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A developmental approach to performance measures—Results from a longitudinal case study

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KEYWORDS

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Summary Performance measurement systems (PMS) serve different functions. These are formal devices for control, and for the formulation and communication of strategy, and as such PMS primarily serve higher-level managers. But we can also aspire PMS to support operational managers, to motivate and enable these managers to improve operations. Building on Adler and Borys [Adler, P.S., Borys, B., 1996. Two types of bureaucracy: enabling and coercive. *Administrative Science Quarterly* 41(March), 61–89] and Ahrens and Chapman [Ahrens, T.A., Chapman, C.S., 2004. Accounting for flexibility and efficiency: a field study of management control systems in a restaurant chain. *Contemporary Accounting Research* 21(2), 271–301], we use the term *enabling PMS*. This study reports on a developmental approach for such PMS, based on a longitudinal case study, with action research. The company has made enormous investments in operations, and it therefore needed PMS to facilitate improvement of processes and to measure the actual realization of the benefits from their investments. The challenge was to develop a performance measurement system as an enabler of performance improvement, rather than merely as a control device. The company adopted a developmental approach to performance measurement, which was based on the following principles: (1) experienced-based, (2) allowing experimentation, (3) building on employees' professionalism, (4) transparency and employee ownership, and (5) outside facilitators. This resulted in extended set of new and well-founded measures, it has enhanced employees' beliefs in the PMS and their commitment to performance improvement, and it has created organizational learning concerning performance measurement.

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Introduction: the challenge to develop enabling performance measurement systems

Performance measurement systems (PMS)—now often called “balanced scorecards” (Kaplan and Norton, 1992, 2006) and preceded by the earlier French “Tableaux de Bord” (Epstein and Manzoni, 1998)—are important in many different functional areas of management, such as operations (Evans, 2004; Davila and Wouters, 2006), marketing and sales (Löning and Besson, 2002; Llonch et al., 2002), HRM (Bontis et al., 1999), or sustainability (Székely and Knirsch, 2005). The topic has been studied by researchers specialized in these different fields, often with little cross-fertilization, however (Chenhall and Langfield-Smith, 2007).

Besides distinguishing these functional areas, it may be useful to explicate that performance measurement systems serve different functions. Such systems can be helpful for strategy formulation and communication (Simons, 1991). The structure and emphasis of the PMS, the definitions of specific performance measures, and the ambition level set for the various measures: these all make the organization’s strategy more concrete and guide the actions of managers lower in the organization (Drew and Kaye, 2007; Epstein and Manzoni, 1998; Mooraj et al., 1999). Furthermore, PMS can be a form of diagnostic controls through measurement of actual results: such systems can focus employees on specific results that are expected from them (by senior management) and make them work harder and put in more effort (Simons, 1995). From both the strategy and the control perspectives, the PMS primarily serves higher-level managers (Ittner and Larcker, 2003; Kaplan and Norton, 1992, 2006).

But what about the role of PMS for managers lower in the organization, the employees whose performance is being measured? Are PMS only something for “others”, or can PMS be something that also supports operational managers in *their* work: PMS that motivate and enable these managers to do a better job and to improve their operations? Building on Adler and Borys (1996) and Ahrens and Chapman (2004), we use the term *enabling PMS*.

We focus on enabling PMS *in operations*, where performance measurement is becoming more and more important (Andrews et al., 2001; Evans, 2004; Groote et al., 1996). There is a substantial literature on PMS in operations, and we refer to several recent papers that provide reviews of the literature (Chenhall and Langfield-Smith, 2007; Davila and Wouters, 2006; Kennerley and Neely, 2003). PMS may include a large number of different measures for each responsibility unit, spanning financial performance, customer relations, internal business processes, and learning and growth objectives of the organization (Kaplan and Norton, 2006). Researchers in operations management have argued for PMS that are multidimensional (with different kinds of measures, on service, inventory, speed, costs, etc., and with a good understanding of the tradeoffs among these) and cross-enterprise (Hausman, 2003). Empirical studies have found that operational strategies such as JIT, quality improvement and flexibility, make it relevant to expand traditional efficiency-focused performance measures and to embrace new performance measures (e.g., Abernethy and Lillis, 1995; Abdel-Maksoud et al., 2005; GChenhall, 1997;

Fullerton and McWatters, 2002; Perera et al., 1997). Yet, Chenhall and Langfield-Smith (1998) found that financial performance measures continue to be an important aspect of management accounting, although these are being supplemented with a variety of non-financial measures. However, design and implementation of PMS pose significant challenges for companies (Melnyk et al., 2004). Far too often measurement system implementations fail (Neely et al., 2000), and one of the key issues is how the behavior of people is affected by these systems.

This study seeks to make the following contributions. First, we aim to help better understand characteristics of *processes for the design and implementation of enabling PMS*, which is complementary to Ahrens and Chapman (2004) who focus more on characteristics of the system than on these processes. How can organizations go about involving employees in design and implementation processes in such a way that employees will judge the PMS as something that actually helps and motivates them to improve? How can organizations avoid that such processes may start as initiatives that people are excited about and have high hopes for, but then turn into a standard template that is irrelevant at best, and may well lead to skepticism and cynicism (Townley et al., 2003)? While several methods for implementing the balanced scorecard have been proposed—Papalexandris et al. (2005) and Bourne et al. (2003) review the literature—processes for developing enabling PMS have received less attention.

As a second contribution of this study, we aim to bring together a number of *different perspectives* on PMS. In particular, from operations management, which has focused on characteristics of supply chains and PMS (Lohman et al., 2004), from organizational studies, which have focused on how PMS affect the behavior of people in organizations (Lowe and Jones, 2004; Townley et al., 2003), and from accounting, which amongst other things has focused on measurement issues and definitions of performance measures (Abdel-Maksoud et al., 2005; Hyvönen, 2007; Ittner and Larcker, 2003). We demonstrate how these perspectives complement each other: because of the characteristics of specific operational processes, creating valid, useful and understandable measures is challenging. This makes it especially relevant to involve people whose performance is going to be measured: to utilize their knowledge of processes, how these are managed, and how this can be reflected in quantitative measures.

A third contribution is to provide a number of *managerial implications* for a developmental process towards enabling PMS, which may both stimulate future research and provide guidance for practitioners. Bridging gaps between academic and managerial research is certainly a contemporary challenge (Van de Ven and Johnson, 2006; Walsh et al., 2007).

