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Enabling control and the problem of incomplete performance indicators

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A B S T R A C T

To which extent do managers care about the design characteristics of performance indicators and other control systems? The paper examines this question with the help of the framework of enabling and coercive control. Drawing upon data from a longitudinal field study in a manufacturing organisation, we study operational managers' attitudes towards the incompleteness of performance indicators. Managers are likely to perceive performance indicators as enabling if the latter facilitate their actions without unduly constraining them. This is true even for incomplete performance indicators as long as managers can handle these indicators in a flexible way, treating them as means rather than ends when carrying out their work. Our case also shows, however, how a flexible use of indicators becomes more difficult to sustain once top management signals an increased importance of the indicators. Incompleteness then becomes a more pressing concern for managers. We illuminate the various forms of top management sense-giving through which such tightening of control is achieved and we show how they translate into managers' perception of the control system as being a coercive rather than enabling one. Taken together, the findings of the present paper add to our understanding of enabling and coercive forms of control and also extend previous studies that have addressed the problem of incomplete accounting information.

Introduction

Performance indicators are nowadays in widespread use in all kinds of organisations. At times, they are combined to form integrated measurement systems which appear in the form of scorecards, dashboards, or measures trees (e.g. Kaplan & Norton, 1992; Neely, Adams, & Kennerley, 2002). While the qualities and design characteristics of performance indicators, such as their degree of completeness, accuracy, or precision, have been discussed in the academic literature (e.g. Feltham & Xie, 1994; Merchant, 2006), relatively little seems to be known about *managers' attitudes* towards the design characteristics of indicators. To which extent do managers actually care about the particular qualities of performance indicators and performance measurement systems?

Some 40 years ago, Hopwood (1972) already suggested that one should not assume that managers are automatically concerned about the design features of accounting systems. Rather, there is a need to examine how accounting information is actually used and to take this as a starting point to understand managers' concerns with the qualities of such information. Indeed, several authors have since then explored the situated use of performance indicators and other accounting information in managerial work (e.g. Ahrens & Chapman, 2004, 2007; Briers & Chua, 2001; Chua, 1995; Dambrin & Robson, 2011; Mouritsen, Hansen, & Hansen, 2009). Notwithstanding different theoretical perspectives taken, a common theme in this literature seems to be that the representational qualities of performance indicators are not of *primary* concern for managers who draw upon these measures to inform their work (Hall, 2010). Accounting information – even if available in detailed form – provides only for a limited

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understanding and handling of the complexity of organisational life (Chapman, 1997), and managers therefore tend not to rely "blindly" on such information. They rather seek to contextualise or complement it by drawing upon other inscriptions or forms of knowledge. Preston (1986), for example, demonstrates how managers draw upon various informal arrangements to learn what is going on in their firm. Jørgensen and Messner (2010) show how engineers in new product development evaluate different design alternatives on the basis of both accounting information and a set of strategic objectives that cannot be easily translated into accounting numbers. Ahrens and Chapman (2007) show how restaurant managers learn in meetings with their superiors how to act upon overall financial objectives. These and other studies illustrate how indicators, when used to facilitate managers' actions, are likely to "become subject to moderation through other concerns" (Chapman, 1997, p. 202). The existence of such moderation can explain why even broad financial indicators can ultimately motivate concrete operational action, as demonstrated by Mouritsen et al. (2009) for the case of innovation management. Given that accounting information will thus be complemented (or "completed") in the world of action, one would then also expect that there is a lower perceived need for such information to be perfectly complete, accurate, or precise. In other words, managers are likely to be somewhat relaxed about the representational qualities of accounting information.

Performance indicators do not only serve to facilitate managerial action, however. They are also instruments of control in the sense that they are intended to impose a particular focus on managers' actions and attention at the expense of other things deemed less important. When introduced top-down in an organisation, they reflect the objectives and strategic aspirations that top management wishes to pursue. Too much flexibility in using such indicators would challenge their ability to serve as effective instruments of control. Hence, the firm's management is likely to try and enforce a certain degree of attention to selected indicators, such as by instituting particular forms of reporting or evaluation. Existing literature provides illuminating examples for such a control focus, ranging from local control initiatives that are restricted to particular functional areas (e.g. Vaivio, 1999) to comprehensive agendas that permeate the whole organisation (e.g. Ezzamel, Lilley, & Willmott, 2004). Reliance on accounting information as a control tool is particularly visible when it comes to incentive plans and performance evaluation practices, as has been extensively documented in the literature (e.g. Hartmann, 2000; Healy, 1985; Hopwood, 1972; Ittner, Larcker, & Rajan, 1997).

There is a potential tension between the decision-facilitating role of accounting, on the one hand, and its role as an instrument of control, on the other. If operational managers feel that flexibility in dealing with performance indicators *enables* them to better manage their work, then a more focused attention on such indicators by top management may easily result in managers feeling *coerced* into a control system (Adler & Borys, 1996). The question that we are interested in here is how this relates to managers' attitudes vis-à-vis the indicators and their representational qualities. Acknowledging that performance indicators can be used both to facilitate operational managers' activities and to allow for top management control, we examine in this paper *how operational managers' attitudes towards performance indicators may change over time and in response to a change in top management control*.

To address this question, we draw upon an in-depth, longitudinal case study of a manufacturing organisation that, in early 2008, introduced a set of performance indicators to facilitate the implementation of a Lean Six Sigma strategy. This set of indicators was perceived as "incomplete" by many operational managers in the sense that it did not capture all the dimensions of performance considered important (Hopwood, 1972). But did such incompleteness constitute a "problem" for the managers? Using data from direct observation of management meetings, interviews, and the study of company documents, we trace how managers' views regarding incompleteness changed from considering it as an accounting issue that is of limited practical importance to seeing it as a "problem" that is of real concern to them. We interpret this change in attitude with the help of the framework of enabling and coercive control (Adler & Borys, 1996; Ahrens & Chapman, 2004), which we enrich by taking a process view on the interaction between top management and operational managers. We consider how top management, through their sense-giving about the role of performance indicators, shapes the way in which middle managers relate performance indicators to organisational concerns and how middle managers make sense of the qualities of these indicators. Our observations suggest that incompleteness is of little concern if managers can handle performance indicators in a flexible way, treating them as means rather than ends when carrying out their work. Such flexibility, which constitutes a design characteristic of enabling control systems (Ahrens & Chapman, 2004), is promoted when a new performance measurement system builds upon existing issues and concerns, thereby allowing managers to create continuity with past practice. Flexibility becomes more difficult to sustain, however, when top management signals through their sense-giving a heightened attention to the indicators. We regard evaluation pressures as an outcome of such sense-giving practices and discuss in more detail than existing literature the mechanisms through which evaluation pressures may materialise in an organisation. Moreover, when evaluation pressures mount, concern with the incompleteness of indicators is further heightened when managers engage in cause-effect thinking to achieve performance improvements when performance on an indicator is already high.

Our analysis allows us to contribute to two strands of literature. First, we contribute to the literature on enabling control (e.g. Ahrens & Chapman, 2004; Wouters & Wilderom, 2008) by highlighting potential tensions that may arise between operational managers' concern with an enabling use of performance measures, on the one hand, and top management requirements for control at a distance, on the other hand. In particular, we show how certain conditions allow an enabling form of control to emerge and how a change in conditions over time results in managers feeling coerced into the control system.

Second, our analysis contributes to previous research on incomplete or imperfect performance indicators (e.g. Dambrin & Robson, 2011; Lillis, 2002; Mouritsen et al., 2009) by discussing conditions under which incompleteness is regarded as a problem. While extant research already provides interesting findings in this respect, our analysis adds to this literature by discussing why managers' attitudes vis-à-vis incompleteness may change over time.

The structure of our paper is as follows. We first describe the framework of enabling and coercive control before linking these notions to the incompleteness of accounting information. We then introduce our research setting and design and, in subsequent sections, present and analyse the empirical findings drawn from our case. After discussing the main insights that our paper brings to the existing literature, we conclude with a synthesis of our work and with some avenues for future research.

Enabling and coercive control

Why do managers at times react positively to the introduction of formal control systems, whereas in other cases their attitude towards such systems is rather negative? One approach to understanding reactions to control systems can be found in the framework of enabling and coercive formalisation, as suggested by Adler and Borys (1996). According to these authors, formal systems will be received positively if managers feel that the systems *enable* them to better master their work tasks. If, in contrast, managers feel that formalisation is an attempt by top management to *coerce* managers' effort and compliance, then formal systems tend to be perceived in a negative way. The usefulness of this theory for understanding the functionality of management control systems was first illustrated by Ahrens and Chapman (2004) in the case of a restaurant chain. Subsequent studies have built upon this framework to explore enabling and coercive control in other settings (e.g. Chapman & Kihn, 2009; Free, 2007; Jørgensen & Messner, 2009; Wouters & Wilderom, 2008).

Following Adler and Borys (1996), these studies suggest that whether a control system is enabling or coercive depends on how the control system is designed and on how the design and implementation process is organised. Regarding the design features, Adler and Borys (1996) argue that enabling systems have four key characteristics. First, they allow users to *repair* the formal system in case of a breakdown or problem. In the case of a control system, this can mean, for example, that managers have the permission and ability to modify the definition and measurement of performance indicators, if deemed appropriate (Wouters & Wilderom, 2008). Second, enabling systems exhibit *internal transparency* in the sense that managers are able to see through and understand the logic of the system. For example, in order for an output control system to be transparent, target values for performance need to be communicated to the managers (Ahrens & Chapman, 2004). The third feature of an enabling system is *global transparency*, which denotes the extent to which managers understand the up- and downstream implications of their work. In the context of a budgeting process, for example, global transparency is achieved when this process increases managers' understanding of the firm's strategy and operations (Chapman & Kihn, 2009). Finally, formal systems enable managers to better manage their work if they allow for some *flexibility* in terms of how they are used. This is the case, for instance, if a process control system for product development specifies guidelines that can be adjusted in order to suit the individual development project (Jørgensen & Messner, 2009).

Formal systems are also more likely to be perceived favourably if the development process of such systems is organised in an enabling way. According to Adler and Borys (1996), this is the case if such systems are designed with user involvement rather than exclusively by outside experts and if the system is made to fit the organisation rather than the other way around. For the case of management control systems, Wouters and Wilderom (2008) suggest that a control system can be rendered more enabling if the managers involved in developing the system have a learning-centred and professional attitude, if they can capitalise on their local knowledge, and if they are able to experiment with the control system design.

