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Maximizing Value from Business Analytics

CIOs need to maximize the value from the significant investment their organizations make in business analytics (BA) initiatives. We explore two themes for maximizing BA value—speed to insight and pervasive use, and present a BA case study at GUESS? INC., a fashion retailer. We provide recommendations for how IT leaders can maximize value from their BA investments.[1]

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Enterprise Business Analytics Capabilities

Companies increasingly deliver value through business analytics (BA), which includes the people, processes and technologies that turn data into the insights that drive business decisions and actions.[2] As Figure 1 illustrates, organizations with enterprise BA capabilities establish a sound foundation of high-quality, usable and integrated data. This data is delivered to business users via a diverse portfolio of business analytics tools, including query, reporting and advanced analytics software. Business users identify insights from the data, make decisions and solve important business problems, thereby triggering actions that generate a wide range of tangible and intangible business value. The data provided through BA is also known as business intelligence (BI). Over time, organizations manage and evolve their BA capabilities through IT and data governance mechanisms.

The Enterprise Business Analytics Capabilities Model[3], shown in Figure 1 is a lens through which we can examine how companies are building, managing and changing their business analytics capabilities. From an analysis of emerging practices recently reported by almost two

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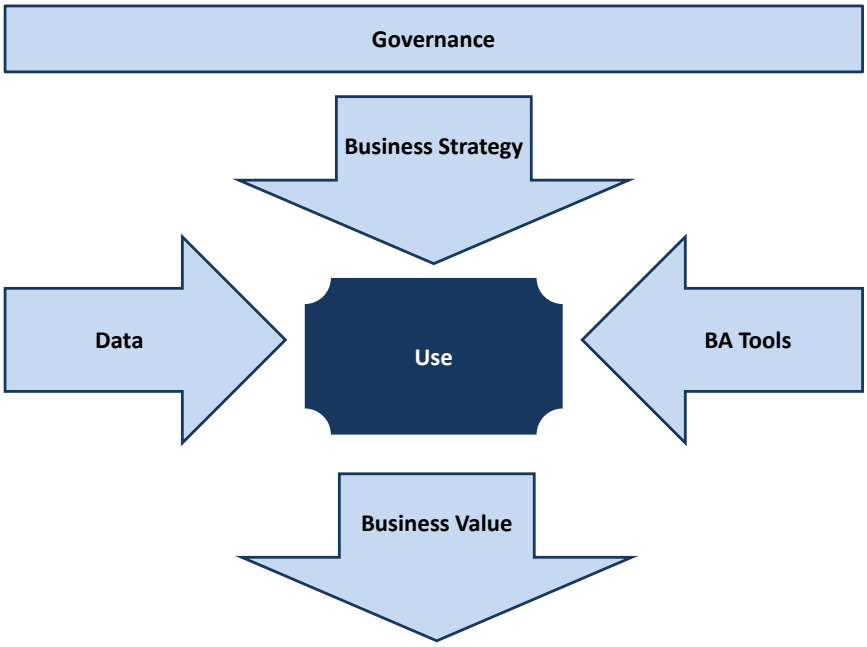
1 This article is based on research sponsored by the Advanced Practices Council of SIM.
2 Eckerson, W. *Secrets of Analytical Leaders: Insights from Information Insiders*, Technics Publications, 2012.
3 For more information about the Enterprise Business Analytics Capability Model, see Wixom, B., Watson, H. J. and Werner, T. "Developing an Enterprise Business Intelligence Capability: The Norfolk Southern Journey," *MIS Quarterly Executive* (10:2), 2011, pp. 61-71.

Figure 1: Enterprise Business Analytics Capabilities Model[4]



dozen companies, two themes emerged that characterize how companies are attempting to maximize business value from their enterprise BA capabilities: speed to insight and pervasive use. In the following sections, we describe these two themes and some contemporary practices that facilitate them.[5]

Speed to Insight

Speed to insight is concerned with how expeditiously organizations transform raw data into usable information. Practices that facilitate speed to insight can be categorized as automation, business requirements and reuse (see Figure 2 and Appendix 1).

