

PART ONE

**DASHBOARD
EXECUTION**

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BUSINESS CASE FOR ENTERPRISE DASHBOARDS

It is a well-established management principle that you cannot manage what you cannot measure. It is equally true, however, that you cannot manage well what you cannot monitor. That is where enterprise dashboards come in.

Enterprise dashboards must provide a clear visibility to steer through the thick clouds of data overload and lack of insight.

The early years of the 21st century have seen a convergence of several management thoughts that further that age-old quest for *the right information at the right time*. The dashboard is the new face of the emerging information management field. Dashboards have become the vehicle of execution for several key initiatives being implemented among organizations worldwide. Some of those initiatives include Balanced Scorecard, Enterprise Performance Management (EPM), also referred to as Business or Corporate Performance Management (BPM), Business Activity Monitoring (BAM), Six Sigma, and the regulatory compliances such as the Sarbanes-Oxley Act.

In hindsight, dashboarding seems to reflect the natural course of progression in the quest for improved information and better decision making. Almost every organization has experienced an exponential growth in computing power and data volumes during the past years. This growth drives the organizational management to create more enlightened decision-making processes in an information-rich environment (see Exhibit 1.1).

During the past decade, capabilities for data analysis and data mining have made great strides as computing power has followed Moore's law¹ of doubling every year. However, until recently, the task of conducting power-

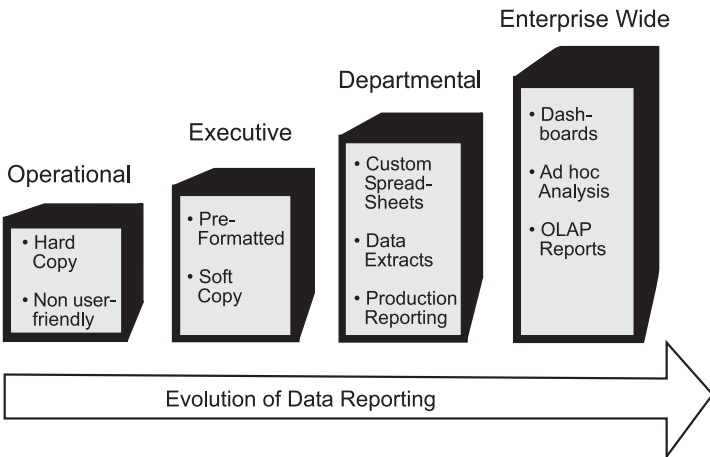
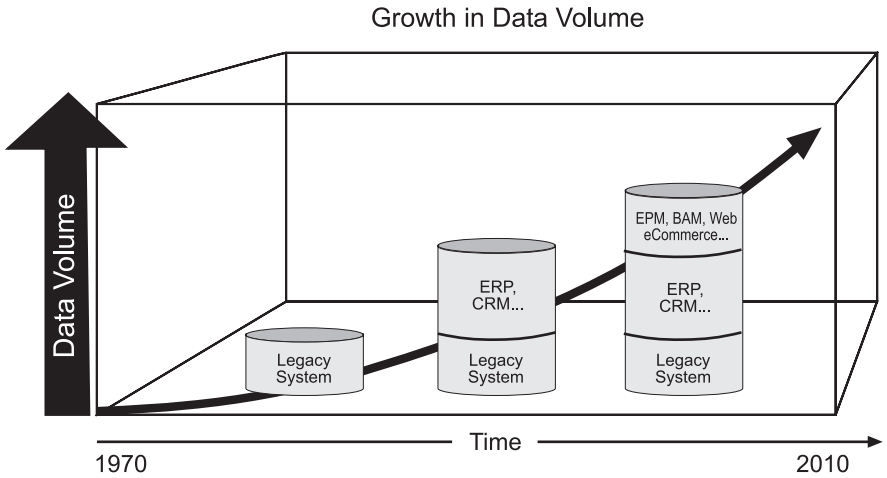


EXHIBIT 1.1 QUANTUM LEAPS IN REPORTING AND INFORMATION DELIVERY WITH THE EXPLOSIVE GROWTH IN DATA VOLUME

ful data analysis has been relegated to well-trained analysts and experts within the respective fields. The rest of the organization depended on this elite group of information champions to decide what information was dispersed, when, and in what format. If someone needed information that was not precanned, it required an ad hoc information request. By the time the

requesting person received the information, it was often too late, the information was obsolete, or perhaps the need for that specific information had evaporated because of rapidly changing daily priorities. The information seeker is forced to make a gut instinct decision to quickly address the narrow window of decision making. For a business user, the frustration resulting from such delays or timely inaccessibility to information can be well imagined!