Whilst the framework of enabling and coercive control suggests paying attention to the design and implementation *process* of a control system, the very understanding of control that emerges from this framework comes across as somewhat static. The focus on the design characteristics of transparency, flexibility, and repair suggests that control is mainly a matter of *system design*. We would suggest, however, that the "design features" that Adler and Borys (1996) propose to focus on should really be seen as the outcome of an on-going interaction between different actors involved, i.e. top management and operational managers. As such, control is a dynamic process the form and intensity of which may well change over time. Moreover, seeing control as a matter of interaction between superiors and subordinates helps seeing the link between the control and action-facilitating roles of accounting. Whether operational managers regard a system as enabling for their work will to an important extent depend on how top management uses that system for control purposes. The process through which top management uses control systems to influence their subordinates' actions can thereby be seen as part of what Gioia and Chittipeddi (1991) refer to as "sense-giving". Sense is given through the very introduction of a particular control system, but also with the help of symbolic practices through which the role and relevance of the control system are communicated. Evaluation processes are thereby of particular relevance. They form part of the signals that top management sends and which, once interpreted by subordinate managers, can make performance indicators appear as a more or less enabling (or coercive) control tool.

Incompleteness and enabling control

It is well established in the literature that accounting information usually does not capture all the dimensions of performance considered relevant for an organisation or manager. If, for example, a hospital is managed exclusively on the basis of cost and revenue information, then it is likely that some arguably important dimensions of its

performance, such as the quality of patient care, will receive insufficient attention. In such a case, accounting information can be considered an incomplete representation of organisational performance and thus also an incomplete guide for appropriate action (Hopwood, 1972). Does such incompleteness pose a challenge for the realisation of an enabling form of control?

Wouters and Wilderom (2008) explicitly relate the framework of enabling control to the incompleteness of accounting information. They suggest that problems of incompleteness can be addressed when managers are involved in the *design and development process* of a control system. Participation in the development process and experimentation with the design of the accounting system are likely to enhance "both the validity and acceptance of the [system]" (Wouters & Wilderom, 2008, p. 512), because they allow managers to reduce the perceived incompleteness before the system is fully used.

Moreover, two of the design characteristics that Adler and Borys (1996) propose for enabling controls can also be seen as solutions to the problem of incompleteness. Flexibility in dealing with accounting information helps managers address the incompleteness of such information, insofar as their actions and decisions will not exclusively rely on the quality of accounting numbers. This resonates with existing literature which suggests that managers tend to complement accounting information with other sources of knowledge, because accounting provides only for a limited understanding and handling of the complexity of organisational life (e.g. Chapman, 1997, 1998; Preston, 1986; Mouritsen et al., 2009). Incompleteness can also be addressed through repair of accounting information. Andon, Baxter, and Chua (2007) illustrate such repair work in their study of the implementation process of a balanced scorecard in an Australasian telecommunications company. They show that, once managers had agreed upon a standard scorecard to implement, they engaged in ongoing discussions about the robustness and appropriateness of some of the measures in that scorecard. This "imbued the BSC with a tentative and unsettled form, which invited further experimentation in an effort to make the measures work" (Andon et al., 2007, p. 293).

The other two design elements, i.e. internal and global transparency, can be seen as conditions for recognising incompleteness in the first place. Internal transparency means that managers understand the definition and measurement of the indicators, which is necessary for identifying a problem with these details. Global transparency is achieved when managers can relate the control system in question to the "bigger picture" of the organisation, as represented, for example, through its vision or strategy statement. Seeing such a link allows managers to question whether the control system is in line with this vision or strategy or whether it is incomplete in this respect.

Following Adler and Borys (1996), the enabling control literature approaches the usefulness of performance indicators mainly from the perspective of operational managers, who draw upon these indicators to master their work (Ahrens & Chapman, 2004; Wouters & Wilderom, 2008). Somewhat less attention is given to the perspective of top management for whom performance indicators are important means of control. While operational managers' discretion in adapting and tinkering with performance indicators and combining them flexibly with other information might turn these indicators into more enabling tools for the managers, it can at the same time lead to a perceived loss of control from the perspective of top management. That is, flexible use and repair of performance indicators might be at odds with top managers' desire for stable and comparable reference points that allow exerting control at a distance. In such a situation, top management may want to signal to operational managers the importance of paying close attention to the indicators and, in this sense, reinforce the indicators as tools for control. It is here where the problem of incompleteness is likely to become more pressing: when operational managers feel limited in their possibilities for flexibility and repair, they are likely to experience the incomplete control system as more coercive.

The distinction between enabling and coercive forms of control is reflected to some extent also in the literature on reliance on accounting performance measures (RAPM). With his distinction between a "budget-constrained style" and a "profit-conscious" style of using accounting information, Hopwood (1972) anticipated the (more general) distinction between coercive and enabling controls. Looking at performance appraisals he found that reliance on incomplete controls is likely to elicit negative reactions among managers evaluated, such as job-related tension or data manipulation. Hopwood's work triggered a series of studies addressing the question of incompleteness. Most of this research examines in greater detail the conditions under which reliance on accounting information is likely to create dysfunctional effects (e.g. Briers & Hirst, 1990; Hartmann, 2005; Hirst, 1981; Otley, 1978). What is interesting about these studies is that they exhibit a strong focus on performance evaluation and, thus, the use of accounting for control purposes. One could perhaps even say that this literature draws a picture of evaluative practices in which evaluation appears as a somewhat isolated and standalone activity, disconnected from other aspects of managerial work. Whilst the studies show how managers' attitudes are affected by evaluative pressures, they do not comment on the decision-facilitating role of accounting, i.e. on how managers handle incomplete accounting numbers when discussing action plans or making decisions. The notions of enabling and coercive control are helpful in addressing exactly this point. Whether an accounting system is regarded as enabling is a matter of how it facilitates managers' work. However, in using the accounting system, managers are influenced by their knowledge of how top management draws upon the system for control purposes.

Drawing upon the framework of enabling and coercive control, our focus in this paper is on developing a context-rich understanding of managers' concerns with incomplete performance indicators. Compared to previous research on incompleteness which has taken a more static perspective (Dambrin & Robson, 2011; Lillis, 2002; Mouritsen et al., 2009), we are interested in understanding why and how concerns with incompleteness may evolve over time. To this end, we consider the way in which indicators are initially introduced into our case organisation and how

their significance subsequently is redefined in the interaction between top management and operational managers. The change in emphasis – from seeing indicators as tools to enable useful operational activities to seeing them primarily as means of control – turns incompleteness into a problem and alerts us that realising an enabling form of control that at the same time meets top management's requirements for control at a distance is not a trivial endeavour.

Research setting and design

Our paper builds upon a qualitative field study conducted in a single organisation. We adopt an understanding of field study research according to which the main task of the researcher is to inquire into a domain of practice and to make sense of his or her observations by moving back and forth between data, theory, and related literature (Ahrens & Chapman, 2006). This requires, first and foremost, close proximity to the field (Garfinkel, 1967; Jönsson & Macintosh, 1997). We sought to acquire this proximity through several visits to the field site, direct observation of actual management practices, interviews and informal conversations with members of the organisation, as well as the study of documents.

The case organisation, hereafter called LeanOrg, is one division of a manufacturing company in the metal and plastics processing industry that operates production sites and sales organisations worldwide. The parent company employs more than 7000 people and generates annual revenues of more than €1.2bn, of which LeanOrg accounts for about €900 m. The corporate headquarters are located in Austria where the company was founded as a family firm in the 1950s. Since then, the company has grown considerably. It is now listed on the stock exchange and organised into three main divisions that manufacture products under several brands. Products are sold to distributors and other companies, as well as to public and semi-public end users such as schools, hospitals and universities. The company offers both mass-market products and project-specific production. It markets its products as high-quality, innovative products and has established a high-end market position, ranking among the top three companies in this industry in terms of worldwide market share. LeanOrg's headquarters are also located in Austria, together with one of its production plants. In addition, there are five further production plants, all located in Europe.

Our fieldwork started in May 2008, shortly after the parent company's board appointed a new Chief Operating Officer (COO) for LeanOrg in January 2008. One of the first decisions of the new COO was to launch a Lean production agenda. To this end, four key performance indicators were introduced and targets for these indicators were set. The four indicators were: on-time delivery, cycle efficiency, Six Sigma quality, and productivity. These indicators were introduced at all production sites and their implementation was delegated to project groups. The groups were responsible for undertaking initiatives to improve indicator values for their respective sites. We monitored implementation of the indicators at the main production site (also where division and company headquarters are located) from May 2008 onwards.

Data were collected through different methods over a period of 28 months. First, we attended ten meetings, seven of which were project team meetings, in order to experience "live and direct" the way in which indicators were talked about. Some of these meetings were recorded and subsequently transcribed; for others, we took notes during the meeting, then compared and summarised them as minutes. Second, we conducted 52 interviews with project team members and other employees, mostly lasting between 40 min and an hour. All interviews were recorded and transcribed (see Appendix for a full list of interviews and meetings). Finally, we reviewed company-internal documents, such as presentation slides from project group meetings and recent issues of the employee magazine, as well as public documents, such as the parent company's recent annual reports.

Implementing Lean Six Sigma with the help of indicators

In January 2008, LeanOrg was given a new leadership. A new appointment became necessary when the company's board decided to terminate its contract with the previous COO, reportedly because he had not met the board's expectations concerning divisional performance.[2] The board expected the new COO to be able to improve performance not least because of the experience with Lean manufacturing and total quality management he had acquired in previous management positions. He joined LeanOrg together with another person who had previously worked as a consultant specialising in Lean manufacturing projects and who now headed a new department within LeanOrg dedicated to Lean management. It is therefore not surprising that, following his appointment, the COO presented a new agenda for the future of LeanOrg's operations: a "Lean Six Sigma" strategy in line with the principles of the Toyota Production System (TPS), i.e. "one-piece-flow", continuous improvement, employee empowerment, and customer orientation (Ohno, 1988).

Previous COOs of LeanOrg had pursued somewhat different strategic objectives. For example, the previous incumbent focused primarily on cost reduction, which he had aimed to achieve through automation and outsourcing, i.e. ideas that were not necessarily in line with the idea of Lean manufacturing. Nevertheless, concern for key principles in Lean manufacturing—efficiency, productivity and quality—was certainly not entirely new to the organisation. With respect to quality, LeanOrg had always positioned its products at the upper end of the market, which naturally implied a high concern for quality. Moreover, in some of LeanOrg's sister divisions, "Six Sigma quality"[3] had been actively pursued for a couple of years. Benefiting from this

[2] In LeanOrg, the COO assumes *de facto* the role of CEO. Formally, however, it is the CEO of the parent company who is also CEO of LeanOrg.

