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Strategizing open innovation: How middle managers work with performance indicators

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ABSTRACT

Open innovation (OI) has become an established business practice followed by many organizations and industries. This paper extends understanding about how middle managers work with performance indicators to strategize OI by taking a bottom-up perspective in the organization. It draws on interviews carried out with eighteen (upper-level) middle managers from different global and internationally recognised organizations. Through an abductive study, we compare how these middle managers reason about their work with performance indicators to mobilise top managers towards an OI strategy. Findings show that the situational nuances middle managers find themselves in, such as the extent of strategic support for an OI strategy by top managers and the degree to which OI practices are adopted, plays a critical role in influencing how they work with performance indicators. According to these situational nuances, we distinguish different OI contexts which affect how middle managers reason about their work with performance indicators. We label the different types of reasoning as *abstaining, initiating, expanding, restructuring,* and *retaining*.

1. Introduction

The accounting literature has highlighted the critical role performance indicators play in the strategic work within organizations (Bhimani & Langfield-Smith, 2007; Chapman, 2005; Chua, 2007). However, to date understanding how this happens has largely been driven by a very top-down perspective. Unfortunately, such an approach neglects a range of influential factors. First, it largely ignores the role and contribution others inside or outside an organization might play in strategizing (Carlsson-Wall, Kraus, & Lind, 2015; Jørgensen & Messner, 2010; Skærbæk & Tryggestad, 2010). Second, it tends to overlook the findings of others which suggest that in the strategizing process, top managers might actually be better integrating bottom-up information from lower levels in the organization (Bisbe & Otley, 2004; Henri, 2006; Simons, 1995). Third, a top down perspective also neglects the role of the middle manager and how they might work with performance indicators to inform strategizing (Burgelman, 1983; Currie & Proctor, 2005; Wooldridge, Schmid, & Floyd, 2008). Given the role middle managers[1] play in organizations, we see this oversight as somewhat surprising.

Through this abductive study (Dubois & Gadde, 2002; Lukka & Modell, 2010), we look to address this oversight by extending understanding about how middle managers might work with performance indicators to strategize open innovation (OI) (Chesbrough, 2003, 2006). The notion of OI relates to an open strategy (Almirall & Casadesus-Masanell, 2010; Chesbrough & Appleyard, 2007; Teece, 2010) by which organizations engage in economic exchange within and across its boundaries to create and capture value from technology, and thereby intend to gain market opportunities and competitive advantage.[2]

The starting point for our investigation was a surprising observation (Alvesson & Kärreman, 2007; Alvesson & Sandberg, 2011) at practitioner events, known as the Berkeley Innovation Forum (BIF), where (upper-level) middle managers from different global and

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[1] Middle managers are defined here as being hierarchically positioned below top managers and higher than first-level supervisors. However, the *defining feature* of middle managers is its access to top managers while simultaneously being closely involved with and knowledgeable about operations (see for example Wooldridge et al., 2008). Middle managers can be relatively highly ranked in the organizational hierarchy and are sometimes described as semi-executives. Their titles encompass varying degrees of Directors and Vice Presidents depending on the specific hierarchical design of the organization and country (e.g. European vs. American companies). By contrast, top managers (members of the executive team) typically hold titles such as Chief Executive Officer, Chief Financial Officer, Chief Operating Officer or General Counsel.

[2] The practice of OI appears to be accepted by many major global organizations, as evidenced through the membership of the Berkeley Innovation Forum (BIF). See http://corporateinnovation.berkeley.edu/executives/berkeley-innovation-forum/ for an overview.

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internationally recognised companies (including Hewlett Packard, Johnson & Johnson, Nestlé, SAP, Shell, and United Health Care) gather to exchange their experience on OI. Those middle managers shared a concern for developing performance indicators for their strategic work with OI practices. However, to our surprise, their reasoning about it differed widely. Following the lead of this observation, we conducted semi-structured interviews with eighteen of those middle managers. All of them were responsible for the probing and/or managing of OI practices in their organizations. Moving iteratively back and forth between theory and empirics (Dubois & Gadde, 2002), we realised that the shared reasoning of middle managers related to their occupational interest in strategizing OI in their organization, yet the differences among them related to the nuances of their strategic contexts. In this study, we therefore explore the following research question: *How do middle managers work with performance indicators to strategize OI?*

This study contributes to the accounting literature in the following ways. First, we contribute to accounting literature that explores the active role of performance indicators in shaping organizational life (e.g. Gerdin, Messner, & Mouritsen, 2014). In doing so we draw on and extend the work of Catasús, Ersson, Gröjer, and Wallentin (2007) who argue that the existence of performance indicators alone does not necessarily trigger action but can support the mobilising of a specific organizational direction. We show that middle managers' priorities about performance indicators depend on what they need to do to mobilise top managers. We find that performance indicators can lead to action but only if what is measured is also mobilised in context and that this influences the ways in which middle managers inform top managers through performance indicators. Linked to this, different contexts are identified through our findings which relate to 1) the extent of strategic support and 2) the extent of practice adoption. Depending on these conditions, we find that middle managers reasoned differently about how they work with performance indicators to inform top managers in strategizing OI. We label their reasoning as *abstaining, initiating, expanding, restructuring,* and *retaining.*

Second, we add to the literature on accounting and strategizing (e.g. Chapman, 2005; Chua, 2007) by adopting the notion of OI (Chesbrough & Appleyard, 2007; Whittington, Cailluet, & Yakis-Douglas, 2011) and shedding light on the reasoning of middle managers about their work with performance indicators in strategizing OI. While previous studies have looked at actors other than top managers (Carlsson-Wall et al., 2015; Jørgensen & Messner, 2010; Skærbæk & Tryggestad, 2010), we add to these findings by analysing how the reasoning of middle managers might frame an active role of performance indicators in strategizing, and demonstrate conditions under which middle managers seek to develop performance indicators that provide hard facts to top managers about the strategic commensurability of OI. Moreover, our findings also demonstrate the limitations of middle managers in informing strategy through performance indicators. We therefore present mixed evidence regarding the extent to which middle managers use performance indicators to inform strategy bottom-up, highlighting both their possibilities but also constraints.

2. Literature and conceptual background

2.1. Performance indicators, strategizing, and middle management involvement

Performance indicators facilitate information to evaluate, implement, and monitor the effective and efficient achievement of strategic and operational objectives (Chenhall, 2005; Ittner, Larcker, & Randall, 2003; Kaplan & Norton, 1992). Neely, Gregory, and Platts (1995) explain that performance indicators[3] relate to 1) effectiveness when they quantify the extent to which actions satisfy a specific strategic or operational objective and 2) efficiency if they quantify how economically an organization's resources are used to achieve those objectives.

In practice, the relevance of performance indicator design is further underlined by adages such as "what you measure is what you get" or "what gets measured gets managed". These statements assume a direct link between performance indicators and actions, thereby highlighting the effects of the measurement choices. Nonetheless, prior research by Catasús et al. (2007) investigating this link demonstrates that the contents of performance indicators are primarily associated with action – if what is indicated by the performance indicators is also mobilised in the organization. Catasús et al. (2007, p. 509) introduced the term mobilising "to emphasise that there is an arena where the organization not only seeks attention but also finds resources and a sense of direction". For Catasús et al. (2007), mobilising comprises "the act of summoning attention, resources and strategies for acting" (2007, p. 509). In this vein, performance indicators are not directly a means to activate the organization, but a means to direct the attention of actors which might ultimately lead to action. This argumentation corresponds with Mouritsen, Hansen, and Hansen (2009) who argue that accounting calculations are not primarily representations of specific actions but rather translate their impact and strategic significance for the organization. As such, performance indicators are not passive representations of what happens in the organization but can have an active role of the organization's constitution (Gerdin et al., 2014; Mellemvik, Monsen, & Olson, 1988). Taking this viewpoint, we explore how middle managers work with performance indicators to actively inform strategy bottom-up.

