An Integrative Approach to Planning and Control using a Stakeholder-Based Knowledge Management System

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Abstract

Short planning horizons and an increasingly competitive environment has changed the organisational strategic planning landscape. Yet, a dissonance between strategy and budgets handicaps organisations when responding to the changing environment and stakeholder needs. Increasingly, an integrative role for management accounting is becoming evident in supporting the implementation of strategy, particularly with developments in management accounting, operational management techniques and information technology

This paper first identifies key components of the integrative approach and illustrates this approach (using a case study) to show how a stakeholder approach supports a knowledge management system to monitor and adapt to changes in the environment. Specifically, the case shows how tacit information from stakeholder engagement and feedback, harnessed and conveyed through networked information technology, complements the explicit structures and knowledge contained in traditional performance measurement and operational tools by enabling the firm to adapt strategy to the changing environment.

Key words

Stakeholder Feedback
Management Accounting Performance Measurement
Operations
Knowledge Management

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Introduction

Historically, developments in management accounting have been shaped by a variety of influences, particularly the nature of the competitive environment (Simmonds, 1981; Ratnatunga, 1983; Kaplan, 1984; Simmonds, 1986; Johnston and Kaplan, 1987; Simons, 1990; Anthony, 2003). Most often, however, management accounting remains isolated from the external influences until the "crisis," as in the 1980s when the increased competition and resultant introspection, revealed that cost systems have "lost relevance" in the changed environment (Kaplan, 1984; Johnston and Kaplan, 1987). The historical perspective serves to illustrate the continuation of "institutionalized" tools although their relevance to the environment may have been substantially altered. Recently, despite an environment increasingly shaped by global competition and advances in technology, an "internal" focus appears to prevail in planning and control, particularly through the traditional budgets (Hope and Fraser, 2003). Gray (1986), for example, identified the problem as follows:

"Managers tend to view the annual planning and budgeting sequence as logically connected but not integrated in fact. While the best strategic analysis starts with environmental analysis and then works in the unit's ability to respond, budgeting usually proceeds by making incremental adjustments to the previous year's internal departmental budgets. This practice allows the momentum of last year's (possibly obsolete) business strategy and this year's functional strategies to determine the funding of this year's business unit plan" (p. 96).

With the decreased time in planning cycles to weeks and months, the "relevance" of this approach is increasingly questionable (e.g., Horngren, 2003).[1] In fact, with the development of technology and the global nature of competition, there is the need to monitor trends and interact closely with

[1] Charles T. Horngren (2003) in "Beyond Budgeting" points out that, "we face rapid change despite having more limited sight than at any time since the 1940s. A climate of international terrorism and volatile stock markets does not encourage planning beyond weeks and months, never mind months and years."

customers and suppliers to identify and initiate change in a timely manner, increasing the need for environmental analysis (Hamel, 2000). This environment also resulted in increased development of tools and techniques such as ABC (Activity-Based Costing) and BSC (Balanced Score Card) in management accounting and TQM (Total Quality Management), TOC (Theory of Constraints), JIT (Just-in-Time) and others in operations management, in addition to phenomenal growth in information technology. Most texts and articles tend to present these tools as discrete, sometimes substitutes and not inter-related elements in the planning and control cycle. While their discrete development supports specific problems, the application of these techniques can become increasingly confusing without an overarching driving force to provide cohesion to perceive the role of each area, and the inter-relationships between them in solving problems of the firm (e.g., Kaplan, 2001).

Stakeholder based management (e.g., Freeman, 1999) forms a natural theoretical and managerial basis for this new environment with the need to incorporate external factors and align internal strengths to implement strategy. Internal changes include valuing and managing intellectual capital to respond to the external environment, which entails development of processes and systems, as well as innovation and knowledge management that is responsive to external factors and stakeholders. This calls for a broad integrative view of the firm, such that accounting and operations management techniques, combined with information technology facilitates planning and control with a focus on stakeholder needs. The paper proposes that stakeholder based management can provide the cohesion to the otherwise disparate techniques, to coordinate and integrate their application, while also serving to highlight their inter-relationships. Specifically, stakeholder based information forms the basis to identify "implementation gaps" between internal management perceptions and external competitive factors and directs resources to bridge this gap to enhance an enterprise's competitiveness (e.g., Lin and Tseng, 2005). This paper uses a case that is expanded to illustrate these concepts and further, provide a scenario where the complexity of the multi-faceted areas in the firm, specifically Management Accounting (MA), Operations Management (OM), and Information Technology (IT), gains cohesion and momentum through a knowledge management system. The integrated model focused on stakeholder needs helps the firms respond to rapid and intermittent changes enabling even large firms to be nimble and responsive to volatility.

The sections are organized as follows. The first section develops key elements of the integrated approach in supporting decisions, where stakeholder interests need to be monitored and strategy adapted to reflect changes in the changing environment. The next section illustrates the integrated approach, using a specific case. The section that follows highlights key insights derived from the earlier case, specifically, how the integrated model supports the stakeholder based management strategy while harnessing the strengths of the models and addressing many of the weaknesses that restrict a traditional model from adding value in this environment. Specifically, the case serves to illustrate how the integration of functional tools and their combination based on a stakeholder strategy serves to increase synergies. The final section summarizes and provides conclusions.

Elements in the Integrated Planning and Control Approach

There is increased scepticism about the ability of traditional budgetary approach to meet the goals of planning and control in the new environment (e.g., Hope and Fraser, 2003). With respect to planning, strategy has grown more complex, involving the integration of stakeholder-based concerns that may not be immediately reflected in financial profits or outcomes. Non-financial measures such as customer satisfaction and innovativeness have been found to predict future financial success. The increased need for functional interaction and integration of processes is often not evident in the traditional planning approach. Ittner and Larcker (1997) found that several strategic control practices were negatively associated with performance, consistent with claims that formal strategic control systems can actually hinder performance in some circumstances by focusing attention on formal and rigid action plans, targets, and information

gathering when flexible and creative strategic responses may be more appropriate.

Key elements in the new environment consist of four major components, grounded in the stakeholder management approach. This view is advocated by Freeman (1999), who asserts, "to maximize stockholder value over an uncertain time frame, managers ought to pay attention to key stakeholder relationships" (1999, p.235). Thus, firms must be cognizant of the multiple stakeholders that interact with the firm and have their own independent goals. Competitive firms seek closer relationships through sustainable profitable relationships with customers, through increased switching costs in opportunities lost rather than "nettlesome" barriers such as contractual obligations to retain customer loyalty. This "deepening" relationship resulting in mutual dependence through "listening and informing," enables the firm to harness its potential to meet the needs that make for long-term relationships (e.g., Johnston, 1992). Hence, the need for a stakeholder-based strategy that responds internally and externally to align strategy to the needs and aspirations of key stakeholders. Underlying this close relationship with stakeholders enables the firm to access timely information that can enable the firm to identify "knowledge management" gaps, i.e., gaps between the perceptions (i.e., knowledge) of management to enhance the firm's competitiveness by meeting stakeholder needs and the knowledge required to do so (Lin and Tseng, 2005). This "intellectual capital" resource is important for managers to retain an open system that enables them to identify factors critical to their effectiveness in creating value for the firm and stakeholders.