[3] Similar to TQM, Six Sigma as a business strategy was originally developed by Motorola and seeks to identify and remove the causes of defects and errors in manufacturing and business processes. Statistics and project management tools, as well as formal training sessions with the objective of setting up an infrastructure of experts in using these tools ("green belts" and "black belts"), form part of this business strategy (Lee-Mortimer, 2006; Taylor, 2008).

experience, LeanOrg had already initiated several Six Sigma activities a year before the new COO was appointed. Similarly, delivery times to customers had been monitored from the early 1990s onwards, reflecting the perceived need to serve customers in the best possible way.

While there was thus some continuity with the past, the particular emphasis the new COO put on promoting the Lean agenda was also perceived as something new. This became clear, in particular, when the COO selected four performance indicators (Six Sigma quality, on time delivery, cycle efficiency, and productivity) to guide the implementation of the Lean strategy. Putting these indicators centre-stage increased awareness of the Lean agenda:

> "The idea of having low inventories, short delivery times, or a high technical quality – this idea, this orientation, was already there before. I could not say that this is something completely new. What is new is to put this down on paper and to have it materialise [in indicators]. [...] We did do this before, but it simply was not a priority." (I-19)

In each plant, selected middle managers and engineers were asked to form project groups and to start working on the implementation of the four performance indicators. This work started in May 2008 with separate working groups for each indicator. The COO and his team provided definitions for these indicators and set objectives ultimately to reach. Table 1 gives an overview of the four indicators with respect to their definitions, measurement and target values, and Fig. 1. displays a presentation slide summarising the targets for the indicators as presented by the new COO at the beginning of 2008.

The project groups met regularly to define and discuss improvement activities ("action plans") to be carried out throughout the organisation. These activities covered a wide range of initiatives. Some of them were relatively short-term in nature, such as the initiative to improve sales forecasts for the summer months of July and August in order to improve on time delivery (OTD). Others were envisioned as longer-term projects, such as the project of changing the production layout to improve cycle efficiency and productivity, or the launch of a reporting system for customer complaints to improve quality. Progress on these activities was reported within the project group meetings, as well as in other meetings regularly held in LeanOrg. In "operations meetings" held monthly, plant managers from different plants informed the COO about progress in Lean Six Sigma implementation, among other things. On a quarterly basis, the COO and plant managers reported to the management board. Finally, within the Austrian plant, there were monthly management meetings chaired by the plant manager and attended by senior managers from different functional areas.

Incomplete indicators

Reliance on the four indicators as means to promote and implement the new strategy became manifest in different forms: indicators shaped the agendas of the various meetings; they created new responsibilities within the organisation; and they motivated a great deal of new actions and initiatives targeted at turning the plant into a Lean factory. Overall, the COO introduced a stronger notion of "management by numbers" into the organisation – arguably not in the extreme form of a panoptic control (see Hopper & Macintosh, 1993), but in a way that people nonetheless perceived as different to the more "people-centred" management style that had prevailed in the past. This is not to say that there had been fewer indicators in the past; however, their use was mostly operational and often driven by middle managers in a rather "bottom-up" way. Combined with the high workload resulting from the additional activities, the top-down approach to implementing indicators chosen by the new COO caused some misgivings among managers and employees. It did not create resistance against the idea of "going lean" – most people seemed to agree that this was a reasonable thing to do and would help improve the performance of the organisation. What it did do was to increase managers' sensitivity to the indicators and to their role in determining how to go about implementing the Lean activities. In both meetings and interviews, managers would sometimes critically comment on the indicators and would question whether these represented what was, in their eyes, really important. On such occasions, managers constructed the indicators as incomplete representations of performance.

Two cases in point clearly illustrate how incompleteness was recognised. The first episode is taken from a meeting of the cycle efficiency group. Towards the end of that meeting, the project group started to discuss the productivity indicator and the following exchange took place:

> Wilhelm: "If we grow by 10%, then productivity will only increase by 1%, but our financial results will double. The results are what shareholders are interested in first and foremost".
> Werner: "Yes, productivity is certainly not everything."
> Wilhelm: "The shareholder will be much happier about doubling the result." (M-CE-1)

It is interesting to juxtapose this episode with the way in which the four indicators were initially communicated by the new COO. When presenting the Lean Six Sigma strategy, the COO explicitly framed the indicators as being in line with "maximization of shareholder value", along with customer orientation and a "happy workforce" (see Fig. 1). This helped managers to understand the bigger picture behind the new indicators, thereby ensuring global transparency (Adler & Borys, 1996). However, whereas the COO suggested that the indicators would account for performance in a comprehensive way, the managers in the above meeting apparently did not agree with this. It was not obvious to them that productivity gains would translate into better shareholder value. Productivity was thus constructed as being incomplete in this respect.

The second example comes from another cycle efficiency meeting held in September 2008. In this meeting, one of the purchasing managers (Bernd) was asked to report upon the analyses and improvement initiatives on the raw materials side. Lead times for sourcing raw materials and days of inventory for these materials accounted in all for almost half of the total lead time. This was therefore

Table 1
Lean Six Sigma performance indicators introduced at LeanOrg.

Performance indicator	Definition	Measurement	Initial target value
Six Sigma quality	Defective parts per million opportunities (dppm)	Customer complaints relative to total orders (Claim ratio = claimed order lines/total order lines)	3.4 dppm
On-time delivery	Percentage of products delivered on time to the customer	Number of deliveries that do not feature any OTD-errors per total amount of deliveries. OTD-errors depend on the actual delivery date, the delivery date promised to the customer, and the product classification	100%
Cycle efficiency	Percentage of value-adding standard time relative to total lead time	Value-adding standard time is measured as time spent to assemble the products and total lead time comprises the time from receiving materials from the suppliers to delivering the finished product to the customer	25%
Productivity	Percentage of value-added use of human resources relative to total use of human resources	Percentage of booked value-added time in minutes per day relative to present full time equivalents (FTEs) in minutes per day	70%

an important issue needing closer scrutiny. At one point in the meeting, Bernd presented a table displaying two rankings of groups of raw materials, one according to days of inventory and the other according to inventory value (costs) of one unit. The table highlighted those materials with a very high average inventory time and those with a high inventory value. Bernd pointed out that, in line with the idea of cycle efficiency reduction, materials with many days of inventory would be problematic. However, he added that materials with a low inventory time might have potential for improvement if their value is high. This comment triggered a discussion about the cycle efficiency indicator, raising the question as to whether this indicator would take into account only inventory time or also the monetary value of stock:

> Bernd: "When it comes to efficiency, values are not relevant."
> Wilhelm: "That's why we should be careful not to let ourselves be captured by this efficiency perspective."
> Mirko: "If we have 22 days average inventory time for raw materials, then we will hopefully take the sum of the values rather than just the units."
> Bernd: "Cycle efficiency is only measured in terms of time".
> Mirko: "But I must take 'value times time' (...). Otherwise, it would be nonsense!"
> Bernd: "Efficiency does not take the value into account."
> Mirko: "But how is this possible?" (...)
> Bernd: "(...) The question is: do we really want to focus on the efficiency indicator or do we want to do something reasonable by also reducing the amount of working capital?"
> Mirko: "It would be better to fix the indicator so that it fits." (M-CE-2)

In this case, the cycle efficiency indicator is perceived to be incomplete because it does not account for the monetary values of inventory, which the project group considers to be important. As in the previous example, incompleteness is constructed by comparing the focal indicator to some outside reference point: in this instance, working capital. Mouritsen et al. (2009) refer to such reference points as "competing calculations". As these authors point out, competing calculations can serve as "problematising devices which challenge dominating arrangements" (Mouritsen et al., 2009, p. 751). That is to say, the incompleteness of an indicator is brought to light by comparing the effects of this indicator with those that a competing calculation would imply. The choice of the particular reference point is informative about the extent of incompleteness that the actors recognise with regard to the focal indicator. If the indicator is compared to another indicator that captures an entirely different dimension of performance, then this signifies that the general idea behind the indicator is called into question – not because it is problematic as such, but because it provides too selective a focus if relied on exclusively. Making sense of incompleteness in such broad terms is apparent in the first of our episodes, where productivity is juxtaposed with shareholder value. If, in contradistinction, managers discuss the details of how an indicator is defined or measured, as in our second example, then incompleteness is made sense of in more narrow terms.

The different forms of incompleteness, ranging from broad to narrow concerns with the representational qualities of the indicators, imply different potential solutions. Narrow conceptions of incompleteness can be solved by rather minor repair work (Adler & Borys, 1996), i.e. changes to the definition or measurement of the indicator, such as in the second of our examples in which Mirko suggests redefining cycle efficiency.[4] For the broader forms of incompleteness, the outside reference point is so different from what the indicator stands for that incorporating it into the indicator is not possible. In such a case, incompleteness could be addressed by adding an additional indicator and/or by reducing the relative attention given to the focal indicator, i.e. by reducing reliance on this indicator and, therefore, allowing for more flexibility in terms of how to motivate decisions and actions (Adler & Borys, 1996). Indeed, this is what Werner seems to be suggesting in the first episode above when he points out that "productivity is certainly not everything".

[4] Following this line of argument, we would suggest that narrow forms of incompleteness also encompass questions of *reliability*, *accuracy*, or *precision* of performance indicators (see Merchant, 2006). In these cases, it is not the idea behind the indicator that is scrutinised, but rather the way in which the indicator is measured or operationalised.