As is often the case, frustration became the mother of innovation. At first, spreadsheets became everyone's favorite tool to manipulate, store, and analyze data as they saw fit. Some departments found themselves developing databases out of Microsoft's Excel because the corporate database group or the information technology (IT) group just could not meet their information needs. In almost every organization, one can find such innovative islets of information ownership. However, information islets fall far short of meeting current needs for constantly evolving and real-time information.

As organizations open myriad fronts of interaction through their customers, vendors, and partners, they can no longer afford to handicap their front-line management with a lack of information. Anyone possessing decision-making authority that may affect organizational performance requires timely, relevant, accurate, and actionable information. Existing modes of information dispersal, whether through standardized report distribution or drag-and-drop reporting, are simply not sufficient anymore. Such reports are too static and often too overwhelming. The reader is highly susceptible to data overload. Opportunities and threats often go overlooked and are discovered too late. For these reasons, dynamic and interactive dashboards have become a fast-growing phenomena coupled with EPM and corporate compliance.

For the most part, the vendors who have developed the potential of enterprise dashboards most effectively are the reporting and Business Intelligence (BI) vendors such as Business Objects, Cognos, Hyperion, and MicroStrategy. Also, there are niche vendors such as iViz Group, iDashboards, Noetix, QPR Software, and Theoris, who have developed dashboard software with certain characteristics that have been left out by the major BI vendors.

INSPIRATION FROM AN AIRCRAFT

The dashboard within an aircraft or automobile has inspired the term *dashboard* within the information and business intelligence fields (see Exhibit 1.2). The purpose of the dashboard in all three of these settings is the same—

to monitor and drive a complex and interdependent system. David Norton and Robert Kaplan draw the analogy between an aircraft dashboard and an organizational need for similar information tools in their landmark book on the subject of Balanced Scorecards:

Skilled pilots are able to process information from a large number of indicators to navigate their aircraft. Yet navigating today's organizations through complex competitive environments is at least as complicated as flying a jet. Why should we believe that executives need anything less than a full battery of instrumentation for guiding their companies? Managers, like pilots, need instrumentation about many aspects of their environment and performance to monitor the journey toward excellent future outcomes.²

If we agree that effective management of organizations requires information tools similar to those required by a pilot for flying an aircraft, we have a useful starting point to describe the basic characteristics of an organizational dashboard.

Contrary to the evident simplicity of an information dashboard, deploying an effective dashboard for a large organization is usually no less a complex task than doing the same for a jet. By no means do I mean to undermine the challenge of developing cockpit dashboards handled by aeronautical engineers, but it would be fair to assume that all aircraft dashboards display the

