Applying the balanced scorecard for better performance of intellectual capital

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Abstract

Purpose – One of the responses to criticisms of traditional forms of accounting reports for knowledge-based firms has been the development of the balanced scorecard (BSC), a strategic performance measurement framework and methodology based on a family of performance measures. This paper aims to examine the issue of measuring performance in relation to a major Australian company, The Fosters Brewing Group, where a newly appointed CEO reversed a decline in performance by adopting, among other initiatives, the balanced scorecard approach to management.

Design/methodology/approach – The paper takes the form of a case study, applying the theoretical framework of the BSC to a declining business in order to achieve a turnaround.

Findings – The paper discusses how a newly appointed CEO of The Fosters Brewing Group reversed a decline in performance by adopting, among other initiatives, the balanced scorecard approach to management.

Research limitations/implications – The BSC is a practical framework to deal with the intangible nature of knowledge, while ensuring that such investments in knowledge and management align with and contribute to their strategic direction.

Practical implications – The paper provides an example of a company using the BSC to deal with the imperative of making investments in knowledge and management skills.

Originality/value – There is a growing body of literature on the limitations of traditional accounting statements that measure tangible, physical assets to capture the current and future value of knowledge. This paper illustrates a framework using the BSC to manage and measure the intangible nature of knowledge.

Keywords Intellectual capital, Knowledge management, Company performance, Balanced scorecard, Performance measures

Paper type Research paper

Introduction

With the rapid development of the global economy, intellectual capital (IC), which can represent the principal assets of many corporations, has become a critical driver for a business's sustainability (Bontis, 2001). The emphasis on intellectual capital highlights an essential difference between companies operating in the "old" and the "new" economies, where the primary market value in the past was in physical assets, while value in the new economy is created and held primarily from the application of knowledge and the firm's intellectual capital. Increasingly, the main assets of companies are held in these intangible forms rather than in physical capital. Innovations in processes and product development are a logical product of intellectual

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capital. Thus, it also follows that in the new economy, companies will perceive creativity and innovation as necessary commercial activities to underpin their global competitive standing, providing a platform for economic growth, profitability and long-term shareholder value.

With the emergence of this emphasis on the intangible nature of knowledge, there has also been a realisation, evidenced by a growing body of literature, of the limitations of traditional accounting statements that only measure tangible, physical assets (Lev, 1996; Mavrinac and Boyle, 1996; Smith and Parr, 2000; Sullivan, 2000; Bontis, 2003). How does one capture the current and future value of knowledge? One of the responses to this criticism of accounting reports for knowledge-based firms has been the development of the balanced scorecard (BSC), a strategic performance measurement framework and methodology based on a family of performance measures. This paper examines the issue of measuring performance in relation to The Fosters Brewing Group, which has used the BSC to manage and measure the intangible nature of knowledge.

Managing the transition to a knowledge economy

Firms enjoy the prospects of significant profits commensurate with a huge increase in market size – the global market place. Yet, an environment replete with opportunity, possibilities and potential also attracts multiple international competitors, each hoping to secure some part of this global market. Thus, the reality is that firms are facing a dramatically new and intense competitive environment. A primary consideration in this situation is the utilisation of intellectual capital to capitalise on the explosive growth in opportunity. However, there are a number of significant challenges and unprecedented pressures that must be resolved if firms are to thrive in this competitive environment. One particularly noteworthy and pressing challenge is in managers and employees accessing the necessary knowledge that is critical to support and sustain the strategic direction of the firm. Another equally daunting challenge is capturing new customers and markets while simultaneously retaining existing ones. Success in meeting both these challenges will depend upon uncovering what are described as knowledge gaps (Levy, 1998), and firms need to systemise and apply the power of their intellectual capital to create enhanced services, products, and features and so enable sustained company value. In sum, the need is for firms to make effective investments in intellectual capital and knowledge that contribute to strategic direction, while simultaneously overcoming inherent impediments as a result of knowledge gaps (Housel and Bell, 2000).

