Dashboards & Marketing:

Why, What, How and What Research is Needed?

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Abstract

Marketing dashboards have become far more common in organizations of all sizes and in virtually all industry types. Marketers spend a significant amount of time trying to identify the “right“ metrics and communicate them effectively to internal constituents in an effort to better understand (and in some cases even justify) the relationships between marketing expenditures and financial value creation for the firm.

In this paper, the authors define marketing dashboards and examine the reasons behind their managerial popularity. Moreover, they show how effective dashboards can be developed and how roadblocks to their use in organizations may be overcome. They conclude by making recommendations for further research in the utility and practical value of dashboards in guiding marketers to better decisions.

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Introduction

"Data is prolific but usually poorly digested, often irrelevant and some issues entirely lack the illumination of measurement." (Little 1970, p. B466)

Still relevant decades later, Little's (1970) quote accentuates the tension between the abundance of marketing data at our disposal and the lack of actionable insights that derive from it. Recent years have seen the introduction of a "marketing dashboard" which essentially brings the firm's key marketing metrics into a single display (LaPointe 2005). The terminology is borrowed from a vehicle dashboard, which reports on a few metrics the driver needs to know. As many as 40% of large US-UK companies report substantial efforts in this area (Clark, Abela and Ambler 2006, Reibstein Norton, Joshi and Farris. 2005). This paper examines the reasons for this development, explains what dashboards are, how to develop them, what drives their adoption and which academic research is needed to fully exploit their potential. The latter is important because the development of dashboards and their operation in practice are far from simple, but provide many opportunities for marketing to exercise a stronger influence on top management decisions. In a broader sense, dashboard popularity reminds us of the need to better understand how management copes with the increasing diversity and complexity of market signals, performance evaluation, and planning.

Why marketing dashboards?

Marketing dashboards are a response to the increasing complexity and diversity of market data faced by senior management in the information age. At least five factors are mentioned by managers as driving the need for dashboards:

1. poor organization of the many pieces of potentially decision-relevant data,
2. managerial biases in information processing and decision-making,
3. the increasing demands for marketing accountability,
4. the dual objective of companies to grow the top-line while keeping down costs for a healthy bottom-line,
5. and the need for cross-departmental integration in performance reporting practices and for resource allocation (LaPointe 2005).

First, data overload is nowadays exacerbated by the fragmentation of media, multi-channel management and the proliferation of product lines and mass-customization (Hyde, Landry and Tipping 2004). Unisys, for instance, gathers tens of metrics (MarketingNPV 2004, Miller and Cioffi 2004), generated by brand tracking, CRM programs, tradeshows, media reports, satisfaction studies and Web logs. Firm alliances and mergers, international expansion and the blurring of industry boundaries (e.g. cameras and cell phones) all work together to multiply the amount of (potentially) relevant data. At the same time though, human processing capacities remain limited (Simon 1957), and a substantial body of research has demonstrated the presence and danger of managerial biases in information processing and decision making (Cyert and March 1963, Wierenga and Van Bruggen 2000).

Next, CEOs, CFOs and CMOs demand more accountability from the marketing department (Rust et al. 2004, Webster, Malter, and Ganesan 2005). Marketing is challenged both to drive growth (Landry, Tipping and Kumar 2006) and to keep costs under control (Ambler 2003), with the immediate focus on either objective swinging with the business cycle. Broad surveys of marketing and non-marketing professionals consistently reveal increased expectations regarding marketing accountability (Hyde et al. 2004). Especially disturbing is the revelation that the goals of the typical marketing department are disconnected from companies' leadership agendas (Hyde et al. 2004, Landry et al. 2006). As a result, CMOs are advised to agree on a 'marketing contract' with the CEO that specifies exactly which metrics marketing is supposed to improve. In this regard, a dashboard helps ensure everyone is 'on the same page' to detect and discuss marketing successes and failures.

Finally, the ability of marketing to reach across functions to accomplish company goals is an increasingly important determinant of its success (Hyde et al. 2004). Firms such as Coca-Cola have integrated marketing, innovation and strategic growth leadership into a single corporate function (Landry et al. 2006). The need for integration is especially strong for companies facing disruptive innovations and a proliferation of product lines (Hyde et al. 2004). Likewise, cross-national mergers and global expansion bring together marketing departments with different values, performance metrics and reporting practices. Standardized tools and processes for efficiency are key characteristics of 'growth champions'; i.e. marketing departments in the upper performance decile (Landry et al. 2006). In the appendix, we offer a case study to

illustrate how a particular company experienced the need, development and outcomes of a marketing dashboard.

What is a marketing dashboard?

Definition

Several definitions of dashboards have been put forth recently, including: Clark et al. (2006, p. 19); O'Sullivan and Abela (2007, p. 81); Wind (2005, p. 869) and Lehmann and Reibstein (2006, p. 7-8). The key elements of a dashboard in these and other articles include the summarization and integration of key performance metrics with underlying drivers or processes to effectively communicate performance throughout the organization. We define a marketing dashboard as *a relatively small collection of interconnected key performance metrics and underlying performance drivers that reflects both short and long-term interests to be viewed in common throughout the organization.*

The notion that a company should have a system for tracking key performance "metrics" or "indicators" is not new. Corporate performance measurement and "business intelligence" systems have aimed to do so for some years now (e.g. Dover 2004, Few 2004). What is particularly challenging about a marketing application of a dashboard is (a) the integration of diverse business activities, some of them qualitative, with performance outcomes, (b) the need to measure both the short-term results of marketing and the long-term health of the marketing asset, and (c) the challenge of isolating the effect of marketing actions from a myriad of other influences on corporate performance (Ambler 2003, McGovern, et al. 2004, Rust et al. 2004).