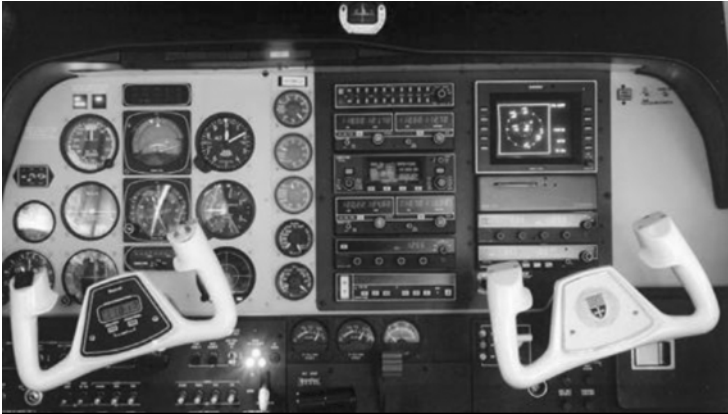


EXHIBIT 1.2 DATA PRESENTATION THROUGH A DASHBOARD, A CONCEPT DRIVEN FROM AIRCRAFT AND AUTOMOBILE TO ENTERPRISE

Source: Federal Aviation Administration Web site, www.faa.gov

same set of key performance indicators (KPIs), such as the aircraft speed, altitude, direction, wind speed, humidity, fuel status, engine temperature, latitude, longitude, and so forth. The various aircraft manufacturers may have different ergonomic designs for their dashboards, but essentially they all have to deliver to the pilots the same set of KPIs critical for a successful flight. The same applies to automotive dashboards. This leads to the ease of replication whereby an aircraft or automobile manufacturer may replicate thousands of dashboards in an assembly line to equip their aircrafts or cars, as the case may be.

However, in contrast to an aircraft or automobile, each organization has a set of KPIs that differs significantly from those of another organization. Even if two organizations are within the same industry or are close competitors, they rarely share an identical set of KPIs. Each organization's business and organizational management has evolved differently, and each division within a given organization has separate sets of KPIs relevant to itself. Finance, Supply Chain, Human Resources, Sales and Marketing—they all have their own set of KPIs that result in different types of dashboards. Although many KPIs are commonplace and standard by definition, such as gross revenue, net profit, gross margin, asset turnover ratio, and so on, each organization has unique nuances of self-management. This diversity in evolution and need necessitates conducting a thorough and individualized requirements analysis in order to build customized and effective dashboards for each organization. This provides a sharp contrast to the manufacture of thousands of cars and aircrafts with identical dashboards in an assembly-line process.

To make matters even more complex, *sources* of information that need to be presented through the enterprise dashboards are invariably in different forms within different organizations. The fact that two organizations may be using exactly the same version of a specific Enterprise Resource Planning (ERP) or Customer Relationship Management (CRM) software program alleviates the task of building these dashboards. However, no two organizations are identical in the myriad information sources that each of them would require to access for their dashboards. This makes building an enterprise dashboard a custom and complex undertaking each time.

ELEMENTS FOR AN ENTERPRISE DASHBOARD

We have borrowed inspiration from an aircraft cockpit to build enterprise dashboards, and yet we know that the analogy has some serious limitations.

So, let us establish the basic characteristics specific to an enterprise dashboard with a useful acronym—SMART. A dashboard must be SMART in that it contains the following underlying elements, which are essential for success:

Synergetic. Must be ergonomically and visually effective for a user to synergize information about different aspects within a single screen view.

Monitor KPIs. Must display critical KPIs required for effective decision making for the domain to which a dashboard caters.

Accurate. Information being presented must be entirely accurate in order to gain full user confidence in the dashboard. The supporting dashboard data must have been well tested and validated.

Responsive. Must respond to predefined thresholds by creating user alerts in addition to the visual presentation on the dashboard (e.g., sound alarms, e-mails, pagers, blinkers) to draw immediate user attention to critical matters.

Timely. Must display the most current information possible for effective decision making. The information must be *real-time* and *right-time*.

This order serves the formation of the acronym and does not indicate the relative priority of these features.

An aircraft-inspired enterprise dashboard must be SMART. However, a SMART dashboard is not sufficient to ensure effective organizational management. To the envy of pilots, an enterprise dashboard must have enhanced characteristics not available even within a cockpit. An enterprise dashboard should also have some of the following advanced elements, captured in another acronym—IMPACT:

Interactive. It should allow the user to drill down and get to details, root causes, and more. Imagine the dramatic benefit if a pilot could click on the fuel gauge showing low fuel to view the consumption rate graph during the past hour, only to find out that the consumption rate shot to twice the normal usage during the last 15 minutes, indicating a sudden fuel leak.

More data history. The dashboard should allow users to review the historical trend for a given KPI. For example, market share may indicate strength within the current time period but a negative trend in a year-ago comparison. A user may then click on the current share to investigate if a shrinking market share is a sudden phenomenon within the current time period or a trend for the past several time periods.