We conducted a longitudinal case study, based on action research. This study focused on a project to develop a PMS in the Logistics department of Grolsch—a beer brewing company in the Netherlands. The project was initiated by the Director of Logistics, who heads the management team of the Logistics department. Logistics includes the departments Materials Management, Physical Distribution, Purchasing, and Packaging Development, totaling around 150 employees. The central theme of the whole study is PMS as enabling devices rather than control instruments. The study

spanned a 4-year period, involving company employees, the researchers, and MSc students as research assistants. More details are provided in Section 2. There is much more material than can be included in a single paper, and this paper focuses on further explication of managerial implications from the overall study. We sometimes have to remain rather brief and refer to other papers from the same study for elaboration on the theoretical foundations and for more empirical results (W and S, 2005; W and W, 2008; W and B, 2007).

The company has a strong brand name and sells nationally and internationally to customers in the hospitality industry (such as bars, restaurants, and hotels) and retail customers. The company has made very significant investments to completely rebuild its manufacturing site, production equipment, and head office. The large investments are connected to ambitious targets for growth of sales and profits, and the company's strategy focuses on brand strength, marketing, product innovation, and excellence in production and the supply chain. Logistics' contribution to this strategy is "to coordinate the supply chain in an effective, efficient, and innovative way for providing optimal service to our customers". Hence, Logistics has four objectives: number one in customer satisfaction, excellence in supply chain efficiency, continuous supply chain innovations, and a professional and learning organization. Grolsch has won several prestigious national prizes for customer service and supply chain management.

The remainder of this paper is structured as follows. The research method is explained in the following section. In a number of following sections, the project at the company is described. The final section concludes the paper with suggestions on how the insights obtained through this case study may be relevant to other empirical settings. This structure, and also the style of the paper, is sometimes slightly unorthodox for an academic paper, and this is a deliberate attempt to write for both an academic and practitioner audience. For example, we often use the present tense rather than past tense when describing results from the case study. We often combine arguments from the literature and from the case context. For example, rather than having a separate literature review section, we present the practical challenges for the company and discuss the literature in the same section to argue for a "developmental approach" versus what we call a "Blueprint and Greenfield" approach (admittedly applying a bit of black-and-white thinking to illustrate the contrast more clearly).

This "developmental approach" became better understood and explicated in the course of the study. The starting point was to explore an experience-based development process and what we then called continuous revision of the PMS (later formulated as "experimentation"). These ideas took further shape during the course of the study through going back-and-forth between the fieldwork and the literature. In other words, the developmental approach is not something that was formulated beforehand based on existing literature and then tested at Grolsch.

Research method

We observed and contributed to the development of the PMS at the Logistics department of Grolsch during 4 years

(August 2002 to July 2006, and informal contacts with the organization continued thereafter), so this study was a form of longitudinal action research. The study combined qualitative and quantitative approaches to a field study.

The *longitudinal* nature of this study is important, because developing an enabling PMS is likely to require a long-term, evolutionary process, during which such a system can be gradually refined (Tuomela, 2005). This suggests that documenting the development over an extended period is needed to understand the nature of such processes (Ahrens and Chapman, 2006; Otley and Berry, 1994). Interactions over a longer time create more familiarity with people and a better understanding of the organization, and this provides "repeated trials for approximating and understanding a research question or topic" (Van de Ven and Johnson, 2006, p. 813).

The choice for *action research* is also important. The objective remains to generate theoretical insights, but helping a company to develop and implement managerial innovations can be a useful means to that end (Kasanen et al., 1993; Jönsson and Lukka, 2007). Action research is particularly compelling for creating active involvement between the researchers and members of the organization—we can learn a lot by working with people (Labro and Tuomela, 2003; Coughlan and Coughlan, 2002). Research projects can be "collaborative achievements in learning among collaborating faculty, students, and practitioners" (Van de Ven and Johnson, 2006, p. 811). And this takes time, which "is critical for building relationships of trust, candor, and learning among researchers and practitioners" (Van de Ven and Johnson, 2006, p. 812). The collaborative nature of the interaction between the researchers and company employees allowed a detailed examination of the evolution of the department's PMS and employees' experiences with performance measurement. Company employees expected that results would impact their work and would be of practical relevance, and this provided an incentive for them to be engaged, to spend time with the researchers, to challenge ideas, and to provide feedback on results.

We collected various kinds of data that we will briefly describe below; see also Table 1. Qualitative data have been gathered and analyzed through a process of reflection, and going back-and-forth between the data, the literature, and the company (Ahrens and Chapman, 2006; Dubois and Gadde, 2002). These data were gathered through various kinds of face-to-face meetings at the company's site (such as interviews with one or a few employees, or active participation in meetings with a larger number of employees), meetings at the university, informal off-site meetings (such as during a diner, or while drinking a beer at a hospitality event that Grolsch sponsored), emails, phone calls, and sample documents. Parallel to gathering and reflecting on these data, we reviewed more literature, discussed the study with other researchers (informally, as well as through presentations in workshops and conferences), wrote (and rewrote) research papers, and also discussed these with people of Grolsch.

The study combines qualitative and quantitative approaches, which seems to be quite rare in field studies. Survey data were gathered through four waves of administering a questionnaire among a representative panel of 42 employees. Key variables in this survey were the "Attitude

Table 1 Data gathering, August 2002 to July 2006

<i>Meetings with^a</i>	Number of meetings	Duration (h)
Employees of Logistics only	11	20
Employees outside Logistics	20	25
Employees from Logistics together with other areas	25	37
	56	82
<i>Number of different company employees interacted with^a</i>		
Logistics	9	
Finance	7	
Production	2	
Marketing and Sales	2	
Other functional areas	8	
	28	
<i>Sample company documents^b</i>		Number of documents
Documents about performance measures in-use in Logistics		21
Documents about performance measures in-use outside Logistics		4
Presentations and documents about performance measurement in the company		8
Minutes of meetings about developments in performance measurement in the company		18
General documents about the Logistics department		11
General company documents		9
Responses to panel survey study		4
		75
<i>Administrations of the survey</i>		
(1) July 2004, 42 respondents	(2) January–February 2005, 40 respondents	
(3) July–August 2005, 42 respondents	(4) January–February 2006, 42 respondents	
<i>Research assistants^c</i>		
January–August 2003, Logistics		
March–August 2004, Materials Management		
March–August 2004, Distribution		
November 2004–May 2005, Internal Transportation		
March–September 2005, Marketing and Sales		
April–November 2005, Production		
April–December 2005, Materials Management		
August 2005–May 2006, External Transportation		
August 2005–May 2006, Supply Team		

^a "Meetings" indicates face-to-face engagements of researchers with members of the case-study organization, either as interviews with one or a few employees, or as active participation in meetings with a larger number of employees. Meetings took place at the research site, with a few exceptions of meetings at the university. Not included in these counts are emails and phone calls, and also not included are the interactions between company employees and the research assistants.

