Evidence-based Decision Making: Using Business Intelligence to Drive Value

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Executive Summary

Business success depends on two abilities – to gain new insights faster than the competition, and to turn those insights into good decision making. The best decisions are those supported by good data. However, while most organizations are drowning in data, they often thirst for relevant information that can support key decisions. This is where evidence-based management (EbM) comes in. Leading organizations use this approach to ensure that they collect the most relevant information to support key decisions. Although the idea is intuitively understood and straightforward, most organizations seem to struggle with (a) collecting relevant and reliable information, (b) finding relevant data among the overwhelming available amount of data, and (c) using the data to turn it into information and knowledge that allows the organization to act on it. This management accounting guideline (MAG) provides an overview of how to apply EbM in organizations by outlining a practical five-step framework that discusses the following elements:

1. how to define the real information needs,
2. how to collect the right data,
3. how to turn data into information,
4. how to present and communicate that information, and
5. how to turn that information into better decisions and actions.

Throughout this MAG, we will also discuss how the critical role of IT infrastructure and Business Intelligence (BI) applications can support EbM.

Introduction

A cursory glance into the operations of most organizations shows a common challenge, irrespective of the industry or sector in which these firms compete. Most struggle to turn the mass of data flowing around the enterprise (which is stored in myriad systems and databases) into the mission-critical knowledge required to win in today’s fiercely competitive and highly unpredictable markets.

Thanks to a decade or so of breathtaking advancements in information and communications technologies, we now live in a world in which data, in all its forms, can be transmitted simultaneously to large numbers of people across the world by a single click of a button – and at the speed of light. Moreover, as a result of equally stunning technological improvements in data storage, much of the mass of data transmitted between employees resides somewhere in the enterprise – in databases, computer systems, or in other devices. Within most medium- to large-sized enterprises, the amount of data being exchanged and stored on a daily basis is almost incalculable – as is its value.
If organizations are struggling today to extract the greatest competitive benefits from their available data, we can be in no doubt that the scale of the challenge will grow significantly going forward, as year after year our capabilities to store and communicate data increases exponentially. Yet recent research predicts that just three years from now, the world’s information base will double in size every eleven hours. We are experiencing an almost unimaginable information explosion.

As a result, decision makers are bombarded by an ever-expanding supply of data, which places them and their organizations under great strain. The more data that is available, the easier it is to miss the most crucial bits of information. A useful analogy is to picture a business leader today as a 19th century gold prospector. Just as those prospectors had to pan tons of worthless silt to find those few nuggets of gold, today’s business leaders are expected to pan masses of essentially worthless (or background) data for those few golden nuggets of information that provide relevant insights that lead it to better decision making and, ultimately, to competitive advantage.

That said, many organizations still fail to grasp the fact that there is a need to systematically extract those “golden nuggets.” Research shows that many organizations are content to hoard data, in the mistaken belief that simply having it available in and of itself adds value, leaving it up to individual decision makers to pan for those golden nuggets of information. Management writer David Apgar is correct when he says that, although new technologies such as faster processors, bigger storage, and optical fibers have made data storage easier, relevance has become less important. “Cheap information has tempted us to neglect relevance and led us into some bad habits,” he says.

But not all organizations have fallen into bad habits. A Hackett Group study found that those finance organizations judged as world-class EPM (enterprise performance management) performers generate significantly less reports – namely 691 reports per year per US$ billion in revenues – compared to 1,474 for the non world-class group, and the formers’ reports were also much shorter. On first reading, it appears that the world-class group was less productive and less value-adding. However, deeper analysis tells a very different story. The finance staff of the world-class group spent considerable time to ensure that the reports they provided to business leaders homed in on the critical information that was required for decision making. They weren’t just throwing a mass of data at business leaders, instructing besieged managers to find something of value somewhere in the mass of delivered pages. The world-class group recognized their core responsibility to apply their analytical skills to translate raw data into golden nuggets of knowledge. And the rewards to their firms for doing so were considerable. The research found that, over a three-year period, the world-class group generated industry-relative equity returns that were more than twice that of the non world-class group.

The likelihood of greater stock market returns as a consequence of better analytics was confirmed by research published in 2008 by the management consultant firm Accenture. A survey of 371 companies found that 65% of top performers said they had significant decision-making support or real-time analytical capabilities – versus...
23% of low performers. The same study found that 40% of top performers use analytics across the whole organization, compared to 23% of low performers.

This performance comparison, of great importance to shareholders, is as compelling as it is logical. Get the right information to the right people at the right time, and you significantly increase the likelihood that they will make better decisions and help the organization win in your markets. Such top performers are leading the way in ensuring that they marshal and analyze available data in a way that can (a) add significant value to the organization, and therefore (b) deliver marked and sustainable competitive advantage. They achieve this by applying well-honed analytical skills which, according to repeated research, are currently in limited supply within most organizations.

To overcome the skills shortage that had led to this situation, many organizations have turned to information technology solutions in the belief that this will solve the problem. In 2007 alone, organizations spent more than $4 billion on license fees for so-called Business Intelligence tools (software applications that allow people to analyze data). In spite of these massive investments, organizations still fail to convert data into strategically valuable knowledge. The fact is that software alone will not solve the decision-support crisis that organizations are facing. To be fully effective, information technology and applications have to be closely aligned with (a) the organization’s business goals, and (b) the information and analysis needs of its people.

What is Evidence-based Management?

Many pioneering organizations throughout the world are using an emerging discipline called Evidence-based Management (EbM) as a way to improve their competitive positions. Through EbM, organizations explicitly use evidence (the best and most appropriate information) to guide the decision-making processes to extract maximum value and competitive advantage from their data and information. Crucially, however, EbM involves much more than just the collection and storage of data and information in large quantities – it also requires building competitive strategies around data-driven insights (see Text Box 1 for an overview of key terms).

Stanford University Professor Robert Sutton argues that “Evidence-based management is a simple idea. It just means finding the best evidence that you can, facing those facts, and acting on those facts. Yet surprisingly few leaders and organizations actually do it – and those that do trump the competition.”

Robert Sutton
EbM is therefore not only about business intelligence technology, and it is not just about analytical processes. EbM calls for an organizational approach towards learning and decision making based on the best available data. Both business intelligence and analytics are therefore necessary sub-components of EbM. However, having business intelligence and analytics capabilities in place is not of itself sufficient to create EbM – you also need an organizational culture that supports and values fact-based decision making, rather than making decisions purely on gut feel.

**The Roots of Evidence-Based Management**

Although EbM is a new approach for most organizations, its roots can be found in evidence-based medicine (EBM), a quality movement that applies the scientific method to medical practice. The scientific method is a well-established practice that refers to techniques for investigating phenomena, acquiring new knowledge, or correcting and integrating previous knowledge. To be termed scientific, a method of inquiry must be based on gathering observable, empirical, and measurable evidence derived from specific principles of reasoning. Applying the scientific method calls for collecting data through observation and experimentation, and formulating and testing hypotheses.

The ideas behind the scientific method and EBM can be effectively deployed through the EbM approach to significantly improve the quality of decision making within any organization. EbM, therefore, conforms to the requirements and meaning of the scientific method. It is therefore not a new fad, but rather a fundamental process on which humans have based their learning for centuries.

**Aim of this MAG**

The aim of this MAG is to provide management guidelines on how to properly apply EbM. Using practical examples and clear step-by-step illustrations, this MAG explains how to create an environment in which decision makers in firms apply analytics and business intelligence to turn data into value-added information and knowledge to guide decision making. This MAG has been written to be relevant also to small-and medium-sized firms that (a) might not have a massive budget for the latest business intelligence tools, and (b) are facing even greater challenges in relation to skills shortage and the need for better decision making. This MAG will therefore provide a number of practical insights and techniques in each section. These can be applied without the need for an expensive IT infrastructure, so that small-and medium-sized organizations (as well as business units and departments of larger organizations) can gain tangible value from this MAG.

**Why is this MAG Relevant to Management Accountants?**

Providing evidence in the form of financial reports and related management information has long been the basis for accountants’ role in decision making. However, over recent years, management’s information requirements have expanded in terms of the range of data, level of analysis, and expected presentation
format. BI vendors have responded by acquiring accounting applications to integrate with their company-wide BI offerings. Although BI may threaten some accountants’ traditional roles in generating reports, it could enable them to provide better information and analysis to support decision making. It could also release some management accountants’ capacity to combine financial expertise and business understanding to help improve performance.

The Evidence-Based Management Model

There are five steps for the effective deployment of EbM (See Figure 1), which we describe fully within this MAG. This begins with Step 1 – Defining Objectives and Information Needs. During this step, these questions are asked: “What are our strategic aims?” and “Based on those aims, what do we need to know?” This vital first step ensures that we clearly articulate the real information needs, and clarify who needs to know what, when, and why. Step 2 – Collecting Data – calls for gathering and organizing the right data. The emphasis here is on meaningful and relevant data to meet the information needs identified in Step 1. Organizations need to (a) assess whether the needed data is already held somewhere in the organization, or (b) know how to devise the best way to collect the data. Step 3 – Analyzing Data – focuses on turning data into relevant insights. Data has to be analyzed and put into context to extract information. Step 4 – Presenting Information – focuses on communicating the information and insights extracted in Step 3. The main focus here is to get the information, in its most appropriate form, to the decision makers. Step 5 – Making Evidence-Based Decisions – is concerned with turning information into knowledge and decisions. The emphasis here is on making sure that the available evidence is used to make the best decisions. Here, it is important to create a knowledge-to-action culture and avoid the knowing-doing gap so prevalent in many organizations today.

