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The design and use of performance management systems: An extended framework for analysis

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ABSTRACT

Issues in the area of performance management and management control systems are typically complex and intertwined, but research tends to be based on simplified and partial settings. Simplification has made the work easier to carry out, but it has come at the price of increased ambiguity and conflicting findings from different studies. To help mitigate these issues, this paper puts forward the performance management systems framework as a research tool for describing the structure and operation of performance management systems (PMSs) in a more holistic manner. The framework was developed from the relevant literature and from our observations and experience. In particular, it elaborates the 5 questions of Otley's [Otley, D., 1999. Performance management: a framework for management control systems research. Management Accounting Research 10, 363–382] performance management framework into 12 questions and integrates aspects of Simons' levers of control framework.

Anecdotal evidence suggests that the extended framework provides a useful research tool for those wishing to study the design and operation of performance management systems by providing a template to help describe the key aspects of such systems. It allows an holistic overview to be taken while making this a feasible task. The paper uses material from two field studies to illustrate how the framework can be used to provide an overview of the major performance management issues within an organization.

1. Introduction

The literature in the area of performance management systems (PMSs) and management control systems (MCSs) increasingly recognises the need for research to be based on more coherent theoretical foundations (Chenhall, 2003; Covaleski et al., 2003). Researchers suggest that theory be used to contextualise findings and to provide a more systematic development of knowledge in the field (Chapman, 1997). Others note that the difficulty in making significant progress in the field partially derives from the compartmentalised approach typically followed by empirical research (Chenhall, 2003; Covaleski et al., 2003). There has been a tendency to focus only on specific aspects of control systems, as opposed to adopting a more comprehensive and integrated approach (Chenhall, 2003; Dent, 1990; Malmi and Brown, 2008). Although this may be due to access or time limitations, or to the difficulty of generating and managing such complex datasets, the lack of a more complete description of the totality of a control system contributes to spurious findings, ambiguity, and potentially to conflicting results (Chenhall, 2003). Others have maintained that our understanding of MCSs will remain 'piecemeal' for as long empirical research continues to ignore the interdependency between different control mechanisms operating at the same time in the same orga-

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nization (Abernethy and Brownell, 1997). Therefore, we argue that research would benefit from a framework that provides a broad view of the key aspects of a MCS and that allows researchers to obtain an holistic overview in as efficient way as possible. This paper proposes such a framework.

It is organized as follows. The following section outlines some of the frameworks found in the literature, placing particular emphasis on the two that our study builds upon. Section 3 puts forward the performance management systems (PMSs) framework itself, with its theoretical development being elaborated in Section 4. This is followed by a discussion on the use of the framework and a conclusion. Two applications of the framework to specific organizations are briefly presented in Appendix A.

2. Management control systems

Much of the early literature on this topic has been categorized under the heading of management control systems, following the seminal work of Robert Anthony (1965). However, in our view, this has become a more restrictive term than was the original intention and we prefer to use the more general descriptor of performance management systems (PMSs) to capture an holistic approach to the management and control of organizational performance. We see this term as including all aspects of organizational control, including those included under the heading of management control systems.

MCSs have been conceptualised in various ways. The classic view, outlined in Anthony's (1965) work, divided the realm of control between strategic planning, management control, and operational control. He defined management control as "the process by which managers assure that resources are obtained and used effectively and efficiently in the accomplishment of the organization's objectives" (p. 17). However, this approach resulted in a disconnect between MCS and strategic planning and between MCS and operational control (Langfield-Smith, 2007; Otley, 1999). Further, it encouraged a narrow view of MCSs that falls short of capturing the richness of issues and relationships implicated in MCS design and use. In particular, it concentrated on formal (and usually accounting) controls without setting them in their wider context.

A number of MCS definitions have been proposed in more recent years (for a review and discussion see Malmi and Brown (2008)). While Simons (1995) views MCSs as the means used by senior managers to successfully implement their intended strategies, others have defined MCS as the systematic use of management accounting in conjunction with other forms of control such as personal or cultural controls to achieve some goal (Chenhall, 2003). A broader notion of MCSs encompasses the entire strategic process, that is, it includes both strategic formulation (Mintzberg, 1978) and strategic implementation (Merchant and Otley, 2007).

We acknowledge that the concept of PMSs is a difficult one to establish. However, we view PMSs as the evolving formal and informal mechanisms, processes, systems, and networks used by organizations for conveying the key objectives and goals elicited by management, for assisting the strategic process and ongoing management through analysis, planning, measurement, control, rewarding, and broadly managing performance, and for supporting and facilitating organizational learning and change. Hence we use the term performance management system to encapsulate these more general processes, and our working definition of a PMS includes both the formal mechanisms, processes, systems, and networks used by organizations, and also the more subtle, yet important, informal controls that are used (Chenhall, 2003; Malmi and Brown, 2008). It is also based on the premise that key objectives and goals are set by managers at every level, but it does not assume that these objectives and goals are necessarily the ones that best serve the organization as a whole. This is consistent with Abernethy and Chua (1996), who follow the view that objectives are set by the "dominant organizational coalition" (p. 573) in that it is managers who are entrusted the responsibility of setting organizational objectives, taking into consideration the expectations of the relevant stakeholders. The definition views the PMSs as performing a supporting role for a broad range of managerial activities, including strategic processes — which involve strategic formulation and strategic implementation (Mintzberg et al., 2003; Pearce and Robinson, 2007) — and ongoing management. Also, through its learning and change facilitation role, a PMS can support or foster emergent strategies (Mintzberg, 1978).

We next discuss Otley's (1999) performance management framework and Simons' (1995) levers of control framework. These frameworks are examined more closely because both played a major role in the development of the extended framework.

2.1. *Otley's (1999) performance management framework*

Otley (1999) proposed an inductively generated framework for studying the operation of MCSs, drawing upon the extant body of knowledge in the field and on his research experience. In essence, the framework highlights five central issues which he argues need to be considered as part of the process of developing a coherent structure for performance management systems. The framework was intended to aid the description of MCSs and to be a first step towards developing a more comprehensive framework.

The first area addressed by his framework relates to the identification of the key organizational objectives and the processes and methods involved in assessing the level of achievement in each of these objectives. The second area relates to the process of formulating and implementing strategies and plans, as well as the performance measurement and evaluation processes associated with their implementation. The third area relates the process of setting performance targets and the levels at which such targets are set. The fourth area draws attention to rewards systems used by organizations and to the implications of achieving or failing to achieve performance targets. The final key area concerns the types of information flows required to provide adequate monitoring of performance and to support learning.

A number of studies have drawn on Otley's (1999) framework. Ferreira (2002) used the framework to struc-

ture the evidence from four case studies, as well as the basis for interpretation and identification of key issues. Similarly, Tuomela (2005) has drawn on this framework to present the findings of his case study that investigated the introduction of a new performance measurement system. More recently, Stringer (2007) has drawn extensively on the framework to evaluate research published in two major journals. She found that less than one tenth of the studies examined displayed an integrated approach to the study of performance management and that research is generally fragmentary.

The framework proposed by Otley has a number of strengths. First, it provides a helpful structure for analysing MCS by focusing on five key areas. The framework seems especially useful for this purpose because it considers the operation of the MCS as a whole and because it can be used with both for-profit and not-for-profit organizations. This contrasts with other frameworks, such as value based management frameworks (e.g. Ittner and Larcker, 2001), which focus only on for-profit entities. Stringer (2007) maintains that the main strength is the breath of performance issues it includes and its integrated nature. Second, the general nature of the framework enables other frameworks to be used to complement its interpretations and insights, as shown by the Tuomela (2005) and Ferreira (2002) studies. Third, its application has been reported to be straightforward, the areas to be addressed are clear and unambiguous, and the questions asked appear meaningful at different levels of management (Ferreira, 2002). Finally, the framework facilitates the process of dealing with data, a particularly important aspect given the difficulty of dealing with large amounts of information in case-based research (Ferreira, 2002). Although 'a way of seeing is a way of not seeing' (Otley, 2008; Poggi, 1965), the framework provides an immediate degree of insight without imposing any evident barriers to observing other relevant aspects. In particular, it encourages an overview of all control mechanisms in use to be taken.

However, there are also a number of weaknesses in Otley's framework. Firstly, it does not explicitly consider the role of vision and mission in MCSs, despite the fact that these may be key elements of the process of control in organizations (Simons, 1995). It is only via key objectives that the framework touches this area of the control system, although it does not explicitly address the issues of what mechanisms and processes are used to bring the objectives to the awareness of employees and managers. Second, the framework can be interpreted as being focused on what Simons (1995) calls diagnostic control systems, yet the importance of considering all four levers of control for understanding the nature of MCSs has been established (Ferreira, 2002; Henri, 2006; Widener, 2007). Third, the framework does not stress the ways in which accounting and control information is *used* by organizations, as against the *existence* of formal control mechanisms. The importance of MCS use is now a well-established aspect of the literature (Hopwood, 1972; Otley, 1978; Simons, 1995) and its omission constitutes a blind spot in the framework. Fourth, the framework tends to look at control systems from a static perspective, perhaps giving a 'snapshot' at a point in time, but equally ignoring the dynamics of control system change and development. A more explicit consideration of the process of change and of its dynamics would clearly enrich the study of MCS. Finally, it has also been noted that the interconnections between different parts of the performance management system are not explicitly addressed (Malmi and Granulund, 2005; Stringer, 2007).

