Business Analytics: Transforming the Role of Management Accountants

By Kristine Brands, CMA, DM, and Mark Holtzblatt, CPA, Ph.D.
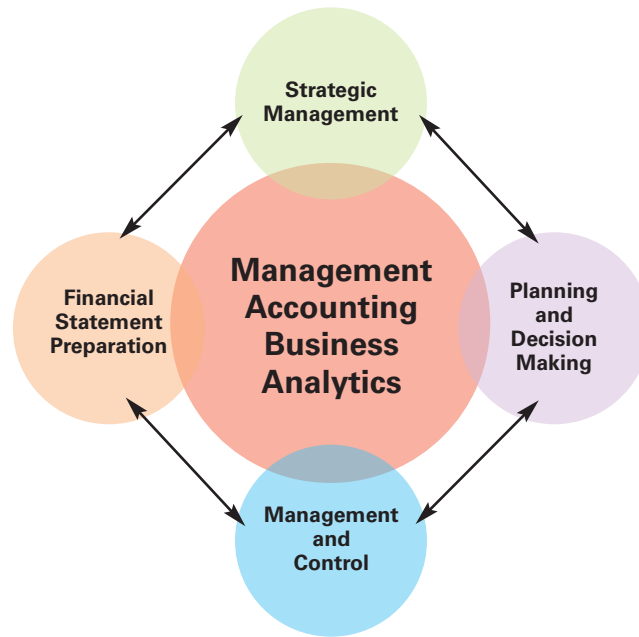
EXECUTIVE SUMMARY

Management accountants are positioned to play a key role in the implementation and application of business analytics in their organizations as they move beyond traditional, transaction-based accounting to analytics. This emerging trend will transform how management accountants analyze and interpret data for their companies.

If you have been a management accountant for any length of time, you know that you traditionally have worn four distinct hats in your organization: participation in strategic cost management to achieve long-term goals and objectives; planning and decision making for internal cost activity; management and operational control for performance measurement; and, to support the first three roles, preparation of financial statements.[1] All four roles have supported decision making by using management accounting and finance data/information for analysis.

This is an exciting time to be a management accountant because recent developments in technology and the field of business analytics are going to equip you with new tools and processes that will enable you to build value in your organization. Rather than being restricted to routine spreadsheet analysis tools, management accounting analysis will be transformed through business analytics. Figure 1 shows how business analytics will anchor and tie together your traditional roles.

Bradford Hamilton, information technology (IT) controller at Cummins Inc., a global power-technology company, believes that you "need to know and be engaged in business analytics because management accountants bring value to the business as business partners. In order to be a business partner, they have to understand the financial dynamics of the

Figure 1: Integrated Management Accounting and Business Analytics Model

Strategic Management

Financial Statement Preparation

Management Accounting Business Analytics

Planning and Decision Making

Management and Control

company often beyond simply what shows up in the income statement and balance sheet. Business analytics provides insight into many cost drivers and other financial dynamics of the business and often in real-time, when the data is most critical. Our business leaders look to us to partner with them in interpreting and utilizing this data." The enhanced role for business analytics is driven by an explosion in the amount of new data available for analysis.

The New Data Ecosystem
Ten years ago, management accountants probably would not have recognized many of the terms shown in Figure 2, much less in the context of business analytics. As more and more information becomes digitized, the data ecosystem continues to explode, providing companies with expanded data that can be combined with traditional company data. The changing data picture is revolutionizing business analytics and is a key technology trend for management accountants. Let us examine this shift in more detail.

Figure 3 shows the changing picture of a company's data sources, which have expanded to include data created outside the company's borders. Historically, companies have relied on internal data for analysis: files and databases generated by enterprise resource planning (ERP) systems, other internal software applications, and spreadsheet programs. For example, management accountants can analyze travel expenses, sales revenue, and product costs by creating spreadsheets or querying a company's ERP system. Because these examples use data with identifiable structures that computer software can recognize and read, management accountants can search and choose specific information to analyze. In contrast, unstructured information is incompatible with a company's data formats and therefore cannot be searched. This includes external Internet websites and new data sources such as tweets, videos, e-mails, maps, and sensors (such as the location-tracking feature used by advertisers), shown in Figure 3.
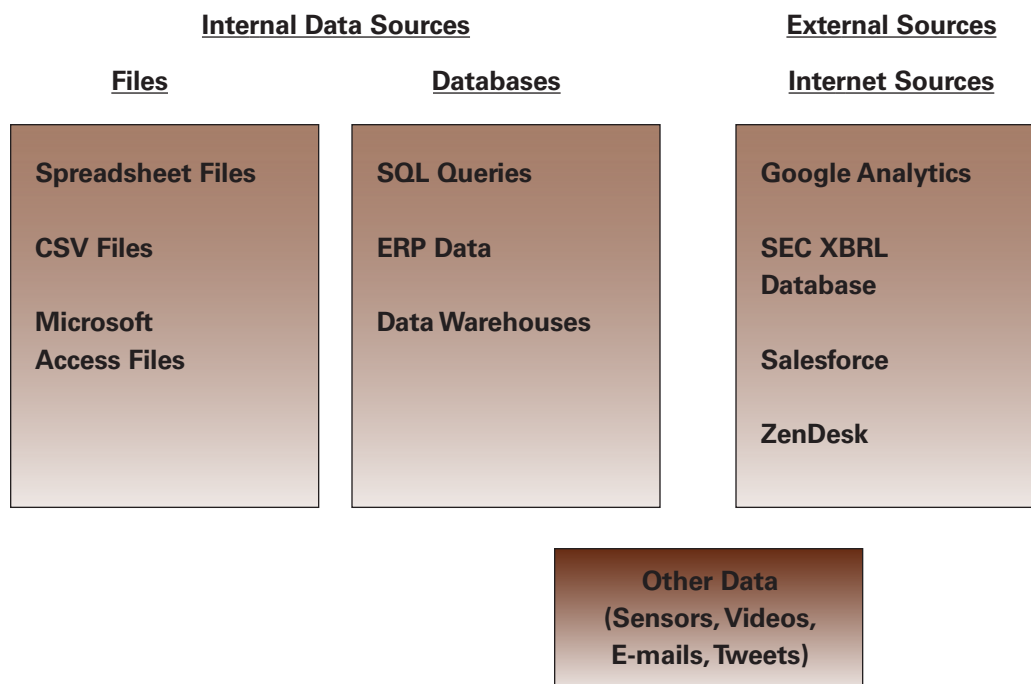
When this data floodgate is opened and becomes accessible, companies will be able to combine external