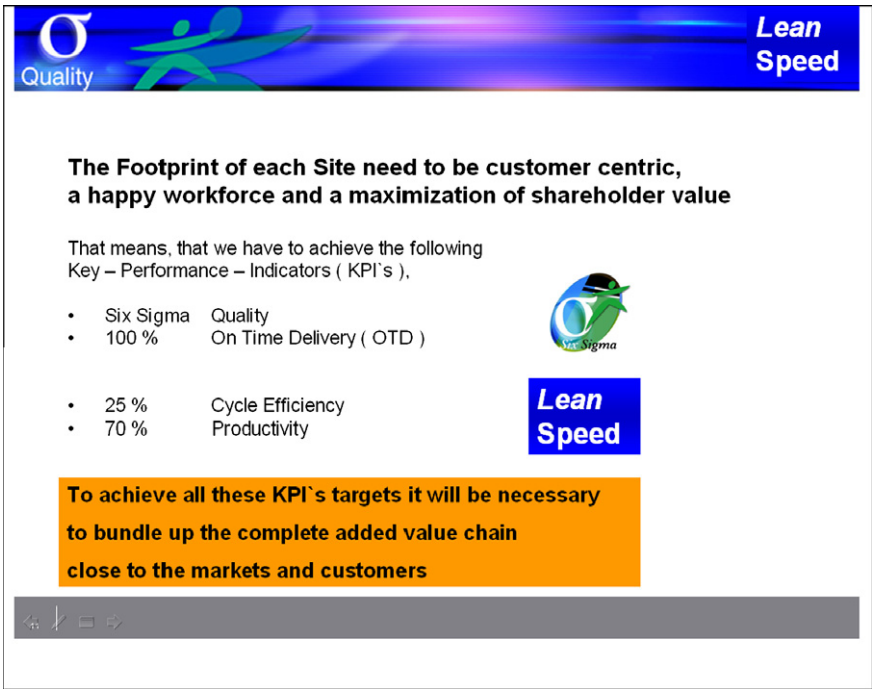

Fig. 1. Indicators and targets (slide taken from a presentation by the new COO).

Note that even for one and the same indicator, constructions of incompleteness may appear in both forms. For example, whereas in the first episode it was suggested to rely less on the productivity indicator and to pay attention also to other dimensions of performance, on other occasions it was the particular definition and measurement of productivity that managers were concerned about. Managers then moved onto discussing whether a different definition of productivity would be more appropriate than the one currently applied.

Interestingly, although discussions regarding the incompleteness of the indicators repeatedly took place, managers ultimately did not always seem that concerned about the representational qualities of the indicators. Indicators were constructed as incomplete, but such incompleteness was not necessarily regarded as a problem. Generally speaking, to designate something as a 'problem' is to accord it some importance in terms of its influence on how people act and experience the world, now and in the future (Smith, 1988). Identifying a problem is a particular form of sense-making. As Miller (1998) says:

> "'Problems' have to be made recognizable, a particular perception has to form, people have to be convinced that problems are intrinsic to a particular device rather than contingent, a measure of agreement has to be reached as to the nature of the problems identified, a consensus has to form that something needs to be done, and another way of calculating that fits the problem identified has to be made available. Then, and only then, do things change." (Miller, 1998, p. 606)

The problems of incompleteness identified in existing literature revolve around job-related tension, dissatisfaction and dysfunctional managerial behaviour (e.g. Ahrens & Chapman, 2004; Hartmann, 2000; Hopwood, 1972; Wouters & Wilderom, 2008). However, when managers in LeanOrg identified or mentioned shortcomings in the indicators, the relevance of these shortcomings was at times played down, such that a 'problem' did not really materialise. It seems that having complete indicators was not always considered so important. The following section elaborates on this observation in more detail.

A pragmatic view on incompleteness

Our observations and interviews revealed several instances where the incompleteness of indicators was approached from what may be called a 'pragmatic attitude'. Power (2007, p. 121) uses the notion of "calculative pragmatists" to designate actors who are tolerant about indicators offering only "crude approximations" of the underlying reality, provided that the indicators "help to steer behaviour and action in the right direction" (see also Mikes, 2009). Managers at LeanOrg adopted such a pragmatic stance when they openly played down the importance of having complete indicators. Rather than trying to improve the representational qualities of the indicators concerned, it was often considered more important to analyse the drivers behind them and to initiate improvement activities. *Doing* something had priority over *measuring* it. Such an attitude became visible in statements such as those that follow:

> "I believe that, in principle, people have a very pragmatic attitude when it comes to numbers. And in our case, the indicators are pre-defined. It's not the case that we are particularly enthusiastic about how productivity is measured. But as long as the right activities emerge from it, we should be happy." (I-21)

> "Finally, we said that we couldn't spend months and months on discussing what has to be part of the definition [of an indicator] and what has not. That's not so important. What is important is that, starting from a number (...), we can see some improvement; that's much more important." (I-8)

A pragmatic attitude was observable not only with respect to the details of how indicators should be defined or measured. Concerns regarding broad forms of incompleteness were at times also qualified by pointing out that other critical success factors would be taken into account anyway. The quality team manager expressed such an attitude with regard to innovation concerns as follows:

> "I'll put it like this. We are aware of the fact that innovations bear a certain potential for failure or risk. It is less risky to use established techniques, but at this point we want to deliberately take that risk. We will continue to offer innovative products, even if this involves a higher risk." (I-7)

In other words, despite greater focus on quality as expressed in the Six Sigma indicator, innovation will not be disregarded. Another manager suggested in a similar way:

> "Personally, I don't see this project as having the ultimate aim to increase the performance on this indicator [i.e. cycle efficiency]. Rather, we want to develop ourselves as a plant and we want to use this focus on cycle efficiency and lead times to develop in a direction that we think will help us in the future." (I-9)

The indicator is framed here as a means rather than an end, which corresponds to a flexible mobilisation of the indicator (Ahrens & Chapman, 2004). It is not seen as the ultimate point of truth, but rather as a 'point of orientation' which, however important, should not exclusively guide managers' decisions and actions. But where did this attitude come from? What were the conditions that allowed it to emerge?

A relaxed attitude towards incompleteness can be explained by the fact that indicators, in and of themselves, can never be complete in the sense of describing or determining action. In order to become consequential, they always need to be "completed" in the world of action. This is well illustrated in existing accounting research. Mouritsen et al. (2009), for instance, show how financial performance indicators provide a context for innovation activities rather than prescribing or detailing which innovative activities should be performed. Similarly, albeit from a somewhat different theoretical perspective, Ahrens and Chapman (2007) consider the use of accounting information in the management of the division of a British restaurant chain. They point out that financial targets for restaurant managers do "not provide for an understanding of their practical effects in all but the simplest of settings" (Ahrens & Chapman, 2007, p. 21). Performance indicators need to be contextualised in order to inform concrete activities by restaurant managers (see also Dambrin & Robson, 2011).

Managers within LeanOrg were aware of this need to place accounting numbers into a context. In their initial talk about improvement activities, project members acknowledged that the definition of the four indicators did not in itself prescribe the activities that would improve performance on these indicators. Rather, it was necessary to think about the practices and processes behind the indicators in order to derive possible areas for improvement. As the human resource manager put it in July 2008, around 3 months after the project teams had started to work:

> "So, this is what many people are concerned about now. (...) Where do we source our products? If they come from far away, such as Asia, then this takes a lot of time. So perhaps we have to focus on suppliers who are closer to us. All these are consequences that do not directly 'jump out' of the indicator. But if you want to improve something – I'm now talking about cycle efficiency – then you also have to think about whether we really should accept such long delivery times for raw materials coming from Asia, or whether we can also solve this locally, which would be more expensive but faster. These are all consequences [stemming from the indicator] as is the fact that, more generally, we need a new production system." (I-8)

Discussions about where to source products may be motivated by the cycle efficiency indicator; but the indicator will not be sufficient in and of itself to guide all the activities in this respect. While this provides a basic explanation for the observed attitude towards indicators, it does not explain the fact that managers quite openly qualified the importance of the indicators and their representational qualities, as explained above. When managers at LeanOrg took critical distance from having too great a concern for the indicators, they did not 'only' acknowledge that indicators needed to be contextualised in the world of action in order to become consequential; they also prioritised concern for this world of action over questions of representation and measurement. Managers in LeanOrg favoured a hands-on approach to getting things done and showed little interest in becoming experts in calculative practices. This was true 'even' for the management accountant who once commented on the idea of implementing activity-based costing by saying:

> "Instead of allocating the costs differently, I said that we should just try and reduce them! That's much cleverer. What is really the benefit of initiating a huge project on how to allocate costs among different products? We will never be able to get this completely right anyway – there are simply limits to this. Let's forget cost accounting and let's try to improve our processes across the whole plant, so that we can reduce costs. And then the problem [of cost allocation] will solve itself." (I-17)

This pragmatic attitude seemed to be part of the managerial culture at LeanOrg – relating to 'how things were done' in the organisation. It is striking, however, that this

attitude extended into the Lean Six Sigma project and the importance of the focal indicators. After all, the new COO had presented the four indicators as the cornerstone of the new strategy designed to shape LeanOrg's activities over the coming years. And yet, these supposedly focal indicators were approached with a good deal of flexibility.

In order to understand how the prevailing pragmatic attitude could affect managers' perspectives on the indicators, it is important to look more closely into the way in which the Lean agenda was implemented. Doing so allows us to shed light on the contextual factors that impact the use of, and attitude towards, the accounting information. As we show below, there are two conditions that allowed the pragmatic attitude to gain momentum in the Lean Six Sigma project. The first is the way in which the implementation process built upon existing concerns and mindsets; the second relates to the way in which the objectives of the implementation process were communicated.

Building upon the past

Implementation of the Lean Six Sigma agenda kicked off when the new COO presented the four indicators and asked the plant manager to build four project groups, one for each of the indicators. In the first meetings of these groups, in spring 2008, the team members clarified for themselves the objective of their work and designated sub-teams to focus on particular topics considered relevant to the focal indicator. Accordingly, within the project team dedicated to Six Sigma quality, for example, a sub-team was created to look into the quality of purchased components ("purchased quality"), while another team examined quality issues arising in development and production ("produced quality").

These topics, and the activities related to them, were not entirely new to the organisation. Most related to concerns that had already existed in the organisation before the Lean Six Sigma strategy was launched. As one of the managers put it:

> "The topics [for the sub-groups] already existed before. However, they were part of the daily business, they were not communicated in a particular way. So, [for example], the purchasing people had always carried out negotiations with the suppliers, but this did not happen in the context of a particular project and was not communicated throughout the organisation. Now, it is defined as part of the project, which means that it also gets reported." (I-6)

Of course, this does not mean that the Lean Six Sigma strategy did not bring about change. The work in the project groups resulted in many new initiatives that considerably challenged existing practice, ranging from the reorganisation of the production layout to the creation of a new forecasting process for sales. Nevertheless, there was an important amount of continuity with respect to the past. Concern for the complexity of the product offering can illustrate how this looked. At the time of our research, LeanOrg was offering a wide variety of products and product variants. Some of these were produced and sold in only very small quantities. In the kickoff meeting of the cycle efficiency team, it was decided to create a 'sub-team' dedicated to the question of product line complexity. Two managers (Jutta and Wilhelm) took responsibility for this issue. As the project manager for cycle efficiency explained, Jutta was an obvious choice, because "it was already her job anyway" (I-6) to look into these things. When asked about her work, Jutta explained:

> "I think it is very important that this topic '[product line] complexity' is part of a project now. We have already discussed this topic repeatedly over the last years, but it is always difficult to reduce product variants, because of product managers. For them, more product variants mean higher revenues. Therefore, it is very important to have this topic positioned within the Lean project (...) so that the product manager cannot simply say, 'No, we don't want this'." (I-14)

The statement suggests that concern for product line complexity did not emerge out of engagement with the CE indicator. Reducing the breadth of the product offering was not considered important *because* of the indicator – it had already been discussed before the indicator was implemented. However, the Lean Six Sigma strategy now provided an opportunity to re-activate this existing concern and to give it more momentum and legitimacy within the organisation.