Second, the emergence of accounting techniques to measure and support this new environment is increasingly evident. Bhimani and Roberts (2004) highlight the role of management accounting in creating "knowledge assets," through codification by "categorizing and abstracting" information. These properties of management accounting serve to classify organisational activities uniformly, and "manage knowledge assets" to make it a principal driver of knowledge-based action. Thus, information from stakeholders, when classified and categorised, can be integrated into performance measures and cost accounting tools to be used to implement strategy. Thus, the "knowledge management gaps" can be identified with measures that provide the direction to bridge that gap. Specifically, measurement, mapping, and communication of strategy are necessary for managing and coordinating change. The BSC design specifically allows the integration of stakeholder interests in management accounting planning and control and further integrates them with strategy through the BSC performance measurement system that encompasses the different organisational activities and stakeholders.

The flexibility of ABC to capture activities and costs across the value chain makes it particularly useful in supporting the BSC through the development of process measures that support the Internal Business Perspective, as well as identifying and aligning the customers in the Customer perspective. Kaplan and Cooper (1998) point out that ABC provides the information to trace product and customer profitability, costs for R&D, and supplier related costs to make decisions about customers based on the total process and quality costs because of the key role of processes that extend from manufacturing to marketing, research and development, and other activities along the value chain and supply chain. When BSC is extended or "bundled" with other management techniques, it facilitates coordination and control in the new environment, and serves as an alternative to traditional budgets.

Ax and Bjørnenak (2005), for example, found that extended or more integrated use of BSC, transformed Swedish companies through non-budget management control systems and greater integration with other management techniques and stakeholder culture. Svenska, the Swedish bank outperformed other banks using this non-budget approach. Examining firms from Germany, Speckbacher et al. (2003) found that those implementing the most sophisticated and integrated forms of BSC that included an incentive system to integrate the firm's planning and control processes, were the most satisfied with the outcomes.

Third, the process of knowledge management has been facilitated through developments in technology that has extended the reach and potential of management accounting techniques in supporting decisions. According

to Mouritsen and Larsen (2005), "intellectual capital" was formerly driven at the individual level, where knowledge management involved spreading the tacit knowledge of individuals to others. The "new wave" of knowledge management was information system driven, involving the networking of knowledge resources related to corporate activities.

This new wave generated intellectual capital through the integration of systems that supported the generation of knowledge closely linked with management of knowledge resources enabling informed judgments and timely management intervention that could not be easily replicated (Mouritsen and Larsen, 2005). Stakeholder information forms the real "deeper tacit" knowledge gleaned from the experiences that, when integrated with the firm's explicit knowledge (available in databases, books and other resources) creates real actionable value for the firm (Walsham, 2001). Additionally, the lateral orientation of process technology (Hansen and Mouritsen, 2007) also corresponds to the ways new information technologies promote the lateral perspective through its database technology and its methods of describing organisational problems, and in integrating internal and external systems to address them, consistent with the "second wave" in the development of intellectual capital. As Dechow et al. (2007), for example, point out, "in complex organisations, information is increasingly used to connect and coordinate various organisational entities and various markets, customers and products" (p.629).

The new technology, such as ERPS (Enterprise Resource Planning Systems), can standardise and integrate data and render such information up-to-date and shareable in real time. Thus, information technology increasingly expands and mediates the availability of accounting information to support control and decisions. IT development has also enhanced the possibilities of global operations and the integration of the system enterprise-wide. It plays an integrative role, for example in facilitating the relation between strategy design and business workflow for the ABC systems. With the BSC, IT facilitates the integration between the vertical and horizontal organisation, supporting and coordinating the causal links between the lead-lag indicators.

Finally, operations management helps drive change by activating the knowledge to bridge the knowledge gap between internal perceptions and actual competitive environment gleaned through stakeholder interaction. Operations management (OM) techniques optimise value across the value chain and supply chain. Research into TQM programs, for example, indicates that quality initiatives can range from basic production-oriented programs to more advanced strategic initiatives that incorporate product design efforts, overall business processes, and supplier/customer relationships in addition to production-oriented activities (Ittner and Larcker, 1995). Thus, TQM supports a strong customer focus, extensive employee participation and development, a well-defined and well-executed approach to process management, and a strong emphasis on design quality (Ittner and Larcker, 1995). While TQM is generally long-run oriented, firms meet customer specifications on time and quality through identifying short-term bottlenecks using the TOC. Further, these operations are enhanced through a strong supplier relationship that ensures timely supplies of quality materials through the JIT approach. Thus, the OM initiatives are often most effective when applied in conjunction with one another. These techniques potentially transform cultures and enable the firm to be adaptive to changes in the environment, another factor that increases the effectiveness of knowledge management networks when working across cultures (Walsham, 2001).

To summarise, an integrated approach based on stakeholder strategy, begins with environmental analysis, and an understanding of the needs of stakeholders. The measurement and operations need to provide the cohesion to support this strategy to meet stakeholder needs. This includes integrating that feedback into strategy and into measures that further form the basis for resource allocation. In contrast to traditional budgets, the new approach to planning is not based on past information from budgets and strategies, but on new realities that face the organisation. Thus, objectives and measures evolve as the firm recognises threats and opportunities in the environment. Additionally, they serve to harness the knowledge creation activities in the firm to set decision parameters and performance targets that support the process management and

process improvement techniques used to attain firm (and stakeholder) goals. For example, mapping and measuring using techniques such as ABC and BSC, combined with operations management techniques such as TQM and TOC drive change to meet performance targets, including quality, innovation, and timeliness. These concepts are illustrated in the case below.

Illustrating the Integrated Approach

The case of LS Inc[2], a global firm in the metals industry with operations in Asia, Europe, and Africa, is used to illustrate and substantiate the integrated approach. LS Inc. is vertically integrated, having developed operations across the value chain, from raw material extraction, through processing, manufacturing, and selective retailing. The information for the case was drawn from documents made available by the firm and from other sources (including publicly available information). Over the years, changes in the competitive environment transformed the firm from a lumbering giant to a lithe and agile global entity that was responsive to the changes in their environment. LS Inc. was now acknowledged to be among the best-managed firms in its industry. One element that preserved the firm was the ability to adapt to changes. This was most evident in the changes in the techniques over the past several years. Management made it evident that they would seek out optimal techniques to meet firm objectives, employing the services of a variety of specialists at different stages in the development of the firm to supplement their own knowledge and skill base. This added to their ability to gain broader and deeper insights into their operations, gaining from the specialisation and global experience of the consultants. For example, McKinsey provided support in integrating strategy and operations, the BSC Collaborative, in supporting strategy through a measurement system, and SAP AG, enabling the firm to design the enterprise-wide information systems that became a key enabler of their strategy by aligning IT capabilities with the goals for acquiring and analysing information to support decision-making. The firm was among the most profitable in its industry and had won many prestigious awards that included the Most Admired Knowledge Enterprise, the Deming Award, Productivity Award, the award for excellence for quality, environment and safety management and Best SAP Metal Sector Implementer, indicating that it was a benchmark high performer.