Performance indicators are perceived to provide the means for top managers to diagnose the market, communicate strategy and to compare outcomes with plans (Anthony, 1965; Franco-Santos, Lucianetti, & Bourne, 2012; Malina & Selto, 2001). A large amount of mainstream accounting research builds on this top-down assumption and examines, for example, the relationship of types of financial and non-financial performance indicators with differentiation, low-cost, and mixed strategies (e.g. Chenhall & Langfield-Smith, 1998; Decker, Groot, & Schoute, 2013; Van der Stede, Chow, & Lin, 2006), the cause-and-effect relationships among performance indicators and the outcomes of strategic performance indicators on organizational performance (e.g. Chenhall, 2005; Ittner et al., 2003; Malina, Norreklit, & Selto, 2007).

In contrast to the above research, Chapman (2005) adopted the concept of 'strategizing' (e.g. Jarzabkowski, Balogun, & Seidl, 2007; Whittington, 2003, 2004) in interpretive accounting research, calling for investigations into how accounting and strategy interrelate and what role accounting plays when strategies emerge bottom-up and from the periphery of an organization (see also Chua, 2007). Several studies show how the information provided by performance indicators are viable not only for strategy implementation but also its formulation (Ahrens & Chapman, 2005; Hansen & Mouritsen, 2005; Modell, 2012). For instance Skærbæk and Tryggestad (2010, p. 121), who explore the role of accounting devices in the active formulation of strategy, reflect that they did not find

> support for the assumption that the key strategic actor and its' rationale are confined to the CEO or the top management team. Rather, the location and rationale of the key strategic actor seems to transgress such formal (hierarchical) boundaries.

However, they do point out that

> accounting devices become strategic in a role of (re)formulating strategic ends and rationales, rather than being limited to implementation. (Skærbæk & Tryggestad, 2010, p. 121)

Similarly, Carlsson-Wall et al. (2015) and Jørgensen and Messner (2010) report in their case studies that preparers and/or recipients of strategic accounting information involve middle managers and

[3] The accounting literature applies the terms performance indicators and performance measures interchangeably. We use the term 'indicator' to denote performance representations that 'indicate' performance dimensions rather than necessarily always providing a sharp 'measure' of specific performance dimensions.

operational specialists, not only top managers.

A number of other survey or case-based studies build on the assumption that strategy can occur as a continuous dialogue between different levels and functions in the organization (Bisbe & Malagueno, 2012; Bisbe & Otley, 2004; Henri, 2006). In this vein, Marginson (2002), drawing on Simons (1995), discusses how top managers use of management control systems frames the strategic context within which middle managers generate new strategic ideas. Nonetheless, research in this area relating to the perspectives of middle managers is scarce, as is understanding about how they might work with performance indicators to inform strategy formulation bottom-up.

This seems to be an oversight in the accounting literature. If we look at the strategy literature, it has been arguing for some time that middle managers (Bower, 1970; Kanter, 1982; Wooldridge & Floyd, 1990) are important mediators in strategizing, connecting different levels of the organization such as top managers and operational personnel (Balogun & Johnson, 2004; Floyd & Lane, 2000; Wooldridge et al., 2008). For instance, Burgelman (1983) developed a model for strategy formulation, arguing that middle managers often champion specific strategic initiatives which are developed by lower ranks in the organization. In turn, top managers ratify and select these strategic initiatives and are mostly involved in resource allocation. This theoretical approach assumes that idea-creation occurs to a large extent in the lower and middle levels of the organization, while top managers are responsible for overseeing the initiatives and making the strategic choices.

2.2. Strategizing open innovation

We focus on the involvement of middle managers in strategizing OI in their organization. The rationale behind OI is that organizational members might be 'blind' to the potential value of an emerging in-house invention or not have the possibility of adjusting the existing organization to create value from it. In turn, many valuable inventions and ideas might be developed outside an organization and not adequately considered in-house. Responding to these issues, Chesbrough (2003, 2006) introduced the notion of OI as follows:

> Open innovation means that companies should make much greater use of external ideas and technologies in their own business, while letting their unused ideas be used by other companies. This requires each company to open up its business model to let more external ideas and technology flow in from the outside and let more internal knowledge flow to the outside (Chesbrough, 2006, p. xiii).

OI refers to the integration of suppliers, customers, and other external knowledge sources like the buying or licensing of patents; relates to benefitting from internal ideas by selling or revealing them to the market, such as selling intellectual property or multiplying technology; and encompasses co-creation with partners via alliances, cooperation, and joint ventures (Dahlander & Gann, 2010; Enkel, Gassmann, & Chesbrough, 2009; West & Bogers, 2014).[4] Hence, openness is understood here as a continuum and can be pursued in many different forms, for example in revealing ideas and knowledge and/or acquiring it.

The notion of OI is a subset of open strategy (Almirall & Casadesus-Masanell, 2010; Chesbrough & Appleyard, 2007; Teece, 2010). Whittington et al. (2011) argue that the strategy literature is 'opening up' because developments in contemporary organizations challenge 'strategic orthodoxies' in two important ways. First, aligned with the aforementioned 'strategizing' literature, an OI strategy acknowledges that strategy is not limited to the CEO and some 'elites' in the organization as was traditionally assumed. Instead, an OI strategy can emerge through the involvement of a wide range of actors inside and outside the organization. Second, an OI strategy triggers an increased transparency of the strategy which stands in contrast to the traditional 'secrecy' of strategic imperatives in organizations. Many aspects of an OI strategy and its related business models are nowadays transparent and easily imitable by other companies, sometimes even 'shared' by multiple competitors (Teece, 2010). This means that organizations have to decide more carefully where to be 'open' and where to be 'closed' in order to maintain competitive advantage (Almirall & Casadesus-Masanell, 2010).

While the ideas behind OI might not be universally accepted, practitioners subscribe to the concept and accept it and seem to see it as being relevant for practice and what they do.[5] OI strategies appeal to organizations because they promise lower costs for innovation, faster time to market and the possibility to share risks with external partners (Chesbrough, 2006). However, changing an organization towards an OI strategy can be challenging because the OI principles are closely interwoven with organizational structure, culture, and history (Chiaroni, Chiesa, & Frattini, 2010; Gassmann, 2006; Wallin & Von Krogh, 2010). Moreover, research indicates that the cost of openness might sometimes exceed its benefits (Saebi & Foss, 2015).

Scholars from both the accounting (Davila, Foster, & Oyon, 2009) and innovation (Gassmann, Enkel, & Chesbrough, 2010) domains emphasise the need to better understand the role of performance indicators in the strategic context of OI practices. Our study adds to such understanding by exploring how middle managers work with performance indicators to strategize OI.