The fact that improvement or change initiatives were not always deduced from concern for the indicator meant that there was space for arguments other than those related to the indicators. In one of the meetings of the cycle efficiency group, Jutta presented some preliminary analyses on the relative importance of different product variants. For one particular product, LeanOrg produces variants with pre-wired or non-pre-wired trunking. Jutta explained that the non-pre-wired variants were only sold in Austria and Switzerland; however this amounted to 33% of the product's revenues. This triggered a short discussion in the group:

> Werner: "We should offer the non-pre-wired variants also in other markets [than Austria and Switzerland]. Obviously, we have not produced what the markets really want!"
> Bernd: "The IP-products [i.e. another product category that is shown on the slide] should be eliminated entirely. It's cheaper to buy them than to produce them!"
> Wilhelm: "We have to request our marketing department to carry out competitive analyses. Because they always argue that we need as broad an assortment as our competitors. (...)"

Clearly, the suggestions and arguments put forward in the above statements were not targeted at an improvement of cycle efficiency. Nevertheless, it seemed worthwhile to discuss these points within the group, and nobody suggested that they were irrelevant to the question of cycle efficiency and should therefore not be discussed. It seemed accepted practice that discussions would at times move away from immediate concern for the indicator. This also became apparent in actors' sense-making about the relationship between particular activities and the indicator.

When asked whether there was a connection between the question of product line complexity and cycle efficiency, Jutta responded:

> "Well, this is certainly difficult to measure. (...) when we reduce product families and have fewer components on stock, to what extent are we becoming more efficient and what effect does it have on our overall stock levels? Certainly, this is very difficult to calculate in the short run, and very hard to measure. But if we are becoming leaner and concentrate more on our core products, then we should be more efficient and faster and we would not have that many components to purchase. It's a cycle, but it's very difficult for me to estimate the effect." (I-14)

One could interpret this along the lines of Malina, Nørreklit, and Selto (2007) who suggest that managers often think in terms of finality rather than cause-effect relationships, i.e. they are satisfied with *believing* in a causal relationship rather than being able to prove or measure it. We would go further, however, and argue that the vagueness of the relationship between product line complexity (means) and cycle efficiency (end) is seen as unproblematic because efficiency is not regarded as the only or ultimate end in the first place. As pointed out above, concern for cycle efficiency offers an opportunity to talk about other concerns – some of which may only be loosely connected to the Lean Six Sigma agenda. The belief in a causal relationship between activities and the indicator may help justify or legitimise the activities carried out; but even in its absence, the discussions about these activities would continue as long as these activities are seen as valuable in and of themselves – as ends rather than simply means.

What are the implications of these observations for the question of incompleteness? We suggest that one condition allowing a pragmatic attitude towards incompleteness to emerge is exactly this flexibility in the handling of the indicators (Adler & Borys, 1996). Clearly, the indicators were far from irrelevant to the project groups, but since they did not *exclusively* guide project groups' discussions and considerations, the incompleteness of the indicators could be approached with some degree of pragmatism. Even if the indicators did not entirely represent what they were designed to, the work of the project teams still made sense to the managers insofar as it built upon existing understandings of what was important and reasonable to do. Why worry about the definition and measurement of an indicator if activities are only loosely related to this indicator anyway?

"Visions", not targets

When strategic change is initiated from the top, executives often adopt a "sensegiving mode" (Gioia & Chittipeddi, 1991, p. 443) whereby they try to influence the way in which organisational actors make sense of the organisation and its future. Gioia and Chittipeddi (1991) provide the example of a university president who initiated change by conveying to the university "the nature of his vision, the values underlying it, and the actual changes that he wanted to achieve as a result" (Gioia & Chittipeddi, 1991). When Lean Six Sigma was kicked off in LeanOrg, a similar sense-giving process took place. As we show in the following, a second condition favouring a pragmatic attitude towards indicators and their incompleteness can be found in the way in which the four indicators and their target values were initially communicated.

As explained above, the new COO introduced the four focal indicators at the beginning of 2008 and defined target values for each of them. These target values were rather challenging in light of LeanOrg's actual performance on the indicators at the beginning of the implementation period. For cycle efficiency, the target was set at 25%, meaning that one fourth of total working hours should be spent directly on the product. While the IT department took a great deal of time to automate the calculation of the value in the way it was conceptually defined, estimates made by the product team leader suggested that the actual value at the beginning of the project was about 0.23%. The gap was equally large for quality, where the Six Sigma calculations suggested a target value of 3.4 dppm. The actual value for the plant, however, was about 4500 dppm. In the case of total productivity, the target value was set at 70%, with actual values at around 50%. The smallest gap between targets and actual values existed for on-time delivery, where the site performed at around 95%. However, the goal that *all* deliveries should be carried out on time (i.e. 100% OTD) seemed no less challenging than the targets set for the other indicators.

Unsurprisingly, project team members were aware of these gaps between requirements and reality. When asked to comment on the target values, many of them would frankly describe these targets as unrealistic:

> "[The new COO] defined goals that were provocative. A productivity target of 70% would imply extreme changes here. For me, it was clear that, if we have no growth, this is not going to happen (...). And because our sales are stagnating at the moment, the possibility of achieving the goals – these provocatively formulated goals – has to be somewhat called into question." (I-10)

> "The targets are, I would say, very visionary. We are, in parts, very far from reaching them – well, at first glance, they appeared unattainable." (I-15)

The initial presentation of the indicators by the COO (see Fig. 1) used the notion of "targets" when talking about the objectives for the indicators. Soon after, however, top and middle managers started to refer to the four objectives as "visions", thereby suggesting that it was general direction rather than specific outcome that counted most. This allowed managers to see the indicators as proxies for a new strategic orientation rather than as ends in and of themselves:

> "It's certainly the case that [the cycle efficiency objective] was a vision in order to accelerate the business, so as to be able to react more quickly to market requirements. And this is clearly a key success factor in our business. [...] Whether the 25% are achievable or not is an entirely different issue." (I-5)

In a sense, top management had promoted this view by not setting any deadlines at the beginning of the project as to when the targets or visions would have to be reached. To be sure, the objectives continued to exist and were displayed in PowerPoint slides and the like. However, their interpretation as visions allowed managers to approach the challenging objectives with a certain ease. This was reflected, for example, in ironic statements made during meetings, such as observed in the following conversation at the end of a CE meeting:

> Bernd: "I will leave the company when we have achieved 3 dppm."
> Christian: "You really intend to work that long?" (*General laughter*) (M-CE-2)

That the targets were deemed unachievable did not always seem to be of that much concern to the project teams—perhaps because it was so obvious that they could not be attained. We suggest that this also had an influence on people's attitudes towards the perceived incompleteness of the indicators. Why worry about incomplete indicators if the objectives for these are out of reach anyway?

Heightened concern for incompleteness

The above discussion suggests that there were conditions that allowed for a flexible use of the indicators in the project groups, which in turn enabled a pragmatic attitude towards the incompleteness of indicators to gain momentum. Over time, however, we increasingly observed episodes in which the incompleteness of the indicators was presented as a problem. In these cases, managers were concerned for what they perceived to be an incomplete representation of performance. We identify two main conditions that promote this way of making sense of incompleteness. The first relates to the use of indicators as evaluation devices, the second to the identification of possibilities for improving on the indicators.

Evaluation concerns

When concerns about the indicators and their representational qualities were voiced, this was often done with reference to the fact that these indicators served as the basis for evaluating managers' performance. For example, an engineer working in product development, who was part of the project team for Six Sigma quality, explained:

> "There is no innovation without risk (...). If I am not willing to take risks, then I am not willing to innovate. That is troubling us massively at the moment, those of us, including myself, who are involved in product development. This is because on the one hand we are pushed to innovate, but on the other we are measured against quality." (I-12)

Quality was, according to this view, an incomplete measure of product development performance insofar as it was in conflict with innovation, which was considered an important dimension of performance. It should be noted that, at the time of our research, the Lean Six Sigma indicators had only a small impact on bonus payments, and only then in the cases of selected managers in higher positions. For most members of the project groups, compensation was not tied to results on the focal indicators. Nevertheless, these managers were of course expected to do a good job and were, in this sense, "measured against" the indicators. This explains their concern in cases where activities carried out in the project teams apparently had no significant impact on the indicators' values. Discussions surrounding the definition of the productivity indicator exemplify this point. The productivity indicator, as initially envisaged by the COO, was a measure of *total* productivity, i.e. it measured the number of productive working hours as a percentage of total employee hours. Total employee hours were the working hours of both shop-floor workers ('direct staff') and employees working in support areas ('indirect staff'). Apparently, the way in which productivity was calculated did not fully reflect some of the improvements that were achieved through the change activities. Consequently, certain activities originally defined as 'indirect' were redefined in the course of the implementation project as 'direct'. In an interview, the service and coordination manager explained the rationale behind this redefinition:

> "Well, we said to the COO that if we were to continue like this, then we would permanently improve things here, but the indicators would show a decrease in productivity. And then the COO himself will have difficulties vis-à-vis top management. (...) It can't be the case that we considerably increase efficiency and at the same time have a negative trend in the indicator only because the latter is defined in the way it is defined. That does not lead us anywhere." (I-26)

Repairing the perceived incompleteness of the indicator was considered important in light of the use of the indicators as evaluation tools. Even though things were "permanently improved", as the above quoted manager says, such improvement was apparently difficult to sell as long as it did not materialise in better performance on the indicators.