Figure 1: Evidence-Based Management Framework

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Defining Objectives and Information Needs</td>
<td>What are our strategic aims? Based on those aims, what do we need to know? Can we clearly articulate our information needs? Who needs to know what, when and why?</td>
</tr>
<tr>
<td>2. Collecting Data</td>
<td>Do we have or can we collect meaningful and relevant data to meet our information needs?</td>
</tr>
<tr>
<td>3. Analyzing Data</td>
<td>How can we turn the data into relevant insights? How can we put the data into context and extract information?</td>
</tr>
<tr>
<td>4. Presenting Information</td>
<td>How can we best present and communicate the insights and information to inform decision makers?</td>
</tr>
<tr>
<td>5. Making Evidence-Based Decisions</td>
<td>How do we ensure that the available evidence is used to make the best decisions? How do we create a knowledgeable-to-action culture? How do we avoid the knowing-doing gap?</td>
</tr>
</tbody>
</table>

IT Infrastructure and Business Intelligence Applications as Enablers

How do we best leverage our information technology infrastructure and our business intelligence applications to support evidence-based decision making?
The five sequential steps of this framework provide a blueprint for evidence-based decision making. However, the logic of good evidence-based decision making is not just linear (from Step 1 to Step 5), as there is a feedback loop between the last and the first step (from Step 5 to Step 1). After learning has taken place and decisions have been made, they in turn inform future informational needs. This is indicated by the arrow at the base of the diagram.

As one can see from the framework, there is a sixth box – IT Infrastructure and Business Intelligence Applications as Enablers. IT and Business Intelligence play a crucial role in evidence-based decision making. However, they cannot make this happen alone, but rather must be used to support the steps outlined here. IT infrastructure and applications are critical enablers of the data collection process, data analysis, and the presentation and dissemination of information. Although IT Infrastructure and Business Intelligence applications are important elements of evidence-based decision making, we decided not to make them a step in this framework. As much as anything, this is to highlight the importance of identifying the right steps, therefore helping to veer organizations away from being seduced into the belief that all they need is a state-of-the-art BI infrastructure.

This belief, that all that is required to serve information needs is a technology application, is of long standing. As far back as 1963, an article in Business Week predicted that, “the great day – when all the information for solving a management problem is only a push button away – is closer than you think.” Fully 45 years later, we are still waiting for this “great day” to arrive. The sensible among us realize that it never will.

That said, investments in technology continue apace. In its report: Making the Difference: The 2008 CIO Agenda, Gartner (the world’s leading information technology research and advisory company) finds that BI (a) was the number one technology priority for the third year in a row, and (b) is seen as supporting the top three business priorities of improving business processes, attracting new customers, and retaining them.

The deployment of BI will only be optimally effective if the business management and IT parts of the organization collaborate closely. Stanford Professor Thomas Davenport and Jeanne Harris make the valuable point that organizations that are serious about analytics and evidence-based management require the support of a fully committed IT organization. However, they stress that the IT departments must play an enabling and not an ownership role. Simply put, the outcome of the joint analytics/BI effort is the knowledge to make and act upon decisions. This has to be owned by the business.

Management accountants should consider the potential for BI in their businesses, and be prepared to champion BI projects where appropriate. It could enable them to provide a wider range of information in more accessible formats. In addition to reporting and monitoring, they could provide more forward-looking analysis that is based on a combination of both financial and non-financial information. It could also release many accountants from the rigor of the reporting cycle to take on decision-support roles.
Management accountants should therefore work more closely with their colleagues in IT to help develop and implement a BI strategy. For example:

- They can work with IT to develop a BI strategy and the business case for investing in BI. They should help determine the actions to be taken and risks to be managed, so that the expected benefits can be realized.
- They can support BI implementation, ensuring the application of change management and project management disciplines.
- They can help ensure data quality, perhaps taking responsibility for this often unclaimed problem area.
- They can help to articulate the business’s information needs for decision making, and support performance management with metrics that reflect value creation.
- They can support less quantitatively oriented or financially articulate colleagues with analysis and modelling of financial and non-financial data to assess performance and enable evidence-based decision making.

We will now discuss each of the five steps in more detail, and outline the role of IT infrastructure and software applications as part of Steps 2 to 4.

### 1. Defining Objectives and Information Needs

Successfully negotiating Step 1: “Defining Objectives and Information Needs” requires careful answering of one key question: “What do you want to know?” This is a vitally important question, and an appropriate place to start creating a data-driven strategy. In most organizations, the use of BI and analytics is driven more by the information that is available than by the information needed to make essential business decisions. This is clearly back-to-front. Effective EbM should be driven by the needs of the organization’s information recipients and decision makers. In essence, identify the information that the recipient is looking for and apply BI and analytical capabilities accordingly.
The cited Hackett study found that world-class organizations spent time identifying the needs of the business before doing the analytics. As a powerful case example of switching the emphasis from focusing on available data to focusing on the needs of the business, consider Purolator, Canada’s leading courier company. Purolator’s finance organizations successfully completed a program to transition from a “scorekeeper” to a business partner. At the outset of the transformation journey, it conducted a survey with internal customers (mostly decision makers) to ascertain how Finance was viewed and what improvements were required. From the viewpoint of this MAG, the following survey findings were telling:

“What the feedback process discovered was that although internal customers were generally satisfied with finance they were also looking for less broad-based reports, and more focused analysis and recommended actions,” explained Deb Craven, then vice-president, finance and administration.

The fat ring binder, bulging with every conceivable financial analysis, graph, and table that Finance believed might be useful (sent once a month to each divisional business leader) exemplified the information overload management complained about.

“We were trying to give them data to address every potential question,” explained Craven, “but the feedback that came from the business was that ‘we’re overwhelmed with the sheer volume of data and unsure as to what to do with it.’ They were telling us they wanted the information to be interpreted, to be action-oriented. We thought we were being useful by giving the business all this data, but in fact all we were giving them was stress.”

The study stated that to a certain extent the creation of a fat ring binder was understandable, as along with investment in systems and technological improvements came an avalanche of new data. “The challenge was to turn that data into actionable information that would drive the right decisions,” says Craven. “In the old finance organization, it would have been tempting to simply increase the amount of data and create more binders. However, we are told by the business that they are getting a smaller volume of data, and that what they receive is substantially more useful for decision-support purposes.”

A useful approach to establishing the objectives and information needs is the following four-phase methodology for identifying why the data is needed, for what purposes, and by whom:

i. Identify the strategic objective/information need.

ii. Identify who has the information need.

iii. Clarify what questions they want answered.

iv. Clarify what decisions need to be taken.

We will consider each phase in turn.
Identify the Strategic Objective/Information Need

In today’s turbulent, unpredictable markets it has become not only important but essential to link the data that organizations collect to the most important drivers of value and performance. By doing so, we ensure that the analytics we generate (a) are relevant to the organization’s competitive positioning, (b) support its greatest information needs, and (c) are not wasted on irrelevant “interesting to know” issues.

In recent years, several models have emerged to help business leaders to identify and articulate their core strategic objectives and the way they drive business success. For instance, consider the Balanced Scorecard-based Strategy Mapping approach, developed by Harvard Business School Professor Robert Kaplan and Dr. David Norton. A traditional Balanced Scorecard framework comprises the four interrelated perspectives of financial, customer, internal processes, and learning and growth for which organizations define their strategic objectives.

Another model that can be used to map strategy is a Value Creation Map based on value-driver analysis. Following the logic of the Balanced Scorecard-based Strategy Maps, it provides the following framework for understanding an organization’s value proposition, its core activities, and its enabling value drivers:

- The **value proposition** (or **output deliverables**) identifies an organization’s purpose, and its roles and deliverables. It also identifies the key output for the stakeholders of the organization and the value delivered to them.
- The **core activities** are the vital few things an organization has to excel at to deliver its value proposition. They essentially define (a) what an organization should focus on, and (b) what differentiates it from others.
- The **enabling strategic elements** (or **value drivers**) are the other strategic elements or objectives an organization requires to perform its core activities and to deliver its value proposition.

The objectives in these three perspectives are then placed in relationship with each other and displayed on a single piece of paper to create a completely integrated and coherent picture of the strategy. As with the Balanced Scorecard, a properly architected Value Creation Map enables the whole of the organization to focus on, and be aligned to, the critical few objectives that will drive success in meeting strategic goals.

Organizations that clearly understand the building blocks of strategic success can ensure they are focusing on the data that is relevant to the strategic journey. The data-driven strategy is then hardwired to the strategy of the organization. All analytics aggregate upwards to these core strategic objectives.

But what many organization overlook when rushing to build strategy frameworks is that such frameworks, when first designed, represent a hypothesis. That is, they are an assumption by the senior team of what drives strategic success – it is a best guess. Such a hypothesis must be tested through implementation or experimentation. This takes us back to the “construct hypotheses and test them through experimentation” components of the scientific method in which EbM is
grounded. Indeed, the value of any scientific theory lies not in anyone’s ability to tell that it’s true, but in the ability to put it to a test, find errors, and improve it.

From the viewpoint of EbM, it is important to use analytics to ensure the crafting of a strategic objective that will drive competitive success. In a decision-support hierarchy, it is crucial that the highest level organizational objectives are robust and correct, otherwise the supporting data-driven strategy will have considerably less value than it should – if it has any value at all.

**Identify Who has the Information Need**

The second phase of the model is to identify who needs the information. Here it is important to define the target audience (information customers). Information customers can be groups of people such as the board of directors, senior managers, the HR department, the marketing managers, or a single person. It is critical to clarify who requires the information, because different audiences have vastly different needs, even in relation to a single strategic objective. For example, there might be an overarching strategic objective to improve customer engagement. But the analytics required by the marketing department (who will be interested in product performance/brand perceptions) will differ substantially from the human resources department (who will want to know what internal training is required to improve the customer relationship).

As part of gaining an understanding of the customers of data and their informational needs, it is a good idea to consider the following questions:

- *What do they know about the issue?* People’s understanding of an issue will vary widely. It’s crucial to take the time to discover the depth of their knowledge, as this ensures that time is not wasted seeking and presenting unnecessary information.

- *What do they want to know?* This identifies the requirement to probe the audience to discover the exact elements of the issue they are most interested in.

- *What do they expect to see?* How would they like the data delivered – graphically, numerically, or through commentary? This helps to understand how they prefer to receive analytics.

- *What will they do with the information?* This identifies how the audience will use the information provided. How will they use this new-found knowledge for decision making?