3. Research setting and methods

3.1. Methodology

We applied an abductive methodology to make sense of the data and develop theory (Ahrens & Chapman, 2006; Lukka & Modell, 2010; Peirce, 1960). Abduction considers existing theory which is successively revised and modified as a consequence of unanticipated empirical findings and emerging theory (Alvesson & Kärreman, 2007; Dubois & Gadde, 2002). In our abductive analysis, we considered that interpretive research can facilitate an understanding of causality by applying contrastive thinking and counter factuality (Lukka, 2014; Morgan & Winship, 2007). Hence, by exploring our research objective, we had an interest in understanding the mechanisms that could explain how outcomes were derived from specific conditions.

3.2. Empirical context and data collection

We triangulated data from two main sources (Denzin, 1983; Modell, 2009; Silverman, 2005). Our departure points were four participations (see Appendix Table A1) at the practitioner event known as the Berkeley Innovation Forum (BIF). This is a biannual meeting where (upper-level) middle managers from large, listed companies exchange their experiences of OI practices. The two-day forum is hosted by Henry Chesbrough, who introduced the term OI. The BIF is limited to 30–50 participants who come from different member organizations that pay a yearly fee. Typically, member organizations are from different industries and not direct market competitors. Companies that are part of the BIF are Hewlett Packard, Johnson & Johnson, Nestlé, SAP, Shell, and United Health Care, to name a few. The authors kept notes about the insights gained from their participation. The forum offered an opportunity for the researchers to attend presentations by member organizations regarding their OI practices; follow panel discussions about specific OI-related topics, e.g. a panel related to OI measurement; and participate in working groups where participants were asked to solve an innovation case.

[4] These three processes are the general elements of OI practices which are relevant for this study. For a more nuanced overview of OI practices see Saebi and Foss (2015).

[5] http://corporateinnovation.berkeley.edu/executives/berkeley-innovation-forum/.

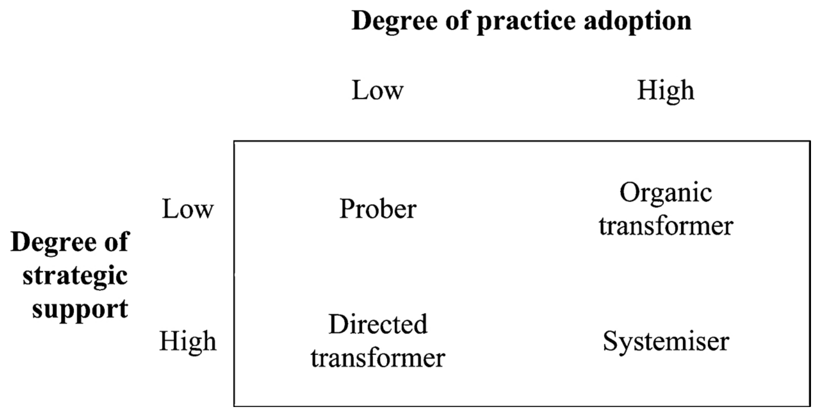

Fig. 1. Types of OI contexts.

Being involved in several of these two-day events provided many informal insights into the challenges, benefits, and hindrances these middle managers face in their everyday activities in managing OI. Through participation the authors were immersed in an event where these middle managers shaped their occupational perspective (e.g. Cooper & Robson, 2006). Based on these insights we realised that these practitioners widely shared a willingness to develop performance indicators for OI strategies. However, to our surprise (Alvesson & Kärreman, 2007), they seemed to reason differently about how to approach such development.

Our second data source builds on semi-structured interviews with eighteen (upper-level) middle managers from listed companies associated with the BIF (see Appendix Table A2). These managers were interviewed about their specific status on designing and using performance indicators for the OI practices either on site or via conference call. Drawing on our preliminary knowledge from the BIF, we selected interviewees based on purposeful sampling (Patton, 1990; Pratt, 2009). Interviewees represented a range of contexts including some extreme cases where OI strategies were at an early stage or highly developed. So, this sampling approach seemed appropriate. These interviews lasted between 35 and 75 min depending on the time schedule of the interviewees and the extent to which they had developed performance indicators. All interviews were carried out by one of the authors. We pursued interviews until we reached a saturation point, that is, new interviews merely confirmed our interpretation and theoretical refinement (e.g. Ahrens & Chapman, 2006).

All interviewees were the responsible middle managers for probing and/or managing the OI practices in their organizations. Although they would have different titles (e.g. various degrees of directors or vice presidents), they all had at least two hierarchical layers above them in the organizational hierarchy. The differences of titles reflect the specifics of the hierarchical design of the organization (e.g. American versus European companies) and also how far an OI strategy had been adopted and what importance the OI practices had in the respective organizations at the time of the interviews. The literature provided pre-understanding and was used to help develop the questions we asked (Dubois & Gadde, 2002). The semi-structured interviews covered the following subjects: the function of the interviewee and their responsibility, strategic relevance, OI practice adoption, and specific examples of that, the current state of the performance indicators and their future development. Since participants all attended the same event and were involved in developing the construct based on the common discussion, they were familiar with the academic-based notions of OI developed by Chesbrough (2003, 2006).

3.3. Data analysis

Field notes and observations were collated. All interviews were recorded, transcribed, and coded. Data were then reduced and condensed before being sorted into descriptive categories and potential themes which seemed to fit with our core interests and which we felt would best address our research objective (Alvesson & Kärreman, 2007; Dubois & Gadde, 2002). The next step involved searching the remaining data for patterns and commonalities. Through this process we looked closely for the links, emerging patterns and connections in the data, reflected on them and discussed them at length.

We coded practical categories such as the interviewees' function, contextual factors, such as strategic mandate and degree of practice adoption, and type of performance indicators. The coding and categorising emerged from the data. However, being aware of the relevant literature and concepts in accounting meant the research team could hold the ideas emerging from the data up against the literature throughout the analysis stage (Alvesson & Sandberg, 2011; Dubois & Gadde, 2002; Modell, 2005). This facilitated our being able to identify how different the situations emerging from our data were to current knowledge and understanding.

Through our empirical investigation and analysis of the data, we identified that these middle managers faced different OI contexts. In some companies and industries, OI practices had already been widely established. However, other companies pursued a more closed strategy. In addition, in some of these contexts, top managers had assigned a strategic mandate for OI practices or even an OI strategy, while in other companies, limited authority and strategic support was given to middle managers in this regard. Accordingly, four types of OI contexts emerged from our data: *prober, directed transformer, organic transformer,* and *systemiser*. These are illustrated in Fig. 1 and will be introduced in the next section.

We grouped the contexts of our interviewees based on these criteria. This categorisation was built from the interview data and informed by the contextual information we gathered at the BIF. Based on our data, we found one company probing OI practices, eleven companies that had transformed OI practices – that were either directed or organic – and six companies that had established a systemic OI strategy. These four OI contexts are not exclusive but typically one of them prevails and characterises the context of the middle manager.

3.4. Empirical evidence

In this section we present our findings to demonstrate how middle managers worked with performance indicators in their respective contexts. The performance indicators relate to any financial and non-financial measurement instrument these middle managers related to in the interviews. These performance indicators could vary from one context to another, as we show in more detail through our analysis in the subsequent discussion section.

a) Prober

We found one middle manager who was probing OI practices. Probing means this middle manager did not have any strategic support from the CEO or other top managers to implement OI practices nor was the organization naturally applying OI practices. However, due to his

Table 1
Prober.