^b These numbers only include documents of the researchers (not the research assistants).

^c Research assistants worked full-time in the company during the periods indicated.

towards performance measures", "Professionalism", "Leadership style", and "Team trust". A survey as part of action research contributes to a better understanding by combining different kinds of data, not only investigating at the departmental level but also at the individual level. The measurement of "Attitude toward performance measures" was developed for this study. The variable reflects the judged usefulness of performance measures that are reported concerning the respondent's department within Logistics. The measurement of "Professionalism" was also

developed expressly for this study. We refer to this new construct informally as being improvement-oriented on the job. Formally professionalism refers to the degree to which individual employees behave in a way that shows commitment to both their profession and their current organization, through efforts aiming explicitly to upgrade or improve the quality of the work carried out. Sample items are: "I learn every day at work"; "I always contribute to new ideas at work". The items are on an individual employee level, and refer to one's own current job. "Leadership style"

was measured using a subset of 10 MLQ items of transformational leadership style. MLQ refers to the currently most used valid questionnaire for assessing leadership; see Bass et al. (2003) for a recent review of the literature in this field. For “Team trust” the measurement scale was comprised of the seven items developed by Edmondson (1999), which have also been employed, for example, in a German study by Baer and Frese (2003).

We gathered additional information through research assistants working at the Grolsch site. Over the course of this study, nine master students in Industrial Engineering or Business Administration worked full time for a period of 6–8 months as an intern at the company, in partial fulfillment of their MSc. They acted as research assistants, they produced monthly reports of performance measures, they carried out the surveys, and they worked with employees in developing, evaluating, or refining various measures. Several continued working as company employee after completing their MSc. These research assistants had numerous interactions with company employees, and this provided an additional source of information for the researchers.

The challenge for the PMS project

The management team used only a limited number of performance measures, mainly overall delivery reliability. This measure was available at various levels of aggregation, ranging from overall delivery reliability in a particular month for the company as a whole, to, for example, the performance of the finished goods warehouse in a particular week for a particular product group. Given the ambitious goals of the company and Logistics’ key role in that, the Director and his team wanted to expand the performance measurement system. They aspired a system that provided more specific, detailed measures zooming in on different performance dimensions, separate periods, and organizational sub-units. Specific, often non-financial measures are more actionable than aggregate, often financial measures, because they provide more direct insights into the causes of good or bad performance (Andrews et al., 2001; Melnyk et al., 2004).

Top management team of the Logistics department had clear view on how performance measurement was supposed to work in the organization: as something that employees would see as enabling of their work, rather than as primarily a control device for use by senior management. They intended to create a PMS that employees would consider as something that they could use for their own purposes to assess how things are going, identify problems, prioritize issues, develop ideas for improvement, engineer solutions for concrete problems, or make decisions. The system would not be directly linked to financial incentives.

Designing and implementing such a PMS is challenging, and not much research is available to guide the development process. The crucial point is that the company envisioned going much further than high-level indicators for top management. Employees at various organizational levels within Logistics needed to be enabled to improve performance and to realize Logistics’ vital contribution to the company’s ambitious strategic objectives. In other words, the company envisioned an *enabling* PMS in Logistics (Adler and Borys, 1996).

We draw on the framework by Adler and Borys (1996) for a number of reasons. Firstly, because this framework conceptualizes the issue that is central to our study: the distinction between performance measurement systems that only serve higher-management needs and control employees’ behavior (coercive formalization), versus systems that support employees to do their work better (by providing feedback, identifying problems, revealing improvement opportunities, help prioritizing action, etc.): enabling formalization. People are likely to have a more positive attitude to formalization—such as PMS—when it enables them to better master their tasks, and they will be more negative when it functions as a means by which management attempts to coerce employees’ effort and compliance (Adler and Borys, 1996). Secondly, we draw on this framework because it helps to articulate that characteristics of the *system* itself, as well as of the *process* for design and implementation of the system may contribute to the coercive or enabling nature of formalization. Adler and Borys (1996) propose that internal and external transparency, flexibility, and repair are characteristics of the system that contribute to the enabling nature of it. Ahrens and Chapman (2004) provide empirical support for this. Thirdly, we draw on this framework because Adler and Borys (1996) offer initial suggestions about what kind of design and implementation process is likely to foster the enabling nature of formalization, such as employee involvement and professionalism. Yet, these ideas are not developed very far in their work, and later studies such as Ahrens and Chapman (2004) have focused more on characteristics of the system than of the process. This study contributes to that literature by explicitly focusing on processes for the design and implementation of enabling formalization, and by further developing why professionalism is important and how employee involvement can take shape. Note that this study, as well as Ahrens and Chapman (2004), provides empirical support in the context of accounting and performance measurement systems, while the suggestions of Adler and Borys (1996) relate more broadly to “formalizations”.

To achieve an enabling PMS, the company followed a developmental approach to design and implement the PMS. This approach assumes that in an organization there is already considerable experience with qualitatively capturing operational performance, and employees may be quite willing to help further develop the PMS. The key is to utilize existing experience and to engage employees in the design and implementation of the PMS. We will discuss the approach below.

Why Grolsch followed a developmental approach

The company felt that existing approaches for the design and implementation of PMS are primarily geared towards the information needs of senior management, while the ambition was to address the information needs of employees at different levels throughout Logistics.

Key elements of most approaches to PMS design and implementation are the connection between strategy and measures, the validity and reliability of the measures, achieving consistency across the company, and periodically refining

the PMS (Ittner and Larcker, 2003). The PMS is designed from the perspective of top management (Kaplan and Norton, 1992, 2006; Simons, 1991, 1995). In the design phase, much emphasis is placed on clearly defining the overall (e.g. corporate-level) strategic objectives, and then formulating operations' contribution toward achieving these overall strategic objectives (Bourne et al., 2003; Kennerley and Neely, 2003; Neely et al., 1997, 2000). In the implementation phase, systems and procedures are put in place to collect and process the data that enable the measurements to be made regularly and reliably (Ittner and Larcker, 2003). Practical considerations that are also often mentioned are to have a *stable* system with measures, presentations, information systems, data, and target levels that are fixed, and to have a *standardized* system with uniformity regarding definitions of performance measures, presentation formats, etc. (see, for example Smith (2007) and Vike (2007)). In the use phase, managers review the measurement results to assess whether operations are efficient and strategic objectives are achieved. The design, implementation, and use of a set of performance measures are not a one-time effort: a firm should install processes that ensure periodic review of the system (Ittner and Larcker, 2003; Kennerley and Neely, 2003).¹

There is typically a role for external consultants, who often bring in a standardized way of designing and implementing organizational change (Sorge and Witteloostuijn, 2004), such as examples (or templates) of PMS, complete with performance measures, presentation formats, and a set consulting approach for designing the system, and software tools. (Townley et al., 2003). Additionally, ERP systems (such as SAP), warehouse management systems, and other logistics information systems often contain a broad set of predefined performance measures.

