IDC Manufacturing Insights

The Role of Analytics in Driving Competitive Differentiation for High-Tech Companies

WHITE PAPER

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IDC OPINION

Analytics has moved from the specialty of a dedicated few to a necessity for broad groups of business professionals to do their job. The following factors have accelerated this change:

- Global supply network complexity and pressure on corporate headcount have made the ad hoc collection and analysis of business information impractical.
- The flattening of hierarchies moves decision-making responsibility to many more individuals in an organization.
- A new generation of knowledge workers, more comfortable with technology, is incorporating the analysis of information into everyday work tasks.
- The availability of analytic applications, prebuilt for industry-specific as well as horizontal decision processes, makes the use of analytics accessible to a broader cross-section of organizations.

The net effect is that the application of analytics for improving decision making is an objective that can be achieved by organizations in every industry.

IN THIS WHITE PAPER

This white paper considers the use of analytics and business intelligence (BI) for improving decision making in the high-tech industry and the benefits of prebuilt analytic applications for achieving this objective across many functions in the organization.

SITUATION OVERVIEW

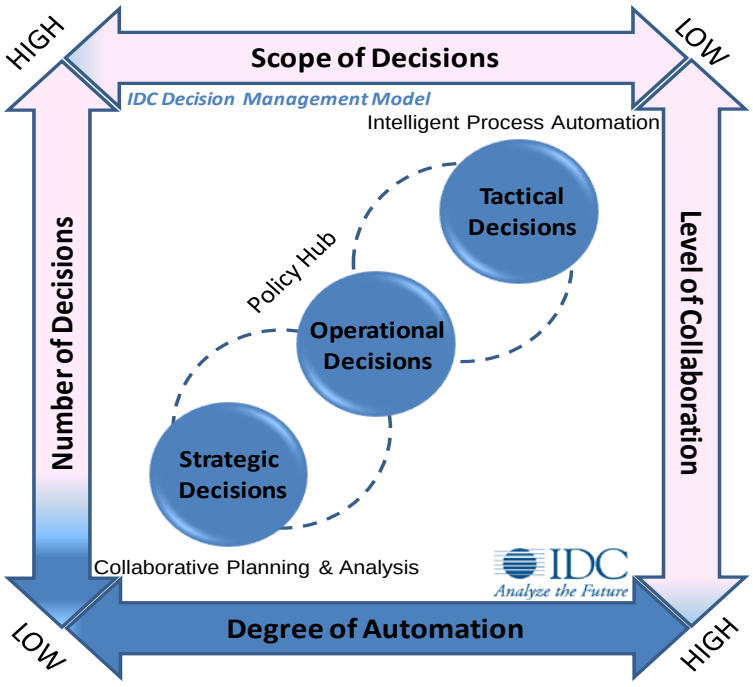
We live in an era of the *intelligent economy*. Organizations across industries are recognizing the need for better intelligence and insight about their business: making the right decision with the right information at the right time. But how far have we come? And what are the best practices that distinguish companies where employees bring intelligence to decision making?

The Turn to Decision Management

With the decline of command and control styles of management, the responsibility for decision making is distributed to knowledge workers across the many functions of an organization. In some cases, the decision process is fully automated: like the next best offer to a retailer's customer who is shopping online or the price to charge for an automobile insurance policy for a new driver. In other cases, the decision process is more ad hoc, involving collaboration of a team of knowledge workers focused on solving a business problem, such as developing a sales and production plan for a manufacturer's product line. Figure 1 shows IDC's Decision Management Model.

FIGURE 1

IDC's Decision Management Model



Source: IDC, 2011

The types of decisions range from ad hoc (strategic) to automated (tactical):

- **Strategic decisions** set the long-term direction for an organization, a product, a service, or an initiative and result in guidelines within which operational decisions are made. Such decisions are made or revised infrequently, but they are of broad scope in their impact on other decisions. Collaborative planning is often a feature of strategic decision making as agreement is sought across members of a team.

- **Operational decisions** focus on a specific project or process and translate the strategy into guidelines for action, such as rules for determining an optimal price. Operational decisions represent a policy hub, as the policies are applied to a variety of decision points where actions are taken.

- **Tactical decisions** repeat frequently and can occur in high volume. Examples are what price to charge a specific customer for a seat on a particular flight or a room in a specific hotel for a specific night. Such decisions lend themselves to automation.

The outcomes of tactical decisions are monitored, leading to ongoing review and adjustments to the guidelines. The record of these changes, in turn, becomes an input into future strategy reviews. This forms a virtuous circle or feedback loop that drives continuous improvement.