For an encyclopedia salesman, the original "dashboard" was probably a single measure such as chart of sales, which may accurately describe the performance of the self-

employed selling a single durable product on commission while facing little local competition. However, many companies need additionally to consider costs (profits), their marketing inputs relative to competition (e.g. relative price and quality) and marketing assets such as brand strength and customer retention – which are not fully reflected in current cash flows. In such context, recent evidence shows that no single measure can adequately summarize performance (Ambler 2003; Lehmann and Reibstein 2006). Moreover, the professionalization of different functional areas, such as finance and marketing, has generated different, often poorly integrated, performance metrics and drivers of future firm value.

Integration is an important characteristic of dashboards in three ways:

1) *Integration of data*. Understanding the firm's market and its position within the market requires information and data from diverse sources at different levels of aggregation and covering different time periods. These varying sources need the common organizing framework provided by a dashboard.
2) *Integration of processes*. The dashboard helps management relate inputs, such as marketing expenditure on various activities, to market performance measures and ultimately to financial performance outputs, such as profits, cash flows, and shareholder value, thus building a bridge between internal and external reporting.
3) *Integration of viewpoints*. Whether assessing the market, performance or planning, a dashboard allows different executives, in different departments and locations, to share the same, equally measured input, i.e. view the firm's market situation in the same light.

As discussed in the next sections, the 'low hanging' fruit is typically the integration of data, while companies have a much harder time integrating processes and viewpoints. Integration requires placing the performance information in some context, such as benchmarking it compared to previous year results, to plan, or to competition (Ambler, Kokkinaki, and Puntoni 2004). For multiproduct or multiunit companies, it is also common to compare performance across different products, market segments, or units. Visually, dashboards do this through devices such as gauges, charts, and tables, often color-coded for easy summarization (Bauer 2004, Lehmann and Reibstein 2006).

Users and purposes

Who uses a marketing dashboard? For a given company both senior management and marketing management could use these metrics to monitor, plan, and communicate company marketing performance. The senior management audience would be likely to focus on overall results and how well the company has carried out its marketing activities. At lower levels of the organization, users are likely to look at specific driver results (e.g., sales force efforts relative to plan) to understand both how to improve their efforts and how their efforts tie in to the overall company results and strategy. Thus, a 'drill-down' feature in marketing dashboards appears important to allow variances to be explained and specific users to obtain the level of detail they need at their levels in the organization. In addition, it implicitly aligns the goals of different organizational levels because drill-down' features make inconsistent measures more transparent.

What is the purpose of a marketing dashboard? First, it provides *consistency* in measures and measurement procedures across department and business units. Second, it helps to *monitor* performance. Monitoring in turn may be both evaluative (who or what performed well?) and developmental (what have we learned?). Third, a dashboard may be used to *plan* (what should our goals and strategies be for the future given where we are now?). Fourth, a dashboard may be used to *communicate* to important stakeholders. In particular, it communicates not only what the performance is, but also communicates what an organization values as performance by the choice of metrics on the dashboard.

Relationship with decision support systems and balanced scorecards

As a tool in marketing, dashboards are related to decision support systems which provide managers with guidance on decisions, such as, promotion activities and sales force allocation. As such, dashboards might be viewed as a combination of individual decision support systems which concentrate on integration and alignment at firm level rather than on individual activity level. In a widely cited passage, Little (1979, p. 11) defines a marketing decision support system as

> *a coordinated collection of data, systems, tools, and techniques with supporting software and hardware by which an organization gathers and interprets relevant information from business and environment and turns it into a basis for marketing action.*

Dashboard systems meet this definition. The dashboard display usually resides as a graphical user interface that is the output of a larger dashboard system. Both Wind (2005) and Reibstein et al. (2005) argue that it is this integration of performance

metrics with underlying drivers and processes that makes dashboards such a powerful management tool. By making the business model explicit and linking data to the model, Wind asserts that "properly created dashboards provide the mechanism to drive effective management and resource allocation decisions (p. 870)." By making key information available throughout the organization, dashboards should enable improved decisions (and, ultimately, financial performance).

The dashboard also owes a great deal to the earlier development of the *Balanced Scorecard* (Kaplan and Norton 1992). The Balanced Scorecard is similar in its recognition that any single performance measure is inadequate and in its combination of key financial and non-financial measures (ibid, p.71). Moreover, one of the four Scorecard perspectives is that of the Customer.

Important differences arise in perspective: the Balanced Scorecard is primarily internally focused whereas the Dashboard primarily considers the context (the market) within which the company operates. Indeed, the Balanced Scorecard's portrayal suggest customer measures which are mainly operational or service metrics derived from the company's internal data. Although they include customer satisfaction, Kaplan and Norton (1992) are reluctant to go beyond the company's internal systems: "But certain other measures forced the company to get data from outside" (p.73). Not only is the Scorecard weak on consumer perceptions but very little attention is given to competition. Furthermore, a Balanced Scorecard puts less emphasis on empirically measuring the links between its different variables. Indeed, a Balanced Scorecard tells the score, that is how a firm currently is performing and where it stands.

