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Key findings:

- This study develops a conceptual framework to understand the roles and uses of control systems in the integration of sustainability within organisational strategy. It highlights the importance of integrating sustainability within management control rather than simply relying on discourse to deliver a triple rather than a single bottom line.
- Our framework presents a repertoire of systems configurations and use for building an organisational diagnostic of the nature and mode of sustainability integration within control systems and of their uses for strategising sustainability. We describe how organisations can move from one configuration to another and highlight various paths toward sustainability integration or marginalisation within organisations.
- The framework provides an analytical tool to investigate the nature and mode of integration between management control systems (MCSs) and sustainability control systems (SCSs). They are often operated by different groups within the organisation. The combination of the use and integration of these systems allows the specification of boundary conditions for sustainability integration.
- This study is composed of three UK corporate case studies and makes 'visible' intra-organisational processes relating to MCSs and SCSs. Overall there is no single avenue for the integration of these two types of systems even in companies which share a strong commitment to integrating sustainability into their strategies. We discuss paths across configurations which emerge from the three case studies and others which emerge from the logic of the framework.

- This study illustrates various ways in which sustainability was integrated into strategy and explains this principally in terms of commercial pressures. We identify cognitive, organisational and technical barriers and enablers of this integration.
- Companies are mobilising MCSs and SCSs but they vary in their integration and precise uses of these systems. Our study shows how systems can be used interactively and diagnostically in order to deploy and renew sustainability strategy and how these uses can be shaped by organisational cultural factors.
- Key barriers to integration of systems are around incompatibilities of measurement systems; organisational silos and stretch; insufficient investment in the sustainability side; and under-developed key performance indicators (KPIs), other metrics and information technology (IT). Key enablers are around the strength of shared staff commitments to and understandings of sustainability; leadership and champions; and IT and metrics development.
- We derived from our study a set of managerial recommendations to overcome the barriers to systems integration, facilitate sustainability integration within organisations, and enhance sustainability strategy.

Introduction

Sustainability has moved from the margins to the mainstream. Concern with the intra-generational justice; inter-generational or global justice and the balance of economic, social and environmental criteria is no longer confined to fringe groups and academics. Sustainability increasingly preoccupies governments as a result of their greater awareness of threats to their national and collective sustainability. In part due to the resultant governmental regulatory ambition but also due to threats to their own sustainability and to opportunities for innovation and cost reduction, companies are increasingly adopting the rhetoric of concern with sustainability.

Now we move from the question as to whether business should engage with sustainability to how these challenges can be addressed. Our report contributes to this latter question area, specifically by focusing on the use of management control for sustainability strategy.

Prior research on sustainability and management control has addressed the emergence of sustainability control systems by either focussing on their impacts upon financial and non-financial performance or describing and analysing the use of dedicated systems to control for sustainability. Surprisingly little is known either about the relationship between 'conventional' (i.e. more financially orientated) management control systems (MCSs) and sustainability control systems (SCSs). SCSs capture environmental and social issues in a more systematic and broader way than conventional MCSs do and are usually operated by groups other than the finance/accounting team within the organisation. Our intention is to address this gap and explore how organisations mobilise and configure both types of system and to investigate their respective roles for enhancing sustainability. One main reason for this endeavour is that SCSs are generally viewed as capable of contributing to effective integration of sustainability within strategy only when they inform MCSs rather than when they are used as 'autonomous strategic tools' (Burgelman 1991; Simons, 1995). Short of this, SCSs may remain peripheral to and decoupled from core business activities and fail to reshape strategy. Consequently, there is a danger that sustainability practices can be symbolically adopted, whether for reporting or stakeholder purposes. This danger may also be compounded by the lack of study of the relationships between intra-organisational accounting practices and sustainability management and reporting.

The first aim of our conceptual framework of configurations of the strategic integration of sustainability is to highlight more precisely the different configurations that are possible for organisations. The eight configurations we identify are

a function – first, of the overall levels of integration of sustainability in control systems (high or low) and secondly, whether conventional MCSs and SCSs are used diagnostically or interactively. The second and related aim of the framework is to enable us to empirically track dynamics of sustainability in our case studies and to inform broader envisioning of pathways for the organisational integration of sustainability.

The aims of our empirical study are to explore how organisations mobilise MCSs and SCSs in order to advance sustainability and how relations between MCSs and SCSs facilitate or prevent the integration of sustainability within strategy. Our goal is to provide managers and accountants with a deeper knowledge of these systems' roles in enhancing sustainable development within the corporation. Throughout the study we note similarities and differences in the responses of sustainability staff and their finance, accounting and management colleagues in order to contrast their views and uncover possible barriers to and enablers of sustainability strategy integration.

The three research questions are:

- How do companies mobilise control systems for sustainability strategy, using the concepts of use and integration?
- How do senior managers, management accountants and sustainability managers interact with each other around the use of control systems in the context of formulation and deployment of sustainability strategy?
- What aspects enhance and/or hamper the co-operation of senior management, management accountants and sustainability managers through control systems in sustainability strategy-making?

The key topics covered by our empirical analysis are:

- drivers of sustainability strategy
- integration of sustainability within overall strategy
- uses of control systems – MCSs and SCSs
- integration of sustainability into control systems
- role of social interactions and culture in sustainability integration
- configuration of uses and integration of MCSs and SCSs.

In examination of drivers of sustainability strategy, we generally examine what sort of factors the companies identify as provoking their development of sustainability strategy – commercial, competitive, operational, compliance or employee driven.

We investigate the extent to which SCSs are linked with MCSs and identify key barriers and enablers of that integration, specifically:

- cognitive – how people think
- organisational – how processes are organised and structured
- technical – how are tools used

(Hoffman & Bazerman, 2005).