No.	Strategic support	Practice adoption	Middle manager perspective	Excerpts
M1	No mandate	No adoption	- recognizes potential benefit of OI practices for the organization but refrains from mobilizing top managers towards an OI strategy. - feels the financial situation of the market and the fierce competition provide an environment unsuitable for OI practices. - has not pursued any pilot cases of which outcomes could be measured to inform top managers about the value of OI practices.	*And trying to create a positive view of what we can do from an innovation perspective is the life blood of the business, but when we market it in a downturn it's extremely difficult to get [top managers] to adopt an OI approach. That's because it means that you're opening up in a more collaborative way, perhaps with your competition. … My problem for a business like ours is that we have lots and lots of different facilities producing very different products, so how do you actually take an OI approach and deliver it within those businesses. And until I've actually got an OI plan and a programme to roll that out, then I can't measure it.*

occupational interest, he attended the BIF and aimed to understand potential benefits of OI practices for his organization in the future. We will briefly present the perspective of this middle manager here (see Table 1) because it provides a contrast to the other middle managers.

M1 explained that in environments with limited financial resources for R & D and a tradition of closed innovation, it was difficult to convince top managers to change towards an OI strategy. His probing of such a change had shown that the organization's members would find sharing with external parties a threat to internal ideas and would negatively affect the bottom line. M1 was concerned that the organization operated in an industry that was in a financial downturn in which the market was perceived to be very competitive. Although it seemed to M1 that the business could potentially benefit from OI practices, he did not have a method to nullify the financial concerns of whether OI practices would create strategic value. Nevertheless, M1 perceived that top managers would be willing to change towards an OI strategy if he could make its positive value clearly visible. M1 was currently discussing with business operations about how to improve their performance indicators for innovation in general. He concluded that to help him develop performance indicators for OI practices, this type of conduct needed to be ingrained in the business first. Since there were no ad-hoc OI practices occurring and only limited performance indicators had been established for innovation, M1 could not demonstrate the financial value of OI practices and was constrained in any efforts to promote an OI strategy.

b) Transformer

Middle managers of transformers worked in environments where they had some OI practices in place. They had either received a strategic mandate to implement specific OI practices or they had traditionally operated with OI practices on an ad-hoc basis. We therefore distinguish two types of transformers: directed and organic. In eight companies we found a directed approach where the OI practices were directed by the CEO and in four companies an organic approach where the OI practices were accepted on an ad-hoc basis but not systematically managed.

b1) Directed transformer

The middle managers of directed transformers were assigned strategic mandates for OI pilot projects (see Table 2) or were in a more

Table 2
Directed transformer (early stage).

No.	Strategic support	Practice adoption	Middle manager perspective	Excerpts
M2	Direct CEO support	Early stage	- employs non-financial performance indicators (e.g. number of OI practices, ideas generated through OI practices) to inform the CEO about the 'successful' implementation of the OI practices (pilot mandate for OI strategy). - seeks to employ financial performance indicators to inform top managers about the financial impact of pilot projects and thereby gain support to initiate the OI strategy across the business.	*… for the business managers, 100% the key criteria for them is dollars, dollars, how much money are you making from these things. … I think if we have a business win we use that as a good case study, a great example to show the decision-making leaders as a proof of point. And that's a very strong proof of point for them, they're like, OK so you guys found through this OI, managed to find new products and services. … it will make it a lot easier to win their backing.*
M3	Direct CEO support	Early stage	- started to employ non-financial performance indicators (e.g. number of collaborations and engagements) to inform top managers about the implementation of OI practices (pilot mandate for OI strategy). - views it as important to develop financial performance indicators to gain support from top managers for an initiation of a broader OI strategy in the future.	*And so it's important to understand that there is value and there are results being generated here and if you don't have some kind of measurement you have a hard time doing that. We can come up with as many anecdotes as we want but until you can say 5% of x,y,z [profits come from OI] it becomes difficult to really get business leaders believing it's an important thing for the organisation. … I think a few key measures are important to this success – Both for OI and also the integration of OI in the business.*
M4	Direct CEO support	Early stage	- argues that OI practices have been implemented because 'it feels right' and without detailed performance indicators in support of the OI practices yet. - seeks to develop performance indicators that inform top managers about the 'value' of OI practices, particularly for situations where strategic choices have to be made between internal and external innovation.	*… you know cutting internal work means actually [laying off people] and saying you've not got a job any more. Therefore without measures about how OI works and how it is still a collaboration that brings value to the organisation, it's always going to be the first I suspect to get cut when profitability falls in the business. If I had a way of measuring the value that would be able to… And I don't know if it would change the decision but it would make it a better informed decision.*
M5	Direct CEO support	Early stage	- employs non-financial performance indicators (e.g. number of ideas generated through OI, engagements with start-ups, involvement in venture capital meetings) to inform top managers about the value generated through OI practices (pilot mandate for OI strategy). - aims to keep the resources for the OI practices relatively low (e.g. budget for the OI team).	*We also try to, in a positive way, we often will think of ourselves of sort of like a start-up within [the organization] and so just accounting-wise we actually try to work in a very sort of frugal way …, we're driving a lot of that value to [the organization] for ultimately, ultimately little cost. … It's challenging because it's difficult to benchmark, it's definitely something where we are wanting to make sure we are, that [top management] feels that they're getting more than their money's worth for the investment they're making.*

Table 3
Directed transformer (advanced stage).

No.	Strategic support	Practice adoption	Middle manager perspective	Excerpts
M6	Direct CEO support	Ongoing	- employs non-financial performance indicators (e.g. number of new products developed through OI practices) to inform the CEO and other top managers about the effectiveness of the OI strategy. The CEO recognized prior achievements and allocated more resources and strategic relevance to the OI team in the current period. - continuously adapts performance indicators to the new strategic goals.	*[The performance indicators] need to evolve with the strategy. Because for OI to be useful for the organisation, you need to make sure where the usefulness comes from. So my metrics were useful until right now but this year they are not the same any more. We need to reinvent them. And they will still be critical to make the management keep believing and investing in this. … I never, right now I haven't been in the situation of needing to ask [for more resources] and I need to justify it, because the results are talking by themselves.*
M7	Direct CEO support	Ongoing	- employs non-financial and financial performance indicators to inform the CEO and other top managers about the progress of the implementation of the OI strategy. After having achieved prior strategic goals, the OI team received more resources in the current period. - undertakes efforts to employ more detailed performance indicators to better show the effectiveness of OI practices to top managers.	*I just sent like, last week the results about 2016 with the proofs of what we have done with start-ups, with partnerships [throughout] the season taken at innovation committee level. The point was how many partnership and agreements with start-ups had we signed after the green light of the innovation committee. So I mean we are really tracking everything because everything goes. I mean the CEO and the company wants to see numbers of course.*
M8	Direct CEO support	Ongoing	- employed mostly non-financial performance indicators to inform top managers about the strategy implementation in the previous periods. The OI strategy has 'successfully' expanded and the focus now turns towards informing about its financial impact. - starts 'selling' the OI practices within the organization to have a better measure for financial impact.	*Before we focussed on the process, on the operations, on the involvement, on the people, but now the focus is on money. It differs and when I sell our services in [the organization] I will ask 'OK, we help you making big projects but we would like to be part of your big projects, your big project is for a billion [currency] but how [much money will I get to] make my part in your big projects?' And we try to count this.*

profound process of transforming the organization towards an OI strategy over several years (see Table 3). All these middle managers were given direct strategic support from the CEO for implementing OI practices, yet they were responsible for implementing the strategic seeds and demonstrating that OI practices would generate value for the organization. Taking their occupational perspective seriously, they expressed their interest to implement an OI strategy on a broader scale across businesses or even corporate-wide over time.

