Performance Measurement for Supply Management

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Abstract. Purchasing and Supply Management (PSM) has experienced substantial change during the last decades, and turned from a clerical into a strategic function. Simultaneously, the scope of responsibility has broadened and there are no indications that the progress will come to a halt soon. While the PSM function has changed, so has the business environment. New challenges include securing current and future supply, safeguarding organizations from reputational damage due to unethical conduct in the supply chain, and optimizing working capital in order to maintain liquidity. Yet, PSM's performance is still largely assessed and reported based on cost savings despite the fact that some literature suggests that managers prefer to rely on non-financial controls in situations of high environmental uncertainty. This discrepancy raises a fundamental question and provides the core of this paper: What type of information concerning PSM's performance do high-level executives and top management actually require? Based on an in-depth case study and by drawing information processing theory, we propose that a more future-oriented approach towards performance measurement is necessary to meet internal stakeholders' demands.

Introduction. Purchasing and Supply Management (PSM) has experienced substantial change during the last decades; from a predominantly clerical and operational function, it has evolved into a tactical and strategic function. The scope of responsibility has broadened and this progression will unlikely come to a halt in the near future. Instead, the "importance of strategies in purchasing will further increase" (Wagner and Kaufmann, 2004) and purchasing will become an important source of sustainable competitive advantage (Carter, Kale and Grimm, 2000). Still, PSM professionals "often complain of a lack of recognition by senior management" (Bales and Fearon, 1993, p. 6) and Ferguson et al. (1996) conclude, "purchasing management must continually recognize the strengths of the function and market those strengths to upper management". Various approaches to address these challenges have been undertaken, often resulting in highly complex, barely manageable measurement and reporting systems (e.g. Nollet et al., 2008); in fact, ''[…] it is possible to argue that in many companies we suffer not from too few measurements but from too many, and those that we have are frequently of the wrong sort.'' (Syson, 1995, p. 25). Thus, it can be stated that PSM managers are still struggling to prove their contribution to the organization's bottom-line and to become a strategic heavyweight (Miller, Hickson and Wilson, 2008).

The spate of information managers face and the growing complexity of the business environment coming along with increasing uncertainty has turned management of information into a decisive factor in achieving and maintaining a competitive edge (Tihanyi and Thomas, 2003; Hansen, 2002). Especially high-level executives are confronted with high-information processing demands in a variety of situations because of the ambiguity of environmental factors (Ungson, Braunstein and Hall, 1981). So far however, little research has focused on the sources of the information processing needs (Tihanyi and Thomas, 2003).

Given the increasing environmental complexity, growing competition, technological advancements, and increased demands for more sustainable business practices, the prevalence of savings measurement (Harwood and Humby, 2008) as the dominant base for performance assessment of PSM needs to be questioned. Following the finding of Gordon and Narayan (1984, p. 37) that "as

decision makers perceive greater environmental uncertainty, they tended to seek external, non-financial and ex-ante information in addition to other types of information", savings-based PSM performance measurement will not contribute to the reduction of uncertainty and is thus of little relevance to decision makers. Purchasing scholars have long acknowledged the absence of appropriate measures and have called for more advanced, formalized measurement and evaluation systems Monczka, Trent and Callahan, 1993. Still, as recent studies suggest (e.g. Harwood and Humby, 2008), little has changed in practice and adherence to traditional, i.e. finance-focused and history-oriented, performance measures is increasingly recognized as an obstacle to the advancements of organizations in general and towards sustainability in particular (Pagell and Wu, 2009).

Having touched upon the limitations of traditional PSM performance measurement and the long-established call for new approaches the inevitable question arises: what hinders the performance measurement evolution in PSM? Although numerous frameworks regarding performance measurement in general and for PSM in particular have evolved, little empirical work addresses the two fundamental questions that needs to be answered prior the development of performance measurement systems (Lebas, 1995): (1) Why is performance measured? (2) What is to be measured?