Even though they take different perspectives (internal versus external market), the Scorecard and the Dashboard need not be direct competitors. Indeed, companies could start with the firm's Scorecard experience and build outwards into the market to correct its weaknesses. Alternatively one could start with a conceptual Dashboard and then modify it to incorporate the Scorecard's strengths. A research question is whether these different starting points would lead to the same ultimate outcome.

How to develop effective dashboards

What constitutes dashboard effectiveness?

The effectiveness of dashboards can be measured along the potential benefits they generate for the organization, including:

(1) a shared definition and understanding of what is important to the firm, how it relates to each user's responsibilities. The sharing of metrics is a key part of establishing the culture of the organization (Deshpande, Farley and Webster 1993; Dover 2004). Wind (2005, 2006) makes the point that the construction of dashboards is inter-disciplinary and therefore positive for developing creative, holistic solutions to business problems;

(2) a framework for recognizing excellent performance, diagnosing poor performance (Reibstein Norton, Joshi and Farris. 2005} and evaluating different options for remedial action;

(3) a source of organizational learning (Clark et al. 2006);

(4) a tool for increased profitability (Eckerson 2005).

(5) a decision making tool (Reibstein, et al, 2005)

Currently, we lack empirical knowledge about dashboards' success along these criteria, which also need to be translated into operational measurements. A recent two-wave survey by Clark et al. (2006) found that "dashboard use was associated with a greater ability to calculate productivity (often called "ROI") for the marketing budget and less perceived waste in the marketing budget." As a result, the use of dashboards is associated with positive changes in revenue (ibid) and the efficiency of marketing spending. However, the research question remains whether and under which

circumstances dashboards also improve profits and, more generally, long-term firm performance.

Dashboard development

While marketing dashboards can be developed differently depending on their exact purpose, labeling, the enabling technology and 'build-or-buy' considerations (Clark et al. 2006; Krauss 2005), we are here concerned with general guidelines. Reibstein et al. (2005) propose five stages of dashboard development:

I. Selecting the key metrics

II. Populating the dashboard with data

III. Establishing relationships between the dashboard items

IV. Forecasting and "what if" analysis

V. Connecting to financial consequences

We detail these stages below.

Stage I Selecting the key metrics

Ambler (2003) distinguishes two main approaches to metrics selection: general and tailored. The general approach argues for keeping the number of metrics down to the few which can be applied to virtually all settings, and has the advantage of comparability, allowing benchmarking across business units, firms, industries and time periods. Ambler's suggested metrics include three P&L measures (revenue, profit, marketing expenditure) and seven 'brand equity' types of measure (awareness, preference, customer thoughts and feelings, brand loyalty, market share, availability and

relative price). In contrast, the tailored approach argues that each business unit/company has its own strategy, positioning and requires differentiated metrics to track progress towards its specific objectives. This approach invites high-level communication throughout the organization of what is important to the business, which is seen as highly beneficial by several companies (MarketingNPV 2005). Paine (2004) recommends that anyone who will (a) use the system, (b) be measured by the system, or (c) make decisions based on the system should be involved in this dialogue. However, the tailored approach is demanding and may take up so much time that organizations get stranded at this stage, or generate too many metrics. Different departments and senior managers often hang on to 'their metrics' and obstruct the necessary simplification, which decreases both satisfaction with and usage of the dashboard (Clark et al. 2006).

Stage II Populating the dashboard with data

Stage II identifies metrics availability. Sticking with currently available metrics speeds up the process at a minimal cost, typically by finding useful proxy and/or combining existing measures. Holding out for better metrics may be worthwhile in the long run. For instance, Johnson and Johnson started with the purpose of identifying the key metrics, unconstrained by data requirements. "Consideration set" was not normally collected, but management recognized its importance and the metric was added. Unisys found that dashboard use transformed marketing from reporting only efficiency metrics (e.g., we sent out X more brochures than last period with the same staff) to business effectiveness measures (MarketingNPV 2004, Miller and Cioffi 2004).

The task of getting the data in the dashboard is anything but a trivial exercise. Data comes from many sources. Perhaps the biggest problem is the periodicity of the data. Some of the data may change daily from sales reports to annually, or even less frequently, such as brand equity measures. The merging of data that come from different sources and time frequency may bog down the process, but it is doable. Some metrics will be more important than others and consideration should be given to priorities (DeBrusk, Brown and Killough 2003). Keller and Lehmann (2006) suggest a structured approach.

Stage III Establishing relationships between the dashboard items

Stage III involves determining the underlying relationships between the metrics. This step moves the dashboard from a simple presentation of information (what we consider a minimum requirement for a dashboard) to a deeper understanding of the business and a decision support system. This requires taking each of the key dashboard metrics and identifying their drivers. Ideally, the underlying relationships can be substantiated with data, and the associated parameters estimated with some regression estimation. Given the nature of the system of relationships and the recursive structure, it would require the specification of a set of simultaneous equations. Unfortunately, because of either the lack of available data and the problems with identification, estimating these relationships may be difficult.

More commonly, what would be required is to use managerial judgments via decision calculus to estimate many of the relationships (Little, 1970). In worst case, the net result is an explication of the specific assumptions the managers have been operating

under. As data become available, it would be possible to test the assumptions that have been driving some of the business decisions. Where there is great uncertainty about the judgments or there is disagreement amongst the management team, it may provide an incentive to initiate some research, in the form of data collection, or experimentation, to better understand the relationships. Once this is accomplished, it would be possible to leave this dashboard and its underlying relationships as a legacy of those newly moving into their positions, rather than the responsibility of building an entire system or mental model from scratch.

