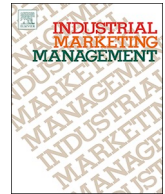




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Institutional means-ends decoupling work in industrial R&D project implementation

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ABSTRACT

Managing goals is a key network management function and is critical in the implementation of industrial R&D projects. In this paper, we explore the implementation of an industrial R&D project, focusing in particular upon the role of means-ends decoupling work to understand how the goals are managed. We combine several data sources in our case research to explore project implementation through an understanding of means-ends decoupling work. We collected in-depth interviews, archival records and field observations within the R&D research setting of an industrial R&D project in the period of 2015 to 2017. Our findings identify three types of means-ends decoupling work in R&D project implementation: 'work on' causal complexity, 'work at' behavioural invisibility, and 'work with' practice multiplicity. In addition, we uncover six dynamic micro-mechanisms that collectively influence the making and nature of means-ends decoupling work and therefore serve to allow for the fluid switching of work as the institutional conditions permit. Overall, our findings have significant implications for understanding means-ends decoupling as a highly skilled network competence for managing R&D project implementation goals.

1. Introduction

Industrial research and development (R&D) projects are intentionally created business networks. Such networks are defined as goal-oriented, value-creating systems (Matinheikki, Artto, Peltokorpi, & Rajala, 2016; Medlin & Törnroos, 2014; Möller & Rajala, 2007). These business networks require managers to mobilize or influence a wide range of industrial R&D actors through relationships to achieve goals (Aarikka-Stenroos, Jaakkola, Harrison, & Mäkitalo-Keinonen, 2017; Mouzas & Naudé, 2007). However, industrial R&D projects often require multi-sectoral collaboration (Raapersad, Quester, & Troshani, 2010), or involve public and private actors (e.g., Reypens, Lievens, & Blazevic, 2016). Furthermore, an array of R&D market institutions also shape R&D project collaboration, including funding authorities (Perkmann et al., 2013); environmental authorities (Ngugi, Johnsen, & Erdelyi, 2010), as well as project sponsors (Raasch & Hippel, 2013). While the involvement of diverse networks is essential for R&D activity, this also complicates management in terms of different goals, interests and pressures in project implementation (Aarikka-Stenroos et al., 2017; Baraldi & Strömsten, 2009; Matinheikki et al., 2016; Möller & Rajala, 2007; Munksgaard & Medlin, 2014).

The management of goals is a key network function (Järvensivu & Möller, 2009). Industrial marketing studies show that the nature of relationship (e.g. asymmetric) and also the status and position within of networks (e.g. centralised hub firms) shape industrial business goals (Aarikka-Stenroos et al., 2017; Matinheikki et al., 2016; Medlin & Törnroos, 2014). Other extant research points to the influence of implementation on business goals; this is, different actors can implement work in different ways or differently to that which advocates had designed or intended (Leischnig, Ivens, Niersbach, & Pardo, 2017; Rapert, Velliquette, & Garretson, 2002). Prior implementation research has demonstrated that 'implementation gaps' emerge as a result of firms failing to achieve the intended goals. Matinheikki et al., 2016 also find that differing goals result in resistance, inertia and tensions.

In this paper, an institutional perspective is adopted to provide insights into how *the work* of network actors purposefully stretches existing institutional arrangements in order to support their work, while also accommodating different, sometimes competing or contradictory, pressures and goals (DiMaggio & Powell, 1983; Strambach, 2010). In industrial marketing study, increasing recognition of how such pressures and goals are managed through decoupling work is emerging (Newton, Michael, & Collier, 2014; Pressey & Vanharanta, 2016; Yang

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& Su, 2014). Prior research on industrial cartels focuses mostly on symbolic policy decoupling, however (Pressey & Ashton, 2009; Pressey & Vanharanta, 2016; Pressey, Vanharanta, & Gilchrist, 2014), while alternative types of decoupling in business markets remain unexplored and under researched.

Two types of decoupling are commonly identified in the organisational literature (Bromley & Powell, 2012): In policy-practice decoupling, an organization adopts policies to cope with external stakeholder pressures symbolically but does not implement these policies internally; and in means-ends decoupling, an organization adopts and implements the policies but fails to achieve the intended goals. Taking examples from Wijen (2014), a case of policy-practice decoupling may be when an organization adopts a chart of green policies to appear environmental-friendly to an external audience but does not incorporate the policies into its business activities and routines, which leads to a gap between policies and practices. In contrast, a case of means-ends decoupling may be illustrated when an organization adopts and implements the green policies but still fails to reduce its environmental footprint, which then leads to a gap between practices (means) and outcomes (ends). In this study, we argue for the importance of expanding the scope of decoupling from a work approach to understand the ‘social skill’ of working in the implementation gaps and the making of those gaps. In this research, therefore, we focus on means-ends decoupling because, in comparison to the decoupling of policies and practices, the decoupling between firm practices (means) and outcomes (ends) has potentially a more critical impact on firms because it creates causal ambiguity between their actions and performance (Bromley & Powell, 2012; Wijen, 2014, 2015).

The overall question of our study aims to address *how compliant adopters, who follow clear inducements and are provided with sufficient resources, still fail to achieve the intended project goals?* The specific objectives of the paper are twofold: i) to further develop an understanding of the nature of means-ends decoupling work, particularly with reference to an industrial R&D project implementation; ii) to identify how the micro-mechanisms dynamically influence means-ends decoupling work within an industrial R&D project implementation. Investigating this question is important as it seeks to identify some of the inherent, institutionally embedded causes and conditions, which consequently lead to the occurrence of means-ends decoupling within intentionally created business networks. We selected a publicly funded industrial R&D project, which was financed by a national French funding scheme, as the field research setting for our case research. We combined in-depth interviews, archival records, and field observations from 2015 to 2017 as data sources to examine how the allocated resources and prevailing practices used to reach the intended project outcomes have instead resulted in the occurrence of means-ends decoupling.

Prior research has highlighted that discrepancies between firm practices and outcomes occur more frequently in opaque field conditions, not least because such fields that are characterized by a lack of transparent practices, absence of well-defined industry standards, or weak regulative pressures to sanction misconducts (Bromley & Powell, 2012; Crilly, Hansen, & Zollo, 2016; Wijen, 2014). Nowhere is this more evident than in R&D project implementation, where managers and stakeholders have difficulties in ascertaining a clear view of the various conditioning factors between practices and outcomes (Leischnig et al., 2017; Rapert et al., 2002). Furthermore, the industrial Market Studies approach have observed opacity in the emergence and construction of market innovation which blur the institutional view on linkages between practices, causality and performance (Hoholm & Olsen, 2012; Kjellberg & Helgesson, 2006). However, despite some early conceptual studies on theorizing means-ends decoupling (Bromley & Powell, 2012; Wijen, 2014), few, if any, research studies investigate the subtle and incremental ways means-ends decoupling work advances or recedes in order to ensure that their implementation can effectively lead to the intended performance outcomes.

In this study, we contribute to our understanding of the industrial

marketing work in four distinct ways. First, through our institutional decoupling work approach our study points to an understanding of the system-level goals, not as iron cages of work outcomes, but rather as a malleable network resource for accommodating business network diversity and providing the direction, maintenance and stability of R&D business networks (Medlin & Törnroos, 2014). In this regard, we identify three types of institutional means-ends decoupling – ‘work on’ causal complexity, ‘work at’ behavioural invisibility, and ‘work with’ practice multiplicity – which permits network actors to purposefully stretch existing institutional arrangements in order to support their work, while also accommodating different, often competing or contradictory, system-level goal pressures (Aarikka-Stenroos et al., 2017; Matinheikki et al., 2016; Munksgaard & Medlin, 2014).

The second contribution builds on Ritter's (2006) notion that network competences such as task implementation (relationship specific vs. cross relational) in business networks. We demonstrate that there is a high degree of skilled agency required to stretch and accommodate the demands of R&D project implementation. In particular, we identify six distinct micro-mechanisms, which underlie and constitute in their sum the higher-level process drivers of means-ends decoupling work. These six micro-mechanisms collectively influence the occurrence of means-ends decoupling and therefore serve to allow for the fluid switching of work as the institutional conditions permit. Third, despite the importance of R&D project implementation work, most studies focus on marketing strategy implementation at an organisational or individual level of business exchanges. Building on calls to extend the firm as a unit of analysis (Pressey, Gilchrist, & Lenney, 2015; Yang & Su, 2014), our paper extends the industrial marketing literature in relation to an institutional understanding of R&D project implementation gaps (Blomquist & Wilson, 2007; Canhoto, Quinton, Jackson, & Dibb, 2016; Cova & Salle, 2007; Mele, 2011). As such we extend the industrial cartel research on symbolic policy adoption gaps (Pressey et al., 2014; Pressey & Ashton, 2009; Pressey & Vanharanta, 2016) as well as Newton et al. (2014) research on loose coupling. Overall, we shed light on micro-level rather macro-level institutional factors and on means-ends decoupling rather than policy-practice decoupling.

Finally, our study can build upon past market studies research where opacity is a characteristic of the emergence and construction of market innovation (Hoholm & Olsen, 2012; Kjellberg & Helgesson, 2006). Our findings show how such market opacity enables agency where traditional project rules do not always apply, where interplay and instability arise between industrial work and the outcomes of the R&D project. While prior studies often assume that the system goals remain intact, our findings demonstrate instead a high degree of institutional malleability. In sum, our study contributes to both the industrial marketing literature and the institutional theory by delineating how the combination of several micro-mechanisms results in the occurrence of means-ends decoupling work within an industrial R&D project.

2. Theoretical Background

We structured this theoretical background section into three parts. The first part provides an institutional analysis of the key themes on implementation, with particular focus on implementation gap, institutional work and concept of decoupling. In the second part, we elaborate the central tenets of means-ends decoupling and provide a conceptual definition of the micro-mechanisms concept. Finally, we summarise in the third part the key elements of compliance barriers and compliance inducements which are considered in R&D project implementation.