In examining the uses of MCSs and SCSs we focus particularly on whether they are used for controlling the deployment of a predefined strategy (diagnostic use) or to trigger learning and stimulate strategy renewal (interactive use).

Turning to the integration of the MCSs and SCSs we investigate the presence of barriers and enablers of integration, again distinguishing the cognitive, organisational and technical.

We study the role of social interactions and culture in enabling sustainability integration in order to assess the extent to which shared values and common corporate culture can contribute here. We distinguish in particular the cultural levers of belief – shared systems of internalised beliefs – and boundaries – understandings of the frontiers of acceptable and unacceptable behaviour.

Together, the findings from this research enable us to illustrate eight different organisational configurations of MCS and SCS uses for sustainability. We discuss actual and possible paths across configurations with regard to the three case study companies and more generally.

Framework

In order to appreciate the modes of sustainability integration within corporate strategy, we focus on the various uses of both MCSs and SCSs – diagnostic vs. interactive – as well as on their level of integration to delineate ideal-types of organisational configurations. The concept of 'control system use' derives from the works of Simons (1991, 1994, 1995). This suggests executives may use control systems either as 'management by exception' tools (diagnostic use) to control and correct actors' actions, or as 'actual strategic levers' (interactive use) to focus actors' attention on key goals and support changes aligned with higher strategic objectives. Integration is defined here as the degree of overlap between the two types of control systems under study which includes technical, organisational/social and cognitive components (Hoffman & Bazerman, 2005). In doing so, we approach integration as a thick socio-technical process (Emery and Trist, 1969).

In organisational contexts characterised by high levels of integration, MCSs and SCSs are tightly coupled whereas in low integration contexts, they are only loosely coupled. We use this broad approach to integration to shed light on the relationship between the two types of systems. Clearly there is something artificial in this dichotomy as in reality, the object of control of SCSs should be environmental, social and economic issues. However, conventional MCSs may also address some sustainability criteria. Moreover, control systems are not necessarily static but in development and MCSs may incrementally add sustainability purposes whereas SCSs may be developed further into more comprehensive systems balancing environmental, social and economic issues. However, the dichotomy reflects a general view that some control systems are designed to address sustainability issues and others are not. Moreover, SCSs are often operated by different groups to the MCSs within the organisation.

With respect to the development of our framework, we distinguish two encompassing types of systems – MCS and SCS – and consider an overall level of systems' integration. Integration is a continuum variable that reflects an aggregated level of technical, organisational, and cognitive integration. However, we assume that overall integration can be either high or low. Within these restrictive assumptions, we explore the combinations of forms of integration and uses of accounting systems to delineate a parsimonious number of plausible configurations of MCS and SCS relationships and specific uses within organisations. These eight configurations are presented in Table 1 and briefly explained and illustrated in Appendix A.

Table 1. Configurations of sustainability strategic integration through management control

Overall level of control systems integration	Use of systems		Configuration
	Management control system	Sustainability control system	
Low	Diagnostic	Diagnostic	Dormant decoupled strategy (configuration A)
Low	Interactive	Diagnostic	Compliance driven sustainability strategy (configuration B)
Low	Diagnostic	Interactive	Strategy emergence through sustainability (configuration C)
Low	Interactive	Interactive	Schizoid sustainability strategy (configuration D)
High	Diagnostic	Diagnostic	Dormant integrated strategy (configuration E)
High	Interactive	Diagnostic	Peripheral sustainability integration (configuration F)
High	Diagnostic	Interactive	Sustainability driven organisational strategy (configuration G)
High	Interactive	Interactive	Integrated sustainability strategy (configuration H)

The eight configurations constitute a set of ideal-types of relationships between strategy-making processes and control systems oriented toward different ends (sustainability vs. financial control). We expect these eight configurations to lead to rather different outcomes in terms of sustainable strategy making. Appendix A looks at: the logic of the relationships between integration (high and low); the use of MCSs and SCSs (diagnostic vs. interactive); and the particular configurations, illustrating these with reference to types of business behaviour. In broad terms we would expect that less robust sustainability strategies would arise in configurations A, C and E than for the configuration B, F, G and H. On the other hand, configuration D appears less predictable in terms of sustainable strategic outcomes. Nonetheless configurations B, F, G and H differ in more nuanced terms as for example, a result of the role of cognitive barriers, the extent of integration and the opportunity that interactive use of MCSs and SCSs can make for renewal of strategies. Likewise the first four configurations also differ accordingly to organisational, market and regulatory factors.

As we shall see in the light of our case studies, we can identify how organisations' sustainability strategies are configured, trace their journeys to this point and anticipate possible future pathways among the configurations.

Research methodology

We investigated three UK companies, covering different sectors, company and product types and sustainability agendas. The three case studies are:

- Boots UK: a retailer of health and beauty products in the UK which is part of an international pharmacy-led health and beauty group. They have over 63,000 employees and a turnover of about £4.85 billion.
- Halcrow: specialising in the provision of planning, design and management services for infrastructure development worldwide. They have 6,000 employees and in 2009, had an approximate turnover of £500m.
- The Commercial Group: an independently-owned office services company in the UK. Its annual turnover was £23m and they have 150 employees.

Because we address why and how questions and because our study clarifies the role of variables that have been overlooked in prior research, the case study method is particularly appropriate (Eisenhardt 1989, Yin 2003). In order to address our research questions, we adopted a multi-case study research design. This compared and contrasted the uses and interactions of various MCSs and SCSs within and across three corporate

contexts. Within each context, we followed a three stages data-collection process and hence consolidated our findings through comparative data-analysis. The purpose was to clarify the factors influencing the specific uses (Simons 1990) and the level of integration of MCSs and SCSs within corporations in order to evaluate their influence on the development and deployment of a sustainability strategy.