This paper intends to address this void in PSM literature, in particular with regard to the often expressed lack of top management attention. The underlying line of reasoning is as follows: savings-based performance measurement in PSM cannot support decision makers in situations of high uncertainty (i.e. when information processing demand is high) e.g. induced by unforeseen occurrences or during planning processes (Rogers and Bamford, 2002; Hoque, 2004). Thus, PSM performance measurement in its current status is of little relevance to high-level executives. According to organizational information processing theory such irrelevant information is filtered in order to prevent information-overflow on higher hierarchical levels, where information processing capacity is limited (Egelhoff, 1991). Consequently, it should be in the interest of PSM managers to know, what kind of PSM performance information actually reduces uncertainty of decision-makers and will thus increase their awareness for the PSM function. Furthermore, from an organizational point of view, how should information processing capacity be utilized in order to meet information processing demand? Hence, the following two research questions guide our work:

(1)What information concerning PSM performance do executives and top management require?
(2) Which factors influence the information demand of top management?

Based on an in-depth case study at a German multi-national company (MNC), the demand for PSM performance information by executives and top management is analyzed and discussed from an information processing perspective. The remainder of this paper is organized as follows: Relevant literature is briefly reviewed and the methodological approach is introduced. The main findings of the case analyses are presented, discussed and interpreted in comparison to existing literature, before limitations and suggestions for further research are presented.

Literature Review. *Performance Measurement* Performance Measurement has been extensively studied for a long time (Holden, Fish and Smith, 1941; Johnson, 1972; Johnson, 1975; Chandler, 1962; Kaplan, 1984. It experienced substantial changes during the late 1970s and early 1980s when numerous frameworks for performance measurement originated due to a state of dissatisfaction with the prevailing retrospective, financial measures at the time Bourne et al., 2000. In the subsequent decade, frameworks evolved, which were more balanced and considered also non-financial and more foresighted measures (Guerny, Guiriec and Lavergne, 1984; Lynch and Cross, 1991; Epstein and Manzoni, 1998; Kaplan and Norton, 1992; Kaplan and Norton, 1993). In view of the increasing

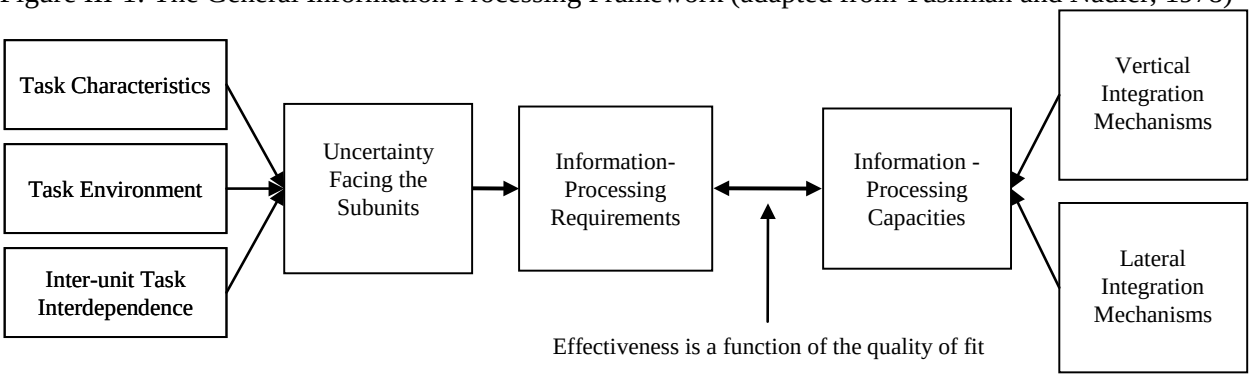
works on performance management in general management literature, Neely (Neely et al., 1995) even talked about a Performance Measurement Revolution. However, definitions of the term 'performance measurement' are still scarce and ambiguous (Neely et al., 1995; Lebas, 1995). According to Lebas (1995), managers and performance evaluators have to answer two fundamental questions: (1) Why do we want to measure? (2) What do we want to measure? According to normative literature, performance measurement may serve various purposes (Lebas, 1995; Schmitz and Platts, 2004): as a form of vertical communication, to support decision making and prioritizing, as a source of motivation, and to provide management information. Accordingly, measures need to be adopted for discrete users and the distinct purposes.