2.1. An institutional analysis of implementation gaps in industrial fields

Managing implementation goals is a key network function (Järvensivu & Möller, 2009). Despite extant research pointing to the importance of implementation on business goals, the current literature

Table 1
Summary of implementation themes relevant to the focus of the study.

Theme	Description and illustrative studies	Implication for implementation goals and gaps
Pressures of implementation	Implementation as a set of changes in the institutional environment. External, internal, outcome pressures. Power and resources (Dibb & Simkin, 2000), legitimacy with customers and stakeholders (Newton et al., 2014).	Gaps in the market, policy and goal alignment and fit. Institutions are rigid and prevent implementation goals. Devise normative solutions, preventing the gaps, or closing them. Existence of competing and contradictory goals. Trade-offs between legitimacy at the expense of efficiency. Questions on how to define success.
Opaque R&D implementation	Types of structures (e.g. new divisions, new projects, new technologies), and change in structures (rules, norms, values) and agency (individual management) across institutional R&D ecosystems (Huikkola et al., 2013; Ngugi et al., 2010; Perkmann et al., 2013; Raasch & Hippel, 2013; Song & Song, 2010; Yao et al., 2014).	Nature of R&D ecosystem influences ‘making the gap’. Formalization leads to more conformity and goal deviance. Lower levels of normative enforcement in high-performing teams. R&D autonomy defines goals and encourages more playfulness.
Institutional work as implementation	Implementation comprises both the highly visible and dramatic and the invisible and mundane, as in the day-to-day adjustments, adaptations and comprises. Implementation as negotiation and bargaining (Pressey et al., 2014; Pressey & Ashton, 2009; Pressey & Vanharanta, 2016), loose coupling (Newton et al., 2014) and decoupling (Yang & Su, 2014).	Institutional gaps are inhabited by individuals. Institutions are elastic and permit the stretching of implementation goals. Stretching of institutional arrangements can accommodate different, sometimes competing or contradictory, pressures and goals. The ‘social skill’ of individuals working in the gaps and the making of those gaps. Institutions are stretched with trade-off in the gap pressures. Decoupling as part of institutional work.

tells us surprisingly little about how multiple organisations can manage implementation goals (Matinheikki et al., 2016). A recent special issue by Möller and Parvinen (2015) on the theme of implementation highlighted several of the major challenges and complexities of achieving goals (Leischnig et al., 2017). Möller and Parvinen (2015), and Leischnig et al. (2017) acknowledge these challenges, indicating that no matter how authoritative system-level goals or idiosyncratic goals are, these can be ‘challenged’ through day-to-day assaults on their validity (Matinheikki et al., 2016; Medlin & Törnroos, 2014; Möller & Rajala, 2007). In Table 1, we have summarized the three essential theoretical themes and their key arguments regarding the implementation.

One explanation for this complexity relates to the rigid properties of institutions and how that does not always correspond well with the demands of implementation change. This rigidity is observable in studies on task and relational conflict in industrial buyer-seller relationships (Hingley, 2005) and non-compliance toward specific rules of exchange (Bello, Lohtia, & Sangtani, 2004). Here, the industrial marketing literature mostly views institutional environments (e.g. rules and regulations as well as social discourses about network roles and functions) as a set of barriers or obstacles to navigate in the adoption of new policy, technology or marketing initiative (Dibb, 1999; Dibb & Simkin, 1994; Leischnig et al., 2017). The challenge with this conception is that it focuses on the outcome of ineffective implementation, where goals are framed as achieved or not (Aarikka-Stenroos et al., 2017; Matinheikki et al., 2016). Whenever implementation goals are not achieved, therefore, research assumes the emergence of implementation gaps (Leischnig et al., 2017).

Business networks require managers to mobilize or influence a wide range of industrial R&D actors through relationships to achieve goals (Aarikka-Stenroos et al., 2017; Matinheikki et al., 2016). Through relationships, social entities must be seen to be conforming to the norms and behavioural expectations to gain resources and the necessary legitimacy for survival (Newton et al., 2014). However, as Newton et al. (2014) note, this quest for legitimacy is often at the expense of efficiency and this trade-off can give rise to tensions in the demands made within or between social entities. Unlike institutional rigidity, recent research suggests existing institutional arrangements which can accommodate different, sometimes competing or contradictory, pressures and goals (DiMaggio & Powell, 1983; Strambach, 2010). This property of institutions – plasticity – is much less considered in industrial marketing. Strambach (2010) suggests that plasticity is the result of the

work of actors that purposefully recombine and convert or reinterpret institutions for their new objectives or goals. Recently, neoinstitutional approaches have begun to ‘zoom in’ on what people actually do in institutions – the ‘intelligent, situated institutional action’ (Lawrence & Suddaby, 2006: 219). This focus on work reverses the emphasis of how institutions govern action by exploring how actions affect institutions, especially the practical actions by which institutions are created, maintained and disrupted (Lawrence, Leca, & Zilber, 2013). To that end, Berk and Galvan (2009) argue that institutions should not be viewed as large systems that structure outcome, but as packets of practice that can be shuffled, rearranged, changed, or used habitually under different conditions.

This institutional work perspective brings a more relational ontology to intentionally created business networks (i.e. R&D projects), one that flattens out implementation goals belonging to one group of actors (e.g. marketing department) and considers agency distributed across a range of actors (e.g. R&D project implementation), and across a network of organisational forms or incentive systems within the overarching institutional system (DiMaggio & Powell, 1983; Huikkola, Ylimäki, & Kohtamäki, 2013; Song & Song, 2010; Yao, Xu, Song, Jiang, & Zhang, 2014). Reflecting this, industrial studies have shown how R&D implementation goals can be influenced by multi-sectoral collaboration (Raapersad et al., 2010), public and private logics (Reypens et al., 2016), R&D funding authorities (Perkmann et al., 2013); environmental authorities (Ngugi et al., 2010), as well as project sponsors (Raasch & Hippel, 2013). While the involvement of diverse networks is essential for R&D activity, this also complicates management in terms of different goals, interests and pressures in project implementation (Aarikka-Stenroos et al., 2017; Baraldi & Strömsten, 2009; Matinheikki et al., 2016; Möller & Rajala, 2007; Munksgaard & Medlin, 2014).

Firms have different ways of dealing with the pressures of diverse network R&D activity and directing institutionally expected ‘allowed’ behaviour, for instance, setting up new divisions or projects (e.g. Skunkworks, R&D projects), and/or by adopting a new technology. These organisational structures can place familiar R&D actors in roles that will fit the institutional arrangement in order to facilitate implementation goals. However, increasing formalization of the R&D process by introducing more rules and regulations and stricter monitoring of R&D work can signal a greater emphasis on conformity to rules rather than achievement of creative goals. Overall, R&D research suggests institutional compromises, balancing a degree of strategic

autonomy with discretionary oversight and the opportunity to deliver institutional goals (Amabile & Gryskiewicz, 1987; Feldman, 1984).

Decoupling work is commonly identified as a means to stretch certain institutional arrangements in order for the firm to buffer implementation, while also maintaining stability (Bromley & Powell, 2012): In policy-practice decoupling, an organization adopts policies to cope with external stakeholder pressures symbolically but does not implement these policies internally; and in means-ends decoupling, an organization adopts and implements the policies but fails to achieve the intended goals (see Crilly, Zollo, & Hansen, 2012; Fiss & Zajac, 2004; Greenwood, Raynard, Kodeih, Micelotta, & Lounsbury, 2011; King & Lenox, 2000; Meyer & Rowan, 1977; Wijen, 2014). Institutional studies in industrial marketing explicitly highlight the role of policy-practice decoupling (Yang & Su, 2014), although there are comparatively few studies apart from initial research on industrial cartels (Pressey et al., 2014; Pressey & Ashton, 2009; Pressey & Vanharanta, 2016). Drawing on data from the European Union regulator for competition (the Directorate General for Competition), Pressey and Vanharanta (2016) show how this decoupling work, via industrial cartel price-fixing networks, allow managers to deal with the pressures or demands from interested parties.

The organization literature research on decoupling (Pfeffer & Salancik, 1978; Thompson, 1967) indicates that organisational responses to external pressures, such as legislation, public policy, and social activism, usually resulted in internal buffering of daily practices from outside control and inspection. Such firms implemented these types of responses to decouple formal policies from their internal technical core and daily work routines (Meyer & Rowan, 1977). In this regard, firms adopted policies as a response to external pressures, which related to formally stated legislation and regulation, while maintaining at the same time their actual internal practices unchanged (Scott, 2008). This literature therefore offers a number of important ideas with the potential to shed light on implementation work in industrial settings. In particular, while industrial marketing studies emphasises a range of factors that hinder and help implementation, it also specifically points to the agentic role of individuals in bringing variation to the implementation processes. In the industrial marketing field, the question of misalignment has been framed in broad implementation gap terms (Möller & Parvinen, 2015). However, one of the weaknesses of the existing institutional analysis is how individuals work in the implementation gaps and the making of those gaps. In the next section, we discuss in detail the relevant literature on means-ends decoupling work for our study.

2.2. Tenets of means-ends decoupling work

Means-ends decoupling work describes the gap that occurs in firms between the implementation of intended policies and the achievement of outcomes. Bromley and Powell (2012) and Wijen (2014) specify several conditions, which favour in their combination the occurrence of means-ends decoupling. These conditions and factors comprise i), the existence of formal structures that have concrete consequences for organisational routines; ii) how managers implement and evaluate intended policies; and iii) how the firms change work activities but where there is little to no evidence which suggests a link to organisational outcomes and effectiveness. Internal constituencies within firms often have to deal with significant structural pressures in work activities. Thus, while they pursue certain work practices, they recognise that this work will have limited utility and a tenuous link to firm outcomes. Wijen (2014) argues that firms will often continue certain practices despite the knowledge that these activities do not link to organisational outcomes.