Our three-stage data-collection process was employed in each of the three companies in order to access information about the uses and level of integration of MCSs and SCSs.

Stage one

We conducted a series of preliminary interviews with individuals in senior management positions. We focused on the head of the accounting/finance department, the head of sustainability department and where possible, talked to senior management directors and other senior staff. We used this data and secondary data collected on site as background information to develop interview guides for each corporation and before meeting other professionals directly involved in the management of these systems.

Stage two

We conducted two focus groups within each organisation, ranging between four and nine managers. The first focus group was comprised of staff of the finance team. The second group included professionals involved in sustainability control – specifically in the sustainability department and the main providers and users of sustainability information in other departments. These workshops allowed further insights into the use and integration of both MCSs and SCSs within the corporation but also enabled comparison of perceptions of these groups. This showed insights into cognitive, organisational and technical barriers to the use and integration of the respective systems the two groups worked on.

Stage three

We organised two workshops within each corporation bringing together:

- individual interview partners from stage one
- managers and professionals involved in the first focus groups in stage two of the data collection process.

These groups allowed us to discuss our findings and consider the possibility of overcoming the barriers identified as well as the organisational effects produced by the various attempts at coupling MCSs and SCSs. In some cases, we completed this process with follow-up interviews with persons involved in stage one.

We have taken a relatively inductive approach to the concept of sustainability for the purposes of this project. This means we took what the companies indicated as their sustainability strategy and their SCSs. As a result there are some differences across the cases in the precise meanings of sustainability reflecting the companies' different operations; risk and opportunity profiles; and different organisational legacies in the related areas of corporate social responsibility and business ethics. One obvious manifestation of this is that at one company, many sustainability agendas are discussed in CSR terms.

Main findings and their implications for practical application

Integration of sustainability into strategy

All three case studies (Appendix B) are making progress towards integration of sustainability into company strategy and more specifically towards the integration of MCSs and SCSs. Their development trajectories in part, reflect the fairly obvious differences in: company size and operations, sustainability risks and opportunities and their regulatory and competitive environments.

Despite the very different business models of the three companies – and particularly the down-stream chains – it is most striking that sustainability, finance, accounting and management staff single out commercial factors. These factors include consumers, customers, suppliers and commercial partners and drive their sustainability agenda and the integration into strategy. This suggests the companies perceive consumer and business customer expectations about sustainability products and services to be highly relevant. While this is in large part a revenue orientation for the companies (i.e. sustainability is part of the bottom line), this is also explained in terms of broader brand reputation. In addition, Boots UK and Halcrow also note the significance of compliance issues and external evaluations of their performance, which presumably reinforce their corporate reputations.

Despite the differences in size and core knowledge of the companies, we found quite a consistent story of barriers and enablers for strategic integration.

Cognitive barriers to integration were around:

- uncertainties surrounding sustainability costs and risks
- uncertainties surrounding the relationship of sustainability to mainstream business performance.

These are tempered by some key *cognitive enablers* of integration:

- Staff awareness of the value of sustainability:
 - in Halcrow this specifically arose from the construction of a business case for sustainability
 - in Boots UK this is a legacy effect
 - in The Commercial Group this results from recent internal initiatives and awareness of stakeholder engagement – particularly around commercial partners and consumers.

- Strong leadership for sustainability.

Organisational barriers were around:

- co-ordination across multiple internal businesses, functions and management levels (particularly for Halcrow given its scale, scope and variety of operations)
- leadership commitment.

There was a certain symmetry with *organisational enablers*:

- leadership
- specification of sustainability in company goals
- Boots UK staff also pointed to the institutionalisation of CSR in company goals, in corporate governance terms, and in the establishment of CSR champions – which was one way of addressing the co-ordination barrier noted above
- in The Commercial Group, the flat structure was an obvious means for a small company to overcome inter-departmentalism, provide access to company directors and enable smooth information flows.

Although technical barriers were noted, they seemed less pressing than the cognitive and organisational barriers identified.

The key *technical barrier* was:

- establishing stable metrics – particularly those that could be applied across the business (most pressing for Halcrow given its size and scope).

Technical enablers included:

- appropriate intranet capacity at The Commercial Group – presumably this was easily achieved, given its relatively narrow and cohesive product and service range
- the development of appropriate KPIs covering product and project life-cycles, balanced scorecards (Boots UK, Halcrow) and consistent carbon footprints (The Commercial Group).

Uses and integration of control systems

All three companies used a number of MCSs from strategic planning, budgeting, financial and non-financial measurement systems, project management, hybrid systems and evaluation and reward. For the most part these MCSs are used diagnostically. Boots UK and The Commercial Group share a similar focus on strategic planning, financial measurement and budgeting. In addition, The Commercial Group places emphasis on evaluation and reward and Halcrow also focuses on project management. They mobilise different systems to be used interactively for strategic purposes. Boots UK uses strategic planning and budgeting; Halcrow mobilises financial measurement; while The Commercial Group uses budgeting and staff evaluation and reward.

There is an even greater variety in the employment of SCSs. Boots UK and Halcrow appear to have well-established systems for strategic planning and related non-financial measurement systems. In the Boots UK case these are relatively well-embedded in the wider MCSs and are used interactively, including in stakeholder engagement and sustainability review. Halcrow is at an earlier stage and SCSs are mainly confined to diagnostic uses. However, SCSs are now becoming better integrated into project tenders and management and prospectively through the development of the new balanced scorecard at group level which includes individual KPIs on sustainability. The Commercial Group has a narrower range of SCSs, most of which are used diagnostically. Interactive systems are around project management and a few emergent environmental impact measurements. There are currently fewer well-integrated with wider MCSs.