It can promote the transparency and repeatability of successful new marketing initiatives. Small-scale experiments (e.g., with new media and/or messages) can be scaled up to full size (Eechambadi 2006).

Stage IV Forecasting and "what if" analysis

Stage IV applies the business model illustrated by the dashboard and enables its use for scenario planning and budget setting. Indeed, we believe that dashboards can go beyond 'what happened?' to help management answer questions such as 'why did it happen?', 'what will happen if' and 'what should be done' (Wierenga and Van Bruggen 2000). Wind (2005) argues that answering these kinds of questions is a fundamental benefit of a dashboard.

Stage V Connecting to financial consequences

Stage V connects marketing expenditure all the way through the interim marketing metrics onto sales and to the financial consequences for the firm, including the link to

shareholder value, and thus market capitalization (Lehmann and Reibstein 2006). This last step is often seen as critical for bridging internal and external reporting, stimulating dashboard attention in the executive suite. It aligns marketing with corporate goals and the investor's perspective (McGovern, et al. 2004).

This five-step blueprint is an exciting prospect, but, as Reibstein et al. (2005) acknowledge, most firms have problems even completing Stage II. Indeed, companies face many challenges on the road towards dashboard adoption and success, to which we turn next.

What drives adoption of marketing dashboards? What are the roadblocks?

As discussed above, a marketing dashboard that moves beyond the first two stages, shares key features with a marketing decision support system. Therefore, we can build on the substantial literature on decision support systems (DSS) and information systems (IS) (Little 1979, Wierenga et al. 1999, Lilien and Rangaswamy 2003, Venkatesh, Morris, Davis and Davis 2003). In this section we adapt and extend the DSS framework in Wierenga et al. (1999) to provide a framework for the adoption and success of marketing dashboards. The purpose of the framework is twofold. First, it is a starting point for research questions about marketing dashboards. Second, it should help companies who want to design and implement marketing dashboards with a systematic inventory of relevant issues.

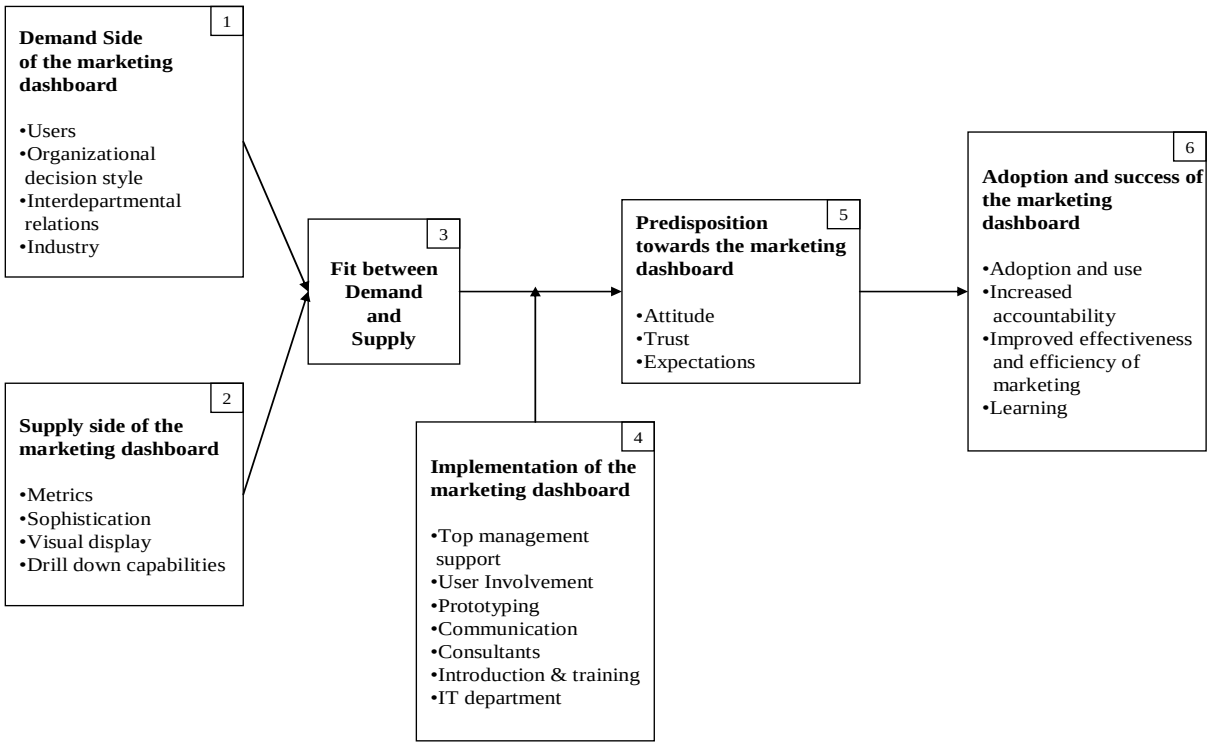


Figure 1: Framework for the Adoption and Success of Marketing Dashboards (adapted from Wierenga, Van Bruggen, and Staelin 1999)

Our framework in Figure 1 proposes that the adoption and success of marketing dashboards is driven by five main factors: (1) the demand side of the marketing dashboard; (2) the supply side of the marketing dashboard; (3) the fit between demand and supply; (4) the implementation process of the marketing dashboard; and (5) the predisposition of the users towards the marketing dashboard.