Bromley and Powell (2012) argue that the theoretical lens of means-ends decoupling helps to address the pertinent question of why implementation work, standards, or institutions show at best ambiguous linkages to intended outcomes. Means-ends decoupling comprises work

in which a firm adopts new aims that link only marginally to its core goals. Lyon and Maxwell (2011) state the example of petroleum firms, which embrace corporate social responsibility standards to protect their organisational legitimacy in societies that become increasingly critical to the adverse effects of the oil business. However, these corporate social responsibility standards do not logically relate to the core goals of petroleum firms.

However, while past research has provided insights into the organisational consequences of means-ends decoupling, the underlying micro-mechanisms, which manifest in the salient work (means) and outcomes (ends) remain largely unknown. We define in our study micro-mechanisms as a systematic set of inferences of how different lower-level entities situated in an institutional context link together and become salient in higher-level phenomena. This definition of micro-mechanisms derives from prominent literature in philosophy of science, which emphasizes the importance to advance theory through gaining insights about entities at a different level, that is, the individual level of actors, than the overarching organisational entities being theorized (Hedström & Swedberg, 1996; Mayntz, 2004; Stinchcombe, 1991). Strategic management and institutional theory literatures have recently adopted this research perspective and emphasized the importance of investigating the micro-mechanisms, which undergird the macro-level decisions and practices of organisations. Exemplary, Abell, Felin, and Foss (2008) specify that the explanatory mechanisms of higher-level organisational phenomena consist of bundles of individual actions and interactions. Consequently, the fine-grained investigation of micro-level mechanisms improves substantially the understanding of macro-level decisions and behaviour (Felin & Foss, 2006; Foss, 2011).

Against this background of micro-mechanisms as sets of inferences of how different individual actions and interactions link together and become salient as means-ends decoupling work on the collective level of the R&D project, we delineate in the remaining part of the background section compliance barriers and compliance inducements which potentially influence the occurrence of means-ends decoupling work. The compliance barriers and compliance inducements provide in turn the central categories in which the micro-mechanisms surface and unfold.

2.3. Compliance barriers and compliance inducements influencing means-ends decoupling

Building on Bromley and Powell's (2012) research, Wijen (2014) summarises the conditions under which the adoption of practices, standards, and institutions leads to the achievement of the initially intended goals in relatively 'opaque fields'. Using the case of voluntary sustainability programs, Wijen (2014) argues that the lack of field transparency, which is caused by 'causal complexity', 'behavioural invisibility', and 'practice multiplicity' leads institutions' designers to set uniform rules, devise strong incentives, and promote transfer of best practices to ensure substantive compliance by adopters. However, the causal complexity and practice multiplicity, which characterise opaque fields, hinder the implementation of rigid institutional regimes, as they imply a trade-off between substantive compliance and goal achievement.

Complementing the compliance barriers, Wijen (2014) suggests that 'setting rules', 'devising incentives', and 'transferring best practices' constitute three compliance inducements. The presence of the attention, knowledge, and motivation barriers in relatively opaque fields compels designers to elaborate institutions in ways that incentivize adopters' compliant behaviour. These three compliance inducements enable institutional entrepreneurs to define a set of organisational measures which facilitate the achievement of intended goals. Table 2 provides an overview of the compliance barriers and compliance inducements which potentially influence means-ends decoupling in organisations.

Table 2
Compliance barriers and compliance inducements influencing means-ends decoupling.

Factors influencing compliance	Key dimensions of compliance factors	Baseline definition of key elements	Related literature
Compliance barriers	Causal complexity	<ul style="list-style-type: none"> • Interactions between multiple heterogeneous actors, factors, and effects • Lead to uncertainty about cause-effect relations and the nature of the institutional field • Result in the lack of knowledge about drivers of substantive compliance 	Levy and Lichtenstein (2012); Espinosa and Walker (2011); Davis et al. (2009); Orton and Weick (1990)
	Behavioural invisibility	<ul style="list-style-type: none"> • Actors maintain a low profile, refrain from accepting external control, and locate in remote areas • Observing and measuring actor behavior becomes difficult 	Aravind and Christmann (2011); O'Rourke (2007); Jiang & Bansal, 2003; Howard et al. (2000)
	Practice multiplicity	<ul style="list-style-type: none"> • Leads to a lack of motivation for adopters to comply • Multitude of divergent practices and heterogeneous routines in field • Creates ambiguity about which practices result in substantive compliance • Makes organisational engagement in compliant behavior difficult 	Young (2012); Santos and Eisenhardt (2009)
Compliance inducements	Setting rules	<ul style="list-style-type: none"> • A set of concrete and specific rules, directions, and guidelines • Cause actors not to pay attention to the field-specific regulations 	Okhmatovskiy and David (2012); Donaldson and Dunfee (1994)
	Devising incentives	<ul style="list-style-type: none"> • Counteracts the uncertainty of causal complexity • Creation of specific incentives and signals of future benefits • Opposes the lack of motivation resulting from behavioural invisibility 	O'Rourke (2007)
	Transferring practices	<ul style="list-style-type: none"> • Leverages the benefits of compliance adopters • Providing variety of implementation options • Enabling capacity building through the transfer of best practice • Counters the lack of knowledge resulting from practice multiplicity 	Perez-Aleman (2011); Terlaak, 2007)

2.4. Compliance barriers

Organisations that operate in opaque fields, that is, contexts in which transparency is lacking, face difficulties to identify the characteristics of prevailing practices, establish causal links between policies and outcomes, and measure the exact outcomes of policy implementation (Briscoe & Murphy, 2012; Bromley & Powell, 2012; Jiang & Bansal, 2003). Wijen (2014) specifies that the existence of complex causal patterns, heterogeneous practices, and hardly visible behaviours results in three distinct compliance barriers.

First, 'causal complexity' evolves in environments in which multiple heterogeneous actors, factors, and effects interact (Espinosa & Walker, 2011; Levy & Lichtenstein, 2012). Causal complexity leads in consequence to uncertainty and ignorance about cause-effect relations and the precise nature of an institutional field (Davis, Eisenhardt, & Bingham, 2009; Lindblom, 1959; Milliken, 1987; Orton & Weick, 1990). The uncertainty and ignorance, which causal complexity provokes, result in turn in a lack of attention and knowledge about key drivers of substantive compliance (Ocasio, 1997).

Second, 'behavioural invisibility' describes institutional environments, in which actors maintain a low profile (Spar & La Mure, 2003), refrain from accepting external control (Howard, Nash, & Ehrenfeld, 2000), and often locate in remote areas (O'Rourke, 2007). Behavioural invisibility exacerbates the difficulty to efficiently observe and measure actor behavior (Jiang & Bansal, 2003). When adopters of institutions pursue the strategy of non-compliance to avoid costly adaptation, behavioural invisibility allows them to conceal their non-compliant behavior and escape eventual sanctions (Aravind & Christmann, 2011). Behavioural invisibility thus leads to a lack of motivation for adopters to comply.

Third, 'practice multiplicity' occurs when actors operating in an institutional field have to deal with a multitude of divergent practices and heterogeneous routines. In consequence, the multiplicity of

practices makes it difficult for organisations to engage in compliant behaviour (Santos & Eisenhardt, 2009; Young, 2012). The ambiguity that stems from practice multiplicity leads to a lack of attention and knowledge about which one of the various coexisting practices results in substantive compliance. Taken together, the designers of practices, standards, and institutions need to overcome these three salient compliance barriers, and their resultant effects of the lack of attention, knowledge, and motivation, to ensure adopters' substantive compliance.

2.5. Compliance inducements

The presence of the attention, knowledge, and motivation barriers in relatively opaque fields compels designers to elaborate institutions in ways that incentivize adopters' compliant behavior. In the other side of the spectrum, Wijen (2014) suggests three compliance inducements to attenuate the compliance challenges which actors faced when they operate in non-transparent fields.

First, 'setting rules' counteracts the uncertainty and ignorance that stems from causal complexity, and that may cause actors not to pay due attention to the field-specific and relevant rules, aspects, and issues (Donaldson & Dunfee, 1994; Okhmatovskiy & David, 2012). Therefore, when institutional designers set concrete and specific rules, directions, and guidelines, they can counteract the causal complexity and increase the chance that adopters show compliance behaviour.

Second, 'devising incentives' opposes the lack of motivation, which results from behavioural invisibility and threatens the effectiveness of institutions and benefits opportunistic adopters. To overcome this compliance barrier, designers need to create specific incentives and signal future benefits for compliant adopters (O'Rourke, 2007).

Third, 'transferring best practices' counters the lack of attention and knowledge, that stems from practice multiplicity, which complicates the choice of adopters to select practices that lead to substantive

compliance. To overcome this barrier, institutions should provide implementation options and enable capacity building through the transfer of best practices (Perez-Aleman, 2011; Terlaak, 2007). Given the presence of the attention, knowledge, and motivation challenges in relatively opaque fields, institutions' designers need to develop and apply specific rules, devise strong incentives, and enable transfer of best practices to overcome the compliance barriers and thus ensure adopters' substantive compliance.

In sum, Bromley and Powell (2012) and Wijen (2014) argue that substantive compliance in relatively opaque fields may not lead to the achievement of the intended goals. We concur to this view and further extend it by advancing the idea that a set of micro-mechanisms underlie the gap between the means and ends. As such, we analyse our data through the lens of the three compliance barriers and compliance inducements.

3. Methods

Our methodological design comprises the collection of qualitative data from in-depth interviews and complementary sources of evidence. This qualitative data gathering aims at establishing and extending theory in new and unexplored research fields (Creswell, 2002; Strauss & Corbin, 1990).

