoretical framework developed and presented in Section 2.3.

2.1. Previous Literature within Accounting and Innovation

The review of the accounting and innovation literature begins with an examination of the relationship between accounting and innovation, found under Section 2.1.1. Subsection 2.1.1.1 explores the role of MCS for innovation, and Subsection 2.1.1.2 examines innovation and accounting in large organizations. We conclude by elaborating on the identified gaps in the domain literature in Section 2.1.2.

2.1.1. The Relationship Between Accounting and Innovation

2.1.1.1. The Role of MCS for Innovation

Studies on the relationship between accounting and innovation center around accounting's role in innovation, particularly through the lens of MCS (e.g., Abernethy & Brownell, 1997; Bisbe & Otley, 2004; Revellino & Mouritsen, 2009). This field of research has primarily focused on whether accounting facilitates or constrains innovation. Early research recognized contingency, arguing that accounting does not inherently hinder innovation but rather that its effects depend on how control systems are designed and used. Formal accounting controls, such as budgetary and performance evaluations, have been shown to be less effective and in some cases insufficiently flexible in highly uncertain environments (Hopwood, 1972; Abernethy & Brownell, 1997). For instance, Hopwood (1972) found that budget-constrained use of accounting data resulted in short time horizons and an inflexible decision process, which also constrained innovation. Similarly, Abernethy and Brownell (1997) showed that accounting controls were less effective than personnel controls in supporting managerial performance in high-uncertainty R&D settings. However, alternative approaches have been proposed to better align control systems with these settings. For example, Brownell (1985) found that budgetary participation was more positively associated with managerial performance in R&D than in marketing, reflecting the greater complexity and information-processing demands of the R&D environment. Additionally, Rockness and Shields (1984) showed that in R&D settings, where technological uncertainty is high and performance is difficult to measure, input controls, such as expenditure budgets, were considered more important than formal mechanisms such as external benchmarks. Hayes (1977) similarly argued that financial data such as budgets are inadequate performance measures in contexts such as R&D due to weak cost-output links and the stronger role played by environmental factors,

instead proposing a contingency-oriented accounting approach that reflects such influences.

As the research field has developed, this nuanced view has continued to receive increased recognition (e.g., Bisbe & Otley, 2004; Bisbe & Malagueño, 2009; Jørgensen & Messner, 2009; Ditillo, 2004; Davila, 2000). For instance, Bisbe and Otley (2004) found that MCS can support innovation when used interactively, but their effectiveness depends on alignment with the firm's innovation management approach. While the innovation of low-innovating firms is favored by interactive controls, the effect is the opposite in high-innovating firms. Additionally, Ditillo (2004) shows that the effectiveness of control systems in knowledge-intensive teams, such as R&D, depends on how well they are configured to match different types of knowledge complexity, with MCS supporting coordination and knowledge integration. Davila (2000) further reinforces this contingency perspective by showing that the usefulness of MCS in new product development (NPD) depends on the type of uncertainty faced, finding that cost and design-related controls are positively associated with performance, while time-focused controls may hinder innovation.

Additionally, research has emphasized that accounting can actively enable product innovation rather than merely constrain it (Nixon, 1998; Jørgensen & Messner, 2010). Accounting can play a critical role in reducing uncertainty and facilitating goal congruence, thereby ensuring that innovation efforts remain aligned with strategic objectives (Jørgensen & Messner, 2010). Furthermore, Simons (1990) shows that MCS, such as planning and budgeting, can enable innovation when used interactively, helping organizations focus attention on strategic uncertainties, stimulate learning, and adapt to emerging markets and technological challenges. Widener (2007) reinforces a broader perspective on control, showing that MCS enable firms to manage strategic uncertainty by structuring attention and supporting organizational learning. For instance, the author finds that diagnostic controls provide the structure that enables interactive systems to guide learning and behavioural alignment on goals and objectives. This broader view on control is in line with studies building on Simons (1995), which have examined the role of interactive uses of MCS in supporting innovation-related processes (Bisbe & Otley, 2004) as well as the dynamic tension between diagnostic and interactive uses of MCS (Bedford, 2015). For instance, Bedford (2015) shows that in ambidextrous firms, the combined and balanced use of diagnostic and interactive controls creates a dynamic tension between competing strategic priorities in innovation settings, supporting firms in simultaneously pursuing goal achievement and opportunity exploration, which enhances overall performance.

More contemporary research has emphasized a shift from examining *whether* accounting influences innovation to understanding *how* it actively shapes product development processes (Mouritsen et al., 2001; Revellino & Mouritsen, 2009, 2015; Christner & Strömsten, 2015). These studies suggest that rather than simply influencing innovation in

a fixed manner, accounting interacts with and helps structure development trajectories by shaping decisions around product design, guiding resource allocation, and contributing to shifts in strategic direction. Revellino and Mouritsen (2009), for example, show that as NPD progresses, control mechanisms evolve, with different types emerging to address technological, organizational, and strategic challenges, ultimately acting not just as constraints but as mediators and active participants shaping the innovation process. Similarly, Christner and Strömsten (2015) demonstrate how accounting calculations shape firms' strategic choices by making certain development paths appear economically viable while discouraging others, influencing how innovation investments are justified and pursued. Revellino and Mouritsen (2015) expand this perspective by conceptualizing accounting as an engine of innovation, showing how calculative practices not only reflect but also mobilize and redirect innovation by generating knowledge and traces that contribute to the drifts of its future direction.

2.1.1.2. Driving Innovation and Product Development with Accounting in Large Organizations

While accounting interacts with innovation, its role in R&D settings varies significantly across organizations, ranging from a central control mechanism to a more peripheral tool, for instance depending on how well the task transformation process is understood (Rockness & Shields, 1984). Furthermore, performance measurement systems and resource allocation processes are also relevant in this context. Bedford et al. (2019) show that measures commonly used to assess innovation performance often encourage incremental innovations, which can limit radical ones. In contrast, Christensen and Bower (1995) argue that established firms can pursue radical innovation when new technologies serve the needs of existing customers. However, the authors also find that these firms often fail to develop simpler technologies aimed at emerging markets, where no customer base yet exists, because resources are allocated to projects targeting current customers. This suggests that larger firms may struggle to adapt to technological change.

Adapting to technological change is not only dependent on resource allocation (Christensen & Bower, 1995) but also on how effectively organizations can manage knowledge flows between different organizational subunits and external stakeholders through communication. While prior research has explored the role of MCS in shaping innovation outcomes (e.g., Abernethy & Brownell, 1997; Bisbe & Otley, 2004), communication structures have been identified as equally critical determinants for managing technological change through innovation (Jørgensen & Messner, 2009). For instance, Jørgensen and Messner (2009) highlight the need for informal communication mechanisms and transparency to balance efficiency and flexibility in innovation processes. This strong focus on communication connects to research on MCS that emphasizes the role of interactive control systems as an important organizational feature contributing to innovation by promoting knowledge sharing and problem-solving (e.g., Simons, 1995). For instance, Simons (1995) argues that the interactive use of MCS

through enhanced communication can foster organizational learning and responsiveness, which can be essential for effective innovation management. Furthermore, accounting, such as financial appraisal methods, has been shown to play a critical role in structuring dialogue among project participants (Nixon, 1998). For instance, Nixon (1998) highlights how tools such as target costing, value engineering, and cost tables, facilitate collaboration and consensus-building in product development.

Internal communication is not exclusively important, but innovation is also contingent on how firms interact with external parties (Baraldi & Strömsten, 2024; Håkansson & Lind, 2004). Baraldi and Strömsten (2024) show that accounting systems, such as cost calculations, not only shape how firms perceive and frame innovation problems, but also influence how they present these problems to other actors. This framing affects how network configurations evolve, guiding whether firms reinforce known relationships and capabilities (exploitative innovation) or pursue new collaborations and resource combinations (explorative innovation). Additionally, Håkansson and Lind (2004) demonstrate that coordination in development processes involves multiple subunits with overlapping responsibilities and divergent goals, where accounting functions as a bridging mechanism that supports cross-boundary interaction and ongoing adaptation without enforcing uniformity.

2.1.2. Identified Gaps in the Accounting and Innovation Literature

Previous research has extensively explored the relationship between accounting, innovation and product development, particularly examining whether MCS facilitate or constrain innovation (Abernethy & Brownell, 1997; Bisbe & Otley, 2004; Jørgensen & Messner, 2009). More recent research in the accounting and innovation domain has suggested that accounting does not merely influence innovation passively but actively shapes product development trajectories (Revellino & Mouritsen, 2009, 2015; Christner & Strömsten, 2015). While the broad domain of accounting and innovation has focused on how accounting influences innovation, further gaps in the existing literature are identified.

Much of the existing research has treated innovation as a unified effort rather than as a result of efforts from organizational departments' different priorities, measures, and interpretations of innovation (e.g., Bisbe & Malagueño, 2009). However, firms often consist of different subunits, each of which is part of the product development process and could potentially have differing perspectives on innovation. For example, Håkansson and Lind (2004) highlight organizational complexity in development contexts, yet their focus on an interorganizational setting leaves open how similar coordination dynamics unfold within a single firm. Thus, while prior studies acknowledge the complexity of aligning various functional areas (e.g., Håkansson & Lind, 2004; Jørgensen & Messner, 2009), they do not explicitly examine how these organizational subunits *shape* innovation but assume that innovation occurs as a cohesive, firm-level process. Rather than being

examined as an organizationally embedded process, innovation is frequently black-boxed, treated as a unified effort, thereby disregarding the mutual efforts and interdependencies among the different subunits. Thus, a theoretical gap exists in understanding how different subunits view innovation within an MNC.

Moreover, scholars have suggested that established firms often fail to develop simpler technologies aimed at emerging markets where no customer base yet exists (Christensen & Bower, 1995), arguably struggling to adapt to technological change. It is also highlighted that accounting systems play a critical role in fostering innovation, particularly for perceiving and framing innovation problems (Baraldi & Strömsten, 2024). However, there is still room to further problematize the role of accounting in innovation processes, particularly in understanding how MCS contribute to cross-functional coordination in large firms. While some studies suggest that accounting mechanisms, such as target costing, facilitate collaboration, coordination, and integration of disparate perspectives (Nixon, 1998), research has not adequately explored *how* MCS is used to coordinate divergent views on innovation across organizational subunits. Viewing innovation as the outcome of cross-functional collaboration highlights the importance of interaction to coordinate divergent perspectives on innovation, thus emphasizing the relevance of organizational forums for coordination.

Furthermore, previous accounting and innovation literature has examined the role of the LOC framework in managing strategic uncertainty (e.g., Simons, 1995; Widener, 2007) and innovation efforts (Bisbe & Otley, 2004). For instance, Bisbe and Otley (2004) investigate whether the interactive use of MCS fosters product innovation and enhances performance, finding that interactive use may stimulate innovation contingent on a firm's existing level of innovativeness. However, due to the sole focus on interactive controls systems, the authors cannot draw conclusions on the potential role a diagnostic use of MCS might have regarding innovation and product development. While Bedford (2015) recognizes that diagnostic and interactive control systems can manage competing innovation priorities, limited attention has been given to how diagnostic and interactive control systems can be *designed* to support innovation processes within large MNCs—a gap this study seeks to address by considering the use of diagnostic and interactive control mechanisms in such setting.