With the ability of firms to do business on the Web, decision cycles are now far shorter, approaching real time in many cases, especially at the tactical level. Decisions that could have taken days (e.g., what to include in a product or offer to a telecommunications customer who is a churn risk) now must be made instantly. This puts a premium on speed and the need to process all relevant information in near real time to select the optimal path among the available decision alternatives. The public attention to the failure of decision making in financial markets has occasioned a realization *across all industries* of the pressing need to apply intelligence in a more consistent and predictable way to decisions throughout the enterprise.

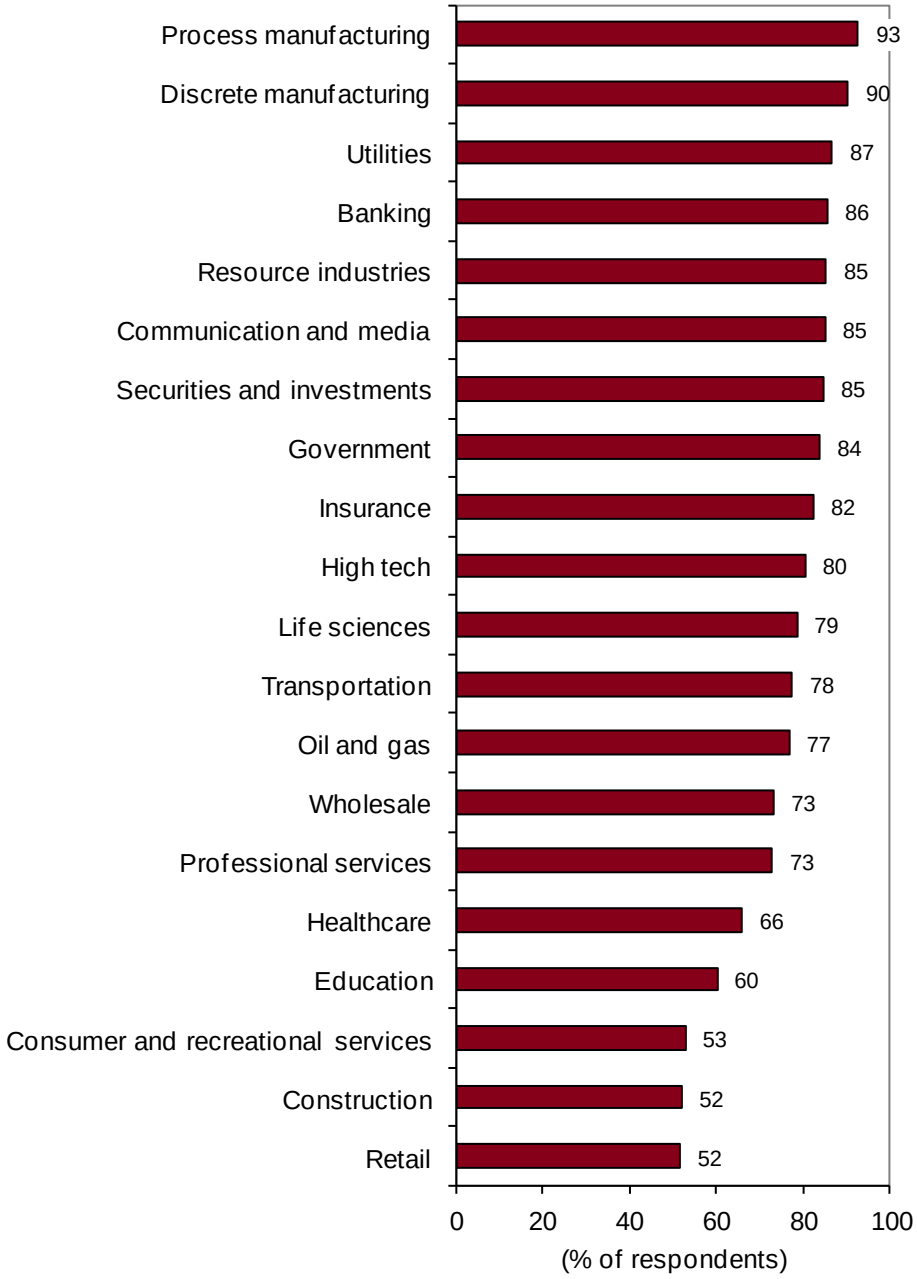
Analytics Adoption Across Major Industries

The importance of intelligent decision making is well recognized. But how widely is analytics being adopted? Recent IDC research shows that over half of organizations have at least started down the path of analytics and business intelligence. See Figure 2, which is based on a 2011 IDC survey of over 2,800 IT managers.