3.1. Sample and research setting

Our selected research setting for collecting data is the project "COI", which was launched and partially funded by France's second largest high-technology cluster. This publicly funded industrial R&D project is driven by growing needs of people living in digital cities, to live original experiences that are highly rich in terms of collective emotions; particularly, within entertainment sectors such as cinemas, concerts, theatres, and other cultural and leisure realms.

We selected the publicly funded industrial R&D project as our research setting for the following reasons. In the context of public funding schemes, selecting industrial R&D projects is a particularly challenging task for evaluators (Santamaria, Barge-Gil, & Modrego, 2010; Takalo & Tanayama, 2010). Governmental agencies generally favour investments in research areas that can lead to achieving competitive advantages over time. Funding for such projects is often granted within the context of calls for projects across public research programs. Accordingly, governmental agencies thoroughly determine specific selection criteria that can help identify projects that meet the requirements of respective programs (Blanes & Busom, 2004). All information regarding the selection guidelines and criteria is available to R&D partners prior to the submission of their proposals. Given that the partners must comply with the strict requirements of R&D projects to qualify for funding, evaluators may be confronted with isomorphic proposals. As they have strong incentives to meet or even exceed the expectations of the constituencies involved in fund allocation, R&D partners may submit proposals that may not reflect their actual capabilities. This strict selection process enforces guidelines and criteria that cause substantial pressures on R&D

partners to conform.

Accordingly, the project designers may set objectives for the project that conflict with partnering institutions' core goals and that cannot be achieved by the partners given their actual resources and capabilities. For example, a recent guideline for a national call for projects, which funds industrial R&D projects in France, requires participating firms to display evidence of substantive market potential for new products or services. While R&D partners might conform to the requirement to provide market evidence by reporting large growth potential for future markets, their company's core goals focus on targeting smaller markets that better fit their actual capabilities (Yang & Su, 2014). Bromley and Powell (2012) and Wijen (2014) argue that fields, in which organisations adopt policies and implement practices that are loosely linked to their core goals, are favourable for means-ends decoupling to occur.

Moreover, the COI project fits the criteria of an opaque field, as it is characterized by a set of compliance barriers and inducements (Wijen, 2014). First, causal complexity is characterized by uncertainty and ignorance about the field specific rules and aspects, and the key drivers of substantive compliance. In the case of the industrial R&D project, COI, the 'technical annex' provides guidance and remedies improvisation. Such specific rules minimize the attention and knowledge problem caused by causal complexity and foster compliant behavior among the project partners. Second, behavioural invisibility allows actors to conceal their non-compliant behavior and escape eventual sanctions. Behavioural invisibility, thus, leads to a lack of motivation for adopters to comply. To overcome this motivation barrier the developers of institutions such industrial R&D projects signal that compliant partners can receive material benefits such as being selected for future projects and capturing value from the achieved innovations. Finally, practice multiplicity leads to ambiguity and lack of knowledge about which one of the various coexisting practices results in substantive compliance. To overcome this barrier, the developers of the publicly funded industrial R&D projects offer implementation options and enable capacity building through transfer of best practices.

Following this line of argumentation, we assume that publicly funded industrial R&D projects provide an appropriate setting to investigate our research question regarding the micro-mechanisms underlying the gap between means (practices) and ends (outcomes).

3.2. Description of the setting

The main goal of the COI project was to innovate experiences that allow extreme levels of immersion and interactivity among audiences in various entertainment sectors. Employing a number of state-of-the-art technologies including augmented reality, connected objects, immersion, interactivity, internet of objects, and high-quality transmission of audio-visual content, the project aims at innovating novel ways for entertaining people. The project consortium is composed of seven partners specialized in one of the latter technologies. Table 3 summarises the partners' fields of expertise.

This project is run over a period of three years (January 2015 – July 2017). There are three main phases in this project: 1) phase 1 regards

Table 3
Participating organisations in R&D project consortium.

Profile of partners	Main field of expertise
Partner 1 (Connected Objects Institution)	Developing connected objects that allow a high level of interaction among the members of an audience or among different groups of audiences.
Partner 2 (Tourism Institution)	Elaborating and managing cultural events and scientific conferences for both public and professional audiences.
Partner 3 (Telecommunication Institution)	Developing networks that can allow a low-cost fluid connectivity among a significant number of connected objects.
Partner 4 (Transmission of audio-visual content company)	Transmitting ultra-HD audio-visual content with lower costs and minimum latency.
Partner 5 (Business Models Institution)	Creating innovative business models that allow the commercialization of innovative products and services.
Partner 6 (Video Mapping company)	Using video mapping technologies to revolutionize the scenography of spaces and create immersive experiences.
Partner 7 (Augmented Reality company)	Using augmented reality technologies to enable virtual interaction among distant audiences and create immersive experiences.

Table 4
Main phases of the R&D research project.

Main phases	Time periods	Description of the missions
Phase 1	January–December 2015	Launching of the project and the clarification of the outcomes expected to be achieved by each one of the consortium partners. Goal 1: Development of the first immersive experience.
Phase 2	January–December 2016	An intermediary evaluation phase in which each one of the partners is supposed to present their advancements to an official committee of auditors and evaluators. Goal 2: Meeting the evaluators' expectations and correcting potential problems with the first immersive experience.
Phase 3	January–July 2017	Goal 3: Developing the second immersive experience and presenting a demonstration of the achieved results and innovations by the consortium to an audience of experts and evaluators.

Table 5
Multiple sources of evidence.

Interviews		Archival records		Field observations	
Number	Respondents	Number	Records	Number	Observations
23	Partners' representatives	12	Corporate: deliverables, confidential documents, business plans, administrative reviews, and emails	28	notes from the monthly meetings, and informal discussions
6	Field experts	16	Public: articles, videos, industry reports, and corporate history		

the launching of the project and the clarification of the outcomes expected to be achieved by each one of the consortium partners. This first phase also includes the development of the first immersive experience (January – December 2015); 2) phase 2 is an intermediary evaluation phase in which each one of the partners is supposed to present their advancements to an official committee of auditors and evaluators (January – December 2015); and 3) phase 3 concerns the development of the second immersive experience and the demonstration of the achieved results by the consortium (January – July 2017). Each one of the two immersive experiences were tested through public events (also called demonstrations). The first event took place during phase 2 of the project, while the second (final event) took place during phase 3. [Table 4](#) provides a description of the three phases.

3.3. Research design and data sources

The specific objectives of the paper are twofold: 1) to further develop an understanding of the nature of means-end decoupling work, particularly with reference to an industrial R&D project implementation; 2) to identify how the micro-mechanisms dynamically influence means-ends decoupling within an industrial R&D project implementation. The institutional outworkings of the industrial R&D project implementation are explored in this study and therefore evolve over time. Accordingly, the case material for this study derives from the three main time periods of the project lifetime. The first round of interviews occurred at phase 1 of the project. The project was initiated in January 2015. This first phase started by clarifying the intended goals of the project, affirming the expected outcomes for each one of the seven partners. Then after, the partners started developing the first immersive experience, which constitutes the first goal of the project. This phase represented the most appropriate timing for us to run the first round of interviews.

In Phase 2 (January – December 2016), the consortium had to submit and present a detailed report of the achieved goals and objectives at that stage by each one of the seven partners. The latter report was submitted and presented to a committee of official auditors and evaluators (goal 2), which represented a key event in the life of the project. This important phase of the project led us to collect the second round of interviews with the same respondents as in the first interview-round.

The last phase (January – June 17) represents the third key event in the life of the project. That is the period when the partners were expected to synthesize their achievements to come up with concrete innovations through the development and testing of the second (final)

immersive experience (goal 3). Accordingly, this third phase resulted in our third and last interview-round, again with the same set of respondents.

Historical punctuations throughout the life of the project create periods within which important evolutions occur. Thus, we use a set of multiple sources of evidence to guide the selection of key work events. In addition to interviewing representatives of the seven partners from the consortium, we interviewed a number of experts in the field of publicly funded industrial R&D projects from the cluster. Other sources of evidence included: 1) archival corporate records (deliverables, confidential documents, administrative reviews, and emails); 2) archival public records (articles, industry reports, and corporate history); and 3) field observations (notes from the monthly meetings and informal discussions). [Table 5](#) illustrates the employed sources of evidence: We have used the semi-structured interviews as the primary instrument for data collection. This qualitative methodology is appropriate to unlock the micro-mechanisms over time, particularly when the investigated phenomenon is exploratory in nature, complex to capture, and represents a confluence of factors ([Lee, 1999](#)).

In the three rounds of interviews, we have interviewed 29 respondents among which 23 are project partners and 6 are field experts. [Table 6](#) describes the accomplished interviews, the interviewees, the interview themes, and the corresponding key events and goals relevant to each one of the three project phases.

3.4. First round of interviews:

In the first interview-round, we attempted to explore whether the COI project fits the definition of an opaque field ([Briscoe & Murphy, 2012](#); [Bromley & Powell, 2012](#); [Jiang & Bansal, 2003](#); [Wijen, 2014](#)) and presents an institutional field in which means-ends decoupling can occur. Accordingly, we asked questions regarding the general work relating to the project missions, expectations, and outcomes as a whole, as well as of each one of the seven partners separately. Further, following [Bromley and Powell \(2012\)](#) and [Wijen \(2014\)](#) argument that fields, in which organisations adopt policies and implement practices that are loosely linked to their core goals, are favourable for means-ends decoupling to occur, we attempted to benchmark the core goals of the project with the core goals of the partnering firms and organisations to assess the level of opacity of the COI project. Appendix 1 provides the questions from the three rounds of interviews.

Table 6
Accomplished interviews throughout the life-time of the R&D project.