The firm grew from a focus on techniques for "survival and cost competitiveness" and "modernization, operational excellence and EVA" to "Growth, Globalisation and Technological Self-Reliance" (Figure 1; please see Appendix: Glossary of Terms, for abbreviations and definitions). With globalisation and increased emphasis on quality, the firm increasingly sought to differentiate itself through branding its products, though they were essentially of a commodity nature. This case focuses on their use of the integrated approach beginning with stakeholder feedback. As the Chief of Quality pointed out:

"We have evolved through different stages, and now that we have become global, we are more concerned to respond to stakeholders in a timely manner. The TQM approach of Plan-Do-Act-Check helps us ensure that our response is adequate and we are meeting targets. When applied firm wide, we now have the confidence that this philosophy takes us towards the goals of satisfying our customers."

Stakeholder engagement and strategic overview

The feedback from stakeholders was the key to a stakeholder-based strategy development, where the stakeholder response system enabled the firm to understand stakeholder needs and continue to innovate to meet those objectives (Figure 2). Creating an environment that encouraged free flow of information with the stakeholder resulted in understanding concerns that were often unique to the experiences of the individuals, based on their specific product or strategy.

[2] The company name and names of officials are disguised to provide anonymity to the individuals and the firm. While information was gathered from onsite interviews, from information provided by the firm, and from other publicly available sources, the proprietary nature of some information limited access and created the need to modify and disguise portions of the information.

Figure 1: Continuous Improvement Journey at LS

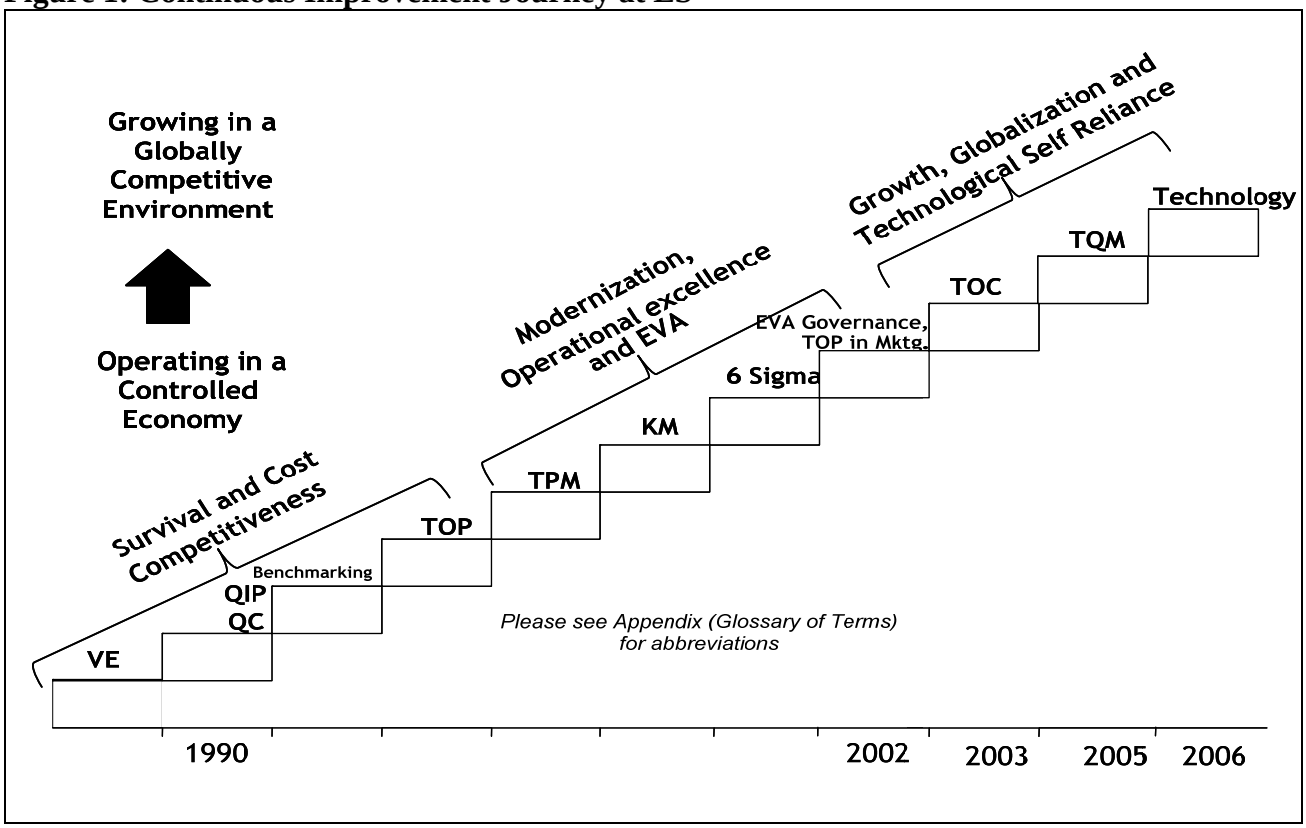
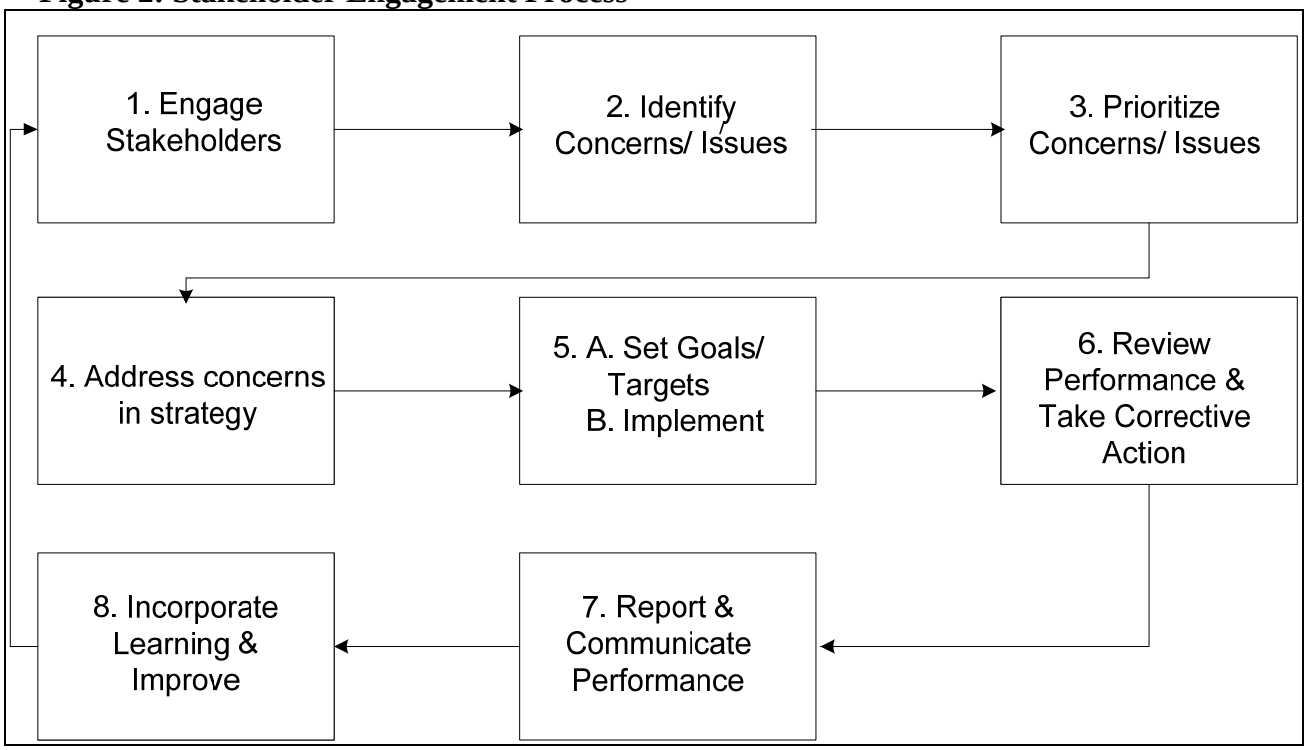