Barriers to and enablers of integration of SCSs with MCSs

There appear to be fairly common barriers to the integration of SCSs with MCSs.

The principle *cognitive barriers* are:

- incompatibilities between the design logics of MCSs and SCSs
- understandings of their respective objectives and operations
- under-developed shared commitments to and understandings of sustainability.

Common *organisational barriers* are:

- latent silo effects
- under-investment in sustainability data collection and development
- insufficient systems and structures enabling staff collaboration

- the range of business units and management levels to be included in any effective integration (particularly for Boots UK and Halcrow).

Technical barriers are also shared and include:

- challenges of developing integrative and comparable KPIs and other metrics
- difficulties in measuring and accounting for the various impacts caused by company activities as well as the value created through sustainability measures
- unavailability of appropriate IT, particularly to integrate sustainability and financial data.

All three companies also identified a broadly common set of *cognitive enablers of integration*:

- awareness of the potential contribution of sustainability to business goals
- Halcrow added extending sustainability awareness to customers.

Organisational enablers were identified around:

- leadership
- staff champions
- management systems for staff KPIs around sustainability.

The common *technical enablers* were:

- the implementation of technologies to automatise the collection of sustainability information (e.g. in real time)
- the development of appropriate IT, software and metrics which support the integration of MCSs and SCSs.

Staff interaction around management systems

The company representatives attested to the importance of staff interaction, particularly in relation to organisational and cognitive barriers enablers of the integration of SCSs into MCSs.

All three companies reveal good staff interaction around control systems in general terms. In Boots UK, this has been underpinned by clear channels of reporting, executive responsibility for operations and named individuals for delivering the CSR programme. In Boots UK and Halcrow the interactions between CSR/sustainability and finance and management staff have recently developed from periodic (e.g. at annual reporting) to more thorough interactions. In both cases, this has reflected increasingly shared cultural beliefs encouraged by leadership initiatives. Given the nature of the technical obstacles to integration at Boots UK, integration between these groups of staff has increased following the integration of financial reporting systems and CSR data management.

This organisational integration has revealed further potential cognitive barriers but are being positively addressed. At The Commercial Group, the interactions are supported by the small size and relatively flat structure.

In all three companies, cultural levels of shared belief appear particularly powerful in supporting integration. These reflect different combinations of legacy, structure and initiative. Cultural boundary levers contribute less overtly to integration, but may operate implicitly where well-embedded systems of governance and ethics operate, particularly at Boots UK.

Configurations of uses and integration of MCSs and SCSs

In this section, we link the empirical findings in the framework previously discussed. The findings of only three companies suggest a diversity of configurations of uses and integration of MCS and SCS, of organisational levers, their influence on sustainability advancement and integration into strategy.

At Boots UK, we observe a strong strategic integration of CSR and sustainability suggesting that the company is currently between the two configurations of 'Schizoid sustainability strategy' and 'Integrated sustainability strategy'. Initially, sustainability integration was advanced through the establishment of comprehensive systems for interactive control of CSR and sustainability issues – in particular, CSR scorecard and strategic planning system. Following a merger and a private equity buy-out MCS was also used interactively, leading to the configuration of 'schizoid sustainability strategy'. From this configuration, the company progressed in integrating sustainability into wider management control. Even though some cognitive and organisational barriers are still present, due to the refocus on shareholder value and the difficulty in assessing the financial value of some sustainability activities, there is now a strong move towards a high level of integration of MCS and SCS. This is reflected in the mobilisation of a similar set of systems to control for business and CSR objectives and important overlaps and hybridisation between these systems. In so doing, Boots UK is striving toward the configuration of 'Integrated sustainability strategy'. This alignment is explained by integrated calculative practices and a technical infrastructure which allow processing CSR/sustainability and financial data according to the same logic. The alignment also increased interaction between CSR and finance/accounting teams, facilitating the creation of a community of management control practice at the overlap of CSR and finance/accounting departments. These relationships are both formal and informal between CSR and finance/accounting individuals.

Halcrow presents a 'Compliance driven sustainability strategy' in which a specific set of diagnostic systems is deployed to meet stakeholders' expectation and control for sustainability targets. In terms of systems' integration, the business and sustainability objectives are mainly deployed through separate and differentiated MCS and SCS (see Appendix B). A subset of the SCS is not fully operational due to prevailing technical software problems. The specific company structure around five main business units presents a particular challenge to sustainability control, although there is an overall conducive and supportive organisational culture for sustainability integration. In response to this risk of sustainability marginalisation from core activities, sustainability managers and executives have recently developed more proactive strategies aimed at embedding sustainability within MCS. Halcrow has started to roll out a balanced scorecard at group level. This reorganisation initiated debate around sustainability and resulted in the integration of individual sustainability indicators in the balanced scorecard. The reconfiguration of MCS and SCS represents a strong movement towards strategic sustainability integration. It also highlights the importance of the design of new control systems in mainstreaming sustainability within core strategy and of managing the centre-periphery tension for the control of sustainability issues across diverse businesses. Depending on the weight given to sustainability within the balanced scorecard and to the progress of SCS, 'Peripheral sustainability integration' and 'Integrated sustainability strategy' could be a possible future pathway. This path could first allow for higher integration of MCS and SCS and then more active mobilisation of the SCS in order to move from compliance to strategy-making for sustainability.