Many firms have made the transition to a knowledge economy by recognising the critical role intellectual capital plays in innovative product design, production, distribution and promotion. Examples of such firms are Walt Disney, H.J. Heinz, Johnson and Johnson, and Merck. In each of these cases, the market value of the firm is more than four times its tangible asset base. The difference clearly reflects the substantial value represented by intellectual capital, which is not captured by traditional accounting statements (Smith and Parr, 2000). These examples highlight the inability of accounting statements to successfully measure and account for intangible assets. On this matter, research by Lev (1996) found that up to 40 per cent of the market valuation of a median corporation could be missing from the company balance sheet. For high-tech companies, this figure rises to more than 50 per cent. From another perspective, a study of some 250 companies by Sullivan (2000) shows that the typical institutional investor devotes substantial attention to non-financial performance issues. Quantifying this estimate, Sullivan suggests that some 35 per cent of the investment decision is driven by investors' evaluation of non-financial data, such as the quality of a firm's intellectual capital.

Investment and valuation considerations

Turning from the challenges of leveraging IC in a knowledge economy to the issue of investment and valuation, there is compelling evidence that shareholders place strong reliance on a broad range of non-financial factors beyond the quantitative data reported in a firm's annual report (Mavrinac and Boyle, 1996). Leading critics of current standards of financial reporting, Mavrinac and Boyle (1996) identify the inability of current financial mechanisms to capture or communicate the value of strategy, processes and such intangibles assets as knowledge, innovation, and customer loyalty. Continuing, as he says, the traditional focus on what is historic and tangible has a profound and depressing impact not only on companies' valuations, but also on the nation's growth, productivity, employment levels and wage rates. As well, "rule-bound" systems are outdated, inaccurate and increasingly irrelevant in today's service-oriented and knowledge-based economies.

Non-financial measures of quality and strategic achievement have a profound effect on investment and valuation (Heller, 1994). For this reason, in a knowledge economy, it is clear, firstly, that investors and managers want more than traditional financial data when making economic decisions about firms (Ittner and Larcker, 1996; Cheney *et al.*, 1991). Secondly, there has been a call for new and improved financial reporting and valuation of intellectual capital from both public and public organisations (Lev, 1996; Mavrinac and Boyle, 1996; Kaplan and Norton, 1997). This research also provides sufficient evidence that the absence of an appropriate and accurate framework for valuation of intellectual capital can lead to disruptions and under-investments in knowledge. The effect of this traditional focus on accounting statements and measures of performance such as return-on-asset (ROA) and return-on-investment (ROI) is to disguise structural cracks in strategy and vision that can jeopardise both a firm's long-term survival and shareholder wealth creation. The reason is that in a hyper-competitive global environment, success depends not so much on short-term performance measures, but on investments in intellectual capital to cover knowledge gaps that can impede future competitiveness. Swissair and Wang Computers are two notable examples of firms that met their demise because of a failure to address knowledge gaps in face of the growing demands of competition in the knowledge economy (Klein, 1998).

The balanced scorecard

One of the responses to criticisms of traditional forms of accounting reports for knowledge-based firms has been the development of the balanced scorecard (BSC). This strategic performance measurement framework and methodology focuses on developing and monitoring strategy via a family of performance measures. The BSC approach grew out of a multi-company study group in the early 1990s, sponsored by CEO of The Nolan Norton Institute, David P. Norton, with support from Dr Robert S. Kaplan, the Arthur Lowes Dickinson Professor of Accounting at the Harvard

Business School. In essence, by placing metrics around customer processes and employee performance, firms are more likely to successfully implement corporate strategies. The BSC thus helps translate corporate strategy into a set of goals and objectives, with implementation tracked through multiple performance measures. As such, the approach also aids in communication and encourages a more broad-based and far-sighted strategic planning process than supported by the earlier sole focus on ROI and ROA.

