

From Hindsight to Foresight - How Organizations Use Innovative Measurement Practices to Improve Visibility

Phil Hendrix

Real-time measurement helps companies rapidly detect and respond to opportunities

Executive Briefing

Despite an abundance of data, organizations are handicapped by limited visibility, heightening uncertainty and undermining their performance. As a result, executives find it difficult to recognize opportunities and manage effectively. Real-time measurement helps organizations improve visibility, rapidly respond to problems and opportunities, and gain an edge over competitors.

Introduction

More and more executives and analysts are using the term "limited visibility" to describe the heightened uncertainty under which they're operating. As observed in Business Week, it sounds much better than "I dunno." With most organizations drowning in data, conventional measures and practices provide limited visibility at best. The clouded conditions that limit visibility make it especially difficult to project sales, earnings, and other key metrics with any degree of confidence. Usually cited under poor conditions, visibility actually reflects an organization's ability to recognize, interpret, and respond to signals under normal as well as poor conditions. Leading companies have much better visibility than their counterparts -

Visibility reflects an organization's ability to recognize, interpret, and respond to signals

within companies, functions operate with varying degrees of visibility. Poor visibility hampers marketing, in particular, producing disappointing results and the "crisis of confidence" that various observers (Jag Sheth, Emory; Tim Ambler, London Business School; and others) have noted.

Leading companies have much better visibility than their counterparts

Visibility is determined by the measurement system and practices of an organization-what gets noticed, captured, analyzed, and acted on. Using the equivalent of telescopes, radar, microscopes, and even night vision, leading organizations recognize and understand developments in their periphery, in the distance, and even up close. This visibility provides significant competitive advantage. As the analyst firm Forrester has noted, "the sooner managers have visibility to...

information, the quicker they can react..." The following examples demonstrate how innovative tools, measures, and practices can dramatically improve visibility.

Improved Visibility = Better Results

- Leveraging information gleaned from its sales pipeline, Cisco anticipated the drop-off in demand long before competitors and took decisive actions to cushion the impact.
- A large credit card company systematically gleans insights from the thousands of conversations its phone reps have with customers each day. Using these insights to rapidly adjust offers, the company has substantially improved revenues.
- Using field experiments and sophisticated marketing science techniques, Kraft, Frito-Lay, and a handful of other companies have calibrated the ROI on various marketing investments, allowing them to project results with greater confidence and optimize marketing activities.
- A leading maritime services company installed sensors in key components that signal when parts are about to wear out. Continuously monitoring the wear and condition of costly equipment allows the company to reduce downtime and produce significant savings for its customers.

Caution: Limited Visibility

Our experience suggests that visibility in most product and service companies is limited by the following measurement problems.

- 1. Cracks and leaks.** Data warehouses and analytical tools have made it easier to store, retrieve, and analyze data. Nonetheless, organizations often miss significant insights because useful information isn't captured (measured) or measures are captured, but are quickly aggregated and the original data discarded. In the cellular phone business, for example, voluminous call records are aggregated for billing purposes and promptly moved to "deep storage." Some innovative companies have begun to extract insights hidden in these records to design and offer

programs to customers based on detailed usage profiles. Increases in retention and average revenue per user (ARPU) have been dramatic.

- 2. Organizational silos.** Despite the appeal of a boundaryless organization, silos prevail, particularly when it comes to measurement. In most companies, measures rarely flow freely within or across organizations. In a debacle that cost the company hundreds of millions of dollars and damaged its reputation, Ford executives claim they were unaware of Firestone data that

Measures rarely flow freely within or across organizations.

revealed the frequency and severity of problems Ford owners were experiencing with vehicles equipped with Firestone tires.

- 3. Disconnected measures.** Organizations often capture various measures at different times, for different purposes. These disconnected measures are difficult to relate to one another, making it hard to establish cause and effect. In Japan, 7-11 convenience store clerks enter customer demographic data (i.e., sex, age,) along with transaction details. Analyzed together, the transaction and demographic data enable the stores to constantly adjust merchandising and promotional efforts. As a result, inventory turn has been significantly improved.
- 4. Latency.** Latency reflects the elapsed time between an event or occurrence, its detection, measurement, and reporting, and the organization's response. Lags and delays are common in many organizations, with few having anything that resembles real-time measurement - even closing the books can take weeks or months.

Lags and delays are common in many organizations

- 5. Lagging indicators.** Because of latency, most companies continue to rely on conventional measures that, for the most part, are lagging indicators. As a result, executives are forced to manage through the rearview mirror, making it difficult to recognize or adjust to shifts in demand or competition. Over the last few years, researchers have developed leading indicators more closely linked to business results, such as brand and customer equity. However, adoption and use remain limited.