Such considerations are understandable and in some sense useful. A coherent and transparent system is practical, using consultants who bring outside knowledge to the process can be both refreshing and efficient, predefined metrics may already have proven successful in other organizations, and comparability with outside data (benchmarking) may be enhanced. This may be an efficient and quick way to implement a new PMS.

However, this well-intended approach also carries the danger of ending up as a "Blueprint" and "Greenfield" approach—and not being effective—because it utilizes outside practices without adjusting these to the local situation, and it acts as if there are no existing experiences with quantitatively measuring operational performance (Townley et al., 2003). Performance measures need to fit in the context in

¹ Standardization, stability, strategic links, and so forth are accountants' and headquarters' concerns, consistent with PMS designed from a top-management perspective (Quattrone and Hopper, 2006; Dechow and Mouritsen, 2005). Previous studies in accounting have also built on actor-network theory and focused on power struggles and such rationalities other than technical ones to understand the implementation of new accounting practices. "In this view, accounting innovations diffuse because they translate the changing and transitory interests of various groups of actors who are looking to maintain their position and influence within organizations and society. Actors use accounting innovations to manufacture 'inscriptions' (i.e. figures and numbers which become 'facts'...) and manipulate them to serve their interests" (Alcouffe et al., 2008, p. 2).

which they are used, and they are not generic or easily passed from one company to another (Soltani et al., 2005). Developing valid, useful, and understandable performance measures is complex and challenging (Ittner and Larcker, 2003). "Valid" here means that the performance as measured by a particular indicator reflects the performance dimension that is intended. It is simply difficult to express all relevant aspects of operational performance aspects in quantitative terms (financial and non-financial performance measures), to estimate tradeoffs among such multiple and potentially conflicting dimensions of performance when setting targets for performance measures, and to consider interdependencies between organizational units (and different time periods) (Lillis, 2002; Lowe and Jones, 2004). Hence, designing and implementing PMS in operations is difficult and requires a careful approach.

A Blueprint and Greenfield approach may lead to designing and implementing a less valid PMS, because performance measures copied from other firms or predefined in standard software may not validly reflect operational performance, because of different operational characteristics. Such an approach may also be less efficient, as it discards existing intellectual capital in the form of existing, yet informal, performance measurement practices. Such an approach also denies the dynamic nature of developing performance metrics. These are not "right" the first time, and so flexibility is important rather than "fixing" the system; design and implementation happen iteratively rather than linear. "Flexible systems encourage users to modify the interface and add functionality to suit their specific work demands" (Adler and Borys, 1996, p. 74). And such an approach does not recognize that employees at different levels in the organization have different information needs. People closer to operational processes require more detailed and idiosyncratic information, and approaches that focus on top management may not facilitate these employees. Rather, the PMS may soon become a device only to report upwardly, and people may become more focused on achieving the required level of performance "as measured" rather than being genuinely stimulated to improve processes in Logistics.

In contrast, involving users and building on experience is consistent with findings that learning and change arise from experience, and having acquired capacity in management accounting also creates expertise and knowledge to make further changes in this (Libby and Waterhouse, 1996; Wouters et al., 2005). Flexibility and transparency (Adler and Borys, 1996), in the context of performance measures, require that employees (whose performance is going to be measured) are highly involved in operating and managing the PMS as an organizational technology. Transparency and flexibility imply that the performance measures are understandable to employees, something they have hands-on experience with, and something they can influence to make it workable for them. These ideas will be developed further in the following section.

A developmental approach to PMS

The company embarked on a developmental approach, which aims to utilize existing experience with qualitatively

capturing operational performance, and to engage employees in the design and implementation of the PMS. We will first describe an example of inventory performance measures, which gives a good impression of the developmental approach. Then we will describe this approach on the basis of five principles.

Example: inventory management

This example represents the situation several years after the start of the project and it concerns inventory performance measures. One of the inventory planners in the Materials Management is responsible for several performance measures concerning inventory levels. He considers it important that he is intimately involved in the development of these measures, and that he himself maintains and reports these every month. "If a monthly report is presented by the financial department and they indicate problems, you are still inclined to become defensive. Now we don't only look at what's causing the problems, but also what are the consequences and what can we do about these. Some measures we can influence ourselves as the central warehouse, and other measures we will discuss with other people, because the processes are transparent."

The Business Warehouse module of SAP makes working with performance measures easy. Before this system was available and effectively utilized, the inventory planner used macros in Excel to download the required data from SAP. This could require up to 45 min for a single measure, the technical specifications of Excel (the maximum number of rows) became a limitation, and it was susceptible to errors. "Performance measures should be a help and not cause extra work" according to this planner, so information technology is important. Also, better measurements stimulate more effective inventory management through better cooperation between Material Management (Logistics), the Bottling department (Production), and suppliers of packaging materials. "With the performance measures, I can indicate what is the performance of other departments or of suppliers. Before, I would for example see that of some materials there was quite a lot of old inventory in the warehouse. When I would discuss this, people raised questions such as 'how much is, and what is sitting there exactly' which I then needed to sort out. Analyzing incidentally takes much more time, and now the groundwork has already been done. By measuring continuously, it is much better possible to discuss issues with people who can do something about it."

The latest development is that suppliers' inventories for some packaging materials are now included in the inventory performance measures. Grolsch does not own supplier inventories, but packaging materials are usually specific to Grolsch. Suppliers provide inventory information, but it was not structured in a way that allowed including these data in the inventory performance measures. The inventory planner has worked with the suppliers on the availability of inventory information, and inventory performance measures now also cover these supplier inventories.

How was such a positive attitude towards performance measures achieved? The developmental approach that emerged through this study is based on the following prin-

ciples: (1) experienced-based, (2) allowing experimentation, (3) building on employees' professionalism, (4) transparency and employee ownership, and (5) outside facilitators.