2.2. Simons' (1995) levers of control framework

Simons (1995) proposed the levers of control (LOC) framework as a tool for the implementation and control of business strategies. According to Simons, the framework is an 'action-oriented theory of control' (pp. ix) that resulted from over 10 years of work, including case studies and related discussions with senior executives and managers. Four key concepts are attached to Simons' LOC: core values, risks to be avoided, critical performance variables, and strategic uncertainties. Each of these is directly controlled by a particular system or, as designated by Simons, a LOC. Core values are controlled by the beliefs system, which guides the creative process of exploring new opportunities and instils widely shared beliefs (Simons, 1995). Risks to be avoided are controlled by the boundary system, which plays the negative, limiting role of circumscribing the domain where the company seeks new opportunities (Simons, 1995). Critical performance variables are controlled by the diagnostic control system, whose function is to monitor, assess and reward achievement on key areas of performance (Simons, 1995). Finally, strategic uncertainties are controlled by the interactive control system, whose role is to encourage organizational learning and the process of development of new ideas and strategies (Simons, 1995). Simons argues that a successful implementation of strategy requires companies to use all the four levers in an appropriate combination.

This framework provides a usefully broad perspective, yet it is limited by the fact that the same control mechanism may be part of more than one lever of control (Ferreira, 2002); the difference comes from the emphasis that is given in the *use* of the control mechanisms. For instance the balanced scorecard has been found to be used both diagnostically and interactively (Tuomela, 2005), as have budgets (Abernethy and Brownell, 1999). Diagnostic use of MCS follows the mechanistic, repressive, traditional control approach, while interactive use of MCS takes an organic, constructive, learning-oriented control approach. Bisbe and Otley (2004) examined the relationship between interactive use of MCS and innovation and found that the direction of the relationship was contingent upon the level of innovation in the firm. For high-innovation companies, interactive use of MCS was negatively associated with innovation, while in low-innovation companies the analysis suggested the opposite (although not entirely conclusively). Henri (2006) found that diagnostic use of MCS had a negative effect on strategic capabilities (i.e. market orientation, entrepreneurship, innovativeness, and organizational learning) and that interactive use had a positive effect. This distinction between diagnostic and interactive use is therefore of particular interest in the extended framework.

Research has also looked at other levers of control (e.g. Collier, 2005; Ferreira, 2002; Tuomela, 2005; Widener,

2007). Collier (2005) used Simons' LOC framework to study the interaction between belief and boundary systems and between diagnostic and interactive control systems in an entrepreneurial organization. Other research has drawn on the LOC framework to structure and interpret case study's evidence regarding MCS issues (Ferreira, 2002; Tuomela, 2005). Importantly, Widener (2007) found that evidence of interdependence and complementarity between all four LOC and that the full benefit of performance measurement arises when they are used *both* diagnostically and interactively. Consistent with Simons's (1995, 2000) argument, she also noted that the "result suggests that managers must consider all four control systems when designing their control system" (p. 782) to increase its effectiveness and thus translate it into organizational performance.

Research has identified a number of strengths and weaknesses in Simons' LOC framework. In terms of strengths, it has been pointed out that the framework strongly focuses on strategic issues and on its implications for the control system. It also offers a broad perspective of the control system by looking at the range of controls employed and *how* they are used by companies (Ferreira, 2002). The association of specific uses to particular control mechanisms enables a better understanding of the design of the MCS. Importantly, the LOC framework provides a typology for alternative uses of the MCS that is widely viewed in the literature as meaningful and helpful (e.g. Abernethy and Lillis, 2001; Bisbe et al., 2007; Bisbe and Otley, 2004; Henri, 2006; Widener, 2007). This aspect is particularly important because the way controls are used is key to establishing whether all four LOC are employed and to assess the balance (or otherwise) between positive and negative controls (Ferreira, 2002; Simons, 1995).

In terms of weaknesses, Collier (2005) maintains that the LOC framework does not give sufficient emphasis to socio-ideological controls. This is consistent with the observation that the framework is strongly focussed on the top level of management and that it does not cope well with the range of informal controls that exist in organizations, particularly in small ones (Ferreira, 2002) or on the operation of controls at lower hierarchical levels. It is therefore unlikely that Simons' LOC framework adequately explains the operation of the *whole* control system, a problem that becomes more acute when informal controls are particularly important.[2] Another weakness is that the meanings of the concepts embedded in the LOC (e.g. core values) are diffuse, leaving plenty of scope for subjective interpretation (Ferreira, 2002). There is also an important ambiguity in the definition of 'interactive controls' which we note later and suggest that this concept is split into two distinct components: *interactive use of controls*, and *strategic validity controls*. Finally, the framework is not susceptible to universal applicability. In some organizations, such as subsidiaries, belief and boundary systems may be largely beyond the domain of control of the subsidiary (Ferreira, 2002). In such instances, only the consideration of the extended organization enables the identification of control mechanisms that match all LOC and, hence, provide a comprehensive perspective of the control system.

There are various common features and points of contact between Simons' (1995) and Otley's (1999) frameworks. Strategy is the key feature that is explicitly common to both frameworks. However, no doubt Otley's objectives influence and are influenced by beliefs and boundary systems. They also impact upon both diagnostic and interactive control systems through the use of performance measures. The issues of target setting and of rewards, addressed by Otley independently, are concentrated essentially on Simons' diagnostic control systems, while information flows are embedded in all LOC.

3. The performance management systems framework

Considering the widespread acceptance of the need to adopt a more comprehensive approach to the study of MCS (Chenhall, 2003; Covaleski et al., 2003) that takes research beyond specific aspects of control systems (Malmi and Brown, 2008), and the limitations of existing frameworks, we put forward a proposal for an extended framework. The extended framework aims to provide a broad view of the key aspects of PMSs and to form the basis upon which further investigations can be developed.

The approach followed has been to extend Otley's (1999) framework to address the issues outlined above. This was thought appropriate because the framework suggests a number of issues to be considered in designing and operating a control system, rather than adopting a prescriptive approach based on an 'ideal model'. If such a model exists it is likely to be contingent upon a wide range of factors as discussed by contingency research (Chenhall, 2003; Otley, 1980). However, no such contingency theory is developed here; rather the focus of the framework and its extension is to provide a descriptive tool that may be used to amass evidence upon which further analysis can be based. However, it is believed that the questions proposed provide a powerful means of relatively quickly outlining the main features of a PMS in a comprehensive manner, and the ways in which it is used in the context of a specific organization. The theoretical development of the framework is provided in the next section, but it also draws upon our understanding of the issues that are associated with PMSs.

The extended framework, which we name performance management systems framework, represents a progression from Otley's 5 'what' questions to 10 'what' and 2 'how' questions. The naming of the framework as 'performance management systems' aims to reflect a shift from the traditional compartmentalised approaches to control in organizations — such as Anthony's (1965) — to a broader perspective of the role of control in the managing organizational performance. It also aims to give a managerial emphasis, by integrating various dimensions of managerial activity with the control system. The 12-question PMSs framework is outlined below:

1. What is the *vision and mission* of the organization and how is this brought to the attention of managers

[2] Otley's (1999) framework also does not explicitly address the issue of informal controls, but its operational nature and presentation in question form make the issue less problematic.

and employees? What mechanisms, processes, and networks are used to convey the organization's overarching purposes and objectives to its members?
2. What are the *key factors* that are believed to be central to the organization's overall future *success* and how are they brought to the attention of managers and employees?
3. What is the *organization structure* and what impact does it have on the design and use of performance management systems (PMSs)? How does it influence and how is it influenced by the strategic management process?
4. What *strategies and plans* has the organization adopted and what are the processes and activities that it has decided will be required for it to ensure its success? How are strategies and plans adapted, generated and communicated to managers and employees?
5. What are the organization's *key performance measures* deriving from its objectives, key success factors, and strategies and plans? How are these specified and communicated and what role do they play in performance evaluation? Are there significant omissions?
6. What level of performance does the organization need to achieve for each of its key performance measures (identified in the above question), how does it go about *setting* appropriate performance *targets* for them, and how challenging are those performance targets?
7. What processes, if any, does the organization follow for *evaluating* individual, group, and organizational *performance*? Are performance evaluations primarily objective, subjective or mixed and how important are formal and informal information and controls in these processes?
8. What *rewards* — financial and/or non-financial — will managers and other employees gain by achieving performance targets or other assessed aspects of performance (or, conversely, what penalties will they suffer by failing to achieve them)?
9. What specific *information flows* — feedback and feedforward —, *systems and networks* has the organization in place to support the operation of its PMSs?
10. What type of *use* is made of information and of the various control mechanisms in place? Can these uses be characterised in terms of various typologies in the literature? How do controls and their uses differ at different hierarchical levels?
11. How have the PMSs altered in the light of the change dynamics of the organization and its environment? Have the *changes in PMSs* design or use been made in a proactive or reactive manner?
12. How *strong and coherent* are the *links* between the components of PMSs and the ways in which they are used (as denoted by the above 11 questions)?

