

# *AN ADAPTIVE METRICS CENTER WHITE PAPER*

## *THE BALANCED SCORECARD: DEVELOPMENTS AND CHALLENGES*

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OCTOBER 9, 2006*

As the years have passed, the Balanced Scorecard, in some sense of this phrase, has been adopted on a worldwide basis. But the variations in conceptualizing and implementing it are so great that it is not always clear what, exactly, is being adopted and whether an intervention using the name "balanced scorecard" is having the impact its sponsors have envisioned. In this White Paper, I'll provide

- a retrospective on the balanced scorecard, and
- an overview of its successes and problems.

### **RETROSPECTIVE**

Since the late 1980s, those developing the balanced scorecard approach have, step-by-step, gradually filled in a more and more sophisticated vision of its full implications. The approach has developed in a number of stages or generations, as some have called it (Cobbold and Lawrie, 2002, Lawrie and Cobbold, 2004, and Phillips, 2006).

In stage 1, roughly from the late 1980s to the mid – 1990s, earlier implementations of the balanced scorecard focused on implementing measurement models that would produce "dashboards" for executives, so they could evaluate performance in each of the four perspectives (financial, customer, internal business process and learning and growth) of the balanced scorecard. Let's call this the "business indicators stage" of balanced scorecard development.

In stage 2, lasting from the mid – 1990s until 2002 or so, practitioners developed the clear realization that indicators and metrics were not enough, and that these had to be selected to accurately monitor and measure progress relative to one's organizational strategy. The Balanced Scorecard had to not only deliver a series of numbers that managers could use to evaluate performance, but also a "strategic linkage model" (SLM) that when coupled with a scorecard's indicators also told a coherent story of organizational progress. I'll call this stage "the strategic modeling stage" of balanced scorecard development.

A concern with strategy had always been an element in the balanced scorecard approach, since, from the beginning, Kaplan and Norton envisioned links among indicators within their four perspectives. Early work specified such links at the most abstract level, stating that the financial and customer perspective (lagging) indicators were outcomes of the internal business process and learning and growth perspective (leading) indicators and, with a bit more specificity, that learning and growth perspective factors influenced internal business process factors, which then shaped customer outcomes, which critically affected financial outcomes. But these early formulations then quickly and inevitably led to questions about the specific cause-and-effect relationships among indicators and about how these fit into strategy.

We see this concern as early as Kaplan and Norton's first book (1996) where they say (p. 29):

"Our experience is that the best Balanced Scorecards are more than collections of critical indicators or key success factors. The multiple measures on a properly constructed Balanced Scorecard should consist of a linked series of objectives and measure that are both consistent and mutually reinforcing. The metaphor should be a flight simulator, not a dashboard of instrument dials. Like a flight simulator, the scorecard should incorporate the complex set of cause-and-effect relationships among the critical variables, including leads, lags, and feedback loops, that describe the trajectory, the flight plan, or the strategy. The linkages should incorporate both cause-and-effect relationships, and mixtures of outcome measures and performance drivers.

The concern with strategy and with modeling cause-and-effect relationships, along with the focus on metrics has been a staple of balanced scorecard practice since the mid-1990s. This is reflected in Kaplan and Norton's succeeding three books (2001, 2004, and 2006). In the second book they (2001) described the use of balanced scorecard perspectives and methodology in developing systems to manage strategy and introduced the tool called *the strategy map*, a diagram of cause-and-effect relationships among strategic objectives identified within the four balanced scorecard perspectives.

Their third book (2004) focused on explaining how to "translate strategy into operational terms" and developed the applications of strategy maps in much more detail. Their most recent book (2006) is concerned with the use of the balanced scorecard and strategy maps in *aligning* organizational units, and to a lesser extent employees, and management processes and systems with strategy. In it, the balanced scorecard is viewed as a "Governance framework" that helps integrate the efforts of the whole organization toward implementing its strategy map.

Stage 3 in the evolution of the balanced scorecard approach has been slowly emerging since at least 2002. Its outlines are not yet entirely clear. But it seems to be the result of a number of converging developments.

*First*, many balanced scorecard practitioners are concerned about the difficulty of working with the four perspective framework and strategy map ideas in order to come up with a set of objectives that can help with specifying targets and measures for the balanced scorecards. They have pointed to the following problems with stage 2 (which they call "2<sup>nd</sup> generation") balanced scorecards.