Some practices, such as data standards and metadata, help organizations *automate* data on-boarding,[6] integration and quality processes. The more automated these processes, the faster data can be physically transformed into usable information. For example, a healthcare company initially estimated a project to on-board more than 30 new data sources into its business analytics environment would take two months. By shifting to configurable, metadata-driven on-boarding processes, the project was accomplished in five business days. And an IT company cut the estimate for a data integration project by 30% after implementing automated data mapping.

Other practices, such as agile development methods, sandbox environments[7] and co-locating developers with business users, enable development teams to more rapidly identify *business requirements* for data and then translate those requirements into business analytics products and services. Until a few years ago, agile development was rarely applied to business analytics projects, but that has changed as companies have seen the positive impact of agile development on delivery schedules. For example, an insurance company moved to an agile development process for all BA projects, adopting techniques like paired programming, story walls and test-driven development. The company realized a four-fold increase in analytics usage over two years, attributed to increased development productivity (i.e., increased BA delivery).

4 Adapted from Wixom et al., op. cit., 2011.

5 The primary data source for identifying the two themes was the applications submitted in 2011 and 2012 by 23 companies for the emerging practices category of The Data Warehousing Institute's (TDWI) annual business analytics best practices competition. A summary table with the specific practices reported by each company is shown in Appendix 1.

6 On-boarding is the process of incorporating new data sources into a company's data infrastructure.

7 Sandboxes are technologies outside of an organization's core systems that, in this context, are used by analytics professionals to develop ideas for new applications.

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Figure 2: Drivers of Speed to Insight

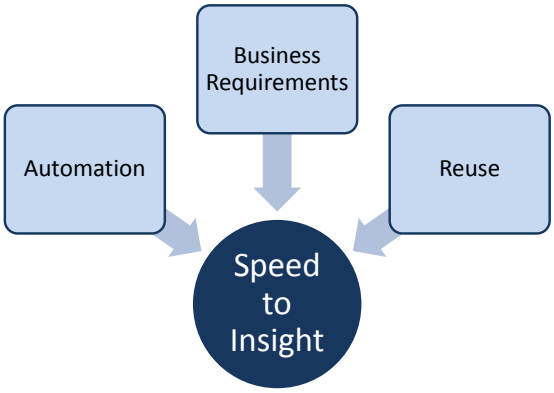
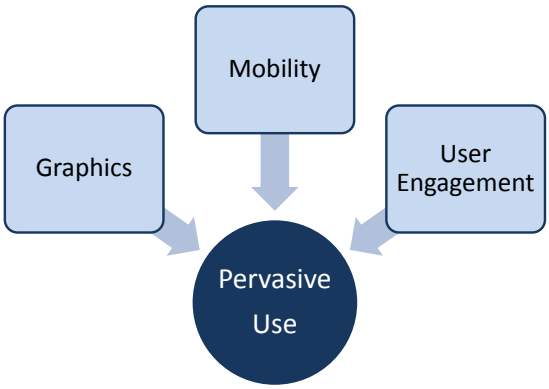


Figure 3: Drivers of Pervasive Use



Finally, companies that invest in *reuse*, which includes such practices as data services, design catalogs and parameterized reporting, can get information into the hands of business users more quickly. A healthcare company reduced data on-boarding from 1,700 hours to a few hours by using a data-as-a-service approach. The company estimates that use of data services reduced developer time by 25% and data store redundancy by 75%. Another healthcare company uses a catalog of best practice approaches for designing dashboards to meet various objectives. Use of the catalog shortened the company's delivery time for dashboards from 12 to five days.

Pervasive Use

On average, 25% of an organization's employees use some form of business analytics to do their jobs.[8] Companies can increase this percentage by adopting practices that encourage more pervasive use of business analytics across the enterprise, such as graphics, mobility and user engagement (see Figure 3 and Appendix 2).