(1) Experienced-based

This involves the identification, appreciation, documentation, evaluation, and consolidation of existing local knowledge and experience with respect to quantitatively capturing and reporting relevant aspects of performance. Organizational change processes that utilize and build on existing, local knowledge are more likely to lead to sustainable changes and improvements (Abrahamson, 2000; Zollo and Winter, 2002). Such processes involve the reconfiguration of existing practices and systems that are successfully in-use elsewhere in the organization, rather the creation of new practices and systems (Abrahamson, 2000). Building organizational capabilities requires adaptation of work processes, reflection upon experiences, and codification of knowledge gained: experience accumulation (Zollo and Winter, 2002). In a study of R&D performance, West and Jansiti (2003) found that retention of knowledge as accumulation of experience, and new knowledge generated through experimentation, were significantly correlated with performance, while factors such as commitment and organization were not. Similarly in the context of this study, building on existing measurement experience is important for the development of enabling PMS. Lohman et al. (2004) present a case study of the development of a performance measurement system in the European supply chain organization of a large company, which also illustrates the importance of understanding existing, "unofficial" performance metrics and reports in great detail.

At the start of new performance measurement initiatives at Grolsch, the first step was to identify existing experiences with performance measures. Such informal measures typically have been developed locally, using local data and information systems. These measures would be quite particular to the specific conditions and processes within a certain area of the Logistics department. The Controller's office may or may not have had a role in developing these, and may or may not be aware of their existence. New measures would only be developed after understanding and re-using as much as possible from the measures that were already in place. This understanding related to: the precise *definitions* of existing measures, the *rationales* behind these existing measures, the *data* that are used for these, the *limitations* that people experience with the existing measures, current *ideas* that people can explain (or may even be working on) for improving the existing measures, and ongoing or expected changes of *information systems* that could impact the PMS. Understanding these issues was a starting point that informed the development of new measures for the PMS.

(2) Experimentation

This involves the first development of a new performance measure and subsequently allowing time to test and refine (in several rounds) its conceptualization, definition, re-

quired data and IT tools, and presentation, together with employees (whose performance is going to be measured), to arrive at a measure that is a valid, useful, and understandable indicator of performance in a specific local context. Experimentation refers to trial-and-error cycles that repeatedly generate and test design alternatives (Thomke, 1998), and experimentation is important for the effectiveness of firms' innovation processes (Thomke et al., 1998; Tidd and Bodley, 2002; West and Lansiti, 2003). In a similar way, first versions of a new performance measure are considered "prototypes", which are used to explicate functional knowledge in different domains, and which become the focal point for evaluation, discussion, and innovation from different functional perspectives (D'Adderio, 2001; Levina and Vaast, 2005).

The development of valid, reliable, and understandable performance measures is not trivial, and that is why using existing experience and allowing experimentation with new measures is important. A performance measure is a translation of a notion of performance into a number that can be calculated with available data. Yet, the question remains: does the performance measure really capture what it is intended to measure (Ittner and Larcker, 2003)? Data are required, but these may be not available at all, or not at the right level of detail, or not with the required accuracy, or not quickly enough, not consistent across different customers or products, etc. A performance measure should not be affected by outside events that add noise and mask the real performance of processes in Logistics. And the causal linkages among performance measures and towards value should be clear, so managers understand which actions to take for improving performance. The set of performance measures needs to reflect the different dimensions of performance linked to the supply chain, such as quality, time, cost, and flexibility—leaving one of the performance dimensions out would jeopardize the conclusions that can be extracted from the measurement system (Lillis, 2002). And determining difficult but realistic targets for detailed performance measures is complicated and sometimes even unwelcome: with separate targets for each specific measure, local managers have fewer opportunities to make trade-offs. The advantage of aggregate measures is that it allows local managers to make trade-offs among all available actions, and maybe they know best how to make such trade-offs (Abernethy et al., 2004; Moers, 2006). In sum, issues of validity, reliability, noise, causality, completeness, and interdependency are at stake.

Given the difficulty of formulating new metrics, these are not likely "right" at once, and the purpose of experimentation is to increase the validity of performance measures. Development activities are carried out iteratively rather than linearly: "work-in-progress" versions of new performance measures "under construction" can be used as "prototypes", which can stimulate the exchange of knowledge among different employees involved (Carlile, 2002, 2004). Experimentation facilitates cross-functional cooperation: People from finance and accounting obtain an in-depth understanding of the operational processes the PMS are supposed to capture and of the operational information systems and data. The operational managers understand more about financial data and information systems and how these can be used to translate the perfor-

mance of operational processes into quantitative performance numbers.

Development activities that we also observed in the case study at Grolsch included conceptualizing of the definition, scope, etc. of a performance measure; identifying available data in the company for determining the actual values of this performance measure; establishing procedures for tracking new data required for the metric; building information systems for reporting performance measurement results; setting performance level targets for a performance measure; and further reviewing, revising and refining both single measures and the overall PMS. The latter activity of experimentation was important: going back to the conceptualization, scope, data, tables, graphs, etc., and tinkering with these.

(3) Professionalism

The utilization of existing experiences and the experimentation with new measures build on a high level of professionalism of employees, at all levels in the organization. Specialized knowledge and expertise are often seen as the characteristics that separate professionals from others (e.g., Gold et al., 2003). Yet, this does not have to be limited to the "traditional" areas of professionalism, such as law or medicine. Adler and Borys (1996) consider "a professional orientation toward the performance of duties" (p. 76) as an important prerequisite for adaptive development. They mean here "the emergence of practices that solve incipient operational problems, practices developed by employees in the course of their work that were not deliberately instituted by superiors" (p. 76). Employees who are more inclined to improve their work practices and work environment are more likely to see performance measures as positive, stimulating, and helpful. For example, Caldwell et al. (2004) found that employees' "Mastery" motivational orientation (i.e., individuals' efforts of personal development by focusing cognitive resources on continued task improvement) predict satisfaction with organizational change. We therefore expect that those employees, who are inclined to improve their daily work tasks with the help of professional values and norms, are more likely to see PMS as a positive development—especially so if these employees are actively involved in the PMS formalization process itself. These employees are more likely to already have some experience with informal performance measures, and they can be made enthusiastic about developing new measures. Professionalism makes it possible to rely on experience and to conduct experiments within a PMS development process.

Indeed, the company is recognized for its professionalism by winning a prestigious national prize in the retail beverages category. In this annual contest, supermarket chains assess their 90 largest suppliers in terms of three criteria: account management (the quality of the sales team), trade marketing (the quality of the sales support for the supermarkets) and supply chain management (the quality of the logistical processes). For these criteria, the company won the highest prize of all suppliers in 2003 and of all beverage suppliers (water, soft drinks, beer, wine and spirits) for several years in succession (2004, 2005, and 2nd prize in 2006).