As for the demand side of the marketing dashboard (Box 1), the most important factors are the following.

- *Users* of the marketing dashboard. It is important to consider whether a marketing dashboard is primarily targeted towards top executives, marketing specialists, representatives of non-marketing areas such as finance, R&D and production, or some combination of these.
- *Organizational decision style*. An organization has a prevailing attitude and a certain standard approach to doing things and making decisions (Pettigrew 1979). Some companies have an outspoken analytical approach; other companies have more an intuitive or heuristic way of going about things. These differences have implications for the marketing dashboard, and for the best way of introducing it in the company. A marketing dashboard that is successful in a company with an analytical decision style is not automatically also successful in a company with a more intuitive decision style.
- *Interdepartmental relations*. If relations between departments are cooperative, goal congruency will exist and the marketing dashboard will be used as an instrument to jointly reach common goals. However, in a situation of rivalry and

mistrust among departments, the marketing dashboard runs the risk of being (mis)used for the interests of individual departments at the cost of the goals of the organization (Markus 1983). Also, departments may try to prioritize those metrics in the marketing dashboards that give a favorable picture of their own activities.

- *Industry*. Different industries have different requirements for marketing dashboards. For the packaged goods industry, metrics about market shares and response to sales promotions are important. For service industries customer satisfaction scores and customer retention rates are examples of key metrics.

Box 2 shows the supply side of marketing dashboards, with the following factors:

- *Metrics*. As we have seen above, the broad range of possible metrics that can be included in dashboards, range from sales, market share and brand equity, to CRM metrics like customer value and customer share. From the supply side, the availability of certain measures have driven what appears on a dashboard, just in the same sense companies such as IRI and Nielsen, spearheaded the development of marketing mix models based on the scanner data they were providing. Critical measures such as customer satisfaction and brand equity were missing from marketing mix models, as the suppliers of these models did not have or provide these measures.
- *Sophistication*. Is the dashboard only capable to retrieve information (i.e., to answer "what?" questions), or can it also make relations between variables, for example between advertising and awareness to sales? In the last case we have a more sophisticated marketing dashboard system, which includes an underlying

model that allows the answering of “what-if?” questions. This corresponds with stage III of the dashboard development model discussed earlier. In this connection Little (1979) speaks of systems with “status reporting” capabilities and systems with “response reporting” capabilities. At present, most marketing dashboards just perform status reporting. A switch to response reporting would strongly enhance their value.

- *Visual display*. Information can be presented in many different ways, for example numbers, graphs, and bars. Colors and motion can be used. The “look and feel” of the dashboard are important, yet they are not the endgame. The display should be such that the information can be quickly understood. There is a limit to the ability of people to absorb the meaning of complex charts (LaPointe, 2005, Chapter 9). Organizational information processing research suggests that information that is summarized (O'Reilly 1983, Huber and Daft 1987), uses vivid, concrete presentation (O'Reilly 1983), and is easily accessible or usable (Peyrot, Childs, Van Doren, and Allen 2002) is more likely to be used
- *Drill down capabilities*. Drilling-down means that one goes from a more general level to a more detailed level of the information. This capability is especially important for variance analysis and for different levels of users. Top management will look at metrics at the global level, whereas specialists may want to zoom in on more detailed levels, for example on specific brands or on specific regions.

The fit between demand and supply (Box 3) is critical for the success of a system like the marketing dashboard (Goodhue and Thompson 1995, Lim and Benbasat 2000). The

type of information provided should match with the decision responsibilities of the users and the metrics in the marketing dashboard should be those that are crucial for the industry or the company. For example, Citrin, Lee, and McCullough (2007) find that information use must be congruent with a firm's strategic orientation for innovation success. Also, format and a level of sophistication should be such that the information is absorbable, given the decision style of the organization.

Next, issues with the implementation process (box 4) can derail dashboards despite a perfect fit between demand and supply. Critical success factors range from top management support for the marketing dashboard to a cooperative attitude of the IT department. Ensuring such buy-in while building a marketing dashboard can help to get the dashboard accepted and to remove possible organizational resistance.

A marketing dashboard with a good fit between demand and supply, carefully implemented in the company, will generate a positive predisposition among its (potential) users, with the following key elements (Box 5):

- *Attitude*. The Technology Acceptance Model (Davis, Bagozzi, and Warshaw 1989; Avlonitis and Panagopoulos 2005) asserts that one of the main drivers of the attitude towards an information system is its *perceived usefulness*. Perceived usefulness is the extent to which a user believes that a specific system will enhance her job performance. Decision makers should be convinced that they do their job better when using the marketing dashboard.
- *Trust*. Decision makers should trust the metrics in the marketing dashboard. They should trust that the numbers are correct and not manipulated. Also, they

should not have the impression that the marketing dashboard is meant to monitor or control them; neither should they see the dashboard as an infringement on their professional autonomy (Speier and Venkatesh 2002).

- *Expectations*. The realization of successful marketing dashboards is also a matter of management of expectations. If the expectations are low, acceptance is not very likely. Setting expectations high will help to generate initial use of the marketing dashboard, but this may backfire when the experience is does not (immediately) live up to the expectations. In particular, users should be prepared for bugs and starting problems when a marketing dashboard is just installed.