The BSC approach measures performance from four different perspectives that together encourage managers to look beyond traditional financial measures. The four perspectives of performance are:

(1) learning and growth (concerned with actions to improve and create value);

(2) internal processes (concerned with what the firm must excel at);

(3) customer (considers how the firm looks to customers); and

(4) financial (considers how the firm looks to shareholders).

The process of translating strategy into action associated with the BSC involves turning the company's strategic vision into clear and understandable objectives based on the above perspectives. Some companies have moved beyond this early vision for the scorecard, to discover its value as a cornerstone of a new strategic management system with the potential to deliver a firm's strategic objectives (Anthony and Govindarajan, 1998). In this regard, Olve *et al.* (1999) suggest that there are four processes involved in establishing this new strategic management system. These are:

(1) translating the vision, which helps managers to build a consensus around the company's strategy and express it in terms that can guide action at the local level;

(2) communication and linking, which lets managers communicate their strategy up and down the organization and link it to unit and individual goals;

(3) business planning, which enables companies to integrate their business and financial plans; and

(4) feedback and learning, which gives companies the capacity for strategic learning, which consists of gathering feedback, testing the hypothesis on which strategy was based, and making the necessary adjustments.

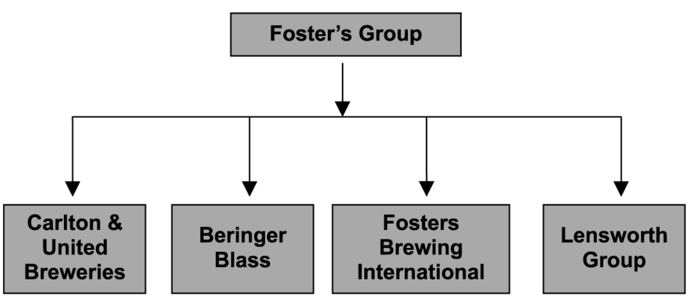
Fosters Brewing Group

The Fosters Brewing Group grew from a Victoria-based company in the mid-1960s into an international company by the mid-1980s. However, in the 1990s the firm went into decline as the group faced considerable upheaval and a continual series of seriously impaired balance sheet statements, the result of high debt and gearing. The alarming fall in the company's share price, clearly indicated that Fosters had both short-term and long-term problems that could very well threaten its survival. Such was the magnitude of financial and organisational problems that the CEO was replaced and in March 1992, Ted Kunkel was appointed as President and CEO of Fosters.

In overseeing the rebuilding of the company, Kunkel recognised a leading problem immediately. The market value of the firm closely reflected its underlying tangible asset base, clearly indicating that there were serious under-investments in the intellectual capital and knowledge base of the firm. Fosters' competitive edge had declined in the face of the onslaught of aggressive international competitors, both nationally and internationally, which had eroded market share and profits. The seeds of decline sown almost ten years previously now threatened the survival of the firm. This was the clear message from the stock exchange, but one to which the previous management appeared oblivious, being content to merely tinker with short-term measures of profit statement and balance sheet performance. Kunkel decided to make meta-changes, including rewriting the vision and mission statements, reformulating strategy, and adoption of the balanced scorecard and activity-based costing systems. This paper focuses on the brewing and premium wine segment of the business, as this segment reflects Fosters' core business competency. However, Fosters also has a residential property development arm called The Lensworth Group, a leader in creating Australia's most liveable communities. The group's organisational chart is shown in Figure 1.

Fosters' vision, mission and values

Fosters' vision is to "inspire global enjoyment" through their premium products – beer, wine, spirits, leisure or property. Fosters' mission is to "work together, respect each other, our heritage, diversity, skills and knowledge to build premium quality, *first choice brands*". This is the true thrust of their differentiation strategy, which charges a premium price for a value-added premium quality brand. An inspiring workplace at Fosters motivates the employees to achieve the organizational goals. Further, excellence in delivery service ensures customer satisfaction by adding value that eventually generates a superior return. Fosters' goal is to be welcomed in the communities in which they operate (see www.fosters.com.au). Their vision and mission are underpinned by strong organizational values and their commitment to integrity and organizational accountability are reflected by the company's organizational structure, their control processes and by underlying ethical values. The company's organizational structure is reportedly based on a people oriented approach – what Fosters describe as a "People Model", but as Mullins (1999) notes, a good organizational structure does not help a company perform better by itself, but a poor organizational structure can make good performance impossible.