Figure 2: The New Data Ecosystem

Emails SQL UnstructuredData BusinessIntelligence BusinessAnalytics ZenDesk Tableau Databases StructuredData W3C Sensors CSV ERP SalesForce Semantics Videos PowerBI365 Tweets XML Microsoft InternetOfThings

Source: Created from Wordle (www.wordle.net)

Figure 3: Internal and External Data Sources

Internal Data Sources   **External Sources**

Files   **Databases**   **Internet Sources**

Spreadsheet Files   SQL Queries   Google Analytics

CSV Files   ERP Data   SEC XBRL
                                                              Database
Microsoft   Data Warehouses
Access Files   Salesforce

                                                              ZenDesk

Other Data
(Sensors, Videos,
E-mails, Tweets)

data with their internal data for richer analysis and insight. Research company Gartner predicts that the amount of data will grow 800% by 2017 and that 80% will be unstructured data.[2] Despite this promising news, however, there are many challenges facing companies' use of data in business analytics.

A Bigger Set of Challenges
While business analytics has much to offer, several issues are affecting its growth and adoption. These include awareness, interoperability, security, and analysis quality.

Awareness
Management accountants may not understand how accessible and valuable business analytics is to their companies. There has been a great deal of hype about "Big Data" and business intelligence (BI) that is outside the scope of smaller companies because of their lack of technical knowledge, inadequate IT infrastructure, and cost constraints. Despite these limitations, however, management accountants need to begin thinking in terms of business analytics for their companies and adopt practices and tools that today are readily available, affordable, and easy to use. As Helen Brand, CEO of ACCA (Association of Chartered Certified Accountants), said, "The key issue now is how the finance function adapts to the fast-evolving technology to better serve businesses in the future."[3]

Interoperability
For business analytics to gain wider adoption, it needs to be able to link structured and unstructured data. But as the Internet expands the amount of data available to companies, much of the data is unstructured and therefore incompatible with the organization's data. As discussed earlier, internal data that originates in ERP systems or other business software applications is structured data with a predefined format.

Help may be on the way, however: The international World Wide Web Consortium (W3C) is addressing the issue of incompatible formats by developing standards to provide structure and linkages for Web data sources to facilitate data consumption.[4] This initiative is driven by the open data movement, which is working to en-

sure that data is available and accessible, reusable, and can be redistributed.[5] Absent this initiative, companies would be on their own to sift through mounds of data and translate it into usable formats to feed business analytics models.

Security
Companies need to protect their data and treat it like an asset. Those that fail to safeguard data jeopardize its integrity, risk severe damage to their reputation, and could possibly invite lawsuits. Responsibility for securing data goes beyond the IT department and requires management accountants' active involvement in implementing and monitoring data protection and internal privacy controls.

Analysis Quality
The quality of business analytics is at risk if companies do not follow structured design processes focusing on data integrity and well-defined objectives. Just because the data floodgate opens does not mean that business analytics will automatically add value and could lead to wasted effort. It also means that the garbage-in, garbage-out (GIGO) concept is amplified if the wrong information is analyzed.

Companies that manage these challenges successfully will get the most from business analytics. In the next section, we will present examples that demonstrate the power and potential of business analytics to enhance the strategic partnership role of management accountants.

Putting Business Analytics to Work
At this stage, you might be wondering, "How exactly do I harness the power of business analytics?" To help answer that question, we have identified five main areas that provide a clearer picture of business analytics applications: (1) franchise sales analysis, (2) accounts receivable and credit analysis, (3) accounts payable analysis and payment monitoring, (4) mergers and acquisitions (M&A) due diligence, and (5) forensic accounting. While several of the following examples are from large organizations, many of the analyses can be performed on desktop, laptop, tablet, and PDA solutions that are available now, which we discuss later.