Personalized. The dashboard presentation should be specific to each user's domain of responsibility, privileges, data restrictions, and so on. For example, the sales manager for the Eastern region should be presented with metrics related to that region's performance and perhaps an aggregated view for other regions for relative comparison. Other aspects of personalization should be available as well, such as language and visual preferences for colors and background style, for better user experience.

Analytical. It should allow users to perform guided analysis such as what-if analysis. The dashboard should make it effortless for a user to visually navigate through different drill-down paths, compare, contrast, and make analytical inferences. In this way, the dashboard can facilitate better business comprehension within a set of interdependent business variables.

Collaborative. The dashboard should facilitate users' ability to exchange notes regarding specific observations on their dashboards. This could also be adopted to accomplish workflow checks and process controls. A well-designed collaboration would serve as a communication platform for task management and compliance control.

Trackability. It should allow each user to customize the metrics he or she would like to track. Such customized tracking could then be incorporated within the default dashboard view presented to the user after login. For example, the sales managers for the Eastern and Western regions may not want to track the same issues. The Eastern region may be facing a highly competitive pressure with a low market share, whereas the Western region may have a high market share but an inventory problem leading to out-of-stock situations.

Again, this order does not indicate the relative priority of these features, but it provides another acronym to remember easily—IMPACT. Therefore, an organizational dashboard must have SMART IMPACT.

RULES OF GOOD SOFTWARE STILL APPLY

Having laid the foundation for an effective organizational dashboard, it is worth noting that the dashboard software must also meet the standards of any good software, which include the following:

- *Fast response.* Users should not experience an inordinate delay in retrieving their dashboards and associated reports.

- *Intuitive.* End users need not be required to go through a big learning curve or mandatory training.
- *Web-based.* Users should be able to access the dashboard through the Web, if they have proper access rights. The Web-based feature may also be referred to as *thin client*.
- *Secured.* System administrators may administer software security easily to reduce and track wrongful access. The software must also provide data encryption to secure sensitive data transmission across the Web.
- *Scalable.* A large number of users may access the software without crashing the system or causing it to slow down below an acceptable performance benchmark. This quality assumes a reasonable hardware and network bandwidth.
- *Industry compliant.* The software should integrate with standard databases of different vendors and work with different server standards (e.g., Net, J2EE) and various operating systems (e.g., Unix, Windows, Linux).
- *Open technology.* The software should not have proprietary standards that would make it difficult or impossible to extend its reach within a complex IT environment. It should work well with the prevailing protocols for information exchange, such as the XML, ODBC, JDBC, OLE DB, JMS, and Web Services. Note, open technology does not mean *open source*, which refers mostly to free software with open access to the source code.
- *Supportable.* It should be easy to manage a large deployment within the existing IT staff with limited training on the dashboard software. In other words, the software should not be so complex that it requires long-term contract or hiring of another expert simply to support its deployment, assuming that the organization has a reasonably qualified IT staff.
- *Cost effective.* The total cost of ownership should be well below the monetary benefit it provides to justify a strong return on investment (ROI). Therefore, the licensing cost, implementation cost, and support cost should be within a range that provides strong ROI and organizational benefits after deployment.

COMMON MISPERCEPTIONS ABOUT DASHBOARDS

There are certain perceptions about enterprise dashboards that are simply wrong.

Dashboards Are for Senior Executives Only (Wrong!)

A commonly prevalent notion is that enterprise dashboards are *only* for senior executives to give them an overall view of organizational performance. Not true! Today's dashboard technology is designed to make an enterprise dashboard an effective tool to be deployed at various levels within the organization.

Most companies deploying dashboards have rolled them out to thousands of members of their workforce. In some cases, organizations initiate by rolling dashboards out to a small group of people, often the senior executives, but invariably the vision has been to deploy it organization-wide once the concept is well tested and proven.