**Clarify what Questions They Want Answered**

Here you want to identify exactly what questions the target audience wants an answer to. The previous step provides a broad understanding of the requirements of various audiences, but we now need to delve much deeper to ensure that the analytics provide the knowledge that will enable the recipients to make the most appropriate and focused market decisions.
Often, however, recipients don’t fully know their exact requirements. A powerful tool for guiding audiences to identifying their specific requirements is to formulate Key Analytics Questions (KAQs). This is based on the concept of Key Performance Questions (KPQs). In essence, a KAQ makes sure that we know what it is that we want to know – that we fully appreciate the exact performance issue that we are grappling with.

It is understood in the context of this four-step process that the high-level strategic objective/information need (as identified through a framework such as the Balanced Scorecard or Value Creation Map) is filtered through the requirements of different audiences. The KAQ then becomes a very narrow and focused operational question. We can argue that it is by finding and implementing the answers to KAQs that we are fully able to understand what data is required to operationalize the corporate strategy.

In constructing a KAQ, it is important to keep it relatively short and clear. A KAQ should only contain one question. Asking a string of questions makes it much harder to guide meaningful and focused data collection. The KAQ should not contain any jargon or abbreviations that might not be understood. Likewise, ensure that the question uses language that those in your organization (and those consulted outside) are comfortable and familiar with.

KAQs should focus on both the present and future. For example, ask “How effective are our attempts to increase our market share?” instead of “Has our market share increased?” By focusing on the future, we open up a dialogue that allows us to “do” something about the future. We then look at data in a different light, trying to understand what the data and management information means for the future. This helps with data interpretation, and ensures that we collect data that helps to inform our decision making (see Text Box 2 for examples). After a KAQ is identified, then the user can move to the next step.

**Clarify What Decisions Need to be Taken**

Because the KAQ significantly narrows the information needs, it better enables decision makers to identify the performance data that will help to improve their decision making. However, although a KAQ narrows the possible data and indicators that can be used, it still leaves many possible indicators to choose from. Another question can be used to narrow the range of possible indicators even further. This question seeks to clearly identify any important decisions the data would support (See Text Box 3 for examples). By articulating the question and the possible decisions performance data will help to address, it is possible to reduce the potential number of indicators from an almost endless number to a smaller and more focused set of possible indicators.
A good example of how to apply the ideas presented here is Google – one of today’s most successful and most admired companies. Google applies the principles of asking questions. CEO Eric Schmidt says:

“We run the company by questions, not by answers. So in the strategy process we’ve so far formulated 30 questions that we have to answer [...] You ask it as a question, rather than a pithy answer, and that stimulates conversation. Out of the conversation comes innovation. Innovation is not something that I just wake up one day and say ‘I want to innovate.’ I think you get a better innovative culture if you ask it as a question.”

After identifying the information needs, it is important then to ascertain whether the data is readily available and of the right quality. If not, a program must be launched to collect and capture that data. If the data is available, we can theoretically move on to Part 3 of the model. However, it makes sense to read Part 2 to assess the quality of the data. If the data is not available or of the right quality, you need to move on to the second part and gather the right information.

2. Collecting Data

An essential component of EbM is having the right data, and data of the right quality. An effective data-driven strategy is predicated on the ability to collect, analyze, and turn data into information. This information in turn is translated into knowledge, as described in the EbM framework. If the data is not appropriate or of the requisite quality, then the data-driven strategy will be compromised. This will lead to a potentially severe effect on the organization’s ability to (a) make important decisions, or (b) implement corporate strategies or any other interventions launched to win in crowded and competitive markets.
This section focuses on providing a thorough understanding of the importance of collecting and organizing the right data (that is, the requisite data to support strategic objectives and/or the needs of a specified target audience).

**What is Good Evidence?**

By rigorously deploying the EbM framework, organizations explicitly use evidence to guide their decision making. But what do we mean by evidence? In its broadest sense, evidence includes any data or information that might be used to determine the truth of an assertion (this serves as a core process within the judicial system, for instance).

Within the context of the EbM framework, we narrow the definition to “scientific evidence.” Such evidence either supports or counters an established hypothesis. Scientific evidence must be empirical (that is, derived from careful observations or experiments rather than from speculation or theory), and properly documented in accordance with the earlier described scientific method.

Building evidence requires the careful collection of the right data. And yet our understanding of the word “data” is confused. People often wrongly believe that the word “data” has a narrow numeric definition. This is incorrect. Data comes in myriad forms – sounds, text, graphics, and pictures are as much data as are numbers.

Consequently, it is important to become familiar with the available data collection methodologies. These approaches are usually described as either quantitative (being concerned with the collection of numerical data) or qualitative (concerned with the collection of non-numerical data). Both approaches have different purposes, and each has identifiable strengths and weaknesses, as we now explain.

### Qualitative vs. Quantitative Data Collection Methods

The aim of quantitative data collection methodologies is to classify features, count them, and then construct statistical models in an attempt to explain what is observed. Quantitative data is usually collected automatically from operations, or through structured questionnaires that incorporate mainly closed questions, with specified answer choices.

Although qualitative and quantitative methods differ (see Text Box 4), a complete polarization of qualitative and quantitative data is not necessarily useful, because it obscures the fact that...
qualitative and quantitative data are intimately related: Most quantitative data is based upon qualitative judgments; and all qualitative data can be described and manipulated numerically.

In Appendix I, we look at some of the most common methods for collecting data, such as surveys, interviews, focus groups, etc. Before deploying any of these mechanisms, organizations must first be clear as to the purpose for doing so (e.g., how will the findings support organizational implementation of corporate strategies and whose information needs does this serve). Organizations must take care that they do not simply collect data for the sake of it, or only collect what is easy to measure.

Collecting Evidence and Data

By collecting both quantitative and qualitative data, we are then able to begin assigning meaning to the data. The systematic approach starts with describing the attributes of a variable using values. To explain, a variable might be party affiliation; the different attributes could be Democrat, Republican, or Independent. Values are then assigned to capture the data, e.g., 1 for Democrat, 2 for Republican.

After data is captured numerically, the next step is to understand what is called the “level of measurement.” This refers to the relationship among the values that are assigned to the attributes for a variable. There are typically four levels of measurement (see Text Box 5): nominal, ordinal, interval, and ratio.

It’s important to recognize that the level of measurement implies a hierarchy. At lower levels of measurement, assumptions tend to be less restrictive, and data analyses tend to be less sensitive. However, at each level up the hierarchy, the current level includes all of the qualities of the one below it, but also contributes something new and value-adding. In general, higher levels of measurement (e.g., interval or ratio) are more desirable than lower levels (e.g., nominal or ordinal).

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**Text Box 5: Levels of Measurement**

**Nominal measurement:** A party allegiance example characterizes a nominal level of measurement, where the numerical values just “name” the attributes. No ordering or prioritization is implied. Numbers one and two for instance have no meaning, other than being shorthand for Republican and Democrat. One is not superior to two, as two is not superior to three.

**Ordinal measurement:** When it comes to ordinal measurement, however, the attributes can be rank-ordered. So one might well be superior to two, for instance, which might in turn be superior to three. That said, the intervals between the numbers are not necessarily equal. A good example is the star ratings of hotels (1-5 stars). In this measure, higher numbers mean better quality and more luxury. But the distance from 0 to 1 is not the same as from 3 to 4. The interval between values is not interpretable in an ordinal measure. Likert scaling is an example of an ordinal measurement that is used extensively within organizations. Likert scaling is a bipolar scaling method, measuring either positive or negative responses to a statement. Respondents might be asked to rate the following on a five point scale “This supplier will go the extra mile for the customer.”

1 = Strongly disagree; 2 = Disagree; 3 = Neither agree or disagree; 4 = Agree; 5 = Strongly agree. Other scales such as 1-7 are also commonly used.

**Interval Measurement:** In interval measurement, the distance between attributes does have meaning. A good example is the Fahrenheit scale for temperature. Here, equal differences on this scale represent equal differences in temperature, and the distance from 30-40 is same as the distance from 70-80. The interval between values is interpretable.

Note, though, that Interval scales do not have a “true” zero point; it is therefore not possible to make statements about how many times higher one score is than another. Returning to the Fahrenheit example, a temperature of 30 degrees is not twice as warm as one of 15 degrees.

**Ratio Measurement:** In a ratio measurement, however, there is always an absolute zero that is meaningful. It now becomes possible to construct a meaningful fraction (or ratio) with a ratio variable. Weight is a ratio variable. In applied social research, most “count” variables are ratio measurements, for example, the number of clients in the past six months. This is because you can have zero clients and it is meaningful to say that “We had twice as many clients in the past six months as we did in the previous six months.” Other examples of ratio scales are length or time, as well as temperature measured on a Kelvin scale. Thus, a temperature of 300 Kelvin is twice as high as a temperature of 150 Kelvin.
Ensuring Data Quality

At the outset of Step 2, we stated that data has to be of the right quality for it to become useful. Assessing its quality requires a robust assessment of its reliability and validity (See also Text Box 6).

Reliability and validity can be substantially heightened through applying the idea of “triangulation.” Simply put, this involves collecting data using various techniques (e.g., interviews with board members, middle managers, and front-line workers) and methodologies (e.g., survey 70% of your suppliers and interview 30%). This allows organizations to contrast and compare the information gathered from use of the different techniques. The rationale behind this is that the more information we have from as many possible sources, the greater the likelihood that it is reliable.

Meaningful sampling is another method of ensuring data quality. Indeed, in most surveys access to the entire population is almost impossible. However, the results from a survey with a carefully selected sample will reflect, extremely closely, those that would have been obtained had the entire population provided the data. Sampling, therefore, is a very important part of the data collection design process. If you have surveyed using an appropriate sampling technique, you can be confident that your results can be generalized to the population in question. If the sample were biased in any way, for example if the selection technique made selection of older people more likely than a selection of younger people, it would be inadvisable to generalize from the findings.

Planning Your Data Collection

Having a good understanding of the available data collection techniques, and being aware of the importance of the levels of measurement, organizations can now move into the careful planning of their data collection strategy. This comprises several decisions:

- Decide on the data collection method.
- Decide on the source of the data.
- Decide when the data will be collected, and in what sequence and frequency.
- Decide who is responsible for collecting the data.
- Decide who measures and reviews the data.