FIGURE 2

Business Analytics Adoption Levels by Industry

Q. Has your organization implemented a business intelligence/analytics solution?



n = 2,856

Source: IDC's Vertical Research Group IT Survey, 2011

Note that the penetration rate differs from industry to industry for adopting at least one business intelligence/analytics solution in the organization. For example, there is an 85% adoption rate in the securities and investments industry compared with a 52% adoption rate in retail. The high-tech industry is toward the top end of the scale at 80%. And keep in mind that the results show only that analytics is present somewhere in the organization, with further opportunities to grow its use.

But how is analytics being implemented? There are two approaches: *build* or *buy*. You can *build* a custom analytics solution out of business intelligence tools and components. Or you can *buy* an application that is customized to a specific data and business environment. IDC's most recent study across industries shows a preference for buy over build for analytics, which follows the trend for all types of applications. This accounts for the strong growth in analytic applications over the past decade.

THE HIGH-TECH INDUSTRY

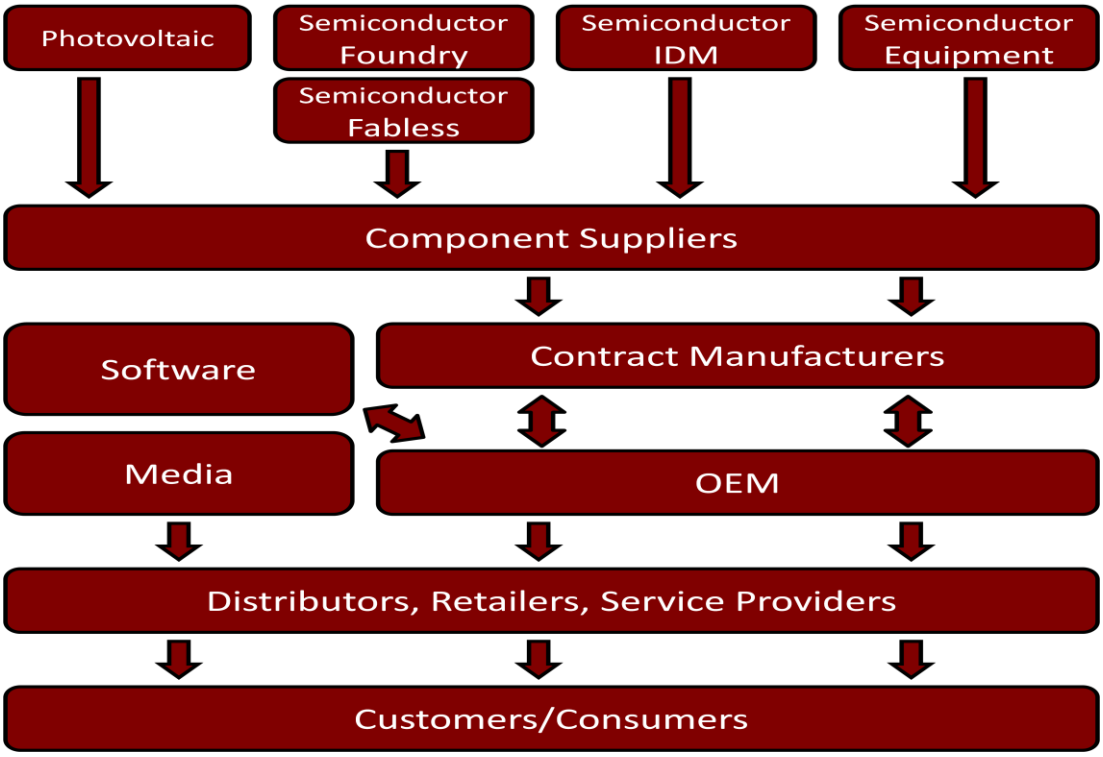
The high-tech industry is characterized by intense competition, unrelenting cost and margin pressures, and ever-shortening product life cycles. High-tech manufacturers manage complex global B2B relationships in their supply network and a combination of local B2B and B2C relationships across their customer base. This "manage globally, execute locally" paradigm can drive quality and service-level issues, particularly in innovation development and delivery.

Certainly, high tech has all the challenges that other industries have, but in many respects these challenges are greater in magnitude in the high-tech industry. High tech is a fragmented industry, with diverse subsegments and high levels of customer turnover. The supply chain, and by extension the inventory, is fragile, dynamic, and particularly susceptible to obsolescence given very short product life cycles. The products themselves are more complex and the margins are thinner. Marketing and sales execution needs to be simple, repeatable, and flawless.

Figure 3 illustrates the complexity of interactions both backward into the supply side of the value chain and forward into the demand side.