The scientific contributions in the field of PSM performance measurement are manifold and parallel, to a certain extent, those of general performance measurement. The need for discrete research in this area was expressed at the beginning of the twentieth century by Lewis (Lewis, 1933; Lewis, 1936). Since then, driven by the "evolution of purchasing to a strategic activity" (Wagner and Kaufmann, 2004), numerous approaches toward PMS in this field have evolved (e.g. Paperman and Shell, 1977; Dobson and Shorrock, 1980; Easton, Murphy and Pearson, 2002; Wagner and Kaufmann, 2004), also leading to ambiguous understandings of performance measurement. Unlike general management literature, literature on purchasing has not yet experienced a 'revolution' in performance measurement (Lardenoije, Van Raaij and Van Weele, 2005). While some studies focus on the measurement of supplier performance, others focus on the measurement of buyer performance or the performance of the entire purchasing function. Nevertheless, works are not limited to conceptual approaches. The impact of the implementation and use of PMS on company performance and employees were examined by various authors (Scott and Tiessen, 1999; Malina and Selto, 2001; Azofra, Prieto and Santidrián, 2003; Ahrens and Chapman, 2004; Raub, 2007; Wouters and Wilderon, 2007). Despite the variety of academic publications, the majority of PSM managers still base their assessment on long-established measures, such as savings (Harwood and Humby, 2008), which are popular but do not measure "the things that count in competition" (Monczka and Morgan, 1994). Roylance, 2006 highlights PSM managers' aspiration that their performance be recognized within the focal company but also indicates PSM's insufficient internal orientation. He further argues that an improved understanding of internal customers' requirements is necessary to better position PSM in the organization. We follow this notion and extend it to the specific field of performance measurement.

Information Processing Theory of Organizations. The information processing theory of organizations evolved among organizational researchers and is based on the assumption that information is the most critical contingency faced by modern organizations (Galbraith, 1973; Galbraith, 1977; Tushman and Nadler, 1977). Accordingly, organizations are built around information and information flows with the aim to reduce uncertainty. The theory emphasizes that a company's information processing demand (high quality and comprehensive information on performance for decision makers) Rogers, Miller and Judge, 1999 must appropriately fit information processing capacity (means of providing sound and comprehensive information on performance) in order to operate effectively (Galbraith, 1974; Egelhoff, 1991).

The idea of 'fit' between the organization's characteristics and its context originates in contingency theory (Burns and Stalker, 1961; Lawrence and Lorsch, 1967) as a prerequisite for effectiveness and has been adapted by information processing scholars (Galbraith, 1973; Galbraith, 1977; Tushman and Nadler, 1977; Egelhoff, 1982; Egelhoff, 1988). By viewing companies as information-processing systems, the grounding assumption is that companies, in order to operate effectively, need to establish a fit between information-processing requirements and information-processing capacity, as depicted in Figure III-1.

Figure III-1: The General Information Processing Framework (adapted from Tushman and Nadler, 1978)



Uncertainty is one of the key elements of IPT and is defined as "the difference between information possessed and information required to complete a task" (Tushman and Nadler, 1977). Companies face uncertainty originating from various internal and external sources (environmental conditions). The greater the level of task uncertainty, the greater is the demand for information processing during task-execution. However, information processing capacity is a restricted resource and its allocation depends on the features of organizational design, e.g. centralization, leadership-style, and formalization (Tushman and Nadler, 1977).

Galbraith (1973, 1977, 2000) proposes that organizations must adopt at least one of four information processing designs in order to improve performance: (1) manage the environment, or the modification of organizations' environment or organizations' response to the environment with the aim to reduce uncertainty. For example, organizations may choose to establish alliances and partnerships, increase efficiency of internal processes, or increase their knowledge about their customers; (2) create self-contained tasks in order to reduce the information-processing requirement at top hierarchical levels of organizations. Thereby, the decision-making authority is moved to lower hierarchical levels. In practical terms, this would include a shift from a functional structure to a divisional structure.; (3) invest in vertical information systems, to enhance the speed and amount of information transferred to top-level planners and decision makers without overloading the hierarchical communication channels. Consequently, organizations may increase the frequency of planning procedures in order to respond timely to increasing environmental uncertainty, ultimately leading to decreased decision-making time and increased effectiveness; or (4) create lateral relations to increase the information processing capacity as they bypass traditional lines of authority and deliver information directly to the place of information demand, i.e. place of decision-making. Similar to the creation of self-contained units, this design choice prevents information overload at the top hierarchical levels and enhances the flexibility to deal with uncertainty.
While the former two are considered to reduce the need for information processing, the latter two increase the organization's capacity to acquire and process information. According to Galbraith, organizations need to increase the amount of slack resources to prevent information overload of decision makers, unless they implement at least one of the design choices.