Executives are forced to manage through the rearview mirror

- 6. Indiscriminant measurement.** For a variety of reasons, observations are frequently given equal weight, particularly in marketing research. Indiscriminant measurement ignores the fact that some observations may be more relevant, important, or even prescient than others. Technology companies, for example, have found that lead users can be much more helpful in detecting opportunities and trends than other customers.

- 7. Scorecard mentality.** Inordinate emphasis on scorecards can lead to gaming, hoarding, and other behaviors that distort measurement and reduce visibility. As Boyle (2001) noted, "If we don't count something, it gets ignored. If we do count it, it gets perverted. We need to count, yet the counters are taking over our lives." The automotive industry, for example, relies on extensive measurement systems

Scorecards can... distort measurement and reduce visibility

to evaluate dealers and salespeople. To game the system, new car salespeople have been known to ask customers to "bring the survey in" so the salesperson can help the customer complete the questionnaire.

- 8. Ignorance is bliss.** In their book *Winning Decisions*, Paul Schoemaker and his colleagues identify a number of pitfalls and biases that can distort managers' interpretations of data. As Clayton Christensen has observed, executives in industry leading companies often have the most difficulty recognizing, accepting, and responding to disruptions in their markets.

Recognizing and overcoming these handicaps are critical to improving performance.

Visibility Matters

As Richard Feder observed in a 1965 Harvard Business Review article on measuring marketing performance, "One would assume that management is supplied information which provides considerable insight into the effect of 'marketing dollars' on profits. Such is not the case." Apparently, little has changed in the last three decades. A recent study by Accenture revealed that almost three quarters of marketing executives say their companies cannot measure a marketing campaign's return on investment. No surprise, then, that finance directors see marketing directors as "unaccountable,

untouchable, slippery, and expensive," according to a recent study by Cranfield University.

In good times, companies can survive and even prosper despite limited visibility. Just as a receding tide reveals rocks beneath the surface, however, several issues raise the importance of visibility and expose organizations' vulnerability:

- Regulation, technology, and other amplifiers are shortening product life cycles and accelerating the rate of change. In turbulent conditions, visibility becomes even more important.
- As the quantity and availability of information explode, executives are finding it increasingly difficult to focus. As Davenport and Beck have noted, attention becomes the ultimate scarce good.
- Increasingly skeptical shareholders and analysts are demanding greater accountability. Once common, postures of "trust me" and "I don't know" are no longer acceptable. As Ambler recently observed, "for years marketers got away with spending untold sums of money without any justification... they recognize those happy days [are over]."

Postures of "trust me" and "I don't know" are no longer acceptable

For Good Measure

To improve visibility, organizations are improving existing measurement practices and extending capabilities well beyond conventional metrics and scorecards. Companies are accomplishing this in the following ways:

- **Plug leaks.** In 20/20 Vision, Stan Davis and Bill Davidson noted that much of the information in organizations disappears through the "information exhaust." They argued that companies can turbo charge their business by capturing and leveraging insights generally lost. Like miners sifting for gold, organizations face several challenges that make it difficult to recognize, capture, and use

Determine whether the "exhaust pipe" contains useful information and confirm the ROI on information captured

nuggets of information. First of all, the sheer number of opportunities can be overwhelming. Second, information often presents itself in a way that makes recording difficult. In addition, the

process of data capture may interfere with other, more pressing objectives. Finally, data capture can be costly.

Effectively plugging leaks requires a disciplined approach to avoid information overload and to confirm the ROI on information captured. While virtually any aspect of a Web-based interaction can be (and is) recorded, other interactions require a systematic effort to sift through opportunities, determine whether the "exhaust pipe" contains useful information, and if so, whether sealing the leaks is feasible or worthwhile.

Plugging Leaks in Financial Services

In the intensely competitive credit card business, a senior marketing executive sought a consultant's help to search for new and innovative ways to stay ahead of competitors. Stymied at first by the usual roadblocks, a team including representatives from marketing and customer service developed a breakthrough approach that produced significant value. First, approximately twenty reps from the company's call centers participated in a series of focus groups to determine whether their conversations with customers contained untapped insights. As the reps described the kinds of comments they routinely heard, marketing's interest grew - the issue was how to systematically harvest the nuggets at a reasonable cost. Sampling proved to be key. The company formed small teams of 6-8 reps, assigning each responsibility for capturing information about a particular issue. For instance, reps on the "balance transfer" team would take a minute or so after each call related to balance transfer to record information on a form specifically designed for that purpose. On average, each team captured and coded information from 50-100 conversations daily. Marketing also assigned an individual to review the information captured by each team and extract insights as data accumulated. During pilots that ran for 2-4 weeks, the teams captured information that had been falling between the cracks, at modest incremental cost. The pilots were judged to be a huge success, both in terms of information and results but also in motivating reps who felt they were contributing to the company in new and important ways. Meeting with the executive sponsor and other marketing team members to hear how the information was being used and what was being accomplished was especially inspiring to the reps.