Source: Foster's Annual Report (2004)

Figure 1. Fosters organizational chart

Fosters' People

Without the right people you cannot deliver the right results. One of the company's key strengths and source of competitive advantage is the talent, initiative and experience of its employees. A key component of the Fosters mission is their *commitment* to create an inspiring workplace across the group to attract and retain qualified and skilled workforce. Fosters' inspired workforce has been vital to their consistent growth and success. Central to Fosters' efforts in achieving this goal is a group-wide initiative called "Fosters' People", which encompasses the activities undertaken that contribute to achieving an inspired work force. To create an inspiring work place Fosters has developed a people model – with six elements as shown in Figure 2.

Company management

At Fosters, teamwork lies at the core of the way they think and work. Encouraging teamwork is one of leadership's roles. Teams strive hard to find innovative ways to enhance their profitability, while team members share knowledge and ideas in order to give the company its competitive edge (*Fosters' Annual Report*, 1991-2003). Accordingly, the company is committed to identifying, monitoring and managing risks associated with business activities, and has established the implementation of practical and effective control systems. These include a clearly defined organizational structure with approved authority limits and annual budgeting and monthly reporting systems for all business units that enable progress against the strategy and annual plan to be monitored, trends to be evaluated and variances to be acted upon. Other control systems include:

- procedures relating to capital expenditure, asset and liability management;
- protection of the Group's brands globally;

Source: Foster's Homepage: www.fosters.com.au

Figure 2.
Fosters' People model: supra-interactive factors that make the mission a success

- policies to manage financial risk;
- appropriate due diligence procedures for corporate acquisitions and disposals; and
- a comprehensive group-wide insurance program (*Fosters' Annual Report*, 1991-2003).

Fosters' vision and mission statements are designed to be inspirational and provide energy throughout the whole organization. Kunkel felt that reporting and measurement measures should not merely be a description of past performance, but that they should articulate and communicate Fosters' strategy to ensure the alignment of individual, organizational, and cross-departmental initiatives to achieve the BSC measures. Noting the maxim "excellent measures precedes excellent performance", we next explore the four perspectives identified by the BSC and their contribution to the development of measures of organisational success.

BSC: financial perspective

Financial measures provide managers with a good picture of the economic consequences of actions already taken. The financial measures commonly used are return on investment (ROI), return on equity (ROE), and operating income. They give a clear picture of the financial performance of the company to ascertain that the implementation of company's strategy and execution are indeed contributing to bottom-line improvement and achieving the desired "goal congruency".

As with any other perspectives, the measures selected for the BSC should translate the strategic objectives of the company. The choice of the appropriate financial measures to be incorporated in to the BSC depends on the stage of business's life cycle (growth, maturity and decline) and the strategic theme chosen for the financial perspective. The BSC measures were also linked to one of three possible strategic financial themes: revenue growth and mix, cost reduction/productivity improvement, and asset utilization. Based on these factors, the measures that appeared relevant to Fosters are displayed in Table I, adapted to the company's specific stages of business cycle and financial strategies. These measures are based on the business cycle stage, the financial strategy, the competitive environment and the business unit strategy, noting also that eventually all measures in the other perspectives are linked to one or more financial measures.