Visually appealing software interfaces using *graphics* encourage pervasive use because the adage "a picture is worth a thousand words" holds true in business analytics. Users react positively to appropriate uses of maps, colorful dashboard displays and advanced visualization approaches. One retailer found that adding photographs of products to reports positively impacted adoption and analyst productivity.

A second driver of pervasive use is *mobility*—delivering business analytics via mobile devices such as cell phones and iPads. Companies reported particularly high adoption success and user enthusiasm with iPad-based BA deployments (as described in the GUESS case below). In general, the key benefits of mobility are portability and ease of access to business analytics. For example, a healthcare company that

8 This figure is cited by Cindi Howson in many of her webinars, which can be found at www.biscorecard.com/businessintelligencewebinars.asp.

transitioned from web-based BA to mobile BA attributed part of the benefits it gained from the iPad's "cool factor." Benefits of mobile BA include more frequent analyses, instant decision making, more consultative decision making, increased self-service and increased productivity. A biotech company estimates that members of its sales force save between 30 and 90 minutes each day through its mobile BA application, and that time saving translates into $4 million annual savings or increased productivity.

Finally, companies can deepen BA usage through practices that promote *user engagement*. This broad category includes self-service approaches (e.g., report wizards), gamification[9] (e.g., incentivizing use) and collaboration techniques (e.g., rating, discussion and sharing portals)—all of which draw users into BA and engages them in an interactive way. An Internet company set up a collaboration portal to support its anticipated BA growth from 1,000 to 4,000 users. The portal offered users a way to share and rate analyses, discuss ideas and even "follow an analyst."

Speed to Insight and Pervasive Use at GUESS

For more than 30 years, GUESS?, INC. (referred to as GUESS) has been designing, marketing, distributing and licensing collections of contemporary apparel and accessories for men, women and children. A $2.5 billion company, GUESS competes globally in the fashion retail industry, operating in 87 countries.

GUESS operates using a variety of business models that vary geographically. The U.S. is predominantly a retail business, with sales to consumers accounting for 85% of business and 15% going to wholesale (e.g., department stores). Europe is about 75% wholesale. Asia is a mixture of retail and wholesale. In Central and South Americas, GUESS engages in partnership arrangements. Although these diverse business models require localized business processes, GUESS centrally controls its brand and delivers a consistent customer experience across its distribution channels.

GUESS succeeds by placing the right apparel in the right store at the right time to appeal to its fashion-savvy shoppers. To do this well, the company needs to be good at fashion and at distribution. To accomplish the former, GUESS employs designers who identify fashion trends and create appealing styles. A staff of buyers, planners and distributors ensure that merchandise is routed appropriately across the GUESS network.

The BA industry has recognized that GMobile, GUESS's business analytics iPad initiative, is an innovative and game-changing BA application.

Table 1: Practices to Drive Speed to Insight and Pervasive Use at GUESS

Speed to Insight	Pervasive Use
• Data Standards	• Photographs
• Agile methods	• Advanced Visualization
• Co-location	• Dashboards
• Shadowing	• Graphic designers
• Templates	• iPads
	• Collaboration

GMobile uses several practices that facilitate speed to insight and pervasive use of business analytics (see Table 1).

The Origin of GMobile

GUESS's CIO and his BA director initiated the GMobile project while attending a BA vendor conference. As the conference keynote speaker described the potential value of the iPad for BA delivery, the CIO realized that the iPad's portability, graphical nature and trendiness could be a good fit for his highly visual and creative business users. During the talk, he texted GUESS's procurement department to order several iPads for his team so they could begin exploring the iPad's potential when he returned.