FIGURE 3

Value Chain Complexity in the High-Tech Industry



Source: IDC Manufacturing Insights, 2011

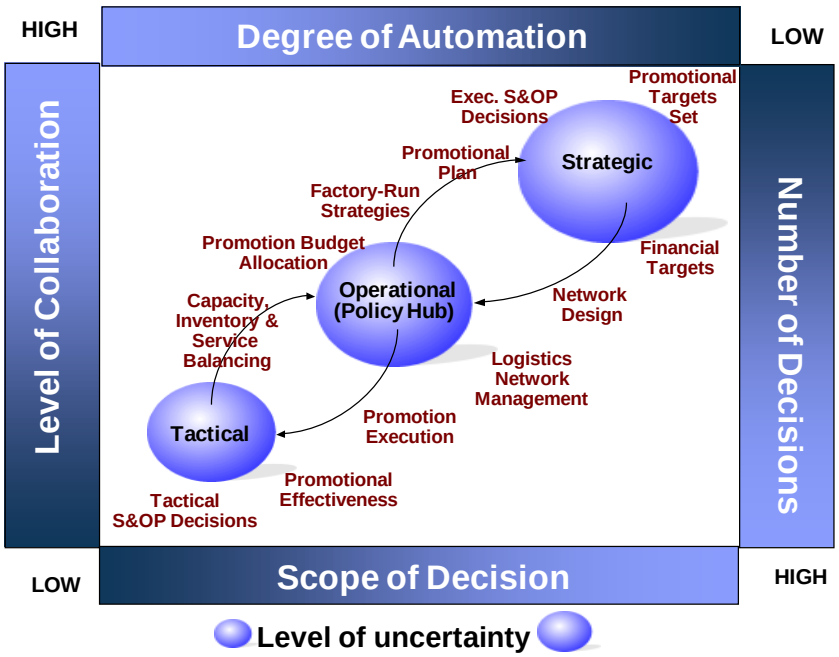
Upstream, high-tech companies manage a high level of supply chain complexity, where supply and contract manufacturers are frequently full partners in the business, including the design and manufacture of new products. Downstream, high-tech companies must effectively manage complex sales channels — distributors, resellers, partners, direct to consumer — by finding ways to drive value-added sales activities; bringing products to market in a timely, effective manner (flawless innovation delivery); and managing/prioritizing customer turnover — both retaining the right customers and identifying/prioritizing profitable accounts.

Given this complexity, and the cost pressure inherent in such a competitive market, high-tech companies have been among the early adopters of many IT technologies, including business intelligence and analytics. Indeed, as more customer, network, and business data becomes exposed through the rich infrastructures of today, and as average profit per user comes under greater pressure, the vast majority of high-tech companies are starting to view analytics as essential to daily business and infrastructure operations. Analytics should be driving both high-level strategic decisions and lower-level, day-to-day tactics

that achieve the strategic goals of the business. Figure 4 illustrates how those decisions spread across the decision-making continuum.

FIGURE 4

High-Tech Industry Decision Hierarchy



Source: IDC, 2011

The Profitability Challenge

Perhaps no segment of the manufacturing industry is subject to the extremes of product obsolescence like high tech. As the development of technology accelerates and elements of fashion intrude into an increasing number of product segments, the window of opportunity for high-tech companies to enjoy premium profits is getting narrower and narrower. For this industry, the use of analytics is about not only providing the right information but also doing so in a timely fashion. Indeed, with the rapid obsolescence inherent in many high-tech products and categories, the use of timely analytics allows manufacturers to trade "inventory for information."

It is an old industry saw that the role of the business analyst is "90% collection; 10% analysis," and while this may be less true today, there is no question that the massive amounts of data available to the high-tech business simply cannot be handled without a robust analytics

infrastructure. In addition to being better able to handle these volumes, modern analytics can bring financial analysis/profitability analysis back into the equation rather than "winging it." Beyond the analytics platform itself, the use of enabling technologies, such as SAP HANA in-memory technology, further extends the usability of analytics capabilities, enabling both faster and more complete insights to drive better business decision making. In a similar vein, mobility technology also makes it possible, particularly for employees who work from virtual or home offices, to have these insights where and when they are needed.

The final point to consider with modern analytics in high tech relating to the profitability challenge is the opportunity to do far more robust "what if" scenario modeling. Particularly as high-tech companies see a diversification of their businesses across B2B and B2C lines, it is critical to be able to anticipate the impact of business decisions — decisions that must be made quickly.

New Product Introduction

As a direct consequence of the rapid product life cycles in high tech, the efficient and effective introduction of new products takes on a critical role as a way to both drive strategic growth and "beat the fade" of the existing portfolio. For many high-tech companies, more than 50% of their revenue comprises products introduced less than three year ago. Further, the high-tech industry includes supplier partners and, to a lesser degree, customer partners in the new product development and introduction (NPDI) process at a far earlier and more granular level than most manufacturing segments. The fact that these partners may be continents and time zones removed exacerbates the need for both effective analytics and product life-cycle management tools.