The configuration at our third case study company, The Commercial Group, can be described as 'Strategy emergence through sustainability' and emphasises that belief and boundary levers can shape organisational behaviours. This is seen through creating a culture supporting sustainability integration, even in the absence of technical integration. The Commercial Group activates belief systems as the core lever to enhance sustainability integration and balances this with the interactive control in a few subsets of SCS such as project management. Overall, the business and sustainability objectives are deployed through differentiated rather than integrated control systems (see Appendix B). Such a distributed approach to MCS and SCS is not problematic, given the organisational size allows mobilisation of complementary and less formal levers of control – i.e. beliefs and boundary levers. To some extent, the lack of sustainability formalization is even an advantage as it supports organisational innovations and initiatives as long as the various levers of control are well balanced. Concern was expressed that a lack of formalisation may also prevent the company from making a step-change on sustainability and a disconnect

was revealed between economic objectives and social and environmental goals. As the organisation grows and competition on sustainability strengthens, there is recognition that greater formalisation and deeper integration of sustainability is required within the systems that constitute the backbone of The Commercial Group – budgeting, evaluation and reward. Avenues to move in this direction would be represented by configurations such as 'Sustainability driven organisational strategy' and 'Integrated sustainability strategy.'

Paths to sustainability integration and marginalisation

Moves through strategic mobilisation vs. demobilisation of control systems

By linking configurations together we can show paths to sustainability integration in strategy – i.e. moves across the configurations are driven by changes in the use of control systems. These changes can take the form of strategic mobilisation, when a control system traditionally used in a diagnostic way is used interactively to deploy a strategy. As highlighted by Simons (1991), chief executive officers (CEOs) can mobilise strategically an MCS in order to reorient the strategy, especially when they are newly appointed (Simons 1995). In selecting a control system to be used interactively, CEOs refocus managerial attention to the dimensions judged crucial to enact the new strategy and build a competitive advantage. Accordingly, the mobilisation of a dormant MCS can renew corporate strategy.

The balance of interactive vs. diagnostic uses of SCSs and MCSs reflects the strategic priorities and the willingness to actually enhance and/or deploy a sustainability strategy that can strengthen a firm's competitive advantage. Mobilising a SCS in using it interactively rather than diagnostically can push the corporation in the direction of sustainability integration within strategy. In Table 1, this corresponds to following moves: from A to C; B to D; E to G or F to H.

However, in contrast with strategic mobilisation, our analysis also suggests the possible demobilisation of a given control system. In Table 1, this can be seen through moves from D to B or D to C. This can happen deliberately, when a CEO decides to de-emphasise a MCS that does not correspond to the strategy they wish to pursue. Following this logic, a sustainability strategy actively deployed through a SCS to mobilise employees, suppliers and customers around sustainability issues can become managed diagnostically, once the uncertainties surrounding sustainability are controlled.

Moves through integration vs. disintegration of control systems

These moves correspond either to enhancement or diminution in the overall levels of integration that result from changes in intensity of technical, social or cognitive modes of integration. In altering the levels of systems coupling through these three dimensions, managers and executives may contribute to the facilitation or prevention of sustainability integration within strategy.

Several factors can contribute to alter the various dimensions of integrations, leading to changes in systems coupling. First, at the technical level the migration toward a new IT management system can enable the sharing of data from various systems, thus facilitating systems integration. In contrast to this situation, a move toward an enterprise resource planning system that cannot process sustainability data can jeopardise prior efforts to integrate SCSs and MCSs. At the organisational level, career management, job design and the transformation of functional boundaries may facilitate the transversal move of people across departments and in turn, enhance exchanges of information from teams working with MCSs and SCSs. However, organisational changes may also enhance departmental boundaries and thus decrease the organisational integration of SCSs and MCSs. Finally, at the cognitive level, arguments related to the business case for sustainability can help in overcoming cognitive barriers to sustainability integration whereas the dominance of the shareholder view can make the integration of sustainability in managers' cognitions difficult.

The combinations and accumulations of moves over these three levels result in changes in the levels of system integration and create switches from low to high coupling. In Table 1, this can be seen through moves from A to E; B to F; C to G and D to H. Alternatively, these changes also undermine integration – in Table 1, moves from E to A; F to B; G to C and H to D.

Implications for practical application

Our study has strong managerial implications.

1. The analysis of the combination of control systems' use and integration allows for specification of boundary conditions for strategic sustainability integration. In uncovering the importance of various forms of system integration, our analysis reveals the strategic mobilisation of a SCS by top managers may not be enough to deploy a sustainability strategy. The conventional MCSs may remain a structuring force of actors' behaviour and sustainability systems can remain peripheral. Our study stresses that integrating sustainability in control systems is a necessary condition to enhance sustainability strategy. Sustainability may be integrated through a MCS that is dormant and which

does not inform the strategy. A more effective approach for managers willing to raise sustainability awareness is to integrate SCSs within the primary MCSs used interactively by executives.

2. The typology of configurations and the list of barriers to integration can be used as repertoires for building an organisational diagnostic of the degree of sustainability integration. They highlight the importance of integrating sustainability within control systems and not only within discourse, to deliver a triple rather than a single bottom line. In so doing, our framework accounts for the complex processes and crucial role of MCSs and SCSs in the progression of sustainability integration within strategy. Yet, it can also help in identifying threats to integration.
3. Our study highlights the contrasting processes of: systemic integration – move from a low to a high integration level – versus dissociation – move from high to low levels of integration. Also, strategic mobilisation – move from a diagnostic to an interactive use of systems – versus demobilisation – move from an interactive to a diagnostic use. It reveals that some paths may be easier than others to follow in order to elaborate a sustainability strategy. Hence, we show important path dependencies as well as levers and barriers to facilitate the progressive integration of sustainability.
4. The case studies not only provide a clearer understanding of the actual and potential role of control systems but also underline the increasingly important role of management accountants in the development and deployment of sustainability strategy. We reveal technical, organisational and cognitive barriers to the communication and interaction between management accountants, sustainability managers and senior managers. Dedicated cross-functional training programs may help overcome silos and build strong communities of practices across different disciplines and departments. More generally, accounting curricula may need to better integrate diverse competencies required to understand, make transparent and control the sustainability issues which are most relevant for both the company's strategy and the society. Our case study findings complement the results of the sustainability survey by CIMA (2010). Interestingly however, they indicate that contrary to these results, we found a will – on the part of management accountants in our case companies – to incorporate social and environmental issues into their roles.