The above 12 questions form the extended PMSs framework. Although not exhaustive, all the questions listed above have been found by the authors to yield significant insight into the various aspects of PMSs design and use, and to form a coherent framework that can be used to structure enquiry in this field. Although they have an underlying logic and may therefore at first sight appear to espouse a normative framework, this is not the case. Rather, they can be used to facilitate the description of PMSs design and use in practice, without any prior assumption as to whether the existence or absence of a particular feature is a good or bad thing. They are put forward as an heuristic tool to facilitate the rapid description of significant aspects of PMSs design and operation. The 12 questions are shown schematically in Fig. 1.

There are two aspects that permeate the PMSs that are not explicitly addressed by the above questions. These are contextual factors and organizational culture. First, the literature has shown that variables relating to external environment, strategy, culture, organizational structure, size, technology, and ownership structure have an impact on control systems design and use (e.g. Chow et al., 1999; Firth, 1996; Gordon and Narayanan, 1984; Govindarajan, 1988; Khandwalla, 1972, 1974; O'Connor et al., 2004; Perrow, 1967; Simons, 1987). Consequently, the study of the operation of the PMSs would require their consideration even if only implicitly. Note, however, that strategy and organizational structure are two of these factors that are already explicitly built into the framework because they are significantly influenced by the organization itself. The other factors can be seen primarily as external influences. Second, organizational culture, a notable contextual variable, pervades the entire control system influencing choices and behaviours of individuals (Hofstede, 1984; Trompenaars and Hampden-Turner, 1997). So, as with the other external contextual factors, the study and understanding of the operation of the control system benefits from the consideration of the impact of culture. But we have not included these factors within the framework as we view them more as contingent variables that might explain why certain patterns of control are more or less effective, rather than characteristics of the control system that need to be incorporated into a description.

4. Theoretical development

4.1. Vision and mission

> What is the *vision and mission* of the organization and how is this brought to the attention of managers and employees? What mechanisms, processes, and networks are used to convey the organization's overarching purposes and objectives to its members?

Performance management begins with purposes and objectives. It has been long established that a fundamental requirement for control is the existence of objectives, which are the used to evaluate performance (Otley and Berry, 1980). Organizations have to meet multiple and sometimes competing objectives (Chenhall, 2003), and these are typically set out by senior managers to meet key stakeholders expectations (Otley, 2008). The corollary of having to satisfy multiple objectives is that performance becomes a multi-dimensional concept for which no single overriding measure is adequate (Otley, 2008).

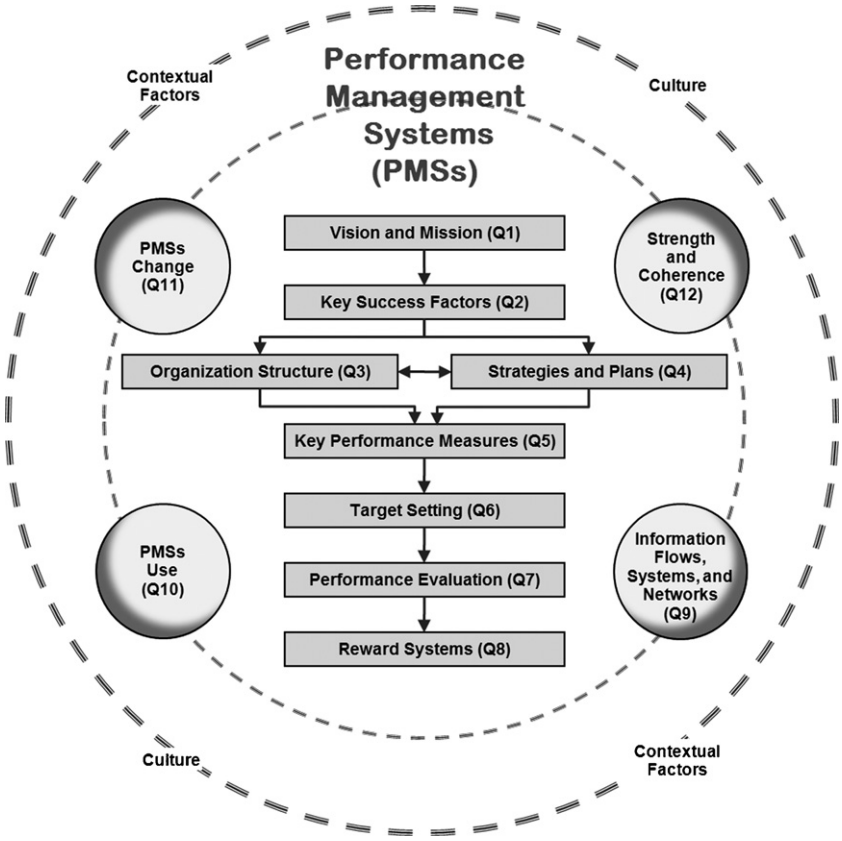

Fig. 1. The performance management systems (PMSs) framework.

The broad orientation and the overall direction that organizations wish to pursue are sometimes expressed by vision and mission statements. The mission outlines the "overriding purpose of the organization in line with the values or expectations of stakeholders", while the vision sets out the "desired future state: the aspiration of the organization" (Johnson et al., 2005, p. 13). So, clearly, vision and mission are more observable than objectives in that they have clear manifestations, but they have importance only insofar as they are communicated and acted upon. Vision is part of the process of setting the direction for the organization (El-Namaki, 1992), while a mission statement aims to "identify the requirements to attract and maintain shareholders, employees, and customers and to do so in ways that are socially acceptable" (Chenhall, 2003, p. 136). The vision and mission are part of beliefs systems (Simons, 1995) and they embody core values core and purposes (Collins and Porras, 1996). Vision and mission statements are landmarks that guide the process of deciding what to change and what to preserve in strategies and activities in the face of changing environments (Collins and Porras, 1996). It is, of course, possible that it is observed that an organization does not have a clearly outlined or consistent vision and mission; such observation is itself relevant to understand how its PMSs may actually operate in practice. Further, although the organization may be clear about its mission and vision, this may not be articulated in explicit mission statements, but may be communicated in less formal ways.

Thus, the focus of this question is to elicit information on how organizational values and purposes are established and communicated as a means of influencing the behaviour of organizational participants. It also suggests the need to observe the impact that such processes have on the behaviour of managers at all levels. This question replaces consideration of objectives in Otley (1999) framework as these can be diffuse and dependent on individual points of view. It is also likely that there will be inconsistencies and tensions in how these values are prioritized and perceived in different parts of the organization.

4.2. Key success factors

> What are the *key factors* that are believed to be central to the organization's overall future *success* and how are they brought to the attention of managers and employees?

The key success factors (KSFs) are those activities, attributes, competencies, and capabilities that are seen as critical pre-requisites for the success of an organization in its industry at a certain point of time (Sousa de Vasconcellos e Sá and Hambrick, 1989; Thompson and Strickland, 2003). They need to be achieved if the organization is to progress towards achieving its vision (Rockart, 1979) and their iden-

tification and monitoring are essential for the fulfilment of strategic goals (Rangone, 1997).

KSFs are those that are perceived to be important by the managers concerned, rather than necessarily representing any objective or external point of view. Managers, however, have been cautioned to "resist the temptation to include factors that have only minor importance" in that an extensive list of KSFs defeats the purpose of focusing management attention on the items which are "truly critical to long term competitive success" (Thompson and Strickland, 2003, p. 108). KSFs are a codification of the vision and mission in more concrete terms and in a more compressed timeframe, recognising that control measures need to be reported on a routine basis. For instance, managers may regard growth of revenue in foreign markets as a KSF for a vision of becoming a global market leader, or the transferring of production to countries with lower operating costs (e.g. China, India) for a vision of leading the industry in low cost. KSFs represent major factors on different timescales that would indicate whether the vision and mission is being successfully pursued.

4.3. Organization structure

> What is the *organization structure* and what impact does it have on the design and use of performance management systems (PMSs)? How does it influence and how is it influenced by the strategic management process?

The classic view of organizations suggests that they are formed to carry out activities that could be carried out by markets to increase efficiency through the reduction of transaction costs (Coase, 1937). Organization structures are then formed as means of establishing formally the specification of individual roles and tasks to be carried out (Chenhall, 2003) and in doing so, they entrust and empower individuals to act within their sphere of responsibility. There are multiple forms of organization structure and they involve choices regarding decentralisation/centralisation of authority, differentiation/standardization, and the level of formalisation of rules and procedures, as well as configuration (Johnson et al., 2005). Configuration "consists of the *structures*, *processes* and *relationships* through which the organization operates" (Johnson et al., 2005, p. 396; emphasis added). Structures include the functional, the multidivisional, the holding company, the matrix, the transnational, the team-based, and the project based. Processes include supervision, planning, and market processes, while relationships refer to internal relationships and external relationships — outsourcing, strategic alliances, networks, and virtual organizations (Johnson et al., 2005). Organization structure determines the responsibilities and accountabilities of organizational participants; it equally defines the activities that individuals with specific roles should *not* pay attention to. It is then not surprising that these "arrangements influence the efficiency of work, the motivation of individuals, information flows and control systems and can help shape the future of the organization" (Chenhall, 2003, p. 145).