Other examples of companies using technology, incentives, and other means to seal leaks are provided below. In each of these instances, the companies followed four steps: (i) determining whether information escaping from various channels has value; and if it appears to, (ii) devising an efficient means of capture; (iii) interpreting and acting on the information; (iv) assessing the value and deciding whether to stop, continue, or revise the effort. As McKenna (1995) observed, this type of activity represents an expanded but important role for marketing in designing and leveraging processes that link companies to their customers, suppliers, and distributors.

- **Measure real time.** In the late '80s, George Stalk of the Boston Consulting Group argued persuasively that "advantages in response time provide leverage for all the other competitive differences that make up a company's overall competitive advantage." Stalk and his associates also observed that rapid response starts with "timely observation and orientation." In the '90s, new technology, systems, and tools that accelerate measurement and reporting became widely available.

Real-time measurement allows organizations to rapidly detect problems and opportunities

Scanner data, for instance, allows companies to monitor store-level product movement in near real time. The Internet, in particular, allows companies to rapidly and efficiently capture and disseminate information from and about customers, suppliers, and other sources. With the widespread availability of these tools, companies might possibly have comparable levels of adoption and use. Evidence suggests, however, that innovative companies are using real time measurement to gain visibility and stay ahead of competitors with limited visibility. Real-time measurement allows organizations to monitor performance, rapidly detect problems and opportunities, and leverage the resulting visibility to gain competitive advantage.

- **Align measures.** Over the last decade, leading companies have aligned internal metrics with their external customer outcomes. The resulting alignment improves visibility and gives constituents - the board, senior executives, employees, and regulators - a common, objective

Measuring Real Time

In new product development, developing an effective user interface, user-friendly instructions, and clear support are critical and often time-consuming tasks. Betasphere has developed an innovative web-based service that reduces the time normally required to develop and test products, interfaces, and instructions. DirecTV recently used the service to test and refine its new Connect & Protect product, which lets customers hook up as many as five computers to one high-speed internet connection. BetaSphere recruited 60 customers to participate in a one-month product trial. Customers ordered the product online, tested the online tool that sets up the computers for networking, and called tech support. During the trial, Betasphere software captured customers' comments and delivered results back to the team on a daily basis. The development team gained significant visibility into user experience - the near real-time measures shaved at least three to four months off of DirecTV's development cycle.

Disney uses real-time measurement to reduce a significant source of guest dissatisfaction - wait times for top attractions like Dumbo, Splash Mountain, and others can reach 2-3 hours at peak times. Disney developed a creative system to continuously monitor wait times. This information, in turn, is posted at various points throughout the parks, enabling guests to rearrange their schedules and minimize wait time. Leveraging real time measurement even further, Disney created a system that allows guests to reserve a slot and visit the most popular attractions during a designated half-hour window, avoiding long lines. The approach has significantly reduced wait times, improved guest satisfaction, and revolutionized queue management across the industry. Other theme parks have been forced to copy Disney's innovative solution. In another creative application, the HR department of a leading technology company uses real time measures to identify candidates for critical, technical support positions. When a customer visits technical support on the company's website and either requests information or poses questions that reveal a high level of sophistication, ads are displayed that promote the company as a good place to work and invite applicants to apply.

basis for setting goals, monitoring performance, and improving results. These businesses are developing new dashboards that are truly balanced. Their instrument panels contain customer satisfaction and related outcomes (retention, share, profitability) as

well as internal, aligned measures that determine these results. John Hauser of MIT refers to these measures as the "knobs and levers" that organizations use to affect results, in contrast to lagging indicators like share, customer satisfaction, etc.

Measure Alignment establishes the linkage between key internal and external metrics.