The Case Study of a Pharmaceutical and Chemical Company. An inductive case study approach was selected in order to explore the information demand of executives and top management concerning supply management's performance. This approach appeared to be adequate for the following reasons: (1) case study research is well suited for investigating complex phenomena, which cannot be illuminated by, for example, surveys alone since it allows the researcher to interact with the informant and to draw on multiple sources of information, leading to information-rich cases (Gerring, 2007, Yin, 2009); (2) the understanding of what constitutes PSM's performance diverges in literature and practice. Hence, clarification is required in order to account for content validity, which could be addressed best in the course of interviews; (3) collecting data from multiple sources allows

for triangulation, increasing internal validity. Our research approach is described best as theory elaboration (Lee, Mitchell and Sablynski, 1999) since the information processing theory of organizations affects our research design when studying the case's supply performance measurement.

(van Weele, 2007) indicates that a well-reasoned case selection is required in order to enhance the recognition of case study research in PSM. Dubois and Araujo, 2007 p. 16) even find that "case selection is the most important methodological decision". The purpose of this study is to identify the initial information demand of top management with respect to purchasing performance. As suggested by Nollet et al. (2008), performance measurement systems evolve in the course of time, beginning with rather straight-forward, hard savings-focused systems before becoming more complex and almost unrulable. Hence, we sought a company, where PSM performance measurement was at the beginning of the aforementioned development cycle in order to investigate the requirements unaffected by previous developments. However, finding information on the development status of performance measurement systems is not an easy task as such, and identifying companies with rather substandard systems is even more of a challenge because of social desirability bias. In the course of preliminary expert interviews with senior purchasing experts, it emerged that purchasing professionals of PhamChem[1] had recently approached their counterparts from various companies in order to identify ways of implementing a performance measurement system for PSM. We approached the PhamChem CPO with our intended research project. Support was granted on the condition that findings would be made available for internal use. Subsequently, the in-depth investigation took place at the headquarters of PhamChem, a large German chemical and pharmaceutical company with production facilities around the globe and more than 20,000 employees worldwide.

During the years prior to our investigation, PhamChem went through a major restructuring of its PSM function and introduced a hybrid lead-buyer organization. The portfolio of goods and services sourced was split into more than ten commodity groups, e.g., raw materials, travel services, packaging, logistic services, and clinical studies. Despite the restructuring efforts, PhamChem's CPO perceived the achievements of the PSM function to be undervalued by executives and top management. He identified the insufficient performance measurement system, and thus performance reporting, as the major hurdle that kept PSM's achievements from being distributed throughout the firm. The existing methods for savings calculation were considered insufficient to adequately present PSM performance to top management and other internal stakeholders.

Information for the case analysis was mainly collected from three sources: (1) semi-structured interviews, (2) regular follow-up interviews, and (3) internal documents related to the computation of savings and performance reporting. In sum, the multitude of sources, according to Yin (2009), provides a robust foundation for triangulation. The interviews with 20 executives and members of the board lasted between 30 to 45 minutes and were jointly conducted by the same interviewers. Except for two, the interviewees were ranked Vice President or higher and represented the major stakeholders of PSM based at the German headquarters, i.e. internal clients as well as representatives from Accounting and Controlling (see Table 1).
In order to obtain a better understanding of the current environment and preconditions, additional interviews were conducted with the CPO and the Vice President International Purchasing. Notes were taken during the interviews and further details were written by each author independently directly after the interviews. These observations were compared and supplemented or corrected if necessary. As a mean of addressing construct validity, a draft of the protocol was sent to each informant separately for confirmation purposes. In order to account for reliability, a record of the

[1] PhamChem is a fictitious name used for confidential reasons.

proceedings was kept, for example the dates of the interviews and information about interviewees, individual settings of each interview, and where and how archival data were collected. Inter-rater reliability was assessed according to the scheme presented by Pagell and Krause (2005). Furthermore, a case database stored individual notes, transcripts from the interviews, the questionnaires, and current performance reports (Gibbert, Ruigrok and Wicki, 2008; Yin, 2009). Secondary data, in the form of archival documents such as exemplary reporting grids, was taken into consideration to understand the current situation of performance reporting. Furthermore, a case database was compiled to store individual notes, transcripts from the interviews, the questionnaires, etc. (Gibbert, Ruigrok and Wicki, 2008; Yin, 2009).

