

Automating the balanced scorecard – selection criteria to identify appropriate software applications

Bernard Marr and Andy Neely

Centre for Business
Performance, Cranfield School
of Management, Cranfield,
Bedford MK43 0AL, UK. Tel:
(44) 01234 75 11 22. E-mail:
bernard.marr@cranfield.ac.uk

Abstract *The balanced scorecard (BSC) is a management tool that helps to align behavior of all employees to the organization's strategy. Research suggests that about half of large US firms have already adopted the BSC and many more are considering implementation. Organization-wide implementation of a BSC requires IT support and numerous software vendors have taken the opportunity to build software solutions to support a BSC implementation. The problem executives face today is that there are over two-dozen application-providers to choose from, each of them claiming that their solution offers unique and important features. Selecting the wrong solution can undermine the entire BSC development effort and the credibility of the performance management system. This article addresses the issue of BSC software by (1) explaining why organizations might need software to support their implementation and (2) by developing a framework to assist organizations in this important decision process.*

Keywords *Balanced scorecard, Performance measures, Performance management, Computer software, Technology led strategy*

Introduction

The balanced scorecard (BSC), first introduced as an improved measurement framework by Robert Kaplan and David Norton (Kaplan and Norton, 1992, 1996), in the early 1990s is proving to be enduringly popular. Research suggests that 60 percent of Fortune 1000 companies have experimented with the BSC (Silk, 1998) and the latest data, from the Gartner Group, suggest that over 50 percent of large US firms had adopted the BSC by the end of 2000. Data collected by the BSC potentially focus article collaborative suggest that of the firms not currently using the balanced scorecard, 43 percent are planning to use one soon and a further 48 percent are considering using one (Downing, 2001).

Over the last decade the scorecard has evolved and its proponents argue that it is far more than a measurement framework, for it provides a novel means of translating strategy into action by ensuring that the behaviors of employees at all levels of an organization are aligned with strategy (Kaplan and Norton, 2000b). One of the implications of this, however, is that the BSC has to be implemented organization-wide and used by all employees if the laudable aims of goal congruence and strategic focus are to be achieved.

The massive interest and adoption has led to the emergence of a host of service businesses revolving around the BSC. Numerous consultants offer facilitation services to companies wishing to develop balanced scorecards. All of the major conference organizers offer events on the BSC and software vendors offer packaged applications to support BSC implementations.



In this article we will focus on one particular challenge facing many organizations – how to select the right IT infrastructure to support a BSC implementation. We will first discuss the reasons for using software applications to support BSC implementations and then explain the growing market place. After summarizing the research approach we present a framework for selecting BSC software.

At this stage we would like to emphasize that software does not come first in any implementation. Before you start considering the software solution you should already have successfully developed a robust balanced scorecard. You should already have developed your success map (Neely *et al.*, 2002; Anonymous, 2002; Kaplan and Norton, 2000a). You should have already developed appropriately defined measures and confirmed that these measures will encourage the right behavior. You should have tackled all of the issues around whether you link your BSC to your organization's reward systems and if so how you plan to do this. So effectively you would now be moving into the implementation phase for your balanced scorecard. You will have defined your set of 15-20 performance measures that you want to track on an on-going basis and disseminate to a wide variety of people. You will have established an appropriate education program to explain to people the way the new world will work. Only then should you start looking for supporting infrastructure that will allow you to integrate, access and communicate the necessary data.

Why automate the balanced scorecard?

According to André de Waal (2001) one of the seven performance management challenges organizations need to address is embracing information transparency in order to have the right information available at the right time, to make the best decisions, and to take actions. Alison Classe (1999) notes that paper and pencil, or simple spreadsheet tools are everything you need to start applying a balanced scorecard, but if you decide to make the method an integral part of the business, automation will usually be necessary. Paul Sharman and Bruce Kavan (1999) add that paper-based measurement systems are too slow, cumbersome, labor intensive and unreliable.