Franchise Sales Analysis

Kilwins, a Michigan-based chocolatier and franchisor, uses business analytics to analyze sales metrics from its franchisees to help determine point-of-sale promotions. According to Jeff Hall, the company's director of marketing, commerce, and IT, prior to implementing software from Tableau, this analysis was performed using customized spreadsheets that required significant manual preparation, including copying and pasting data—an error-prone and time-consuming process.[6] Making matters worse, the report writer that had been used to run the analysis often crashed. In contrast, the business analytics model is automated, allowing a data refresh function to populate the model with the most recent information, thus providing the company with accurate, timely data for decision making.

Accounts Receivable

Business analytics can also be applied to tracking days' sales outstanding (DSO). Infosys developed an application that examines the accounts receivable (AR) collection history by customer using a portfolio model that evaluates several AR characteristics.[7] The model segments accounts receivable by the following attributes: customer exposure by industry, customer response history by AR department contact, customer payment history, AR payments by past-due category, and reasons for nonpayment. Based on an AR and DSO portfolio analysis model, companies can develop credit and collection policies that minimize bad debt risk.

Payment Monitoring

The Improper Payments Elimination and Recovery Improvement Act of 2012 (IPERIA) mandates that U.S. federal government agencies address improper payments and requires the agencies to implement internal controls to identify fraudulent activity.[8] In keeping with the law, the U.S. Department of Defense (DoD) Defense Finance and Accounting Services (DFAS), the agency authorized to disburse almost all of the DoD's funds, implemented accounts payable activity monitoring software and adopted a business analytics approach to evaluate payments. By 2013, the DoD had saved more than $4 billion in its first four years of using the software. The payments are continuously monitored and evaluated against payment-decision rules that flag fraudulent transactions—rules that were defined by payment processers based on their experience. By the DoD automating this process, its search for fraudulent payments is vastly more efficient than if the process were performed manually. Not surprisingly, the risk of overpayment has dropped dramatically, too.

M&A Due Diligence

Another application of business analytics is in the area of due diligence for mergers and acquisitions. Accurate business valuations for M&A deals require exhaustive analysis of the target companies' financial data. Focusing business analytics on this activity helps improve the due diligence process by providing more-accurate valuations. How so? According to authors Dan Tiemann and Joe Hartman, data sets from both entities can be run through models for scenario planning and forecasting, as well as to test data accuracy and to evaluate business synergies between the companies.[9]

Forensic Accounting

Business analytics provides forensic accounting with fraud detection analytics (FDA) strategies to identify fraud, bribery, and corruption in companies. EY's 2014 *Global Forensic Data Analytics Survey* found that many companies are reviewing relatively small data volumes of around 10,000 records—a number that hardly puts the analysis in a Big Data context and allows small and medium-sized enterprises (SMEs) to apply business analytics with as much skill as the bigger players.[10] For example, companies can search for fraudulent payments by examining the payment descriptions on accounts payable checks.[11] By using textual analysis, the payment description field from the accounts payable voucher file is searched for suspicious descriptions that might indicate fraudulent disbursements, such as miscellaneous refunds, consulting payments, and cash payments. This analysis can be performed without expensive software by extracting payment descriptions to a spreadsheet, using the count function to summarize the number of suspicious payment descriptions, and then ranking the results by number of occurrences. Companies that fail to implement FDA strategies lose the opportunity to leverage their data to address fraud.

Figure 4: Business Analytics Sales Report

Source: Tableau Software, www.tableau.com/learn/gallery. Used with permission.
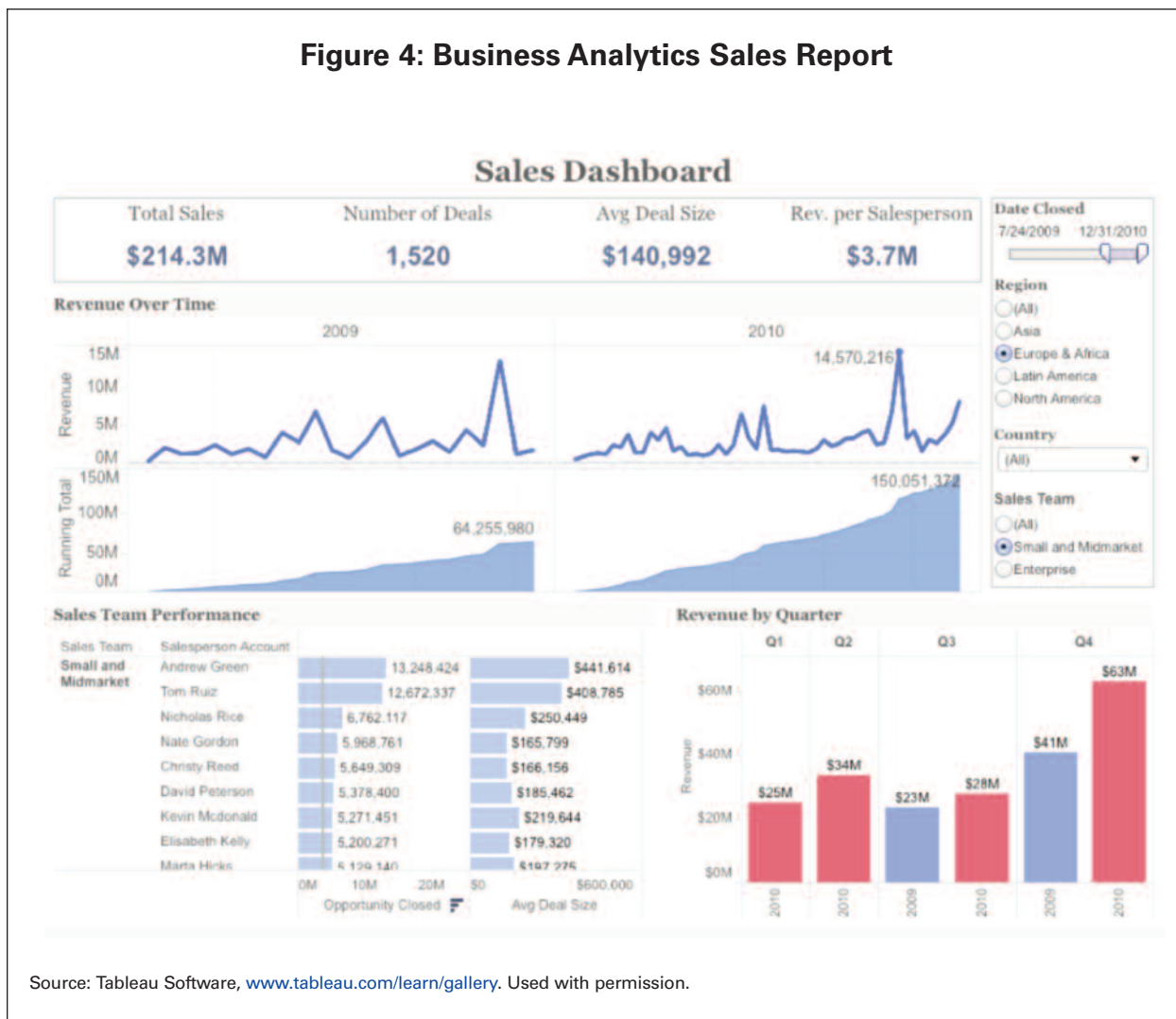
As you can see, business analytics opportunities are powerful and can be customized to meet any company's needs. But the best news is that today's tools to perform business analytics transcend the limitations of historical analysis because they use groundbreaking graphics technology.