Phases	Key events and goals of the project	Interview themes	Number of interviews	Total respondents
Phase 1 - 1st round of interviews	<p>Launching of the project and the clarification of the outcomes expected to be achieved by each one of the consortium partners.</p> <p><u>Goal 1:</u> Development of the first immersive experience.</p>	<p>Questions regarding the missions, expectations, and outcomes of the project. A comparison the core goals of the project with the core goals of the partnering organisations.</p>	<p>1 representative of each one of the seven partners (n = 7) and 3 experts from the field of industrial R&D projects from the cluster (n = 3)</p>	n = 10
Phase 2 - 2nd round of interviews	<p>An intermediary evaluation phase in which each one of the partners is supposed to present their advancements to an official committee of auditors and evaluators. <u>Goal 2:</u> Meeting the evaluators' expectations and correcting potential problems with the first immersive experience.</p> <p><u>Goal 3:</u> Developing the second immersive experience and presenting a demonstration of the achieved results and innovations to an audience of experts and evaluators.</p>	<p>Assessing the advancements of the partners toward achieving the project's goals. Questions regarding the results reported to the evaluators and the extent to which these results were actually accomplished.</p>	<p>10 representatives of the project partners (n = 10) and 2 experts from the field of professional and cultural events management (n = 2)</p>	n = 12
Phase 3 - 3rd round of interviews		<p>Assessing the success or failure to achieve the intended outcomes. Questions regarding the factors that led to the actual outcomes.</p>	<p>6 partners (n = 6) and 1 expert from the field of industrial R&D projects (n = 1)</p>	n = 7

3.5. Second round of interviews

Means-ends decoupling occurs when adopters demonstrate substantive compliance through deploying the necessary resources for policy implementation (Brompley & Powell, 2012; Wijen, 2014). Thus, the second interview-round of the cases aimed at investigating whether the partners have deployed the necessary resources and showed substantive implementation of the project's guidelines and instructions. As this phase is characterized by an intermediary report by the partners, we also tried to assess whether the goals of this first phase were met as initially envisaged by the project developers.

3.6. Third round of interviews

Means-ends decoupling occurs when a gap emerges between implementation and achievement; in other terms, when policy implementation does not lead to the achievement of all the envisaged goals (Bromley & Powell, 2012; Wijen, 2014). The aim here is to explore first if indeed means-ends decoupling has occurred in the case of COI project; and then, to assess the institutionally embedded causes, events, and factors, as well as the partners' causal justifications and plausible explanations for not achieving the intended goals. Accordingly, this last interview-round was run toward the end of the project in phase 3, where the achieved innovations were tested and evaluated by an audience of experts and professionals.

3.7. Data collection and analysis

Our level of analysis is the lower-level micro-mechanisms which underlie and constitute in their sum the higher-level means-ends decoupling within our research setting of a publicly funded, industrial R&D project. Our unit of analysis are consequently the various individual actions and interactions, which relate to implementing and achieving the intended goals of the R&D project (Yin, 2017). The individual actions and interactions are contained in the different data sources of our study, that is, the archival records, the interviews, and our project observations. We specifically focused for the identification of the micro-mechanisms on the evolution and change of these individual actions and interactions over the time period of the three successive project phases.

3.8. Combining top-down theorizing and inductive theory building

We combined top-down theorizing (Lee, Mitchell, & Sablynski, 1999; Shepherd & Sutcliffe, 2011) and inductive theory building (Eisenhardt, 1989; Ridder, Hoon, & McCandless Baluch, 2014) to identify the institutionally embedded causes and factors that led to the emergence of the means-ends gap. Combining top-down theorizing and inductive theory building is more appropriate when a phenomenon is not comprehensively understood and there is little or no built theory that explains the emerging relationships between relevant concepts and the mechanisms through which these relationships operate (Christensen & Raynor, 2003).

The combination of these two complementary methodological approaches allowed us to rely on means-ends decoupling literature to develop an appropriate framework for our research. Specifically, we identified in the top-down theorizing approach the central conceptual tenets for means-ends decoupling in the institutional literature. Our review of the literature has revealed the existence of three different categories of compliance barriers, that is, causal complexity, behavioural invisibility, and practice multiplicity. We likewise derived three categories of compliance inducements from the existing theory, that is, setting rules, devising incentives, and transfer of best practices (Wijen, 2014). We then used these categories as a framework the inductive theory building with our data collection and the resultant categorization of the salient micro-foundations underlying means-ends

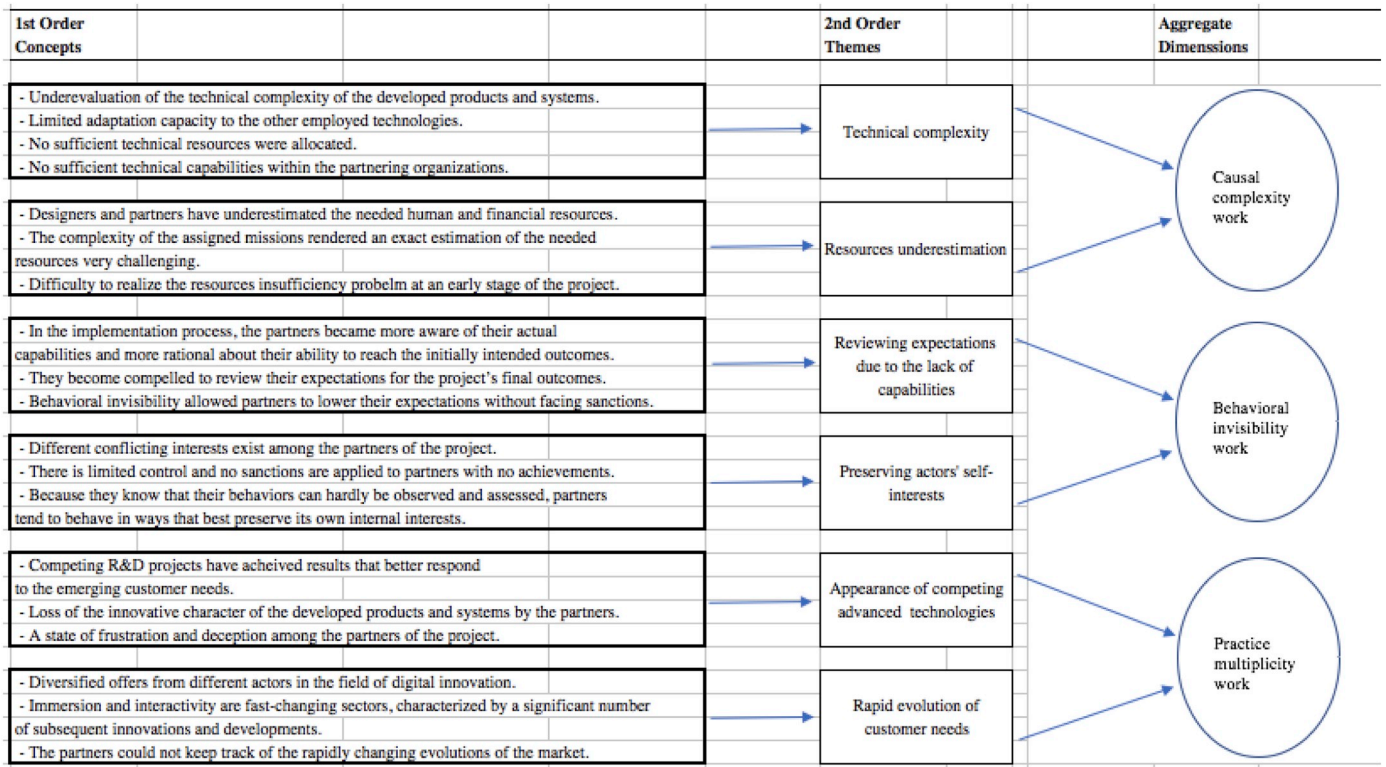


Fig. 1. Micro mechanisms involved in means-ends decoupling in R&D projects.

decoupling work in our data analysis.

3.9. Design and stages of data collection

The collection and analysis of data were performed following four main stages. In *stage 1*, we identified from the review of the literature the primary categories of data of interest for the investigation. The resultant semi-structured interview guideline allowed to determine the respondents' causal justifications and the institutionally embedded causes for not achieving the intended goals. We next selected the sample of interviewees for the three successive rounds. In *stage 2*, we carried out the interviews to collect data on key categories, while tracking new ones. The interviews aimed at determining key patterns and mechanisms that may explain the occurrence of means-ends decoupling throughout the life of the project. The collected data has reached saturation by the end of the interviews, as no central new themes emerged in the verbal accounts of respondents. Thus, the findings account for most of the respondents' reported behaviours. In *stage 3*, we analysed the findings through identifying eventual causes and effects, as well as elaborating and further modifying the categories from stage 2 of the research process. After coding interview transcripts and key points (Miles & Huberman, 1994; Strauss & Corbin, 1990), the obtained codes were manually stored into an open-coded database. The same methodological approach was followed to transcribe and code the data collected through the other sources of evidence as described in Table 2. Finally, *stage 4* involved the triangulation of the obtained results with the other sources of evidence at hand, ensuring a replication with the initial sample of field experts to obtain their feedback regarding the achieved findings. The findings were also re-examined with topic experts of R&D management for validation and approval. Further, we sought feedback from several respondents from the original interviewed sample through subsequent informal discussions, phone calls, and emails to validate the obtained results. This follow-up stage validated and further detailed our main findings.

3.10. Coding procedure

In analysing the interview data and other sources of evidence, we started by implementing a micro-analysis, which allowed for identifying the segments of text that were relevant to the occurrence of means-ends decoupling. Then after, we run an inductive analysis of the qualitative accounts through creating a set of open-codes that classify the identified means-decoupling causes, factors, and patterns in relevance to three compliance barriers and inducements. Finally, the six micro-mechanisms were inductively determined through axial-coding, while simultaneously linking these latter to our framework, fitting each micro-mechanism to the most relevant compliance barrier category.