> *"Twenty minutes into the conference presentation, I was convinced that this was the perfect device for my merchants to consume data. They are always running around with 5- or 6-inch binders filled with hundreds of pages of 8-point text with every little metric—and they still seem to be missing key pieces of information. If we*

9 Gamification is the integration of game mechanics or game dynamics into an information system.

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built them a buyer's workbench, it would be the perfect application." CIO, GUESS

At the time, GUESS had significant BA capabilities in place. For ten years, the company has had a data warehouse that supported ad hoc analyses, BlackBerry reports and web-based dashboards. The BA director, who previously worked for a BA vendor, not only had deep technical expertise, but had a strong working relationship with GUESS's business users. However, the CIO and BA director believed that delivering BA via the iPad could potentially be a game-changer.

Developing GMobile

As a first step, the BA director asked his team to download highly rated iPad apps and identify what made them so popular. The team not only explored media and productivity apps, but also games. For example, a vegetable chopping game showed the importance of color, ease of use and fun. The team found that exploring and discussing apps helped with its understanding of app workflow, the way in which data could and should be delivered (i.e., how much and when), communicating instructions and the effective use of graphics.

The BA director then began shadowing his users "because the scenarios for which we were designing were so different from previous scenarios." The vision for GMobile was a buyer's workbench that would replace binders of reports and support core work for the GUESS knowledge workers responsible for product distribution. The BA director visited stores with users. *"We sat in their meetings. We had never asked them to open up that much to us before, but I think they realized that it would be very cool to have a tool that could help them at those meetings or when they were on the road."*

The BA team engaged a graphic designer to help develop GMobile. *"We wanted the graphic designer to polish the app and make it look really good so that people would be drawn in. We wanted our users to wake up Saturday morning, read the newspaper and look at sales on their iPad app."* The designer helped to implement a visually appealing app that incorporated a Hollywood theme with related graphics and colors. The app also included product photos and geospatial mash-ups.

"We didn't want to create a series of dashboards. We wanted more of a multi-dimensional, interactive workflow where a user can tap and quickly get to more insight and more detail. And you can go back to your beginning point easily. Think of it as one of those old 'Choose Your Own Adventure' books that we read as kids. Flip to page 73. You open the door on the left. Page 14, you open the door on the right. And each choice leads to a different path through the book." BA director, GUESS

The type of information delivered via the iPad evolved over time as users asked for more and different functionality. For example, the app initially provided best-sellers by stores. Over time, users asked for store best-sellers categorized by additional dimensions, such as style and color.