Visualizing the Data

Business analytics/BI software tools are available for companies of all sizes and budgets. These tools have three functional categories in common, according to Gartner: enable, produce, and consume. "Enabling" facilitates data collection, "producing" processes business analytics, and "consumption" creates displays and reports.

Desktop, laptop, and tablet computers; dedicated servers; and cloud solutions can accommodate a range of data and analytical needs. For example, smaller companies with small data sets can install business analytics software on these devices. Companies with large data sets can run their analyses on the cloud; ERP companies such as Oracle and SAP provide this solution. Other business analytics software solutions, available now and scalable from personal use to large companies, include Microsoft Power BI for Office 365, Tableau, and Sisense.

One of the wonders of business analytics software is that it uses data visualization (dataviz for short) to summarize results pictorially. Traditional financial reporting presents information as financial statements, as spreadsheet analyses, and in graphs and charts as fixed, for-

Figure 5: Business Analytics Airfare Expense Report
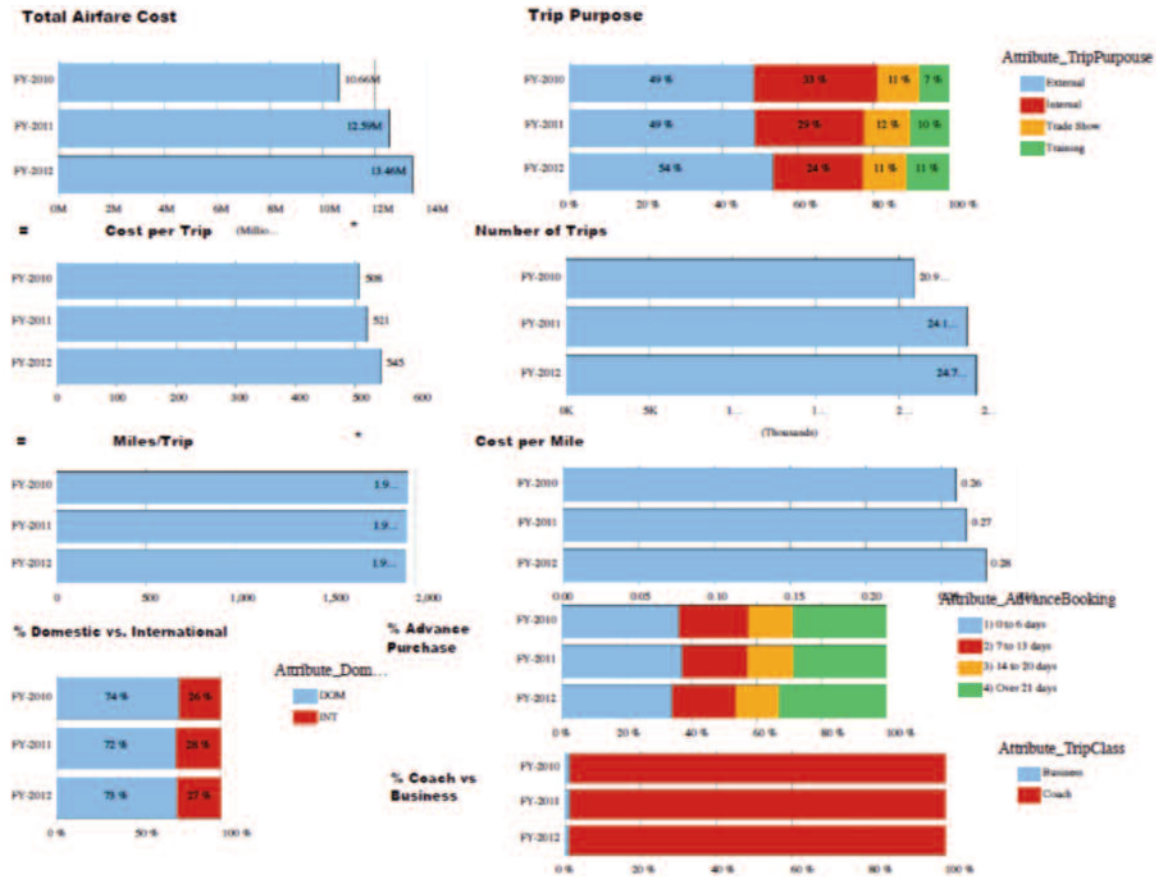
Source: Microsoft Power BI for Office 365, www.microsoft.com/en-us/powerBI/solutions/bi-for-finance.aspx.
Used with permission from Microsoft Corporation.