- Questions about whether the clusters identified in stage 2 scorecards lead to the identification of strategic objectives representative of all the important objectives of the organization (Cobbold and Lawrie, 2002, Lawrie and Cobbold, 2004, pp. 5–6).
- Questions about whether causal linkages among objectives identified in Balanced Scorecard models are valid (Cobbold and Lawrie, 2002, Lawrie and Cobbold, 2004, p. 6, Strohhecker, 2004, 2004a, Huegens and Zelewski, 2006). These arise first, from the idea that the four perspective Balanced Scorecard leads people to miss important objectives that never get into causal models, second, because its emphasis on the learning and growth/internal business process/customer outcome/financial outcome causal ordering may very well ignore important feedback links among the perspectives, and third, from the idea that hypothesized causal linkages in models may very well be in error.
- Problems with selecting measures, setting targets, and cascading balanced scorecards to lower levels of an organization (Lawrie and Cobbold, 2004, p. 6).
- Problems with ensuring that a strategic vision is shared among decision makers before they are asked to select objectives and

specify cause-and-effect relationships in a strategy map (Lawrie and Cobbold, 2004, p. 6).

- Problems with requiring that decision makers select objectives before considering the cause-and-effect relations among them. (Stage 2 scorecards require the selection first; the causal modeling afterward. Lawrie and Cobbold, 2004, p. 6).

*Second*, one approach to some of these Stage 2 scorecard difficulties is to use "destination statements," a much more operational version of a strategic vision, to describe in more detail where an organization would like to be 3– 5 years after implementing a strategy – embedded scorecard (Cobbold and Lawrie, 2002, 2004). Destination statements were first used by Stage 2 practitioners as a kind of check on the objective selection and target setting activities in the balanced scorecard design process (Lawrie and Cobbold, 2004, p. 6). But it was found that a destination statement, if generated as the first design activity, could serve as a guide to selecting strategic objectives, specifying targets, and developing cause-and-effect hypotheses linking the objectives (p. 7).

Lawrie and Cobbold (2004) propose that destination statements used in this way, along with a simplification of the ". . . strategic linkage model – with a single 'outcome' perspective replacing the Financial and Customer perspectives and a single 'activity' perspective replacing the Learning and Growth perspectives and Internal Business Process perspectives" (p. 8) are the primary enhancements distinguishing the 3<sup>rd</sup> generation Balanced Scorecard. But Phillips (2006, p. 6), while referring to Cobbold and Lawrie's (2002) paper and to destination statements, is much less clear in defining 3<sup>rd</sup> Generation scorecards, and mentions enhanced modeling functionality, use of systems theory, and testing using simulation methods as important elements in distinguishing such scorecards from earlier generations.

*Third*, there's an increasing amount of work on balanced scorecards emphasizing formal modeling and simulation of causal linkages in strategic models and experimental work. Two examples of this are in studies by Strohhecker (2004, 2004a) and Huegens and Zelewski (2006). These studies herald a growing turn toward more rigorous methods of developing strategic models within which to embed balanced scorecards

My own view is that the 3<sup>rd</sup> Generation of Balanced Scorecards is not quite here yet, in spite of the above trends, and Cobbold and Lawrie's (2002) view, because there's not enough agreement in the balanced scorecard field on the characteristics of a new generation of balanced scorecard implementations. The 3<sup>rd</sup> Generation, or as I prefer to call it, Stage 3, will probably incorporate Destination Statements, an emphasis on systems theory, simulation, formal modeling, and perhaps more formal methods of measurement modeling. And, it may also involve major modifications of the four perspective conceptual framework, since to qualify as a new Stage or Generation, a new wave of practice has to involve more than incremental changes in techniques and tools relative to present patterns of practice.

In sum, there have been two clear stages of development of the Balanced Scorecard and recent trends indicate that a third stage is emerging, and that, according to some practitioners it already has. Why such rapid evolution of the Balanced Scorecard? The answer lies in an analysis of its successes and the challenges presented to it by its problems.

### **SUCCESS OF THE BALANCE SCORECARD**

The Balanced Scorecard, after a decade of rapid growth in adoptions, is now the leading approach to organizational performance measurement and management in private, public, and non-profit sectors. According to the extensive Bain and Company Management Tools and Trends 2005 survey of executives (Rigby and Bilodeau, 2005, p. 13), 57% of their companies were using the Balanced Scorecard in the year 2004, and this

represented a slight decline from an earlier survey where usage had peaked at 62%. There's a wide variation in use of the Balanced Scorecard depending on size of company (Rigby and Bilodeau, p. 19). Seventy-five percent of large companies used it in 2004; while only 44 % of small companies did. Among medium-sized companies, the rate using it was 59%.