- **Open the kimono.** Innovative companies are also improving visibility by collaborating and sharing measures with suppliers, customers, and customers' customers. Recent turbulence in the business world underscores the lesson that companies with limited visibility, up or down the value chain, are highly vulnerable, particularly as conditions change rapidly. Recently, companies dramatically overestimated demand for telecom equipment because they failed to measure their customers' customers. The drop-off in orders even caught Cisco by surprise. The record-setting write-offs led to downsizing, plunging market caps, and doubts about many companies' viability.

Measuring up and down the value chain requires careful planning and collaboration. By sharing sales and other measures with suppliers, Wal-Mart, Dell, and other innovative companies have streamlined their supply chains and achieved extraordinary agility. Their experience demonstrates that peering up and down the value chain, with the equivalent of a telescope, improves visibility. Getting customers and suppliers to open the kimono and share information requires mutual trust and open, collaborative relationships, as well as standards for capturing and exchanging data. Customers can also outsource measurement, presenting suppliers with another opportunity to add value and help optimize the value chain.

Opening the Kimono at Cisco

Opening the kimono and sharing measures with suppliers and customers can yield significant benefits. Cisco, for example, maintains a public "bug database" that allows customers, employees, VARS, and suppliers to post online any problem with a Cisco product or service and to chat electronically about possible solutions. By making measurement visible, Cisco encourages customers to report problems. The approach also builds trust

Aligning Measures at a Major Service Company
Several years ago, the COO of a large regulated company was uneasy. The executive had just reviewed the most recent customer satisfaction results with the board of directors and, for the second quarter in a row, customer satisfaction (CS) had declined. The downward trend was troubling to the board and senior management, as competition and regulatory scrutiny were intensifying. Adding to the pressure, roughly 50 percent of the executive team's compensation was linked to CS. Relying on projections from the head of operations, the COO assured the board that the trend would be reversed as capital improvements were completed over the next two quarters. After leaving the meeting, the executive asked his staff to examine the CS results more closely. What he learned was troubling - their analyses showed that CS was declining even in areas that were not slated for capital improvements. Furthermore, closer examination of results in areas where work had been completed showed only modest improvement - customer satisfaction was still below levels from the previous year.

Reflecting on the situation, the COO reached an important conclusion - he and the rest of the organization were operating in a mode of "trust me." No one clearly understood how the company's products and service influenced customer satisfaction. As he noted, "we're investing \$50m to improve access to customer service reps in call centers - while we think it's the right thing to do, we don't know what the payback will be."

Shortly after, the executive initiated a company-wide effort to establish and better understand the linkage between key internal and external metrics. Employing an approach called Measure Alignment, teams in each business unit systematically worked back from drivers of customer satisfaction - like "accurate billing" or "installed correctly" - to identify, or when necessary, develop an internal measure closely aligned with the corresponding customer requirement. Some proved more difficult than others - for instance, the billing team struggled before coming up with an objective, internal measure for a bill that is "easy to understand."

Within six months, each business unit had developed a new dashboard that was truly balanced - the new instrument panel contained customer satisfaction and related outcomes (retention, share, profitability) as well as the internal, aligned measures that determine these results.

and loyalty and reinforces Cisco's reputation as an extraordinary, customer focused organization.

In business-to-business markets, few customers (small or large) have sophisticated measurement capabilities. Leading suppliers like Grainger and Baxter Healthcare are helping their customers capture inventory, cost, cycle time, and other important measures. These measures, in turn, provide an objective basis for negotiating gainsharing agreements that reward the supplier for improving customer results. Companies are also incenting customers to share measures, as described below.

Opening up an organization's measurement system can improve visibility for consumers as well. A leading homebuilder developed a sophisticated measurement system to track quality, cost, status, and other key measures. Construction managers used the measurement system to monitor and improve processes and their "product" - defect-free homes built on-time and within budget. While marketing and sales touted favorable results to prospective buyers, the company also recognized homebuyers' significant financial and psychic investment and gave them online access to the status, schedule, and other information about their homes. With the ability to monitor progress and determine the status of permits, change requests, etc., homebuyers placed fewer anxious calls to construction supervisors, freeing them up to manage subcontractors and vendors.

- **Co-opt customers.** At one time or another, every executive has wished for the equivalent of a microscope, crystal ball, or similar device that would provide a clearer, better understanding of customers - what their preferences are, how they buy, how the company's products stack up against competitors', how customers are using products, share of wallet, and other questions.

Customers can be encouraged to share measures or even outsource measurement to suppliers

The best companies use a wide range of solutions to gain an intimate understanding of customers. To improve visibility, most companies rely on customers to cooperate and share inputs and feedback. Innovative companies use a variety of other strategies to gain customer cooperation and recognize the challenges as well as the importance of gathering valid, timely inputs.