But why did concern for evaluation grow in the course of the project? Was it not the case, as elaborated above, that the objectives for the indicators were regarded merely as "visions" and that improvement activities were therefore only loosely coupled to the focal indicators?

Although it is true that the objectives, as initially defined, maintained their status as "visions" throughout the implementation of the strategy, after a few months these visions were supplemented by shorter-term goals for each of the indicators. This was done in consultation with project managers, as the manager of the quality team explained for his sub-group:

> "We do speak of visions, because the targets, as they were defined, are set very, very high, and it will presumably not be easy to reach them. That is to say, if we can achieve 1500 dppm in the next three years, then we will have done a good job. And if you put this in relation to the 3.4 dppm that we have got as target, then you see [the difference]. We do want to achieve signif-

icant improvements and, in this respect, we will soon submit to our management a realistic target proposal of where we want to land. And this will be 1000 to 1500 dppm in five years." (I-7)

The chief management accountant confirmed the rationale behind this new approach:

"Management tried to establish some kind of path [towards the initial goal], because the initial target had been a bit too heavy. People need some kind of guideline to know what they should achieve and when. And I think that the initial visions – 70% [productivity] or [25%] cycle efficiency, which was even worse – were problematic, because they were really out of reach. You can't communicate this to people. And I think that they are now trying to think more in terms of what is the next step." (I-21)

In the case of productivity, the initial goal of 70% was reset to 60% to reach over 3 years. Moreover, this value was broken down for each year, and for the business year 2010 (ending in April 2010), the target was set at 53%. Targets for cycle efficiency and OTD were also adjusted and broken down into shorter horizons.

Lowering the targets and clarifying the time horizon for meeting the objectives can be seen as a way to balance different interests and to solve conflicts between the focal indicators and other important business objectives (see Hansen, 2010). The human resource manager elaborates:

"Initially, we had 70% productivity as the final step to be reached. That's very challenging and, looking at a horizon of the next three years, we said that we want to reach at least 60%. Because EBIT also plays a role, and this is not one of the indicators. There should be a reasonable result on EBIT. But in economically difficult times, this number can get out of hand. Now we say that productivity is important, but it is not everything. And 60% productivity is more realistic than 70% in this time horizon. We have not abandoned the 70% - but there are also EBIT and other effects that we do not want to neglect, that's why we set the 60%." (I-20)

However, in adjusting the targets rather than continuing to work merely with "visions", the significance of the indicators was also strengthened. The newly set targets were *not just visions*; they were specific goals that had to be reached. The human resource manager, who in the above quotation had argued against an exclusive focus on the Lean indicators, confirmed eight months later that the attention paid to the indicators had subsequently increased:

"The indicators are becoming more and more binding. There is a telephone conference once a day for two of the indicators, between headquarters and all six sites. For a while now, this has really been enforced, every day, with a conference on Productivity and OTD. In the sense of: 'Where do you stand? Why is it like this? What are you doing? (...) The indicators continue to be relevant, and engagement with them has currently intensified." (I-29)

In imposing this kind of intensified dialogue about the indicators and in specifying targets and timelines, top management changed their sense-giving (Gioia & Chittipeddi, 1991): the Lean indicators increasingly moved to the centre of attention – "at the expense of other valued and important criteria" (Hopwood, 1972, p. 160). As a result, the indicators came to assume also a more dominant position in the way in which managers made sense of improvement activities and project progress. This became visible, for example, when reference to the target values was made in meetings. As explained above, for the business year 2010, the COO had set a target value for total productivity of 53%. During a meeting in July 2009, which was dedicated to productivity on the shop floor, one of the engineers reminded his colleagues that the first half of the business year would end in October and that top management had announced that they would pay special attention to changes in the productivity figure. Thus, the engineer cautioned: "If we want to keep the [management consultants] out, then it would be good to reach the 53%". A renowned management consultancy was already looking into some areas of LeanOrg (not related to the Lean production project) and there was apparently the fear that, if results in the project did not improve, then the consultants may be also mandated to intervene in this project.

Evaluation concerns were also triggered when the Austrian plant was compared to other factories within the division. At the beginning of the implementation phase, such comparisons were not really considered important or even appropriate. A few months after the project's kick-off, the human resources manager explained that the project work should allow each plant to improve on the indicators, while "it should not be the case that we say, 'We have 45 here and the other site has 35, so we are already better' (...)" (I-8). Nevertheless, such comparisons were made in the course of the implementation. Presentation slides presented during team meetings regularly put the performance of the Austrian site alongside that of the other plants; posters displayed within the factory showed the same type of comparisons; and top management was believed to study such comparisons regularly: "I mean, that's what [the managers] are doing at the top, (...) and [that's why] we have to report productivity on a daily basis" (I-30).

Concern for the specific target values as well as for comparisons between plants increased managers' sensitivity to the perceived incompleteness of the indicators. When asked whether changes in the definition and measurement of the productivity indicator would amount to a mere 'numbers game', the plant accountant answered:

"Yes, that's a game, but currently we present ourselves in a very bad light, particularly compared to other plants. These comparisons are made and the pressure is very high. Therefore, I don't understand why it takes us that long [to redefine the indicator]. We should at least integrate [into the classification of direct labour] what has been approved from above. It has already been approved that these indirect material providers can be counted as direct labour. Thus, we should change this immediately." (I-30)

Whereas in some cases concern for evaluation led to questions about the definition and measurement of the indicators, as exemplified above, in other instances it motivated managers to question too strong a reliance on the four indicators more generally. In a meeting dedicated to discussing changes to the production layout, it was mentioned that the head of another plant in the UK would be invited to the Austrian plant in order to share his knowledge. Several people seemed critical of the benefits of such an invitation. One member of the Lean Six Sigma team (Silvia) responded by saying that it was unfortunate that this particular plant was often held up as an "example" simply because it performed well on the Lean indicators. Another person (Wilhelm) suggested that, "it would be good if the plant that brings in most of the money were taken as an example" (M-PROD-1). From our interviews, we learned that there was a degree of scepticism over whether the reported productivity value at the UK plant was true—in fact, some argued that it was so impossibly high that it could not be true. But even if it were true, the indicators may not be the best way to represent the performance of the plants, according to the above statements. They are perceived as incomplete, and this incompleteness is seen as a problem given that the indicators are made sense of in their capacity to serve as comparable evaluations of the plants.

Cause and effect

It was not only in light of evaluation concerns that the representational qualities of indicators drew increased attention. We could identify another, complementary, condition that made such concerns more likely to emerge and, consequently, a pragmatic attitude towards incompleteness more difficult to sustain.

As elaborated above, a pragmatic attitude towards indicators existed especially at the outset of the Lean Six Sigma implementation, when objectives were formulated in the form of 'visions' alone. Later on, with more specific targets, the pragmatic attitude gave way to a more pronounced concern for the details of the indicators. This concern did not only increase because of the motivational function of the targets, however. As time went by, it also became more difficult to identify further improvement activities. In the early stages of strategy implementation, it was deemed important to get things started. There was still a lot of "low hanging fruit" that could be harvested and could be expected to impact the indicator positively, even though this link was perhaps not actively ascertained. Later on, in contrast, after a lot of improvement activities had already been undertaken, any additional activity needed more careful selection if it were to have a positive impact on the indicators. This implied that internal transparency regarding the definition or measurement of the indicators became more important (see Adler & Borys, 1996; Ahrens & Chapman, 2004) and that there was heightened concern for potential incompleteness regarding the details of the indicators.

We can illustrate this with the example of the definition and measurement of OTD. Calculation of OTD was a rather complex issue and hinged on the definition of an "OTD error". Whether an order featured an OTD error or not depended on different types of information, such as the actual date of delivery, the delivery date promised to the customer, and the product category. Moreover, OTD calculation was complicated by the fact that a customer order usually consisted of different order lines, with an OTD error being triggered as soon as one order line was not on time.

Compared to the other indicators, the plant's performance on OTD was quite good, with a value of 95% in May 2008 compared to the initial objective of 100%. When the objective was later lowered to 97% for all plants, the gap between actual and target became even smaller. To be sure, maintaining OTD performance at that high a level was not an easy task. OTD performance continued to fluctuate significantly and the reasons behind this fluctuation were not fully understood. The supply chain manager, who was made responsible for OTD and CE as of September 2009, explained in March 2010 that an OTD task force had been set up to better understand the drivers of OTD:

> "The OTD task force has been at work since mid-September. Their primary goal is to bring OTD to a reasonable level, that is, a consistent performance at a level of 97%. (...) There is a complex combination [of factors] that has an impact on OTD, so that even experts can hardly figure out the causes of OTD errors. It is really a very complex issue, incomprehensible for a simple production scheduler. And there is not enough time to conduct a causal analysis and to take appropriate action. Therefore we needed the task force. We seek to identify the drivers and take measures, and at the end of the day, of course, we also need to improve the measurement system. However, so far, we haven't changed the measurement system, because we first had to do our homework – which we have now done." (I-41)

It is interesting to observe that the supply chain manager makes a clear prioritisation here between the "homework" – i.e. the activities needed to understand the drivers behind OTD and to take appropriate measures – and the modification of the measurement of OTD. This is in line with our previous analysis regarding the pragmatic attitude towards the details of the indicators. At the same time, changes to the measurement system did take place once the more pressing issues had been dealt with. The service and coordination manager described the rationale for changing measurement of the OTD indicator as follows:

> "We have improved and corrected OTD measurement a lot. (...) It's a very complex measurement. When is the order received? How is it recorded in the system? How is it classified? Has the plant confirmed a delivery date that differs from the requested date? (...). Now, we have a list of different errors that make causes of OTD visible. We knew many of these errors already, but we said that if we come very close to the target, then we should get rid of inaccurate measurement. Therefore, we started to refine measurement (...), because if you

are already at 96%, and you try to improve even further, then the air gets extremely thin. At that level, to gain half a percentage point or one percentage point requires a lot of effort. (...) On the one hand, we want to get as close as possible to the target. On the other, we know that it is very challenging to stabilise at such high levels [of performance]. That is why a measurement error of one per cent would be a big issue. We wouldn't know whether we are improving or not. (...) To reach 85% starting from a level of 40% is a big step, but you can work with 'hammer and chisel', whereas further towards the top, it gets more difficult." (I-43)

Thus, at a later stage in the implementation process, in spring 2010, when some of the more basic improvements had already been implemented and it had become more difficult to improve OTD performance further, it became more relevant to understand, and potentially change, measurement of OTD in order to ascertain the link between improvement activities and changes in the indicator. That changes in the indicator were considered relevant has, of course, to do with the evaluation concerns, as elaborated above. However, as long as improvement activities are rather fundamental and can be expected to impact the indicator anyway, closer scrutiny of the indicator does not appear necessary, even if evaluation concerns are high. In contrast, more specific initiatives seem to require such scrutiny, in order to make sure that improvement on the indicators actually occurs. This point extends the argument made by Malina et al. (2007) by highlighting a context factor that makes concern for cause and effect relations more likely to emerge. It implies, moreover, that the reasons for engaging with the indicator's perceived incompleteness are different between the two settings. When actors frame the indicator mainly as a tool for evaluation, incompleteness is seen as problematic insofar as the indicator does not fairly represent performance. When, in contradistinction, actors make sense of the indicator also, or primarily, as a tool for identifying improvement activities, then incompleteness is likely to be seen as problematic mainly because it does not enable actors to understand how best to act. In other words, incompleteness in this case becomes a problem not only for evaluation but also for coordination and action (Chapman, 1998).