Results of the surveys among employees in Logistics provide further indications of the crucial role of professionalism. Between the first and fourth survey, employees' "Attitude towards performance measures" and "Professionalism" both increased significantly. Also, the level of "Professionalism" was strongly associated with the "Attitude towards performance measures". Moreover, there is support for a *causal* relationship from a higher level of professionalism to a more positive attitude towards performance measures: we estimated a number of alternative regression models with "Attitude towards performance measures" in the fourth survey as the dependent variable and "Professionalism" in the third survey as one of the independent variables, and in each model the coefficient for this variable was large and statistically significant. These results are reported in [W and B \(2007\)](#).

(4) Transparency and employee ownership

Transparency and employee ownership are also key elements of the developmental approach. Transparency means that users have a good understanding of the logic of a system's internal function and of the underlying rationale for why certain control mechanisms are in place ([Adler and Borys, 1996](#)). Transparent controls are designed to afford employees an understanding of where their own tasks fit into the whole context within which they conduct their work ([Adler and Borys, 1996](#)). One of the most effective ways for creating transparency of PMS could be to have a situation in which employees whose performance is measured produce the measures themselves rather than the controlling department. And this is what we mean by employee ownership here. At Grolsch, performance measures were not owned by, nor understood solely by the technical specialists in the Finance and Accounting department. Instead, employees had been an integral part of the development of the measures from the outset, and they were in some cases managing the system after its implementation and producing the reports. The Director of Logistics and his team wanted the employees rather than the controllers to be responsible for reporting performance. "If people are not going to take the effort to do the measurements and make the reports, it probably means it's not essential to do them." Whether new measures would actually be implemented was considered a kind of relevance test. Where needed, the operational managers obtained further training with spreadsheets, SAP BW, or other IT tools.

(5) External facilitation

Finally, university researchers and students provided external facilitation. An outsider can be instrumental to unearth existing experiences and to help people expressing new ideas. But the facilitator is not just "taking notes". The facilitator also brings the ideas of employees to a next level: the facilitator knows about utilizing information systems and tools, can find data in the organization's information systems, makes prototypes of concrete measures, and gently brings fresh ideas to the table. The facilitator needs to be an expert on PMS design, but this expertise is for the most part used to ask questions, to clarify, to compare and

challenge ideas, to sometimes make suggestions, to build things, and to ask for feedback. The facilitator/expert is not there to "Design and Implement" nor to deliver a "turnkey PMS". It is unlikely that consultants can achieve this facilitator role. Their fees are most likely too high for spending the time with employees required for the detailed documentation of existing practices and experimentation with new practices. And their high fees may typically create expectations of expertise, rather than of facilitation.

Over a 4-year period, the researchers and the research assistants provided many ideas and did a lot of work to manage and further develop the company's PMS, as explained above. Note, however, that the interaction was geared towards supporting the previously mentioned characteristics of the developmental approach that centers on employee involvement—it was not to mimic consultants. The Logistics' Director and the managers in his team consider that the development process had benefited from the stimulating and challenging interaction with outsiders—researchers and students in this case. This facilitation constitutes an example of the kind of joint discovery and learning that [Van de Ven and Johnson \(2006\)](#) talk about, as discussed above in the section on the research method. People in the company are considered active partners in the research process—not passive "study objects"—and faculty, students, and practitioners collaborate to achieve and to understand certain phenomena in a practical context.

Example: performance measures for internal transportation

Now we will describe an example of performance measures for internal transportation, and this serves several purposes. It illustrates the principles discussed above, and we include references to those five principles in the text below. It gives a concrete impression of the kinds of performance measures developed in the course of the study. And it demonstrates the relevance of the characteristics of a developmental process argued above: a lot of detailed knowledge is involved in developing the new measures, and the development of new measures is closely tied to specific operational characteristics—developing enabling operational performance measures is not trivial. In fact, the example may come across as overly detailed for a paper in this journal. Well, that is exactly the point—developing enabling PMS at the operational level is an intricate process, maybe more so that typically reflected in studies of PMS design and implementation that take the top-management perspective.

One of the metrics concerns the efficiency in the finished goods warehouse. This department transports goods from the production area to the warehouse and (un)loads delivery trucks. The workload for these activities is unevenly spread throughout the day. For managing efficiency it is important to plan the appropriate number of forklift-truck drivers per shift, to make sure that they carry out the work quickly, and to perform certain preparatory activities during idle time. A new performance measure was needed to capture efficiency. Based on existing ideas within the department and the controllers' office, and on discussions with employees in the transportation department (1), the performance

measure is defined as “the number of transportation activities carried out per labor hour”. For example, one transportation activity could be to pick up a pallet from the automatic conveyer belt and bring it to a particular location in the warehouse. A research assistant worked with people in the Internal Transportation department to facilitate the development of this new performance measure (as indicated in Table 1) (5).

Measuring the number of transportation activities is feasible, because almost all movements are issued by the warehouse management system to terminals on the forklift trucks. Measuring the number of labor hours spent is also possible using the warehouse management system, and so the ratio of the two can be calculated. However, not all activities that need to be carried out are issued by the warehouse management system. For example: particular types of pallets need to be rotated 90° before they can be transported; the forklift-truck drivers sometimes need to move lorries for loading and unloading; containers for international destinations need to be closed and sealed. An initial list of more than 30 of such side activities was prepared and a copy was given to each forklift-truck driver to estimate the time spent on these activities, and to add new activities to the list. This led to the final list of side activities and an estimation of the workload for these. The professionalism of these employees was mobilized in the process (3).

After implementation of the initial version of the performance measure, weekly evaluations were conducted with the department’s manager and shift leaders, and this led to further adjustments based on working with the new measure in practice. For example, for some side activities it was decided not to estimate the amount of work involved every week, but rather include a more general estimation; adjustments were made to the format of chart; the term “overcapacity” was replaced by “theoretical utilization” and the

chart’s original label “Efficiency of Internal Transportation and Warehousing” was changed to “Number of Transportation Activities per Labor Hour in Full Products Warehouse”. The experimental nature of developing and refining the new measure is clearly recognizable (2).