matted, static reports that cannot be modified easily. In contrast, business analytics software includes interactive capabilities and automatic data set updates, permitting users to view the analysis results as dashboards, tables, charts, and reports. This allows users to drill down into the data to explore details and relationships, and the analysis parameters can be modified on the fly. According to Bill Inmon, president of Forest Rim Technology, Inc., "The difference between showing somebody raw data and showing them visualized data is truly night and day. All of a sudden they can see relationships, they can see visualizations. It comes alive for them."[12]

Business analytics tools provide menus with drop-down boxes that allow the user to create and modify queries of underlying data. Figures 4 and 5 present examples of dataviz: a sales analysis prepared using Tableau and an airline expense analysis created with Microsoft Power BI for Office 365.

These examples demonstrate the power and value of business analytics using dataviz. The software tools' power to drill down into the source data and the flexibility to change the analysis parameters are what make business analytics a game changer. As dataviz continues to take off, companies will be challenged to find qualified management accountants to participate in business analytics as well as identify strategies to develop and hire the right talent.
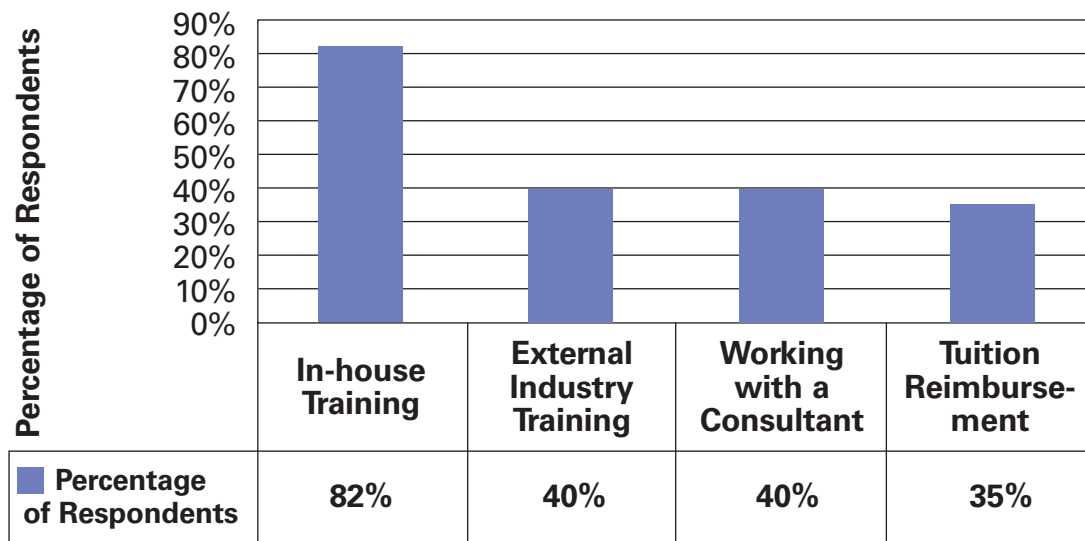
A Growing Field

The job outlook in business analytics is strong for those management accountants with the right skill sets. According to a 2014 survey of 2,100 CFOs from companies in the United States conducted by Robert Half Management Resources, 46% responded that business analytics skills are mandatory for some positions, 15% said that they should be mandatory for everyone, and 22% responded that the skills are nice to have but are not mandatory.[13] According to Paul McDonald, senior executive director for Robert Half, finance and accounting departments must learn how to identify, analyze, and interpret key data.[14] A company's decision making increasingly will rely on data-driven recommendations, and, as a result, the skills necessary to provide this information will shift from "nice to have" to "mandatory."

To prepare employees for business analytics, companies need to create new training strategies for them to develop appropriate skill sets. Figure 6 shows how companies are honing their employees' business analytics skills through in-house training, external industry training, working with consultants, and tuition reimbursement. (Because of the rapid changes in business analytics, continuing education is needed as well.) On-demand training videos, white papers, and case studies developed by business analytics software vendors and professional associations are other training resources.

According to the employment website Indeed.com, job opportunities in business analytics and related fields (business intelligence, data analytics, and Big Data) steadily increased between 2006 and 2014 (see Figure 7). The percentage growth rate for these job categories is summarized in Figure 8, and Table 1 summarizes the number of jobs posted in each category.