Data Analysis. Data analysis was carried out in two major phases. The first phase consisted of an analysis of the responses of each individual interviewee. Individual profiles were developed to become familiar with the peculiarities of the individual function and needs. In the second phase, we sought to identify common patterns among the information given by the individual respondents. Tabular displays were used to identify differences and similarities among the individuals. The 20 informants were divided into three groups based on their primary function: (1) Accounting & Controlling, (2) Operations, (3) Others; the findings are presented accordingly. For each group, we elaborate on the respective stakeholders' perception of PSM's contribution and their primary information demand, before theoretical explanations based on information processing theory are presented. First, however, a brief overview on the status quo of PSM performance measurement at PhamChem is given.

Status Quo of PSM performance measurement

According to the retrieved reporting grids of the various commodity groups, and statements made by interviewees, the performance measurement system presented at the beginning of our investigation was informal and showed little stringency. Corporate-wide spend transparency was neither given nor available. Instead, database queries from various systems were necessary to yield approximations. Reports were issued regularly but only to a limited number of recipients. A variety of savings calculation methods were applied, based on period-to-period and quoted price comparison. However, these methods were explicitly tailored to certain commodity groups and required manual data gathering and calculation. None of the methods had ever been approved by the board and corporate standards were not established. Thus, a collective understanding of PSM's contribution to the organization's bottom-line did not exist and an aggregation of the performance to enable statements to be made regarding the overall performance was impossible. In addition to these already limited financial performance indicators, further qualitative or quantitative measures were not available.

Group 1 "Accounting and Controlling"

Due to its function, Accounting and Controlling (AC) was not a major internal client to PSM but was regarded to be a crucial stakeholder because of its role as process owner of reporting procedures and thus a major contributor do the design of information systems. Consequently, this department was considered the most knowledgeable source regarding the organizations' information demand because it linked the long-established performance measurement routines of other departments and divisions with PSM data. In general, the activities of AC were guided by the regulatory requirements for (external) accounting and the internal reporting scheme and schedule. Thus, the primary tasks were well predictable and posed little uncertainty during task execution. Yet, information processing requirements were high due to AC's function as a data consolidator and provider of information to management. Accordingly, informant 18 stated:

> "Controlling needs very detailed information. Usually they will be the first addressee and forward the processed information to the relevant recipients."

In order to handle the large amount of quantitative data, AC relied on comprehensive information systems and databases, partially enabling online data processing and on demand reporting. AC

considered PSM's greatest contribution to the business to be Supply Risk Management and ensuring the quality of products and services. The monetary contribution of PSM, i.e. savings or cost avoidance, was only considered to be of minor relevance. However, AC demanded information from PSM concerning the developments of quantity, price, and spend, based on an annual period-to-period comparison, in particular for recurring purchases. The AC informants made clear distinctions regarding reporting frequency and level of detail: an abridged monthly report, a more comprehensive quarterly report, and an exhaustive annual report were required prior the organizations' annual planning period.

Based on information processing theory of organizations, the findings can be interpreted as follows. Although task uncertainty of AC is low, information processing requirements are high due to its two-fold function as (1) a proxy for top management's information demand (due to high levels of environmental and task uncertainty), and (2) consolidator of company-wide quantitative, especially financial, data in order to meet regulatory requirements.

However, the uniformity of information demand would have allowed for the use of vertical information systems. Such vertical information systems enable high speed transportation of data to top level executives and strategic planners, but they are restricted to standardized, highly formalized data. Once in place, information can be processed automatically, allowing for frequent, i.e. even monthly or daily information input. Yet, these systems are complex and adaptations are costly, allowing for little flexibility once they are set up. These circumstances also explain the quantitative, financial focus of the information demand: The incorporation of other types of information would require either manual processing or the previously mentioned costly adaptations of the information system. Thus, the derived demand for information on PSM performance can be characterized as 'routine information processing' (Egelhoff, 1991) with low levels of uncertainty. The interdependence between AC and PSM resembles a single planning-cycle, since there is no feedback from AC to PSM. These 'pooled' interdependences are comparably less demanding (Thompson, Hamilton and Rust, 2005) and integration can be achieved rather easily. The necessary information processing requirements for the PSM function are well predictable and the information processing capacities can be well adapted to meet the requirements, and cause a good fit.