**Decide on the data collection method:** Before deciding how to collect the data, it is important to establish whether or not existing data can be used. It is important, though, to make sure that the existing data is of the appropriate quality. If appropriate
data is not available or needs to be supplemented with more evidence, we can choose the most appropriate data collection method from the suite of instruments listed in the Appendix.

**Decide on the source of the data:** At this stage, it is crucially important for the designer of an indicator to think about access to data (existing or new), and answer questions such as: Is the data readily available? Is it feasible to collect it? Will the data collection method, for example interviews with senior managers, provide honest information? If not, it might be appropriate to combine various data collection methods.

**Decide when the data should be collected, and in what sequence and frequency:** Here, the designer of an indicator thinks about when and how often the data for that indicator should be collected. Some indicators are collected continuously, others hourly, daily, monthly, or even annually. It is important to decide what frequency provides sufficient data to answer the key analytics questions (as described in Step 1 of the model) and helps to support decision making.

**Decide on who is responsible for collecting the data:** Here we identify the person, function, or external agency responsible for data collection and data updates. The person responsible for measuring could be an internal person or function within your organization or, increasingly, it can be external agencies, since many organizations outsource the collection of specific indicators. This is especially common for indicators such as customer satisfaction, reputation, brand awareness, and employee satisfaction.

**Decide who measures and reviews the data:** At this point, we identify the person, function, or external agency responsible for data measurement and review. It is also important here to clarify whether there are any review or sign-off cycles. It is common, for example, for one person to input the data and for another person to cross-check it or sign it off before release.

**Role of IT Infrastructure and Applications in Collecting Data**

The main role of IT infrastructure and software applications in collecting data is this. Software applications can help collect data, and data repositories are used to store the data after collection. For example, software applications and web interfaces can be used to create survey tools that help to collect data directly from users. Furthermore, tools like sensors and applications can be used to collect operational data automatically. This can include, for example, automatic quality checks during manufacturing. A more innovative example come from a retailer who is using heat sensors to automatically detect the number of people waiting at the supermarket checkout. If the system detects that the queues are getting too long, it sends a message to staff to open more checkouts.
Data repositories store data after collection. The pervasiveness of computer systems means that today most data is stored electronically. The simplest storage mechanism is a computer hard drive, using applications such as Microsoft Excel spreadsheets, or a database application such as Microsoft Access. Although valuable, such applications are more suitable for storing personal rather than organization-wide data.

**Text Box 7: Disadvantages of using Spreadsheets and Data Repositories**

**No scalability** – Spreadsheets are not designed either to handle large amounts of data or to incorporate significant complexity – such as color coding, macros, or calculations. Attempting to squeeze every increasing amounts of data into a spreadsheet quickly takes the application to its full capacity, leading to slowness of data analysis and frequent crashing.

**Time-consuming to update** – Spreadsheet-based solutions are usually manually fed and updated. It is not unusual for business analysts to spend a substantial amount of their time simply updating their spreadsheets. This has many downsides. Not least, perhaps, is that it is a wasted use of what are usually well-paid and highly educated staff, whose time would be much better spent conducting strategically focused analytics. Furthermore, the requirement for manual input means that most spreadsheets will comprise errors, often with major and devastating consequences. A KPMG study found that over 90% of existing spreadsheets contained significant mistakes. In a separate piece of research, PricewaterhouseCoopers (PwC) confirmed a 90% plus figure for significant errors. PwC described just how damaging these errors had proven to be. For example, spreadsheet errors caused one company to undercharge a client by millions of dollars; another company falsely inflated its estimated net present value by 54%; and yet another computed pre-tax profits 32% lower than the actual figure.

**Difficult analysis** – Analysis becomes very complicated when data is stored in individual spreadsheets. It is both challenging and time-consuming to bring together disparate spreadsheets for analysis across more than one data set.

**Text Box 8: Enterprise data warehouse vs. data marts**

**Enterprise data warehouse**
An enterprise data warehouse is a central data repository that brings together data from underlying operational systems. Data is centrally held, and all applications and users access the one repository. Data warehouses are designed to facilitate reporting and analysis. This classic definition of the data warehouse focuses on data storage. However, the means to retrieve and analyze data, to extract, transform and load it, and to manage a data dictionary (essentially a catalogue of all data held in a database) are also considered essential components of a data warehousing system. Many references to data warehousing now use this broader context.

**Data Marts**
Data marts are broken down into dependent and independent data marts. Dependent data marts are often used when data is extracted from the central data warehouse and then stored in a separate data mart to support specific applications. In the independent data mart, each application has its own independent data repositories, populated from different source data systems. In such an instance, no central repository of data exists.

We should note that current trends are to move away from independent data repositories to more enterprise-wide and integrated solutions.
And yet, somewhat shockingly, research findings show that the vast majority of organizations in both commercial and governmental (local and central) settings still rely heavily on spreadsheet applications for their data storage needs. A quick summation of the disadvantages to organizations of doing so, provided in Text Box 7, should discourage the reader from adopting or continuing this practice.

Today, data is usually stored in what we call a data warehouse. A data warehouse is a repository of an organization’s electronically stored data, making it more manageable and accessible. Data warehouses essentially come in two formats: the Enterprise Data Warehouse (used by different parts of the organization for multiple purposes), and the Data Mart (typically a single-function data warehouse used by a single part of the organization, which exists dependent on or independent of the Enterprise data warehouse) (see also Text Box 8).

Organizations should ensure that their data warehouses do not become data dumps. It is important that stored data stays meaningful, and that people can easily retrieve information that is relevant to their needs. We therefore recommend adoption of good practices, such as using logical groupings and data aggregation. As with physical warehouses, things that are not properly labeled will be difficult to find. Furthermore, although we want to avoid data redundancies and data replication, we do need adequate replication for security purposes. It’s also important that security systems and processes ensure that the data – an extremely valuable asset in any EbM organization – remains safe.
3. Analyzing Data

After ensuring that we are collecting the right data, we need to turn this data into insights and information. Step 3 of the five-step EbM framework focuses on turning data into information. To put data into context, we need to analyze it. Data analysis is a core requirement in creating evidence used for decision making. Yet repeated research shows that most organizations are still more focused on simply collecting and distributing data than they are in doing any meaningful analysis. Research by the Hackett Group finds that while world-class finance organizations (classified as top quartile performers in both the effectiveness and efficiency dimensions) spend 40% less time collecting and compiling data than they do analyzing data. Non-world class organizations spend less time on analysis than on data collection.

Analysis to Support Strategy

In Step 1 of the EbM framework, we stressed the importance of ensuring that analysis supports a core strategic objective of the enterprise. A powerful case example of this is provided by the US leading car rental company, Enterprise Rent-A-Car. Enterprise Rent-A-Car has an unmovable conviction that only through the delivery of outstanding customer service will it secure sustainable competitive advantage in what is a very crowded and competitive market. The organization does not want to be the biggest in the business, but the best in the eyes of the customer. A commitment to customer service excellence has been a hallmark of the organization since its founding in 1957. Indeed, the market research organizations, J.D. Power and Associates and Market Metrix, have repeatedly named Enterprise Rent-A-Car number one in customer satisfaction in the car rental industry. The organization has created a unique way to measure customer satisfaction. It has created an Enterprise Service Quality index (ESQi) that hinges on two simple words: completely satisfied. Each month, the organization measures customer satisfaction at each local branch through telephone surveys of hundreds
of thousands of customers. Using a 5-point scale (see information on the Linkert scale in the previous step), the organization asks a simple question: “How satisfied were you with your last experience?”

Each branch earns a ranking based on the percentage of its customers who say they were completely satisfied. The organization calls that ranking “top box,” and that becomes the standard of excellence it sets for itself when working with customers. Note, however, that in its analysis Enterprise Rent-A-Car only counts the respondents who are completely satisfied. Internal research had shown that customers that are completely satisfied are three times more likely to return as a customer. The company now focuses on driving up the frequency of this response to this question. Having validated the results over time, the company now doesn’t need to store the responses to the other four scale items.

Recognizing that there is a difference between customers who are completely satisfied (or in the following case, who are very satisfied) and those who are just satisfied was uncovered as early as the mid-1990s by research by Rank Xerox (then the European arm of the Xerox Corporation). Rank Xerox found that a significant percentage of customers who said they were satisfied still defected to their competitors at the end of the contract. This was not so of very satisfied customers, the vast majority of whom remained loyal. Deeper analysis found that certain characteristics of the relationship that very satisfied customers had with Rank Xerox significantly heightened the likelihood of their continuing their patronage. Armed with this knowledge, Rank Xerox could then work to imbue those characteristics more widely into its relationship with customers.

Both the Enterprise Rent-A-Car and Rank Xerox examples highlight a common problem with the ordinal measurement scale. Too often, companies lump together satisfied and very satisfied data in the mistaken belief that characteristics of the two groups are similar. They are not – and believing that they are can lead to grievous errors in decision making. Indeed, in many instances the distance between satisfied and very satisfied might be substantially greater than the distance from neutral to satisfied.

The Text Boxes 9a and 9b in this section outline a number of analytical techniques that might be applied as part of EbM.

Analysis to Test Your Strategy

A practical illustration of how an organization’s hypothesis regarding the drivers of strategic success proved false (as observed through implementation), consider Banking 365, the remote banking arm of the Bank of Ireland, launched in 1995 and therefore an early example of a remote bank. Banking 365’s senior team crafted a strategy based on a person-to-person, differentiated service – essentially ensuring that its operations delivered outstanding services to its customers, which they did consistently.

Although this strategic focus led to extremely high levels of customer satisfaction, the downside was that costs became unacceptably high. There was a disconnect
between customer satisfaction and financial success. So the leaders of Banking 365 faced a conundrum. How could they continue to achieve exceptionally high customer satisfaction scores while keeping costs to an acceptable level?