Given the narrow margin opportunities available to high-tech manufacturers, quick and timely decisions are critical if new products are going to be successful. Although time to market is important, for the high-tech industry, time to volume is the key capability — and decision making must be done interactively based on the initial performance of a product.

At the same time, demand volatility for both new products and the existing base has never been higher, and companies are seeing their forecast accuracy numbers plummet. In the high-tech industry, particularly, there is the view that supply-side responsiveness is the best way to manage this volatility rather than chasing small, incremental gains with forecasting complexity. Again, though, the ability to quickly react to demand-side changes with supply-side agility is completely dependent upon the speed with which companies can process data and distribute insights. This simply cannot be done without an effective analytics platform.

Evolving Sales and Marketing Models

Slumping global economic conditions have had a severe impact on high-tech companies that face declining markets and shrinking margins. A critical success factor for companies to regenerate profitable growth has been the ability to take advantage of new revenue opportunities; however, revenue growth in post-recession global markets has not just been a matter of simply ramping up production and waiting for the customers with pent-up demand to coming knocking; rather, it has been about actively identifying key growth customers and key growth products and services. This is particularly true for high-tech markets, where innovation appeal routinely trumps brand or customer loyalty. Four key areas have become the catalysts for gaining share and increasing profitability:

1. **Targeted innovation.** The number of new products introduced each year has been steadily increasing, and even as success rates (achievement of expected market share) improve, there remains the view that new products underperform. Increasingly, the objective is to serve narrowing market niches with product variations. This is particularly true in consumer electronics where "fashion" often trumps form or technology.

2. **Emerging markets.** The transition of China, India, South America, and Eastern Europe from "low-cost countries" to "emerging economies" progresses, and consumers increasingly demand a globally fair wage. It is also notable to point out that emerging economies are typically oriented to a younger population given the lack of comprehensive preexisting infrastructure. Consequently, demand continues to grow. Reaching and appealing to these markets will be essential to driving new revenue and growing share.

3. **Services.** High-tech companies are increasingly connecting key services (including content, content management, service support, and software) to their product platforms. In some cases, the physical asset may be sold through a dealer or reseller network (B2B), but the service is sold directly to the consumer (B2C). In other cases, both the physical asset and the service component may be sold through the dealer or reseller network. Offered services could also include new ways of consuming products, such as moving from perpetual licenses for software to consumption-based licensing. Regardless of the specific service model employed, revenue growth for many companies will depend on their ability to offer value-added services on top of the products that they sell.

4. **Aggressive movement into new markets.** Analogous to the situation in the services area, the ability of high-tech companies to move into adjacent markets has been instrumental in their growth. Perhaps the most obvious example is Apple, which moved from the hardware manufacturing business into the music business.

The net result of these growth focus areas has been a blurring of industry boundaries, particularly forays into traditional consumer industries, with fundamental changes to business strategy, cost structure, market competitors (both traditional competitors and new/disruptive entrants), and consumer interactions. This blurring of industry boundaries has also meant that high-tech companies must have new capabilities to segment their business (both products and services) and manage disparate supply chain capabilities (B2B versus B2C). These capabilities are all reliant on the ability of the business to analyze data and make better decisions more quickly.

Aligning IT Capabilities with LOB Goals

For line-of-business (LOB) managers and their IT and network partners, the challenges lie in access to information to make informed decisions and the quality of the underlying data. They are challenged by the ability to make the data useful to the business goal, including tracking of performance against KPIs. Especially in a technology-rich industry such as high tech, IT and business leaders may be overly tempted to view infrastructures in terms of generations of technology or as component parts of the access or core network segments (often due to ownership and partnering structures).

The primary challenge for high-tech manufacturers is not a technical issue necessarily — data warehousing and analytics technologies are not the gating factor — but a mindset issue. The walls that exist among internal functional organizations, such as IT, supply chain, and marketing, have limited their ability to aggregate and analyze customer data derived from multiple sources. For an increasing number of high-tech companies, the current transformation of their business from OEM-driven B2B to a consumer and services-driven B2B/B2C mix is prompting organizational changes to break down self-imposed silos of information — both "what" is consumed and "where" and "when" it is consumed.

The consumption of information in the high-tech business is changing in fundamental ways, and IT often struggles to keep up:

1. **Creation versus consumption tools.** While the creation of content has remained largely the province of the desktop or laptop computer, the far more ubiquitous consumption of that content has branched out in myriad ways.

2. **I want to see it my way.** This applies not only to the tools themselves but also to the way in which information is formatted and displayed. It means a blurring of business and personal technology tools (BYOD) by personalized information displays for scorecards and root-cause analyses.

The final point to note is that there is pressure on IT organizations to provide both greater mobility support and complementary analytics.