In the next section, we introduce the method theory used to construct our theoretical framework to analyze the empirics, enabling us to address the identified research gaps. Drawing on Galison's (1997) concept of trading zones, we examine how accounting facilitates coordination across distinct subunits within a large MNC. In such organizations, innovation processes are rarely cohesive. Rather, they are fragmented across organizational subunits, where each of these likely operate with its own priorities making cross-functional coordination an organizational challenge in the innovation process. Thus, we aim to explore how these divergent perspectives can be coordinated.

We believe that MCS might play an important role here in mediating this fragmentation, enabling coordination without requiring ultimate consensus across different subunits.

2.2. Method Theory

The following section is structured as follows: Section 2.2.1 introduces Galison's (1997) concept of trading zones, beginning with an overview of subcultural distinctions within scientific disciplines (Section 2.2.1.1), followed by a discussion on the formation of trading zones through shared languages (Section 2.2.1.2). Section 2.2.1.3 extends Galison's concept via Collins et al. (2007), offering a more nuanced classification. Finally, Section 2.2.2 draws on Kellogg et al. (2006) to apply the concept within organizational settings, enhancing its relevance for this study.

2.2.1. Trading Zones

The concept of trading zones, introduced by Galison (1997), provides a framework for understanding how different subcultures within a discipline interact and coordinate their actions *despite* epistemic differences. This framework addresses the challenge of incommensurability, the notion that certain scientific paradigms are so distinct that their theories, methods, and findings are mutually unintelligible. Galison (1997) offers an alternative to logical positivists' (e.g., Rudolf Carnap) and anti-positivists' (e.g., Thomas Kuhn and Russell Hanson) views of scientific progress, proposing instead a model of scientific practice that acknowledges the disunity of science while explaining how its various subfields maintain coordination and continuity, even in the face of incommensurability.

Galison (1997) opposes the idea of treating science as a unified field with a harmonized language, or as a fragmented collection of isolated frameworks. Rather, the author argues that scientific communities are composed of integrated subcultures, each with its own distinct form of reasoning, experimental methods, and ontological commitments. These subcultures do not necessarily share a common conceptual framework but find ways to communicate and collaborate through localized mechanisms of exchange. The trading zone serves as a conceptual or physical space where these subcultures interact, negotiating shared rules, tools, and languages that enable productive cooperation despite different epistemic grounds.

2.2.1.1. The Existence of Subcultures

Galison's (1997) work is based on observations from the field of physics. Physics is shaped by the interaction of at least three major subcultures, which Galison (1997) identifies as theorists, experimentalists, and instrument makers. Each of these groups operates within its own specialized domain marked by distinct problem-solving methods, evaluative criteria, and communicative practices. For instance, theorists develop formal models using mathematical logics, while experimentalists develop empirical strategies to

test hypotheses. Meanwhile, instrument makers specialize in designing and refining the technologies that enable experimentation to occur in the first place. These communities do not always share the same understanding of concepts such as "mass," "energy," or "measurement,". However, they still must collaborate to advance scientific knowledge.

2.2.1.2. The Emergence of Trading Zones

Given the existence of multiple subcultures within science, how do these communities interact despite their differences? Galison (1997) introduces the concept of trading zones to explain how local coordination occurs between groups that do not share a common epistemic ground. The author argues that trading zones function as spaces, conceptual or physical, of negotiated interaction where different groups with their own jargons develop shared vocabularies, tools, and practices that allow them to collaborate and trade. In some cases, trading zones emerge through tools, such as shared laboratory equipment, that different communities can use without fully adopting each other's conceptual frameworks (Galison, 1997).

2.2.1.3. Different Types of Trading Zones

Galison (1997) describes different types of trading zones where groups frequently establish contact languages. A pidgin language is developed between groups that do not share a common language and implies minimal communication relying on simplified vocabularies allowing for practical collaboration. Over time, if interaction within the trading zone becomes more sustained, a creole language may emerge, where elements of the interacting subcultures become deeply intertwined to the extent that it can serve as a reasonably stable native language (Galison, 1997).

While Galison's (1997) typology offers an understanding of how scientific subcultures interact, it primarily emphasizes the linguistic and structural forms of coordination. To build on this, Collins et al. (2007) refine the concept by introducing a more systematic classification based on two dimensions; homogeneity versus heterogeneity, and collaboration versus coercion. Collins et al.'s (2007) first dimension considers homogeneity versus heterogeneity. In homogeneous settings, groups not only work together but begin to understand and use tools in similar ways, enabling more integrated collaboration. In heterogeneous contexts, however, collaboration still occurs, but each group brings its own professional logic and interpretive lens. This often means that even when the same models are used, they are understood and acted upon differently, depending on each group's perspectives and priorities. As a result, coordination relies more heavily on translation or negotiation, rather than shared understanding.

The second dimension, collaboration versus coercion, distinguishes between mutual, collaborative, negotiation and hierarchically imposed, coerced, coordination. In collaborative trading zones, actors engage willingly, contribute their perspectives, and jointly shape both processes and outcomes. Decision-making is mutual, and differences are bridged through compromise. In contrast, coercive zones are characterized by top-

down directives, where one group's perspective dominates, and others are expected to comply, sometimes without fully understanding or agreeing with them. This may result in superficial alignment, resistance, or the use of tools and models without shared ownership or meaning.

These two axes create a fourfold matrix defining four different types of trading zones: fractionated[1], inter-language, enforced, and subversive; each of which presents a distinct type of cross-boundary coordination (see Figure 1).

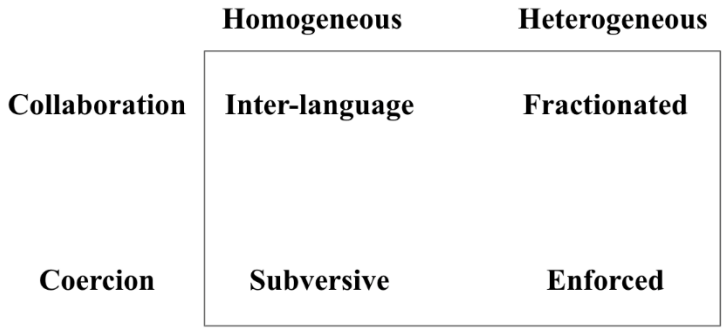


Figure 1. Illustration of the Fourfold Matrix, Adapted from Collins et al.'s (2007).

In fractionated trading zones (heterogenous, collaborative), distinct communities work in parallel exchanging information but still retaining their own epistemic autonomy (Collins et al., 2007). Enforced trading zones (heterogeneous, coercive) occur when a dominant group imposes its language, methods and standards on others, limiting diverse perspectives. Subversive trading zones (homogeneous, coercive) appear when one party's language gradually overwhelms and replaces that of another party, thus leading to a state of homogeneity. Lastly, in inter-language trading zones (homogeneous, collaborative), shared vocabularies or hybrid frameworks are developed to facilitate integration.

2.2.2. Extending Galison's (1997) Trading Zones Beyond the Field of Physics

Galison (1997) introduces the concept of trading zones in scientific contexts, which Collins et al. (2007) later expands on by identifying different types of trading zones. Subsequent research has elaborated on the concept in other settings, for instance in an organizational one (Kellogg et al., 2006), thus broadening its applicability and generalizability further. Kellogg et al. (2006) extend Galison's (1997) framework to post-bureaucratic organizations, showing how trading zones facilitate coordination in fast-paced and rapidly changing environments. The author finds that members engage in cross-boundary coordination practices that enhance visibility and mutual understanding, allowing for continuous revision and alignment, and suggests these practices enact a

[1] This thesis does not distinguish between the two types of fractionated trading zones: boundary object trading zones and interactional expertise trading zones.

coordination structure that supports adaptability, speed, and learning. However, such mechanisms do not resolve jurisdictional conflicts and can result in issues such as prioritizing speed over quality, and suppressing differences. Extending Galison's (1997) insights into the organizational domain reveals the dynamic and contingent nature of trading zones, emphasizing their role in enabling strategic coordination, boundary spanning, and knowledge work in complex environments.

2.3. Theoretical Framework

The literature review highlighted a few gaps in the current accounting and innovation domain. First, prior research assumes that innovation occurs as a cohesive, firm-level process, but lacks the view of innovation as a fragmented, iterative process, where different subunits coordinate perspectives on innovation within large firms. Second, the use of MCS to coordinate these organizational subunits' diverse perspectives on innovation has not been adequately explored. Third, while Simons' (1995) LOC framework has been used to study how organizations manage strategic uncertainties, there is a gap in how different diagnostic and interactive control systems can be designed to support innovation processes within large MNCs. Given these literature gaps, and our view of innovation as a fragmented, iterative process formed by diverse subunit perspectives on innovation, we draw on Collins et al.'s (2007) four-fielder model to study innovation across departmental boundaries. Whereas Galison (1997) used the theory in a scientific setting, we study trading zones at an organizational level instead, an approach already applied by Kellogg et al. (2006).

Since we also recognize accounting's role as a potential mediator between these diverse perspectives, we combine this model with Simons' (1995) LOC, specifically diagnostic and interactive controls. We thus aim to explore the interplay between control systems and varying levels of collaboration and homogeneity. The integration of diagnostic and interactive controls is motivated by the view that control mechanisms actively shape innovation processes: diagnostic controls reinforce accountability by monitoring outcomes against predefined targets, while interactive controls support learning and adaptation through continuous dialogue and engagement with strategic uncertainties, which product development is an example of (Simons, 1995). Furthermore, Tessier and Otley (2012) argue that diagnostic and interactive controls should not be treated as fixed systems, but as managerial practices whose function depends on the broader organizational context in which they are enacted. Therefore it is relevant to explore how Simons' LOC (1995), specifically diagnostic and interactive controls, interplay with Collins et al.'s (2007) framework of trading zones. This approach aims to address a more context-sensitive understanding of control systems (Tessier & Otley, 2012) and enables a richer analysis of how MCS coordinate divergent subunit views on innovation.

By integrating Simons' (1995) LOC with Collins et al.'s (2007) classification of trading zones, the framework will guide us in exploring how diagnostic and interactive control

systems are likely to be emphasized across the four zones. The central proposition is that there is a *dynamic* between the design of diagnostic and interactive controls and the different types of trading zones in which innovation unfolds. We treat the level of emphasis on diagnostic controls and interactive controls as central in shaping how control systems and different types of trading zones interplay. This allows for theorizing how varying levels of collaboration and homogeneity interplay with the design and use of control systems in cross-functional innovation settings.

High emphasis on diagnostic controls is characterized by formalized, structured and recurrent use of performance metrics to monitor progress against predefined goals. Tools, such as budgets and roadmaps, are treated as shared evaluative frameworks that structure discussions and decision-making across subunits. In contrast, low emphasis on diagnostic controls denotes weak reliance on formal, standardized evaluation mechanisms, with performance often assessed through interpretive or informal criteria.

High emphasis on interactive controls refers to situations where managers engage directly and regularly with the employees to address strategic uncertainties, stimulate cross-functional dialogue and coordination, and support organizational learning. For example, underlying assumptions are questioned, cross-functional dialogue is fostered and strategic adaptation is supported. In contrast, low emphasis on interactive control refers to systems used primarily for monitoring performance against pre-set targets, with limited managerial engagement and cross-functional interaction. Rather than enabling dialogue, learning and flexibility, these systems tend to reinforce existing assumptions and prioritize routine execution.