Banking 365 therefore introduced self-service options for customers (almost unheard of in the mid-1990s), who could still deal with an operator directly if they wished. The Operations Director commented that it was through the use of a strategy framework that they were quickly able to detect a problem with the strategy. “Therefore we were able to introduce a different strategic approach early on and monitor its success,” he said.

Experimentation as a Way Forward

In applying the scientific method that underpins the EbM framework, we are much more interested in the creation of scientific evidence than in just evidence (see definitions in the previous step). A useful demonstration of the difference between evidence and scientific evidence-based analysis was provided by Bill James in his book Moneyball. James focused his research on the sport of baseball. He challenges the long-held notion that baseball experts and talent scouts could spot the best talent simply by watching them play. Put another way, he questioned the conventional wisdom that the naked eye of an expert provided sufficient evidence of the ability level of a baseball player.

James argued that simple observation was not itself sufficient to differentiate a .300 hitter from a .275 hitter (for non-baseball enthusiasts, this is a difference of one hit every two weeks), claiming that if someone watched a game during the season, there would be a 40% chance that the .275 hitter will have more hits than the .300 hitter in that game.

James instead created a new formula that put much more emphasis on a player’s on-base percentage, which gives higher ratings to those players who tend to walk more often. His formula was: Runs Created = (hits + walks) x total bases / (at bats + walks). The validity of this approach was shown when the general manager of the baseball team the Oakland As decided to work with James and track new talent based on hard (or scientific) evidence. This allowed the Oakland As to hire players like Jeremy Brown, who were considered by traditional scouts as “too fat,” who then proved to perform well.

Essentially, James ran an experiment to test an assumption – in this case that the naked eye (even an expert’s naked eye) was sufficient to identify great ball players.

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**Text Box 9a: Practical Analysis Examples (1)**

**Marketing and Sales Analysis:** Here, organizations are using analytics to better understand their markets and their customers. Examples here include retailers like Tesco, one of the big success stories in the industry. Tesco is a very active user of itsclub card data (a very successful loyalty card scheme that allows Tesco to collect detailed data on each of their users), which allows the retailer to understand changing consumer trends and buying patterns. It also allows Tesco to tempt individual customers with much more targeted and customized offers.

**Click Stream Analysis:** Web sites are able to generate large amounts of click stream data to understand how each visitor has navigated (clicked) through their site, what buttons they hit, how much time they spend on each page, etc. No traditional organization is able to collect that same level of detail about how customers browse its store, the exact route they take before they make (for example) a purchasing decision, where they pause, and even the exact point when they might change their minds or abandon transactions. Click stream analysis can lead to very powerful insights that allow organizations to optimize their websites.

**Quality Analysis:** Since the awakening of the total quality movement in the 1980s, quality analysis has been an important component in most firms. Based on data from mass manufacturing, tools such as Six Sigma are now also used in service organizations. It basically uses statistics to understand variations in performance levels. This then allows organizations to set much more precise quality targets, and understand (a) what levels are acceptable, and (b) normal fluctuations in quality. Tools such as statistical process control, Six Sigma, and other quality analytics are not just used to monitor an organization’s own performance, but also to design and measure performance contracts with suppliers using, for example, service level agreements.
Organizations should conduct many more experiments to test assumptions. In applying the EbM framework, testing or experimenting is essential to our ability to prove or disprove a hypothesis. Scientific testing requires the complete removal of bias (it is clear to see how people who have spent much time developing a new proposition, service, or product might be inclined – even unconsciously – to a bias sufficient to “prove” their hypotheses).

Organizations can learn much from long-established experimenting approaches used within medical industries, such as pharmaceuticals. In a medical trial, the effectiveness of a new drug or medicine is tested scientifically. The new drug/medicine is administered to one group of patients suffering from the condition. Another group of sufferers (the control group) receives a placebo. The results from both groups provide an unbiased view of the drug/medicine’s benefits. Such experimentation can lead to surprising findings. For example, the drug Buproprion (marketed under several names, one being Zyban) was developed as an anti-depressant. However, medical trials found that some of the patients who had taken the drug were able to stop smoking. It was later certified for sale as an aid for those who wished to stop smoking, as well as an anti-depressant.

A best practice example of an organization that makes good use of experiments is Yahoo! Inc. The organization receives many millions of hits to its home page each hour. To test new assumptions (in this case that making a certain alteration to the home page will change behaviors of visitors) they randomly assign one or two hundred thousand users to an experimental group and have several million other visitors as a control group. By doing so, they can quickly see whether or not the alterations to the home page leads to the assumed change in the behavior of the customer. This in turn allows them to optimize their offerings to enhance revenues and profits. The results of these experiments can often be seen within minutes, and Yahoo! typically runs about 20 experiments at any given time. This way, the results of the analysis drive behaviours, cutting out lengthy discussions about website design best practices, which of course can be extremely subjective and biased.

Text Box 9b: Practical Analysis Examples (2)

Budgeting and Planning: The right analytics allow organizations to produce much more precise forecasts and better predict future revenues, profits, cash flows, etc. For example, Hewlett-Packard has created a sophisticated algorithm to better predict monthly and quarterly revenues. Their (then) CFO noted, “It is reassuring to have a solid projection algorithm. It’s crisper and cleaner, it has rigor and methodology as opposed to my own algorithm.”

Reporting and Consolidation: Having the right available data and appropriate analytics capabilities can enable organizations to consolidate their information and automate their reporting. A good example is multinational IT company Dell, who is able to “close their books” in just one working day, and is able to produce the consolidated accounts after each working day.

Value Driver Modelling: One type of analytics that is becoming increasingly popular is value-driver modelling. Organizations have realized over the years that financial indicators such as earnings per share, net income, or economic return on invested capital are not reliable predictors of future performance (e.g. market value of a company). Many organizations have started to create more comprehensive models of value creation to include some of the more intangible drivers of future performance. They use approaches such as multiple regression analysis to understand how various elements such as brand reputation, customer service, or staff engagement might drive future performance.

Role of IT Infrastructure and Applications in Analyzing Data

Since first becoming available in the late 1980s/early 1990s, BI applications have been used to enable the analysis of, and the extraction of insights from, data. Some generic BI applications enable consistent and reliable data manipulation and reporting capability. However, many tailored applications are now available to perform specific analysis in areas such as customer profitability and supply chain optimization.

An early decision is whether to purchase a BI application (that is, a packaged solution that is purchased from a vendor and comes with preconfigured software, data transformation, management, and access in a single package, usually with business models), or to build your own. The make or buy decision hinges on whether the required packaged solution exists, and whether the level of skills required to build your own exist within the organization. But research shows that...
it generally pays to go for packaged applications. According to the IT research firm IDC, projects that implement packaged analytical applications yield a median ROI of 140%, while custom-built analytical applications yield a much lower 104% ROI.

BI tools are a type of application software designed to report, analyze, and present data. The tools generally read data that have been previously stored in a data warehouse, a data mart, or in some other facility.

BI tools allow users to perform the types of analysis we referred to in Part 3 of this MAG. Examples include:

- Reporting and querying software (tools that extract, sort, summarize, and present selected data)
- Dashboards - these can be a simple and static visual display of performance, but in their most advanced forms are fully interactive, allowing drill-down analysis. Advanced dashboards are often tightly integrated with OLAP tools.
- OLAP (usually used by advanced users, they make it easy for users to look at the data from multiple dimensions) – see Text Box 10.
- Data mining (used for finding correlation among different factors).
- Text mining tools (allow companies to extract key elements from large unstructured datasets, mainly text, discover relationships, and summarize the information. Text accounts for about 85% of an organization’s information store.

Analytical software tools enable an effective and comprehensive analysis of data. Such software provides the data analyst with many capabilities. For instance, interactive drill-down capabilities provide a simple and intuitive way of exploring and analyzing performance data. Moreover, many of the software applications come with powerful graphics capabilities that go far beyond what ordinary spreadsheet applications can deliver. We explained in Step 3 that being able to visualize data is powerful for data presentation reasons; it is also of great value at the analysis stage.

Other important capabilities offered through BI software include the ability (a) to conduct root-cause analysis (that is, it finds the root cause of a problem), and also (b) to model and assess correlations or regressions in causal models. So, if an organization has built causal models (at the highest level), it might model the drivers of strategic success as described in a framework such as the Value Creation Map or a balanced scorecard. BI tools can be used to test and validate assumed relationships. As a simple example, how true is our assumption that increases in staff customer service training positively impact customer loyalty? In some of the analytical applications, users are able to create simulations based on their cause-and-effect logics, but note that a lot of quantitative data is required to make such simulations meaningful.

Often, data has to be viewed from different perspectives, and a sophisticated technique is needed to explore accumulated data. Multidimensional analysis tools usually perform this task, enabling the easy visualizing and analyzing of business

**Text Box 10: OLAP Analysis tools**

OLAP (On-Line Analytical Processing) tools are often used to make sense of multidimensional data. Author and consultant Nigel Pendse has coined the acronym FASMI (Fast Analysis of Shared Multidimensional Information) to describe OLAP capabilities.

**FAST** means that the system is targeted to deliver most responses to users in less than five seconds, with the simplest analyses taking no more than one second and very few taking more than 20. Although Pendse says that this often proved problematic in organizations, he asks, “If Google can search a large proportion of all the on-line information in the world in a quarter of a second, why should relatively tiny amounts of management information take orders of magnitude longer to query?”

**ANALYSIS** means that the system can (a) cope with any business logic and statistical analysis that is relevant for the application and the user, and (b) keep it easy enough for the target user to understand.

**SHARED** means that the system implements all the security requirements for confidentiality.

**MULTIDIMENSIONAL.** The system must provide a multidimensional conceptual view of the data, including full support for hierarchies and multiple hierarchies, as this is the most logical way to analyze businesses and organizations.

**INFORMATION** is all of the data and derived information needed, wherever it is, and however much of it is relevant for the application.
metrics across different points of view. These tools are linked to a graphical user interface that presents the results on the computer screen in tables or graphs.

Multidimensional technology plays a significant role in BI by enabling users to make business decisions. This is done by creating data models that reflect the complexities found in real-life structures and relationships. It consolidates and presents summarized corporate information from a multitude of sources.