The appetite for analytics capabilities is moving at the "speed of imagination," and IT organizations must recognize the need to deliver both "on time and in full."

CONSIDERING PREBUILT SOLUTIONS

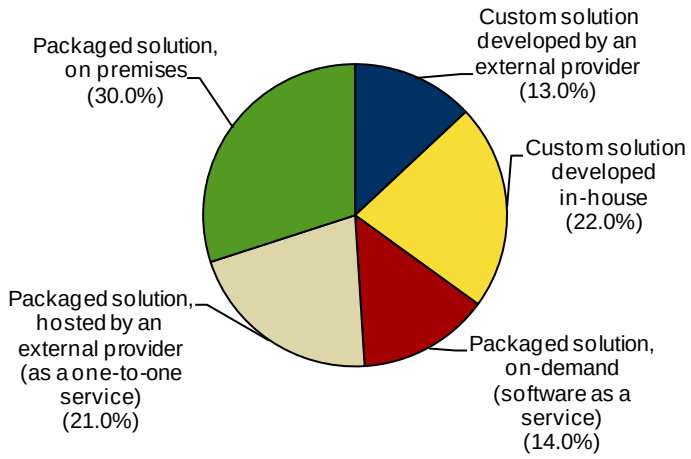
Analytics was viewed as the province of large organizations with the means to hire skilled consultants or to maintain large internal software development staffs. But this is no longer true. An IDC survey of over 2,700 IT managers shows that 91% of large enterprises (over 5,000 employees) have implemented an analytics solution, while 83% of medium-sized enterprises (between 500 and 5,000 employees) have done so. This reflects a lessening of the skills gap in organizations on the implementation and application of analytics to business decisions.

One of the reasons is the greater availability of prebuilt or packaged solutions. The same IDC survey of IT managers shows that over half of the respondents have packaged rather than custom analytics solutions (see Figure 5).

FIGURE 5

Custom Versus Packaged Analytics Solutions

Q. What type of business analytics solution do you have?



n = 2,774

Source: IDC's Vertical Research Survey, 2010

Let's explore these packaged solutions in more detail. Prebuilt analytic applications are increasingly becoming available not just for horizontal functions like finance but also for vertical-specific processes across all major industries and categories of decisions.

Analytic Applications

IDC was the first to define this category of software (*Analytic Applications and Market Forecast: Changing Structure of Information Access Markets* by Henry Morris, August 1997). At that time, we noted that the convergence of several factors was enabling the packaging of expertise in a prebuilt application aimed at improving decision making:

- For one thing, the growth of prebuilt transactional applications and suites (like financials, procurement, and the like) made it possible to define common procedures for preparing the data captured by these widely deployed systems.
- In addition, the growth of data warehousing and analytics since the 1980s had provided a wealth of experience and knowledge that could be captured in these applications.
- Finally, a set of business metrics, such as the balanced scorecard of Kaplan and Norton, defined popular metrics that were broadly adopted and could form the basis for analysis across organizations in diverse industries.

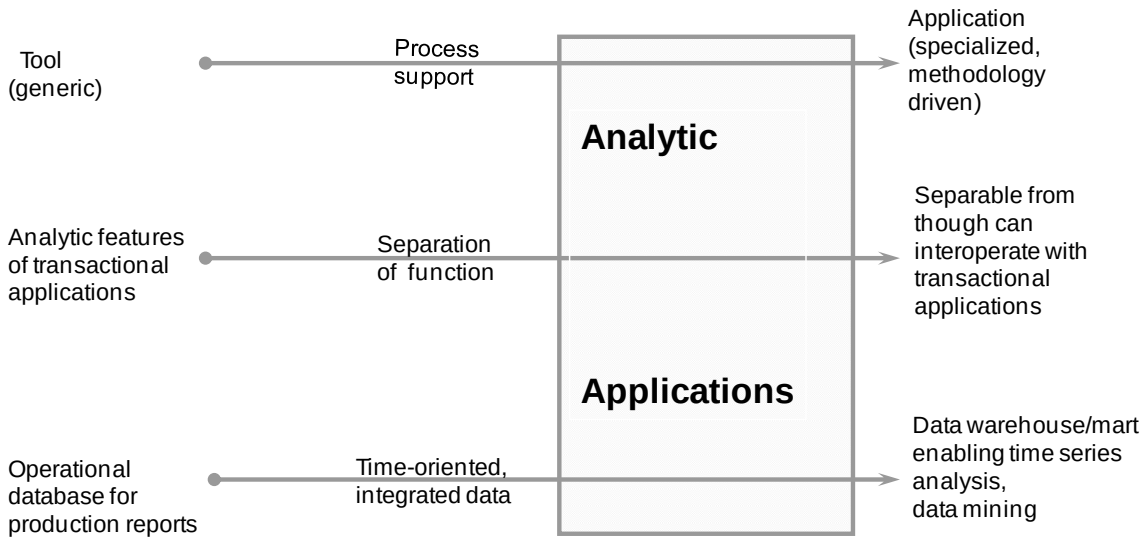
These factors made it possible to package analytic applications, designed to spread the benefits of business intelligence more widely in the marketplace.