Middle managers in the early stages of applying OI pilot projects (M2-M5) were mostly working with non-financial performance indicators. For example, they measured the number of engagements with external parties (M3) or the number of generated ideas through OI practices (M2, M5). Those non-financial performance indicators could vary depending on the contents of the specific strategic trial mandate. With the exception of M4, these middle managers informed the CEO and other top managers about the progress of the strategy implementation through performance indicators. Performance indicators provided the means for those middle managers to inform top managers about the 'successful' achievements of the pilot projects, which in turn would justify the receipt of more resources and an initiation of a wider strategic mandate from top managers in the next period.

These non-financial performance indicators were a way to inform top managers about the 'value' of the OI strategy, and a justification for the investments in an OI strategy being made (see M5). However, the middle managers also expressed that to get wide support from diverse top managers across business units, it was necessary to develop financial performance indicators that demonstrated the financial impact of the OI strategy. Such demonstration of impact was required to change top managers' ideology of how to pursue innovation in the organization. As a consequence, middle managers aimed to develop pilot cases that would illustrate a financial impact of OI specific practices. For example, pilot cases could demonstrate revenues and profits generated through the introduction of new products and services or could demonstrate significant cost savings in the innovation process. Financial performance indicators would be a stronger argument for the OI strategy. For example, when managers were in a situation to reduce resources, financial performance indicators could provide essential information about the commensurability of the OI strategy. OI practices would otherwise be difficult to justify compared to purely internal projects; as M4 explained, 'You know cutting internal work means actually [laying off people]'.

By contrast, middle managers of more advanced directed transformers (M6-M8) worked in an environment which had already transformed towards a systemic OI strategy for several years and had widely expanded the OI strategy. While they had similar priorities as M2-M5, they emphasised that they would continuously redesign their performance indicators. Hence, there was an ongoing iteration between the strategy (re-)formulation through expansion, and the development of performance indicators. Interestingly, middle managers were involved in, or even determined, the design of performance indicators which simultaneously set up the tool for top managers to assess if the OI strategy was 'successful'. For example, M6 mentions that they need to 'reinvent' the performance indicators to make them aligned with the new strategic priority and expansion, and that those redesigned performance indicators remain important 'to make the management keep believing and investing in this'. Moreover, a major difference of the more advanced directed transformers was that they were in the process of implementing more profound financial performance indicators. After a few years of implementation, top managers expected to see financial performance indicators to assess the financial impact on a wider scale. These findings show how middle managers used non-financial and financial performance indicators to demonstrate the value of the OI strategy. There was a continuous iteration between the strategy and the performance indicators from a strategic seed towards transforming the strategy at the business unit-level or even corporate-wide level.

b2) Organic transformer

The middle managers of organic transformers worked in an environment where OI practices were accepted and widely applied in the business units, yet they were performed without an explicit strategic mandate for OI practices but ad-hoc as an integral part of projects/initiatives (see Table 4). In these organizations, top managers did not explicitly support a systemic OI strategy. Although these organizations engaged in OI-related practices, middle managers confessed that the processes and structures for OI practices were not optimised. From an occupational perspective, these middle managers had an interest in improving the strategic effectiveness and operational efficiency of OI practices by restructuring the innovation process to be better aligned for an OI strategy. Strategic effectiveness meant that all possibilities of

Table 4
Organic transformer.

No.	Strategic support	Practice adoption	Middle manager perspective	Excerpts
M9	No mandate	Accepted and applied ad-hoc	- employs loosely collected non-financial performance (e.g. based on surveys in the organization) to inform top managers about the application and benefits of existing OI practices. - seeks to develop performance indicators at the project-level (e.g. input/output ratios) to systematically manage OI practices. However, without a strategic mandate, those indicators are difficult to develop.	*Right now a lot of our projects are selected mostly on an ad hoc basis … I think measuring [OI] allows you to make a case for its impact. But also measuring it allows you to refine how you do it. … So, when it comes to OI to the extent that we eventually develop a strategic mandate to do this, then the question is not whether we do it or not, it's how well we do it. … And we don't have the definitions yet of what will qualify as a strong OI content. So the definitions don't exist, accounting systems don't exist and so the more bottom line impact questions we're not able to address at this time.*
M10	No mandate	Accepted and applied ad-hoc	- seeks to develop more systematic OI practices (e.g. external OI competitions) to design the innovation process for new products more efficiently and effective. - seeks to develop performance indicators that inform top managers about the difference between the current mode of working versus working based on a systemic OI strategy.	*I think the challenge is to explain the options and the benefits [of OI] because I don't think that there is too much resistance by the executives. It's rather that we've got so busy that bringing new elements into our way of working requires some type of report and patience. … And then we have to show the gap between the current way of working versus introducing OI [as a strategic mandate] because in all areas of the company we do behave and act at least partly according OI ideas of course. … I see the potential with OI in our company is the effectiveness of the innovation, the cost effectiveness.*
M11	No mandate	Accepted and applied ad-hoc	- employs non-financial and financial performance indicators to inform about OI practices which are widely applied. However, feels there is a lack of strategic support from top managers. - argues that one of the key criteria to receive a strategic mandate from top managers is to demonstrate a significant financial impact of existing ad-hoc OI practices which seems still difficult to achieve at this point.	*The economic value that OI delivers is still fuzzy for the broad executive people. So they are hesitant to engage with it and carry it out in the different variations that are available. So there are still some lack of resources, some unclarities, some fears … And sometimes they just don't know what OI is, how it could deliver value add and in which areas where OI is able to create a value add. … The executive level or the board level, you know, when have you reached a size when they are waking up. You have to have impact in a million or even billion areas that you have made a change, and these cases are quite rare so far.*
M12	No mandate	Accepted and applied ad-hoc	- views OI practices as an implicit part of organizational projects (e.g. programmes, initiatives) which are measured based on typical output measures such as revenue and profitability. OI practices are integrated in projects when it makes strategically sense but the OI content is not separately measured or managed. - is involved in informing and evaluating the projects which might contain OI practices.	*… OI in most cases is a means to an end, it's being applied implicitly and the owner of this programme, of this initiative, needs to clearly understand the role of OI, to use it as a tool to better reach these financial goals, but it's not being made explicit in terms of I was only able to reach my goals using OI principals. I mean at times this certainly happens and then we also communicate it externally, but it's not something, I don't know, we typically make explicit, it's more an implicit element of the approach and, again, being used as a means to an end.*

OI practices were taken systematically into consideration along the stages of the innovation process and operational efficiency meant that the innovation process could reach best output with minimum resources.