Finally, we come to the dependent variable of the framework. The adoption and success of a marketing dashboard can be measured along different dimensions (Box 6):

- *Adoption and use*. This is the extent to which the intended users actually use the marketing dashboard. Obviously, this is a necessary condition for success
- *Increased accountability*. Improving the accountability of marketing efforts and marketing investments is one of the key purposes of a marketing dashboard (LaPointe 2005)
- *Improved effectiveness and efficiency of marketing efforts*. Marketing efforts and investments should not only be better monitored, but should also be better deployed as a consequence of using the dashboard. This deployment should lead to gains in effectiveness and efficiency.
- *Learning*. Marketing dashboards are not only made for immediate decisions, but should also help decision makers to get a better understanding of the marketing processes that are relevant for their business. Learning can take the form of

explicit learning, i.e. when managers develop better mental models about marketing processes, but also of implicit learning. Continued exposure to the stream of metrics from a marketing dashboard will help decision makers to train and develop their intuition.

Based on a survey of nearly 100 executives, Reibstein et al. (2005) find the dashboard adoption news is mixed. While most managers report their firms are working on the development of a dashboard, almost none consider the dashboard complete, nor do they rate its quality very high. Yet, the desire for dashboards remains high. This calls for the need for more assistance and input in this area, which we believe can be provided by systematic research, as we now discuss.

A Research Agenda for Dashboards and Marketing

Several authors highlight significant gaps between the promise and theory of dashboards and current practice (LaPointe 2005, Lehmann 2005, Reibstein et al. 2005). If dashboards are as important a tool for firm integration and alignment as we suggest, we need more research into dashboard development and use. Below we outline what we feel are the major areas for future research.

How do, and how should, managers select the dashboard metrics?

Dealing with complexity, e.g. reducing the number of metrics to a single visual display, is a key benefit from a dashboard. Mintzberg (1973) tells us that attention at the executive level is "brief, fragmented and varying". Wiesel, Skiera, and Villanueva (2008) recommend considering five customer metrics as key performance indicators for firms with contractual customer relationships, three on the revenue side: number of customers, customer cash flow and retention rates, and two on the expenditure side: acquisition as well as retention expenditures. Ambler (2003) recommends the metrics should give early warning of likely failure, and should cover all customer levels (end consumers and channels). Identifying such a comprehensive set of metrics is a separate problem from reducing them to a manageable number. Different departments and senior managers often hang on to 'their metrics' and obstruct the necessary simplification. Empirically, Ambler (2003) recommends deleting metrics which show little variation over time, which are too volatile to be reliable, which add little in explanatory power to existing metrics or which are not leading indicators of financial results. These criteria suggest the need for time series analysis of each metric separately, in its relation

with other metrics (data reduction techniques) and in its relation with firm outcome measures (e.g., Granger Causality tests).

What are the causal relationships among the selected metrics?

As argued in the development steps, we feel dashboard systems should move the 'what happened?' question to help answer questions such as 'why did it happen?', 'what will happen if' and 'what should be done' (Wierenga and Van Bruggen 2000). Likewise, Lehmann (2005) argues that dashboards suffer from the major shortcoming that "they often do not identify what drives what, much less indicate the impact of one variable on the others". Therefore, "what is needed is the next phase in dashboard systems where links among the measures are both highlighted and estimated". Such causal chains are context dependent, i.e. they only fit specific buying settings (Ray et al. 1973, Rothschild and Gaidis 1981, Smith and Swinyard 1982, Vaughn 1986). Empirical modeling is needed to demonstrate and estimate causal relations between metrics in different situations.

Modeling the dashboard data is complicated by the likely endogeneity among its metrics, the dynamic nature of their relations and the desire to predict, if only to provide a baseline for what-if analyses. These criteria fit well with vector-autoregressive or vector error correction model, which allow for a flexible estimation of dynamic effects through impulse response functions (Dekimpe and Hanssens 1999) and have recently been adapted for restricted simulations to disentangle these effects (Pauwels 2004). However, such models require relatively long time series for all key metrics, easily run into

degrees-of-freedom problems and currently lack the capability to efficiently vary parameters based on incoming data.

Alternatively, one can use less econometrically sophisticated approaches, such as estimating several single equations to be combined later, or to have the relationships "informed" by data and incorporated with management judgment, in a decision calculus form (Little 1970, Blattberg and Hoch 1990). We call for a detailed comparison of different approaches, which may take the form of a competition similar to the one on predicting customer churn reported in Neslin et al. (2006).

Are dashboards worth it?

Besides helping managers to develop better dashboards, researchers should also analyze to what extent they are successful and whether their costs outweigh the benefits. Relevant research questions include: Do executives see the benefits of dashboards in the ways outlined in this paper? If so, to what extent do they develop dashboards and what are the blockages? To what extent does dashboard use realize expected advantages? As argued in section 4, some dashboard designs may be technically valid, but have little chance of being adopted and used by key employees. Currently, we lack empirical knowledge about dashboards' success along these criteria, which also need to be translated into operational measurements.

A contingency approach appears appropriate, distinguishing the characteristics of the competitive landscape, the company's customers and the company employees (users) and design and implementation characteristics of the dashboard (Wierenga, Van

Bruggen and Staelin 1999). Empirical evidence can be drawn from field experiments with control groups (e.g., subsidiaries with and without the dashboards) or periods (before/after).

What drives the adoption of marketing dashboards?