Definition

The definition of "analytic application," first set out in 1997, still applies today. Figure 6 shows the three dimensions of an analytic application.

FIGURE 6

The Three Dimensions of Analytic Applications



Source: IDC, 1997

As shown in Figure 6, an *analytic application* must meet each of the following three conditions:

- **Process support.** Packaged software that structures and automates a group of tasks pertaining to the review and optimization of business operations (i.e., control) or the discovery and development of new business (i.e., opportunity)

- **Separation of function.** Can function independently of an organization's core transactional applications, yet is dependent on such applications for data and may send results back to these applications

- **Time-oriented, integrated data.** Extracts, transforms, and integrates data from multiple sources (internal or external to the business), supporting a time-based dimension for analysis of past and future trends, or accesses such a database

To be classified as an analytic application, a software package must have each of these attributes. According to IDC, all types of analytic applications combined account for $8.3 billion in total software revenue, with a 7% compound annual growth rate forecast for the next five years.

Benefits and Trends

Initially, analytic applications were created for horizontal processes that applied equally across industries. The most common target was the financial function, and analytic applications addressed needs such as business planning, consolidation, and cost or profitability analysis. Though these applications start out as department specific, they soon involve users across functions. A good example is financial planning, which originates in finance but has users across the organization.

The most popular alternative to a planning or budgeting analytic application is the use of spreadsheets. But a spreadsheet is a productivity tool aimed at individuals, while the production and review of a budget requires the coordination of multiple individuals in a highly collaborative process. Prebuilt analytic applications for planning provide the needed process support and should be flexible enough to enable alteration of the workflow as needed. The same could be said for financial consolidation, which requires a collaborative process and the integration of multiple data sources, in this case general ledgers from heterogeneous financial systems. An analytic application can provide consistency in process execution and transparency on how information is gathered and consolidated.

Starting with financial analytics, over time the inventory of prebuilt analytic applications that were sold in the software marketplace expanded to include all major horizontal processes and the decisions required to run and manage them. But in recent years, there has been real progress in the availability of analytic applications for a broad set of industry-specific processes. This area remains the most fertile one for innovation and is still the most underserved sector of the analytics marketplace.

In the area of planning alone, there are many industry-specific examples. Sales and operations planning is a requirement for manufacturers seeking to balance three constantly changing variables: inventory, capacity, and demand. Workforce planning can be tailored to meet the needs of industries, such as scheduling skilled personnel in a hospital setting. Some planning applications are tactical and must be able to accommodate near-real-time changes to key variables, such as sudden spikes in demand for communications services. Other analytic applications take a longer-term view and are used to evaluate trade-offs for building new capacity, such as new manufacturing plants or healthcare facilities.

Another trend worth noting is the appearance of analytic application suites. This follows the pattern of transactional applications, which moved from standalone applications for specific functions (finance, human resources) to application suites. In like manner, suites of analytic applications are emerging that focus on a group of related decisions in a specific area: fraud, risk, operational planning, customer segmentation, and many other cases. The application suites leverage a common data set, such as all data pertaining to a customer or data on trades of individual investments and the performance of an investment portfolio.

CHALLENGES AND HOW ORGANIZATIONS ARE OVERCOMING THEM

The following challenges impact the deployment of analytics:

- **Data issues.** Organizations may be stymied by their inability to support the sharing of information both within and across groups. This limits the ability to support line-of-business analytics projects or enterprise initiatives that cover a range of related decisions, such as a single view of the customer (or supplier or partner).

- **Expertise issues.** The skills in shortest supply tend to be finding individuals who understand the analytical techniques and know enough about business issues to be able to marry one to the other. Packaging expertise in prebuilt analytic applications can help bring the benefits of analytics for industry-specific decisions to organizations of all sizes.

- **Cultural issues.** Companies differ in the extent of their analytical orientation. This refers to whether or not there is a culture that encourages fact-based rather than gut-based decisions. Without an analytical orientation, employees lack the necessary support for seeking to make the right decision with the right information at the right time.

Let's examine how to deal with each of these challenges.

Focusing on Data Issues

It's not a question of getting more information; rather, it's a question of bringing together and analyzing *relevant* information. And what defines relevance? The key to relevance is context: identifying the information that is needed for a specific *decision,* enabling the discrimination between optimal and suboptimal alternatives.