To place these results in a broader context, the same Bain and Company survey provided the following rates of usage for other important management tools (p. 13): Six Sigma (34%), Knowledge Management (54%), Total Quality Management (TQM) (61%), Customer Relationship Management (CRM) (75%), and Strategic Planning (79%). In viewing these results, keep in mind that the Bain surveys identified the Balanced Scorecard specifically, rather than Business Performance Measurement as a general category. Since there are other frameworks for Business Performance Measurement (such as The European Quality Foundation Model (EQFM) and the Economic Value-Added (EVA) approach) aside from the Balanced Scorecard, the results are that much more impressive.

Other indications of perceived success of the Balanced Scorecard are recorded in the many reported success stories about success from its applications. A good source of such stories is the Balanced Scorecard Hall of Fame case studies available at the Balanced Scorecard Collaborative website ([https://www.bscol.com/bsc\\_online/learning/hof/](https://www.bscol.com/bsc_online/learning/hof/)).

### ***Software Tools for the Balanced Scorecard***

The rapid spread of the Balanced Scorecard has brought numerous software vendors into the Balanced Scorecard support market so that there is an embarrassment of riches. There are 23 vendors whose offerings are certified by the Balanced Scorecard Collaborative as I write this. In addition, there are many more, perhaps as many as 80, that offer Balanced Scorecard products including some very well-known names in Business Intelligence and Performance Management. Outstanding tool

vendors in this category in terms of the comprehensiveness and flexibility of their offerings include: Cognos (2006), Business Objects (2006), QPR Software, plc (2006), Corvu (2006), Performancesoft (2006), ActiveStrategy, (2006), and SAP (2006).

All vendors support necessary elements to implement the Business Indicators stage of Balanced Scorecard development including: display of Key Performance Indicators, gaps between objectives and actual performance, display of strategic goals, and representation of the initial Balanced Scorecard framework. Almost all vendors also support 2nd Generation Balanced Scorecarding incorporating Strategy Mapping, and also offer rudimentary causal modeling capabilities.

Only a few vendors offer more robust modeling capabilities. One is SAS (2006), which offers the widest variety of modeling capabilities of any company. Another is PROCOS (2006), which offers testing and neural network-based simulation capabilities as part of its Balanced Scorecard offerings. QPR (2006) also offers collaborative capabilities which may prove important in the 3<sup>rd</sup> Stage of Balanced Scorecard development. There are no vendors whose offerings are designed to support the emerging 3<sup>rd</sup> Stage with its emphasis on facilitation and both measurement modeling and robust and complex dynamic modeling, and with its explicit requirement for a far broader Balanced Scorecard framework. The current offering that would be most adaptable in that respect would be SAS, Inc.'s product. The reason would be its capability to draw upon the unequalled modeling resources available in other SAS modules.

### **CHALLENGES TO THE BALANCED SCORECARD**

In spite of the considerable successes of the Balanced Scorecard, the technique must rapidly evolve to meet the challenges it faces. Here are five categories of highly visible challenges.



- 1) Dissatisfaction and perceived failure involving Balanced Scorecards appears to be too high and reports of lack of impact too plentiful
- 2) The strategic component of Balanced Scorecards often lacks concreteness and undermines strategy mapping efforts
- 3) The Balanced Scorecard framework is conceptually inadequate as a guide to specifying key performance indicators, because the basic framework is not comprehensive enough
- 4) Balanced Scorecards are characterized by measurement modeling weaknesses which lead to either too many indicators or a set of indicators that don't encompass important variation in organizational behavior
- 5) Balanced Scorecard implementations have substantial impact modeling and evaluation research weaknesses that prevent testing of strategy maps.

I'll discuss each of these problems briefly.

***Dissatisfaction, Perceived Failure, and Lack of Impact***

Reviewers of Balanced Scorecard implementations have been reporting dissatisfaction, perceived failure, or lack of impact for some years. Lewy and Dumeénil (1998) cite the results of Lewy's survey work on Dutch companies. His results showed a management dissatisfaction rate of 70%.

A study by Hendricks et al (2004) studied 42 Canadian firms that had adopted the Balanced Scorecard, "measured and tested the abnormal financial performance for adopters up to three years after the BSC was implemented. Our preliminary tests on a subset of the overall sample did not reveal significant performance improvements in . . ." Return on Sales or Return on Assets after introduction of the Balanced Scorecard." But

there was insufficient longitudinal data to draw any firm conclusions about post-intervention performance.