Figure 2: Stakeholder Engagement Process



This information flow was a critical part of the new environment, but management was keenly aware that the value of such information depended on the responsiveness of the system to the stakeholder needs. The firm receives feedback from the various stakeholders through a variety of processes. Those listed by the firm included "investor satisfaction surveys", analysts' meetings, customer conferences and "satisfaction surveys", "vendor dialogues", "meetings with key suppliers", "press briefings and releases", "employee dialogues", "senior citizens forum", and "joint community meetings".

The marketing manager, for example, indicated instances where manufacturing processes were altered and delivery mechanisms developed to meet specifications from customers (especially large OEM [original equipment manufacturers] customers), such that the information gleaned was used to create value for the customers and suppliers along their entire value chain. There were also forums to "engage" different stakeholders at least once a year (except the public/government, which occurred as needed). The CEO had a monthly video conferencing with all employees, where employees could directly interact with him.

Thus, the engagement approach began with "listening" to stakeholders, to understand their needs and envision the future, and set and communicate direction. This information, captured through the information systems, formed the basis for a stakeholder-based strategy whereby the firm identifies key stakeholders within stakeholder groups, assesses their concerns and prioritises them, and addresses these concerns in the context of corporate strategy. Stage 5, which consisted of two sub-sections, setting goals and implementation and stage 6 (Review Performance) formed the accounting for planning and control cycle, through the use of BSC, measures and benchmarks, initiatives and feedback on performance.

The overall purpose of the integration model is the responsiveness to the changing environment, through the planning and control processes. The planning stages, as indicated in Figure 2, begin with the stakeholder engagement (Stage 1) and culminate in the development of goals that are incorporated into the measures (Stage 5A). Strategic Control begins with the implementation (Stage 5A of Figure 2) and includes the feedback that is finally incorporated into the learning and growth stage (Stage 7 of Figure 2). As elaborated in the sections below, the role of accounting is to translate the stakeholder feedback into strategic goals and measures, where information technology provides the web of communication across the planning and control stages, while operations management supports process development and implementation to meet strategic goals.

The Accounting Role: ABC, Balanced Scorecard and EVA

The stakeholders' "concerns and issues" that were identified were prioritised based on the firm's strengths and vision for the future, and integrated into strategy (Stages 2, 3 and 4 of Figure 2) through the Strategy Map that articulated these concerns and expectations. Beginning with the Strategy Map that provided the basis for development of BSC (Figure 3), Stages 5 (A and B) and 6 from Figure 2 formed the core of the strategy implementation processes that included measurement, operations management to drive change, and information technology for analysis, review and communication. The CEO's BSC (or the Corporate BSC) is further distilled across organisations, as departments and support units integrate their strategy to match that of the overall corporate strategy. The CEO found the BSC to be an excellent communication tool, and valued the non-financial measures and the challenging goal of becoming "EVA positive." Performance expectations across the organisation are set through the BSC approach. All BSC measures are compared with those of competitors and benchmarks, as appropriate. Through regular review of Key Performance Indicators (KPIs), the leaders (or process owners) identify opportunities for improvement and innovation, translate these opportunities into prioritised actions, and assign these to a project team or task force for action.

Thus, the strategy map, further decomposed into more detailed components, is communicated throughout the organisation to all levels, enabling employees to be aware of how their activities accomplish overall strategic goals. Extensive benchmarking of

best in class firms was used to develop targets and initiatives to achieve the targets. These initiatives, tied to corporate strategy, form the basis for development of capital and operational projects that are evaluated using EVA determinants. Improvements in the BSC are tied to the EVA. To meet the EVA determinants, LS Inc. evaluates financial risks through the process – investment proposals resulting from a possible criteria are put through a financial analysis and only those proposals that satisfy the hurdle criteria are put up to the Study Group.

The Study Group comprising experts from various disciplines analyse and debate the proposals on technical, financial, environmental and regulatory aspects. The proposals that qualify the evaluation are discussed in the Investment Management Committee, indicating layers of scrutiny before projects are finally approved. Additionally, capital projects are directly integrated with the strategic focus of the firm. The company manual specifically states that, "Performance expectations across the organisation are set through the Balanced Scorecard approach cascaded up to the Key Result Areas of the individuals ensuring complete alignment throughout the organisation."[3] The broader view provided by these tools (particularly the scorecard) enables the firm to identify those areas that would otherwise be neglected or omitted from integration with strategy. For example, sustainability, particularly the environmental perspective, is integrated into strategy through the BSC, and enables the firm to integrate measures and techniques such as the Life-Cycle Costing Analysis (LCA) when developing products.

Information Flows: Integrating Measurement and Operations

Feedback from stakeholders used to develop strategic objectives can be depicted through an Information Flow "roadmap" that corresponds to the components of the Strategy Map (Figure 4). It indicates the usefulness of the ABC system for developing and evaluating measures to support the strategy components. Manufacturing/service and customer specific activities provide diagnostic capability for systems and processes and assessment capability to classify customers.[4] These consider the process measurement, including possible ways of benchmarking and improving processes through understanding and valuing activities.

The drivers of change, indicated in Figure 1, enable the firm to direct the operations to meet the goals of strategic priority areas. These have been incremental, as seen in the expansion of Knowledge Management with the new Information Technology focus. ABC provides supporting information for connecting the key internal business perspective objectives with the customer perspective components (Figure 4, arrows b and d). Specifically, the cost as well as activity drivers help the organisation understand the customer and product, and align the use of internal business resources more effectively to combine cost information and management concepts in product development (product life cycle analysis) and customer profitability analysis.

As indicated in Figure 4, the information flows in the "roadmap" begin with information from customers that determine their requirements and support needs. Customer profitability enables the firm to develop an understanding of the profile of the profitable customer. ABC–customer sustaining and product sustainability activities provide the basis for segmentation and feedback when combined with the feedback (external and internal) as well as for strengths (e.g., customer profitability from basis to segment customers), along with product information (i.e., future strategic initiatives of the firm). This information also enables the firm to identify the needs of targeted customers (arrows a and c), to clarify strategic priorities. Determining "profitability"

[3] The scorecards included a Corporate Scorecard and scorecards at the business unit levels and service units that are developed from the strategy map. These scorecards contain measures, benchmarks and initiatives, and form the basis for integrating, providing incentives, and allocating resources.