Coopting Customers

In some product/service categories, like cellular phone service, measures of customer usage are captured automatically. To improve visibility, however, most companies rely on customers to cooperate and share inputs and feedback. Among conventional tools, surveys are widely used to measure customer attitudes and behavior, with consumer and B2B companies spending hundreds of millions of dollars annually. Difficulties reaching respondents have reduced response rates and forced companies to rely on incentives to gain cooperation, raising concerns about potential response bias. Harris, SatMetrix, and others have established panels of customers who have agreed to be interviewed via the internet, lowering cost and improving cooperation.

Recognizing the challenges as well as the importance of gathering valid, timely inputs, innovative companies are using a variety of other strategies to gain customer cooperation. Airlines, grocers, and entertainment companies have created loyalty programs to capture detailed information about customer purchases. NetFlix rewards customers for rating movies - the more movies the customer rates, the more precisely NetFlix can recommend other movies - old and new - that match the customer's preferences. Customers are motivated to disclose information to receive individualized recommendations and superior service. It is unclear why leading video rental stores, like Blockbuster, have not installed a kiosk in stores to help customers identify and choose alternate or additional movies that match their interests.

Similar tools are being used by other retailers to better measure customers - literally - and reduce the number one cause for apparel returns - poor fit or wrong size. The Right Size (www.therightsize.com), for instance, provides retailers like JC Penney with an ASP solution that prompts customers to supply information about their own best fitting and most liked clothes. Clothes that most closely match the customer's profile are then recommended.

Drazen Prelec, a marketing professor at MIT, has developed an innovative new way to elicit and elaborate information from a group of potential customers. Called the Information Pump, participants play a computer facilitated "game" that reveals what they really believe, feel, think, and understand about a new product concept or prototype.

In industrial contexts, customers can be encouraged to share measures or even outsource measurement to the supplier to reap the benefits of joint, gain-sharing arrangements. Other incentives are also useful to gain customer cooperation. Many service companies, for example, have adopted service guarantees to prompt customers to report product/service failures. Non-monetary incentives can also be effective. B2B and consumer goods companies have persuaded customers to participate in highly intrusive studies that record details that even the customer may be unaware of. For instance, consumers have agreed to be filmed while shaving, brushing their teeth, and preparing and eating meals. Hospitals and physicians have agreed to share detailed data on patient conditions, treatments, and outcomes. While financial incentives, including equity in the venture that owns the data, can be effective, many respondents cooperate to exchange feedback with other customers and to remain on the cutting edge of new applications and solutions. Finally, researchers are beginning to explore novel tools that encourage customers to provide more complete and candid responses and inputs.

- **Leverage technology.** Technology is changing the way companies detect, measure, and respond to events and developments. The Internet, wireless devices, and other technologies are being used to monitor competition, capture customer related measures, and better assess operational performance. Emerging technologies make it possible to embed sensors in products and processes, as described below.

Leveraging Technology

Introduced just 10-15 years ago, IVR (interactive voice response) systems now handle the majority of customer service requests in banking, airlines, and other service categories. While IVR's are efficient for companies, customers often complain that the systems are difficult to use. Several years ago, a large service company responded to customer complaints and undertook a project to upgrade its IVR system. The company formed a cross-functional team to assess the existing system and to recommend criteria for evaluating and choosing a new solution. The technicians supporting the existing system were pleased when

the team requested information on a number of key metrics, like the percentage of customers that opted out at various nodes in the tree. The results were revealing - one option, for instance, allowed callers to obtain a list of payment locations in an area by keying in their ZIP code. Analysis showed that the majority of callers were transferring out of the IVR to request the information from a live customer service rep - when the list exceeded five locations, or about 20 seconds in length, the percentage opting out rose to 90%.

Now, even more sophisticated performance monitoring tools are available, thanks to technology. Empirix, for example, can dial into and systematically measure IVR performance along four key dimensions, including transaction failure rate, transaction length, variability, and "dead air." Dead air is the time customers spend waiting for an IVR or database to respond. A study done by Empirix for Call Center magazine found that airline IVR's had the slowest response time, while the highest failure rate was in the wireless sector. Tools that automatically measure performance (availability, quality, reliability, etc.) have been deployed in numerous other industries, including wireless, online ordering, and even parcel delivery.

Other innovative technologies allow companies to capture information that historically has been difficult to measure. Retailers, for instance, can now track and develop profiles of customers' in-store movements using sophisticated new imaging technology (described below). Rivalwatch sends its crawler to competitors' Web sites and measures product assortments, prices, types of promotions offered, and other information of interest. As Sinha (2000) noted, the internet has increased the "transparency" of information, including cost, for customers and competitors alike. Technology has largely automated the measurement of web-based information.