Today, the most widely used software to support a BSC is Microsoft Excel. The major disadvantages of standard spreadsheet documents are the following (Marr and Neely, 2001):

1. No scalability – scorecards quickly reach the capacity desktop spreadsheets can handle.
2. Time-consuming to update – usually they are manually fed and updated, which is slow and leaves immense room for errors.
3. No collaboration and communication support – data is stored in individual spreadsheets, often scattered around on different machines, and it requires enormous discipline to work on the same spreadsheet.
4. Difficult analysis – because data is stored in individual spreadsheets, it is difficult and time consuming to bring them together for analysis.

Robert Kaplan notes in his foreword to the BSC software report that BSC software helps organizations become strategy-focused by (1) providing a visual representation of their strategy through strategy maps; (2) cascading high-level scorecards down to customized scorecards in business units, shared services and corporate staff units; (3) communicating scorecards to all employees; and (4) making strategy a continual process by providing a new reporting and feedback framework (Marr and Neely, 2001, p. 6).

Summarizing the existing literature the following three reasons can be considered as the main ones for managers to implement a BSC software application:

1. Data integration: BSC software allows organizations to integrate data from multiple data sources (Missroon, 1998).
2. Data analysis and storing: BSC software allows organizations to analyze the data across all data sets of the scorecard, qualitative and quantitative (Silk, 1998).

- Communication and collaboration: BSC software can facilitate communication of performance data among users, top down and bottom up (McCann, 2000) and enable collaboration and feedback loops (Silk, 1998).

However, various authors draw attention to the fact that software is only a tool and not a substitute for the initial hard work of strategic analysis (Marr, 2001; Sharman and Kavan, 1999). Software enables organizations to implement the BSC organization-wide with one precondition – that employees will use it. Therefore it is important to pick a solution that meets the requirements of the organization in order to ensure the usage and subsequent success of a BSC implementation (Marr *et al.*, 2000).

The BSC software marketplace

Turn to the Internet, search on BSC software, and you will easily find in excess of 30 different organizations all of whom are willing to offer you BSC applications. For an overview of some software vendors offering BSC solutions see Figure 1. Each vendor will claim unique advantages for its particular product. Each vendor will be able to demonstrate applications of his product and provide credentials from satisfied users. So how do you know which of these different vendors to go with? How do you even cut down the list from 30 to three that you might put on your shortlist? What is the process of making the right decision about selecting scorecard reporting software?

This is a significant issue for most organizations. Typically the cost of developing a BSC – i.e. deciding what and how to measure – can cost in the region of \$100,000, for even a simple application. The reporting software package prices vary enormously from a few thousand dollars

Figure 1 Software vendors with solutions to support a BSC implementation

<i>Company name</i>	<i>Product name</i>	<i>Internet address</i>
Active Strategy	Active Strategy Enterprise	www.activestrategy.com
Cognos	Metrics Manager	www.cognos.com
Comshare	Comshare MPC	www.comshare.com
Corporater	Corporater Balanced Scorecard	www.corporater.com
CorVu	CorStrategy/CorBusiness	www.corvu.com
Crystal Decision	Balanced Scorecard Analytic App.	www.crystaldecisions.com
Dialog Software	Dialog Strategy	www.dialogstrategy.com
EFM Software BV	Bizzscore	www.efmsoftware.com
Ergometrics	Ergometrics	www.ergometrics.com
Hyperion	Hyperion Performance Scorecard	www.hyperion.com
IC Community	Dolphin Navigator System	www.icvisions.com
IFS	IFS Scorecard	www.ifsworld.com
InPhase Software	Performance Plus	www.inphase.com
Insightformation	Balanced Scorecard Framework	www.insightformation.com
Nexance	NeXancePM	www.nexance.com
Open Ratings	SPlmact Balanced Scorecard	www.openratings.com
Oracle	Oracle Balanced Scorecard	www.oracle.com
Panorama Business Views	PB Views	www.pbviews.com
Peoplesoft	Enterprise Scorecard	www.peoplesoft.com
Pilot Software	Pilot Balanced Scorecard	www.pilotsoftware.com
Predicate Logic	TychoMetrics	www.tychometrics.com
Procos AG	Strat&Go Balanced Scorecard	www.procos.com
ProDacapo	Prodacapo Balanced Scorecard	www.prodacapo.com
QPR Software	QPR ScoreCard	www.qprsoftware.com
SAP	SEM Balanced Scorecard	www.sap.com
SAS Institute	Strategic Performance Management	www.sas.com
Show Business Software	Action Driven BSC	www.showbusiness.com
Stratsys AB	Runyourcompany	www.runyourcompany.com
The Vision Web	Scorecard.nl	www.scorecard.nl
Vision Grupo Consultorues	Strategos	www.visiongc.com
4GHI Solutions	Cockpit Communicator	www.4ghi.com