[4] The operations are supported by shared services like boiler houses, power generating and distributing facilities, specialized component manufacturing units, repair and maintenance workshops, automation lab to develop and deploy specialized automation solutions, research and development labs to develop new products and processes and maintenance support.

and "external feedback" provide the basis for further innovation. The firm uses that information from stakeholders (arrows a and c) to develop R&D and operational programs (e.g., delivery schedule, quality etc.) to align with stakeholder information (arrows b and d). Similar information is also available at the product level through marketing and production personnel to develop product-sustaining activities. The measures and indicators (such as cycle time, response time, and product and service quality) are selected, aligned, and integrated using the BSC process (arrows e and f).

The information generated through the ABC analysis supports key aspects of the integration model in the planning and control processes. Specifically, results of the analysis of the projects and the use of ABC integrated with feedback enables the firm to set goals (Stage 5A) by evaluating project and customer information in the light of product and customer profitability. Thus, the firm can now inter-relate external and internal information so that goals are prioritised and integrated into strategy. These form the goals that are diversely spread to the different "process owners" and form the basis for the control processes that begin with implementation in Stage 5B of Figure 2. Specifically, ABC enables the firm to develop measures and set benchmarks for the process owner to control the performance of the processes. The control process is further integrated with incentive systems (Stages 5 and 6 of Figure 2) that motivate process owners to meet current challenges in the changing environment. The use of measures and targets combined with incentive systems supported the implementation of management control. Thus, in effect, these elements play the role of control that was the traditional domain of the budgeting systems. The firm particularly emphasised the importance of knowledge management to integrate this learning into the system and strategy implementation. This is further elaborated below.

Information Technology and Knowledge Management

LS moved from the Materials Information Management System (MIMS) to Enterprise Resource Planning (ERP) systems running on SAP and BaaN. Lotus Notes was particularly useful in unstructured communication channels, such as in capturing, tracking and resolving customer complaints, and was fully integrated into the firm's information systems. The new information system provided the backbone for integrating the stakeholder information into processes and measures to execute stakeholder strategy. Thus, information (i.e., tacit knowledge) collected from stakeholders and other sources was analysed (see Figure 5) and communicated to different levels within the firm, in a suitably structured form, as appropriate (Figure 6). Information Technology now performed a role in capturing, and analysis and dissemination, supporting integrating functions in the Stakeholder Engagement Process (Figure 1). Thus, as in Figure 5, Information Systems provided the networks that engaged stakeholders and enabled them to access and incorporate their viewpoints into the system daily (operational) or less frequently (organisational performance) using suitable technology (ranging from SAP and Lotus Notes to manual and 3rd party surveys). The information, integrated into the database (consisting of the explicit knowledge or the knowledge frameworks from existing operations and management accounting technologies) was used in the output analysis functions in the stakeholder engagement process, including performance reviews (stage 6), reporting and communicating performance (stage 7), and incorporating learning and improvement (stage 8). Thus, it enabled the firm to capture the tacit knowledge into a form (e.g., translated into a suitable measure) that supported decision-making at different levels corresponding to processes in a timely manner to enable "process owners" to adjust their operations as necessary to meet targets. Process owners could monitor "in-process" measures and take steps to implement improvements methods. Further, the outcome measures were tied to "in-process" measures and evaluated at higher levels in the firm to determine effectiveness of the strategy and the mapping and implementation of that strategy through the Strategy Maps and the Balanced Scorecard. Thus, the individual process units are now streamlined with overall strategy.

The components of the measurement system, the specific technologies required to capture and analyse the information, as well as the nature of the analysis are indicated in Figure 5.

Figure 3: Strategy Map

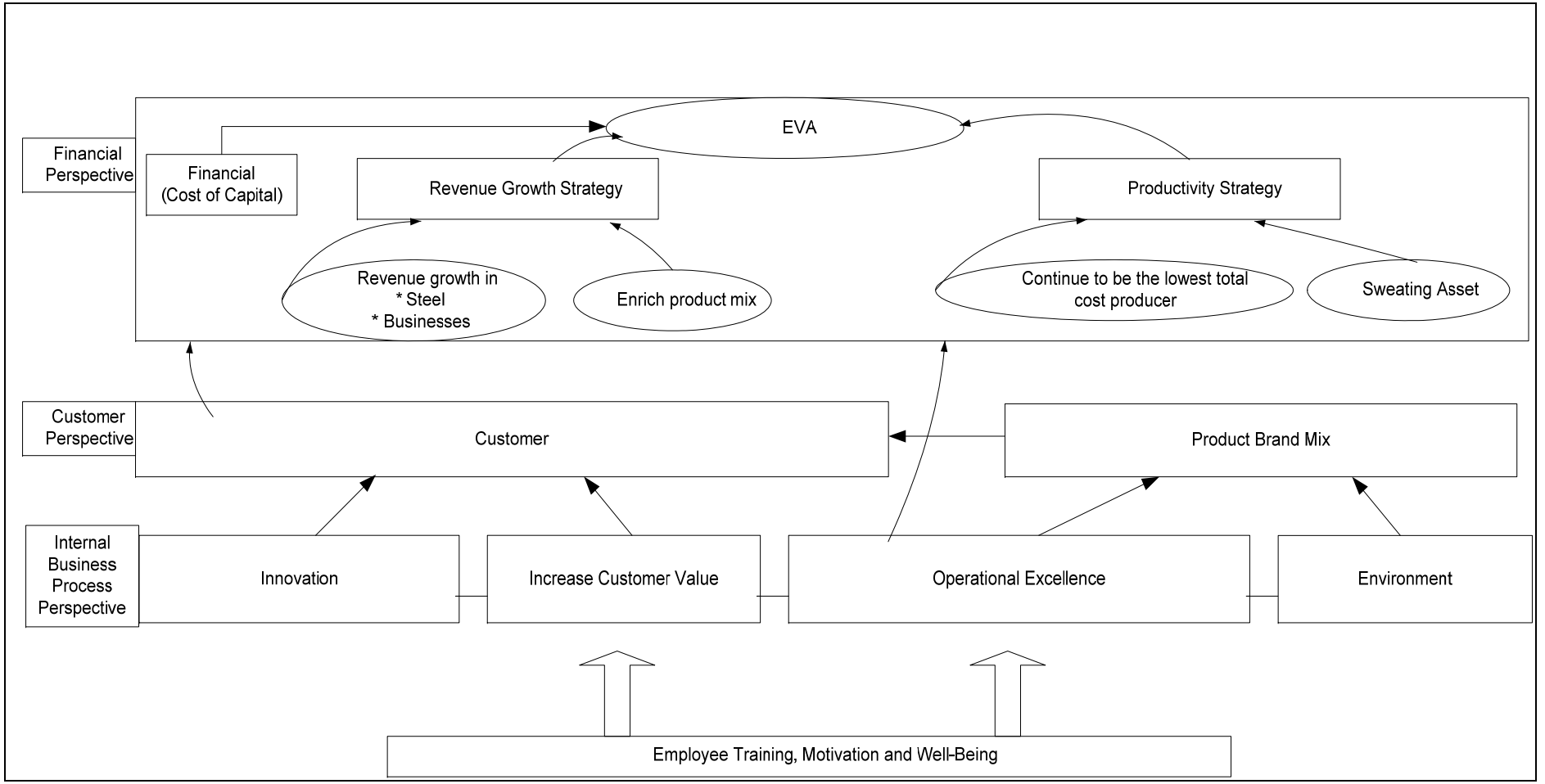
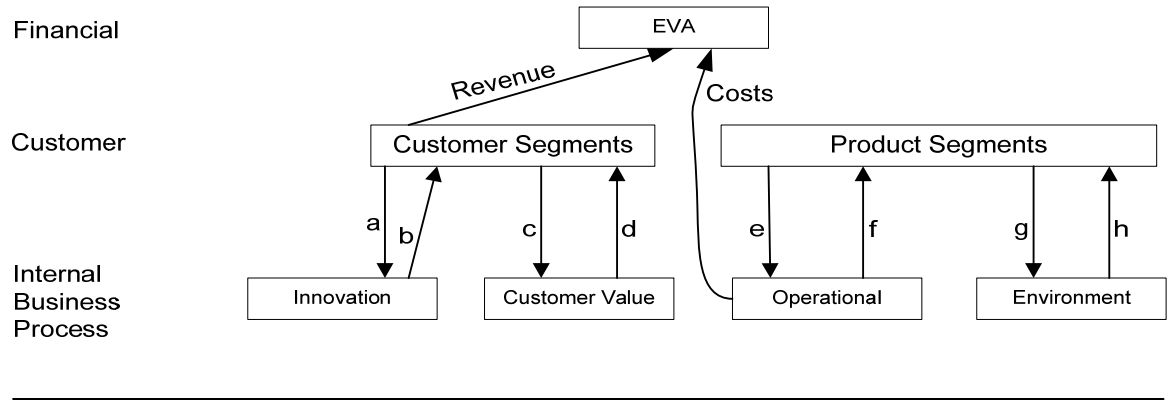