Figure 6: How Companies Are Improving Business Analytics Skills

| Percentage of Respondents	In-house Training	External Industry Training	Working with a Consultant	Tuition Reimbursement
Percentage of Respondents	82%	40%	40%	35%

Source: Adapted from Robert Half Management Resources, http://rhmr.mediaroom.com/file.php/1566/MR_0914_GRAPH_Business-Analytics_v4.jpg. Used with permission.

Figure 7. Demand for Business Analytics Jobs Is Rising
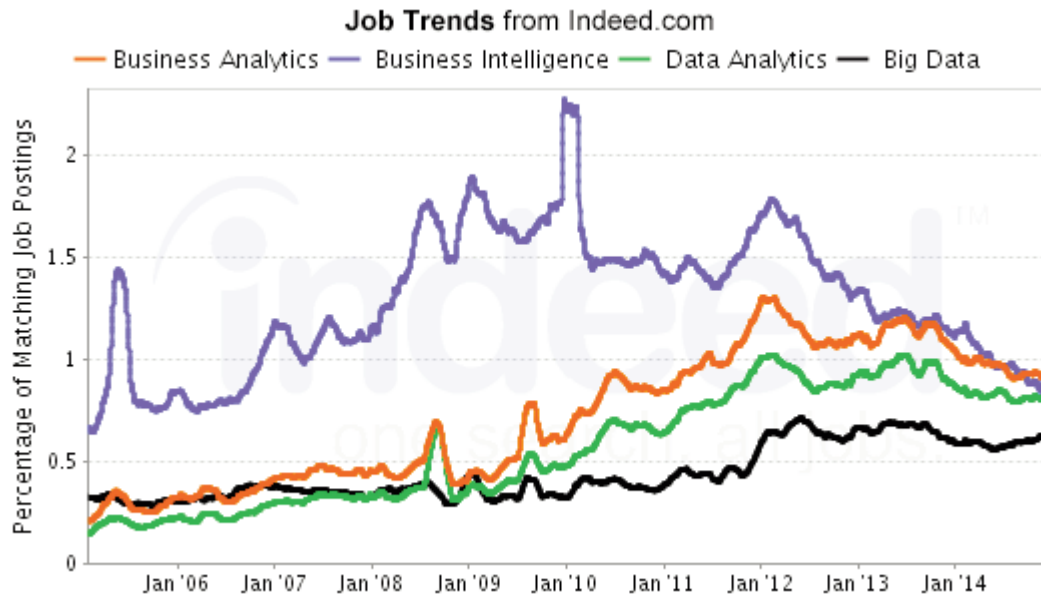
Source: www.indeed.com

Figure 8. Percentage Growth Rate for Job Categories
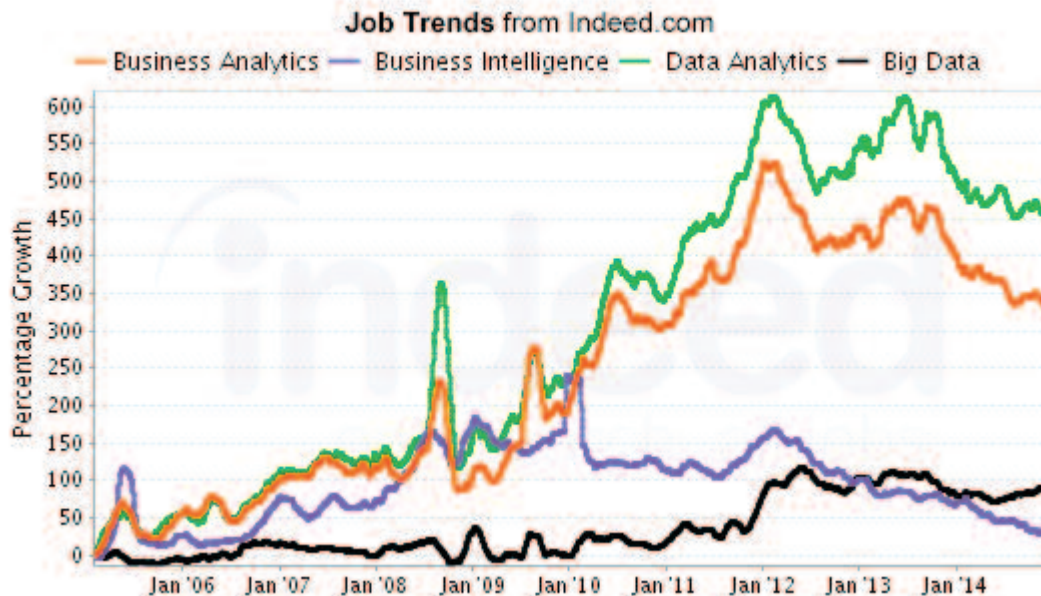
Source: www.indeed.com

Table 1: Available Business and Data Analytics Jobs*

Job Category	Number of Jobs Posted
Data Analytics	62,260
Business Analytics	56,330
Business Intelligence	47,223
Big Data	30,813
Total	**196,626**