to far over a million dollars, with typical spends and investments in the region of \$200,000 for reasonable sized organizations. Making the wrong decision, buying the wrong software, can not only result in a significant waste of time, energy and money, but can also undermine the entire BSC development effort and the credibility of the performance management system you are trying to put in place. This decision process is a fundamental one and needs to be taken with great care.

Research approach

In order to develop a selection framework we conducted a longitudinal research project involving over 80 companies in three years. After initial pilot case studies we realized that there are numerous members of organizations influencing the selection process with very different agendas. IT directors looked at the IT infrastructure and integration capabilities; finance directors looked for the economically most sensible solutions; business analysts looked for the most comprehensive analysis capabilities; and general managers looked for a good user interface and ease of use. This meant we had to use a case study approach where we gathered the views from multiple members in each organization (Yin and Campbell, 1994). Using theoretical sampling techniques (Glasser and Strauss, 1967) we attempted to gather data from a broad range of companies with the intention to develop a selection framework applicable across organization types (Eisenhardt, 1998). The sample was not random, but was intended to reflect the views of organizations from each category (Harris and Sutton, 1986): public (dependent and independent), private (dependent and independent).

We also interviewed 25 senior members from consulting firms including Accenture, Gap Gemini Ernst and Young, KPMG and Gartner who were involved in BSC implementations and accompanying software selections. Furthermore, we interviewed over 45 members of software companies specialized in providing BSC and performance management software. This broad data set allowed us to code the data and extract the key aspects organizations need to consider when selecting a BSC software solution. Bringing those aspects together enabled us to develop a framework to guide organizations through the software selection process.

Selecting BSC software: a decision framework

It is important to recognize that each organization has a unique set of requirements for a BSC software application and it is not possible to provide a single list of requirements appropriate for every organization. Organizations differ in terms of size, IT infrastructure, communication style, required level of security, cash position, scorecard design, IT literacy, in-house capabilities, etc. All these aspects affect the selection criteria of a BSC software solution. For the purpose of developing a selection framework this means that we can present the criteria organizations should consider, but then organizations have to weigh each of the criteria to reflect their unique set of requirements.

Following the same logic, the 30 or so different BSC reporting packages that are available on the market each have different strengths and weaknesses. Particular packages will be relevant for your organization for particular reasons, while they may be completely inappropriate for others. So rather than worrying about the packages on the market, begin by thinking about what you need from your BSC application in your organization. The easiest way is to create a two-directional matrix in which organizations put weightings against each criteria, this matrix can then be used to compare available software product against the organizational requirements (see for example Figure 2). In the following we will define and explain each of the ten selection criteria companies should discuss when choosing a BSC software.