Due to the lack of a strategic mandate, middle managers faced the situation that the structure of the organization was not designed to separate the processes and outcomes of existing OI practices which made it difficult to track the impact of OI practices with performance indicators. In contrast to directed transformers, practicing OI organically meant there was no immediate need to evaluate OI projects in defence of a strategic mandate. However, from the middle manager's perspective such information would be useful to promote a more systemic OI strategy. Middle managers worked with existing performance indicators within their organization and made them more aligned to enable performance indicators for OI practices (M9–M11). This information was collected from different systems and surveys but not in a systemic fashion (M9, M10). OI practices were an integral part of project-level performance indicators without separating projects with external from such with purely internal innovation (M9, M10, M12). Middle managers would use surveys to gather information of a loose and unsystematic collection of OI practices to demonstrate existing OI practices to top managers (M9, M11). Middle managers worked with performance indicators on input and process but were challenged in presenting output-oriented performance indicators of OI practices.

While M9, M10, and M12 perceived that their top managers would be ideologically aligned with OI practices and needed to be informed about the advantages of restructuring the innovation process towards a systemic OI strategy, M11 was in a different situation. He perceived the top managers to be partially sceptical about the benefits of OI practices despite those practices being applied and accepted in many business units of the organization. Compared to the other three managers, M11 therefore put a higher emphasis on informing top managers about the financial impact of specific OI practices (similarly as directed transformers) to find acceptance for a systemic OI strategy.

Middle managers differed regarding the extent to which they would systemise the OI strategy. While M9, M10, and M11 envisioned a more profound restructuring towards an OI strategy, M12 was more selective in terms of such structural change. He noticed that the organic approach for OI practices seemed to work well in the organization, yet that there are specific areas of OI practices (e.g. crowdsourcing, collaborative business model innovation) were a strategic mandate was necessary to simplify and speed up the process which meant also that the decision authority about those areas had to be delegated from higher to lower hierarchical levels in the organization.

c) Systemiser

Middle managers of systemisers worked in an environment with a strategic mandate for an OI strategy (see Table 5). Those middle managers had a systemic approach, were the most advanced in practicing OI and worked in an environment that embraced an OI strategy. OI practices were widely common in the business unit or even across the whole corporation. As a consequence, the middle manager was in a strategically important position and the OI practices had strategic

Table 5
Systemiser.

No.	Strategic support	Practice adoption	Middle manager perspective	Excerpts
M13	Mandate	Adopted	- employs and continuously develops non-financial and financial performance indicators to inform top managers about the 'successful' implementation of the OI strategy. Achieving the strategic goals is acknowledged by top managers and associated with more resources for the OI team and more strategic focus in the area.	*The strategy is defined for us and we're honing that strategy and informing that strategy and maybe even evolving it based on the external environment and how we engage in it. … we are defining the measures of success for us as a department as a whole and those measures are typically around establishing meaningful collaborations that are serving on that need. … And then ultimately, it's measured by the revenue … There is also a recognition of the value that we're bringing and acknowledgement that we're achieving the objectives.*
M14	Mandate	Adopted	- employs non-financial and financial performance indicators to inform top managers about the implementation of the OI strategy. - is involved in the strategy process and decides on a case-by-case assessment whether a new collaboration fulfils the direction of the OI strategy.	*We do tracking, we look at when something gets to the market or pre-market stage, that's a portfolio and we do analyse what was based on internal innovation and what is based on external innovation. And it's about half and half, internal verses external. … [Performance indicators are] important to me. We have to report to our management periodically. … There's no question here that OI is necessary, they just want to see results.*
M15	Mandate	Adopted	- employs detailed non-financial performance indicators at the project-level to systematically assess projects and inform top managers about the strategy implementation. These performance indicators are widely applied in the organization and contain various dimensions to evaluate the quality of a collaboration, both technically as well as socially.	*We evaluate the specific project with their technical merits, and the deliverables, and how the behaviour about the partners and some business conditions … We measure both. We have some indexes, for example technical, the technical capacities. We have the output and we have good relationship with our partners and we have a good climate for their collaboration.*
M16	Mandate	Adopted	- employs non-financial and financial performance indicators to regularly inform top managers about the progress and implementation of the OI strategy. - is experimenting to extend the existing performance indicators with forward looking performance indicators that predict the financial returns of specific OI practices.	*It's very hard to do a simple return on investment calculation. You know we've always wanted to be able to look at some kind of financial measure, it's just much harder to do because some of these things can take several years before they have significant paybacks. And in the space, especially of software and services, it's not clear to me that anyone's come up with a good model for doing financial predictions or calculations for return on investment.*
M17	Mandate	Adopted	- employs a set of non-financial and financial performance indicators to inform top managers about the value of the OI strategy. - seeks to develop performance indicators that take into account the human capital and networks associated with the OI strategy for more detailed tracking in the future.	*And so whether it's employees within the company or our partners in the ecosystems of other software companies, or it's our end customers. And even with end customers, it all comes down to a set of individuals. It's not just one big company that we're interacting with, it is specific people within that customer. And so the value that's created, or the potential value to be created, is a function of the networks, skills, backgrounds, capabilities, etcetera of those people.*
M18	Mandate	Adopted	- employs a far developed set of non-financial and financial performance indicators to inform top managers about the OI strategy. Specially, based on data and many years of experience, the company experiments and develops algorithms to assess OI practices and its alignment with company's OI strategy.	*So the thing that's actually limiting our business right now is the ability of universities to create start-ups aligned with [our organization] and to grow them to 100 million revenue (laughs) as rapidly as possible. So we're trying to increase the quantity and quality of start-ups coming out of universities … the algorithms kind of guide you but, you know, algorithms are algorithms they're, you know, everything is unique so but it's nice to have the algorithms because they kind of give you a way to measure …*

relevance, and its purpose was unquestioned and taken for granted by organizational members. Middle managers were continuously implementing and partially expanding the OI strategy. However, the middle managers did not aim to achieve significant expansion and structural changes as the middle managers of transformers, but rather redirected and expanded the OI strategy at the operational level.

Middle managers of systemisers were well versed in the design of financial and non-financial performance indicators that measured the output of OI practices (M12-15).[6] They were able to track the launch of a new process, product or service and identify if the original idea was developed via internal or external resources. As the organizational structure was aligned with OI practices, these performance indicators were readily available to middle managers. OI practices were integrated into their operations and had strategic priority. Middle managers established OI processes, the triggers to measure them and a clear set of key performance indicators. In these companies, the share of OI practices was relatively high. Although the OI strategy was developed, performance indicators were used to inform top managers about the strategy implementation and to provide justification to expand it situationally.

In most of these companies the performance indicators were well developed and provided the information to make informed judgements about the possibilities of OI practices. However, the focus of these middle managers was on fine-tuning the performance indicators they had in place and looking closely at how they approached some of the more difficult elements of measurement. For instance, they experimented with more sophisticated performance indicators that would help them understand the future value creation of OI practices (M16-

[6] To demonstrate possible non-financial performance indicators for some of the OI processes, M16 summarised them as follows: jointly authored publications; patent filings; patent disclosures; invention disclosures that are filed jointly as well as separately as part of a project; the number of technologies that go into products or services; the number of students and people involved; the amount of funding leveraged; commercial and university partners; and the amount of technologies that have accelerated faster to market via external collaborations.

Table 6
Strategizing OI: Types of reasoning by middle managers about their work with performance indicators.