4. Findings

The project COI offered important insights into identifying the micro-mechanisms that lead to means-ends decoupling work in the institutional outworkings of the publicly funded industrial R&D project. To reach a better understanding of such micro-mechanisms and the process through which they cause a gap between means and ends, it was important to engage in a dialogue with the key involved actors, understand their perspectives, and listen to their problems and concerns. The qualitative responses collected from the semi-structured interviews and the other sources of evidence at hand helped at accomplishing the latter goal. A number of divergent elements, perspectives, and justifications were noted in the respondents' accounts in explaining the occurrence of means-ends decoupling.

Our analysis of the evidence reveals that six micro-mechanisms influence means-ends decoupling work of organisations in the context of an industrial R&D project implementation. We labelled these six cognitive mechanisms as 'Technical Complexity', 'Resource Underestimation', 'Revising expectations due to the lack of capabilities', 'Preserving actors' self-interests', 'Appearance of competing advanced technologies', and 'Rapid evolution of customer needs'. The Fig. 1 below displays the data structure underlying our identification of the six

Table 7
Data supporting salience of micro-mechanisms involved in means-ends decoupling.

Aggregate dimension	2nd order themes	Representative quotes from the interviews and other sources of evidence	Source of evidence
Causal complexity work	Technical complexity	“Now when I look back at the time when we were developing our product, I think we didn't care much about the fact that we had a set of different complex technologies that needed to function together.”	Interview: Manager of Research Projects, Partner 1 (Connected Objects Institution), May 2017.
		“The employed technologies in the project COI are very complex and their synergy may be counterproductive, while the use of such technologies independently from each other can provide a more valuable outcome than combining them together.”	Confidential document, deliverable: Senior Consultant, Partner 5 (Business Models Institution), February 2016.
	Resources underestimation	“Employing a number of state-of-the-art-technologies including augmented reality, connected objects, immersion, interactivity, internet of objects, and high-quality transmission of audio-visual content, the main goal of the project is to innovate experiences that allow extreme levels of immersion and interactivity among audiences in various entertainment sectors.”	Confidential document: Technical annex of the project.
		“The challenge was not about developing innovative products; it was rather about developing products that have a sufficient adaptation capacity to the other technologies ... I think many of us (partners) didn't have the necessary technical resources and capabilities internally to overcome this problem of complexity.”	Interview: Head of the project COI, Partner 4 (Transmission of audio-visual content company), April 2017.
Behavioural invisibility work	Revising expectations due to the lack of capabilities	“The video mapping company is in charge of developing the scenarios for the immersive experiences, but part of their mission according to the technical annex, is also to conceptualize the scenes for the two events. I am a bit surprised why they haven't planned to engage a professional scenographer in the project.”	Notes from the meetings: Manager of innovative projects, Partner 7 (Augmented Reality company), March 2016.
		“We haven't deployed such a person (professional scenographer) in our team because there is no such a competence in our firm and we would not hire a scenographer particularly for that matter. You all know how much that costs and frankly we didn't think it would be really necessary to have a professional scenographer in our team.”	Notes from the meetings: CEO, Partner 6 (Video Mapping company), March 2016.
	Preserving actors' self-interests	“The provided financial resources are not sufficient to accomplish all the objectives assigned to my institution. We have to develop a fully operational network connecting all the employed devices in the immersive experience and so on ... Well, we did agree on these terms at the beginning, but the overall cost of such a mission is a very complicated thing to estimate. It's with the advancement of the project that we start realizing this problem of financial insufficiency.”	Interview: Manager of research projects, Partner 3 (Telecommunication Institution), April 2016.
		“What we can conclude from the collected feedback of the participants is mainly the deceiving character of the offered immersive experience offered by our team (first event). It is important to emphasize that our performance didn't meet the expectations of the professional audience that constituted the vastest majority of the present audience.”	Interview: CEO, Partner 2 (Tourism Institution), April 2016.
		“This audience of professionals from the field of event management turned to be a highly expert and knowledgeable audience in the field of immersion, interactivity, connectivity, and so on. Considering the level of this first demonstration, it would be essential to review or even lower the expectations of the project for the second (final) demonstration that would be characterized by an even more exigent and demanding audience.”	Interview: CEO, Partner 2 (Tourism Institution), April 2016.
		“Guys seriously, we are miles away from the initial goals, we have got to do something about this ... Given our current capabilities, I don't see that happening.”	Notes from the meetings: Head of the project COI, Partner 4 (Transmission of audio-visual content company), May 2016.
		“One of the main challenges that we have faced in this project and that I believe had impacted to a certain extent our ability to achieve the project's intended outcomes, is the fact that the partners have realized toward the end of the project that following the exact instructions of the project may not serve and can conflict with their own interests. So, whenever an important decision had to be made regarding the project, each representative tried to make sure that the interests of his organization comes first.”	Interview: Head of the project COI, Partner 4 (Transmission of audio-visual content company), June 2017.
		“Working toward the same goal in the project doesn't mean that we have no differences ... When seven people (partners) try to achieve a consensus, I can tell you that's not a friendly discussion.”	Interview: Senior Consultant, Partner 5 (Business Models Institution), May 2015.
		“In all my years of experience as a project (industrial R&D project) developer, I have never seen someone (partner) being sanctioned because they haven't accomplished their missions ... there is very little control so they (partners) do pretty much what serves their best interests.”	Interview: Field expert (Cluster), Designer of industrial R&D projects, June 2017.

(continued on next page)

Table 7 (continued)

Aggregate dimension	2nd order themes	Representative quotes from the interviews and other sources of evidence	Source of evidence
Practice multiplicity work	Appearance of competing advanced technologies	<p>“We weren’t able to build a strong business model as expected, mainly because the value proposition of the developed system already exists in the market and the immersive experiences offered by our competitors better fit the current needs of customers.”</p> <p>“The initial idea was to commercialize something which is highly innovative. How are we supposed to do the same for an already existing product and knowing that what we have achieved (in the project) does not even compete properly with the existing offer.”</p> <p>A recent research that investigates industrial R&D projects within the field of immersion and interactivity have reported the creation of systems that allow high levels of immersion and interactivity for audiences in entertainment sectors. These achievements exceed the intended objectives of the project COI.</p> <p>“Don’t worry guys, we need to keep on ... I know it’s a bit frustrating and deceiving to know that someone else out there is proposing nicer things, but we can always have a good contribution through our work.”</p>	<p>Interview: Senior Consultant, Partner 5 (Business Models Institution), March 2017.</p> <p>Interview: Senior Consultant, Partner 5 (Business Models Institution), March 2017.</p> <p>Archival records: Public document, Industry report, February 2017.</p>
	Rapid evolution of customer needs	<p>“As an expert in event management, I can tell you that audiences nowadays are becoming more and more demanding, particularly because they are faced with a huge number of highly diversified offers from all these different types of actors in the field of digital innovation. So, we have noticed through our years of experience, that the needs of customers in this field evolve so fast that most companies have a hard time to follow.”</p> <p>“This project is a long one that undergoes for 3 years. Maybe we should have kept asking people what they wanted throughout the life of the project so that we could make sure that what we have done through this period fits their expectations.”</p> <p>“People living in digital cities are driven by a growing need for living immersive experiences that can allow high levels of collective emotions. Our needs assessment has revealed an increasingly growing number of actors operating in this field and attempting to respond to fill this growing gap, resulting in a subsequent number of disruptive innovations in the entertainment and leisure sectors.”</p>	<p>Note from the meetings: Manager of research projects, Partner 3 (Telecommunication Institution), March 2017.</p> <p>Interview: Field expert (Digital event management), April 2017.</p> <p>Interview: Senior Consultant, Partner 5 (Business Models Institution), March 2017.</p> <p>Confidential document, deliverable: Partner 6 (Video Mapping company), February 2016.</p>

micro-mechanism.

In addition, Table 7 below summarises several representative interview quotes supporting the six identified micro-mechanisms.

In the following sections, we present how the gap between means and ends has evolved throughout the life of the industrial R&D project COI. We structured the results of this research along the identified categories from the literature review, namely the compliance barriers and inducements.

4.1. Working on causal complexity

The adopters of institutions, such as industrial R&D projects, are faced with uncertainty and ignorance that stem from the causal complexity, which cause the adopters to lack the attention and knowledge about the field specific rules, aspects, and issues and key drivers of substantive compliance. Accordingly, setting concrete and specific rules, directions, and guidelines by designers can minimize the causal complexity and increase chances for compliant behaviour for adopters. In the case of the industrial R&D project COI, the technical annex provides guidance and remedies improvisation. Such specific rules minimize the attention problem caused by causal complexity and foster compliant behaviour among the partners.

While the designers of the COI project focused on establishing specific rules, guidelines, and instructions and clarifying the exact intended outcomes to ensure substantive compliance among the partners, the envisaged goals of the project were yet not achieved. Our analysis of the results reveals two micro-mechanisms that can potentially explain this mismatch between means and ends in relevance to the causal complexity barrier; namely, technical complexity and resources

underestimation.

4.2. First related micro-mechanism: technical complexity

The COI consortium regroups companies and institutions that are specialized in a multitude of advanced digital technologies. The initial goal of the project was to innovate new products and services through creating a synergy among all these different technologies. However, creating a coherence among all these various and complex technologies proved a highly challenging task throughout the life of the project.

Our analysis of the interview accounts suggests that most of the partners under-evaluated the technical complexity of the products and systems to be developed. The results explain that the developed prototypes have a limited adaptation capacity to the other employed technologies. Further, no sufficient technical resources were allocated for this matter; a problem worsened by the limited technical capabilities available within the partnering organisations. For instance, we noted a comment by the representative of a partnering research institution (connected objects) who claims in his interview:

“Now when I look back at the time when we were developing our product, I think we didn’t care much about the fact that we had a set of different complex technologies that needed to function together.” (Manager of Research Projects, Connected Objects Institution, May 2017).