This is not a small matter. IDC research has consistently shown that 70–80% of the effort of an analytics project depends on resolving data issues. It's reasonable to assume, therefore, that data issues are the biggest reason for the failure of analytics projects.

Support is needed from an organizational perspective. The breakthrough is when business stakeholders take responsibility to own the data, with IT providing the technical data architecture in support of this mandate. This commitment can come only when a business unit recognizes the financial impact of suboptimal decisions caused by not having the right data at the right time. This realization was evident in a United Kingdom–based global auto dealership that has about 630 end users ranging from the CEO to regional and local retail office managers accessing the BI solution. The company has been able to create a "common global language" for analyzing performance-related

topics. The CEO can walk into any dealership or into any regional executive's or general manager's office and be assured that there will not be any miscommunication about the performance metrics being discussed.

Analytic applications begin to address the data issues in two important ways. First, an analytic application packages a data model that is optimized for analysis. Second, an analytic application includes software routines that transform data from popular prebuilt transactional applications into the form specified by the data model. These features can help accelerate the implementation process.

Addressing Expertise Issues

Analytics requires many types of skills: data integration as a foundation and then forecasting, modeling, and simulation that explore patterns that can guide future action. These skills often exist in pockets in an organization, but not necessarily within each business unit. Hence, the ability to transfer learning across an organization is key to success in applying analytics to additional areas of decision making.

Addressing the issue of the uneven distribution of skills, many organizations have established a shared services model. This model is realized via a BI Competency Center, a central resource staffed by business and IT professionals with a potent mix of skills. The mission of such a group is to transfer knowledge gained in prior analytics projects to new business groups getting started with analytics. Training in analytical techniques and data governance processes is part of the ongoing menu of services provided.

Complementary to this shared services model is the use of prebuilt analytic applications. These applications package expertise on how to apply analytics to common types of decisions encountered across industries or in specific industries. This preserved knowledge can provide a jump start to beginning with analytics or extending it to new areas.

Combining a BI Competency Center with standard metrics that can be reinforced with standard methodologies pays dividends. A United States–based restaurant chain, faced with the inability to make operational decisions based on a consistent set of corporatewide metrics, adopted a formal performance management methodology. Additionally, the company established a BI Competency Center. Within 18 months, 3,000 business end users, including restaurant operators, managers, general managers, and executives — representing the vast majority of potential users — were actively using the newly deployed BI and analytics software.

Recognizing Cultural Issues

Success in analytics relies on organizational dynamics as much as or more than it relies on technology. To this end, IDC research has shown that organizations differ in their cultures in terms of their support for fact-based decision making. We call this *analytical orientation*.

Organizations that seek fact-based evidence to support their decisions are more likely to assess themselves as competitive in their markets. A recent IDC study shows that 80% of those companies that see themselves as highly competitive versus their peers have a high analytical orientation. On the other hand, only 58% of those that see themselves as lagging behind from a competitive perspective have an analytical orientation to fact-based decision making.

Let's consider the example of a government agency that is realizing the benefits of an analytical orientation, as employees continually find new ways to leverage information for better decisions. The director of the fraud and recovery section of a U.S. state agency said: "Initially we built a new BI system based on a particular need to get better access to information by moving from paper reports to an interactive BI tool based on a data warehouse. As a result of on-demand access to the most relevant data, we were able to increase the efficiency of fraud detection within the state food stamp program. However, now employees [have] discovered that the data they had access to could be used to support several decisions that the system wasn't necessarily designed to support. For example, they could monitor the performance of benefits administration with data designed to detect fraud. The organization has started to ask new questions and arrive at new decisions to improve other processes."

The encouragement of fact-based decision making using analytics became contagious, spreading from one group to another and from one type of decision to related decisions. In such an environment, the analytical orientation of the organization steadily grows.

PUTTING IT ALL TOGETHER

Today, analytics within many high-tech companies is dominated by a sense that too much data exists within the organization, often on multiple platforms, but that it is separated structurally (organizational divisions, regulatory mandates) and functionally (IT, network). There is also the view that despite these many systems, data is not analyzed in a timely enough fashion to inform key business decisions.

As the use of analytics systems progresses, high-tech companies will move to run their businesses with a richer set of metrics and with greater capabilities to run an agile business — one that can respond more quickly to ever-changing market dynamics. We expect to see the

relationship between OEM high-tech companies and their key suppliers become more metric driven and thus dependent upon more precise service-level agreements.

Successful high-tech companies must be fast, agile, and responsive to their customers and consumers and aware of competitive pressures from both traditional sources and new/disruptive entrants. The rapid obsolescence of products, extensive innovation churn, and the constant search for new business models make the high-tech industry a particularly good candidate for the use of sophisticated analytics.