Given the expressed interest in marketing dashboards through seminars and surveys (Lenskold 2006), it would be good to know how many companies are in each stage of the adoption process, and, as noted above, the blockages to further development. Analyzing that information by industry sector and country could be informative. Dashboards can be seen as new products and it would be interesting to understand the diffusion process in that light (e.g. Bass, Krishnan, and Jain 1994). What drives the decision to have a dashboard? Are these primarily internal forces, i.e. from within the company, or imitation of dashboard practice by others? What is the role of external agents, for example consultancies and security analysts? Abrahamson (1996) refers to consultants as part of the population of management "fashion setters" who help diffuse new ideas through the business community.

More specifically, using the Wierenga and Van Bruggen (2000) framework above, research questions are: (1) What are the most common discrepancies between the demand and supply side of dashboards?; (2) Which implementation variables are most critical, under which conditions (contingencies)?; (3) How can we measure attitudes, trust and expectations with respect to a dashboard and how can we relate these variables to the success of a dashboard?; (4) How do we measure the different

dimensions of success?; (5) How can we obtain empirical data to analytically study the relationship between success dimensions of a dashboard and their antecedents?

Will marketing dashboards be useful in improving the standing of marketing within a company?

Rust et al. (2004) note that the "lack of accountability has undermined marketers' credibility, threatened the standing of the marketing function within the firm, and even threatened marketing's existence as a distinct capability within the firm." Consequently, there is a need to translate marketing resource allocations and their performance consequences into financial and firm value effects as well as disclose these consequences to enable investors, creditors, and other "consumers" of financial information to clearly understand the firm's capability to generate shareholder value. Doing so may support marketing's reentry into the boardroom, because it aligns marketing with corporate goals and the investor's perspective (McGovern, et al. 2004). Thereby, firms are faced with the problem of how much and which critical marketing information should be made available to investors (e.g., Ambler 2003, Quelch and McGovern 2006, Srinivasan and Hanssens 2007, Wiesel, Skiera, and Villanueva 2008 – see also MSI's Call for Research on "Marketing Strategy Meets Wall Street"). Since a dashboard may be used to communicate what an organization values as performance, it may also be used as a starting point to systematically disclosing critical marketing information to investors. Because if information is important for managing the business, it also must be important to investors that want to assess performance and future prospects (PricewaterhouseCoopers 2005). Future research is needed to examine how to stimulate usage of a marketing dashboard for a firm's investors' relations activities.

Furthermore, research is needed whether systematically tracking and communicating critical marketing information to investors will improve marketing's standing within a company.

Conclusions

In conclusion, this paper set out to explain what dashboards are, their development, what drives their adoption and where academic research is needed fully to exploit their potential. Their development is triggered by their rapid growth in large companies and the attention that CMOs and CEOs appear to be giving them. Essentially they are a tool for integration and alignment at firm level and therefore have a potentially crucial role in helping the firm navigate its trading market in much the same way that a car dashboard helps the driver. Marketing dashboards display the key metrics and force companies to standardize the measurement of those metrics across departments and business units. Additionally, they highlight metrics inconsistencies across the organization and levels so that goals can be integrated. Doing so, marketing dashboards should assist within and across three major firm processes: understanding its market, planning and performance assessment. We hope that our contribution will increase awareness and understanding of dashboards and will trigger more research. So far, the marketing dashboard has been driven by practice and software providers. Academic marketing research can help make dashboards more attractive and valuable to use and more effective in their decision supporting role.

Appendix: Dashboard Case Study

Situation

A $5Billion US-Based multinational software company had experienced rapid growth through a series of software innovations and several large acquisitions. Business units serving the enterprise, Small and Medium Business, and consumer markets became all part of a single company. Product lines had expanded from a few to several dozen. Acquisitions had brought a mélange of marketing processes and cultural pre-dispositions. Geographic expansion had complicated the situation with language barriers and significant channel complexities.

The marketing organization was spending significant amounts of money just meeting the many demands for support on a SBU/product/regional level. But they too had been cobbled together from a variety of cultures and experiential backgrounds, with no common understanding of resource allocation process and no definitions or targets for marketing effectiveness or efficiency. The CMO was increasingly frustrated trying to define opportunities and threats from the hundreds of ad-hoc reports and dozens of "metrics" being tossed about in Excel and PowerPoint files by factional silos within the marketing organization. More importantly, the CMO couldn't adequately answer the questions of the CEO and CFO about the value of maintaining or increasing the present rate of marketing expenditures. This was creating significant conflicts between Marketing and Sales for access to discretionary dollars. The conflicts were fueled by altruistic but highly subjective interpretations of what would be best for the business.