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Appendix A: configurations

The configurations are introduced by moving from low to high levels of integration and from fully diagnostic to fully interactive uses of MCSs and SCSs.

Low integration configurations

Configurations corresponding to a low level of integration refer to organisational contexts within which the combination of cognitive, organisational and technical integration between sustainability and regular MCSs is low. This then leads to a poor or a loose co-ordination between both systems.

Dormant decoupled strategy – configuration A

This configuration occurs when the corporation possesses parallel systems of control for financial, environmental and social issues, yet none of them is actually mobilised to deploy any kind of strategy (Simons, 1991: 53-55). The organisation lacks vision for its development and has no clear strategy. This situation can occur in developed or bureaucratised organisations enjoying monopoly power in their market. For corporations acting in dynamic and competitive markets or listed on a stock exchange, such a situation is likely to be transitory, as pressures for strategising are likely to emerge either from shareholders or competitors.

Compliance-driven sustainability strategy – configuration B

This configuration can emerge as the corporation strategically mobilised one of its MCSs to deploy its strategy (Simons, 1991, 1994), yet pays little attention to sustainability issues which are managed diagnostically through a parallel system. The development of the SCS may have been driven by external pressures to report on social and environmental issues such as legal pressures and/or stakeholder pressures (O'Dwyer & Owen, 2007; Kolk, 2003). This configuration has often been observed during early stages of sustainability integration – for instance in the case of Nike reported by Zadek (2004) (see also, Mirvis & Googins, 2006; Maon et al., 2009).

Strategy emergence through sustainability – configuration C

This configuration arises with an emerging strategic renewal through sustainability. Here, MCSs and SCSs are still not integrated but the sustainability system is mobilised strategically by the top management team to deploy a sustainability strategy (Simons, 1994). This configuration could arise with the creation of a dynamic new department for sustainable development, made up of entrepreneurial actors who are triggering changes within a bureaucratised organisation (Burgelman, 1984).

Schizoid sustainability strategy – configuration D

The low-integration configuration refers to an organisational context within which contradictory sustainable and conventional strategies are followed and deployed actively through parallel sustainability and conventional MCSs. For example, diversified multinational corporations have been shown to exhibit contrasting sustainable behaviours in various countries, supporting the view of corporate actors 'being good while being bad' (Strike et al., 2006).

High integration configurations

A second set of ideal-type configurations corresponds to situations where MCSs and SCSs are strongly coupled and integrated through cognitive, organisational and/or technical processes. This high integration means that MCSs and SCSs are co-ordinated, yet important differences emerge from the various uses of both systems.

Dormant integrated strategy – configuration E

Although both systems are strongly tied, they are not necessarily mobilised to deploy any kind of strategy. This situation can be found in a corporation that has recently integrated sustainability within its balanced scorecard but does not mobilise this system due to the emergence of new radical uncertainties. For example, the prospect of a merger or a hostile takeover, which temporarily prevents the adoption of strategic action.

Peripheral sustainability integration – configuration F

This situation corresponds to an organisation within which only the encompassing MCS is used interactively to deploy the strategy, with the management of sustainability being used as a diagnostic tool. This can occur when organisations that have derived their sustainability systems from pre-existing MCSs and do not consider the main strategic uncertainties to be related to the sustainability area. In such a configuration, sustainability data does not feed the process of strategy-making and therefore, sustainability-driven innovation is very unlikely (Gond & Herrbach, 2006). Further, they experience some constraints and boundaries related to sustainability because of diagnostic monitoring of the respective sustainability issues.

Sustainability-driven organisational strategy – configuration G

This configuration occurs when the MCS is not used interactively and where the strategy-making process is driven by sustainability through the interactive use of the SCS. This sustainability driven strategy may arise at an early stage of development when the MCS has not yet been integrated into the strategy making process.

Integrated sustainability strategy – configuration H

A last configuration arises when there is interactive use of both integrated systems in which sustainable strategy and strategy making overlap completely. This allows the deployment and renewal of a sustainability strategy through the use of coherently integrated systems. This configuration corresponds to the highest level of sustainability implementation in which a control infrastructure is in place for embedding sustainability. This configuration allows managers to derive process, service and products innovations from engagement with sustainability (McWilliams & Siegel, 2000) and is therefore consistent with a differentiation positioning (Porter, 1980). Within this configuration, the interactive use of systems can trigger processes of organisational learning and changes (Gond & Herrbach, 2006) which can enhance organisational performance on multiple dimensions.

Appendix B: case studies

Boots UK

There is consensus that commercial pressures through suppliers and partnerships as well as customer expectations are the main drivers of CSR at Boots UK. Interestingly, the commercial customer demand is mostly driven by the need to protect the trust in the brand – doing the right things – and to a lesser extent proactively promoted and used to enhance revenues. In general, reputational risk considerations are seen as an overarching theme encapsulating not only commercial but also legal and other drivers relevant to the CSR agenda. Further drivers include competitive pressures impinging on Boots UK's reputation via external benchmarking exercises and employee expectations, supplemented by, respectively: compliance and prospective regulation and operational benefits – e.g. savings, integration and communication. The Boots UK organisational culture is regarded as propitious for integration of CSR with strategy due to its heritage in social responsibility. Initially, there was some uncertainty over the implications of the recent merger and private equity buy-out, until the 'taken for granted' attitude to integration of CSR. However, there is a growing momentum for stronger integration of CSR into the overall organization.