Hence, organizational structure is clearly a fundamental control element, and one which has become subject to change and amendment.[3] It is, at a minimum, a constraint on PMSs design and use, and in the longer-term a necessary issue that requires specific consideration as organizations grow and develop. Many control processes operate horizontally rather than vertically, although these typically use non-financial measures. However, the extant control literature seems to concentrate on vertical controls rather than those which follow business processes or value chains. Also, organizations are sometimes part of wider networks or alliances that impact upon their control arrangements, and these need to be considered explicitly. Finally controls are sometimes built into the physical structure or organizational architecture (e.g. production systems; kan-ban inventory controls) which might get overlooked by conventional approaches to the study of MCSs.

Organization structure decisions are linked to KSFs as well as to strategic decisions. The identification of KSFs requires organizations to assess the suitability of the existing structures. For instance, a KSF like "to have the ability to respond quickly to market conditions" may require the organization to embrace decentralisation or to form team-based structures (*structures*), to reengineer processes (*processes*), or to form strategic alliances (*relationships*), all of which are examples of configuration changes as defined previously (Johnson et al., 2005). There is also a relationship between organization structure and strategy, but this appears to be bi-directional. Some research suggests that structure needs to be matched to strategy (Chandler, 1962; Chenhall, 2003; Thompson and Strickland, 2003) — e.g. diversification strategies requiring divisional structures — while other research suggests that structure precedes strategy to the extent that it limits the scope and the authority of managers to develop strategies (Donaldson, 1987). The relationship is likely to be complex, with the balance of power leaning towards *corporate* and perhaps *business* strategy in affecting organization structure, but towards organization structure in affecting *operating* strategy. It is also likely to be associated with whether the organization is experiencing an evolutionary or revolutionary stage of development (Greiner, 1998), with strategy being likely to follow structure in an evolutionary stage and structure likely to follow strategy in a revolutionary stage. This issue is beyond the scope of this study and we maintain that strategy and structure are mutually interdependent in that they constrain and support each other. This view is consistent with Chenhall (2003), who argues that strategy is likely to be implicated in the relationship between MCS and structure and recommends they be examined together.

However, the question elicits the broader relationship between organization structure and the strategic management process. The strategic management process comprises both strategic formulation (i.e. the product of strategic analysis and strategic choice) and strategic implementation (Langfield-Smith, 2007; Mintzberg et al., 2003; Pearce and Robinson, 2007). The formulation of strategy is

[3] Organizational design initiatives can take the form of restructuring, reengineering and rethinking — Keidel (1994).

concerned with deciding the path to undertake to achieve the organization's objectives, while the implementation of strategy focuses on ensuring that the strategic choices are carried through and monitored to ensure they deliver desired outcomes (Mintzberg et al., 2003). Organization structure conditions and is conditioned by the strategic process, as it is by the strategy itself.

4.4. Strategies and plans

> What *strategies and plans* has the organization adopted and what are the processes and activities that it has decided will be required for it to ensure its success? How are strategies and plans adapted, generated and communicated to managers and employees?

Strategy is the direction the organization chooses to pursue over the long term as the means of achieving organizational objectives (Johnson et al., 2005; Thompson and Strickland, 2003). The strategy literature argues that the organization needs to develop the strengths that match its KSFs (e.g. Ansoff, 1965; Porter, 1980; Sousa de Vasconcellos e Sá and Hambrick, 1989) to achieve the desired outcomes it sets for itself. A key element of this entails translating strategic goals into operating goals to attain alignment (Chenhall, 2003; Kaplan and Norton, 1996). Research also suggests that a match between the environment, strategy, and internal structures (such as MCS) is associated with higher performance (Govindarajan, 1988; Govindarajan and Gupta, 1985).

The literature focusing on the relationship between strategy and MCS is now relatively abundant (for a review of the literature see Langfield-Smith, 1997, 2007), but it was not until the 1980s that strategy began to be considered as a contingent variable for MCS design and use (e.g. Daft and Macintosh, 1984; Govindarajan and Gupta, 1985; Simons, 1987). Different strategies and plans require changes to control configurations (Otley, 1999) to ensure that the effectiveness of the MCS is achieved. However our understanding of the relationships between strategy and MCS remains limited (Langfield-Smith, 2007; Otley, 1999).

Various strategy typologies have been proposed over the years. These include Miles and Snow's (1978) defender, analyser, prospector and reactor strategies, Porter's (1980) cost leadership and differentiation strategies, Miller and Friesen's (1982) conservative and entrepreneurial strategy, and Govindarajan and Gupta's (1985) build, hold, harvest strategies, which were based on the eight types — i.e. aggressive build, gradual build, selective build, aggressive maintain, selective maintain, competitive harasser, prove viability and divest — proposed by MacMillan (1982). All these typologies represent a useful way of looking at a particular organization's strategy and a way to reflect on how they are translated into the PMSs. The observation of the strategic typology the organization has selected can give insights into the way it sees itself. But the framework deliberately does not specify any particular strategic typology as a preferred basis for analysis, not least because some of these typologies are not suitable for use in not-for-profit organizations. The literature review conducted by Langfield-Smith (2007) provides a sound basis from which to begin untangling the relationships between strategy and PMSs.

The focus of this question is on the actions that management have identified as being necessary for the successful development of the organization. Thus, the emphasis is on the actions that are thought likely to achieve outcomes (i.e. relationship between means and ends). It is possible that we could observe that an organization has clear goals and objectives — perhaps expressed through mission and vision statements — and has identified the appropriate KSFs, but has not thought through what actions will be necessary to achieve such goals (i.e. a strategic planning failure). Alternatively, it may have explicitly decided that it will not operate through a detailed planning process, but adopt a more flexible, adaptive approach to respond to environmental uncertainties. That is, forecasting is believed to be so unreliable, that it is thought better not to plan, but to have the capacity to respond quickly to events as they unfold (e.g. as in agile manufacturing). The literature on beyond budgeting clearly makes the point that planning has lost much of its relevance in today's highly competitive and changing environments (Hope and Fraser, 2003a,; Player, 2003). Finally, we have included the process of devising and communicating strategies and plans in this area of the PMSs framework. This process can be as important as the outcome of the strategic planning and thus it warrants explicit consideration. Lack of direction is one of the key control problems observed in practice (Merchant and Van der Stede, 2007) and failure to communicate strategies and plans to organizational members may result in a lack of understanding of how individual actions contribute to the overall strategy. Thus, the stance taken is that of communicating intended strategies, not of developing emergent strategies. The issue of emergent strategies (Mintzberg, 1978) will be dealt with in question ten, which focuses on how the use of the PMSs may support strategy formation.

The question also elicits the nature of strategic management process by asking how strategies and plans are generated and communicated to managers and employees. The process can follow the traditional top-down approach — where top managers undertake the strategic thinking, decision-making, planning, and then communicate it to the wider organization — or it can follow a bottom-up approach — where there is involvement of all levels of management in the strategic process. Empowerment has become more important with the rise of the 'lean', 'delayered', horizontal organizations, in place of hierarchical and vertical organizations (Otley, 1994). Although there are strong advocates for the top-down approach to strategic change (Kotter, 1995), research shows that top managers find it difficult to control how such change is understood by middle managers and that, as a consequence, they ought to place greater emphasis on the adaptation of emergent strategies (Balogun and Johnson, 2004). It appears clear that a wider involvement of lower echelons of management in the strategic management process is likely to result in greater understanding the strategic intent, acceptance of the path to be undertaken and, importantly, provide for broader organizational alignment.

Compared to Otley's (1999) framework, this question shows two differences. The issue of how strategies and plans are generated and communicated has been added, while the issue of performance measures has been explicitly separated and further elaborated in the next question.

4.5. Key performance measures

> What are the organization's *key performance measures* deriving from its objectives, key success factors, and strategies and plans? How are these specified and communicated and what role do they play in performance evaluation? Are there significant omissions?

Key performance measures are the financial or non-financial measures (metrics) used at different levels in organizations to evaluate success in achieving their objectives, KSFs, strategies and plans, and thus satisfying the expectations of different stakeholders.[4] They are explicitly identified in the PMSs framework to reflect both the importance that is attached to performance measures in most contemporary organizations and the influence that such measures have on individual behaviour. This question relates to Simons' (1995) critical performance variables; that is, those measures that are directly linked with the success of the organization. However, the question also encompasses Simons' (1995) 'interactive' use of control systems to the extent that it refers to those measures on which senior managers focus their attention and use to drive subordinate behaviour.[5]

The question is explicit about whether performance measures are derived from objectives, KSFs, and strategies and plans to the extent that identification of suitable performance measures is part of the strategic implementation process (Johnson et al., 2005) and indicative of the alignment between operations and strategy. This idea of alignment is consistent with Chenhall (2005), who refers to the links between operations and strategy and goals as one of the features of integrative strategic performance measurement systems. Furthermore, Ittner and Larcker maintain that "the choice of performance measures is a function of the organization's competitive environment, strategy, and organizational design" (2001, p. 379). There is evidence that alignment between performance measures and strategy affect performance; in particular, the pairing of quality-based manufacturing strategies with the extensive use of subjective non-financial performance measures was found to have a positive performance effect (Van der Stede et al., 2006).