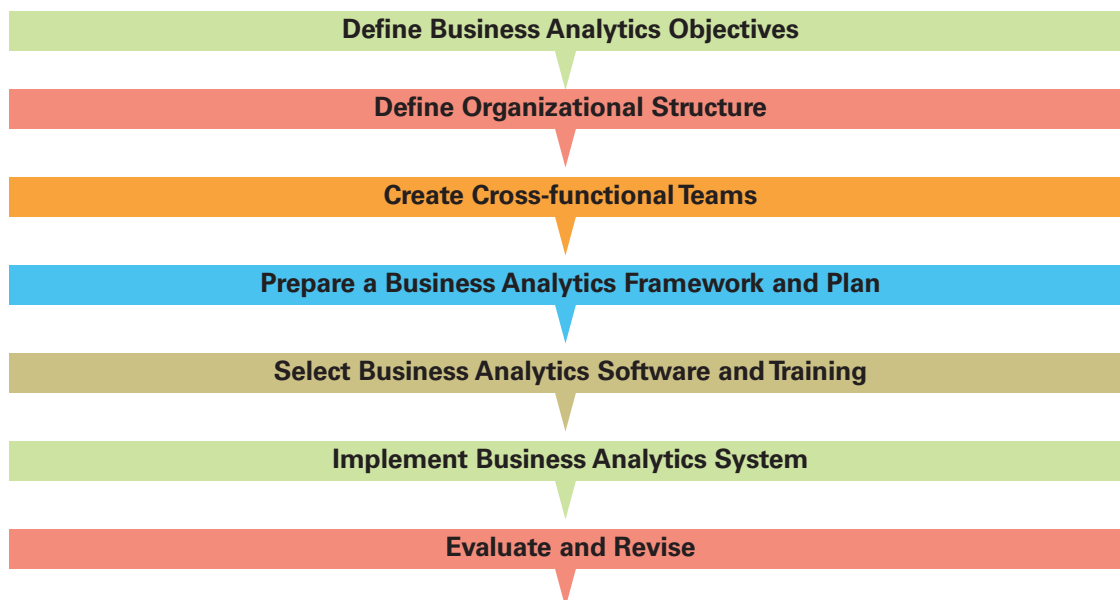*As of March 2015. Source: www.indeed.com

As you can see from these illustrations, management accountants who have the right skill set face a strong job outlook. The next challenge is developing a strategy for implementing business analytics, and that requires companies to create an adoption blueprint.

A Road Map for Adopting Business Analytics
Management accountants have a difficult task ahead of them. If they fail to leverage the opportunities provided by the digital information revolution, they could jeopardize their organization's operating performance and competitive advantage. Put simply, management accountants and other financial professionals must identify how they can use and analyze data. This does not mean that they need to adopt complex analyses. Rather, they need to develop a strategy that fits their company's size and resources when integrating business analytics into its corporate information management strategy. As we have learned so far, business analytics solutions are not one-size-fits-all; they need to be tailored to each company's requirements. Figure 9 shows the steps in this process.

Figure 9: Business Analytics Implementation Process

Define Business Analytics Objectives

Define Organizational Structure

Create Cross-functional Teams

Prepare a Business Analytics Framework and Plan

Select Business Analytics Software and Training

Implement Business Analytics System

Evaluate and Revise

Define Your Objectives

Defining a company's business analytics objectives is the first step in this process. What are the company's requirements for business analytics, and how do they support the company's mission and strategies? Without a clear focus, there is no high-level view of what is really needed. This is especially important for SMEs with limited resources. By spelling out its objectives, the company is able to set priorities and address them as resources become available.

Define the Organizational Structure

Gartner recommends an organizational structure that combines centralized and decentralized teams for a company's business analytics deployment.[15] The centralized model, where top management selects and implements business analytics, provides important consistency in the overall approach, governance, and internal control of company data. Nevertheless, a company needs to combine the best attributes of both structures (centralized and decentralized) for effective business analytics development and management and to provide its business units with autonomy. The decentralized structure provides end users with flexibility to develop and manage their business analytics needs without getting locked into a centralized structure's fixed models.

Create Cross-functional Teams

Establishing cross-functional teams is a critical part of the business analytics initiative. Management accountants are key members of the teams because they have insight into the company's financial activities and have experience preparing and analyzing information to be used in decision making. The IT function is necessary to identify data sources, set up initial data flows to business analytics applications and updates, create data links, and develop business analytics displays, such as dashboards, static reports, and interactive reports that users can customize as they see fit. (After the initial setup, users can change their own report parameters for different views, eliminating reliance on the IT department.) The IT function also needs to safeguard the applications from unauthorized access and protect them from internal and external data breaches.

Prepare a Business Analytics Framework and Plan

The next step is to develop a detailed plan defining the company's business analytics framework and applications to support it. The plan serves as a specification document that translates the requirements of the objectives defined in the first step into business analytics models; defines and identifies data necessary to populate the models; and creates dashboards, displays, or reports to summarize the analysis. A key consideration is to ensure that business analytics serves business requirements by using the right information to achieve the analysis objectives. Developing an analysis that is misleading, incorrect, or irrelevant might be misinterpreted and can lead to flawed decision making. A formal process for developing business analytics models—including oversight, approval, data privacy, and internal controls—should be part of the business analytics plan.