BSC: customer perspective

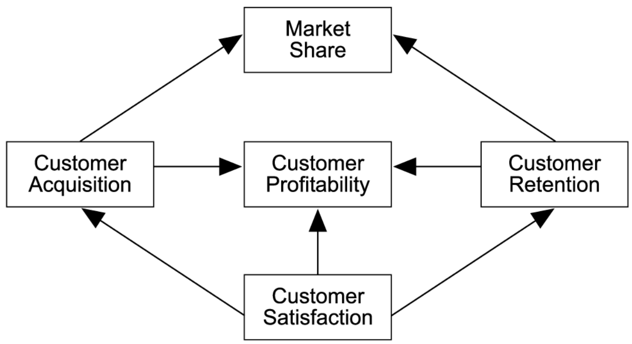
The customer perspective aims at identifying the customer and market segments in which the organisation competes. The first step is to determine the best measures of the business unit's performance for these targeted segments and core measures that will describe the successful outcomes of a well-formulated and implemented strategy. According to Kaplan and Norton (1992), core measures include customer satisfaction, retention, new customer acquisition, customer profitability, and market and account share, and building a sustainable customer relationship (see Figure 3).

Foster's had to identify the attributes that build a healthy customer value and choose the value proposition that would deliver earning above average return (AAR). Kaplan and Norton (1993) suggest these attributes and measures fall into three classes:

Table I.
Financial measures

	Strategic themes		
Business strategy	Revenue growth and mix	Cost reduction/ productivity improvement	Asset utilisation
Growth	Sales growth rate by segment Percentage revenue from new products, services and customers	Revenue/employee	Investment (percentage of sales) R&D (percentage of sales)
Maturity	Share of targeted customers and accounts Cross-selling Percentage revenue from new applications Customer and product line profitability	Cost versus competitors Cost reduction rates Indirect expenses (percentage of sales)	Working capital ratios (cash-to-cash cycle) ROCE by key asset categories Asset utilisation rates
Decline	Customer and product line profitability Percentage unprofitable customers	Unit costs (per unit of output, per transaction)	Payback Through-put

Source: http://isds.bus.lsu.edu/cvoc/learn/bpr/cprojects/spring 2003/bsm/page2.html



Source: Olve *et al.* (2003)

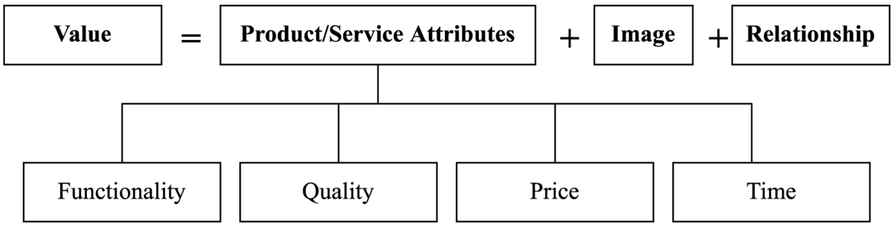
Figure 3.
Customer perspective core measures

(1) product and service attributes (functionality, quality and price);
(2) customer relationship (quality of purchasing, experience and personal relationship); and
(3) brand building (image and relationship).

Figure 4 tabulates Fosters' customer value proposition with the focus on creating superior value consisting of the aggregates of the variables of product and service attributes, image and relationships. In the face of a tough competitive environment, this proposition is believed to deliver a sustainable competitive advantage for Fosters. The combination of core activities and measures describing valued attributes helped Fosters to focus their organisational efforts on delivering superior value to their customers.

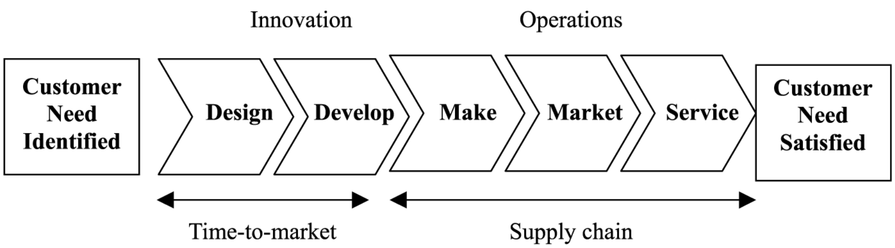
BSC: internal business process perspective
Fosters Group had to identify the internal processes crucial to their success by thoroughly scanning their internal environment, identifying the competency level and undertaking a "gap analysis". Those critical processes identified were the ones that added superior value to their existing customers apart from meeting competency requirements and desired financial targets. The procedure of undertaking a rigorous internal analysis and relating it to the BSC (Figure 5) is one of the latest trends in the modified BSC compared to traditional performance measures. In view of the phenomenon of "time compression" as an outcome of global competition observed by Levy (1998), the "time to market" for new and innovative products and services is now extremely short. Not only must firms be able to design and develop products quickly, but also they must be able to support "supply chain" activities in order to earn an above normal profit.