According to The Hackett Group's (Answerthink, 2004) 2004 Finance Book of Numbers research, nearly two-thirds of typical companies have a balanced scorecard in place or in development. But only 17 percent of these "developed mature balanced scorecards that rely on a mix of financial and operational metrics," indicating the difficulty of implementing the Balanced Scorecard in most companies.

In a recent "microworld" simulation study, Strohhecker (2004) reports the conclusion of his attempt to test the performance improvement theory underlying the Balanced Scorecard. He says: "Preliminary statistical analysis indicates that the Balanced Scorecard's impact on performance might be overestimated. . . ." (P. 21), but also notes that before his conclusions are final he needs to complete an enhanced statistical analysis to rule out certain effects that may have contaminated his findings.

The same Bain Company surveys that record the widespread use of scorecarding also report on levels of satisfaction with its results. In 2004, the level of satisfaction expressed with the Balanced Scorecard averaged 3.86 out of 5.00. Strategic Planning had the highest score (4.14) among the top 25 tools mentioned in the survey, while Loyalty Management had the lowest score (3.67). The Balanced Scorecard was tied for 18<sup>th</sup> out of the 25 tools, along with Economic Value-Added Analysis.

The spread between those who were extremely satisfied (15%) with the Balanced Scorecard and those who were dissatisfied (6%) was 9%. By comparison the median spread was 15%, and the greatest spread was 30% for strategic planning. The rank of the spread characterizing the Balanced Scorecard was 19<sup>th</sup> out of the 25 tools included in the survey. And relative to most of the other tools, the Balanced Scorecard has both a

low frequency of extreme satisfaction and also a high frequency of indifference, compared to many other tools.

### ***Lack of Concreteness in Strategic Targets***

After some years of practice with the Balanced Scorecard, it was recognized that the strategic vision produced as part of the scorecarding process was too vague for people to have clear ideas about strategic goals. Some scorecard practitioners began to respond to this problem by having stakeholders construct "Destination Statements," much more concrete specifications of an organization's strategic vision, in order to validate previous work done in developing objectives for strategy maps (Cobbold and Lawrie, 2002, 2003, Lawrie and Cobbold, 2004). An even smaller number began to have stakeholders construct Destination Statements prior to constructing strategy maps, customizing the Balanced Scorecard framework, and selecting indicators as measures of objectives. For these practitioners "Destination Statements" became the solution to the problem of lack on concreteness in strategic targets, but this solution has yet to be fully adopted in Balanced Scorecard practice, so the problem of lack of concreteness persists.

### ***Conceptual Incompleteness***

From the early days of the Balanced Scorecard there have been questions about the adequacy of the framework. Kaplan and Norton (1996, p. 34–35) put off such questions by saying that the perspectives "should be considered a template, not a strait jacket." (p. 34) Then they follow this remark with an example from a client who insisted on including an environmental and community performance perspective in their own scorecard. Paul Niven (2003, 2003a) gives examples of frequent revisions of the frameworks in specific cases covered in his books. And Lawrie and Cobbold (2004), point out that public sector managers are happy to reduce the four perspective framework to a two perspective 'activity' and

'outcome' framework, that proved entirely adequate in the context of Destination Statements and their use in specifying objectives and targets.

These and many other examples indicate that the four perspective framework may be more honored in the breach today, than it is in actual practice. More accurately, its present significance may be that it is used as a starting point; a kind of 'straw man' to bounce off managers in an effort to get the ball rolling in the Balanced Scorecard design process.

Even considered as a 'straw man' however, the question arises as to whether it is any longer adequate to the task. After all, the Balanced Scorecard's four perspective framework does provide an orientation to thinking about the sorts of indicators that might be included in the scorecard. If the framework is manifestly unrepresentative, it may still bias one's thinking even when Destination Statements are used to structure modeling and the selection of objectives.

### ***Weaknesses in Measurement Modeling***

One of the major issues in the Balanced Scorecard literature has always been the constraints that ought to be placed on the number of indicators used in Balanced Scorecard systems. Kaplan and Norton (1992, p. 72, 1996, pp. 162 – 164) have emphasized the idea that relatively few indicators should be used in their initial treatments of the subject and they have continued to emphasize the issue in each of their major publications. Schneiderman (1999, p. 7) has also heavily emphasized the importance of restricting the number of indicators and thinks that an excessive number of indicators in Balanced Scorecard systems is a primary reason for failures in Balanced Scorecard interventions. In fact, there is a near unanimity of view among writers and practitioners emphasizing the importance of constraints on the number of indicators if one wishes to have a successful implementation.