Select Business Analytics Software and Training

This process requires participation from the accounting/ business and IT departments to ensure that the software meets business analytics requirements and fits within the company's IT infrastructure. SMEs may not have the bandwidth or the budget to run complex data mining and BI models available to *Fortune* 500 companies, but software such as Microsoft Power BI for Office 365 and Tableau, both of which are affordable and easy to use, brings smaller companies to the business analytics table. Before your organization purchases any software package, however, make sure it meets your business analytics objectives, is supported by existing hardware or cloud configurations, can be operated and maintained by the existing accounting/business and IT staff, and fits your budget. A comprehensive training program must be part of this step to ensure that everyone with business analytics responsibilities understands the functions and features of the software and how to leverage them to maximize benefit and value to the company.

Implement and Test the System

An implementation plan is necessary after developing the framework and the business analytics plan. A project management team, led by a project manager, should be designated to implement the business analytics models. Management accountants should review and

test the system to ensure that business analytics models use the right data, generate accurate results, satisfy business requirements, and add value to the company. All business analytics tools should be phased in slowly to ensure that the company's resources can manage projects effectively and continuously improve the process.

Evaluate and Revise

Finally, because your company's business analytics requirements will likely change and evolve, periodic review, revision, and development of new business analytics models are necessary. In fact, because technology is changing so quickly, it is smart to review new software options and data sources annually.

Preparing for the Future

Companies that embrace business analytics will be able to transform how they manage and consume data and information for decision making. This translates into enhanced insight, leading to a competitive advantage. As we have discussed, affordable and user-friendly business analytics tools are available today, so there is really no excuse why any company cannot begin training its employees to participate in business analytics initiatives. Management accountants are ideally suited for this role because they are the stewards of companies' internal accounting information and financial analyses.

Technology is the game changer that will elevate the management accountant's role. Helen Brand summarizes the risk of ignoring this trend. She says that emerging technologies are reshaping the accountant's role and that accountants must "adapt or die."[16] To that we say to management accountants: "Don't get left behind. Embrace business analytics today!" ∎

Kristine Brands, CMA, DM, is an assistant professor of accounting at Regis University in the College for Professional Studies School of Management in Colorado Springs, Colo. She is also a member of IMA's Pikes Peak Chapter. You can reach her at (719) 264-7035 or kbrands@regis.edu.

Mark Holtzblatt, CPA, Ph.D., is an associate professor of accounting at Cleveland State University in the Monte Ahuja College of Business. He is also a member of IMA's Cleveland Chapter. Mark can be reached at (216) 875-9711 or m.holtzblatt@csuohio.edu.

Endnotes

1 Edward Blocher, David Stout, Paul Juras, and Gary Cokins, *Cost Management: A Strategic Emphasis*, 6th ed., McGraw-Hill Higher Education, New York, N.Y., 2012.

2 Tom Groenfeldt, "Big Data—Big Money Says It Is A Paradigm Buster," *Forbes*, January 6, 2012, www.forbes.com/sites/tomgroenfeldt/2012/01/06/big-data-big-money-says-it-is-a-paradigm-buster.

3 Helen Brand, "Big Data: Adapt or Die," *Accountancy Live*, March 3, 2014, www.accountancylive.com/big-data-adapt-or-die.

4 See more at www.w3.org.

5 "What is Open Data?" *Open Data Handbook*, http://opendatahandbook.org/en/what-is-open-data.

6 Michelle Wallace, "Chocolate + Data = One Delicious Must-Read," Tableau Software, March 17, 2014, www.tableau.com/about/blog/2014/3/chocolate-data-delicious-must-read-29088.

7 Chartered Institute of Management Accountants and Infosys, *Using Analytics to Reduce Days Sales Outstanding (DSO)*, 2014, www.cimaglobal.com/Documents/Thought_leadership_docs/Management%20and%20financial%20accounting/using-analytics-to-reduce-dso.pdf.

8 The original IPERIA law was passed in 2002 as The Improper Payments Information Act of 2002 (IPIA), which was amended in 2010 (The Improper Payments Elimination and Recovery Act of 2010) and in 2012 (IPERIA).

9 Dan Tiemann and Joe Hartman, "Data Analytical Due Diligence is Driving M&A Deals," *Financial Executive*, April 2013, pp. 32-35.

10 EY, *Big Risks Require Big Data Thinking: Global Forensic Data Analytics Survey 2014*, www.ey.com/Publication/vwLUAssets/EY-Global-Forensic-Data-Analytics-Survey-2014/$FILE/EY-Global-Forensic-Data-Analytics-Survey-2014.pdf.

11 Jared Crafton, "Data Analytics for Finding Corruption," www.tableau.com/learn/webinars/data-analytics-finding-corruption?signin=9dbac1fd83f725031d4300111afda74d.

12 Interview with Bill Inmon, Tableau Software, www.tableau.com/learn/stories/tableau-will-be-us-long-we-make-sales.

13 Robert Half Management Resources, "Business Analytics: The New Must-Have Skill Set," September 25, 2014, http://rh-us.mediaroom.com/2014-09-25-Business-Analytics-The-New-Must-Have-Skill-Set.

14 *Ibid*.

15 Kurt Schlegel, Owen Milbury, Frank Buytendijk, and Dan Sommer, "Create a Centralized and Decentralized Organizational Model for Business Intelligence," Gartner, November 4, 2014, www.gartner.com/doc/2897718/create-centralized-decentralized-organizational-model.

16 Brand, 2014.