Company and product

First it is a good idea to check the vendor background as well as basic product information. Key at this stage is pricing, since prices vary significantly, as do the pricing models. Here it is important to check not just license fees but also maintenance fees, which can fluctuate between 10 and 25 percent of the license fees. Software pricing is a very difficult issue and different pricing models might be more applicable to your organization than others, e.g. pricing per user

Figure 2 Selection matrix for Balanced Scorecard software

<i>Criteria</i>	<i>Required</i>	<i>Weight</i>	<i>Product A</i>	<i>Product B</i>	<i>Product ...</i>
Company/product					
Sub-criteria I	Yes/no	1-10			
Sub-criteria II	Yes/no	1-10			
Scalability needs					
Sub-criteria I	Yes/no	1-10			
Sub-criteria II	Yes/no	1-10			
Flexibility needs					
Sub-criteria I	Yes/no	1-10			
Sub-criteria II	Yes/no	1-10			
Features and functions					
Sub-criteria I	Yes/no	1-10			
Sub-criteria II	Yes/no	1-10			
Communication needs					
Sub-criteria I	Yes/no	1-10			
Sub-criteria II	Yes/no	1-10			
Technical needs					
Sub-criteria I	Yes/no	1-10			
Sub-criteria II	Yes/no	1-10			
User interface					
Sub-criteria I	Yes/no	1-10			
Sub-criteria II	Yes/no	1-10			
Analysis needs					
Sub-criteria I	Yes/no	1-10			
Sub-criteria II	Yes/no	1-10			
Service requirements					
Sub-criteria I	Yes/no	1-10			
Sub-criteria II	Yes/no	1-10			
Future developments					
Sub-criteria I	Yes/no	1-10			
Sub-criteria II	Yes/no	1-10			
		Score:			

versus pricing per package. However, software companies are often flexible in their pricing and pricing models are subject to negotiation. It is also important to consider training and implementation costs as they can drastically increase the overall price of solutions, but often remain initially hidden.

In terms of company it might be good to understand the background of the company and the product, e.g. how many people work on the BSC solution. Very large software companies might have only a few people working on their BSC application, which might be treated as a by-product. On the other hand, a small company, which specializes in performance measurement software might have more expertise and a larger client list. The size and global presence of a software vendor might be important if organizations plan to implement the BSC globally or across countries. You might want to check the economic viability of the software vendor considering recent collapses in this market.

Scalability

In order to assess the scalability needs it is important to consider the final implementation scope. Companies might initially implement the BSC in one department or business unit only, but later roll it out organization-wide. There are three aspects of scalability:

1. The application should be scalable in terms of programming. It should be easy to add new scorecards at any time.
2. The underlying database should be scalable as the amount of data accumulates quickly.
3. The communication approach should be scalable so that it is easy to disseminate the information through e.g. the Web.

Language can also be an issue for international organizations and they might want to check whether the application comes in various languages.

Flexibility and customization

This is an important aspect and nowadays organizations are less willing to invest in applications that are not, for example, able to integrate with other applications. Many tools provide interfaces with reporting packages, activity-based costing solutions, CRM or planning tools. Flexibility should also be provided in terms of methodology support. Many organizations have multiple performance measurement approaches such as EFQM, Baldrige Award, Investors in People in place and it would make sense to use the same application for all the performance measurement needs. Furthermore, companies might call their approach a BSC but have altered the approach, e.g. added additional perspectives or followed the performance prism methodology (Neely *et al.*, 2002). For this it is important that the software allows for such flexibility so users can add perspectives, create personal views or personal scorecards.

Features and functions

Under this heading organizations can discuss needs in terms of administrative tasks and access control, exception alerting, collaboration and reporting. It should be possible to assign owners (and persons responsible for data entry) in order to contact them or even send them automated reminders. Some organizations like automated e-mails and workflows, other organizations do not feel that such an approach fits their work culture. Organizations might want the software to support action and include activity or project fields that allow to track progress against strategic objectives. Organizations need to decide about the level of security needed in the system; some companies are very open and share any aspect of the scorecard among all employees whereas others require very tight security.