### 4. Presenting Information

We will now consider Step 4, presenting information. We stress throughout this MAG that it is crucial, when analyzing data, to keep the target audiences and their specific needs in mind. After all, organizations gain competitive advantage when the right information is delivered to the right people at the right time.

In Step 2, we described the core responsibilities of the people who design performance indicators. The designer must identify the main audiences for the data and their exact information needs. It is important to note that indicators can have different audiences, with different needs. It is therefore usually sensible to identify primary, secondary, and tertiary audiences. The primary audience will be those directly involved in the decision making related to the strategic element being assessed. The secondary audience might be other parts of the organization that would benefit from seeing the data. A possible tertiary audience could be external stakeholders.

But it is crucial that the information presented is relevant to that audience. Earlier in this MAG, we cited the Hackett Group’s view that world-class finance organizations prepare smaller, more focused reports than do their peers. It is far too easy to create large reports for different groups, and reports that are too detailed. The fat ring-binders that were once popular at the Canadian courier Purolator are still the norm in many organizations.
Earlier, we outlined the importance of the right reporting frequency; a great indicator is of little use if that information gets to its audience too late for timely decision making. The designer of the indicator must also consider reporting channels – that is, the identification of the outlets or reports that are to be used to communicate the data. An indicator can, for example, be included in the monthly performance report to the executive management committee, or included in the quarterly performance report to the board. It might be required for the weekly performance reports to heads of service, or might be reported on the organizational Intranet, or made available to external stakeholders through external reports or the website.

It is important to cross-check the identified reporting channels with the reporting and measurement frequency to ensure that they are aligned and that data is available in time.

The designers of indicators must also consider reporting formats, thus deciding how best to present the data. As examples, data can be shown as a number, a narrative, a table, a graph, or a chart.

The designers of indicators might also consider notifications and workflows. To explain, workflows are predefined and automated business processes in which documents, information, or tasks are passed from one person or group of persons to others. Notifications are predefined and automated messages that point performance data, messages, or alarm notifications directly to predefined individuals or groups. Defining possible workflows and notifications is especially useful as a first step toward automation, using performance management software applications. For example, e-mail notifications or workflows could be automatically triggered (a) if an indicator requires updating, or (b) to tell a specific audience that new data is available or that an indicator has moved over or below a predefined threshold.

**Visualizing Data**

Let’s look in more detail at presentation formats. We will stress that, in engaging the minds of the target audience, it is crucial that the visual presentation tools are clear, informative and compelling. Keep in mind that about 70% of the sense receptors in our body are dedicated to vision. “Vision is by far our most powerful sense. Seeing and thinking are intimately connected.”

In displaying information, we would recommend always starting with the key analytics question (KAQ) that the data/information sets out to answer. This provides context to what will follow. It should also ensure that the report is focused squarely on meeting a critical information need of the target audience, thus avoiding any inclination to focus on “interesting” rather than “valuable” information.

The KAQ should be followed by meaningful graphs and charts. Graphs are the most widely used visual display tools used in...
organizations. Many different types of graphs can be deployed to convey information. These include, for example, pictographs, tally charts, bar graphs, histograms, scatter plots, line graphs, and pie charts.

Each chart has a different purpose, and should therefore be used appropriately. See Text Box 11.

Graphs provide many benefits for conveying information. They are quick and direct, highlight the most important facts, facilitate an easy understanding of the data, and can be easily remembered. Here are some more generic tips for producing graphs:

• Keep them simple and focus on the message the user needs to receive.

• Try to avoid 3-dimensional graphs – they are harder to read.

• Use emphasis colors (e.g., bright red, yellow, orange, or green) rarely, and only where you want to highlight specific issues.

• Don’t use too many different varieties of graphs, because an analysis across different graphs is difficult.

• Try to avoid any unnecessary decorations, background colors, etc. Any additional and unnecessary elements just distract us and make it harder to extract the insights.

Placing a graph directly after a KAQ is a great way of quickly showing progress in answering that question. Note, however, that graphs should not be used when the data is widely dispersed, when there is not enough data (one, two, or three data points), when the data is very numerous, or when the data shows little or no variation.

Headlines and Narratives

Flowing down from the graphs, a good report should then use narratives and “headlines.” A headline summarizes the main finding from the data, whereas the narrative puts context around and provides meaning to it. Using graphs and narrative together enable the telling of the story, which neither can fully do in isolation. For instance, a graph containing past performance is extremely useful for analyzing trends over time, but a narrative can put context to the graphical information – explaining why the trend is as it is. This highlights the importance of using both quantitative and qualitative data. If you feel you need to include the raw data in numbers and tables, keep them separate, for example in an appendix.

Performance Dashboards

Over the past few years, we have seen the growth in use of performance dashboards. These are visual displays of “The most important information needed to achieve one or more objectives which fit entirely on a single computer screen so it can be monitored at a glance.”
A key reason why performance dashboards have become popular is that in today’s fast moving marketplaces, senior executives and other managers need a way to keep track of the most important performance data and to continually assess their relevance.

The following example from a large global IT systems provider, which we call InfoCom, shows how a dashboard was created for use at several organizational levels. InfoCom was looking for a performance dashboard that would serve as a steer for the executive committee, and also provide “slice-and-dice” capabilities, so that management teams at all levels could (a) view their own performance against the critical dashboard metrics in near real time, and (b) compare their results with other parts of the organization.

In addition to setting an overarching “one source of truth” goal, the InfoCom project team charged with creating the dashboard was tasked with (a) creating a fact-based foundation for decision making, and (b) identifying a vital few key metrics with which the executive committee could monitor progress towards strategic goals. The dashboard was expected to be utilized in monthly and quarterly business reviews, monthly transformation meetings (which are held to manage the strategic initiatives that drive the company forward), and as a steer for daily operations. All this meant that the veracity of the dashboard content had to be unquestionable.

Creating the dashboard required first a clear statement of the problem. The problem was that the company’s lack of “one source of truth” for key metrics had led to organizational misalignment. It was an overarching problem that could be distilled into four current-state problems, each with accompanying goals for their resolution and new capabilities required for meeting those goals. For example, one current-state problem was defined as “Executive management is dissatisfied with their inability to access data needed to run the business.” The corresponding goal was to “enable executives with timely access to data beyond their daily operational information.” The identified new capability was “better executive decisions based on one view of data across business units.”

Next, the InfoCom team reviewed strategy goals and identified initial Key Performance Indicators (KPIs) in a series of two week-long workshops involving the dashboard team and subject matter experts across business units, regional theaters, and functions. These were followed by frequent meetings that focused on functional issues. At the workshops, participants were charged with meeting the following objectives:

- Determine overarching goals, issues, and opportunities for the dashboard project
- Identify strategies to reach corporate goals
- Identify specific metrics, goals, issues, and opportunities
- Clarify specific goals and metrics
- Review all components
- Finalize KPIs

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**Text Box 12: Information Dashboard Design Mistakes**

In his book, *Information Dashboard Design*, Stephen Few outlines the following 13 common dashboard design mistakes:

1. Exceeding the boundaries of a single screen
2. Supplying inadequate context for the data
3. Displaying excessive detail or precision
4. Choosing a deficient measure
5. Choosing inappropriate display media
6. Introducing meaningless variety
7. Using poorly designed display media
8. Encoding quantitative data inaccurately
9. Arranging the data poorly
10. Highlighting important data ineffectively or not at all
11. Cluttering the display with useless decorations
12. Misusing or overusing colour
13. Designing an unattractive visual display
An important function of the workshop team was to formulate standard definitions of measures. For instance, although everyone thinks they know what “revenue” means, creating a very specific definition is actually quite challenging. The team recognized, however, that it was very important to reach a consensus if the dashboard were to work effectively.

Furthermore, for each metric (a) a target was set, (b) the data source identified, (c) the extraction frequency defined, (d) how the metric could be sliced (e.g., by business unit, theater), and (e) a contact name for that metric listed determined.

In the end, the balanced dashboard created in the workshops comprised the four perspectives:

- **Sales**: metrics such as pipeline dollars and win-rate percentage dollars
- **Finance**: metrics such as customer revenue and forecasted orders for new business
- **Human Resources**: metrics such as open requisitions and attrition
- **Transformation**: metrics such as those used for enterprise-wide strategic projects

InfoCom has created a browser-based dashboard that runs on Internet Explorer. It enables a daily cross-theater, cross-business unit, and cross-functional performance snapshot of the company. About 80% of the metrics are updated each day, and people can see performance from multiple “slices and dices” based on their requirements. It is now possible for managers and executives to view the performance of individual units, or to see performance comparisons between business units and theaters, or any combination they wish.

Given the speed of change in the markets in which InfoCom operates, the dashboard cannot be cast in stone, and will need to change in the future. For this reason, a steering committee of high-ranking company managers has been appointed to oversee its usage. A key role of this senior team is to control the amount of information in the dashboard, attempting to limit it to between 30 and 40 metrics. And as new metrics come in, others are cycled out to keep the dashboard relevant and strategically focused.

Tracking performance to dashboard objectives and metrics is usually done through the use of traffic lights or speedometer dials. The red, amber, green traffic light convention has become a popular way to show whether an organization is ahead of target (green), within a specified target (amber), or below target (red). A key benefit of traffic lighting is that identifying where performance is off target can trigger an exception report and an initiative to improve performance.

As an example, the City of Christchurch Council, New Zealand, has an on-line dashboard that includes a traffic light reporting component, which helps focus the reports delivered to the executive team. The senior team receives a high level one-page overview of performance, followed by a detailed list of exceptions (results flagged as amber or red, plus options and recommendations provided by managers...
to deal with these results. This focuses leadership on the “vital few” pieces of information that must drive decisions.\textsuperscript{12}

Role of IT Infrastructure and applications in presenting information

The key role of IT and software applications is to help engage people in the information. Data and information can be brought to life through powerful communication and collaboration features that use graphical user interfaces. For example, dashboards can be used to create visually rich displays so that users can understand information at a glance. These displays are often automatically updated based on the latest available data. Color coding and intuitive displays allow users to understand the key messages. Most of the applications available today are web-based, which means that only an internet browser is needed to view the information. Many of the tools have powerful graphics engines to enable users to produce a number of different charts and graphs in order to present the information in the most appropriate and easy to understand format.