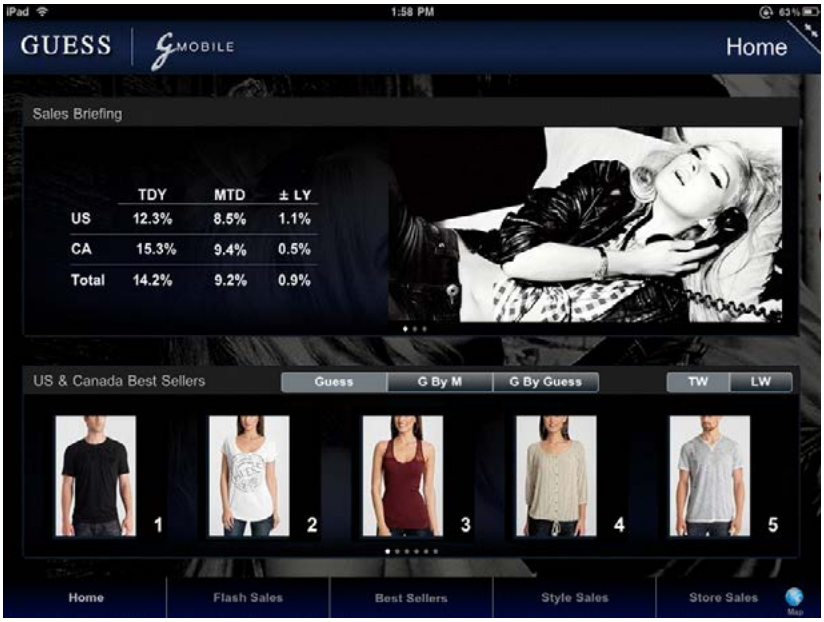
GMobile Data Foundations

GUESS's varying local business models require localized point-of-sale systems and regional ERP systems. The company achieves data standardization through a centralized Product Lifecycle Management (PLM) system that serves as the GUESS system of record. All style information—whether about a fabric, trim or garment—is created in the PLM system and then pushed into the ERP systems to achieve consistency with local execution. Additionally, the three regional data warehouses (for Asia, Europe and the U.S.) use the same data model with common attribute definitions. This ensures that regional reporting is consistent and that data can be integrated into a single global view.

"We built our own data model. I have a core team that has worked for me on average for 15 to 17 years. A lot of these guys have worked for me at four different retailers. They have a lot of retail experience. Since we've looked at many industry data models, we are familiar with what is out there—and know what other retailers have used. We created what we consider the best of breed." CIO, GUESS

The regional data warehouses, running on traditional data warehousing technology, had met GUESS's needs for the past decade, but the IT team found that GMobile generates different technical requirements. iPad users expect

Figure 4: GMobile Screen Shot



extremely fast response times, yet the iPad does not have the technical capacity to support techniques such as caching. This means that the data warehouse has to close the performance gap.

To improve performance, the BA team ported the North American data warehouse to a column-oriented data warehouse appliance. While the previous data warehouse took 20 to 30 minutes to run complex analyses, such as product affinity or market basket, the column-oriented appliance performed the same analyses in seconds.

> *"We named the new data warehouse 'the Maserati.' I told our users 'We were driving around in a Volkswagen beetle—but now we are running around in a Maserati. It is light years ahead in terms of speed.' ... It's been a huge enabler because GMobile requires that we serve up queries quickly."* BA director, GUESS

GMobile Business Analytics Tools

Prior to GMobile, GUESS's business analytics software portfolio had evolved from ad hoc queries to reports delivered via BlackBerries to web-based dashboards. Throughout this evolution, users became more comfortable and familiar with using reports and dashboards—and, in general, with using data for decision making.

The GUESS IT group believes that the iPad had potential to be a game-changing method for delivering business analytics because it combines the best of all worlds—the portability of a mobile phone, the functionality and screen size of a laptop, and the rich media, interactivity and appeal of a current "hip" technology. The latter proved particularly true. The IT group suspected that some users signed up for GMobile simply to receive an iPad. This did not concern the team because, over time, users with iPads ultimately would become highly engaged BA users.

The iPad's rich media support is important for GMobile. The app incorporates a variety of charts, graphs and maps that depict best-sellers and store sales information. The development team discovered that its decision to include product photographs into the app excited its business users (Figure 4 shows a GMobile screen shot).

> *"It was a breakthrough in realizing that visual analytics didn't mean a geospatial tool or a lot of time creating charts and graphs. There was a missing piece of analytics that we could bring just by doing something as simple as adding a picture instead of listing styles so that the users could visually see what's happening." BA director, GUESS*

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Table 2: GMobile Business Value

Transactional	Informational	Strategic
• Less paper • Time savings • Fewer meetings • Reduced headcount • Faster cycle time • Convenience	• Factual decisions • Real-time decisions • Single version of the truth • Business pattern discovery • More collaboration	• Speed to market • Improved business understanding • Reputation

The development team leveraged two important roles when creating GMobile. The first was a graphic designer, who worked with the IT group to make the screens attractive and consumable. The designer incorporated a "fun, Hollywood theme" into GMobile to create an appealing user experience. Additionally, the designer focused on making the app easy to use by supporting an intuitive workflow and ensuring that users could always find their way back to an earlier screen or to the app home page. This was helpful for the less tech-savvy users, who found the iPads highly approachable.