Figure 4: Information Flow Road Map



a. Customer information – profitability and segmentation
b. R&D solutions – value creation – Target Costing / Life Cycle Accounting
c. Customer support needs basis for analysis of activities and menu-priced pricing
d. Customer specific activities and reports by customer segments/profitability
e. Product – Core Products and other
f. Customer support costs – assess activities and operational costs – specific to products
g. Environmental needs - assessment
h. Environmental activities/costs – assessment and life cycle costs

The information systems provide the connections between the stakeholders and decision-making through the collection of information using a variety of technologies. For example, the closed loop integrated complaint handling process supported on Lotus Notes provides early warning signals that are reviewed and closed only after "technical resolution." At the department and functional level, inputs from Customer Complaint Handling Process, Customer Satisfaction Index (CSI) feedback, and Customer Visit Reports are incorporated into strategic planning to improve operational effectiveness parameters like cycle time, response time, product and service quality. They also provide for a system of measures that broadly include in-process measures that enable "Process Owners" to monitor and coordinate the improvement of processes directed to increasing organisational goals and stakeholder satisfaction, which constitute the Outcomes or Results measures contained in the Balanced Scorecard[5] (see Figure 6).

When tied to incentive systems, these measures served as key motivational factors in supporting strategy implementation. The resulting measurement system also led to a need to coordinate reporting mechanisms to optimise the timely availability of relevant measures at appropriate levels in the organisation. The decentralised decision structure closely aligned with the processes to coordinate process improvements through coordinating mechanisms such as TQM and TOC. Thus, the three crucial techniques in the Growth Stage (Figure 1) formed a critical triangle in executing the attainment of goals indicated through the measurement system and as a response to stakeholder feedback.

In addition, stakeholder and end-user feedback enabled the Information Systems (IS) department to tailor the systems to the needs of strategy and the availability of resources. The firm had discovered that neglecting stakeholder and customer feedback in the development of information systems could result in the development of systems that were often under-utilised, and that could even be counter-productive. Therefore, the IS department CIO worked closely with users during systems development.

[5] Different terms used for the measures, most commonly Key Performance Indicators (KPIs) are the measures monitored regularly and deal with the operational aspects under the control of the firm, whereas Key Result Indicators (KRIs) form the outcome measures in the BSC, which generally result from the operations (e.g., Schneiderman, 1999).

Figure 5: Key Data and Information gathered for daily operations and organisational performance (sample, not exhaustive)

	Key Data & Information	Type	How collected	Strategic objective supported	Primary analysis
Daily Operations	Sales	Lead	SAP	Sustainable growth	Trend, Gap, Lost sales, Share of spend
	Dispatch compliance	Lead	SAP	Value creating partnership with customers	Trend, Gap
	Productivity Lead	Lead	SAP	Continue to be the lowest cost producer of steel	Cause-Effect, Bottleneck, Root Cause
	Cost	Lead	SAP	Continue to be the lowest cost producer	Pareto, ABC, Variance
	Quality	Lead	SAP	Value creating partnership with customers	Regression, Pareto, Cause-Effect.
	Customer Complaints	Lead	Lotus Notes/Manual	Value creating partnership with customer	Cause-Effect, Root Cause, Technical Analysis
	Employee Grievances	Lead	Manual	Enthused and happy employees	Trend
Organisational Performance	Safety Performance	Lead	Safety Incident reporting system	Ensure safety	Cause-Effect, Root Cause, Pareto
	Customer Satisfaction Index	Lag	3rd party survey	Value creating partnership with customer	Attribute wise trend, Top Box
	Supplier satisfaction index	Lag	3rd party survey	Value creating partnership with supplier	Trend
	Employee satisfaction index	Lag	Internal survey	Enthused and happy employees	Trend
	Corporate citizenship index	Lag	Internal survey	Improve quality of life	Trend
	EVA	Lag	SAP	EVA positive core business	Value analysis
	Profit after tax	Lag	SAP	EVA positive core business	Profitability, Variance, Trend
	Operating profit	Lead	SAP	EVA positive core business	Profitability, Variance, Trend
	Asset utilisation	Lead	SAP	EVA positive core business	OEE, Bottleneck
	Return on Equity (ROE)	Lag	SAP	EVA positive core business	Profitability, Variance, Trend
	Market Share	Lag	3rd party survey	Sustainable growth	Share of spend, Trend, Lost sales

Figure 6: In Process and Outcome Measures

Key Support Processes	*Key Process Requirements*	*In-Process Measures*	*Key Performance Measures*	*Process Owner*
Procurement	Timely availability of products & services at competitive prices; Partnership with suppliers	Average lead time; GRN cycle time; Vendor feedback on timeliness; Trends in improvement in response time (IT)	Savings thru Strategic Sourcing; Supplier Satisfaction Index	Chief Procurement
Information Management	Timely availability of data and information at all levels for decision-making	Trends in improvement in response time (IT); IT uptime	Overall Customer Satisfaction Index (internal) with ITS	CIO
Human Resource Management	Skilled manpower; Motivated & happy employees; Compensation system; Employee cost	Grievance handling; Unauthorised Absenteeism; Rightsizing	Employee Satisfaction Index; Skill Ratio; Labor Productivity; Employee cost as percentage of turnover	VP (HRM)

The SAP, for example, was developed in two phases, the first with a focus on *Order Processing* and *Fulfilment*. This generated information on the front end, and supported customer profitability and feedback, valuable to customer relationship management. The next phase (using mySAP ERP) extended to the back end, including financial accounting, costing, procurement and plant maintenance, thereby enabling connections between internal and external stakeholders. The firm completed implementation successfully in 2001 and was awarded the SAP Star Award by SAP for best use of the SAP System as a strategic tool. The firm, however, also continued to use legacy systems and other software where their requirements were not fully met by or integrated with SAP. The achievements in networking, notwithstanding, the potential for technology did not appear to be exhausted, with continued opportunity to add value as it had created the culture of integration of resources and information to support the firm's goals.[6]