Barriers were identified and included:

- cognitive barriers were identified – focus on costs rather than on the value of CSR, the introduction of different national business cultures.
- organisational barriers – co-ordination challenges across multiple businesses and functions, middle management support, absence of financial incentives
- technical barriers – in developing stable metrics, in obtaining supply chain-wide assessment, in integrating IT platforms.

The perceived barriers are seen to arise naturally from further embedding the CSR agenda into the organisation and pulling this out of core business. Both sets of staff single out organisational enablers as paramount – e.g. through supportive corporate governance, CSR champions network, integration of CSR goals across the business. Cognitive enablers were also identified – e.g. staff recognition and appreciation of CSR, support for an ethical business approach and for sustainability innovation, underpinned by customer focus. Overall these perceptions reflect well on the level of integration of CSR within strategy and the enablers developed and applied offer a strong basis for the future integration.

Turning to the use of MCSs, the budgeting system is the most critical for Boots UK, supported by strategic planning and a monthly financial measurement system. Non-financial measurement systems provide other relevant information

such as market developments, operational metrics and some CSR related data. On the other hand, evaluation and reward are also increasingly mobilised for achieving the organisation's objectives. They tend to be used diagnostically, reflecting the size of the organisation and the well-established management control at Boots UK. Exceptions include cash budgeting which is used more interactively given the strong financial emphasis impressed by the private equity involvement and strategic planning because of strategic re-orientation.

Interactively used SCSs are mainly in the form of strategic planning and non-financial measurement systems in deploying and informing CSR strategy. There is a high level of systems' integration through regular reporting on CSR – within regular board reports and through executive involvement in the CSR control systems. While CSR issues are strongly integrated into the reporting verification process controlled by the finance/accounting department, the main SCS – a CSR scorecard – is facilitated by a separate database. The latter enables monthly evaluation of progress and the resultant information appears to be well embedded in wider management control – financial measurement and budgeting systems – providing coverage of a range of sustainability dimensions. Like MCSs, the SCSs are put to more diagnostic purposes. Integration of sustainability criteria into traditional reward and recognition schemes is emerging, though CSR-related objective setting and performance review remains limited to key individuals within the CSR process.

Despite the strength of the system barriers are identified to MCSs and SCSs integration. At the cognitive level, there is still the view that CSR data could be better integrated into financial and accounting systems, but this would require some broadening of focus of these systems themselves as well as greater specification, clarity and reliability of the CSR/sustainability indicators. Cognitive integration progresses iteratively in order to overcome disciplinary barriers reflected in different mind-sets, language use and methods related to sustainability accounting and control. At the organisational level, the persistence of some silos of staff orientation is identified as inhibiting further integration around costs/benefits of sustainability actions and more generally, closer collaboration between CSR and finance staff. There is a view that further investment could be made in collecting and deploying CSR data in a more robust fashion.

Organisational enablers of systems integration were particularly valued by the finance/management staff – such as collaboration of CSR and finance/accounting staff, investment in developing CSR reporting and accounting competencies. Cognitive enablers included the strong shared language and understanding of CSR budgeting, auditing and reporting processes between CSR and finance and management staffs, although these are still at an early stage. The main technical enabler was identified as the

development of software to further the consolidation of CSR and financial information.

The staff tend to interact well around CSR, reflecting CSR's integration into the overall organisation – e.g. the head of CSR's extensive reporting lines, executive involvement in each of the main CSR strands, monitoring of CSR performance. This has only recently extended to CSR finance/accounting staff collaboration – a process assisted by shared cognitive awareness, the positive organisational culture, as well as some routine changes – such as from annual to quarterly reporting. Shared values and a common corporate culture across staff have proved a key belief lever for integration of CSR, despite some CSR staff apprehension about future loss of flexibility as the organisation focuses on control mechanisms for financial objectives.

The strength of achievement appears to provide a propitious foundation for future challenges such as further investment in CSR and sustainability information, further MCSs and SCSs integration, and greater interactive use of these systems.

Halcrow

Halcrow staff concur that sustainability is principally driven by customers with additional drive from compliance and legal imperatives – also impinging on customers. Moreover, Halcrow sees these drivers as having great future potential. The sustainability staff also considered the external rankings as an independent driver of managerial interest in sustainability whereas the finance/management staff see sustainability agendas as mainly in response to competitive needs. These differences are reflected in the lack of full integration of sustainability and strategy. The sustainability staff tended to attribute this to cognitive barriers – levels of senior management understanding of sustainability opportunities, preference for compliance approach at the expense of business, risk and reputational opportunities. The staff also see organisational barriers – scope for further investment in, and senior level commitment to, sustainability, early-stage integration of MCSs and SCSs. Finance/management staff point to other cognitive barriers – lack of stakeholder – particularly customers and governments – awareness.

The two staff cohorts agreed about the key organisational enablers of strategic integration of sustainability – formalisation of company-wide policy, communication by the sustainability team, engineering cultural value on improvement. On the other hand, the sustainability staff also noted cognitive enablers – the construction of a business case, corporate leadership. Technical enablers – KPIs, measurement of project life-cycles – were also valued.