The BSC approach goes beyond a simple assessment of existing processes by providing a framework for analysis and measurement. The quantitative nature of the framework is its major strength. Fosters implemented the BSC framework of all processes that were critical for the firm to make the turnaround and return to profitability. The implementation of these processes was linked to one of a number of



Source: http://isds.bus.lsu.edu/cvoc/learn/bpr/cprojects/spring2003/bsm/page2.html

Figure 4.
Customer value proposition



Business Processes:

Innovation Processes:
- Product design
- Product development

Operations processes:
- Manufacturing
- Marketing
- Post-sales service

Source: http://isds.bus.lsu.edu/cvoc/learn/bpr/cprojects/spring2003/bsm/page2.html

Figure 5.
Internal business process perspective

business improvement methodologies, such as just-in-time (JIT), total quality management (TQM), etc. Each business unit had to identify different process that should be improved to increase value.

Kaplan and Norton (1993) suggest that the balanced scorecard should not only consider operations processes, but also innovation processes. By incorporating innovation process measures, the BSC provides managers with a set of tools that can add value in both the short and long term. Fosters applied the major elements of analysis that the original BSC prescribed, but added elements that made the scorecard more relevant to its own needs (see Table II).

BSC: learning and growth perspective

The authority of this (or any other) framework and associated indicators relies on their synergistic relationship. In applying the learning and growth perspective, Fosters had to identify the organizational infrastructure that would best fit its strategic goals. That said, for successful implementation, while in the other three perspectives managers needed to identify where the organization stood currently and where it had to be in the future in order to be successful, this fourth perspective provides the actions on "how to get there". The learning and growth perspective has three dimensions – people, systems and organizational perspectives – and Kaplan and Norton (1993) outline an eight-step process to build and implement the balanced scorecard. The steps in the process are:

(1) *Preparation* – identify the business unit where a scorecard is appropriate. The business unit should have its own customers, distribution channels, production facilities, and financial performance measures.

(2) *Interviews* – first round, key organisational executives and senior managers are interviewed to obtain their input into the organisations strategic objectives and tentative BSC measures.

Financial	*Customer*
Shareholder equity/total assets (per cent)	Market share (per cent)
Return on investment (per cent)	Brand image index (per cent)
Added value/employee ($)	Satisfied customer index (per cent)
Market value ($)	Annual sales/customer ($)
Profits from new products or business operations ($)	Customer loyalty index (per cent)
Process improvement	*Learning and growth*
Inventory turnover (no.)	Investment in the development of new markets ($)
Improvement in productivity (per cent)	Satisfied employee index (no.)
Administration expense/employee ($)	Marketing expense/customer ($)
	Investment in new product support and training ($)
	Research and development (number of patents and trademarks)
	Knowledge management – tacit and explicit ($ value of estimated values)

Table II.
Balanced scorecard for Fosters

(3) *Executive workshop* – first round, the top management team is brought together to develop the BSC through discussions on the mission and strategy.
(4) *Interviews* – second round, individual interviews are completed to further refine the work completed during the initial workshop phase and seek opinions about issues involved with implementation.
(5) *Executive workshop* – second round, top executives and their senior managers and direct reports debate the organisations vision, mission and the tentative scorecard. The BSC is linked to existing plans and initiatives and a start is made on the implementation plan.
(6) *Executive workshop* – third round, the senior executive team meet to finalise the BSC and the implementation plan. The team must agree on the implementation plan including communicating the BSC to employees, integrating the BSC in to the management philosophy, and developing an information system to support the BSC.
(7) *Implementation* – a new team is established to drive the introduction and ensure successful implementation including the implantation of appropriate technology to ensure success.
(8) *Periodic reviews* need to be monitored and report on success of the BSC.