Through our theoretical framework, we examine how R&D, Sales, and PPM coordinate perspectives on innovation using MCS, specifically diagnostic and interactive controls. This study thus builds on the more contemporary accounting and innovation literature view (e.g., Revellino & Mouritsen, 2009, 2015; Christner & Strömsten, 2015) and aims to contribute to the field by showing how accounting may be used to create cross-functional coordination and shape innovation processes, while also providing a more contextually grounded understanding of how different MCS function in different organizational settings. This is examined by answering our research question: *How are MCS designed and used to facilitate coordination of innovation across subunits in an MNC?*

3. Methodology

The following section elaborates on the research methodology. Section 3.1 describes the research design, with Subsection 3.1.1 specifying the empirical method and Subsection 3.1.2 detailing the selection of the research setting. Section 3.2 describes the gathering of the empirical material. Section 3.3 discusses the empirical analysis followed by Section 3.4 presenting the research data quality.

3.1. Research Design

3.1.1. Empirical Method

This thesis aims to understand how MCS is used by the different subunits in SupplyCo to coordinate perspectives on innovation. The question of how in our study is difficult to measure quantitatively since the data points cannot be expressed in number terms (e.g., Dyer & Wilkins, 1991), hence a qualitative case study was deemed more appropriate. According to Ahrens and Chapman (2006), a qualitative case study is particularly suitable for exploring social realities as emergent, subjectively created, and objectified through human interaction. This aligns with our research question to explore the design and use of MCS to coordinate diverse perspectives when driving innovation at SupplyCo.

Furthermore, we conducted a single case study, a methodology employed in prior research within accounting and innovation (e.g., Nixon, 1998; Jørgensen & Messner, 2009; 2010), as it was deemed more appropriate to answer our research question. According to Siggelkow (2007), a single case study can effectively illustrate an example, offering valuable conceptual insights into a specific phenomenon. In addition to its theoretical relevance, the storytelling and rich contextual focus of a single case study often make it more persuasive and easier to recall than statistical demonstrations supporting ideas and claims (Dyer & Wilkins, 1991).

3.1.2. Research Setting

Given that we were to explore the role of accounting in innovation, we established several criteria for selecting a case company. First, the case company needed to have innovation as a core aspect of its operations. Second, since our study examines innovation coordination between a large firm's different organizational subunits, the case company also had to be of such size and maturity that such subunits exist. This criterion of large size and maturity was also important to provide insights into how accounting is used for a more fragmented innovation process where cross-unit dependencies can exist. Third, we preferred the case company to be located in Sweden to facilitate site visits, which contributes to a richer contextual understanding.

The chosen case company for the thesis, SupplyCo, fulfilled all these criteria and was thus deemed relevant for our study. SupplyCo is a large MNC and one of the leading providers of industrial solutions, with a global market presence and offices. SupplyCo's status as an MNC is beneficial, as such organizations offer a rich and complex context, making them ideal for theory development (Roth & Kostova, 2003). Additionally, the organizational complexity and size of an MNC could highlight the need for coordination, making it a suitable setting for exploring trading zones. Furthermore, SupplyCo has a functional organization structure that seemed suitable for this thesis given the presumably differing subunit innovation perspectives. Although large organizations involve multiple stakeholders, our primary focus was on internal stakeholders, particularly employees and managers, due to their greater accessibility, with only a few data sources from clients to provide further nuances.

Our study focuses on SupplyCo's R&D unit, with particular attention to its innovation-centric Concept and Application (C&A) teams, along with its Sales and PPM subunits. The rationale behind the choice is that during SupplyCo's innovation process, it is these subunits that are the key players. Whereas R&D develops the concept and subsequently the product, Sales creates the business case for it, and this is all driven through PPM.

Further, during this study, the case company was developing a new separator for application in mainly the pharmaceutical industry, henceforth called *Tiny*, which was our reference point for innovation at the firm. As such, we were able to examine innovation in real-time, allowing us to account for it as it progresses. Tiny is an architectural innovation, meaning that it reconfigures existing product components without altering the core technology (Henderson & Clark, 1990), in this case of their larger separators. While firms may retain expertise in individual components, their architectural knowledge can become obsolete, making adaptation difficult (Henderson & Clark, 1990). Arguably, this type of innovation presents further complexity for an organization where different subunits interact in a fragmented innovation process, adding nuances that also resonate with our choosing of SupplyCo.

3.2. Data Collection

3.2.1. Primary Material

The primary material collected consists of semi-structured interviews conducted with individuals from mainly R&D, Sales, and PPM. Interviews with employees involved in the innovation process served as a key source of information, providing insight through their opinions and experiences (Patton, 2002). Further, a few interviews were conducted with selected individuals from other organizational functions, as well as with certain customers deemed relevant for this study. While these interviews are not explicitly reflected in the empirics, they provided additional context. A contact person at SupplyCo facilitated our access to various interviewees and assisted in establishing connections with

different subunits of the company. At the start of each interview, participants were briefed on the study's scope, sometimes also in advance through our contact person at SupplyCo. Anonymity was guaranteed to all, and we signed a non-disclosure agreement, which we informed the interviewees about. This aimed to protect their integrity and create a comfortable and open interview setting. Furthermore, we chose the format of semi-structured interviews since it allowed us to combine a set of predetermined questions with the flexibility to explore topics in more depth as they arose during the conversations (Bryman & Bell, 2015). The semi-structured approach is advantageous as it enables the exploration of emerging areas of inquiry (Ryan et al., 2002). Our interview guide was initially designed based on our theoretical framework and evolved throughout the study to reflect the unique perspectives and roles of each interviewee (Dubois & Gadde, 2002). Insights gained from early interviews informed adjustments to the guide, introducing new questions that enriched later discussions.

To answer the research question, 24 interviews were conducted in total, whereof 21 were unique prospects. Following these interviews, we began to observe theoretical saturation, as participants increasingly echoed insights shared in earlier interviews (Eisenhardt, 1989), and as such, the primary data collection was deemed sufficient. Further, the interviews lasted between approximately 25–90 minutes, which all were conducted over a 3-month period between February and April 2025. All interviews, except for one held over telephone, were conducted over Microsoft Teams due to logistical preferences and were held in both Swedish and English, depending on the interviewee's preferred language. While conducting interviews in the native language helps ensure that no important data is excluded by the interviewee due to language barriers (Moll et al., 2017), it also presents the challenge of translating quotes into English without altering their original meaning. All interviews were recorded and transcribed with the support of the artificial intelligence (AI) tool Circleback (see Appendix A). Notes were also taken during the interviews to further support the interpretation of interviewees' responses and facilitate asking emerging questions to receive elaborative answers essential for addressing the research question (Kvale & Brinkmann, 2015).

Both authors attended every interview, actively engaging with the interviewee to capture diverse perspectives while maintaining consistency in the empirical findings. Further, 8 weekly meetings were held with the responsible contact person from SupplyCo following up on the process of the thesis work. A summary of the interviews and the weekly conversations is provided in Appendix B.

3.2.2. Secondary Material

While interview findings served as the primary data source, additional external and internal material was collected to complement the empirical collection. External material was collected from SupplyCo's website, including business and division descriptions and annual reports, to understand the context for the case study. Internal material has been

sourced from SupplyCo and consists of internal presentations deemed relevant for the purpose of our study. Taken together, the secondary material offered valuable insights that extended beyond the findings of the primary material mainly with regards to concretely understanding processes, contributing to answering the research question as thoroughly as possible.

Additionally, site visits and informal interviews were held with SupplyCo (see Appendix C). To start with, four online meetings were held to familiarise ourselves, and establish collaboration, with SupplyCo. Then, a total of three major site visits were made at the company's site on the outskirts of Stockholm. The first visit focused on touring the site, viewing Tiny, and establishing the practicalities of the collaboration. During our second visit, we met with potential interview candidates from SupplyCo to introduce ourselves and generate interest in participating in our study. On our third visit, we participated in SupplyCo's test-run of Tiny with a potential customer present. We also observed one of its quarterly Innovation Forum (IF) meetings through Microsoft Teams, where R&D and PPM aligned on the product pipeline. The site visits and observation allowed us to observe elements beyond the interviews which contributed to a richer contextual understanding of SupplyCo. To reduce the risk of misinterpretation of the informal and non-recorded interviews, we documented initial reflections immediately afterwards. Further, around late March, a half-way presentation of the study was held with our supervisor as well as our contact person from SupplyCo, to update on progress as well as the plan ahead.

3.3. Data Analysis

To guide the collection and interpretation of our gathered data, we employed an abductive approach, a process characterized by moving back and forth between theory and empirical observations (Dubois & Gadde, 2002; Lukka & Modell, 2010). Rather than adhering to a predefined path, this approach allowed our framework to evolve in response to new insights emerging from the data. We began by organizing the empirical material around the dimensions outlined in our theoretical framework, while remaining open to revisiting it as new patterns and questions arose. This iterative engagement between data and theory enabled us to refine our analytical focus and adjust direction as our understanding deepened. Immediately following each interview, we reflected on our insights and identified potential areas of interest, which helped us continuously refine the interview guide and clarify our focus. Subsequently, we applied a thematic approach, categorizing the transcribed material into detailed themes. This helped us structure the data and identify patterns of similarities and differences in the data. Over time, this process contributed to a more nuanced understanding of the empirical data, allowing us to contrast it with previous research and explore how our findings could refine or extend existing perspectives.

3.4. Research Quality

Lincoln and Guba (1985) suggested that, instead of applying conventional measures of validity and reliability which are common in quantitative research, qualitative research should be evaluated using the following criteria on trustworthiness; credibility, transferability, dependability, and confirmability. These criteria, combined with the concepts of authenticity (trustworthiness) and plausibility introduced by Lukka and Modell (2010), provide a robust framework for assessing the research quality of this interpretive study. As our research explores how individuals perceive and coordinate innovation, rather than seeking objective truths, it aligns with an interpretive approach. Moll et al. (2017) point out that a challenge in qualitative research is the risk that the researchers, in selecting relevant data, develop biases that both shape what is considered relevant and hinder a deep understanding of the empirical setting, which can distort the study's credibility. Aware of the risk of oversimplification, we asked our SupplyCo contact to review the empirical material for accuracy prior to publication.

Authenticity was achieved by presenting rich, detailed descriptions of the research setting. This includes quotations from interviewees to capture their diverse perspectives, ensuring that the findings are conveyed credibly and not shaped by the authors' interpretations (Lukka & Modell, 2010). Additionally, observations from informal meetings and site visits added authenticity, enabling readers to engage with the dynamics of the research environment (Scapens, 2004). To further support the clear and faithful communication of the empirical material, we made limited use of writing support tools, more specifically ChatGPT, particularly during later stages of the writing process (see Appendix A). To address the potential for bias in a case study, as identified by Yin (2009), empirical data was reiterated multiple times and interview transcripts were independently analyzed by both authors before meeting to compare (Bryman & Bell, 2011). Additionally, data was collected from participants across a range of organizational roles and hierarchical levels to avoid biases in the narrative. Further, plausibility, which refers to the credibility of our findings and the extent to which they appear reasonable and well-founded, was reinforced through reviews from our SupplyCo contact.

4. Empirical Findings

The following section will present the empirical findings. Section 4.1 provides background information about SupplyCo and Tiny. Thereafter, Section 4.2 presents SupplyCo's innovation process, organized into subsections based on the relevant meetings. Finally, Section 4.3 elaborates on the subunits of R&D, Sales, and PPM.