Discussion

While organisations have grown larger and more complex, with the multiplicity of management and accounting techniques, changes in the external environment make any cohesion important but increasingly difficult. The case illustrates this complexity, and the efforts of the firm to bring cohesion and management control within the chaos of a changing environment. While a tool such as the BSC provides a broad framework to support strategy, usefulness of such tools is limited when operating in a closed system. The case provides insights into several areas, drawing on the theoretical framework and practical insights to illustrate how an open system that interacts with the external stakeholder environment can bring synergy to the operations of the firm. Specifically, the extended BSC model that combined information systems and operations to deliver a sensitive stakeholder based approach to planning and control enabled the firm to transform itself into a global player, and an acknowledged industry leader in implementing modern management techniques. Complexity is evident in the many techniques (particularly operations management) that have accumulated over the years (Figure 1). However, the additional techniques are integrated into the system through the stakeholder management approach depicted in Figure 2.

Operations Management (OM) has a process view to support the integrated objectives for quality, time and cost (rather than trade-offs). Consistent with the case, Hansen and Mouritsen (2007) point out that TQM forms the foundation for other advanced

[6] SAP consultants saw room for further integration with new features of SAP such as NetWeaver and Services Oriented Architecture (SOA) to increase connectivity and flexibility.

manufacturing techniques such as JIT production, flexible manufacturing, and business process reengineering. Additionally, OM forms the basis for the continuous improvement processes through the development stages of the firm to reach transformational goals. Yet, management accounting (MA) plays the distinct role in the measurement sphere to support attainment of such goals. As Hansen and Mouritsen (2007) point out, underlying the processes is the person, with the individuality, need for accountability and motivation and who makes the decisions. MA is interested in the person, as it focuses on responsibilities and decision-rights; OM is focused on the process as "one thing," relegating separation of the duties, responsibilities, obligations and decision rights to a secondary role.

MA emphasises that the person is the source of uncertainty. However, OM now provides the goals for that individual, not from the structural terms, but more in process terms, aligned with the lateral focus of the firm. Thus, as seen from Figure 6, MA enables the firm to see the process mechanisms at work, linking accounting measures to process requirements and decisions of "process-owners." While OM focuses on steps in transformation (JIT or TQM steps in production or marketing processes), MA focuses on the series of questions about decision-making, responsibility and accountability on the process of transformation. This is facilitated through the new "lateral flows of information" consistent with process management in contrast with the traditional "hierarchical flows of information for planning and control" (p.729).

Consistent with Dechow et al. (2007), the case illustrates how information technology also increases the lateral process view of the firm, as opposed to the traditional hierarchical relationships. Technology is driven by multiple factors such as accounting, manufacturing and logistics, requiring additional hardware and software on an ad-hoc basis that may add technical complexity. This is evident in the use of different technologies to capture and analyse information (Figure 5), where individual technologies can be combined effectively through the cohesion provided by stakeholder principles. However, growth of technology provides more options to integrate these functions (as suggested by SAP consultants).

Firms have to make choices to ensure that their technology investments yield results. The growing potential created by technology serves as the enabler, to connect people with databases so that information can be communicated, and analysed in problem identification and solving. Often, "value creation" is easier where increased analysis and dashboards can facilitate improved decision-making in a timely manner. The stakeholder approach gives the firm access to the key element in the decision-making process, the information that connects them with the stakeholders and their immediate concerns as it inter-relates to the firm. This gives new meaning to the creation of "intellectual property" consistent with the "Second Wave" of knowledge management, where systems support control over knowledge creation (to meet the "corporate concern to identify what has to be known"), and its use in creating value for the firm (Mouritsen and Larsen, 2005; p. 377).

Additionally, stakeholder feedback provides greater buy-in from stakeholders/users, and the meanings they attribute to the system, necessary ingredients to successful implementation of information technology goals (Boonstra, 2006). Stakeholder orientation also increases the "inter-dependency" between sub-units working to common goals, increasing the probability of successful implementation (Gattiker and Goodhue, 2005).

The integrated approach also increases the viability of the individual management accounting techniques through input from the stakeholder as well as benefits from mutual interaction. This feedback, the "deeper" tacit knowledge that resides in the experiences of the individual, in this case the stakeholder, can be contrasted with the explicit knowledge existing in databases and constructed from existing systems and available knowledge. It is this tacit knowledge in interaction with the explicit knowledge that adds value to the information systems processes to create intellectual capital of value to the firm (Walsham, 2001). In the context of the BSC, Mouritsen and Larsen (2005) point out that correlations between leading and lagging

indicators do not indicate much, unless the system of measures indicates the strength of "an underlying reality of intellectual capital" (p.380). The cause-effect relationship of the BSC is criticized for not being directional or a timely response to environmental change (Nørreklit, 2000). The stakeholder responsive system potentially helps overcome this weakness as it enables the firm to monitor the external environment to understand those factors (i.e., that tacit knowledge) that can influence different perspectives to align them to stakeholders. Specifically, customer preferences and feedback may be better indicators of future needs for learning and growth and business processes than other input indicators. Business processes and operations adapt to respond to the specific needs of the customers. Likewise, feedback from suppliers is used to develop the supply chains that drive production and just-in-time processes.

The specific role of management accounting in this integration framework can be understood from different perspectives. First, they have the role of "codification" through classifications and abstractions that give meaning to information, the starting point to creating "manageable" knowledge (Bhimani and Roberts, 2004). This clarity is critical in the next step of decision-making, as the different measures need adequate classification and further, need to be developed in a form that can direct attention to key factors that support an understanding of the problem and therefore, the decision to be made. In this context, the role of the BSC as a measurement system provides insights into the classification and abstraction process. The BSC provides a framework to develop and communicate strategy, but is limited without the driving force of adequate classifications. Schneiderman (1999) for example, points out the distinction between results metrics (seen by process owners) and process metrics (internal measures that cause the results).[7] The "tacit" knowledge from the stakeholder engagement process provides the input in determining the constructs and measures that become institutionalised for data gathering and measurement.

[7] This distinction is important and highlighted in the case (e.g., measures in Figure 6), as the latter (process measures) are critical to achieving the former, the measures visible in the BSC.

Further, management tools play complementary roles in the knowledge management framework, as for example, combining BSC and ABC helps align knowledge with decision-making. The BSC strategy identifies the value proposition and the targeted customers, and ABC used in conjunction with BSC enables measurement of in-process measures that are the drivers of the underlying processes. Conversely, activity based costing, while necessary, is not sufficient to address the complex environment, particularly in relation to decisions linked to strategy, such as developing systems that satisfy customers. As Johnston (1992) points out, "while ABC gives companies a better "rack and stack" of their overhead costs, it does not drive them to change their fundamental views about how to organise work to efficiently satisfy customers" (p.153). When combined with customer and product profitability analysis achieved through ABC, the Customer perspective provides the basis for identifying customers segments for the key outcome measures such as customer acquisition, satisfaction and retention, and the nature of internal business processes that need to be developed or enhanced to further the customer outcomes.