Since this initial proposal a number of writers have further refined the implementation process. Novak (2000), for example, has suggested that the most important element in the BSC is alignment. She has linked her approach to the human performance improvement (HPI) models, stressing the importance of ensuring that all members of the organisation are aligned in their view of the organisation's strategy and vision, proposing a 12-step process that results in the implementation of the HPI scorecard with an operational plan.

Summary and recommendations

Fosters' establishment of a more flexible structure has allowed the company to quickly adapt to a changing environment. Kunkel has been an outstanding leader of Fosters for the last 12 years, guiding the company through the recovery, restructuring and strategy development phases, and in the process re-establishing the credibility of the Fosters Group. Under Kunkel's leadership, Fosters has achieved a number of strategic goals, including diversification, ongoing cost reductions, productivity improvements and innovation, the pursuit of growth and opportunities, observance of highest standards of corporate governance and ethics (*Fosters' Annual Report*, 1991-2003). Today, Fosters Group has emerged as one of the world's leading brewers and leading premium wine companies dedicated to delivering quality beer, wine and spirit products that are enjoyed by millions of consumers around the world every day. The company employs more than 13,000 people. The company's present annual turnover is around $5 billion, and it has brewing operations in ten countries including Australia, Fiji, Vietnam, India, the USA, the UK, and China. The stock price clearly reflects that the firm has been able to reverse its decline and is, once again, a vehicle of long-term shareholder wealth creation.

Successful implementation of a well-formulated BSC is, of course, more important than formulating the array of matrices. However, formulating a scorecard that best fits the strategic interest of the organisation is vital. Table II summarises the different elements of the BSC that the firm implemented to achieve sustainable competitive advantage. This scorecard encapsulates the short- and long-term measures of the modified BSC that Fosters Group considered for motivating employees to achieve goal congruency, rather than using it just as a measuring tool for employee performance.

In closing, major changes often take a long time to effect, especially in large organisations. Many forces, such as the departure of key people and change agents, and the costs of maintenance can stall the process of change when still far short of the finish line, which in any case is hard to determine. The BSC is thus arguably never really complete. Rather, because the business environment is dynamic and constantly evolving, an organisation's scorecard needs to be constantly reconceptualised to reflect developments outside the framework. These can include volatile forces such as new competitors and changing customer demands that can affect a firm's strategy. As the business environment changes, current strategies will be challenged and new strategies may need to be formulated. Similarly, the indicators (measures) in the scorecard will need to be reviewed to ensure the indicators continue to reflect strong relationships with performance. Finally, and most importantly for the BSC team at Fosters, it needs to be understood that the scorecard is not an ongoing metrics project. Rather, the BSC represents a meta-change initiative, which needs careful monitoring, measuring and maintaining on a continuous basis. The danger is that the application of the BSC may fall victim to any of the forces of inertia, including cost of maintenance, departure of key change agents, or success blindness. Of these, the cost of maintenance perhaps poses the biggest single threat, as it does to any major change initiative. For Fosters to continue its success, the scorecard provides a valuable methodology particularly suited to measuring the intangible nature of knowledge. The main proviso is that the scorecard needs to be regularly amended and nurtured to take account of the changing environment.

References

Anthony, R.N. and Govindarajan, V. (1998), *Management Control Systems*, 9th ed., Irwin McGraw-Hill, Homewood, IL.

Bontis, N. (2001), "Assessing knowledge assets: a review of the models used to measure intellectual capital", *International Journal of Management Reviews*, Vol. 3 No. 1, pp. 41-60.

Bontis, N. (2003), "Intellectual capital disclosure in Canadian corporations", *Journal of Human Resource Costing and Accounting*, Vol. 7 Nos 1/2, pp. 9-20.