One of the shift supervisors of the department makes a report in Excel every week, shown in Fig. 1, and he downloads data from the ERP system using SAP (4). He considers this a very useful performance measure and comments that “everybody is watching the number of transportation activities per labor hour”, and he is also positive about the department’s other performance measures. It is important that he has been intimately involved in the development of these measures, and that he, rather than the finance department, prepares the weekly and monthly reports. “When a performance measurement report is completely delivered by the finance department, there is more distrust. Now we ask ‘how can this be, what’s causing it’ when there are deviations.” These are “their” measures. Furthermore, deviations of the actual outcomes are often understandable. “For example, because it was very busy and the workload was nicely spread over the day, and that shows in the number of transportation activities per labor hour. And if we are wide of the mark on a particular day and we have, for example, only 38 transportation activities per labor hour, it can also be explained. We may, for example, have planned too many people during a shift, or problems occurred in the production department [so the transportation workload is less], or the planned loading of containers [for international shipments] was cancelled.”

Results for Grolsch

The approach has yielded a number of valuable results for Grolsch, which we discuss below. We also discuss a number

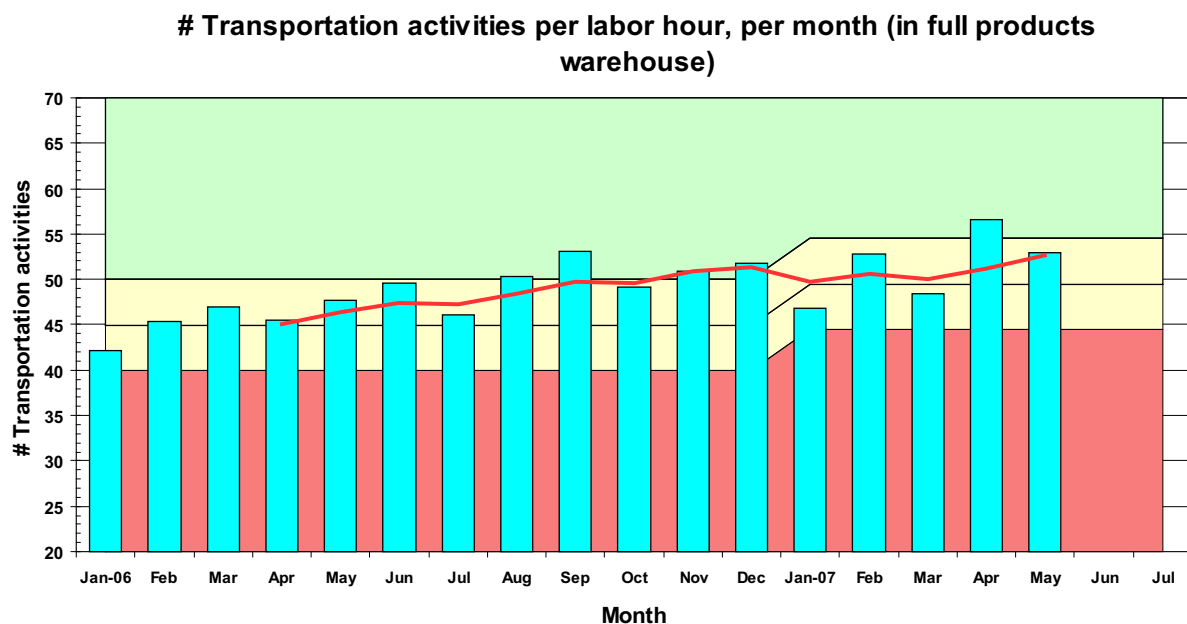


Figure 1 Graphical representation of actual results regarding the performance measure on the number of transportation activities performed per labor our, per month, in the warehouse for full products. The term “full products” is used to distinguish this from the warehouse that handles the goods flow of empty, used packaging materials (bottles and crates) for re-use.

of reasons why this approach was successful in the context of Grolsch. It is not an easy approach, so a number of contextual conditions are decisive for developing PMS in this way.

(1) It has resulted in an extended and “thorough” *set of metrics*, which is what the company intended to achieve. Currently, the PMS is much more extensive compared to 2003. The scorecard for the business team Supply Chain (which is now of combination of Production and Logistics) contains 13 performance measures, and departments within Logistics use more detailed scorecards: Material Management uses 12 metrics, Physical Distribution uses 33 metrics across four different scorecards, and Purchasing uses 2 metrics. Even more detailed measures are used by supervisors and shift leaders in these departments.

The use of performance measures is dynamic: for example, Grolsch used a set of indicators in Physical Distribution to monitor the introduction of a new type of bottle (and the phasing-out of the old bottle), which had considerable implications for managing the goods flow of returning bottles (for re-use). Physical Distribution in Logistics worked together with the account managers in the Sales department, and these account managers discussed with their accounts (i.e., large retail customers) how returning bottles could be handled to avoid mistaken bottles as much as possible. A temporary scorecard was created by the Physical Distribution department, which helped jointly solving the operational issues. This scorecard showed overall and per customer the composition of the return flow (percentages of the new type of bottle and the old type of bottle) and the level of mistaken bottles (so an old type of crate that contains some new bottles, or a new type of crate containing some old bottles). These performance measures were abolished after completing this packaging introduction.

(2) A second benefit of the developmental approach is that it contributes to employees’ beliefs in the PMS and their commitment to *performance improvement*. Achieving performance improvement through the introduction of contextually appropriate PMS is difficult and certainly not automatic (Soltani et al., 2005). Employee involvement in PMS formalization is essential for the enabling nature of PMS, as employees are then enabled to learn and improve their work situation because of gained experience with PMS (Chenhall, 2005; Haas and Algera, 2002). The extent of performance-measurement practices initiated by employees, the interview data, and the survey results show a positive reception of performance measures by employees. We also refer to W and W (2008) and W and B (2007) for more empirical results supporting this.

(3) A third result is that the developmental approach contributed to *organizational learning* about performance measurement. As explained above, employees in operations have been an integral part of the development of the measures and are often producing the reports. This reduced dependency on specialized resources for PMS development and maintenance. For example, in March 2005 middle managers in Logistics discussed the need for more specialized support for PMS development, such as from IT specialists and the controller’s office. But one of these managers commented: “But these practical issues have never stopped us from going forward with implementing performance measures. And if you look at our performance measures in

Physical Distribution, we designed and implemented these almost completely by ourselves.”