Finally, merchants and service providers are providing technology at the point-of-sale, making it easier for customers to submit requests and provide timely feedback. Convenient, automated, and anonymous, kiosks avoid some of the difficulties involved in reaching and surveying customers at their home or office. Companies are also equipping their salespeople, technicians, and other customer contact people with PDAs and other devices that make it easier for them to record (measure) information in a timely manner. FedEx and UPS pioneered such applications, giving their drivers devices to record real-time such critical information as time of pickup and delivery. The growing popularity and improved interface of

wireless devices, like the RIM Blackberry, also make it easier to notify supervisors, technical support, and even executives when measures exceed certain thresholds. At Amazon, for instance, when order backlogs reach certain levels, everyone drops what they are doing and chips in to make sure the company meets its delivery commitments.

➤ **Embed sensors in products/processes.**

Companies in many industries are using emerging wireless technologies such as RFID to embed sensors in products and processes and capture powerful new insights. Embedded sensors aren't merely automating data collection. They allow companies to capture previously unavailable information, sealing some of the leaks mentioned earlier. Someday, sensors will be embedded in virtually all products-not just vehicles and vending machines, but durables, clothing, and even food products-and most processes, providing information that can be used in ways limited only by our imagination. Companies must balance privacy, customer welfare, and other concerns as they deploy these devices and systems.

Embedding Sensors

FedEx and UPS have demonstrated the benefits of capturing information about core processes - in this case, package pickup and delivery - and providing near real time feedback to customers and operations. With sophisticated scanning systems that track package movement through their systems, the companies can now alert customers if a package has been delayed for some reason. Competition has now moved beyond pickup and delivery reliability to information about the status, location, and condition of parcels. Companies in other industries are also using emerging technologies to embed sensors in products and processes, capturing powerful new insights, as the following examples suggest.

Brickstream has developed a system for retailers that uses video cameras located in the ceiling of stores to record where customers go and what they do. Software interprets the video images to create an activity log for each shopper and calculate "tracks" of customers, all anonymously. Data are aggregated to produce metrics related to queues (length and wait time, abandonment rates, average, minimum, and maximum service times, etc.), shopping patterns (percentage of customers interacting with product or display, duration of interaction, path before and after interaction, etc.).

The insights from Brickstream's innovative system helps retailers optimize service levels and labor costs and assess return on store layout, in-store displays, and product placement.

With declining costs, RFID and other wireless sensors are being integrated into a growing number of products, as Joe Manget of the consulting firm Boston Consulting Group describes:

- *Toshiba and other manufacturers are using wireless technology to remotely monitor the condition of their products - "[photocopier] technicians can be dispatched as soon as there are signs of a problem, reducing servicing costs and - since machines are out of action less often - increasing usage and revenues."*
- *Vending machines are using wireless devices to transmit information on inventory levels and maintenance problems. By improving distribution and product selection and reducing the frequency and duration of out-of-stock, the technology has increased profits per machine by as much as 70 percent.*
- *Bandag manufactures and distributes retread tires for trucks through a network of over 500 dealers. With differences in price and quality diminishing, Bandag pioneered by embedding computer chips in their newly retreaded tires. The chips gauge tire pressure and temperature and count revolutions, helping customers determine when each tire should be retreaded. The sensors reduce downtime caused by blowouts and help clients improve fleet utilization, giving Bandag a significant competitive advantage.*

Progressive Insurance recently completed a trial in which customers' premiums were based on actual driving behavior, not just self-reported or historical information. In-vehicle wireless devices allow insurance companies, rental agencies, and even parents to monitor the status, speed, and location of their vehicles, providing unambiguous answers to the question "how's my driving?" Customer centric hospitals have even begun to use such devices to keep track of - and hopefully reduce - the length of time patients wait for various procedures.

As a final example, Vivometrics LifeShirt is a lightweight (8 oz.), machine washable, easy-to-use shirt with embedded sensors that continuously measure individuals' respiratory, cardiovascular and other physiologic functions. Individuals can also enter time-stamped symptom, mood and activity information in a

digital diary, allowing researchers and clinicians to correlate subjective patient input with objectively measured physiologic parameters. The data allow researchers to measure the effect of specific therapeutic interventions, dramatically improving the efficiency of clinical trials. The LifeShirt is also useful for diagnosing sleep and other disorders (see www.vivometrics.com)

- **Tune in to informative sources.** Companies can gain insight, lead time, and competitive advantage by paying close attention to "informative" customers. In practice, lead users, demanding customers, and others have proven especially informative. Companies are increasing the yield on their measurement efforts by rethinking conventional practices that treat all units of observation (e.g., customers, representatives) as equally important.