Cheney, P., Devinney, T. and Winter, R. (1991), "The impact of new product introductions on the market value of firms", *Journal of Business Finance*, No. 15, pp. 18-27.

Fosters' Annual Report (1991-2003), available at: www.fosters.com.au (accessed 5 March 2004).

Heller, T. (1994), "The superior stock market performance of a TQM portfolio", *The Centre for Quality Management Journal*, Vol. 3 No. 1, pp. 23-32.

Housel, T. and Bell, A.H. (2000), *Measuring and Managing Knowledge*, McGraw-Hill, Toronto.

Ittner, C.D. and Larcker, D. (1996), "Measuring the impact of quality initiatives on firm financial performance", in Neef, D., Siefeld, T. and Cefola, J. (Eds), *The Economic Impact of Knowledge*, Butterworth, Boston, MA, pp. 273-93.

Kaplan, R.S. and Norton, D.P. (1992), "Balanced scorecard – measures that drive performance", *Harvard Business Review*, January/February, pp. 71-9.

Kaplan, R.S. and Norton, D.P. (1993), "Putting the balanced scorecard to work", *Harvard Business Review*, September/October, pp. 134-42.

Kaplan, R. and Norton, D. (1997), "Why does business need a balanced scorecard?", *Journal of Strategic Performance Measurement*, February/March, pp. 5-11.

Klein, D. (1998), "The strategic management of intellectual capital", *Knowledge Engineering Review*, Vol. 10, pp. 115-52.

Lev, B. (1996), "Knowledge measures in financial reports", in Neef, D., Siefeld, T. and Cefola, J. (Eds), *The Economic Impact of Knowledge*, Butterworth, Boston, MA.

Levy, N.S. (1998), *Managing High Technology and Innovation*, Prentice-Hall, Englewood Cliffs, NJ.

Mavrinac, S.C. and Boyle, T. (1996), "Sell-side analysis, non-financial performance evaluation, and the accuracy of short-term earnings forecasts", working paper, Ernst & Young Centre for Business Innovation, New York, NY.

Mullins, L.J. (1999), *Management and Organizational Behaviour*, 5th ed., Pearson Education, Harlow.

Novak, C. (2000), "HPI balanced scorecard", *ASTD Info-line*, No. 10, October.

Olve, N., Roy, J. and Wetter, M. (1999), *Performance Drivers – A Practical Guide to Using the Balanced Scorecard*, Wiley, Chichester.

Smith, G.V. and Parr, R.L. (2000), *Valuation of Intellectual Property and Intangible Assets*, 3rd ed., Wiley, New York, NY.

Further reading

Arora, R. (2002), "Implementing KM – a balanced scorecard approach", *Journal of Knowledge Management*, Vol. 6 No. 3, pp. 240-9.

Davis, T.R.V. (1996), "Developing an employee balanced scorecard: linking frontline performance to corporate objectives", *Management Decision*, Vol. 34 No. 4, pp. 14-18.

Hepworth, P. (2000), "Weighing it up – a literature review for the balanced scorecard", *Journal of Management Development*, Vol. 17 No. 8, pp. 559-63.

Lee, S.F. and Ko, A.S.O. (2000), "Building balanced scorecard with SWOT analysis, and implementing Sun Tzu's 'The Art of Business Management Strategies' on QFD methodology", *Managerial Auditing Journal*, Vol. 15 Nos 1/2, pp. 68-76.

Letza, S.R. (1996), "The design and implementation of the balanced business scorecard – an analysis of three companies in practice", *Business Process Re-engineering & Management Journal*, Vol. 2 No. 3, pp. 54-76.

Robbins, S.P. (2003), *Organizational Behaviour*, 10th ed., Pearson Education, Harlow.

Waal, A.A. (2003), "The future of the balanced scorecard: an interview with Professor Robert S. Kaplan", *Measuring Business Excellence*, Vol. 7 No. 1, pp. 30-5.

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