The emphasis on constraints in the number of indicators is an attempt to address the problem of focus in Balanced Scorecard systems. It is connected to the idea that such systems ought to provide a simple "dashboard" that executives can use to drive the organization, much as a flight simulator provides a dashboard for pilots using the simulator, and that Balanced Scorecard practitioners are very committed to the idea that the dashboard they develop for executives must be as economical as possible in the number of indicators it contains.

Unfortunately for the requirement of simplicity/economy, its undoubted importance as a criterion of evaluation in evaluating a model's validity, and the importance of the need for focus in a dashboard, it is only one of a number of criteria of comparison relevant for assessing model validity. A balanced scorecard that is limited in the number of indicators it incorporates because of an a priori rule limiting the number of indicators in a Scorecard to 12, or 15, or 25, or any particular number of indicators, may or may not accurately reflect the state of performance of one's organization at any particular time. Moreover, an a priori limited number of indicators may not provide key indicators whose variation reflects the primary dynamic patterns of behavior of one's organization over time.

In other words wishing or requiring that one's organization can be modeled with 12, 15, or 25 indicators will not in general make it so, and the belief among Balanced Scorecard practitioners that they can impose a limit on the number of variables in a scorecard by rule of thumb, is a belief that betrays their view that the Balanced Scorecard is primarily a tool, an instrument that we can shape according to our requirements. However, I think that belief is mistake. Balanced scorecard models especially ones incorporating strategy maps are not just tools. Rather, *they are theories of the firm's, or the organization's, performance*; and they must therefore be evaluated *from the viewpoint of whether they are true or false*, and not from the viewpoint of whether as tools they fit a priori criteria of simplicity or economy.

But, one might ask, if this is so, and if the number of indicators in Balanced Scorecards cannot easily be limited to a relatively small number, then how can we use scorecards to create dashboards that busy top-level executives can use to monitor and drive their organizations and strategies? The answer is that Balanced Scorecards must use techniques of measurement modeling (Firestone, 1971, Firestone and Chadwick, 1975) to create indices (measures) that combine indicators into a smaller set of composite variables that executives can use for monitoring performance, and that modelers can use to develop strategic linkage models.

So far, however, the Balanced Scorecard literature has not reflected much concern for measurement models relating indices to indicators or for creating dashboards by using measurement modeling, rather than by selecting a small set of indicators to populate a dashboard. This situation can change, however, and change it must if Balanced Scorecard models are to incorporate all the indicators that may be needed to reflect the dynamics of strategy, while at the same time supplying the economical dashboards needed for managers to use scorecards once they're constructed.

### ***Impact Modeling and Evaluation Research Weaknesses***

In addition to measurement modeling weaknesses, the Balanced Scorecard field is still in its infancy in its use of impact modeling to both predict and measure the effects of Balanced Scorecard interventions, changes in strategy, and changes in policy, program and project interventions on organizational performance (Ittner and Larcker, 1998, Malina and Selto, 2001, Salterio and Webb, 2003, Hendricks, Menor, and Wiedman, 2004, Strohhecker, 2004).

Efforts to remedy this problem have begun, and focus around the use of System Dynamics and statistical analysis. Since 1997 a considerable literature has developed proposing or illustrating the use of System

Dynamics to investigate the impact of Balanced Scorecard interventions of performance. Cavaleri and Sterman (1997) advocate designing System Dynamics interventions in advance in order to perform impact evaluation. Sterman, et al (1997) developed a Balanced Scorecard-based dynamic simulation model for the case of Analog Devices, the site of the Balanced Scorecard implementation claimed by its developer, Arthur Schneiderman, (1999) to be the first. The Sterman et. al. model explained the delay at Analog Devices in observing the impact of non-financial measures on financial ones, in terms of non-linear feedback relations and dynamic complexity.

Wolstenholme (1998) specified three ways in which System Dynamics could be used to develop Balanced Scorecard systems. First, it can be used to model relationships among components of a strategic vision in strategy maps. Second, it can be used to develop dynamic relationships in sub-models. Third, it can be used to model specific, but still high-level relationships dealing with trade-offs among performance measures. Sloper et. al. (1999) developed a dynamic feedback framework for public sector performance management specifying how System Dynamics and the Balanced Scorecard can be combined in the context of databases, intranets, data warehousing, and text mining.