Care needs to be taken both to observe the measures that are *actually* in use and also areas where measures are *absent* or limited in scope. It is a truism that what is measured tends to drive out what is not measured and so omissions may be as influential as measures in use. Further, the number of such 'key' measures is also of relevance, as managers' limited attention span means that the use of many performance measures reduces their impact. For instance, the proponents of the balanced scorecard address this issue by recommending a maximum of 25 performance measures in total (Kaplan and Norton, 1996). The articulation of measures between organizational levels is also of interest, especially as non-financial performance measures may well have to be different at different organizational levels. Similarly, the explicit development of causal relationships between measures in some form of causal model (such as 'strategy maps' (Kaplan and Norton, 2000, 2004)) also provides evidence of how an organization views its performance measures.

4.6. Target setting

> What level of performance does the organization need to achieve for each of its key performance measures (identified in the above question), how does it go about *setting* appropriate performance *targets* for them, and how challenging are those performance targets?

Target setting is a critical aspect of performance management (Ittner and Larcker, 2001; Otley, 1999; Stringer, 2007). It should then be no surprise that the issue of setting targets and using them for evaluating and rewarding performance has been the subject of discussion in the literature and is likely to continue to receive attention in years to come (Covaleski et al., 2003). However, Stringer (2007) notes that field research has failed to provide an in-depth analysis of these issues, particularly in regard to the relationship between target setting and other aspects of the PMS.

This question, which has been left unchanged from the original Otley's (1999) framework, reflects the universal tension between what is desired and what is thought to be feasible in determining targets for all aspects of organizational performance. The process of target setting (e.g. imposition, consultation, participation) may be as important as the outcome (e.g. perceived target difficulty) (Emmanuel et al., 1990). The literature on budgetary control provides a good guide to the major issues involved (e.g. Libby, 2001; Shields and Shields, 1998), and it is also applicable to a wider set of non-financial targets, as evidenced in balanced scorecard implementations. Research has found that target levels have effects on performance, with moderately difficult goals enhancing group performance (Fisher et al., 2003), with evidence that, in practice, targets tend to be 80 to 90 per cent achievable and this is regarded as desirable (Merchant and Manzoni, 1989). Aggressive target setting in situations where there is need for cooperation between units is not associated with higher performance (Chan, 1998), as managers become less willing to make concessions and take longer to reach agreements (Smith et al., 1982). However, the embedding of continuous improvement into targets appears increasingly inescapable, as companies face competitive and globalised

[4] Key performance measures are sometimes referred to as key performance indicators or simply KPIs.

[5] We will develop the idea of *how* performance measures are used in Section 4.10.

markets (Chenhall, 2003). Also, the use of benchmarking (Elnathan et al., 1996; Spendolini, 1992), particularly the use of external benchmarks, appears to provide a greater degree of legitimacy for targets, as shown by their use in the health sector (Northcott and Llewellyn, 2003), and has been strongly advocated by the beyond budgeting movement (Hope and Fraser, 2003b).

4.7. Performance evaluation

> What processes, if any, does the organization follow for *evaluating* individual, group, and organizational *performance*? Are performance evaluations primarily objective, subjective or mixed and how important are formal and informal information and controls in these processes?

The area of performance evaluation represents a critical nexus in control activities. Managers tend to be most affected by areas that senior managers signal as important, with success in these areas potentially determining status and progression in the organization. Thus both formal performance evaluation activities and informal indications of what is felt to be important are both covered in this question. It is particularly important to distinguish between performance evaluation routines (often orchestrated by the human resources function) and those actually operated by senior managers. Again, this is an area where subordinates' perceptions of what is believed to be the situation are even more important than the formal situation, with research showing that trust between the parties plays a major role (Gibbs et al., 2004). It is important to note that this question is not concerned exclusively with *individual* performance evaluations, even though they are likely to be the most observable. It also includes the evaluation of the performance of various groups of individuals (e.g. teams, departments, and divisions) and, more generally, the organization as a whole. Research shows that performance evaluations of business units that use balanced scorecards place greater emphasis on common measures than on unique measures (Banker et al., 2004; Lipe and Salterio, 2000) and that they are influenced by strategically linked measures only to the extent that business unit strategies are communicated in detail to evaluators (Banker et al., 2004). Research has also found that managers who are evaluated on the basis of company profits achieve higher joint outcomes when following a team orientation than an individualistic orientation (Schulz and Pruitt, 1978). There is also research that shows that cooperation and integrative problem solving among executives occurs more frequently when performance evaluations focus on corporate profits rather than on divisional profits (Ackelsberg and Yukl, 1979).

Performance evaluations can be objective, subjective, or fall in-between these two extremes. Under subjective performance evaluations, the specific weightings placed on the various dimensions of performance are unknown to the evaluee and determined subjectively by the evaluator. However, the evaluator may make these weightings more explicit by flagging which aspects are more important. The use of subjective evaluations has the important advantage of enabling evaluators to correct for identifiable flaws in performance measurement (Gibbs et al., 2004), but they also come at the cost of expensive managerial time and perceptions of bias. The use of subjective performance evaluations in conjunction with the balanced scorecard has attracted criticism for permitting favouritism and for creating uncertainty about evaluation criteria (Ittner et al., 2003). Other research on the use of subjective evaluations has found them to be positively related to the level of spending on training, the severity of the consequences of missing targets, the extent of interdependency between subunits, and increased pay satisfaction and productivity (Gibbs et al., 2004). In contrast, under objective performance evaluation there is no scope for ambiguity in the weightings; assessment is based only on the actual results and, typically, they do not allow for adjustments to the agreed standards of performance nor to their weightings. Therefore, objective, formulaic performance evaluations are likely to be acceptable in situations where the input-output relationship is clear, the performance is controllable or, when it is accepted as part of institutionalised practice. Further, the whole area of 'gaming' behaviour (Argyris, 1952; Hofstede, 1968) and the degree to which it is stimulated by different patterns of use of performance measures is covered by this question.

Relative performance evaluations (RPEs) are a practice that is attracting increased attention. They reflect instances where the performance of an individual or entity is measured in relation to that of another (Dye, 1992) in an attempt to eliminate distortions caused by uncontrollable factors. RPEs have also been hailed as a solution to the 'fixed performance contract' problem (Hope and Fraser, 2003b). However, there is little evidence to suggest that RPEs are effective, even though the underlying principle is appealing (see Hansen et al. (2003) for a useful review of the 'Beyond Budgeting' approach). Dye (1992) shows that the benefits of RPEs are a positive function of the number of projects that executives have available to them, while Aggarwal and Samwick (1999) conclude that the high administrative costs of RPEs are likely to explain their low adoption in executive contracts. To the best of our knowledge there is no evidence in the literature of the use and effectiveness of RPEs at lower levels of management, although there is evidence that the introduction of RPEs in the health care in the UK has been highly problematic (Northcott and Llewellyn, 2003).

4.8. Reward systems

> What *rewards* — financial and/or non-financial — will managers and other employees gain by achieving performance targets or other assessed aspects of performance (or, conversely, what penalties will they suffer by failing to achieve them)?

Rewards are typically the outcome of performance evaluations and as such reward systems are the next logical

aspect to consider in the analysis of PMSs. Rewards are considered broadly here and may range from expressions of approval and recognition by senior management (or lack of criticism), through financial rewards (bonuses and salary increases) to long-term progression and promotion. This question is carried over from Otley's (1999) framework, but now making explicit the fact that rewards can include both financial and non-financial elements. It also opens up the issue of the distinction between positive (i.e. rewarded) and negative (i.e. penalised) control activities, which were hinted at in Simons' (1995) distinction between beliefs and boundary systems (i.e. those things that should be done versus those things which should be avoided). The area of non-financial rewards is worthy of further elaboration as it may often include quite subtle attitudes and behaviours of superiors. Thus informal praise or criticism and general attitudes about a subordinate's progress within the organization can significantly influence the subordinates' behaviour and thus the workings of the PMSs. Issues of equity, fairness and inclusiveness (Hope and Fraser, 2003b) between different managers also loom large in many organizations. The issues covered by this question relate strongly to the processes and structures of accountability (Merchant and Otley, 2007) and corporate governance more generally, that are now the subject of widespread interest in the literature.

The relationship between rewards, motivation and performance is complex, perhaps more so than it appears at first sight. It has been long recognised that reward systems are used to motivate individuals to align their own goals with those of the organization (Hopwood, 1972) and that desired behaviours that are not rewarded tend to be neglected (Kerr, 1975). Some research, however, suggests that extrinsic motivation (i.e. rewards) undermines intrinsic motivation (Deci et al., 1999), but this has been disputed by other studies (e.g. Jenkins et al., 1998). Financial incentives do not necessarily translate into performance as shown by Jenkins et al. (1998), who suggests a positive relationship between financial incentives and performance quantity (e.g. number of tasks completed), but not with performance quality (e.g. supervisor ratings). Additional evidence in support of a positive relationship was provided by Bonner et al. (2000), but this was only observed in half of the studies they reviewed. They also found that this positive effect decreased as tasks became more complex and that the relationship differed across types of incentive schemes. The effect of monetary incentives on performance occurs when individuals possess the necessary skills, but the increased effort generated by the monetary incentives does not flow through to performance when they do not have such skills (Bonner and Sprinkle, 2002).