Attempting to combine a multitude of technologies led to increased technical complexity among the partners, a problem hardly managed by the members of the consortium as the level of complexity faced exceeded the scope of their knowledge and skills and went

beyond their zone of expertise. This technical complexity diminishes the actors' ability to connect causes and effects, and increases uncertainty and ambiguity regarding the outcomes of their actions.

4.3. Second related micro-mechanism: resource underestimation

The complexity of the assigned missions in the project renders the estimation of the required human and financial resources a very challenging task. Thus, some of the partners underestimated the needed human and financial resources and could perform an exact estimation only after the start of the implementation process. The following notes from the meetings illustrate this issue:

“The video mapping company is in charge of developing the scenarios for the immersive experiences, but part of their mission according to the technical annex, is also to conceptualize the scenes for the two events. I am a bit surprised why they haven't planned to engage a professional scenographer in the project.” (Manager of innovative projects, Augmented Reality Company, March 2016).

The representative of the video mapping company replies:

“We have not deployed such a person in our team because there is no such a competence in our firm and we would not hire a scenographer particularly for that matter. You all know how much that costs and frankly we didn't think it would be really necessary to have a professional scenographer in our team.” (CEO, Video Mapping Company, March 2016).

Within the same vein, the representative of the telecom institution states in his interview:

“The provided financial resources are not sufficient to accomplish all the objectives assigned to my institution. We have to develop a fully operational network connecting all the employed devices in the immersive experience and so on ... Well, we did agree on these terms at the beginning, but the overall cost of such a mission is a very complicated thing to estimate. It's with the advancement of the project that we start realizing this problem of financial insufficiency.” (Manager of research projects, Telecommunication Institution, April 2016).

These accounts suggest that the project developers, as well as the partners, have underestimated the needed human and financial resources for the project. Due to the technical complexity of the employed technologies and complexity of the suggested scenarios for the immersive experiences, the allocated resources turned out not sufficient to achieve the intended aims.

4.4. Working at behavioural invisibility

When adopters of institutions such as industrial R&D projects have a self-interest in noncompliance to avoid costly adaptation, behavioural invisibility allows them to conceal their non-compliant behaviour and escape eventual sanctions. Behavioural invisibility thus lead to a lack of motivation for adopters to comply. To overcome this motivation barrier the developers of the COI project signal that compliant partners can receive material benefits such as being selected for future projects and capturing value from the achieved innovations. Although such compliance inducements ensure substantive compliance of the partners, intended outcomes were yet not achieved. We identified two micro-mechanisms that can explain the gap between means and ends relevant to the behavioural invisibility barrier.

4.5. First related micro-mechanism: revising expectations due to the lack of capabilities

Partners in an industrial R&D project may submit misleading or untruthful proposals to conform to the strict selection requirements set

by the evaluators and, thus, increase their chances for being accepted. Accordingly, they report information that may not reflect their actual capabilities. When partners become convinced of their inability to achieve the ends, they set new expectations that better fit their actual capabilities. The following interview account by the representative of the tourism institution illustrates the latter point:

“What we can conclude from the collected feedback of the participants is mainly the deceiving character of the offered immersive experience offered by our team (first event). It is important to emphasize that our performance didn't meet the expectations of the professional audience that constituted the vastest majority of the present audience ... This audience of professionals from the field of events management turned to be a highly expert and knowledgeable audience about the fields of immersion, interactivity, connectivity, and so on. Considering the level of this first demonstration, it would be essential to review or even lower the expectations of the project for the second (final) demonstration that would be characterized by an even more exigent and demanding audience.” CEO, Tourism Institution, April 2016).

In the implementation process, the partners became more aware of their actual capabilities and more rational about their ability to reach the initially intended outcomes. Thus, they become compelled to review or even lower their expectations for the project's final outcomes. This element of behavioural invisibility allowed partners to lower their expectations without the risk of being faced with eventual sanctions.

4.6. Second related micro-mechanism: preserving actors' self-interests

Different conflicting interests exist among the partners of the consortium. Because they know that their behaviours can hardly be observed and assessed, each one of the partnering organisations tended to behave in ways that best preserve its own internal interests. For instance, the leader of the COI project points to this issue in his interview; he states:

“One of the main challenges that we have faced in this project and that I believe had impacted to a certain extent our ability to achieve the project's intended outcomes, is the fact that the partners have realized toward the end of the project that following the exact instructions of the project may not serve and can conflict with their own interests. So, whenever an important decision had to be made regarding the project, each representative tried to make sure that the interests of his organization comes first.” (Head of the project COI, Transmission of Audio-visual Content Company, June 2017).

In such a context where multiple actors may have different or even conflicting self-interests, this element of behavioural invisibility enables the partners to behave in ways that best serve their interests, without being tracked or sanctioned.

4.7. Working with practice multiplicity

Actors operating in institutional fields that are underlined by a multitude of divergent practices and heterogeneous routines, such as industrial R&D projects, find it difficult to make sense of practice diversity and engage in compliant behaviour. The ambiguity that stems from practice multiplicity leads to a lack of attention and knowledge about which one of the various coexisting practices results in substantive compliance. While the developers of the COI project offered implementation options and enabled capacity building through transfer of best practices to clear this compliance barrier, we found that the project has failed to attain its intended goals. Our findings suggest the existence of two micro-mechanisms that explain the means-ends gap relevant to the practice multiplicity barrier; namely, appearance of competing advanced technologies and rapid evolution of customers' needs.

4.8. First related micro-mechanism: appearance of competing advanced technologies

At some point during the implementation process, the COI partners have realized that other R&D projects that operate within the same field have achieved better results that exceed the intended goals of the COI project. This has resulted in a state of frustration and deception among the partners as the latter development jeopardizes the innovative character of their products and services and minimizes the possibility for commercialization. Analysing the data from the public records at hand, we noted that a recent industry report investigating industrial R&D projects within the field of immersion and interactivity has reported the creation of systems that allow high levels of immersion and interactivity for audiences in entertainment sectors. These accomplishments exceeded the intended objectives of the COI project. A relevant account to this micro-mechanism was raised by the representative of the business model's institution who argues:

“We were not able to build a strong business model as expected, mainly because the value proposition of the developed system already exists in the market and the immersive experiences offered by our competitors better fit the current needs of customers.” (Senior Consultant, Business Models Institution, March 2017).

These accounts taken together suggest the competitive nature of industrial R&D projects within the immersion and interactivity field. The COI partners were faced with a multitude of divergent practices and heterogeneous routines, as other R&D projects might have implemented different practices and routines to achieve the same ends. Indeed, as revealed by our results, competing advanced technologies by other industrial R&D projects appeared in the market, causing a certain frustration and deception among the COI partners. The ambiguity that stems from practice multiplicity made it difficult for the COI partners to identify which one of the various coexisting practices leads to goal achievement, causing the project to lose its innovative and state-of-the-art character.

4.9. Second related micro-mechanism: rapid evolution of customer needs

Immersion and interactivity are rapidly changing sectors, characterized by a significant number of subsequent innovations and developments. The COI partners could not keep track of the newly emerging needs of customers, making it difficult for the project to catch up with the fast-changing evolutions of the market. For example, an expert from the field of digital event management states:

“As an expert in event management, I can tell you that audiences nowadays are becoming more and more demanding, particularly because they are faced with a huge number of highly diversified offers from all these different types of actors in the field of digital innovation. So, we have noticed through our years of experience, that the needs of customers in this field evolve so fast that most companies have a hard time to follow.”

A similar comment, that was noted in one of the meetings, illustrates this element of rapid change of customer needs:

“This project (COI) is a long one that undergoes for 3 years. Maybe we should have kept asking people what they wanted throughout the life of the project so that we can make sure that what we have done through this period fits their expectations.” (Senior Consultant, Business Models Institution, March 2017).

In the COI project, a needs assessment for customers in the entertainment sectors was accomplished at the beginning of the project, but was not pursued over the life of the project. As the project runs over 3 years, this assessment needed to be updated on a regular basis as it operates in a rapidly evolving sector. Thus, partners lost track of the newly emerging needs of customers, resulting in a less competitive offer

by the project. Practice multiplicity that underlies industrial R&D projects caused the COI partners to lack the attention and knowledge about the exact practices that can lead to goal achievement, leading a gap between means and ends.

5. Discussion – working in the gap

Newton et al. (2014: 747) noted that “the means by which organizational units act to resolve potential contradictions in the demands placed upon them has attracted surprisingly little attention within the marketing discipline”. Research show that contradictions in the demands placed on managers can get in the way of work getting done. These institutional contradictions are particularly evident in multinational subunits (Newton et al., 2014), price-fixing cartels (Pressey & Vanharanta, 2016) and also the implementation-strategy gaps associated with marketing innovation work. But do such institutional contradictions always get in the way? In this study, we sought to understand R&D project implementation and why it failed to achieve the intended goals. That is, why adopters, which are provided with clear inducements and sufficient resources, still fail frequently to achieve the intended institutional goals. In doing so, we examined how actors engaged in institutional means-end decoupling. Means-ends decoupling work therefore represents an important theoretical concept in understanding how managers leverage institutional contradictions in their industrial work. At the heart of this work approach is viewing implementation as a dynamic social practice. The institutional means-end decoupling work provides a renewed focus on the social practice associated business to business interactions with institutionalization, rather than the traditional view of institutions as reified social structures with docile agents. Our main evidence-based contribution is the identification of six distinct micro-mechanisms, which underlie and constitute in their sum the higher-level phenomenon of means-ends decoupling in a publicly funded industrial R&D project. Consequently, the six distinct micro-mechanisms collectively serve to allow for the fluid switching of work as the institutional conditions permit. Our findings have important implications for theory and practice.