5. Making Evidence-Based Decisions

In this final step, we look at how to turn the information into (a) knowledge, and (b) better decisions that we can act on. Let’s look at an example. In the last five years, the apple crop in Somerset, England has grown by 10\% per annum. Over the next year, the crop is predicted to grow by a further 10\%. Therefore, the organization has to find markets for the 10\% more apples that will be grown. The information (trend analysis data of five years of growth in the apple crop) has been used as the basis for deciding to predict the same percentage crop growth over the following year. Both the decision and prediction can be correctly described as “knowledge,” in that they are outcomes of an analysis of available information.
Often, managers are in such a rush to gain performance advantages from “proven” approaches that they fail to ensure consideration of other information when making decisions.

The Best Use of Information

Yet, just as we caution care in how organizations analyze data sources (for example, that they should not be overly concerned with quantitative data only), we also suggest a certain circumspection in the use of information for decision making. We often find a predisposition to make important decisions based on a very narrow information set. Consequently, erroneous decisions can be made that have damaging, and sometimes catastrophic, consequences. Often, managers are in such a rush to gain performance advantages from “proven” approaches that they fail to ensure consideration of other information when making decisions.

This failure was well illustrated by Stanford University Professors Jeffrey Pfeffer and Robert Sutton in their seminal 2006 book on EbM. Based on observing the practices of many organizations, the authors point to a number of poor decisions that might result from relying too heavily on a narrow field of information. For instance, they highlighted mistakes made by firms within the US automotive industry in the use of process benchmarking (through which an organization studies and replicates, for its own use, a best practice process of another firm) to learn the basis for the successes of their Japanese counterparts. Note that with their market share and profit margins under great pressure from the successes of far eastern car manufacturers, US companies were certainly keen to understand, capture, and replicate the successes of their Asian competitors.

The authors described how the US companies tried to embrace Toyota’s total quality management approach (which is called the Toyota Production Systems – TPS – and which works systemically to eliminate waste, implement make-to-use, and have the people who know the work solve the problems). However, in their haste the US organizations ignored critical performance facts that were much wider than the techniques and practices they observed, thus leading to either failure or at best partial success. The fact is that the TPS techniques that the US visitors saw on their benchmarking tours – the kanban cards, andon cords, and quality circles (as examples) – represented only the surface of TPS but not its soul. The Toyota Production System is more about philosophy and perspective, taking into account people, processes, quality, and continuous improvement. To an extent, it is a cultural mindset and not just a set of easily replicable techniques or practices. In this instance, the US companies were interested only in information pertaining to process steps. As a result, they did not gain enough information to see the whole picture – which would have enabled knowledge-based decision making.

Process benchmarking can, however, be a powerful aid to decision making. Sometimes, through, this requires thinking “outside the box.” A good example is the US-headquartered facilities management firm, Johnson Controls, which has built a robust 15-step process benchmarking model to drive world-class innovation. Johnson Controls had a client that wanted to improve its landscaping activities. Rather than look at the available examples from the campuses of other commercial organizations, Johnson Controls studied and adopted the best practices from a golf course – because landscaping was their core business. It therefore looked more widely for information to turn into knowledge.
Other inappropriate practices that Pfeffer and Sutton identify in the use of information for decision making include doing what (seems to have) worked in the past and following deeply accepted yet unexamined ideologies.

Knowledge must be drawn from the best available information, which will likely come from many sources. In their book, Pfeffer and Sutton provide a powerful example of turning information into actions. However, this example comes not from a company, but rather from the personal experience of a celebrated organizational leader.

Until 2005, Dr. Andy Grove was chairman of the microcomputer giant Intel – and had previously been its CEO – and indeed was one of its first employees. In 2005, Dr. Grove was diagnosed with prostate cancer. His response was to assiduously track down all the data he could find to compare the treatment options for the illness with their risks and benefits. From this analysis of a wide pool of data, he placed himself in the best position to decide on an appropriate course of treatment. This is EbM in practice. He didn’t just simply follow a prescribed course, but rather analyzed all the available data and information to find the best fit for his circumstances and requirements. Today, Dr. Grove serves as an advisor to the executive leadership of organizations and is a board member of the Prostate Cancer Foundation. In another arena, Dr. Grove made a comment that should be taken into account by any organization that wishes to take EbM seriously. “Let’s think for ourselves. Let’s not repeat mindlessly ... suppositions that are true merely because somebody else says they are.”

Dr. Grove’s comment fits nicely with the following quotation, which serves as a useful description of how EbM is not simply a step-by-step process for transforming known data in knowledge, but rather represents a mindset shift in how organizations seek and apply data. “Evidence-based management requires a mindset with two critical components: first, willingness to put aside belief and conventional wisdom – the dangerous half-truths many embrace – and instead hear and act on the facts; second, an unrelenting commitment to gather the facts and information necessary to make more informed and intelligent decisions, and to keep pace with new evidence and use the known facts to update practices.”

But amassing knowledge, however insightful or compelling in and of itself, is of little value unless it is turned into action. Put in stark terms, if knowledge is not turned into action, then the entire effort expended in sequencing through the previous steps in the EbM framework would have been a pointless exercise and a waste of resources. Decisions have to be made and acted upon.

As a useful and simple example (and this illustration may or may not be apocryphal, but is nonetheless powerful), a US supermarket analyzed the buying patterns of its customers. Examination of the data revealed a curious relationship. It discovered that men who go shopping on Friday night to buy beer also tend to buy diapers (or vice versa). This is a fascinating and perhaps surprising piece of information, but unless something is done with these insights then the findings are worthless. Of the endless options here, the supermarkets might (a) put the beer and diapers (or nappies as they are termed in the UK) adjacent to each other to make their mutual...
purchasing easier, (b) putting them as far apart as possible to tempt shoppers to buy other things en route from one purchase to the other, (c) provide a package deal, or (d) reduce the price of one to attract customers and raise the price of the other to generate profits. Simply put, this fascinating piece of information is only useful if one of the above options is implemented.

The Knowing Doing Gap

In their book The Knowing-Doing Gap: How Smart Companies Turn Knowledge into Action, Professors Pfeffer and Sutton explain why many organizations that possess plentiful knowledge fail to turn that knowledge into action. The authors argue that the knowing doing gap (where knowledge is not implemented) is the most menacing phenomenon that most organizations face today. This phenomenon, they rightly claim, costs organizations billions of dollars and leads to a wide array of failures in strategic implementation and other failures. Their book resulted from a four-year research program that set out to identify a common malady that the authors had observed in organizations, and which they articulated as the **knowing doing problem** – that is, the challenge of turning knowledge about how to enhance organizational performance into actions consistent with that knowledge.

The most destructive aspect of the knowing-doing gap, the authors argue, is what they call the “smart talk trap,” where talk becomes a substitution for action, and where myriad members of the organizations make decisions that change nothing. Other reasons for the gap are entrenched and outdated culture, fear of change, internal competition, and measurements that lead nowhere.

Consequently, closing this knowledge-doing gap often requires a wholesale reworking of the process for turning knowledge into action – a reworking that has cultural as well as process, structural, and technological components.

Indeed, as with any major transformation efforts launched by organizations, the cultural challenge is probably the most daunting. Most change programs fail because of inappropriate culture, not because of the other dimensions.

Seven Steps to Creating a Knowledge-to-Action Culture

For creating a culture that is conducive for transforming knowledge into action, we recommend that organizations use the following seven steps, each of which we will consider in turn.

i. Have passion for learning and improvement
ii. Ensure leadership buy-in
iii. Develop widespread analytical capabilities throughout the organization
iv. Use judgment
v. Share information
vi. Reward EbM
vii. Build appropriate IT infrastructure
i. Have passion for learning and improvement

The most important ingredient, which is why it is the first on the list, is to create an organization-wide passion for learning and improvement. Of course, this is extremely cultural. A good case example of making this happen is Canada’s Clarica Life insurance. Steered by Executive Vice-President Strategic Capabilities, Hubert Saint-Onge, in the late 1990s and early years of this decade, Clarica (now part of Sun Life Insurance Company of Canada) was a pioneer in implementing knowledge management and learning organization practices. Within Clarica, people were (a) encouraged to form the mindset that “work is learning” and “learning is work,” and (b) provided the space and tools to make this mindset a practical reality. E-learning tools and communities of practices were used extensively for making learning and improvement an organization-wide passion. Within the EbM framework, learning must be based on asking the right questions (following the principle of the key analytics questions that should steer all data collection and analysis – see earlier steps) and collecting evidence to answer them – therefore leading to decisions and actions.

ii. Ensure leadership buy-in

To make EbM a reality, senior level buy-in and support is important. Thomas Davenport and Jeanne Harris (the authors of the Accenture study described in the introduction) argue in their book *Competing on Analytics*: If the CEO or a significant faction of the senior executive team doesn’t understand or appreciate at least the outputs of quantitative analysis or the process of fact-based decision making, analysts are going to be relegated to the back office, and competition will be based on guesswork and gut feel, not analytics.” It is therefore important for the senior leaders in an organization to believe in evidence-based decision making. It helps if they have some appreciation about what makes good evidence and what makes good analysis, and they should be able and willing to act on the findings resulting from the analysis. Organizational leaders have to show visible commitment to EbM and analytics, and need to explain the importance and role of evidence-based management in their organization-wide communications.