Solution

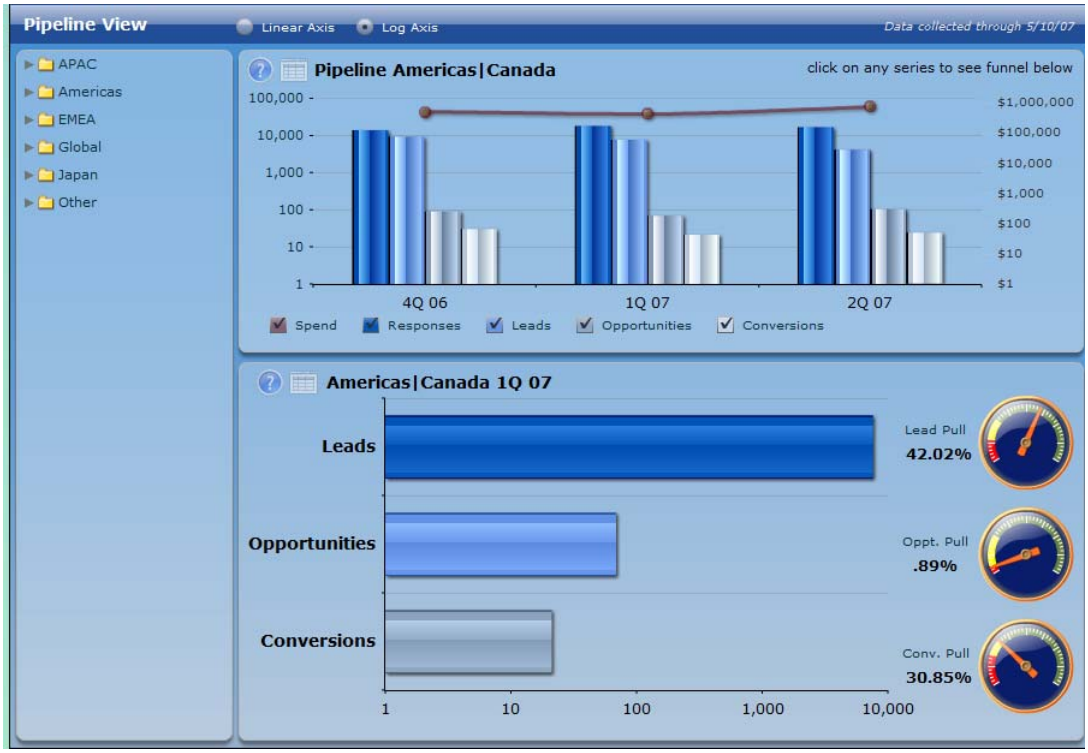
A common marketing dashboard was proposed to unify the marketing organization behind a select set of prioritized metrics and a disciplined process for producing and interpreting them.

The process began with in-depth discussions with key executive stakeholders in marketing, sales, finance, and the SBUs regarding their perceptions of the role of

marketing in helping the organization achieve its stated business goals. Differences in perspectives were rationalized through a series of facilitated sessions, ultimately arriving at a clear definition of the specific and prioritized roles marketing was being assigned. There were 8 highly-specific roles identified including generation of qualified sales leads; development of the brand asset to assure pricing power; identification of market trends and possible product/service innovation opportunities; and increases in customer value amongst key market segments. These marketing roles were incorporated into a Strategy Map (Kaplan and Norton 1992) alongside those of Sales, R&D, and the SBUs. The Strategy Map was then debated, modified, and approved by the Executive Committee.

Working from the consensus on the role of marketing, a broader group of senior and middle-managers from the 4 functional areas were interviewed to identify a superset of the possible metrics for measuring the performance of marketing vis-à-vis its responsibilities. This superset of 100+ possible metrics was evaluated by a cross-functional steering committee and an outside consultant against the criteria of comprehensiveness, reliability of data streams, diagnostic insight, predictive insight, and credibility. Importantly, ease of implementation was deliberately NOT a factor considered at this stage so as to avoid a tendency towards an availability bias in metric selection.

With an objective of ultimately limiting the critical metrics to approximately 10, the steering committee realized that it could not reduce the number below 25 at the present time due to lack of clarity and understanding in which metrics would offer the most valuable insights. So the 25 metrics were arranged in logical groups, one group to a “page”, and the dashboard was designed to be a collection of 7 pages, each telling part of the story of marketing effectiveness/efficiency. One page, for example, tracked the flow of qualified leads in relationship to marketing expenditures by product, by region. Another evaluated the changes in the size and effectiveness of the distribution partner channels. And a third focused on the changes to customer value by segment and geography. The screens in this dashboard were similar to the following screenshot:



Dashboard image courtesy of www.MarketingNPV.com

Once the Steering Committee (remember, cross-functional including marketing, sales, and finance) agreed on the final dashboard structure, a work team was assembled to build the necessary data collection, validation, and transformation processes. A web-based dashboard management platform was licensed to provide a simple point-and-click means of comparing metrics side-by-side and moving fluidly between products, segments, and geographies. Implementation was staged in quarterly “releases” where additional metrics were added until the full 25 were deployed. Data was refreshed monthly.

The CMO then structured monthly conference calls and quarterly marketing resource reviews around the information flowing through the dashboard. Each marketing manager requesting resources was required to support their request using facts derived from the dashboard. In addition, the CMO met regularly with the CFO and EVP Sales to review dashboard summaries, discuss the implications, and agree on appropriate action steps.

The first iteration of the dashboard quickly morphed into a second, and subsequently a third. Each successive version was tuned to modify some of the metrics for increased relevancy, while dropping some completely as they were found to be of little value. For every 3 dropped, 2 were added (often completely new ideas not included in the original superset) in a continual search for the most insightful set of metrics. The process was controlled by the Steering Committee.

Outcomes

The entire global marketing organization has now developed:

A) A common lexicon for marketing performance measurement and resource allocation;
B) A shared definition of what is important and how it relates to their individual responsibilities;
C) A framework for resolving differences of subjective interpretation; and
D) A clearer understanding of what effective and efficient resource allocation means.

In the whole, the dashboard was the tangible manifestation of a significant effort to align expectations and definitions both across and within functions. It has become the centerpiece of a continuous improvement process for improving the effective and efficient allocation of marketing resources.

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