In this respect, it is instructive to compare the situation of OTD with that of Six Sigma quality. The service and coordination manager, who was made responsible for the plant's productivity and quality indicators, was not entirely happy with the measurement of quality. Concerns about detailed measurement problems, however, were not as strong as in the case of OTD, because there were a lot of rather fundamental activities that were considered necessary even in the absence of a clear picture of how they would impact the quality indicator:

"Quality is clearly an exciting issue. We are setting up a comprehensive 'quality concept', but in parallel we are already discussing a lot of activities which will improve quality rather fundamentally. It would be presumptuous to wait for the quality concept to be fully rolled out and only then to start with these important activities. Therefore, we do it simultaneously: rolling out the pilot project and in parallel initiating a lot of activities in order to improve quality. For instance, we have a big problem with initial failures of [a specific type of product]. That costs a lot of money. Therefore, we started a set of activities specifically directed at this problem." (I-38)

There was a lot to be done regarding quality, and while the definition and measurement of the quality indicator was not to everyone's satisfaction, it was not deemed critical to correct it in order to identify appropriate improvement activities. Specific quality problems were known and solutions to these problems were sought – independent of the exact definition or measurement of the indicator. In a sense, managers were prepared to accept measurement problems because they were confident enough that their actions made sense in terms of improving quality.

This does not mean, however, that there were no concerns at all about the indicator. As for the other indicators, the increased need to deliver performance caused managers to reflect upon potential incompleteness of the quality indicator. In one interview, the service and coordination manager explained that, although quality costs were under budget, the value of the quality indicator had not really moved in response to the activities carried out. The indicator was seen as incomplete because it was not sufficiently 'sensitive' to the activities that were carried out (Banker & Datar, 1989), while these activities themselves were deemed appropriate to improve quality:

"We don't really know why it does not react. We will have to find that out, at the moment we simply don't know. There have been a lot of activities that should have made a difference (...). So I am somewhat concerned that we are doing something wrong in the data collection in this respect. However, we said that we had more important things to do at the moment. But [eventually] we will have to deal with this, because we are now getting the first messages [from management] to the effect that: 'You're always telling us about the many things you are working on, but the value is frozen in place'." (I-26)

In light of pressures from top management, the incompleteness of the quality indicator becomes a more serious concern. In contrast to the case of OTD, however, concern for the quality indicator is triggered purely by evaluation pressures and not by managers' own concerns about cause and effect. Indeed, the interviewee stresses that there are "more important things to do" than to spend time discussing or repairing the indicator. However, mounting evaluation pressures make a flexible use of the indicator more difficult to sustain, and managers feel increasingly coerced into paying attention to the indicator (Adler & Borys, 1996), in spite of their own convictions that the indicator should not be the ultimate point of truth.

Discussion

The case of LeanOrg illuminates how performance indicators can be used to communicate and drive change in an organisation. Our empirical inquiry is focused on creating a context-rich understanding of *how managers' attitudes towards the incompleteness of performance indicators may change over time and in response to a change in top management control.*

What our case demonstrates is that, although managers may well recognise that accounting information does not fully represent the performance dimensions that are deemed important, such perceived incompleteness is not always regarded as a problem. In LeanOrg, managers identified several issues with the focal indicators, but especially at the beginning of the implementation phase seemed rather unconcerned about these. They at times took a cynical stance towards the qualities of the indicators or openly played down the relevance of having complete indicators. This is evidence for what we refer to as a "pragmatic attitude" towards incompleteness (see Mikes, 2009; Power, 2007). It seems surprising that such an attitude prevailed especially at the beginning of the Lean Six Sigma implementation, given that the indicators were initially presented as the cornerstone of the Lean Six Sigma strategy (see Fig. 1) and could thus be expected to be seen as important points of reference for middle managers' activities.

We suggest that the pragmatic attitude towards incompleteness can be associated with the indicators being perceived as an enabling form of control in the early stages of the implementation process (Adler & Borys, 1996; Ahrens & Chapman, 2004). Operational managers were not particularly excited about the way in which the performance indicators were defined and measured. Nevertheless, they regarded them as facilitating their work rather than unduly constraining it. As a consequence, the incompleteness of the indicators was not of that much concern to operational managers.

Flexibility and incompleteness

Whether control systems are perceived as enabling or coercive depends to an important extent on their design characteristics (Adler & Borys, 1996). We suggest that the key characteristic at work in our case was the flexibility with which operational managers could approach the focal indicators. The notion of flexibility refers to the extent of discretion that users of a system have in carrying out their work (Adler & Borys, 1996). To some extent, the degree of flexibility can be designed into the control system itself. When a firm chooses broad financial measures, it allows managers more flexibility than with narrow operational indicators. It is important, however, to see flexibility not just as a matter of technical design, but as being a matter of how a technical system is used by operational managers. Flexibility here refers to the relative importance given to the selected output indicators as compared to other concerns. If there is a unique focus on the indicators in question, actions will be oriented mainly towards increasing performance on these indicators. If, in contrast, managers see the indicators only as part of what they should pay attention to, they will exercise more flexibility in linking their actions to these indicators. Indeed, what we could observe in the case of LeanOrg was that indicators were treated more as means than ends at the beginning of the implementation phase. When discussing potential improvement activities, managers made sense of the indicators as "points of orientation" only rather than as focal points of concern.

We suggest that there were two conditions that allowed operational managers to realise such flexibility. The first was the way in which top management communicated the role and relevance of the indicators. In particular, there was little perceived evaluation pressure at the beginning of the implementation period. With the presentation of target values as "visions", top management signalled that the indicators were not to be understood as specific goals to be reached at a certain point in time. This form of sensegiving (Gioia & Chittipeddi, 1991) was consequential for how operational managers related to the indicators. Whereas previous research suggests that low targets can introduce slack and flexibility (Davila & Wouters, 2005; Lukka, 1988), our observations suggest that very high targets or "visions" can have a similar effect in that they allow managers to distance themselves from too close a concern with the indicators. The second condition is to be seen in the way in which the performance measurement system built upon existing practices and concerns. In the case of LeanOrg, a flexible handling of performance indicators was facilitated by the fact that managerial practice exhibited an important degree of continuity with the past. Improvement activities, which were supposedly done "in the name of the indicators", were often a continuation of past practice and thus, at least to some extent, "business as usual" (see Balogun & Johnson, 2004). Indicators were not really "needed" in order to motivate such activities and therefore did not come to dominate managers' sense-making in the project groups. We suggest that such continuity with the past is more likely when a new performance measurement system builds upon existing concerns, since this allows acting in the "spirit" of the project without tightly coupling actions to the indicators. If, in contrast, a performance measurement system introduces completely new dimensions of performance, then the new indicators will probably attract more attention because they constitute the primary "access" to these new concerns.

These findings contribute to previous research which proposes that incomplete or "imperfect" calculations are not always problematic in practice (Briers & Chua, 2001; Dambrin & Robson, 2011; Mouritsen et al., 2009). In line with this literature, we suggest that the "problem of incompleteness" is not a function of the representational qualities of the indicators per se, but rather depends on how indicators are related to the world of action. What our analysis adds to this stream of research is to spell out some important conditions that facilitate a flexible use of indicators and, thus, a pragmatic attitude vis-à-vis incom-

pleteness. In so doing, we also add to the literature on enabling and coercive forms of control that has commented upon the problem of incompleteness. Wouters and Wilderom (2008) suggest that problems of incompleteness can be addressed when managers are involved in the design and development process of a control system, during which indicators can be experimented with before they are actually used. In addition to such experimentation during the design and development process, our analysis highlights the possibility of addressing incompleteness by adopting flexible ways of using indicators once they are in place.

Evaluation pressures, transparency and incompleteness

Flexibility in dealing with an incomplete performance measurement system can ensure that such a system maintains being seen as enabling rather than coercive. Yet, from the perspective of top management, too much flexibility in using indicators may challenge their usefulness as effective instruments of control. As control systems, performance measures are supposed to impose a particular focus on managers' actions at the expense of other things deemed less important. Seen in this light, it is perhaps not surprising that, over time, LeanOrg's management attached increased importance to the focal indicators. Several mechanisms contributed to such an increased control focus. First, top management engaged in a more intensive discussion about the indicators' performance, as was evident through more frequent interactions and more intensive reporting. Second, the Lean Six Sigma indicators took on a more central relevance when top management specified more realistic target values instead of the broad "visions" that existed in the beginning. Third, there was a reduction in the time horizon to reach certain performance targets, which meant that the pressure to produce results was more immediate. Finally, managers were faced with more frequent comparisons between the different plants, adding to their impression that what counted was the performance on the selected indicators.

Taken together, these mechanisms can be associated with increased evaluation pressures. The RAPM literature also highlights the role of such evaluative pressures, but does not discuss in detail the particular mechanisms through which they may materialise in the organisation (e.g. Briers & Hirst, 1990; Hartmann, 2005; Hirst, 1981). We demonstrate how evaluation pressures are – individually and collectively – reflected upon by operational managers and how they raise managers' concern with the incompleteness of the indicators. Managers were particularly concerned about incompleteness when they felt the need to see the effect that their activities had on the indicator. Such cause-effect thinking is an expression of tight coupling between the indicators and managers' actions. It is likely to materialise both when evaluation pressures are high and when the performance on the indicator is already high, such that additional improvements are possible only by having a clear understanding of the factors that cause the performance on the indicator to rise or fall. Cause-effect thinking is an expression of the link between the use of indicators as control tools, on the one hand, and their decision-facilitating role, on the other.