4.1. Empirical Background

4.1.1. SupplyCo

SupplyCo is a listed global industrial company based in Sweden. This thesis focuses on the company's separator unit within the Life Sciences application area. Within this unit, SupplyCo operates a functional organization structure with distinct responsibilities assigned to the different subunits. This thesis focuses solely on the subunits; R&D, Sales, and PPM (see Figure 2). These subunits, as well as the other ones in Figure 2, are all led by functional managers who also form the separator unit management.

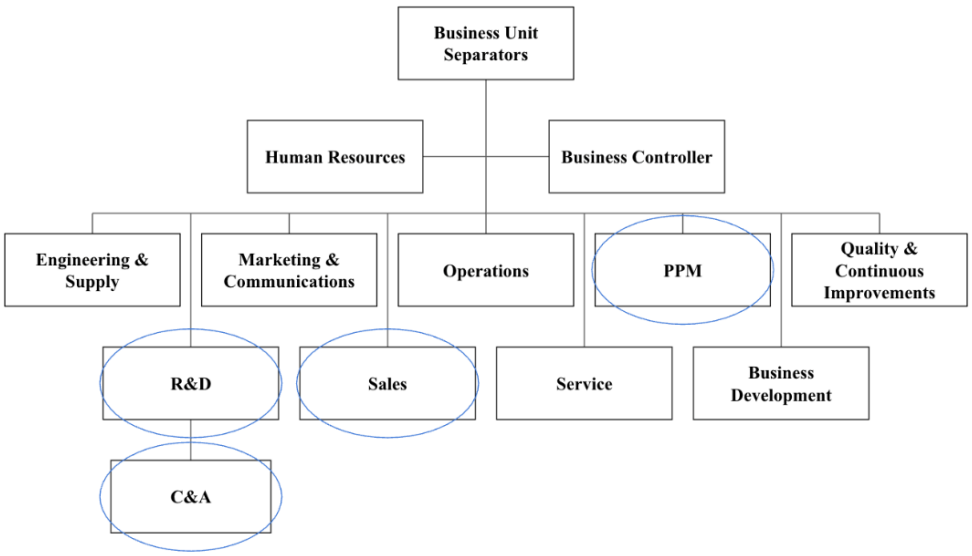


Figure 2. Overview of the Separator Business Unit's Functional Organization Structure.[2]

The R&D unit consists of different subunits, one of which is C&A. New ideas are typically first explored in C&A, where different solutions are tried in their lab. Thus, C&A can be seen as the research component, the "R" in "R&D", representing the pre-new product development (pre-NPD) part of R&D, which is further elaborated on in Section 4.2. They develop prototypes and engage with clients but unlike for Sales, the purpose of R&D's client contact is to develop the products rather than to sell them. This

[2] Other subunits, besides C&A, also exist under the R&D unit.

thesis specifically focuses on C&A, as this is where innovation primarily occurs at SupplyCo. While the emphasis is on C&A, the broader term R&D is also used since interviewees from other parts of the R&D organization still considered C&A's perspective.

Sales is organized into a Global Sales function and Sales companies. Whereas Global Sales focuses on supporting the Sales companies with deeper knowledge, the Sales companies have a broader focus on actually selling the products to the clients. In this study, these two were lumped together when considering Sales since they demonstrated a similar perspective.

PPM oversees the full life cycle of separators, from early concept to phase-out, while ensuring the overall portfolio remains competitive and balanced short- and long-term. This includes setting product strategies, initiating development programs, and evaluating products' financial implications. PPM also actively monitors customer needs, market trends, and competitor offerings to identify gaps in the product portfolio. Among the three subunits, PPM holds the most hierarchical position due to its greater decision-making authority in the product development process.

4.1.2. Tiny

In the context of Supply Co's innovation initiatives, Tiny is a new separator mainly for Life Science applications, representing a concept that will be different from the company's traditional industrial-scale separators. Tiny has been developed by the C&A team as a working prototype, not yet on the market, to explore the feasibility and potential of offering separation technology at a much smaller scale. Currently, Tiny is in the pre-NPD phase and is planned to enter the feasibility-stage (see Figure 3) during the second quarter of 2025. Target segments for Tiny include biotech startups, university research laboratories, and R&D within large pharmaceuticals. Technologically, the concept builds on SupplyCo's core separation technique, thus enabling scalability from small batch-separation to industrial scale.

4.2. The Innovation Process

The R&D, Sales, and PPM subunits partake in the different forums[3] and contribute to documentation as part of the broader innovation process, summarized in Figure 3. SupplyCo separates its work into three phases; pre-NPD, NPD, and existing product development (EPD). The pre-NPD phase ends after toll gate (TG) 2, i.e. upon entering the "Review & Budget Planning"-stage in Figure 3.

[3] Informal meetings may occur, for instance over lunch, in corridors or similar. However, due to their unpredictable nature, these have not been systematically examined.

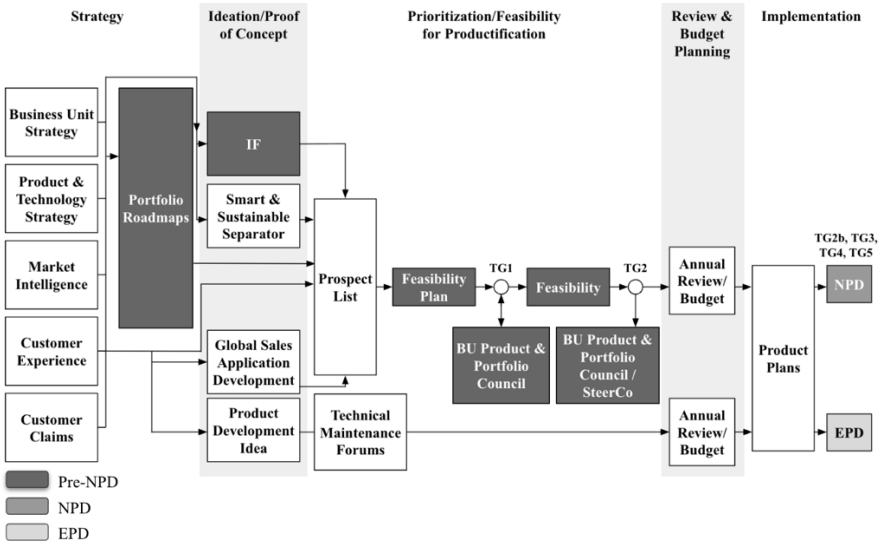


Figure 3. Detailed Overview of SupplyCo's Workflow.[4]

After TG2, concepts become official projects. First, the NPD phase begins with the pre-study planning (before TG2b). This is followed by the pre-study execution (before TG3), realization (before TG4), and finally, project closure (before TG5). After TG5, the EPD phase begins. With the aim to study SupplyCo's innovation process, this study will solely focus on the pre-NPD phase. In the pre-NPD phase, R&D, Sales, and PPM have a total of seven different types of meetings, five of which are recurring and two of which are set up ad hoc. The subunits represented at the respective meetings are seen in Figure 4.

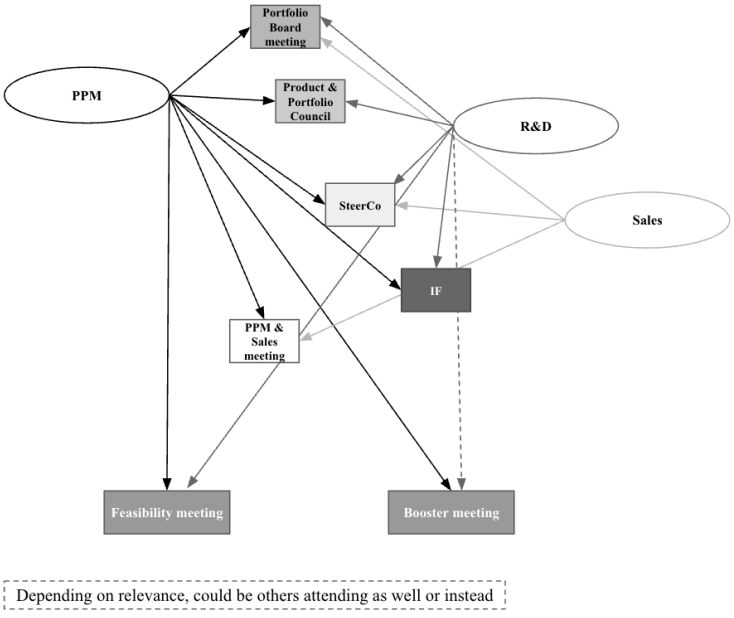


Figure 4. The Participating Subunits at Each Forum.[5]

[4] Other pre-NPD forums, tools, and documentation also exist.
[5] This thesis considers only R&D, PPM, and Sales, however, other subunits may also partake in the meetings.

4.2.1. Portfolio Board Meeting

The Portfolio Board (PB) meeting is held once per year and lasts for half a day. All three subunits are represented during the meeting. The meeting is held to plan and discuss activities, as well as align a budget for product development, for the upcoming year. The functional manager of PPM is the chairman of the PB meeting and sets the agenda, which is standard and seldom diverged from. Prior to the meeting, PPM, together with middle managers of R&D, prepare a proposal for the upcoming year's pre-NPD, NPD, and EPD activities. This proposal is based on an assumed R&D budget, which remains stable from year to year for SupplyCo's separators within Life Sciences. The fixed annual budget was described by C&A as limiting.

> There is no room in the budget to act when something unexpected happens, unless it comes from top management. And even then, you cannot go around the layers of managers in between. (R&D 3)

Final decisions around the proposed budget split are made by the business unit managers, including the functional managers. The budget allocated to pre-NPD activities is subsequently revisited later in the process, upon passing TG2, to ensure alignment with the resource requirements for transitioning into the productization phase (i.e., NPD), as illustrated in Figure 3. Besides referring to the budget, the PB meeting also includes discussions around the feasibility plan, any changes in the Product and Portfolio (PP) roadmap, and a follow up on the Cost-Benefit Analysis (CBA) for ongoing projects. The feasibility plan outlines, on a quarterly basis over a two-year period, the duration of various feasibility studies conducted between TG1 and TG2, i.e., in the feasibility phase. Further details on feasibility studies, feasibility proposals, and CBAs are provided in Section 4.2.2, while the PP roadmap is discussed in Section 4.2.4.

The PB meeting involves active discussion among all attending participants, not exclusively the business unit managers. While the PB meeting provides an opportunity to influence the strategic direction, it is not typically a forum for initiating major shifts in it.

> It is typically possible to clarify strategic initiatives but not to challenge them. You align around what is there, not what could be. (PPM 1)

After the PB meeting is closed, R&D's functional manager communicates through channels the meeting outcome with the rest of the R&D unit. The meeting is not formally followed up on, which was expressed as a concern by a middle manager of the R&D function, who emphasized the need to learn from e.g., missed parameters or deadlines. With activities and budgets now set, R&D proceeds to initiate or continue the corresponding work.

4.2.2. Product & Portfolio Council Meeting

Each quarter the Product & Portfolio Council (PPC) meeting is held and lasts for approximately 1.5 hours. PPM is the chair of the PPC meeting that is also attended by

R&D but not Sales. The agenda is thus set by PPM and may be diverged from when appropriate, though maintaining the meeting's intended purpose was considered important. The PPC meeting serves as the first TG, during which PPM presents business cases for their selected ideas and, supported by the feasibility proposal, discusses why each concept should progress into the feasibility stage. The feasibility proposal is a document that outlines, for instance, the success criteria during the feasibility-stage and identifies the key questions that must be addressed to determine whether the project is suitable for later advancement into the NPD phase.