The integration framework views accounting as the performance measurement system that provides input to the OM to drive change. However, as mentioned earlier, accounting, unlike OM, is "people-centred", and therefore, must consider the "behavioural" or motivational aspect. In this respect, the combination of different techniques can address some of these "behavioural" issues. Take the use of EVA and the BSC in incentive plans. While BSC increases subjectivity in weighting non-financial measures (Ittner and Larcker, 2002), EVA is prone to weakness of accounting measures, as EVA can be increased in the short-run by actions that have detrimental long-term effects (McIntyre, 1999). Kaplan (2001) suggests that employees evaluated under EVA would take the predictable path of productivity improvement because EVA does not provide incentives for near-term increased spending, innovation, and risk-taking that is necessary for growing revenues by developing new products, services, and markets, and enhancing customer relationships, improving service, and increasing employee capabilities.

However, when BSC based non-financial measures are combined with the EVA, the element of subjectivity is reduced, while innovation and stakeholder responsiveness increases. In addition, the ABC allows financial impacts from customer-focused process measures to be integrated with the EVA to facilitate increased management control. Specifically, customer and product revenue from product innovation and provide mix strategies, combined with short-run variable cost information (e.g., set-ups, vendor and volume related information), and long-run variable costs (capital investments in capacity, design, administration and marketing related costs) increases the granularity and transparency of the EVA measure.[8] Thus, the adequacy of this measurement system from the "people-centred" perspective is critical in increasing the effectiveness of the OM function in driving the measures in the desired direction.

Finally, the overall strength of the model is in its ability to perform the planning and control tasks using the non-budget management control system, and integrating other management techniques and stakeholder feedback. This model illustrates the transformation of firms found in some studies (for example, Ax and Bjørnenak, 2005; Williams and Seaman, 2010) through increased integrative systems that address strategic and stakeholder-based concerns while forming an alternative to traditional budgeting. Ax and Bjørnenak (2005) find that Swedish firms used an integrated form of BSC as non-budgetary control systems, while Williams and Seaman (2010) find that "high reliability organisations" developed integrated systems that enabled them to be more "mindful," characterised by a "reluctance to simplify" and "sensitivity to operations," that increased their ability to cope with uncertainty. Overall, firms that adopted the integrated approach used incentives and other forms of control that, in the short run, complemented budgeting, while in the long term, could replace the traditional budgeting approach (Ax and Bjørnenak, 2005).

[8] The author is indebted to Prof. K. V. Ramanathan of the University of Washington in Seattle for this insight.

In this changing environment, the ability of the management accountant to support this organisational transformation requires further examination. The Siegel and Sorensen (1999) study had highlighted the need for management accountants to add value to their organisations by becoming "business partners and team members" directly involved in supporting strategic management and process development. While studies indicated that some firms extended management accounting tools to monitor the environment and support strategic decisions, many continued to view the developments in management accounting with scepticism (Williams and Seaman, 2010; Speckbacher et al., 2003; Collier et al., 2007). Collier et al. (2007), in their survey of firms using budgeting, found the widely prevalent opinion that accountants had a limited role within organisations in developing systems that supported strategic decision-making. The need to keep things "simple" in the face of complexity of business combined with scepticism that "objective" methods were reliable in this environment led to this prevailing attitude among business managers.

In contrast, Williams and Seaman (2010) found that "High Reliability Organisations" were not willing to accept simplification given the critical need to understand more fully their changing environment, but rather embraced complexity when such complexity served to extend the use of management control systems to cope with uncertainty. Thus, while Siegel and Sorensen (1999) and Collier et al. (2007) among others have advocated a proactive stance for management accountants to take the initiative to increase the use of techniques that support strategy, such intervention can only occur when accountants develop that combination of knowledge and skill sets that can equip them for this challenging role. The LS Inc. example indicates the importance of teamwork skills given diverse knowledge and skill sets required to support the strategic planning and control framework. While the uniqueness of each firm based on the industry, environment and managerial proclivity will make each situation distinctive, the case analysis indicates that management accountants benefit from expanding their knowledge and skills in areas where accounting intersects with areas such as operations management and technology, to enhance their capability in supporting

organisational value creation and strategic decision-making.

Summary and Conclusions

Using deductive reasoning, the paper identifies key elements consistent with the literature in management accounting developments that form part of a stakeholder-based integration approach that can be more responsive to the changing environment and that explains the success of the firm, LS Inc. As Horngren (2003) pointed out, the current environment does not allow planning beyond weeks and months, leave alone months and years. In this context, stakeholder theory has much to offer. Generally used to address a management "accountability" and resource allocation problem in management decisions, this alternative view sees stakeholders as a resource of value creation. Specifically, stakeholders are a reservoir of untapped tacit knowledge that can help shape strategy in a changing environment and complement the role of explicit knowledge contained in the firm structures such as databases and operational techniques. This is increasingly feasible, given the reach and facilitation of information technology, combined with integration of different management tools and techniques. Thus, the stakeholder approach creates an open system, while growth of technology provides the capability of responding effectively to changes in the environment. Internal change is stimulated by creating a culture of change.

The case provides a broad framework that highlights the integrative role that different management tools and techniques can play in developing such a responsive system. Modern accounting techniques support this environment by providing measures and targets that direct action to key areas and monitor progress in that direction. The integration model has several features that support the overall effectiveness of the firm in responding to rapid change. In bringing together the various elements that form the complex modern corporation, this paper highlights the critical need for management to make sense of this disparity and diversity of tools so that they are used in cohesion and not result in creation of silos. Additionally, insights from knowledge management and the creation of intellectual capital enable the firm to achieve the goals of integration. The potential for this integration extends to providing a perspective on the individual tools in the context of the larger framework and can serve to increase their effectiveness in attaining corporate goals. As in most case research, limitations are not apparent or easily accessible. However, the key areas sensitive to constrain the effectiveness of this approach include the depth of stakeholder engagement that enables timely capture of tacit knowledge, the feasibility of translating such knowledge into actionable information and the adaption of the firm and employees to the pressures of an environment where change is the norm.

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Appendix: Glossary of Terms

VE: Value Engineering, is an organized approach for identification and elimination of unnecessary cost.

QIP: Quality Improvement Projects.

QC: Quality Circles, small group activities that involve first-line employees who continually control and improve the quality of their work, products and services.

Benchmarking is a process of exploring for best practices and performances across the world and putting systematic efforts to bridge the gap.

TOP: Total Operational Performance, an initiative launched in 1998 with the help of McKinsey. Major focus of this initiative was on cost reduction, quality & throughput improvement.

TPM: Total Productive Maintenance, an approach to maintenance that optimizes equipment effectiveness, eliminates breakdowns and promotes autonomous maintenance by operators through day-to-day activities involving the total work force.

KM: Knowledge Management, program for the company to systematically and formally share and transfer learning concepts, best practices and other implicit knowledge.

TQM: Total Quality Management, implemented through the stages of Plan-Do-Check-Act, was implemented across the firm in widely different units from operations to services and facilities management.

TOC: Theory of Constraints focused on removing bottlenecks to improve customer response times in different units and services across the firm.