OI context		Middle manager	Prevalent performance indicators	Types of reasoning by middle managers
Prober		M1	Lack of performance indicators; Constrained to anecdotal evidence	**Abstaining:** Does not inform top managers
Directed transformer	Early stage	M2–M5	Non-financial performance indicators that track the input, process, and/or output of OI pilot projects; Financial performance indicators on input and/or output if available	**Initiating:** Informs top managers about the 'successful' implementation of strategically directed OI pilot projects to gain acceptance for the initiation of an OI strategy
	Advanced stage	M6–M8	Financial and/or non-financial performance indicators that track the input, process, and/or output of OI practices	**Expanding:** Informs top managers about the value and 'successful' implementation of strategically directed OI practices to gain acceptance for an expansion of the OI strategy to other areas
Organic transformer		M9–M12	Loose collection of financial and non-financial performance indicators (based on surveys; available but unaligned performance indicators; benchmarks); Financial performance indicators of OI practices if available	**Restructuring:** Informs top managers about the benefits of releasing a formal strategic mandate for OI to facilitate a restructuring of the innovation process and thereby enhance strategic effectiveness and operational efficiency of OI practices
Systemiser		M13–M18	Systemic set of financial and non-financial performance indicators along all stages of input, process, and output; Predictive performance indicators (e.g. big data, algorithms, indicators about human networks)	**Retaining:** Informs top managers about the implementation and development of the strategic mandate (at the operational level of the business unit and/or corporation) to retain (and situationally expand) the OI strategy

M18). M16 explained that they worked together with an academic to develop forward-looking performance indicators that would discount the future value of strategic options. M17 was about to experiment with the human capital involved in OI practices and how to best include them in performance indicators. M18 disclosed that they had algorithms in place to predict the future value of specific OI projects. This was possible in an area where they had built up experience and where they had the possibility to measure the data of a large population and learn from that data. Overall, middle managers of systemisers relied heavily on financial and non-financial performance indicators to inform top managers about the implementation of the OI strategy, and to retain and evolve the strategy at the operational level.

4. Discussion

The findings presented in the previous section show that performance indicators are important for the strategic work of middle managers in informing top managers about OI. Middle managers employed performance indicators to demonstrate the impact of OI practices to top managers and thereby provide information about the commensurability of a strategic mandate or, more commonly, to demonstrate the 'successful' strategy implementation, and thereby obtain acceptance for a reformulation and expansion of the OI strategy. On a general level, as we will discuss, these findings add to the broader debate about an active role of accounting devices in strategizing (Chapman, 2005) and the shaping of organizational life (Gerdin et al., 2014).

The situations of middle managers differed regarding the extent of strategic support for an OI strategy by top managers and the extent of OI practice adoption. According to these situational nuances, we found that these middle managers reasoned differently about their work with performance indicators. Based on these emerging empirical patterns we build on prior findings from Catasús et al. (2007) to theorise that middle managers employed performance indicators differently to inform top managers and mobilise them towards an OI strategy; labelled here as abstaining, initiating, expanding, restructuring, and retaining reasoning. Table 6 collates the evidence presented in the previous section to provide an overview of the elements which inform our framework. It shows the OI context, the prevalent types of performance indicators available, and how middle managers reasoned about their work with performance indicators to strategize OI. Subsequently, we will elaborate and reflect on these findings in each context separately in the light of prior literature.

The middle manager of the prober sympathised with the idea of an OI strategy. However, despite his interests being drawn from an occupational perspective and being in an organizational position to inform top managers on strategic matters, he could not justify an OI strategy to them without demonstrating the financial value of OI practices. While we would expect accounting calculations to support strategic imperatives rather than overrule them (e.g. Carlsson-Wall et al., 2015; Jørgensen & Messner, 2010; Skærbæk & Tryggestad, 2010), in the context of the prober, the absence of suitable performance indicators seemed paramount and even discouraged the middle manager to initiate a strategic initiative at all. This is an important finding which extends prior research on the mobilising effects of performance indicators (e.g. Catasús et al., 2007) because it shows that performance indicators can be crucial for the middle manager in the decision whether to mobilise top managers towards a strategic initiative or not.

Employing the counterfactual account of causality (Lukka, 2014) and as the middle manager put it himself, had there been some belief by top managers in the value of OI practices, he would have had an early "OI plan and a programme to roll out" and it would have also been possible to develop performance indicators for OI practices. These insights illuminate the argumentation by Catasús et al. (2007) who assert that performance indicators are mostly associated with action if there are other resources activated in the organization to mobilise action. However, what we show is that it is difficult for the middle manager of the prober to employ performance indicators for strategizing without a strategic trial mandate or existing ad-hoc OI practices. Since this middle manager did not undertake any effort to inform an OI strategy with performance indicators, we label the reasoning of this middle manager as *abstaining*.

In the context of directed transformers, middle managers obtained the strategic support from the CEO to implement OI pilot projects or even develop a more profound OI strategy in the organization. Middle managers with OI pilot projects primarily relied on non-financial performance indicators to inform top managers about the progress of the strategy implementation, and thereby demonstrate the usefulness of OI practices to inform an initiation of a broader OI strategy. While non-financial performance indicators of the inputs, processes, and outputs of OI practices were acceptable for top managers in the early stages, middle managers were challenged to provide evidence and pilot cases to show the financial impact of OI practices over time. Financial performance indicators create some commensurability of strategic choices, which was relevant in market situations with limited resources available. Since the measurement of these pilot projects informed the acceptance of a broader OI strategy by top managers, we label this type of reasoning *initiating*.

Middle managers of more advanced directed transformers emphasised even more the financial performance indicators. In those companies, OI practices were in place for several years and the outcomes of initiatives could begin to be captured more generally in products and services, or other outcomes. Performance indicators could provide hard facts about the positive financial impact of OI practices, supporting both, a justification of OI implementations and justification for a reformulation of the strategy within or across business units. Hence even though performance indicators would measure strategy implementation, in the middle managers' reasoning they would simultaneously relate to strategy (re)formulation (e.g. Ahrens & Chapman, 2005). These middle managers also noted that they would continuously redefine the performance indicators to best reflect and measure the current purpose of the OI strategy. Importantly, performance indicators provided the means for middle managers to inform top managers about their progress in the implementation of the OI strategy, yet simultaneously those middle managers would also decide about the design and selection of those performance indicators. These insights extend our understanding on the close inter-linkages between strategy formulation and implementation (Bhimani & Langfield-Smith, 2007; Chua, 2007; Skærbæk & Tryggestad, 2010) by illuminating the perspective of middle managers and their work with performance indicators. In addition, the insights show the role of non-financial performance indicators as additional means to inform and influence the strategy bottom-up, especially when the feasibility of financial performance indicators on outcomes are limited. Since middle managers in the context of advanced directed transformers primarily intend to gain evidence of the strategic value of OI practices to facilitate – with support from the CEO – an ideological shift towards a systemic OI strategy in the organization, we label this type of reasoning *expanding*.