Discriminating Measurement

Several years ago, a consultant was engaged by a large service company to design and implement a system to measure customer satisfaction with the company's phone representatives. The consultant presented a number of recommendations that generated considerable debate within the client organization - the recommendations involved such fundamental issues as (i) which customers to survey, and (ii) which questions to ask various respondent. In essence, the consultant recommended that:

- Feedback from certain customers was more useful than from others, and therefore the length of interviews should vary from one customer to another. Interviews with more "informative" respondents would be lengthier, and vice versa
- The number of interviews conducted per representative should vary, with inconsistent or lower performing reps receiving closer scrutiny and more detailed feedback from a larger sample.

Unfortunately, these recommendations ran counter to the client's traditional approach, and were only partially adopted. Few companies focus disproportionate attention on a subset of observations. The examples below suggest the insight and competitive advantage that companies can gain by zeroing in on informative customers. In the '90's, Silicon Graphics developed a well-deserved reputation for detecting and responding to opportunities well ahead of competitors. Ed McCracken, the CEO, insisted that the company

work closely with "lighthouse customers" who were at the forefront of adopting new technologies - such customers gave Silicon Graphics a unique opportunity to understand and monitor emerging technologies. The approach enabled Silicon Graphics to identify and develop partnerships with companies like Netscape long before they became household names (Prokesch 1993).

MIT professor Eric Hippel has advised companies to identify and involve "lead users" in their R&D efforts. Lead users are customers that stretch the functionality of current products and services, adapting and in some cases creating their own solutions to compensate for inadequacies in current solutions and vendors. 3M and a handful of other companies have used the lead user approach to gain significant new insights.

Software companies give free copies of new releases to hackers and other early adopters willing to beta test their products. These venturesome users revel in testing the product, identifying bugs and errors, and suggesting new twists and refinements. More recently, P&G and other companies have been using the internet and services like Recipio to create online forums for customers - these forums allow the companies to facilitate and "listen in" on discussions among their most avid customers. Such customers are often passionate about the products being discussed and represent an invaluable source for ideas and feedback.

- **Calibrate cause and effect.** As the examples cited earlier suggest, a handful of leading companies are demonstrating that critical marketing relationships can be calibrated and vexing "what if" questions answered. However, relatively few marketing, advertising, and branding professionals are taking steps to actually measure marketing effectiveness. Fortunately, considerable attention is being devoted to the issue. For instance, the Marketing Science Institute (MSI) has ranked ROMI (Return on Marketing Investment) as its number one research priority and is sponsoring a number of initiatives to advance industry practice.

Calibrating cause and effect

Calibrating cause and effect requires suitable measures and careful analysis. FritoLay, for example, conducted large scale, systematic experiments to better understand the dynamics of advertising over a period of several years. The analysis provided important insights that allowed the company to dramatically improve the ROI on advertising and promotional investments.

Jeff Hunter, Director of Consumer Insights, Best Practices, and New Technology at General Mills, indicates that the company has used panel data to link long-term effects to short-term market mix results. Efforts to calibrate these complex relationships provided a clear understanding of the mechanics of "why we got the results we did." Not surprisingly, Hunter indicates that the insights "changed our behavior."

Marketers are often their own worst enemy, making it difficult if not impossible to calibrate relationships. As Stanford supply chain expert Hau Lee notes, "some of the demand-based management instruments have not been effective in the past because tracking of results is often inaccurate and inadequate. For example, instruments like rebates, price protection, group discounts, and other incentive schemes require accurate tracking of orders, sales, and inventory across multiple channels in the supply chain. Such information is often not tracked properly, so companies fail to leverage these instruments and their benefits are lost."

- **Reinforce use of measures.** As former General Electric CEO Jack Welch observed, "You can't run a business without numbers, but neither can you run it with only numbers." In all of the instances described here, senior management has played a critical role, asking the difficult questions and not accepting "I dunno." Whether marketers have the discipline to improve what we've called visibility remains to be seen. As Ambler points out, "given the choice between being accountable and not being accountable, which would you rather be? It's like turkeys voting for Christmas... marketers are hardly likely to vote for accountability if they can do without it."