5.1. Implications for theory and practice

Our findings on means-ends decoupling work have important implications for understanding business networks. Our findings move us some way toward understanding how market actors accommodate different, sometimes competing or contradictory, pressures and goals in R&D project implementation. An institutional means-end decoupling work approach offers useful research complementarities, linking system-level goal studies (Matinheikki et al., 2016; Möller & Rajala, 2007), with implementation gap research (Leischnig et al., 2017; Rapert et al., 2002). Whenever the industrial R&D project fails to reach the intended system-level goals, question marks are invariably raised in relation to implementation (Aarikka-Stenroos et al., 2017; Medlin & Törnroos, 2014). An institutional decoupling work approach provides a new way of understanding implementation gaps where competent network actors inhabit and maintain project implementation gaps. These findings deepen extant understandings of the workings of implementation gaps, leveraging vertical trust spaces (Newton et al., 2014), impression management tactics (Elsbach & Sutton, 1992), and creating and maintaining price-fixing cartels (Pressey et al., 2014). R&D project implementation also sheds light on the remarkable plasticity of business network institutions. As Strambach (2010:414) explains, plasticity permits “variation in the attachment of new elements to existing institutions, the slow rise of peripheral meanings to dominant institutions and their conversion by the redeployment of old institutions to new purposes.” Such institutions are therefore not iron cages, with precise goals that cannot be stretched to accommodate business network diversity and work.

Another important implication of our study concerns the

identification of the six micro-mechanisms. We find that these micro-mechanisms contribute to maintaining project implementation gaps, while simultaneously complying to the institutional regime. Our study supports how discrete combinations of micro-mechanisms can determine the nature of means-ends decoupling work. Prior studies in means-ends decoupling literature primarily focused on macro-level conditions and factors impacting institutional regimes and fields, in which compliance adopters are situated (Levy & Lichtenstein, 2012; Espinosa & Walker, 2011; Aravind & Christmann, 2011; O'Rourke, 2007; Young, 2012; Santos & Eisenhardt, 2009). In this study, we have taken the reverse research direction, by identifying and aggregating lower-level micro-mechanisms in our model and by empirically validating their relevance with reference to the broad spectrum of actor-based and firm-based data sources in our case research. It is important to draw this distinction as we have seen how different micro-mechanisms can serve to allow for the fluid switching of means-end decoupling work as the institutional conditions permit.

An equally important implication of our study analysis is the way that it uncovers the linkage between the lower-level mechanisms and the nature of the actual industrial project work. In particular, our findings show how such micro-mechanisms hold causal powers over the nature of that work, where traditional project rules do not always apply or work in vague institutional settings. By implication, then, there is always 'wiggle room' in the work directed towards institutional goals, regardless of the scrutiny that that implementation gap brings. This means going beyond the all-or-nothing assessment or where some but not all intended outcomes of implementation are achieved.

Finally, our study investigated the phenomenon of means-ends decoupling in the institutional field of a publicly funded, industrial R&D project, which was financed by a national French funding scheme. The research setting of the large majority of studies is to date situated in contexts of marketing information systems and sales promotions (Noble & Mokwa, 1999), corporate social responsibility (Crilly et al., 2012; Wijen, 2014), or channel changes (Sarin, Challagalla, & Kohli, 2012). This study complements and broadens the empirical scope for research on means-ends decoupling, building upon a stream of industrial marketing literature on the workings of project networks and implementation work (Blomquist & Wilson, 2007; Canhoto et al., 2016; Cova & Salle, 2007; Mele, 2011).

So how should practitioners interpret the findings? Rather than viewing goal-setting as a one-off salve for boasting R&D project performance and implementation, we suggest that managers might wish to think about the R&D project design in a way increases extra-institutional behaviours. For example, to consider how individual project leadership, evaluators and investors, along with different institutional regimes, can frequently discuss and bring different emphasizes and different weight on selection criteria that can increase or decrease partner flexibility, technical capabilities and resources. Second, to attenuate the 'resources underestimation' micro-mechanism, R&D projects' designers might consider the institutional maintenance required to enable a continuous follow-up of the partners throughout the project life-time. Thus, investors can make the necessary adjustments to fill unanticipated needs in terms of human and financial resources.

Our results have revealed that the two micro-mechanisms relevant to 'revising expectations due to the lack of capabilities' and 'preserving actors' self-interests' are mainly due to the motivation barrier caused by 'behavioural invisibility'. The lack of visibility among actors, incentivize them to act in ways that best serve their self-interests. Thus, for institutional entrepreneurs to downplay these two micro-mechanisms, perhaps a combination of autonomy, engagement and reward, invitation and event involvement and evaluation could be undertaken to recognise individual actions that take advantage of field opacity.

In designing industrial R&D projects, developers might consider taking into account the highly competitive and rapidly changing nature of the institutional field. To overcome the micro-mechanism relevant to the 'appearance of competing advanced technologies', the R&D project

should be implemented in a way that preserve the innovative aspect of the innovations. This can be achieved through a continuous monitoring of the competing R&D projects and state-of-the-art technologies. Further, considering the rapidly changing evolution of markets, the project partners should implement continuous needs assessment studies to capture the newly emergent customer needs over the life of the project, and accordingly adopt their innovations to these new customer needs.

Taken together, these practical recommendations can serve as actionable directions for projects' developers and partners to overcome the means-ends decoupling micro-mechanisms and, accordingly, create improved conditions for goal achievement.

5.2. Limitations and future research

Our study has some limitations that present opportunities for future research. We identify three broader categories of means-end decoupling work along with six micro-mechanisms. First, we discussed the respective linkages of the six micro-mechanisms to the theoretically informed aggregate levels of the compliance barriers. Building on these insights, further studies can draw upon an institutional approach to build a more comprehensive validation of our empirically grounded model and gain a more detailed understanding of how internal and external factors affect the occurrence of means-ends decoupling works in opaque fields. Arguably this is not an exhaustive list of the type of means-end decoupling work used. Future studies might consider the follow-on work from means-end decoupling. That is, exploring the nature of the recoupling work to make adjustments, improve and sustain the R&D project implementation legitimacy.

Second, as our research was situated in the context of a publicly funded, cooperative R&D project, it raises the question of whether and to which degree we can generalize our findings to other field conditions. However, we designed our case research to develop theory on the phenomenon of decoupling in the setting of industrial R&D projects. So, the main study purpose is to provide an analytic generalization, that is, to provide with a fine-grained analysis of qualitative evidence deep insights into phenomenon of interest by linking our results and implications back to theory (Eisenhardt & Graebner, 2007; Yin, 2017). Building on our work, future empirical studies could explore how different fields might comprise different types of micro-mechanisms, which might in turn lead to variations in the nature of means-end decoupling work, and in alternate manifestations of the phenomenon. In addition, future research might consider the extreme loss of legitimacy in R&D project implementation where the project is unworkable or written off or where the field conditions view it as entirely illegitimate. There is therefore the need to search for further mechanisms that explain observed means-end decoupling work.

Third, while our study evidence tentatively suggests that the six micro-mechanisms link together in the occurrence of the higher-level means-ends decoupling phenomenon, the empirical grounding of these linkages and their causal effects are beyond the scope of our evidence base and our analytic approach. In consequence, the further uncovering of interactions and causal effects of micro-mechanisms, as well as the temporal unfolding of the diverse micro-mechanisms in the materialisation of means-ends decoupling work, provide promising perspectives for future research.

Finally, an interesting avenue for research to address the question of how firms may limit the occurrence of means-ends decoupling would be to examine the potential of new technologies in industrial settings. For example, the emergence of metrics and big data mining in the advertising industry has considerably reduced the opacity of how investment dollars lead to advertising performance. New audience tracking technologies have provided more accurate metrics to calculate the returns on investment of advertising campaigns, which increases the coupling of means and ends for advertisers. In high-technology driven industries, new technologies may help firms optimize some of the mechanisms to

couple means and ends. Therefore, investigating how new technologies may impact means-ends decoupling in technology-driven industries would be a promising research.

Appendix A. Examples of interview questions

A.1. First round of interviews

- 1) If you compare the core goals of the project work and the core goals of your organization, do you think that there is a gap or there is a match between the two?
- 2) In case you think there is a gap between the two, would you lean toward achieving the goals of the project work or toward achieving the goals of your organization?
- 3) Given the resources allocated to your organization, do you think your team will be able to achieve all the goals assigned to them by the project work?
- 4) In case you have pressure from both the project work and your organization to achieve both parties' goals. How would you deal with such a situation?

A.2. Second round of interview

- 1) To what extent your team is moving toward the intended goals of the project work, as agreed upon at the beginning of the project?
- 2) Have you deployed all the necessary resources for implementing the project's guidelines and instructions?
- 3) Knowing that the reception of the remaining part of your funding is dependent on the results of the intermediary report, have you reported the actual results achieved by your team?
- 4) In case there was initially a gap between the core goals of the project work and the core goals of your organization, do you see yourself leaning toward achieving the goals assigned to you by the project? Or do you always put the achievement of your organization's core goals at first?
- 5) Do you think that the means (practices) and ends (outcomes) of the project work are maintaining distinct trajectories throughout the first phase of the project?
- 6) What do you think would be the reasons behind such a gap?
- 7) How do you plan to manage the pressures of the project work and your organization for the last phase of the project work?

A.3. Third round of interviews

- 1) Was the project work in your opinion a failure or a success, if you would have to choose between the two answers?
- 2) What were the factors and elements that might have impacted this success or failure?
- 3) If you have another opportunity to take part in a similar project work, what work would you do differently to increase the chances for the project's success?

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