Communication

The communication aspect of any scorecard implementation is key. Organizations have to address issues such as: Do we want the software to be web-enabled? Or even WAP enabled? Do we want users to be able to comment on any aspect of the scorecard including strategy, objectives, measures, activities, etc.? And do we want to restrict the comments to any group e.g. managers responsible for certain aspects in the BSC. Some software solutions are able to trigger automatic alerts, e-mails or SMS messages, which can be sent to individuals or groups indicating that certain areas of the business are under performing and action is required. For most implementations it is important that the BSC software supports e-mail and comments can be sent to specific users attaching or linking to performance reviews or analysis results from the scorecard tool.

Technical specifications

The technical requirements depend on the existing infrastructure in each organization. Any new piece of software should support the existing desktop or network operating system. For a scorecard application it is important to be able to extract data from existing data sources, which can be a major obstacle for any implementation. The BSC usually requires information from a variety of different databases as well as text based data. It is also worth to check the browser compatibility as few software tools



only support MS Internet Explorer. For the discussion about technical requirements the IT department should be involved.

User interface/ data presentation

Here organizations have to decide how they want the data to be presented, applications vary between very graphical to more text and tables based. One of the most important aspects is the display of success maps or strategy maps. If organizations use this powerful way to visualize the cause-and-effect relationships it is important that the software packages support those dynamically. Some tools just display graphics without any real dynamic. Having the underlying data in the strategy map. Dynamic maps allows organizations to use it as the main communication tool with traffic lighting and even the opportunity to mathematically test assumed relationships over periods.

Analysis functionality

Tools offer different levels of analysis capabilities, stretching from simple drill-down capabilities to multidimensional analysis, complex statistical functionality, forecasting and even scenario planning. Companies that require more complex analysis functionality often have tools for this in place and have to decide whether to integrate or replace those. Analysis functionality also includes the number of graphical displays (from bar charts to advanced 3-D charts) and tolerance settings. Requirements in terms of charts and graphs depend on the measures the organization tracks and their visualization requirements. For this discussion it is especially important to include the business analysts.

Service

Vendors offer different levels of service. Some offer no implementation support and instead partner with consulting companies. Other vendors offer comprehensive service including own implementation service, international service hotline. Organizations need to be clear how much support they want and whether the vendor or its partners can deliver this.

Future

This criteria includes future developments and release frequency of the product, which might indicate the vendors attention and commitment to the product. It is also important to understand the future vision of the software vendor, which will influence the future product development direction. Organizations want to share the future vision with the software vendor in order to ensure future compatibility.

If companies cannot find a matching product to their requirements they have the option to build their own solutions. Packaged solutions are generally more cost-effective and quicker to implement (Marr *et al.*, 2000), however solutions offer the possibility of creating a solution that meets the unique needs and objectives of organizations (Sharman and Kavan, 1999). DaimlerCrysler, for example, decided to build their own scorecard solution but it took five to ten people 18 months to develop the first, dubbed BSC (Leibs, 1999). On the other hand, companies such as Skandia and Ericsson developed their own solution and later converted their development into a product. Both have spin off companies which now sell the software solution.

Conclusion

The contribution of this article is twofold. First, based on the existing literature it identifies the following three main reasons to implement BSC software: integrates data from disparate data sources, allows comprehensive data analysis, and facilitates organization-wide communication of the BSC. Secondly, based on extensive case study research and interviews it introduces a decision framework that can assist organizations in the selection process to find the right BSC software application that matches their individual organizational requirements.

The selection framework supplements the existing literature by supporting many of the arguments put forward by Silk (1998), Sullivan (2002), and Classe (1999; Silk, 1998). And by

extending the eight-step BSC software selection process put forward by Sharman and Kavan (1999) with a detailed package evaluation framework.

More research is encouraged in the area of performance measurement and performance management software applications. Research opportunities are enormous in topics such as implementation benefits of software solutions or performance improvements through software implementation. Further areas of interest include studies comparing implementations of self-made tools with packaged solution as well as studies towards approaches of measuring the return on investment of such software applications.

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