The PPC meeting also functions as the second TG as concepts with a finished smaller[6] feasibility study are presented and approved or rejected by the council to enter the project-stage. Additionally, the previously set project budget is revisited to align on the resources required for entering the productization phase.

The feasibility study has two attachments: the Market Demand Specification (MDS) and the CBA. Together with the MDS, the feasibility study addresses key considerations such as the concept's productization process and sales strategy. The CBA is developed by PPM and subsequently revisited at each TG up to TG5, when the project transitions into the EPD phase. The CBA is prepared in an Excel-file that calculates the project's Net Present Value (NPV) and Return on Investment (ROI). It also includes projections of margins, revenues, and service over a 10-year period, and the expected payback time. While no formal thresholds are applied, projects with a strong ROI and a payback time under 10 years are typically pursued. However, decisions are not based solely on financial metrics; some projects are initiated due to factors such as obsolescence, compliance, quality, or strategy. In cases where quantification is challenging, soft values become more prominent in the evaluation. Although PPM emphasizes using the CBA, its perceived accuracy was viewed more cautiously by others.

> CBAs are often overly optimistic, for instance regarding expected sales. It is natural that it turns out that way, otherwise the concepts would not get approved as projects. It is probably more the rule than the exception that CBAs overestimate reality. (R&D 5)

In general, the PPC meeting maintains a constructive tone and allows for varying perspectives. Decisions are made collectively by the 10–15 participants attending the meeting. After the meeting, Meeting Minutes (MM) are sent out, which formally document key decisions, participants, and outcomes of the meeting.

4.2.3. SteerCo Meeting

The SteerCo meeting occurs quarterly, is attended by the business unit managers, including functional managers from all three units, and is chaired by a middle manager of R&D. The agenda is standard, although additions can be made, and the 2-hour-long

[6] Projects with larger feasibility studies are decided upon in SteerCo.

meeting begins by reviewing actions from the previous SteerCo meeting. SteerCo meetings are mainly for projects in the NPD phase given that the meetings serve to make TG decisions, raise risks, and update on delays and scope creep for projects after TG2 to TG5. However, projects with larger feasibility studies are, as part of TG2, also decided upon in SteerCo. As such, SteerCo meetings are still considered a forum which is part of pre-NPD. Decisions are made by the business unit managers, informed by recommendations from lower-level managers. The feasibility study's CBA is also updated at each TG and therefore referenced during all SteerCo meetings. Subsequent versions are compared to the initial CBA to identify any deviations and their underlying causes. Besides feasibility studies and CBAs, project budgets are also reviewed during SteerCo meetings to assess their status in relation to the initial forecast.

The SteerCo meeting tends to generate the most debate and disagreement among the forums, largely due to their broad scope. Thus, the material is distributed in advance to promote alignment between R&D, Sales, and PPM, thereby facilitating a more efficient meeting.

> Despite our differing views, open discussions are always encouraged. (PPM 2)

4.2.4. Innovation Forum Meeting

At the end of each quarter, the IF meeting is held. PPM leads the 1.5-hour meeting, which R&D, but not Sales, also attends. The IF meeting serves a proactive planning function and aims to capture early-stage concepts, thereby potentially influencing the strategy. Ideas, typically lacking proof-of-concept and with low technical readiness, are discussed during the meeting as part of the PP roadmap review. The PP roadmap reflects higher organizational strategy and is set by PPM. It serves as a long-term planning tool, outlining project prioritizations across a decade. The PP roadmap is not limited to pre-NPD projects but also encompasses projects across the full product lifecycle, including NPD and EPD. The PP roadmap integrates C&A's technological outlook with PPM's long-term market planning, whilst ensuring alignment with the overarching divisional strategy.

> The PP roadmap enables us to look at our portfolio from both sides—where we need new technologies, and which technologies are promising. (PPM 2)

However, confusion around the PP roadmap still exists. During the IF meeting, participants expressed uncertainty about who is responsible for what, what the purpose of the roadmap is, and whether they should even call it a roadmap or use one at all.

> We need a roadmap of what a roadmap is. (R&D 3)

4.2.5. PPM & Sales Meeting

Each month, PPM has monthly 1.5-hour meetings with the Sales team of the application area that they are responsible for. Thus, R&D does not partake in these meetings. The meeting has a free agenda and serves as a forum for Sales to gain insight into the PP

roadmap, including the upcoming pipeline and planned or executed product improvements, as they are not attending the IF meetings. Since not all Sales personnel within Life Sciences participate in the SteerCo or PB meetings, PPM also communicates their outcomes and the feasibility plan to them. Additionally, the PPM & Sales meetings allow for PPM to receive updates from Sales on market trends, customer needs, projects with high sales momentum, and feedback on product and portfolio gaps. Topics requiring follow-up are revisited at the subsequent PPM & Sales meeting. The PPM & Sales meetings encourage open discussion and often involve differing perspectives. After the meeting, PPM compiles an idea-collection or adds to the feasibility plan, depending on the concept's level of advancement.

> Some ideas are not fully ready when they are shared, but that is the point—we discuss them together. (Sales 2)

4.2.6. Feasibility Meeting

Once TG1 is approved during the PPC meeting, a feasibility proposal has been developed and the project enters the feasibility stage. At this point, Feasibility meetings are initiated; these do not occur regularly throughout the year but are instead organized on an ad hoc basis as projects transition into this stage. Usually lasting between 0.5 to 1 hour, the meetings occur weekly or bi-weekly depending on the scope of the feasibility study and the number of people involved. Typically, the Feasibility meetings function as coordination forums between PPM and R&D, excluding Sales, to monitor the progress of the feasibility study and to align and discuss results in a stepwise manner. PPM drives the meeting and sets the agenda, which remains flexible. Decisions regarding the design and scope of the feasibility study are made jointly by PPM and R&D. R&D typically guides the technical aspects and PPM's recommendations are more prominent for commercial considerations. While the meeting allows for discussion and clarification, substantial disagreement is uncommon.

> We tend to think alike in these meetings and they are more about refinement than debate. (R&D 2)

4.2.7. Booster Meeting

The Booster meeting is a 1-hour ad hoc meeting designed as a focused extension of the IF meeting, centered around a specific topic. Accordingly, the agenda is flexible, and open discussions welcome diverse perspectives.

> Everyone brings a different view, and that is the point—it sets the stage for deeper discussions. (PPM 1)

For instance, the Booster meeting may address which new concepts are considered promising and should be prioritized for future innovation efforts. The meeting may conclude with an assessment of the concepts' maturity and potential application. After

the meeting, a feasibility proposal may be initiated, or C&A may conduct additional work to be revisited once further progress has been made. Such follow-up actions are agreed upon collectively by the participants. Additionally, the PP roadmap and feasibility proposals and studies may be referenced during the meeting when deemed relevant to the discussed topic. Organized by PPM and attended by R&D (mainly C&A), the meeting excludes Sales and typically involves a smaller, topic-relevant group compared to the broader IF meeting.

4.3. Organizational Units' Perspectives on Innovation

The innovation process is fragmented and as previously discussed, co-created by subunits with differing views of innovation. Yet, within each unit, perspectives appeared aligned.

4.3.1. R&D

The R&D unit approaches innovation from a forward-looking and technically driven perspective. R&D's long-term exploratory approach is reflected by them seeking to introduce new technologies that are creating a demand that customers were unaware of, rather than merely responding to the current ones. With an ambition to develop new technologies, the unit has less emphasis on the overall business case. In the case of Tiny, R&D employees viewed its role as central and proactive in initiating and advancing the concept, emphasizing a lack of formal support from other parts of the organization in an early concept phase.

> Despite the lack of initial funding and formal endorsement, the R&D team proceeded to build and test a prototype of Tiny. Once it was in place and demonstrated technical potential, other units became involved. (R&D 2)

However, this forward-leaning stance from R&D was not without friction. In several cases, R&D expressed frustration that financial constraints or commercial risk aversion could delay, or even halt innovation efforts. There was a sense that long-term ambitions were often overridden by short-term pipeline priorities.

> The pipeline is full of things that just have to be done, such as fixing quality issues on existing products or finishing late-stage NPD projects that were not properly completed. There is no room for new concepts. (R&D 5)

R&D acknowledged that pushing innovation within the organization can be difficult, especially given SupplyCo's stable financial performance. Without pressure from competitors or senior management, efforts to pursue innovation were often dependent on R&D's willingness to pursue new initiatives. While management support varied over time, R&D expressed concern that there was no consistent strategy or ownership for guiding innovation efforts within the company.

> There might be a strategy on paper, but it does not guide us in concept or application development, we have had to define that ourselves. Things only seem to move when a competitor does something or a new manager comes in. Otherwise, innovation is not prioritized. (R&D 3)

Further, R&D were optimistic about Tiny's potential. They noted that customer reactions to the prototype had been positive, especially regarding its scalability potential. The ability to test at a small scale and use the same separation technique across other separators was seen as especially important for potential customers. Interviewees noted that this could open up new markets and lower adoption barriers of larger separators.

> Tiny is a great entry point—small, portable, and easy to bring into shared labs. Customers really like the scalability, and it opens doors to new markets. It is already getting a lot of interest. (R&D 4)

4.3.2. Sales

Sales expressed a strong and consistent customer orientation, with a focus on identifying immediate commercial value and usability, describing their primary role as understanding what customers want today. While there is some recognition that long-term orientation is necessary, Sales tends to prioritize immediate sales potential and meeting actual near-term customer needs, particularly when viewing the attractiveness of new concepts, such as Tiny.

> If you ask a salesperson how SupplyCo could improve its products or introduce something new, Sales are often thinking, "What would help me sell something next year?" (Sales 5)

> When I moved from R&D to Sales, I saw that many customer needs are actually quite simple. But R&D often overcomplicates things; if you ask them to fix a light switch, they might redesign the entire electrical system. (Sales 3)

Besides meeting customer needs, Sales emphasized the importance of a business case. For Tiny, several Sales employees questioned where the quantified business case for Tiny lies, pointing out that even if customers express interest, that interest does not automatically translate into purchase commitments.

> It is not enough that customers say they like it—where is the business case for Tiny? Where is it clearly quantified? Unless there is a commitment to actual volumes or long-term uptake, interest alone does not mean much. (Sales 1)

Ease of use is another recurring theme in Sales' view of Tiny. Sales employees were concerned that overly complex features or unnecessary technical sophistication could hinder customer adoption. Some Sales representatives, drawing on past experiences, noted that high-performing but difficult-to-use products often resulted in claims and dissatisfaction, which could damage customer trust and the company's reputation. This was also true for products that were commercialised before sufficient technical maturity.

> Other separators were brought to market before they were fully ready, and that led to a number of customer claims. That experience may explain why we have been more hesitant about Tiny, as we are wary of repeating past mistakes with products that are not yet mature enough for reliable use. (Sales 2)

Sales consistently described themselves as having more direct and frequent contact with customers than other units. This proximity to the customer creates a sense of superior understanding of customer needs and sometimes leads to skepticism toward R&D and PPM, which are perceived as more detached from customer realities.