Our observations regarding the role of evaluation pressures appear, at first sight, to contrast with the findings from Dambrin and Robson (2011) in their study of sales reps in the pharmaceutical industry in France. Dambrin and Robson find that the sales reps are rather unconcerned about the "flawed measures" on the basis of which their activities are evaluated and their sales bonuses calculated. This relaxed attitude towards performance measurement prevails despite the fact that the bonuses represent a rather high percentage of the sales reps' remuneration. It would thus seem that, in this case, evaluation does not trigger concerns with the representational qualities of the performance indicators. It is important, however, to consider the contextual factors at work here. Among other things, Dambrin and Robson (2011) point to sales reps' belief in the rationality of the measurement system – a belief that is enabled by the lack of transparency of the system. As Dambrin and Robson argue, the complexity and "opacity" of the bonus calculation system contributed to sales reps' attitude, as it prevented them from being able to problematise the details of the system: "Transparency would offer opportunities to question the interruptions of traces between drug reps' activities and the performance measures" (Dambrin & Robson, 2011, p. 441). This is in contrast to what we could observe in the case of LeanOrg, where operational managers could see through the performance measurement system and, because of this transparency, were able to recognise issues with the choice and definition of the indicators. While "internal transparency" allowed for the recognition of narrow forms of incompleteness in terms of definitional and measurement details, "global transparency" was created by linking the indicators to the overall objectives and strategic imperatives of the firm. When introducing the lean six sigma indicators, LeanOrg's top management framed these in a "rhetoric of comprehensiveness" that suggested that these four indicators covered everything that was important (see Fig. 1). This, we suggest, created particular awareness among middle managers of what these indicators, collectively, did not account for. And this awareness turned into a more pressing concern when evaluation pressure increased. Vaivio (2004) suggests that operational indicators are "provocative" insofar as they create strong visibility on operational activities. Presenting a set of arguably *selective* indicators as a *comprehensive* measurement system can create a different type of provocation – one that creates particular visibility and awareness of the incompleteness of these indicators.

We can therefore conclude that the relationship between transparency and enabling control is an ambivalent one. On the one hand, transparency can increase managers' acceptance of a control system because it helps them understand the rationales behind the particular form of control (Adler & Borys, 1996; Ahrens & Chapman, 2004). Yet, on the other hand, transparency also opens up the possibility to identify incompleteness in the control system, which may entice managers to question the system. Such transparency would thus seem to be the precondition for a problem of incompleteness to emerge (Dambrin &

Robson, 2011). However, as we demonstrate in our paper, it is only when evaluation pressures mount, and the scope for flexible handling of the indicators is reduced, that incompleteness turns into a real concern for the managers.

Seeing incompleteness as a problem, managers engaged in efforts to achieve repair of these indicators. Granting managers the possibility of repair increases the likelihood that the control system is perceived as enabling (Adler & Borys, 1996). In LeanOrg, operational managers did not have discretion over the definition and measurement of the indicators. They were however able to lobby the specialist staff concerned with these issues to engage in corresponding activities. We could indeed observe some changes to the definition and measurement of the indicator that resulted from this concern with incompleteness. Yet, we could also see that the repair activities that were carried out in LeanOrg did not completely eliminate concerns for incompleteness. This is because repair was a solution only for narrow forms of incompleteness, i.e. those that concern the details of the indicators, rather than also for broad forms, i.e. those that relate to the selective focus on the four performance indicators more generally. Despite modifications in the measurement of some of the indicators, managers still felt that, taken together, there was too much focus on the four indicators as compared to other concerns such as innovation or financial performance. With reduced scope for flexibility and limited possibilities of repair, the control system in LeanOrg was increasingly seen as coercive (Adler & Borys, 1996).

Conclusion

Performance indicators are used in many organisations to control and facilitate managers' decisions and actions. Not much is known, however, about the extent to which managers actually care about the design characteristics of such indicators. Our study focuses on this question and examines managers' responses to performance indicators when these are perceived as incomplete. Drawing upon an in-depth case study, we find that such incompleteness does not necessarily constitute a "problem" in the eyes of managers. As long as a flexible handling of the control system is possible, such a system can still be regarded as *enabling* despite its perceived incompleteness.

What our case study also demonstrates, however, is that managers' attitudes may change over time. More specifically, we could observe an increasing concern with the design of the control system in our case organisation. As Ahrens and Chapman (2004, p. 297) point out, management control systems may be particularly prone to coercive uses as they are "strongly and complexly bound up with issues of hierarchy and performance evaluation". Indeed, our observations in the case of LeanOrg illustrate how "easily" a flexible use of indicators can give way to a control and evaluation focus that leaves operational managers with few possibilities other than to try and "make the numbers". There may, of course, be good reasons for top management to enforce such a strong focus on a selected set of indicators or strategic priorities. After all, such a control focus can have important motivational effects. However, if middle managers and employees do not sufficiently understand or agree with such a prioritisation, i.e. if they regard the control system as incomplete in important respects, tensions and dissatisfaction are likely to emerge.

The move from an enabling to a more coercive control system (or the other way around) should probably not be regarded as an exceptional event. Organisations are hardly ever places of complete harmony and, in many cases, management control will be regarded as coercive (rather than enabling) at least at some point in time. Especially the introduction of a new control system can easily create feelings of coercion among middle managers and employees. This does not mean, however, that it has to remain being seen as coercive. Not only can top management react to subordinates' dissatisfaction by modifying the control system or reconsidering the relative focus they place on it; middle managers and employees may also, over time, come to understand and appreciate the benefits of new accounting information – in the sense that they discover, for instance, how they can employ such information in a flexible way so as to better master their work. In this respect, the present study is subject to an apparent limitation. Although our longitudinal approach provides more than a static account of managers' attitudes towards incompleteness, the empirical story that we tell had to end at a somewhat arbitrary point in time. If we had stayed longer in the organisation, perhaps we could have observed another change in managers' attitudes towards the performance indicators, i.e. back again to a more enabling form of control. Such swings between enabling and coercive forms of control may happen at different speeds in different organisations. Future research could examine such dynamics in more detail in order to further improve our understanding of the multiple and changing roles of control systems in organisations.

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Appendix A

Interviews conducted and meetings attended at LeanOrg from May 2008 to August 2010.

	Date	Interviewee	Code
Interviews (52)	8-5-2008	Holger, Chief management accountant (production site)	I-1
	27-6-2008	Werner, Project manager (Six Sigma quality project team)	I-2
	2-7-2008	Bernhard, Management accountant	I-3
	2-7-2008	Wilhelm, Service and coordination manager	I-4
	23-7-2008	Hans, Project manager (OTD project team)	I-5
	23-7-2008	Emil, Project manager (CE project team)	I-6
	23-7-2008	Werner, Project manager (Six Sigma quality project team)	I-7
	24-7-2008	Hannes, Human resources manager	I-8
	24-7-2008	Mirko, Team member (CE project team)	I-9
	29-7-2008	Holger, Chief management accountant	I-10
	29-9-2008	Hans, Project manager (OTD project team)	I-11
	25-11-2008	Tobias, Team member (Six Sigma quality team)	I-12
	25-11-2008	Werner, Project manager (Six Sigma quality team)	I-13
	25-11-2008	Jutta, Team member (CE project team)	I-14
	26-11-2008	Herbert, Team member (OTD project team)	I-15
	26-11-2008	Mirko, Team member (CE project team)	I-16
	26-11-2008	Holger, Chief management accountant	I-17
	26-11-2008	Emil, Project manager (CE project team)	I-18
	27-11-2008	Daniel, Team member (OTD project team)	I-19
	27-11-2008	Hannes, Human resources manager	I-20
	26-2-2009	Holger, Chief management accountant	I-21
	26-2-2009	Kurt, Lean consultant	I-22
	26-2-2009	Gabriel, Foreman at the production site	I-23
	26-2-2009	Hans, Project manager (OTD project team)	I-24
	7-4-2009	Hannes (HR) and Wilhelm (Service & coordination)	I-25
	27-4-2009	Wilhelm, Service and coordination manager	I-26
	27-4-2009	Joseph, Production line manager	I-27
	27-4-2009	Emil, Project manager (CE project team)	I-28
	21-7-2009	Hannes, Human resources manager	I-29
	21-7-2009	Bernhard, Management accountant	I-30
	22-7-2009	Emil, Project manager (CE project team)	I-31
	18-8-2009	Christian, Lean Six Sigma manager	I-32
	18-8-2009	Thorsten, Supply chain manager	I-33
	17-11-2009	Wilhelm, Service and coordination manager	I-34
	17-11-2009	Herbert, Team member (OTD project team)	I-35
	18-11-2009	Silvia, Lean Six Sigma manager	I-36
	18-11-2009	Paul, Quality manager	I-37
	2-3-2010	Wilhelm, Service and coordination manager	I-38
	2-3-2010	Emil, Project manager (CE project team)	I-39
	3-3-2010	Herbert, Team member (OTD project team)	I-40
	3-3-2010	Thorsten, Supply chain manager	I-41
	3-3-2010	Georg, Lean Six Sigma manager	I-42
	19-4-2010	Dominik, Business Process Improvement Manager	I-43
	19-4-2010	Klemens, Manager at one of LeanOrg's suppliers	I-44
	20-4-2010	Wilhelm, Service and coordination manager	I-45
	16-7-2010	Wilhelm, Service and coordination manager	I-46
	16-7-2010	Richard, Human resources manager	I-47
	16-7-2010	Michael, Quality manager	I-48
	16-7-2010	Martin, Controller	I-49
	28-7-2010	Silvia, Lean Six Sigma manager	I-50
	17-8-2010	Herbert, Team member (OTD project team)	I-51
	17-8-2010	Rafael, Plant manager	I-52

	Date	Type of meeting	Code
Meetings (10)	3-6-2008	Quality meeting	M-QU-1
	27-6-2008	Quality meeting	M-QU-2
	18-7-2008	Cycle efficiency meeting	M-CE-1
	29-7-2008	OTD meeting	M-OTD-1
	17-9-2008	Cycle efficiency meeting	M-CE-2
	4-12-2008	Cycle efficiency meeting	M-CE-3
	26-2-2009	OTD meeting	M-OTD-2
	22-7-2009	Meeting on production layout	M-PROD-1
	22-7-2009	Production review meeting	M-PROD-2
	17-2-2009	Meeting on production layout	M-PROD-3

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