iii. Develop widespread analytical capabilities throughout the organization

In the introduction to this MAG, we provided research evidence to show that analytical capabilities are generally lacking in most organizations, and that where they are evident, widespread enterprise-wide sustainable competitive advantage is more likely to be achieved than where these capabilities are absent. Companies such as Marriott, Google, Yahoo! Inc, Amazon, and Procter & Gamble are exceptionally capable in their ability to systematically turn their data analysis into insights and actions that lead to significant competitive advantage. They are, however, still counted within a group that we can label the exception rather than the norm. As Davenport and Harris write: “The overwhelming majority of organizations…. have neither a finely honed analytical capability nor a detailed plan to develop one.”15 Supporting our comment about the challenges of culture change made earlier, Davenport and Harris continue on to say that changing employees’ behaviours is one of the most difficult and time-consuming elements of creating an
analytics capability. “When most people visualize business analytics, they think of computers, software, and printouts or screens full of numbers. What they should be envisioning, however, are their fellow human beings. It is people who make analytics work and who are the scarce ingredient in analytical competition.” Put another way, it is the employees of an organization who need to take insights from the analysis and turn them into actionable knowledge. We stated in the introduction that organizations often see an investment in BI tools as being the proper response to the challenge of analyzing data. This is plainly mistaken. It is people who make analytics work, not systems.

iv. Use judgment

Bringing people into the equation brings with it a dimension to building evidence that we have not yet described. That is, in making analytics work, employees (at all levels) must balance facts and judgment. William Perez, former CEO of Nike, puts it nicely: “I am a data man – I like to know what the facts are… [but] judgment is very important. Feel is very important. You can’t replace that with facts. But you can use data to guide you.” As a powerful example of this, a few years ago the author of this MAG attended an analytics course run by the software provider, SAS Institute. During a data mining session, it became strangely evident that there was a strong correlation between the share price of the company being analyzed and the length of the lawn outside the corporate headquarters – the share price seemed to be higher when the grass was long than when the grass was short. Even though the analysis suggest a relationship between these two variables, common sense tells us that there is obviously no relationship, and that we shouldn’t conclude that longer grass will lead to improved share performance. This would represent a failure to apply judgment to information provided through data analysis.

v. Share information

Despite more than a decade of consultants peddling the latest and greatest approaches to knowledge management, the fact is that in a large number of organizations employees are still reluctant to share information. And technology is failing to provide the answer. A 2008 research report by Atos Consulting, for instance, found that less than one-third of study participants strongly agreed/agreed with the statement that: “The deployment of technology has greatly improved enterprise-wide strategic learning processes.” Just as worrying, research finds that employee groups seem much more interested in gaining ownership of information than in figuring how to share it to secure competitive advantage. According to a recently published report, finance, IT and marketing departments in many organizations are fighting one another for responsibility to manage the company’s information. Those working in IT believe that they have the most clearly defined role. Eighty percent of those in Finance felt that they had a more clearly defined role, while 67% of marketing specialists felt that they had the most clearly defined role. For EbM to be effective, the message has to get out, loud and clear, that information belongs to the enterprise, and that all employees should be focused not on its ownership but on working together to create the richness of different perspectives that can turn this information into golden nuggets of knowledge.
vi. Reward EbM

“What gets measured gets done. What gets rewarded gets done well.” is a well-known management maxim that is typically attributed to Peter Drucker, but whose origin is actually obscure. But the fact is, rewards – most powerfully financial but also non-financial – tend to quickly make a new idea or approach uppermost in the mind of an employee at any level. In planning their strategy for implementing the EbM framework, organizations should look to weaving in some form of supporting reward strategy, as it is important to recognize and reward EbM attempts. This will show that organizations take the approach seriously, and value those trying to make it a practical reality. This can start with a simple thank-you and sharing of success stories.

vii. Build appropriate IT infrastructure

You can have a wealth of analytical intentions and skills, but you also need the tools to put them into practice. Organizations need the right IT infrastructure. Essentially, this comprises (a) databases, data warehouses, data marts, etc. to store the data; (b) networks and connections to share the information and to make it accessible; and (c) the software to analyze and share the data.
Conclusion

What makes organizations succeed in today’s competitive and unpredictable world is the ability to learn faster than the competition, and the ability to act on any insights to drive competitive advantage. In this MAG, we have outlined how EbM can enable organizations to do exactly that. Any organization can boost its competitive position by aligning the data collection to the strategic value drivers, and collecting the best available evidence, by using this evidence to extract valuable insights and by communicating the information in a way that allows acting on those insights. The tips, tools, and templates presented as part of the five-part EbM model should enable organizations to become more evidence-based in their decision making, and avoid the traps of making decisions based on anecdotal data or dangerous half-truths.

Appendix 1: Data Collection Methods

This appendix provides an overview of some of the key data collection methods.

Surveys and Questionnaires

Surveys and questionnaires are probably the most extensively used method of data collection. This is not surprising, as it can be a relatively inexpensive way of collecting valuable performance data. For instance, at minimal cost an employee engagement survey can be distributed electronically to many thousands of employees throughout the world.

Surveys and questionnaires first became widely popular in the early 1990s. Organizational enthusiasm was galvanized by the then-emerging total quality movement, which encouraged a more customer or quality focus to operations. Consequently, large numbers of organizations began to use survey instruments (then paper-based) to seek information on customer satisfaction and customers’ perception of service and quality, among other things.

However, such enthusiasm soon led to difficulties. Organizations began to receive many questionnaires from many suppliers, and soon grew tired of having to dedicate not insignificant amounts of time to their completion. Today, therefore, it is much harder to solicit customer feedback than it was, say, a decade ago. Some organizations even have a policy of not completing surveys, due to the time previously been spent in doing so.

That said, surveys and questionnaires should still be used, where appropriate, to capture performance data relating to customers, employees, or suppliers. But in order to increase relevance and reduce time, organizations should ensure that the purpose of the survey is well articulated (e.g., how will it help decision making) and that the content of the survey is easy to understand and, crucially, is quick to complete.
A good questionnaire should conform to the following requirements:

- Include a good brief (why we are doing this survey)
- Ensure that the function of each question is clear (why we are asking this question)
- Use clear phrasing (avoid ambiguity, which is one the major weaknesses of questionnaires – and perhaps the most annoying)
- Use simple language (avoid difficult words, complex sentences, jargon)
- Make them easy to complete (avoid too-long questionnaires and include clear instructions)
- Make the survey attractive (professional looking with good use of spacing, etc.)

**Interviews**

Interviews are another popular way to collect data. These can be very structured and just a verbal way of collecting survey data, or they can be semi-structured or unstructured, in which case interviews are more qualitative in nature. Being guided conversations, they are deployed to provide insights into the feelings or experiences of the interviewees. This therefore involves the use of open-ended (how, why, what) questions in a conversational, friendly, and non-threatening manner.

Interviews are usually face-to-face or telephone-based. But organizations should look to leverage online capabilities to extract deeper insights than can normally be secured from interviews. From our experience, the following two approaches might provide outstanding qualitative data, if managed appropriately.

- **Bulletin boards:** Setting up a bulletin board allows threads of a discussion to develop over time. Regular interaction with respondents allows an idea or concept to grow over many weeks or even months. The German car manufacturer BMW employs user forums to identify new trends as well as existing problems with their cars.

- **Blogs:** Diaries are a great tool, and blogs can be even better. Personal blogs allow access to respondents’ innermost thoughts and can be constantly replenished and updated with pictures, texts, and graphics. Asking people to keep diaries for specific areas of their work has long been used in management research.

**Focus Groups**

Focus groups are facilitated group discussions (usually 5-20 participants) in which participants can express and share their ideas, opinions, and experiences. They provide an interactive way to gather information, and allow the collection of rich, qualitative information. Focus groups are good ways of assessing employee and customer-related performance indicators, such as customer experience, customer or staff engagement, team-working, organizational culture, or trust.
Mystery Shopping

Mystery shopping is the assessment of a service by a “secret shopper” posing as a client or customer. Some organizations have in-house “mystery shoppers,” while others hire external suppliers. Many organizations have started using mystery shopping to assess customer experiences. Trained “mystery shoppers” can also be used for many other internal performance assessments, such as organizational culture or atmosphere.

External Assessments

External organizations and institutions can provide independent performance assessments and indicators. Independent surveys that measure brand recognition, customer awareness, or market share in specific segments are good examples of external assessments. An independent company creates a set of criteria, and then measures everyone against these criteria.

Peer-to-Peer Assessments

Peer-to-peer evaluation means the assessment by participants of each other’s performance. This can be done either openly or anonymously, and enables people to learn from each other and to consider their own performance from the perspective of their colleagues. Peer-to-peer evaluations have been successfully used to gauge elements such as (a) trust, (b) knowledge and experience, (c) teamwork, and (d) relationships.

Observations

Observations allow the collection of information by observing situations or activities with little or no manipulation of the environment. “The power of using observation methods is that it engages all of our senses not just our sight. It enables us to take in and make sense of the entire experience through our nose (smell), eyes (sight), ears (hearing), mouth (taste), and body (touch). Unlike other data collection methods, observation data can provide us with a more holistic understanding of the phenomenon we’re studying.” Observation outputs can take the form of score sheets, checklists, narrative reports, and video or audio taping. Observations have been successfully used in assessing organizational culture, skill and experience levels of employees, emotional intelligence, and creativity, to give a few examples.
Useful Websites

The Advanced Performance Institute: www.ap-institute.com

Evidence-Based Management: www.evidence-basedmanagement.com

Endnotes


2. This is based on research in 2006 by the US-headquartered benchmarking firm The Hackett Group.


4. Source: www.evidence-basedmanagement.com

5. A Case Study within *Creating a World-Class Finance Function*, James Creelman, Business Intelligence 2005.


**Bibliography and Further Reading**

Together with proprietary and web-based research, the following references have been used to provide material for this MAG. Many examples, supporting material and cases have been extracted from these books.


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Bernard Marr is a global authority and a bestselling author on strategic performance management. In this capacity, he regularly advises leading companies, organizations and governments across the world, which makes him an acclaimed keynote speaker, researcher, consultant, and teacher. Bernard Marr is acknowledged by the CEO Journal as one of today’s leading business brains.

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Prior to his current role as chief executive and director of research at the Advanced Performance Institute (API), Bernard Marr held influential positions at the University of Cambridge and at Cranfield School of Management. Today, Bernard Marr also holds a number of visiting professorships and editorial board memberships at many leading journals in the field.

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