A rule of thumb should be that if anyone in the organization is responsible for managing \$1 million or more per year in direct business or internal resources, that staff member should be provided with an appropriate dashboard to help increase productivity. The math is simple: If the dashboard improves productivity and revenue for a 1% gain, then the return is at a minimum \$10,000 per year for the individual. An enterprise-wide deployment and support of dashboards should cost a fraction of this, and hence have a strong ROI.

The following are the contemporary thoughts of industry leaders within the business intelligence space:

We honestly believe that the BI of the past was really designed for a subset of users in an enterprise who understood deep analytics, the PhDs in analytics. But our view is you can't solve business problems unless we move [BI] closer to the user, and that is where our investments are going.

—Karen Parrish, VP of BI Solutions, IBM³

In 5 years, BI will be as ubiquitous as spreadsheet and word processing today.

—Bernard Liautaud, Chairman and CEO, Business Objects⁴

As visionaries and business intelligence (BI) industry leaders predict such ubiquity of BI, dashboards would be just as ubiquitous as the new face of BI.

Dashboards Are for Report Distribution Only (Wrong!)

Dashboard deployment should not be treated only as a platform for convenient report distribution and KPI viewing. This greatly diminishes the true

value and effectiveness of dashboards and how they can enhance organizational performance. Imagine that a car's dashboard displayed a detailed report on how much gas was filled during the current month, instead of sounding a visual and audio alarm to the driver when the car is running low on gas. The report would not be of much use in this instance, because the key quality of real-time functionality would be lost.

Although it does so much more, the *central* purpose of a dashboard is to warn the user when any relevant metrics are out of acceptable boundaries. In the dashboard terminology, these *alerts* consisting of rules and actions add critical value to an enterprise dashboard deployment complemented with strong visual indicators of warnings.

DEFINITIONS FOR FUTURE REFERENCE

You should now have a familiar understanding of the scope and functionality of enterprise dashboards for organizations through comparison and contrast with aircraft and automotive dashboards. Now we leave the aircraft and automobile behind. In subsequent chapters, all references to the term dashboard will refer to the *enterprise dashboard*. (Others may use the terms corporate dashboard, executive dashboard, and so on, but the meaning is the same.)

DIFFERENCE BETWEEN PORTAL AND DASHBOARD

The distinguishing feature is that a dashboard is an application with a collection of metrics, benchmarks, goals, results, and alerts presented in a visually effective manner, whereas a portal is a collection of different applications presented together within a personalized framework. A dashboard could be part of a portal, but not vice versa.

A portal, for example, could contain a dashboard, a company's events calendar, weather conditions, individual profile details, financial market conditions, financial stock tracking, and so on. A dashboard in its strictest definition should not contain a company's events calendar, personalized weather conditions, and other elements like these. There are dedicated portals for varied applications such as e-commerce, auctions, e-mails, as well as corporate portals for company information. A dashboard, however, is intended specifically for the presentation of organizational and individual performance metrics and alerts.

Metrics

Metrics are measurements of activities to evaluate performance, mostly within a relative framework of time, geography, and aggregation. For example, a sales metric may be *Gross Sales for Quarter 1 for North America for an Item/Category*.

Enterprise Performance Management and Business Intelligence

EPM is the application of BI, metrics, and methodologies to improve enterprise performance. BI is the capability to track, understand, and manage information across the organization.

ENDNOTES

1. Gordon Moore, co-founder of Intel, observed in 1965 that since the invention of the integrated circuit, the number of transistors per square inch on integrated circuits had doubled every year. Mr. Moore predicted that this trend would continue for the foreseeable future. In subsequent years, the pace slowed down a bit, but data density has doubled approximately every 18 months, and this is the current definition of Moore's Law.
2. Robert S. Kaplan and David P. Norton, *The Balanced Scorecard: Translating Strategy into Action* (Boston: Harvard Business School Press, 1996), p. 2.
3. Ed Scannell, "IBM Rolls Out BI Solution for Banks," *InfoWorld*, March 15, 2004.
4. Bernard Liautaud, Chairman and CEO, Business Objects, *Business Objects Americas Partner Summit keynote speech*, Palm Springs, California, May 18, 2004.