> No one understands the customer better than a good Sales representative. I see myself as the quarterback in the information flow, constantly in touch with the field. (Sales 4)

4.3.3. PPM

PPM approaches innovation with a focus on commercial potential, strategic fit, and internal capabilities. Rather than driving technical development or managing customer accounts directly, PPM takes a broader commercial view, concentrating on how new concepts fit within the existing portfolio and align with the company's strategic and financial goals. As such, the unit should employ a broader perspective by combining its own lens with those of other units. With regards to Tiny, PPM employees viewed it as a strategically valuable addition to the portfolio, however, its direct commercial potential was seen as limited.

> Tiny serves as an entry point for customers to consider our separator technology at a larger scale. That argument I fully support. But I do not believe that Tiny will necessarily generate substantial commercial upside as a product. (PPM 2)

Although PPM recognized Tiny's strategic potential, its launch was not considered urgent. This position was underpinned by external and internal considerations. Externally, the absence of perceived market urgency contributed to the view that delaying Tiny would not cause SupplyCo to lose significant market position or. Internally, the decision was influenced by factors beyond commercial potential, including broader portfolio dynamics and resource limitations. Tiny had to be evaluated alongside other ongoing projects, including within EPD, which necessitated a careful balancing of priorities across the pipeline. In addition, PPM emphasized that their role was not to base product decisions solely on customer preferences as expressed today, but rather to act as long-term portfolio stewards, assessing how concepts align with anticipated market developments and internal strategic priorities.

PPM also emphasized the importance of considering supply chain structures already at the concept stage. They noted that concepts relying on components outside the company's existing supply base often require redesign and adjustment, adding time and complexity to the development process. As such, alignment with the company's existing supply chain was seen as a key consideration.

Additionally, PPM's role required ongoing navigation between R&D and Sales. They described their role as unpopular, characterizing it as one where they often had to decline proposals from both units. This stemmed from the need to manage trade-offs, mediating between R&D's technically driven proposals and Sales' emphasis on revenue potential. Their position involved constantly managing tensions between short-term and long-term priorities.

> Everyone hates PPM—Sales think that we are not supporting their needs because we spend money on things like Tiny, which they do not see as big money. And R&D gets frustrated when we have to slow down their cool, innovative ideas, even though customers do not always want the most fancy solutions. (PPM 1)

5. Analysis and Discussion

This section analyzes and discusses the empirical findings. By contrasting the analysis to previous literature on accounting and innovation, we firstly discuss that the innovation process is fragmented, with subcultural differences in how innovation is viewed. Second, we elaborate on how MCS can coordinate divergent views on innovation across organizational subunits by highly emphasizing diagnostic and interactive controls. Third, a conceptual framework is proposed to deepen insights into the recursive dynamic between diagnostic and interactive controls and trading zones.

5.1. Innovation is a Co-created, but Fragmented Process, of Differing Subcultural Perspectives on Innovation

While some prior studies acknowledge the challenges of aligning different functional units (e.g. Jørgensen & Messner, 2009), they often treat innovation as a cohesive, firm-level process (e.g., Bisbe & Malagueño, 2009) rather than examining how distinct subunits shape it. In contrast, our findings reveal a more fragmented reality, similar to Håkansson and Lind's (2004) depiction of complexity in interorganizational development contexts, but in an intra-organizational setting. Drawing on our study of SupplyCo, we show that while R&D, Sales, and PPM are all actively engaged in the innovation process, innovation emerges through their interactions rather than as a cohesive, firm-level process. Analyzed through our theoretical framework, the empirical findings reveal that these subunits constitute distinct subcultures, each epistemically grounded in different, and at times conflicting, perspectives on innovation. SupplyCo's forums structure cross-functional interactions, but do not necessarily dissolve these underlying epistemic divides. Instead, following Galison's (1997) notion of trading zones, innovation at SupplyCo is shaped through ongoing coordination and interaction between these subunits that maintain distinct perspectives. Thus, while this finding is in line with previous scholars' acknowledgment of organizational complexity in the innovation and development process (e.g., Jørgensen & Messner, 2009; Håkansson & Lind, 2004), it adds the nuance by highlighting the *mutual* efforts and interdependencies between subunits in an intra-organizational setting.

R&D views innovation primarily through a forward-looking, technically driven lens. The development of new technical features is seen as a guiding ambition, while commercial considerations tend to receive less emphasis. This orientation reflects a focus on exploration, experimentation, and long-term technological trajectories. In contrast, Sales view innovation by emphasizing alignment with immediate customer needs, usability, market readiness and commercial viability. Tiny, for instance, was met with skepticism by Sales, who questioned its business case and technical maturity. PPM, positioned between these subunits, mediates between exploratory ambitions and commercial imperatives to effectively balance the product portfolio. PPM recognized Tiny's strategic

value for SupplyCo's long-term positioning but remained cautious due to its limited immediate financial contribution and the broader pipeline constraints. Unlike R&D's forward-looking and technically driven perspective or Sales' focus on near-term customer needs, PPM's interpretation of innovation is contingent on balancing expected future market developments, internal operational constraints, and financial priorities.

These differences illustrate that innovation is not objectively viewed but is actively constructed within, and contested across, organizational subcultures. Each subunit mobilizes different evaluative criteria and time horizons when engaging with innovation concepts such as Tiny. This focus is shaped by, for instance, their roles and responsibilities within the organization and their respective proximity to different sources of uncertainty including technological, market, and organizational. In line with Galison's (1997) findings, these role-based divisions produce differences in innovation perspectives. Thus, what constitutes a promising innovation for one subculture may appear uncertain or marginal from another's standpoint. While Jørgensen and Messner (2009) examine how enabling control systems adapt in response to a shift in product strategy, the tensions observed in our study emerge *without* such a shift. Here, divergent assessments of the prioritization of strategic objectives arise not from an incomplete calculation tool that prompts a shift to informal solutions, but from how subunits view innovation differently based on factors such as their roles. This suggests that even within a stable product strategy, our study shows that the assessment of innovation is filtered through distinct professional lenses. Thus, where Jørgensen and Messner (2009) link evaluation challenges to the introduction of a new product strategy, our findings point to the inherent interpretive fragmentation that may persist even in the absence of strategic change.

5.2. MCS Can Coordinate Divergent Subunit Perspectives on Innovation by Highly Emphasizing Diagnostic and Interactive Controls

5.2.1. Portfolio Board Meeting as an Enforced Trading Zone

The PB meeting is formally open to input from multiple units but remains predominantly structured around hierarchical decision-making. Decision-making authority is concentrated among business unit managers, suggesting a coercive dynamic despite opportunities for open discussion. Although diagnostic tools such as the annual budget for R&D activities establish a common procedural structure, the underlying ways of perceiving innovation still differ across the participating units. Different units retain distinct, heterogenous perspectives on how innovation should be supported, as reflected in expressed dissatisfaction with the rigidity of the budgeting and limited flexibility for new initiatives. Besides the budget, the PB meeting also refers to the CBA. These diagnostic controls are clearly defined and structured, suggesting a high emphasis, serving as a shared framework for discussions. Interactive controls are present through cross-functional dialogue and reviews, yet their impact is limited due to the meeting's

main focus on aligning around pre-set plans rather than dynamically questioning assumptions or rethinking strategic uncertainties. The lack of a regular follow-up inhibits learning, which reinforces the idea that the meeting is execution-focused rather than adaptation-focused. As such, there is a low emphasis on interactive controls.

The PB meeting resembles an enforced trading zone, characterized by heterogeneous grounds and coercive coordination, where a high emphasis on diagnostic controls and a low emphasis on interactive controls are also observed. Consequently, the PB meeting struggles to coordinate divergent views on innovation across subunits. While joint reviews are intended to function as interactive controls, their emphasis remains low within a hierarchically structured and execution-focused setting, limiting the integration of distinct perspectives into coordinated innovation efforts.

Nixon (1998) highlights how accounting can act as an integrating vernacular to support coordination between participants in product development. At SupplyCo, enforced trading zones similarly rely on accounting-related tools, such as the annual budget for R&D activities and CBA follow-ups, to structure discussions, suggesting a high emphasis on diagnostic controls. However, these tools tend to function more as instruments of hierarchical control than as vehicles for collaboration. Their capacity to support innovation coordination is further limited by the absence of interactive controls aimed at surfacing divergent views and jointly shaping innovation priorities. As such, these meetings do not replicate the communicative and integrative function of accounting described by Nixon (1998), but instead adds nuance to his findings by showing how MCS, when a high emphasis is placed on diagnostic controls but not on interactive controls, can *reinforce* epistemic boundaries *rather* than bridge them. These observations also reinforce Simons' (1995) argument that control systems are most useful when used in balance. While budgets and CBAs offer a shared evaluative framework, their integrative potential is undermined when not complemented by interactive forums that engage actors in navigating strategic uncertainty. In this way, the enforced trading zone at SupplyCo illustrates how an overreliance on diagnostic systems can limit the management of strategic uncertainties.

5.2.2. Product & Portfolio Council Meeting as a Fractionated Trading Zone

The PPC meeting fosters collaboration by bringing together participants from R&D and PPM to collectively conduct concept evaluations, encouraging cross-functional dialogue and input into TG decisions. While PPM formally sets the agenda, the meeting often accommodates a diversity of viewpoints and interpretations, particularly when evaluating the feasibility proposal and the feasibility study. This diversity reflects heterogeneity, as participants draw on divergent perspectives—R&D emphasizing technical aspects, and PPM focusing on strategic fit and market alignment. As such, the PPC meeting exemplifies a fractionated trading zone, where collaboration occurs despite heterogeneity.

We observe that the PPC meeting reflects a relatively low emphasis on diagnostic controls. Although feasibility proposals and feasibility studies are consistently referenced, their evaluative function is weakened by the absence of formal thresholds and the acknowledged variability in how these documents are interpreted. Additionally, decisions are not based solely on financial metrics; some projects are pursued due to reasons such as obsolescence, compliance, quality, or strategic alignment. These ambiguities reduce the ability of these tools to function as shared evaluative benchmarks. The PPC meeting's low emphasis on diagnostic controls limits its ability to channel R&D's technical assessments and PPM's strategic considerations into consistent concept selection criteria, as evaluation remains contingent on case-by-case interpretation rather than guided by transparent, cross-functionally accepted benchmarks. Furthermore, interactive controls, such as collective decision-making practices and the recurring revisiting of prior evaluations, are highly emphasized in the PPC meeting. Additionally, the flexibility in deviating from the agenda and the structured yet open discussions of each concept support ongoing cross-functional engagement.

5.2.3. SteerCo Meeting as a Fractionated Trading Zone

Focusing specifically on the pre-NPD phase and TG2 decisions for projects with larger feasibility studies, the SteerCo meeting at SupplyCo can be interpreted as a fractionated trading zone, characterized by heterogeneity and collaboration. The SteerCo meeting brings together participants from R&D, Sales, and PPM to jointly make decisions on TG2 decisions fostering a highly collaborative environment and encouraging cross-functional dialogue. However, similar to the PPC meeting, the absence of clear thresholds and differing views on validity (e.g. skepticism toward overly optimistic CBAs) lead to heterogeneity, reflecting the diverse perspectives across subunits, especially when some projects are pursued for reasons other than financial ones.