Reinforcing Use

WalMart and Dell are two legendary examples of companies that use measurement to gain competitive advantage. Walmart gathers information about customers, competitors, products, sales, inventory, and virtually everything else using a variety of sensors, including weekly store visits by regional executives. During their Friday meetings, "in God we trust, all others bring data" characterizes their deliberations.

Long before exploiting the internet, Dell had earned a reputation for measuring almost everything that

matters to customers and affects profitability. Mark Mastrianni, buyer from GE, paid Dell the ultimate compliment by observing "This relationship from the very beginning has been driven by data, not dinners."

Summary

Innovative measurement practices improve visibility, helping organizations achieve results and gain competitive advantage. The following strategies have proven especially useful:

1. Plug leaks
2. Measure real time
3. Open the kimono
4. Co-opt customers
5. Leverage technology
6. Embed sensors in products/processes
7. Tune in to informative sources
8. Calibrate cause and effect
9. Reinforce use of measures

References

- Tim Ambler (2000), *Marketing and the Bottom Line: The New Metrics of Corporate Wealth*. Financial Times, Prentice-Hall: New York.
- David Boyle (2001), *The Sum of Our Discontent: Why Numbers Make Us Irrational*.
- Clayton Christensen (1997), *The Innovators' Dilemma*. Harvard Business School.
- Thomas H. Davenport and John Beck (2001), *The Attention Economy: Understanding the New Currency of Business*. Harvard Business School: New York.
- Stan Davis and Bill Davidson (1992), *20/20 Vision*. Fireside.
- John Hauser and Don Clausing (1988), *The House of Quality*, Harvard Business Review, May/June.
- Hau Lee (2001), *Ultimate Enterprise Value Creation Using Demand Based Management*, November, Stanford Global Supply Chain Forum
- Joe Manget, David Dean, and Marc Gilbert, *The Untethered Enterprise*, Boston Consulting Group.
- Regis McKenna (1995), *Real-Time Marketing*, Harvard Business Review, July/August.
- Sheridan Prasso (2001), *A New Word For 'I Dunno'*, Business Week, April 9.

Steven Prokesch (1993), Mastering Chaos at the High-End Frontier: An Interview with Silicon Graphics's Ed McCracken, Harvard Business Review. November/December.

Paul Schoemaker, J. Edward Russo, and Margo Hittleman (2001), Winning Decisions. Doubleday.

Jagdish N. Sheth and Rajendra S. Sisodia (2001), High Performance Marketing, Marketing Management. September/October.

Indrajit Sinha (2000), Cost Transparency: the net's real threat to prices and brands, Harvard Business Review, March/April.

George Stalk (1988), Time - The Next Source of Competitive Advantage, Harvard Business Review. July.

A two-part version of this article was published in the November/December 2002 and March/April 2003 issues of Marketing Management.

About the Author

Dr. Phil Hendrix is an independent consultant and head of immr (the institute for mobile markets research, a think-tank based in Atlanta). He has been a principal and partner in several consulting firms, a professor on the faculty of leading business schools, and a scientist in one of the world's leading research institutes. For over 15 years, he has helped established and emerging companies build enduring, profitable relationships with customers. With consumer and business-to-business clients, he has worked with senior management to craft and implement strategies that span targeting, positioning, product development, retention, and other strategic decisions. Much of his work incorporates innovative research approaches (qualitative and quantitative) to develop new insights and guide decisions.

Phil has been a partner with DiamondCluster (strategy and technology consultancy with 1,000+ professionals), founder and head of IMS (Integrated Measurement Systems), and a principal with Mercer Management Consulting. He has developed and led significant engagements, often involving multiple business units, with clients in financial services (Allstate, American Express), telecommunications (Ameritech, AT&T, BellAtlantic, BellSouth, Motorola), advertising/publishing (BAPCO, NIRC), utilities (Duke Power, Southern Company), and parcel delivery (UPS), among others. Under his guidance, IMS developed and helped more than a dozen organizations implement Measure AlignmentSM, a systematic approach that focuses processes and people in organizations on outcomes that matter to customers. He has also worked with a number of organizations on a pro bono basis, including the Children's Museum of Atlanta, the Alliance Theatre, and others.

Dr. Hendrix has held faculty and research positions at Emory University and at the University of Michigan, teaching courses in research design and analysis, buyer behavior, and marketing. At the U. of Michigan, he held a joint appointment in the Survey Research Center, leading large-scale survey research funded by the National Science Foundation, Census Bureau, and industry consortia. Phil received his PhD from the University of Michigan.

**Phil can be reached at:
phil.hendrix@immr.org
(770) 612-1488**