Group 2 "Operations"

Operations characteristically promotes the flow of production. The demand for commodities as a major input factor in the pharmaceutical and chemical industry is comparably stable. The products wer well-specified and purchases were predominantly re-buys. Accordingly, task uncertainty was relatively low, requiring little information processing capacity during task execution. However, purchasing volumes were high and products were highly critical since any interruption in supply might have posed severe consequences for the entire production facility. Moreover, the supply environment was subject to high price volatility. Price fluctuations on the commodity market pose opportunities and risks to PSM and Operations. In times of increasing prices, long-term contracts might provide a competitive edge; however, in times of decreasing prices, such contracts may impede competitiveness. Operation's informants agreed that PSM's monetary contribution was the most important for their business. Furthermore, Operations predominantly required less frequent, i.e. quarterly, performance reports on a Previous-to-Actual Year comparison regarding price and quantity developments. Ad-hoc reports were only requested for unforeseen changes (and reasons for the changes) affecting the most important or most valuable products. Accordingly, Informant 6 stated:

> *"Quarterly reporting is sufficient, except for deviations regarding our strategic products; then, information needs to be provided as soon as possible."*

Ad-hoc information was necessary, but not exclusively sufficient, in order to resolve the potential issues that arose as a consequence of the deviations. If, for example, a dramatic price increase

occurred on the commodity market, operations would rely on information provided by PSM in order to identify the cause-and-effect chain. Ex-post information on previous price developments was valuable to predict further developments. The unilateral flow of information became bilateral because decisions made by operations had to be immediately activated by PSM, commencing a feedback loop.

From an information processing perspective, the findings suggest the following: High product volumes and high risks increase the exposure to loss and enhance uncertainty. Hence, information on deviations, e.g. regarding security of supply, is of high importance and needs to be processed and forwarded immediately to the decision-makers. In the case of plan variance, information demand increases further, and previously routine information processing turns into reciprocal information processing. For the latter, a good fit can be achieved best by means of lateral relations, which provide the fastest way of transporting a limited amount of rich information, since hierarchical structures are circumvented. In contrast, information on the market environment and developing trends is important on a rather medium- to long-term perspective, for example, in order to identify new suppliers, and to determine the proper purchasing strategy. Thus, uncertainty concerning the future is existent but does not need to be resolved immediately, explaining the comparably long reporting intervals.

Group 3 "Others"

Although this group is made up of various departments such as Marketing, Environmental Health and Safety, and Corporate Information Systems, a number of communalities could be identified. First, one-time purchases related to rather complex, costly and highly customized projects were prevalent. Second, pro-active communication of PSM's contribution to business performance was demanded. Third, quarterly or even less frequent performance reporting was preferred, except in the event of unforeseen circumstance. Finally, a clear perception of the monetary contribution as the most important contribution to the business was observable. Despite the latter, there was noticeable ambiguity on how the contribution was achieved and subsequently on the actual information demand. For example, informant 16 stated:

> *"PSM should stop focussing on savings; they should provide transparency on their value added to the business."*

In a similar vein, informant 14 said:

> *"The advantages of CP involvement are not obvious and CP should improve its 'internal marketing'"*

Based on information processing theory of organizations, the findings can be interpreted as follows: The high degree of novelty among purchase transactions and the complexity of those projects induce high degrees of uncertainty, since experience and knowledge of the purchase are comparably low. Planning provides means of reducing uncertainty by anticipating various conditions and outcomes but requires comprehensive information prior task execution. However, once planned, little additional information is required during task execution. This is exemplified by (1) informants call for 'ad hoc' instead of frequent performance reports concerning the purchase of projects, and (2) their preference for plan-to-actual spend comparisons. Once the project has been initiated, only deviations from plan are of relevance for executives, since they may require immediate counter measures. Otherwise, the project is assumed to be on track and frequent information would unnecessarily overload information processing capacity.

The ambiguity concerning PSM impact on business performance can also be explained by the extensive planning efforts: during planning of one-time purchases, PSM and its internal client work closely together; their interdependency is of reciprocal character. According to information processing theory of organizations, this causes high levels of uncertainty. In practical terms, the contribution by the individual participants in this reciprocal process is hard to identify and would require extensive tracking of the sources and effects of every single amendment in the planning

phase. In turn, this would pose high information processing requirements, for example, by taking minutes of every single discussion and finally identifying the effects in monetary terms.

Summary and Conclusion. Based on an in-depth case study at the German pharmaceutical and chemical company 'PhemChem', we assessed contingencies of information demand and information processing requirements for PSM performance reporting, as well as measures to meet these requirements.