In the SteerCo TG2 meeting, similar to the PPC meeting, the emphasis on interactive controls remains high: actions and evaluations from previous SteerCo meetings are reviewed, enabling continuous adaptation and learning. However, there is a low emphasis on diagnostic controls: feasibility studies and their CBAs are used, yet evaluation occurs on an ambiguous, case-by-case basis rather than through shared evaluative benchmarks. As a result, the SteerCo meeting struggles to coordinate R&D's, Sales', and PPM's divergent views on innovation, as existing mechanisms offer limited opportunities for reinforcing accountability due to the lack of monitoring outcomes against predefined targets.

5.2.4. Innovation Forum Meeting as a Fractionated Trading Zone

The IF meeting at SupplyCo can be classified as a fractionated trading zone, characterized by heterogeneous grounds and a collaborative dynamic. Although the PP roadmap considers both PPM's market planning and C&A's technological outlook, distinct

interpretive frames persist. This is reflected in the confusion around basic elements of the PP roadmap such as its definition, purpose, and activity ownership, which illustrates the enduring heterogeneity between subunits. Still, the meeting demonstrates a collaborative dynamic by bringing together PPM and R&D in a recurring forum designed to surface and jointly shape early-stage innovation ideas, while also providing space for openly expressing uncertainties and disagreements that are not suppressed but actively addressed through dialogue.

We view the emphasis on diagnostic controls in the IF meeting as low, as interpretations of the PP roadmap's role are divergent and stable evaluative criteria for early-stage ideas are absent. This limits its ability to coordinate PPM's and C&A's divergent views on innovation, as the persistent ambiguity surrounding the PP roadmap signals that these views are exchanged but not yet productively coordinated into a shared innovation direction. In contrast, the emphasis on interactive controls is high: the IF meeting provides a forum for proactive dialogue aimed at capturing early-stage concepts and adjusting strategic priorities through discussions rather than rigid assessments.

5.2.5. PPM & Sales Meeting as a Fractionated Trading Zone

The PPM & Sales meeting at SupplyCo brings together two distinct perspectives: PPM's long-term strategic planning and Sales' current customer-facing market knowledge. These differing focuses and time horizons reflect the heterogeneous grounds underpinning the PPM & Sales meeting. Nonetheless, meetings are characterized by a free agenda that encourages open dialogue and iterative revisiting of topics, enabling participants to surface divergent views without hierarchical imposition, which fosters a collaborative dynamic. Reflecting these dynamics, the PPM & Sales meetings are classified as a fractionated trading zone.

The open format of the PPM & Sales meeting suggests a high emphasis on interactive controls, as the meetings function as iterative forums for capturing market intelligence, adjusting strategic priorities, and managing strategic uncertainties through dialogue. In contrast, emphasis on diagnostic controls remains low, as discussions lack standardized evaluative frameworks and are not governed by rigid assessment criteria. The low emphasis on diagnostic controls constrains the meeting's ability to translate divergent views into a coordinated innovation direction, as the absence of evaluative structures leaves integration of perspectives contingent on dialogue rather than anchored in shared reference points.

5.2.6. Feasibility Meeting as an Inter-language Trading Zone

Once a project passes TG1, ad hoc feasibility meetings between PPM and R&D are initiated to monitor and align on feasibility study progress. The meetings are characterized by collaboration and joint decision-making between all parties involved. Rather than relying on top-down directives, the meetings are structured to allow mutual discussion

between all participants. Disagreements around purpose and methods are described as rare, which reflects shared priorities and approaches, contributing to homogeneity.

Diagnostic controls are clear, structured around explicitly agreed technical milestones, timelines and commercial considerations articulated in the feasibility study. This reflects a high level of emphasis on diagnostic controls and ensures a shared evaluative ground between PPM and R&D. Interactive controls are also highly emphasized: frequent meetings and flexible agendas support continuous learning and iterative adjustments. While the scope is limited to an already approved concept, the format enables open discussion, joint decision-making, and collaborative problem-solving between PPM and R&D, allowing emerging uncertainties to be addressed as they arise.

Feasibility meetings represent an inter-language trading zone, which is characterized by homogeneity and collaboration. In these meetings, MCS serve not only to monitor project progress but also to actively facilitate innovation progress through structured yet dynamic cross-functional collaboration. Thus, by designing *highly* emphasized diagnostic and interactive control systems, the inter-language trading zone stands out as the only forum in which MCS can coordinate divergent subunit views on innovation. This finding resonates with that of Nixon (1998), elaborating on how accounting can support the coordination of many disparate activities in product development. In his case, tools such as target costing assisted communication, built consensus, and coordinated diverse actors. Similarly, in the Feasibility meeting, it is the combination of a high emphasis on diagnostic and interactive controls that enables MCS to perform a comparable integrative function. This suggests that under the right conditions, MCS also can coordinate diverse views on innovation. However, in the other trading zones, where either diagnostic or interactive control emphasis is low, MCS do not achieve this coordinating function, and divergent views on innovation are not bridged.

5.2.7. Booster Meeting as a Fractionated Trading Zone

The Booster meeting is designed for creative exploration focusing on thematic innovation opportunities identified within the application areas, evaluating promising concepts for future development. The meeting reflects heterogeneity as participants approach innovation from different perspectives such as R&D's focus on the technical aspects, and PPM's emphasis on portfolio fit, which highlights divergent views on innovation. Despite these differing perspectives, collaboration remains high where the format allows for open dialogue, exploration of emerging ideas, and collective prioritization without rigid evaluation structures.

Diagnostic controls are largely absent during Booster meetings, thus its emphasis is low. Assessments of concept maturity are informal, lack standardized criteria, and are not used for systematic monitoring, making them loosely defined. While references to the PP roadmap or feasibility proposals may arise, they serve as optional inputs rather than

structuring the discussion. Instead, the emphasis on interactive controls is high, with cross-functional discussions allowing participants to explore early-stage ideas.

Accordingly, the Booster meeting aligns best with a fractionated trading zone. While this format is beneficial for fostering creative ideas, the absence of a high emphasis on diagnostic controls highlights the need for later formalization to ensure that promising concepts can be translated into structured innovation initiatives with coordinated views. All SupplyCo's meetings classified as fractionated trading zones foster cross-functional engagement through a high emphasis on interactive controls. However, the low emphasis on diagnostic controls, such as clearly defined budgets and CBAs, limits the ability of MCS to translate discussions into coordinated concept evaluations. This lack of shared evaluative structures constrains the meetings' capacity to systematically reconcile divergent perspectives. In this way, our findings add nuance to Nixon's (1998) finding that accounting can support integration across the organization by providing a context for evaluating innovation. Thus, these meetings show that in the absence of such frameworks, MCS lack the ability to perform the coordinating function that Nixon (1998) describes, *falling short* in managing strategic uncertainties present in innovation settings.

5.3. There is a Recursive Dynamic Between Diagnostic and Interactive Control Systems and Trading Zones

Based on our empirical findings, each identified trading zone was associated with a distinct emphasis on diagnostic and interactive control systems, which appeared to correspond to the groups' degree of collaboration and homogeneity. The fractionated trading zones observed in the PPC meeting, SteerCo meeting, IF meeting, PPM & Sales meeting, and the Booster meeting, were consistently characterized by a low emphasis on diagnostic controls and a high emphasis on interactive controls. For example, in the PPC and SteerCo meetings, feasibility studies and their CBAs were referenced but interpreted differently, while the Booster meeting, PPM & Sales meeting and IF meeting lacked formal and standardized evaluation criteria altogether. In contrast, interactive controls were highly emphasized across these meetings through, for example, open dialogue, iterative learning, and collective decision-making, even when epistemic differences remained unresolved. The interlanguage trading zone, observed in the Feasibility meeting, was marked by a high emphasis on both diagnostic and interactive controls, as seen in the use of clearly defined technical milestones and timelines alongside frequent meetings, flexible agendas, and joint decision-making. Lastly, the enforced trading zone, observed in the PB meeting, displayed a high emphasis on diagnostic controls, such as budgets and CBAs, and a low emphasis on interactive controls, as cross-functional dialogue and reviews were limited by hierarchical decision-making and an execution-focused agenda.

These observations suggest a potential relationship between the trading zone and the level of emphasis placed on diagnostic and interactive controls. While the empirics indicate a

correlation between trading zone type and control system emphasis, they do not establish the direction of the causality. On the one hand, each of the identified trading zones were associated with a certain level of emphasis on diagnostic and interactive control systems depending on the groups' degree of collaboration and homogeneity. Notably, the inter-language trading zone was characterized by high emphasis on both forms of control. On the other hand, our empirics could also indicate that a certain emphasis on these control systems correspond with the emergence of a particular type of trading zone. That is, the design of these control systems would have the potential to shift a meeting from one type of trading zone to another. This would imply that, for example, when highly emphasizing diagnostic and interactive controls, the innovation process would be supported by structure and cross-functional collaboration, leading to an inter-language trading zone. This points to a *recursive dynamic* between diagnostic and interactive control systems and the emergence of different trading zones. Thus, accounting can function both as a *reflection* of the level of control system emphasis in a certain trading zone, and as an *engine* (Revellino & Mouritsen, 2015) that enables movement between trading zones through different emphasis on diagnostic and interactive control systems. Based on this recursive finding, a conceptual framework has been developed (see Figure 5).

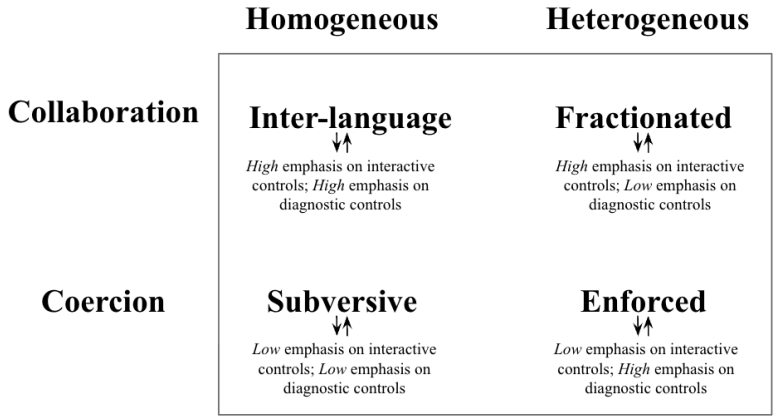


Figure 5. Illustration of the Authors' Conceptual Framework. Adapted from Collins et al.'s (2007) and Simons (1995).

In the fractionated trading zone, groups retain distinct perspectives but engage in collaborative dialogue to manage these differences. The emphasis on interactive controls is high: mutual dialogue allows for coordination across subunits despite heterogeneity. However, the emphasis on diagnostic controls is low, limiting the ability to coordinate or systematically evaluate concepts. The recursive dynamic implies that a fractionated trading zone enables the use of interactive controls to support collaboration despite heterogeneity. However, the low emphasis on diagnostic controls reinforces fragmented tool use, which in turn sustains divergence that cannot be bridged.

In the enforced trading zone, epistemic differences persist, and coordination is largely imposed through hierarchically structured diagnostic controls. The emphasis on interactive controls is limited, and collaboration is weak. Although control systems

provide structure, their top-down implementation often results in superficial compliance. The recursive dynamic implies that an enforced trading zone enables the use of diagnostic controls to coordinate, but a low emphasis on interactive controls reinforces hierarchical dynamics and prevents collaboration, limiting bridging of epistemic boundaries.