Bonner and Sprinkle (2002) provide a theoretical framework to examine the relationship between performance-contingent incentives, effort and performance. In particular, they examined how person variables (e.g. skills), task variables (e.g. task complexity), environmental variables (e.g. assigned goals), and the incentive scheme (e.g. the rewarded dimension) intervened in the relationship between monetary incentives, effort and performance. Bonner and Sprinkle found that the combined effect of target setting and monetary incentives on performance exceeded that of monetary incentives alone. However, they concluded that there are many unanswered important questions and that strong recommendations were unwarranted.

Group reward practices have attracted increased attention from both academia and practice in recent years. Such rewards are based on collective achievement and come under many guises, including profit-sharing schemes, team-based incentive schemes, and gain-sharing plans. The use of group rewards faces a number of challenges, including the potential for free riders, for individuals to see themselves as detached from the group and for a lack of equity. Furthermore, there is the difficulty of relating individual performance and group performance. Notwithstanding these challenges, group rewards can create an ownership culture and research suggests that they are often effective (Merchant and Van der Stede, 2007; Rosen et al., 2005). In fact, group rewards have been strongly endorsed by some researchers due to the difficulty of identifying the marginal contribution of individuals to overall performance, and when organizations are viewed as "a complex network of interdependent relationships" (Hope and Fraser, 2003b, p. 107).

4.9. Information flows, systems and networks

> What specific *information flows* — feedback *and* feed-forward —, *systems and networks* has the organization in place to support the operation of its PMSs?

Information flows, systems and networks are essential enabling mechanisms to any performance management system (Otley, 1999); they are the binding agent that keeps the whole system together. They act like the nervous system in the human body, transmitting information from the extremities to the centre and from the centre to the extremities. The question notes the difference between *feedback* information — that is, information used to enable the undertaking of corrective and/or adaptive courses of action — and *feed-forward* information — that is, information used to enable the organization to learn from its experience, to generate new ideas and to recreate strategies and plans. In other words, it distinguishes between information flows aimed at the correction of past shortcomings from those which attempt to anticipate future events and respond in advance of their occurrence. This question represents an extended version of the final question in Otley's (1999) framework.

Feedback and feed-forward information flows are omnipresent in contemporary organizations (Otley, 1999) and they are directly related to the notions of single loop and double loop learning (Argyris and Schön, 1974, 1978). Single loop learning entails a response to a signal of deviance from a pre-defined course of action that does not question the initial objectives or strategies; it sees the deviance as the product of a deficient operationalisation (Argyris and Schön, 1978). Hence, its association with the ubiquitous feedback information flows. In contrast, double

loop learning "involves questioning the role of the framing and learning systems which underlie actual goals and strategies" (Usher and Bryant, 1989, p. 87) and hence their association with feed-forward information flows.

Systems are used to organize accounting and other control information. They are part of the information system (IS) and information technology (IT) infrastructure that pervade contemporary organizations. Enterprise Resource Planning (ERP) systems, for example, are not accounting systems in the strict sense of the word, but they are interdependent with accounting and other control processes (Chapman, 2005). They provide a platform for accounting and control information to flow, but they may also create impediments to the design and implementation of control systems (Granlund and Mouritsen, 2003). It also needs to be recognised that the well-developed and reliable systems that are generally in place to provide financial information do not necessarily exist in such robust form for non-financial information. The quality of the non-financial information needs to be assessed, particularly in regard to its vulnerability to manipulation and misreporting. The relationship between accounting and IT is one of interdependence and mutuality, with accounting needing IT for both reporting and performance management purposes, and IT needing accounting to justify its existence (Dechow et al., 2007).

How performance and control information is structured is another key issue to be considered. In many organizations, performance management processes revolve around budgeting systems, however, increasingly organizations are moving towards broader PMSs, such as balanced scorecards. Other operating systems, such as production, quality control, logistics systems, and customer-relationship systems may be part of the overall package of systems in use. There are also a number of additional issues to be considered that are related to the characteristics of the information flows in the PMSs. These includes issues such as information scope (i.e. narrow scope or broad scope), timeliness (i.e. frequency and speed of reporting), aggregation (i.e. by period and by functional areas), and integration (i.e. inter-relationships and interactions between subunits) (Chenhall and Morris, 1986). They also include issues such as the level of detail, relevance, selectivity, and orientation (Amigoni, 1978).

Networks represent another layer in the IT/IS infrastructure. Many organizations have organized their systems in networks that are made available to various parties within the organization. However, information networks go beyond formal mechanisms. Informal networks of individuals can also play a key role in the dissemination of information within the organization. This is something that will be shaped by and shape the prevailing organizational culture.[6]

[6] Organizational culture is not explicitly discussed in this paper, although it may be seen as implicit in the prior discussion of mission and vision. It is seen more as a contingent variable that may influence PMS design rather than an organizational characteristic that can be manipulated. However, it is recognized that culture can have both of these attributes, and it may be a highly influential feature of PMSs use as discussed in the next section.

4.10. PMSs use

What type of *use* is made of information and of the various control mechanisms in place? Can these uses be characterised in terms of various typologies in the literature? How do controls and their uses differ at different hierarchical levels?

The use made of information and controls is a cornerstone of the PMSs. Case study evidence suggests that the use of control information can be more significant than the formal design of the control system (Ferreira, 2002). It is rather surprising that this was omitted from Otley's (1999) framework, given the work he conducted on the effects of different uses of control information and also by other studies in the area (Govidarajan, 1984; Hopwood, 1972; Otley, 1978). Nevertheless, the concept of 'use' has not been well-developed in the literature. Apart from Hopwood's (1972) categories — now often discussed in terms of 'rigid' and 'flexible' use — perhaps the only substantial contribution is that made by Simons (1995) in terms of his four LOC, and his concept of interactive use. Even this has been inadequately measured in subsequent studies for, as Bisbe et al. (2007) argue, interactive control as defined by Simons can be seen as a composite of five different sub-areas — intensive use by senior managers, intensive use by operating managers, pervasiveness of face-to-face challenge and debate, focus on strategic uncertainties and a non-invasive, facilitating and supportive involvement — each of which need to exist for control to be described as interactive (in their view). We argue that Simons conflates the intensive use of information by managers with the identification of an inadequate strategy. Both of these are key issues, but it seems confusing to link them together in the overall concept of 'interactive use'. There is considerable scope for the development and operationalisation of the concept of use, and for research to ascertain the effects of different types of use of control systems.

Simons' (1995) concepts of diagnostic and interactive use have substantial commonalities with other concepts found in the literature. For instance, the feedback information flows are fundamental to diagnostic use as they enable single loop learning, while feed-forward information, with its double loop function (Argyris and Schön, 1978), can provide a check for strategic validity. The alignment between strategic intent and strategic action is unlikely to persist in dynamic environments and strategic dissonance will then result (Burgelman and Grove, 1996). Dissonance becomes strategic at key moments typified by "the giving way of one type of industry dynamics to another; the change of one winning strategy into another; the replacement of an existing technological regime by a new one" (Burgelman and Grove, 1996, p. 10). The role of strategic validity controls is to signal the need to review strategies, and such revisions can be facilitated by frank, open discussions between different managers and other employees (Burgelman and Grove, 1996). The use of strategic validity controls should not be confused with the interactive use of other controls. Both diagnostic and interactive use of control systems

are key components of organizational learning processes. However, it is the use of strategic validity controls that primarily serves the important role of identifying the failure of intended strategies and the rise of emergent strategies (Mintzberg, 1978).

Broadbent and Laughlin (2007)[7] have built upon the idea of 'transactional' and 'relational' uses of PMSs, and this provides an additional dimension of 'use' at an organizational level of analysis. Transactional use of a PMS "has a high level of specification of ends to achieve (e.g. through performance measures, targets etc.) as well often a clear specification of the means needed to achieve these defined ends", whereas relational use of a PMS "can be less specific about the ends to achieve and the means to achieve them if this is the view of the stakeholders designers but could be very precise if they so chose" (2007, pp. 25–26). Transactional and relational uses are the extremes of a continuum that represent ideal constructions which do not necessarily translate neatly into practice, but they are analytically distinct to the extent that they represent the domains of cultural elements of instrumental rationality and of communicative rationality (Broadbent and Laughlin, 2007). Broadbent and Laughlin maintain that "context affects the PMS functional questions and the financial transfers, yet culture expressed through communicative and instrumental rationalities, has an even more direct and ultimately more significant effect on the PMS design" (2007, p. 25). From the perspective of our framework, Broadbent and Laughlin's work is valuable as it emphasizes an organizational level of analysis of the concept of 'use' to complement the typically individual level of analysis found in earlier work. That is, relational and transactional usage typifies the overall 'use' made of a range of control mechanisms across a whole organization, or by one organization in its dealings with others.