Since these early efforts, a good bit of work (Todd and Palmer, 2001, Ritchie-Dunham, 2001, 2002, Akkermans and van Oorschot, 2002, Linard, et al, 2002, Ittner and Larcker, 2003, Ittner, et al, 2003, Newton, 2003, Braam and Nijssen, 2004, Strohhecker, 2004, 2004a, Young and Tu, 2004, Capelo and Dias, 2005, and Kim et al, 2006) has attempted to show the utility of combining System Dynamics modeling with the Balanced Scorecard. The work shows that System Dynamics allows explicit specification of hypotheses about causal influences and single- and double-loop feedback effects, and that when combined with experimental or field-based data collection and statistical analysis, it is possible to *test ideas* about the impact of Balanced Scorecard

interventions, rather than just claim impact because certain changes follow the introduction of Balanced Scorecards.

On the other hand, findings from this work are very tentative at this writing. The work has not been extensive enough yet to refute the skeptical view that Balanced Scorecard interventions are not effective. In fact, sparse findings so far, suggest that Balanced Scorecards *don't* improve performance when interventions have a measurement focus alone, but that they *may* have a positive impact when they are linked to strategy and when managers using them develop a good understanding of the cause and effect and causal loop aspects of the strategic models linked to the Balanced Scorecard. However, much more work has to be done before hypotheses about impact may be viewed as having survived testing.

Since impact studies are in their infancy, it's not surprising that the record is also ambiguous in the area of actual versus perceived positive impact of the Balanced Scorecard. But why is it so hard to measure and evaluate its impact? It is hard because of the problem of isolating the impact of the Balanced Scorecard from other effects.

The Bain company survey indicates the problem. Many of the companies that had adopted the Balanced Scorecard probably also adopted many of the other top 25 tools. Six other tools had usage rates above 70% and five more had rates above 60%. All but the lowest ranking tools had usage rates above 50%. The Bain report unfortunately doesn't report profiles of tool usage, but from the frequency rates it does report, it is very unlikely that more than a few companies, if any, used only the Balanced Scorecard among the top 25 tools. This suggests that even if one has extensive data on a company that has adopted the Balanced Scorecard, it would be hard to show without very good longitudinal data that changes in organizational performance, either positive or negative, were due to a



Balanced Scorecard initiative, rather than another initiative that was also associated with the changes.

In any event, the data about Balanced Scorecard interventions from which actual impact is inferred is case study data. It frequently shows that organizational performance improves (see the Hall of Fame cases at [www.bscoll.com](http://www.bscoll.com)) *after* introduction of the Balanced Scorecard. But, generally, because of the sparseness of data, the lack of adequate evaluation designs, and the absence of impact modeling, these case studies have no way of *corroborating* that performance improvements *are due to* adoption of the Balanced Scorecard, rather than other factors, even when such improvements occur.

## **CONCLUSION**

In spite of the rapid spread of Balanced Scorecard implementations and software tools for supporting them, the evidence doesn't yet show that these implementations are broadly successful. I think the problem of impact needs to be addressed by meeting the challenges I've identified. Lack of concreteness in targets, conceptual incompleteness, weaknesses in measurement modeling, and in impact modeling and evaluation research all have to be addressed. The 3<sup>rd</sup> Stage of Balanced Scorecard development, hopefully, will do that.

I said earlier that the 3<sup>rd</sup> Stage will probably incorporate Destination Statements, an emphasis on systems theory, simulation, formal modeling, more formal methods of measurement modeling, and major modifications of the four perspective Balanced Scorecard conceptual framework. In this paper, I've reviewed some of the research reflecting systems theory perspectives, systems dynamics simulation, and formal modeling done in the past, and we can expect that much more such research should and will be forthcoming in the next few years in the quest to evaluate the impact of Balanced Scorecards. Hopefully, simulation and systems theory will become standard tools in the Balanced

Scorecard practitioner's kitbag. As for enhanced conceptual frameworks and improved techniques of measurement modeling, I've recently offered my detailed views on those subjects in "From the Balanced Scorecard to the Adaptive Scorecard: An Adaptive Maturity Model," a Cutter Consortium Executive Report. It's available at:  
<http://www.cutter.com/offers/adaptivescore.html>

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