While a company sustainability strategy has been achieved, it is not yet fully integrated into overall strategy, due to the cognitive and organisational barriers noted. These could be obviated by organisational and technical solutions to provide staff with data to enable evaluation of sustainability within projects, which would also encourage a greater cognitive drive for sustainability. A strong move towards higher integration of MCSs and SCSs has recently been made through the development of a balanced scorecard at group level incorporating sustainability indicators.

Halcrow uses a wide range of MCSs, most significant are strategic planning, financial measurement, budgeting, and project identification and management. From the conventional management control perspective, these are principally used interactively (including strategic planning) but also for some diagnostic work (e.g. monitoring and feedback concerning project management). The SCSs appear to be in development rather than fully operational. Firstly, there are non-financial measurement systems, strategic planning and project management which tend to be used diagnostically – as is intended by ISO norms and the European Foundation for Quality Management (EFQM) model. Secondly, integration of sustainability within project management and tenders is emerging from ad hoc to more regular and comprehensive assessment of projects. There was evidence of some technical barriers to the full exploitation of SCS integration into MCSs as KPIs and appropriate technology support were still in the process of development. However, the development and mobilisation of a balanced scorecard at group level which includes sustainability indicators represents a potentially strong move towards integrating sustainability into management control.

Although MCSs and SCSs are integrated in overall strategy-making, the fit is not yet established at the level of project management. Halcrow is developing a limited set of KPIs for sustainability management but these are yet to be integrated into wider MCSs. This is primarily explained in terms of organisational barriers in a very large, multiple portfolio and internationally dispersed business – e.g. inter-departmental responsibility barriers, failure of sustainability to permeate organisational design, improvable investment in sustainability systems. Other barriers noted are technical – e.g. insufficient IT, inappropriate sustainability metrics – and cognitive – e.g. general understanding of sustainability. Key enablers of integration are recognised as organisational – e.g. sustainability champions across the business, management systems for sustainability KPIs – and cognitive – e.g. in being more proactive in raising sustainability issues with clients.

Interactions around MCSs in general appear open and wide-ranging while those between sustainability and finance/management staff are only currently gaining momentum and closeness. This is due to the belief levers of integration that begin to emerge following senior management initiatives (e.g. balanced scorecard) and the integration of sustainability at recruitment. In terms of boundary levers of control, there appear to be well-grounded understandings of basic business ethics and governance imperatives and these offer a strong foundation for extension of the boundary understandings associated with sustainability agendas.

Despite the disconnect between MCSs and SCSs – which reflects an unexplored potential of sustainability integration within strategy – the less formal belief and boundary levers both create room for advancing sustainability. The culture of innovation and experimentation and the project system allowed for spontaneous engagement in this domain. The engineering corporate culture also focused on efficiency and the willingness to address technical challenges compatible with the search for sustainability. This potential could be reinforced through the mobilisation of the new balanced scorecard if the integration of sustainability indicators proved successful.

The Commercial Group

Overall sustainability is well-integrated into the strategic and commercial activities of the organisation and this was recognised and understood by sustainability and strategy / finance managers. Demand by customers is recognised as the key driver for the development of the company's sustainability strategy.

There were shared views as to the barriers and enablers of strategic integration. Barriers were perceived as:

- cognitive – surrounding perceived costs and risks, knowledge gaps
- cognitive cum organisational – insufficient sales staff's appreciation of integration opportunities
- organisational – cross-departmental communication
- technical – appropriate metrics.

Enablers were perceived as:

- organisational – leadership commitment, conducive culture, flat structure enabling smooth and positive information flows
- cognitive – maintenance of cultural shift, engagement of stakeholders
- technical – use of the intranet.

Sustainability appears to be managed and controlled for through stand-alone control systems though some progress

on integration has been made. Being highly embedded is ensured through the belief lever of control and rests largely on organisational cultural factors.

The main MCSs deployed were monthly budgetary reviews and performance evaluation and rewards. Overall, the MCSs tend to be used in a diagnostic rather than interactive mode. Evaluation and reward seem to play a critical role in focusing the attention of managers and employees on deploying corporate strategy and is used interactively. Very different types of SCSs are deployed. Most relevant are project management but also non-financial measurement, predominantly used interactively. The belief lever of control is mobilised in several cases such as for strategic planning and evaluation and reward. In general, these systems are relatively emergent and independent of over-arching MCSs and of each other. They make for high levels of engagement and flexibility, though they may benefit from some formalisation in the future as the business continues to grow despite the financial crisis – e.g. evaluation and rewards in relation to sustainability issues.

In contrast to the case of overall strategic integration of sustainability, technical barriers were perceived as most pressing for the integration of the MCSs and the SCSs – attaching numerical value to sustainability phenomena, integrating these data through control systems. This was followed by organisational barriers – fit with other MCSs used for other organisational purposes – and cognitive barriers – the primacy of metrics concerning profitability. Technical enablers of systems integration were most valued – deployment of new technologies, as befits an office supplier – along with organisational enablers creating cross-departmental communities of practice and cognitive enablers were acknowledged – recognition of complementarities of sustainability and profitability.

Turning to the interaction of staff, the small size, flat structure and shared vision enable very good communication around the MCSs and SCSs and the number of staff familiar with the SCSs has recently increased. Thus cultural levers of control appear the most effective for The Commercial Group to integrate MCSs and SCSs both around shared beliefs as well as shared boundary assumption of the appropriateness of sustainability independent of reward system application.

Overall, there is modest formal integration of MCSs and SCSs and while the former are over-arching, some of the latter are rather adhoc. However, the organisational culture enables easy adoption of SCSs at different parts of the business. It may be that greater systems integration will enable consolidation of the emergent strategic intent to make sustainability core to the business. Such processes should be assisted given the evidence of the powerful enablers of integration we have noted.

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