4.11. PMSs change

> How have the PMSs altered in the light of the change dynamics of the organization and its environment? Have the *changes in PMSs* design or use been made in a proactive or reactive manner?

Change and its dynamics have been included into the extended framework. Environments change, organizations change, and so PMSs also need to change in order to sustain their relevance and usefulness. The idea of change in the PMSs applies to both the design infrastructure that underpins the PMSs (e.g. the management control techniques and the key performance measures used) and also to the way performance management information is used (e.g. the aspects which are emphasized and those which are not). However, the issue is not the process of change itself, but rather the extent and type of change that has taken place in the PMSs design and use as a response to or in anticipation of changes in the organization and its environment. In other words, the question draws the attention to the antecedents (i.e. the causes) and consequences (i.e. the outcomes) of change in the PMSs, leaving issues of process aside. For instance, the observer may ask why performance measures were introduced or removed from the PMSs and examine the economic and/or behavioural implications of those decisions, rather than dwelling on the detail of change processes. There is also the common situation where organizations are working towards the implementation of a change to rectify a known problem, but the timescale of change is often extended due to the (computer and other) systems changes which are required.

This is an area of major importance as the rate of change increases. The incorporation of change dynamics into the analysis of PMSs design adds to our understanding of how different PMSs components interrelate with each other. In particular, it draws attention to the issue of lags in PMSs design which can result in an extant system appearing incoherent. These PMSs change issues clearly link to the wider area of management accounting change more generally (e.g. Baines and Langfield-Smith, 2003; Burns and Scapens, 2000; Burns and Vaivio, 2001; Busco et al., 2007; Dambrin et al., 2007; Lukka, 2007; Scapens and Jazayeri, 2003).

It is also important to consider the scope of strategic change in the increasingly competitive environment faced by contemporary organizations. Strategies are a core component of a PMS and a strategic change can be expected to send ripples across the entire PMSs. Thus, the extent to which strategies have changed is an issue of interest for understanding the functioning of the PMSs. Chenhall (2003) recognises this when he states that our understanding of how MCSs are involved in strategic change is limited and later provided, in his work with Euske, a range of related theoretical perspectives to assist the development of knowledge in this area (Chenhall and Euske, 2007).

4.12. Strength and coherence

> How *strong and coherent* are the *links* between the components of PMSs and the ways in which they are used (as denoted by the above 11 questions)?

The strength and coherence of the links within a PMS is crucial to understanding its operation and therefore an area that needs to be considered in the extended framework. Like any other system, a PMS is greater than the sum of its parts and there is a need for alignment and coordination between the different components for the whole to deliver efficient and effective outcomes. Although the individual components of the PMSs may be apparently well-designed, evidence suggests that when they do not fit well together (either in design or use) control failures can occur (Ferreira, 2002). The theoretical development provided in the eleven preceding questions of the PMSs framework makes clear the key links between its components and, thus provides a good starting point for questioning, critical analysis and assessment of the balance, harmony, consistency and coherence of the links in

[7] Note that this reference is to a working paper which has been developed into the article that also appears in this issue of *Management Accounting Research*; see Broadbent and Laughlin (2009).

the whole PMSs package. However, it is important to stress that there are no deterministic rules here; the components of PMSs combine with each other and their interactions have effects on organizational outcomes (Abernethy and Brownell, 1997).

Chenhall (2003) provides hints as to what to look for when examining the strength and coherence of the PMSs. He suggests that judgements should be made about the extent to which the control system "consider(s) multiple stakeholders; measure(s) efficiency, effectiveness and equity; capture(s) financial and non-financial outcomes; provide(s) vertical links between strategy and operations and horizontal links across the value chain; provide(s) information on how the organization relates to its external environment and its ability to adapt" (p. 136). A key issue to be considered here is the extent to which key performance measures link back to strategies (Van der Stede et al., 2006), and how strategies link back to key success factors and to the over-arching objectives of the organization. In studying PMSs' operation at different hierarchical levels there is also the potential to observe mismatches, perhaps caused by changes being made at one level that have yet to be carried through to other levels.

Evidence of the importance of translating values into coherent performance measures has been shown by Jazayeri and Scapens (2008). They stress the idea of *coherence* between and across performance perspectives unlike Kaplan and Norton's (1996) cause-and-effect relationships. The specification of cause-and-effect relationships requires assumptions to be made which may inhibit further strategic questioning and reduce the associated strategic learning opportunities. It is also worth considering the inter-relationship between the design and use of a PMS and whether these are mutually supportive. The information flows, systems, networks and techniques used need to be considered in light of the overall objectives that are desired. The strength and coherence of the links in the PMSs are no doubt the most challenging aspect of using the framework, but they are clearly fundamental.

However, it should be noted that it is not assumed that an extant PMS will be coherent. Otley (1980) discussed control 'packages' rather than control 'systems' because he had found that they tended to be composed of sets of loosely coupled elements. These were often designed and implemented by different people, in different parts of an organization, at different times. Their interactions often emerged rather than being planned. It is therefore likely that observations of PMSs in practice will exhibit characteristics of systemic and designed coherence together with characteristics of tension and conflict between the different elements. This is a similar tension to that found in organization design between rational and natural elements, with rational intentions being overtaken by natural adaptations (Scott, 1981).

4.13. The overall framework

The 12 questions elaborated above form the extended PMSs framework. It should be noted that a normative position is not taken on the mechanisms that should be used in any specific context; this is regarded as a matter for empirical research which can study the consequences of different control configurations in different contexts. Also, it is not expected that there will be consistency between the practices adopted from one part of an organization to another. Rather, we would expect both 'rational' differences caused by differences in subunit context and 'unplanned' differences caused by the natural evolution of organizations. Further, we would also expect considerable differences between practices at different hierarchical levels, and for all these practices to be changing and evolving over time. We believe the role of the framework is to help a 'snapshot' to be taken of the package of practices that are in operation at a particular point in time, and to gain some sense of how these practices have evolved into their current form. As such, we believe that it can serve as a useful research tool to enable such practices to be documented and correlated with other variables, such as in traditional contingency studies.

5. Discussion

It is believed that the PMSs framework represents a considerably improved tool to that originally developed by Otley (1999) for describing many important aspects of PMSs design and use. Nevertheless, it is acknowledged that despite our belief, empirical evidence, especially (but not exclusively) from case study research, is required to assess its robustness and validate its adequacy. The fact that the issues addressed by the PMSs framework have been informed by our experience in conducting case studies indicates that it has been inductively derived. Two brief examples that illustrate the key features of PMSs design and use are given in Appendix A.

We have found it to be a valuable tool which allows the speedy and comprehensive description of many aspects of PMSs design and use, as illustrated in these two cases. However, full use of the extended framework requires the questions to be asked at the various hierarchical levels down to the first level of management and the gathering of evidence about patterns of usage and behaviour at each level, so as to understand the overall effects of the PMSs. The case studies reported in Appendix A examined only senior managers' descriptions, but the changing nature of control at different hierarchical levels can be examined by asking the same questions at each hierarchical level. Anecdotal evidence from the use of the framework in teaching settings (by ourselves and colleagues), as well as in student projects (involving the analysis of organizational practices in terms of PMSs design and use) has shown promising signs with regard to its potential. As a group of MBA students noted regarding the use of the PMSs, "having a specific framework helped to systematize the analysis of the companies' options and helped to better prepare a mental map to connect all the dots while not losing strategic focus and all the interconnections with all the different business and production areas of the company."

The working paper version of the PMSs framework (i.e. Ferreira and Otley, 2005) attracted considerable interest from academics, with it featuring in a number of studies (Berry et al., 2009; Broadbent and Laughlin, 2007; Collier, 2005; Merchant and Otley, 2007; Otley, 2008; Stringer,

2007). Collier (2005) used the PMSs draft framework in his longitudinal study of an owner-controlled multinational company. He concluded that framework was "useful in a rational-instrumental sense but has been limited to accommodating only two of Simons' control systems: diagnostic and interactive controls" (p. 338). While we acknowledge that the framework may give the impression that its focus is on diagnostic and interactive control systems, we challenge Collier's criticism on two grounds. Firstly, the framework explicitly considers vision, mission, key success factors, strategies and plans, and organization structure. These control structures are expected to be part of or, at the very least, influence belief systems, boundary systems or both. Furthermore, the strength and coherence aspect of the framework relates to the idea of balance between positive and negative controls mentioned previously, which is intrinsic to the relationship between diagnostic and interactive control systems and between belief and boundary systems. Secondly, the purpose of Collier's study was to use the frameworks to understand the relationships between formal and informal controls and therefore his conclusions are not unexpected. The 2005 working paper PMSs framework was primarily intended to provide a description of the design of formal control systems. In the PMSs framework version presented in this paper, we have explicitly added concepts of control systems use, noted the need to examine design and use at different hierarchical levels and given much greater emphasis to informal controls.