In contrast, in the context of organic transformers, OI-type practices were informally accepted and were part of the everyday rationality of many organizational members. However, there was no strategic mandate and the organizational structure related to the innovation process was not aligned with OI practices. Existing OI-type practices were not managed in terms of their strategic effectiveness and operational efficiency. This observation differs from the prior accounting literature on strategizing (e.g. Carlsson-Wall et al., 2015; Jørgensen & Messner, 2010; Skærbæk & Tryggestad, 2010). What our findings show is that the middle manager worked with performance indicators to obtain a strategic mandate for a practice which – in principle – seemed already widely accepted in the organization. Hence, we add to the literature by showing how performance indicators support the visualising of strategic ineffectiveness and operational inefficiencies and how this delivers arguments for a formulation of a strategic mandate, here an OI strategy. Based on such a formulated strategy, the middle manager could align the structure with taken-for-granted OI-type practices which is why we label this type of reasoning *restructuring*.

The distinction between the context of directed and organic transformers is an important finding of our study. It extends our understanding of the role of performance indicators in strategy formulation (e.g. Bhimani & Langfield-Smith, 2007; Bisbe & Malagueno, 2012; Skærbæk & Tryggestad, 2010) by contrasting the work of middle managers in different contexts. Specifically, we find that their work with performance indicators differs according to whether they are concerned about the strategic value of new practices (directed transformer) or the ineffective or inefficient performance of widely accepted practices (organic transformer).

Finally, if the OI strategy was systemic, middle managers mainly worked with performance indicators (and information from related devices) to ensure decisions being made were in alignment with the overall strategic mandate, and to situationally inform an expansion of the OI strategy. These observations add to prior literature (e.g. Carlsson-Wall et al., 2015; Jørgensen & Messner, 2010; Skærbæk & Tryggestad, 2010) by improving our understanding of how the work with performance indicators relates to the strategic influence of the middle manager. The status of the middle managers of systemisers was highly regarded in the organization. They had to ensure they were at the forefront of their occupational developments. This included being conscious of – and attentive to – the design of performance indicators to improve the efficiency, effectiveness and predictability of OI practices. Therefore, they had an active interest in developing performance indicators that went beyond basic measurement (e.g. Malina & Selto, 2001; Malina et al., 2007). As our evidence shows, middle managers were complementing their financial and non-financial performance indicators with innovative tools to predict the value of strategic options or they would experiment with tracking the network of OI participants. We label this type of reasoning *retaining* because these middle managers intended to improve the OI strategy with regards to effectiveness, efficiency, and predictability, yet did not intend to change the overall strategic direction.

5. Conclusion

Our research question was *how do middle managers work with performance indicators to strategize OI?* To approach this research question, we compared the situations of eighteen (upper-level) middle managers, from the business units of different global and internationally recognised companies, in their strategic endeavours to adopt an OI strategy. We found that the work of middle managers with performance indicators relates to both the extent of strategic support for the OI strategy by top managers and the extent of practice adoption. According to these situational nuances, we theorised that middle managers worked with performance indicators differently to inform and mobilise top managers for an OI strategy; labelled here as abstaining, initiating, expanding, restructuring, or retaining.

We contribute to understanding of the active role of accounting devices in strategizing (Chapman, 2005) and the shaping of organizational life (Gerdin et al., 2014). In doing so, we drew on Catasús et al. (2007) to explore the mobilising qualities of performance indicators and extend their findings by providing evidence to show how such mobilising is part of the middle managers' reasoning in their work with performance indicators. We distinguished several scenarios where middle managers differ in their reasoning about how they inform top managers with performance indicators. Our findings extend understanding in the accounting literature about who informs strategy and how performance indicators are employed beyond top-level management in the organization (e.g. Chapman, 2005; Chua, 2007). While prior studies, such as those from Carlsson-Wall et al. (2015) and Jørgensen and Messner (2010), find that middle managers are often involved in the preparation and/or usage of strategic accounting calculations, our study demonstrates the key role of the middle manager and analyses how their reasoning about performance indicators contains intention to strategize bottom-up within the organization. Through comparing our middle managers, we highlight both the possibilities but also the limitations these managers face in informing strategy through performance indicators.

This study provided a valuable research opportunity to compare the reasoning of upper-level middle managers. Based on our study of OI, we developed a typology for understanding the role of performance indicators in strategizing which might be valid also in other strategic settings. While our study addresses an important issue in the literature, it opens therefore several avenues for future research. It would be useful if further research could extend and/or test our theoretical insights through other settings and methods, such as longitudinal case research or cross-sectional survey-based research. Future research could also develop our theoretical findings by examining how the reasoning of middle managers develops over time through their strategic work with performance indicators. Moreover, OI is a largely unexplored research area in accounting which offers many opportunities for future research. Although research shows mixed results about the benefits of OI strategies for companies (Saebi & Foss, 2015; West & Bogers, 2014), their acceptance in practice seems widespread in the private as well as the public sector, where they have been adopted by small, medium, and large organizations (Chesbrough & Crowther, 2006; Huizingh, 2011; West, Salter, Vanhaverbeke, & Chesbrough, 2014). This study shows we need to know more about the role of such strategies, especially within the accounting domain.

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Appendix

Table A1
Participation at Berkeley Innovation Forum (BIF).

No.	Forum	Participation	Contents (concerns all forums)
1	San Jose, CA, USA; Spring 2011	Authors 1 and 3	Two-day event; About 30-50 participants; Presentations about OI experience and issues by individual members; Interactive Panel Discussions; Innovation Challenge (Group Work); Informal coffee and lunch breaks
2	Berkeley, CA, USA; Fall 2011	Author 3	
3	Jacksonville, FL, USA; Spring 2012	Authors 1, 2 and 3	
4	Berkeley, CA, USA; Fall 2012	Author 3	

Table A2
Interviews with middle managers.

No.	Interview with	Industry	Revenues (in USD)	Date (month-year)	Length (min)
1	Senior Vice President, Market Solutions	Foods	> 2 billion	Apr-11	35
2	Vice President, Innovation Development	Health care	> 5 billion	Apr-11	55
3	Senior Vice President, Technology Innovation	Health care	> 5 billion	Apr-11	40
4	Director, Co-innovation	Technology	> 5 billion	Apr-11	45
5	Director, Strategy and Innovation	Technology	> 5 billion	Apr-11	75
6	Vice President, Projects & Technology	Oil and gas	> 5 billion	Apr-11	55
7	Innovation Strategist	Pharmaceuticals	> 5 billion	Apr-11	50
8	Director, Resource Allocation	Cruise ships	> 5 billion	Apr-11	65
9	Senior Director, Global Innovation	Technology	> 5 billion	Jun-13	55
10	Director, Innovation	Banking	> 5 billion	Jun-13	50
11	Manager, Technical Collaborations	Telecommunications	> 5 billion	Feb-17	50
12	Open Innovation Manager	Banking	> 5 billion	Feb-17	60
13	Head of Innovation Team	Banking	> 5 billion	Feb-17	50
14	Head of Innovation Planning	Power	> 5 billion	Feb-17	40
15	Vice President, Head of Business Model Innovation	Technology	> 5 billion	Feb-17	55
16	Vice President, Open Innovation	Consumer goods	> 5 billion	Feb-17	35
17	Senior Consultant, Innovation Management	Technology	> 5 billion	Mar-17	35
18	Head In-licensing and R & D Alliances	Foods	> 5 billion	Mar-17	40

All interviewees were the responsible managers for Open Innovation (or the probing of it) in their respective organizations. All of them (including the Senior Vice Presidents) fulfil the criterion of middle managers (see footnote 1) and had at least two hierarchical layers above them. To keep the participating companies anonymous, the numbers of the managers do not correspond with Tables 1–5.

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