The inter-language trading zone reflects a homogeneous and collaborative environment, where different subunits collaborate around a shared interpretive framework. Both diagnostic and interactive control systems are highly emphasized: diagnostic controls provide structure, shared milestones, and evaluative clarity, while interactive controls foster continuous dialogue, learning, and adaptation. The recursive dynamic implies that an inter-language trading zone enables effective use of both controls, and the repeated use of these controls reinforces the inter-language trading zone.

Lastly, the subversive trading zone is characterized by heterogeneity and coercion. Although the empirics did not point to a subversive trading zone for any of SupplyCo's meetings, there is a reason to believe that neither diagnostic nor interactive controls would be highly emphasized, resulting in disengaged participants and lack of accountability. The recursive dynamic would imply that the low emphasis on diagnostic and interactive controls reinforces epistemic fragmentation and low collaboration. In turn, this inhibits the emergence of shared tools or mutual dialogue, thereby remaining in the subversive trading zone.

The inter-language trading zone is the only one which coordinates divergent subunit views on innovation. This finding is in contrast to Bisbe and Otley's (2004) conclusion that interactive controls do not favor innovation in high-innovative firms—a category into which SupplyCo falls. Following Bisbe and Otley's (2004) reasoning, forums would better promote innovation if they were situated within either a subversive or an enforced trading zone, where the emphasis on interactive control is low according to our conceptual framework. Yet, the framework suggests that these trading zones are suboptimal due to their limited dialogue and mutual exchange between subunits. It should be noted, however, that while Bisbe and Otley (2004) focus on interactive control systems, we examine both diagnostic and interactive control systems. This might help explain our contrasting findings to Bisbe and Otley (2004). Specifically, our findings make it reasonable for us to believe that there is a recursive dynamic in which specific control profiles both shape and are shaped by trading zones. Bisbe and Otley (2004), instead, view the relationship between interactive controls and innovation as direct. Furthermore, while Bedford (2015) highlights the importance of diagnostic and interactive control systems for balancing exploration and exploitation, our study adds nuance by suggesting that a high emphasis on both forms of control not only supports the emergence of an inter-language trading zone, but is also made possible by it. This points to a recursive dynamic in which the design and use of control systems and the type of trading zone enables and reinforces each other. In doing so, our study extends Bedford's (2015) contribution by

proposing how the combined use of diagnostic and interactive controls does more than manage competing innovation priorities when their emphasis is high.

6. Conclusion

The purpose of this study has been to examine how accounting can be used to create cross-functional coordination and shape innovation processes, while also providing a more contextually grounded understanding of how different MCS function in different organizational forums. Through a synthesis of the existing accounting and innovation literature, we draw on Galison's (1997) concept of trading zones, extended by Collins et al. (2007) and combine this with Simons' (1995) LOC to answer our research question: *How are MCS designed and used to facilitate coordination of innovation across subunits in an MNC?*

First, we find that rather than being a cohesive, firm-level process, innovation at SupplyCo is a co-created yet fragmented process shaped by the divergent perspectives of R&D, Sales, and PPM. Each subunit brings its own innovation view: R&D approaches innovation from a forward-looking, technically driven perspective, Sales focuses on immediate market needs and commercial viability, and PPM acts as a mediator, balancing these exploratory ambitions and commercial imperatives. These divergent perspectives stem from distinct subcultural logics shaped by, for instance, their roles. Drawing on Galison's (1997) notion of trading zones, we show that innovation emerges through cross-functional coordination within structured forums that enable interaction without fully resolving these epistemic divides. As seen in the case of Tiny, what is viewed as promising by one subunit may appear marginal to another. Unlike Jørgensen & Messner, (2009) that attribute evaluation challenges to incomplete calculation tools due to a shift in product strategy, our findings suggest that such tensions are inherent even without such a shift. Thus, the innovation process at SupplyCo is understood as ongoing coordination among organizational subcultures.

Secondly, at SupplyCo, MCS play a central role in coordinating divergent views on innovation across organizational subunits by highly emphasizing diagnostic and interactive controls. This finding contributes to answering our aforementioned research question. The inter-language trading zone is where MCS successfully coordinate subunit perspectives on innovation, achieved through a combination of highly emphasized diagnostic controls and interactive controls. This finding is in line with Nixon (1998), arguing that accounting tools can coordinate diverse actors in product development. However, in trading zones where there is a low emphasis on either diagnostic or interactive controls, MCS cannot fulfill their integrative function in managing divergent perspectives on innovation, adding nuance to Nixon (1998). For example, in fractionated trading zones, cross-functional dialogue is fostered through a high emphasis on interactive controls, aligning with Simons' (1995) view that such controls support learning under strategic uncertainty. However, the low emphasis on diagnostic controls limits MCS' ability to translate dialogue into coordinated innovation efforts. Furthermore, in enforced trading zones, accounting tools function more as instruments of hierarchical

control than collaboration. Without a high emphasis on interactive controls, divergent views are not surfaced, and innovation priorities are not jointly shaped, thereby reinforcing epistemic boundaries rather than bridging them.

Third, we suggest a recursive dynamic between diagnostic and interactive control systems and trading zones. On the one hand, we propose that certain emphasis on these control systems correspond with the emergence of a particular type of trading zone. Each trading zone is shaped by the level of emphasis on diagnostic and interactive control systems, which in turn reflects the degree of collaboration and homogeneity across groups. On the other hand, we suggest that the specific configuration of these control systems can actively influence and give rise to particular types of trading zones, similarly to how Revellino and Mouritsen (2015) describe accounting as an engine. While Bedford (2015) highlights diagnostic and interactive control systems as important in balancing exploration and exploitation, we propose that a high emphasis on both not only enables but is also enabled in inter-language trading zones. This suggests a recursive dynamic, whilst Bisbe and Otley (2004) instead view the relationship between interactive control and innovation as direct, arguing that the innovation of high-innovating firms' is not favored by interactive controls.

The aforementioned findings are subject to certain limitations. First, it should be noted that the study is grounded in a specific organizational context, limiting generalizability. For example, our analysis centers around the architectural innovation Tiny, which means that other types of innovation may involve different dynamics and yield alternative insights. Furthermore, our ability to observe meetings directly was limited to the IF meeting; for other forums, insights were derived solely from interviews due to restricted access. Nonetheless, we conducted a substantial number of interviews with key participants to develop a robust understanding of these meetings. Finally, our analysis considers formal meetings in SupplyCo's pre-NPD phase, yet informal interactions and coordinating mechanisms likely also play a role in shaping the innovation process.

Future research within accounting and innovation could for example explore how the recursive dynamic between diagnostic and interactive control systems and trading zones unfolds over time. Longitudinal studies might reveal how shifts in business dynamics alter the degree of collaboration and homogeneity, or, alternatively, how changes in the level of emphasis on diagnostic or interactive controls contribute to a shift in trading zones. Additionally, research could explore different organizational contexts to assess the broader applicability of these findings. Comparative studies across firms, industries, or innovation types would help evaluate the generalizability of our findings. Lastly, applying the trading zone lens to different innovation phases could offer insights into how MCS adapt across the broader innovation lifecycle.

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8. Appendices

8.1. Appendix A: Usage of AI in Thesis Writing

AI was not used for data collection or analytical reasoning in this thesis. Instead, it supported language refinement and interview transcription. ChatGPT was used to support language clarity and structural coherence, allowing us to focus more fully on interpreting the findings. However, all analytical insights remain entirely our own. Aware of the data protection risks involved in using third-party platforms, we anonymized transcripts before uploading them. These measures allowed us to benefit from AI-assisted language enhancement without compromising the privacy or integrity of the data.

For interview recording and transcription, we used Circleback, which allowed both authors to be fully engaged during conversations. Circleback was chosen for its strong data security standards—it is SOC 2 Type II and HIPAA-compliant, aligned with the EU-U.S. Data Privacy Framework, and uses encryption protocols for data at rest and in transit. It also does not use customer data for model training. Additionally, the data was stored only in the tool and not shared with any other services. Besides data security risk, transcription accuracy risk was identified with using Circleback. To mitigate this and verify the empirics, we cross-checked all quotes and empirical excerpts against relevant parts of the original recordings of the interviews.

8.2. Appendix B: Overview of Interviews and Weekly Conversations

Overview of interviews

#	Interviewee role, Division	Company	Date	Duration
1	Industrial Phd Student, R&D	SupplyCo	6/2-25	59 min
2	Program Director Life Science, R&D	SupplyCo	10/2-25	45 min
3	Concept Manager, R&D	SupplyCo	12/2-25	1 h 10 min
4	Application Developer, R&D	SupplyCo	13/2-25	58 min
5	Chief Technical Advisor, R&D	SupplyCo	13/2-25	57 min
6	Quality Manager Specialist, Quality	SupplyCo	13/2-25	37 min
7	Product and Portfolio Manager, PPM	SupplyCo	13/2-25	58 min
8	Program Director Life Science, R&D	SupplyCo	14/2-25	36 min
9	Manager Marketing & Business Intelligence, Marketing	SupplyCo	14/2-25	57 min
10	Regional Sales Manager, Sales	SupplyCo	17/2-25	28 min
11	Global sales manager, Sales	SupplyCo	18/2-25	54 min
12	Global sales manager, Sales	SupplyCo	18/2-25	45 min
13	Chief Engineer, R&D	SupplyCo	21/2-25	57 min
14	Regional Sales Manager, Sales	SupplyCo	4/3-25	46 min
15	Business Unit Manager	SupplyCo	5/3-25	56 min
16	New Technology Manager	CustomerCo 1	6/3-25	46 min
17	Area Sales Manager, Sales	SupplyCo	6/3-25	26 min
18	Vice President Next-Generation Food	SupplyCo	6/3-25	39 min
19	Chief Technical Advisor, R&D	SupplyCo	6/3-25	55 min
20	Vice President and Head of PPM, PPM	SupplyCo	6/3-25	58 min
21	Principal Scientist CMC Development	CustomerCo 2	20/3-25	25 min
22	Chief Technology Officer	CustomerCo 3	20/3-25	27 min
23	Regional Sales Manager, Sales	SupplyCo	21/3-25	29 min
24	Product and Portfolio Manager, PPM	SupplyCo	16/4-25	1 h 37 min

Weekly conversations

#	Role	Company	Date	Duration
1	Contact person	SupplyCo	31/1-25	30 min
2	Contact person	SupplyCo	7/2-25	30 min
3	Contact person	SupplyCo	14/2-25	30 min
4	Contact person	SupplyCo	21/2-25	30 min
5	Contact person	SupplyCo	28/2-25	30 min
6	Contact person	SupplyCo	7/3-25	30 min
7	Contact person	SupplyCo	21/3-25	30 min
8	Contact person	SupplyCo	2/5-25	30 min

8.3. Appendix C: Site Visits and Informal Interviews

#	Focus	Session Date	Length
1	Introduction to AL	17/12-24	45 min
2	Introduction to separator unit	27/12-24	45 min
3	In-depth presentation of separators	3/1-25	45 min
4	Collaboration meeting	9/1-25	60 min
5	Introduction MISUM	15/1-25	3 h 30 min
6	Introductory meeting	30/1-25	1 h 30 min
7	Customer meeting	13/3-25	4 h 30 min
8	Observation Innovation Forum (Q1-2025)	25/3-25	1 h 30 min
9	Half-way presentation	26/3-25	2 h