Other researchers have commented on the draft PMSs framework. Stringer (2007) observes that it makes the interconnections between the different components of the PMSs explicit and that it may only be applicable at the senior level of management. While we entirely agree with the first point, we see the second as an unduly narrow application of the framework. It has been noted that the PMSs framework offers a useful checklist of issues to be considered in a comprehensive analysis of control systems (Merchant and Otley, 2007) and that it offers a logical structure to enable the identification of the various components of a PMS as well as the links among those components (Otley, 2008). This is not to say the framework is now hermetically closed; on the contrary, it is open to extension (Berry et al., 2009; Otley, 2008) and has, indeed, already been extended by the incorporation of the work of Broadbent and Laughlin (2007) in this version. Their extension is an example of the inter-disciplinary approach required for the expansion of the PMSs framework (Otley, 2008).

Broadbent and Laughlin (2007) highlight the importance of the PMSs framework in taking "forward the conceptual understanding of PMS" (p. 4). However, they appear to have misunderstood the place of context and culture in our framework. They have included the last four areas of the PMSs under the umbrella of context and culture, while we broadly see this as involving three levels of analysis. The first eight issues considered are at the core of the PMSs. The final four issues form a second level because they pervade the whole PMS and have been explicitly included to help provide a more holistic perspective. Thirdly, in our view, culture and context are part of a third level, which we have left unexplored, because the factors involved are largely outside the control of the organization.[8] It is entirely appropriate to try to study the (contingent) relationship between external circumstances and PMSs design and use, but the framework is intended to act as a descriptive mechanism to capture the latter variables only. However, we hope that it provides a valuable tool to be used in the conduct of research that seeks to examine the appropriate design of PMSs in different contexts.

6. Conclusion

The PMSs framework proposed in this paper draws on the extant literature, but also on personal observations of MCS design and use in a variety of organizations over the years. It represents the result of inductive reasoning applied to a variety of studies known to the authors. The PMSs framework is put forward as a research tool for examining the structure, operation and use of PMSs in an holistic manner.

We believe that the PMSs framework provides a tool which researchers can employ to describe the structure and use of the 'package' of controls deployed by management and designed to ensure that an organization's strategies and plans are effectively implemented. At the very least, the framework provides a powerful means of obtaining an overview and appreciation of the structure of the PMSs that are currently in use in a specific organization. Research using the framework has considered it to be useful (e.g. Broadbent and Laughlin, 2007; Collier, 2005) and anecdotal evidence of the use of the framework for teaching purposes has also been very encouraging.

We hope the framework will prove to be a useful tool for empirical researchers and will assist them in documenting the PMSs of both for-profit and not-for-profit organizations, to both describe their operation and to go on to explore the underlying reasons for such control configurations.

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[8] There is often some confusion in the literature between external culture and organizational culture, and our comments above refer to external culture. The issue of organizational culture and the extent to which it can be managed is controversial; suffice it to say that some aspects of organizational culture may well be open to managerial influence, and culture in this sense might be appropriate for consideration as part of a yet wider framework.

Appendix A. Illustration of the application of the PMSs framework

The application of the PMSs framework is illustrated by drawing on material collected from two case studies conducted by Ferreira (2002). These exploratory cases examined the operation of MCSs in the studied companies. Ferreira's analysis of the case study data drew on Otley (1999) and Simons' (1995) LOC framework and were a precursor of the development of the PMSs framework.

The first case company is the Portuguese Post Office, a public sector organization that appeared to have a rela-

Table 1
The Portuguese Post Office through the lens of the PMSs framework.

1. Vision and mission
- To move towards a company organized in three main service areas: a universal mail service network, a distribution and logistics network, and a retail and distribution of services network.
- To obtain positioning and entrepreneurial assertiveness in the message market, in the distribution and logistics market, in the financial services market, and in the convenience and multi-services market.
- These above aims were communicated through formal means.

2. Key success factors
- To provide a quality public service.
- To enhance profitability.
- To increase organizational flexibility.

3. Organization structure
- Managers' responsibility lines clearly defined and reinforced by a very peaked hierarchical structure.
- High levels of formalisation, centralisation and structure in processes.
- Organization structure supported a top-down strategic process, dominated by senior managers and assisted by external consultants.

4. Strategies and plans
- To move towards a prospector-type strategy.
- Strategic orientation defined by the executive board, sometimes with the support of consultants.
- Limited degree of delegation to first line managers in establishing means-end relationships.
- Strategy and plans formally communicated in public addresses and through guidelines for the budgeting process, known as "budgetary assumptions".

5. Key performance measures
- The formal structure of key performance measures was on the process of being explicitly defined and linked to strategy.

6. Target setting
- Targets generally set centrally by the board of directors after consultation with human resources, finance, and planning and control managers.
- Some degree of participation (negotiation) of first line managers in target setting.
- Negotiation of budget and plans at lower levels created budgetary slack.
- Targets set at achievable levels.

7. Performance evaluation
- A formalised and institutionalised process driven by human resources guidelines.
- Performance evaluations used to determine training needs and to set performance targets at operational levels.
- Reliance on subjective performance evaluations was predominant.

8. Rewards systems
- Financial incentives awarded with explicit rejection of their link to individual performance evaluations.
- Managerial discretion could and was used within certain limits in awarding incentives to subordinates.
- All managers were eligible to incentives.

9. Information flows, systems and networks
- Control system built to address the needs of managers at different levels, but with clear restrictions with regards to information access privileges, which were dependent upon hierarchical positions.
- Use of a sophisticated intranet IT application to disseminate information throughout the organization.
- Short-term feedback information on plan and budget variances provided.
- Information largely dominated by operational matters.
- Some feed-forward information could be observed at the level of meetings.
- Strategic and horizontal information available throughout the organization was scarce.

10. PMSs use
- Large number of control mechanisms (e.g. plans and budgets, benchmarking) used diagnostically.
- Limited use of the management control systems interactively created an imbalance between the positive and negative forces within the control system.

11. PMSs change
- The ongoing restructuring process at the organizational level required adaptation of the MCS to cope with new lines of reporting and new information needs.
- Introduction of KPIs hierarchies under way as means of creating a culture of "performance" and of entrepreneurialism.

12. Strength and coherence
- Imbalance between the positive and the negative forces within the control system.
- Disconnect between performance evaluation and performance rewards.
- Low level of interactive use of PMSs and of feed-forward controls may have detracted from strategic success.
- Apparent inconsistencies between key objectives, organization structure and culture.

Table 2
Texco through the lens of the PMSs framework.

1. Vision and mission
- To be highly profitable and financially strong from an international perspective.

2. Key success factors
- To dominate the industrial and commercial 'know how'.
- To achieve high productivity levels.
- To foster the evolution of the group's information systems and its relationship with customers and suppliers.
- To control the logistics of the business.
- To offer quality, innovation and differentiation.
- To dominate the markets either alone or through strategic alliances.

3. Organization structure
- Moving towards a flat, highly decentralised structure.
- Family-controlled business with a mix of family managers and external managers.
- Management teams encouraged to run the businesses autonomously from other group companies.

4. Strategies and plans
- Pursuing an analyser type of strategy.
- General strategic orientation defined at the group level.
- A business plan ensued the strategic process.
- Autonomy given to company's top managers in establishing means-end relationships.

5. Key performance measures
- KPMs mainly focused on financial and operational performance measures.
- The link between KPMs and strategy was unclear.

6. Target setting
- Targets generally set on the basis on expected market conditions and 'historical' reasonableness of figures.

7. Performance evaluation
- Performance evaluation process of shop floor employees was largely objective.

8. Rewards systems
- No use of financial incentives to reward managerial performance.
- Use of bonus scheme at the shop floor level that was directly to performance evaluation.

9. Information flows, systems and networks
- Key performance measures monitored by a *tableau the bord*.
- Information largely dominated by operational matters.
- Monthly feedback on a range of information including budget variances.
- Little evidence of feed-forward information flows.

10. PMSs use
- Control mechanisms, such as the *tableau de bord*, budget, and business plans were used diagnostically.
- Limited use of the management control systems interactively.

11. PMSs change
- The MCS was undergoing a period of stability with no change in recent times.

12. Strength and coherence
- There was an imbalance between the positive, creative, learning controls and the negative, limiting, monitoring controls.
- Performance management system appeared to be reasonably well conceived.

tively advanced MCS in terms of the information produced, but fairly conventional MCS in terms of the techniques used. The company was undergoing a process of strategic change, moving from a reactor- to a prospector-type strategy (Miles and Snow, 1978). The second case company is Texco,[9] a medium sized, family-controlled company that operated in the traditional textile industry. Texco had endured a major restructuring in the 1990s to avoid bankruptcy. The cases were brief, involving a small number of interviews focussing on individuals at the top of the companies' hierarchies, but they did illustrate many aspects of PMSs in both organizations. Importantly, these cases show how the PMSs framework set out in this paper can be used to effectively generate a preliminary overview of the key features of PMSs. However, some of the answers to the PMSs framework's questions are not complete as insufficient evidence was gathered at the time to address all the issues outlined in this new framework. Tables 1 and 2 illustrate, respectively, the application of the framework in the Portuguese Post Office and Texco cases.

For the reason noted above, some issues of the PMSs framework have been left unanswered and new questions naturally emerge from the snapshot. However, the cases provide an indication of how the PMSs framework might be used to describe PMSs. In addition, the results proved to be of interest to organizational managers and indicate how the framework might also be used as a diagnostic tool by practitioners.

[9] Texco is pseudonym used for confidentiality reasons.

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