The findings indicate that the information demand varies according to the uniqueness of the purchasing situation. For this study, two conditions were distinguished: (1) straight/modified rebuy, and (2) new task. New tasks induce higher uncertainty since experience and knowledge related to the purchase are strictly limited. In the particular context of PhemChem, new tasks were predominantly related to more complex, one-time purchases, inducing high uncertainty. Planning provides a mean of reducing uncertainty by anticipating various conditions and outcomes but requires comprehensive information prior to task execution. However, once planned, little additional information is required during task execution. This is exemplified by two situations: (1) informants called for 'ad hoc' instead of frequent performance reports concerning the purchase of projects; and (2) informants preferred plan-to-actual spend comparisons. Once the purchasing project is initiated, only deviations from plan are of relevance for executives because they may require immediate counter measures. Otherwise, the project is assumed to be on track and frequent performance reporting would unnecessarily utilize information processing capacity. The focus on plan-to-actual spend comparison also has significant implications for PSM: the reliability of its planning activities becomes a major determinant of its performance.

Compared to one-time purchases, the findings for re-buys are not entirely contrary but distinct. Although expertise evolves in the course of (re-)buying the same products, thus reducing uncertainty about product specifications and range of potential suppliers, the environment induces high degrees of uncertainty especially concerning the purchase of commodities. Price fluctuations on the commodity market provide opportunities as well as risks to the PSM function. Long-term contracts might provide a competitive edge in times of increasing prices, but may actually impede competitiveness in times of falling prices. Case company informants predominantly required frequent performance reports on previous-to-actual year comparisons and price developments, and ad-hoc reports only for changes affecting the most important or most valuable products. High volumes and greater risks increase the chance of loss and enhance uncertainty, providing an explanation for the high information demand. Concurrently, this study identifies the relevant basis for PSM performance assessment regarding recurring purchases: the price development on a previous-to-actual year comparison. This comparison allows for evaluation of PSM performance based on how well it exploits market dynamics in favour of the focal company.

The findings further indicate a particularly high information demand prior to PhamChem's annual planning period. Such strategic planning activities are characterized by high degrees of uncertainty and information processing requirements. The case study informants additionally emphasized the need for more qualitative and non-financial performance information. According to information processing theory of organizations, highly-formalized information, such as accounting data or data on cost savings, allows for the transportation of comparably large amounts of standardized data, for example via vertical information systems, but requires information processing capacity for coding and decoding of the information. However, during this transformation, information is irreversible condensed. For example, PSM performance can be expressed by a monetary value in terms of savings for every purchased product and this data could be easily further aggregated by addition. However, information on the circumstances under which the savings were achieved is lost. Thus,

lateral information systems, based on formalized data, provide comparably less rich data than, for example, qualitative data.

The contribution of this paper is threefold. First, we have complemented the mainly conceptual research on performance measurement in PSM by empirically assessing the information demand of top level executives as important addressees of performance reports. Second, we emphasized the need for more contingency research on performance measurement. Third, we have sought to complement the discussions on performance measurement in PSM by providing theoretical explanations based on information processing theory of organizations for varying information demands. By adapting the model developed by Tushman and Nadler (1978) and under consideration of the presented case study, we can summarize by stating that three key contingencies affect information demand for PSM performance by top level executives: (1) purchase characteristics, (2) planning environment, and (3) interdependence between PSM and other organizational units.

The presented findings have important practical implications for companies and managers in PSM responsible for designing and maintaining performance measurement systems. First, the results suggest that PSM needs to follow a contingency approach to performance measurement, depending on the addressee of performance reports. Different recipients require different types of information in varying depth and frequency. Second, understanding the implications of various approaches of information processing is essential and matching the information processing capabilities with information processing requirements will not only be beneficial to the organization as a whole, but also to PSM and its recognition as a strategic function. Third, by providing suggestions for contingent usage of adequate integration mechanisms, executives receive guidance on how a better fit of information processing demand and information processing requirements can be achieved. By providing these insights, we hope to enable managers to take these considerations into account when designing and maintaining performance measurement systems for PSM that meet the objectives.
To conclude, we highlight potential areas for further research. The findings derived from the presented case study might be specific to the focal organization, the industry, or the developmental status of the PSM function. Hence, further research is needed to assess whether the findings hold true under different circumstances as well. Furthermore, it would be fruitful to follow up on the actual use of information provided by PSM performance measurement systems. Performance measurement should not be the ultimate answer to success. However, considering the limited information processing resources present in organizations, their efficient use is key to improving organizational performance.

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