Why was the developmental approach effective at Grolsch? The developmental approach seems to have a need to root on solid ground, because this approach is demanding on employees, senior management, and support functions. At Grolsch, a number of contextual elements might have been decisive in the possibility of developing PMS in this way. First, the Director of Logistics had a clear view on why he wanted to expand the department’s PMS, which he clearly communicated: the PMS was to support people in their work. The enabling nature (although this word was not used) had priority and should not be confused with information for control and accountability. He also promoted that people would become responsible for reporting their own information, and he expected the Controller’s office to help employees in Logistics. Second, time and local autonomy were available to experiment. There was not a fixed timeline specifying when the PMS needed to be “ready”, and there was an understanding that introducing new measures in this developmental way would take time. There were no corporate guidelines or specific rules limiting the kinds of new measures being developed. This all helped to free up creativity and to motivate people to come up with their own ideas and to get to work with these. Third, one member of the management team of the Logistics Department acted as a “champion” on this project. She was professionally enthusiastic about this topic (believed in it), promoted the project among colleagues in the Logistics Department, thought about next steps, worked with the researchers, etc. And based on this study, she was shortlisted to become Logistics Manager of the year 2007 in the Netherlands. Fourth, there was a high level of professionalism in the organization, and a number of individual employees quickly got enthusiastic about it, and they were important to move forward and set examples. The champion and these employees were also involved in writing and presenting about this project for their fellow professionals in the field of logistics. And finally, the availability of modern IT support was helpful and important. The company has an up-to-date SAP system and a tool that enabled analysis of the SAP data, called Business Warehouse.

Conclusions

“Finally, metrics exist as tools for people” (Melnyk et al., 2004). We discussed a developmental approach to design and implement a performance measurement system, based on a case study of the Logistics department of Grolsch. The key objective was to have a PMS that was not only intended for top management of Logistics, but one that employees at all levels would find helpful in their work and enabling to achieve performance improvement. This goes far beyond a high-level scorecard. From the perspective of top management, it may be sufficient to state in more general terms which high-level objectives should be reflected in the PMS through measures concerning efficiency, innovation, quality, customer satisfaction, employee learning, etc. These are perhaps the usual suspects and not so surprising. However, in this study the contribution of the Logistics department to the company’s strategy was quite clear at the

outset. The real challenge was to make this contribution more tangible and measurable at lower levels in the organization, to provide a more concrete direction for action, to convince employees of the importance of performance measurement, and to increase their commitment for performance improvement using measures. The challenge simply did not lie in the early steps, such as focusing on defining the firm's strategic objectives, defining each functional area's role in achieving the various strategic objectives, and developing global performance measures capable of defining the firm's overall competitive position. This setting may resemble the PMS challenge in operational departments in many other organizations as well.

The experiences from this project clearly point to the importance of involving employees in the development of performance measures, for several reasons. Firstly, to use existing intellectual capital (Zollo and Winter, 2002): knowledge pertaining to specific existing practices for the quantitative measurement of operational performance. The company invested in the identification, appreciation, documentation, evaluation, and consolidation of existing local knowledge and experience with respect to quantitatively capturing and reporting relevant aspects of performance. Secondly, employees are involved in the development of new metrics through a process of prototyping and experimentation (Carlile, 2002, 2004). Measures need to reflect specific operational characteristics and are not "right" the first time, so flexibility of the system is important rather than "fixing" the system. After the initial development of a new measure, the firm allowed for the subsequent testing and refinement (in several rounds) of its conceptualization, definition, required data, IT tools, and presentation, together with employees, to arrive at a measure that is a valid, useful, and understandable indicator of performance in a specific local context (The Devil is in the Detail). Thirdly, this project demonstrates that it can be useful to involve employees by providing them with ownership: employees were responsible for periodically reporting on the new metrics. Compared to a situation in which the Finance department would provide performance reports to employees and in which defensive behavior is more likely, now employees were stimulated to investigate the reasons for good or bad performance, to look at the causes and to investigate improvement opportunities.

This study provides a number of contributions. The findings help to better understand the principles that foster the creation of *enabling PMS*: (1) experienced-based, (2) allowing experimentation, (3) building on employees' professionalism, (4) transparency and employee ownership, and (5) outside facilitators. Furthermore, we brought together a number of different perspectives on PMS, from operations management, organizational studies, and accounting. And finally, we provide a number of managerial implications:

- *Senior management* needs to have a clear vision and communicate their objective for developing a PMS: is it to monitor and report upwardly in the hierarchy, or is it also (or even primarily) intended to support lower-level employees in their work? Senior management also needs to behave in accordance with an enabling PMS: balancing

between recognizing the incompleteness of the PMS (so there is a story next to measured outcomes) and demanding certain performance.

- A *developmental approach* can be followed if the objective is to have an enabling PMS. This approach is discussed in detail in this paper.
- *Resources and rewards* are needed to facilitate a developmental approach, such as time to work on it, and bestowing prestige upon PMS developers. Support from experts (IT specialists, accounting) and the availability of IT tools with which non-specialists can work (such as SAP Business Warehouse) are prerequisites. And the development process may benefit from the stimulating and challenging interaction with outsiders, such as researchers and students.
- *Time and local autonomy* are needed to really understand in detail what is already in place, and to evaluate what will be re-used and what not. Time and local autonomy are also needed to not "fix" the PMS too soon (for example, because senior management wants to start monitoring things longitudinally), so there are still degrees of freedom for making adjustments to local conditions, to improve the validity, usefulness and understandability of the PMS. At the same time, coordination with central PM initiatives is required.

The developmental approach may not be equally relevant to every organization:

- A developmental approach may not be particularly relevant when the objective is *not* to introduce an enabling PMS that is intended for different levels of employees, but when a PMS is implemented only for top management, or to make and monitor agreements with customers and suppliers.
- In some organizations PMS may be well developed and stable, so emphasis on experimentation and further development by employees may not be required.
- A developmental approach to shape the PMS may be less relevant if operations managers have other kinds of information that are more informative than performance measures, such as direct observations of processes.

As with any study, there are limitations which may provide suggestions for further research. Although the study is based on a multitude of observations, it is based on a single case study. Results may be difficult to generalize to other empirical settings, also because the researchers have not only been neutral observers; they were also involved in helping to expand and refine the PMS. However, the advantage of this approach is that interactions with members of the organization were always lively, detailed, and involved. Our ideas were critically challenged, because ideas pertained to "their" PMS and the development and actual usage of it. These interactions were not discussions about abstract ideas in the interest of the researchers' project or theory. Rather they dealt with what made sense to organizational members in the context and language of their own work. This type of interaction may help increasing the validity of the conclusions (Van de Ven and Johnson, 2006).

Future research could try to better understand the reasons why and conditions under which a developmental PMS approach is most feasible and effective. We could further explore the theoretical linkages between this approach and theories on organizational behavior and psychology. Why is a developmental approach sometimes effective? How does it work through factors such as motivation, leadership styles, and a better understanding (cognition) of effective actions? Which factors moderate the effectiveness of the approach? Furthermore, investigating the benefits to the organization (such as employee learning, or financial benefits), as well as assessing other consequences of a developmental approach is an intriguing line of future research.

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