The second role was an app developer. This person ensured that GMobile leveraged the nuances of the iPad, such as swipes and gestures, within the interface design. The app developer also ensured that GMobile did not simply replicate previous dashboard reports that were developed for the web; in fact, the GMobile app delivers data that was previously reported through 12 different dashboard applications. The iPad supports a more interactive, versatile way to deliver data, which supports a wide range of user work styles and work flows.

> *"Different people work in different ways—and they like to see information in different ways. Through the app, you can manipulate and view data however you need it."* Director of Mexico & Latin America Support, GUESS

One drawback of deploying BA through the iPad was that the device technology was still fairly new when development began, and many bugs had to be fixed. The team needed to develop workarounds and seek BA vendor assistance to solve issues with memory management, security support and networking. *"We basically had a lifeline to them,"* explained the BA director. The team also had to address "bring your own device" (BYOD) issues for users who wanted to put GMobile on their personal iPads.

Generating Value with GMobile

The GMobile app generates a wide variety of tangible and intangible business value for the company that can be categorized as transactional, informational and strategic (see Table 2).

Transactional Benefits. GUESS is gaining several productivity improvements from GMobile that result in bottom-line cost savings. As anticipated, the iPad devices have replaced reams of paper reports, reducing paper costs and increasing eco-friendliness.

> *"I like that I can carry the iPad and not carry an inch of paper as I did in the past. When information is not in GMobile, I create PDFs and have that available through a PDF app. When the visual team goes out to stores and creates actual windows with product, they take pictures and send them to us. The iPad is a piece of equipment with a lot of information in it."* Director of Planning, Retail, GUESS

Since the GMobile app was created to answer many more questions than its predecessor applications, users spend less time finding answers and fewer analysts are needed to prepare reports.

> *"Four years ago, we had about 12 planners, and now we are down to seven because we are doing less reporting. And the reporting is more cohesive."* Director of Planning, Retail, GUESS

People at GUESS no longer need as many meetings as previously to "get people on the same page." Traditionally, GUESS held a weekly meeting for 40 representatives across the company to discuss best-selling items. Now that meeting is bi-

monthly because the GMobile app communicates best-seller information so effectively.

Informational Benefits. As business users adopted GMobile, the IT group observed that the nature of some work began to change, particularly in the way users collaborated and communicated with each other. Since the iPad became most users' primary information repository, they incorporated other kinds of reporting, note taking and even photographs into their decision-making processes. Users now take photos using the iPad to capture store layouts, window designs and even competitor marketing efforts. These photos are then incorporated into future decision processes or referenced in meetings with others. Overall, GMobile provides users with more and better information, leading to improved, more fact-based decisions.

Strategic Benefits. BA also delivers strategic benefits to GUESS. One important benefit is that users develop a deeper understanding of the business. GMobile users cite numerous examples where this understanding has resulted in stronger business performance. One merchandiser used the app to understand how the launch of a new product performed in its very early stages within North America and how that performance translated into South American market performance. This understanding led to better purchasing and distribution decisions, and, ultimately, more sales of higher profitability items in her region. Another user applied BA to identify size profiles for stores, discovering that some stores tend to have customers who purchase smaller sizes and other stores tend to sell a greater number of large-sized clothing.

> *"Once you incorporate size profiles into your decision processes, you actually increase your sales in every store by some amount, because now all these people who are extra-smalls are not walking [out the store], as opposed to other stores where people who are larges and extra-larges are walking because we didn't give them enough. You increase your business and you reduce your markdowns because you no longer have extra units of some items sitting in a store."* Director of Factory Planning, GUESS

GMobile also generates intangible strategic benefits. Use of the iPad app communicates the perception that GUESS operates in a leading-edge and "hip" manner, which resonates well with its many partners around the globe. Additionally, the adoption and popularity of this iPad initiative fosters innovation internally at GUESS, prompting other iPad-related projects elsewhere in the company.

Summary of GUESS's Enterprise Business Analytics Capabilities

Figure 5 summarizes GUESS's key enterprise BA capabilities. The company achieves standardized and high-quality data from its PLM system and enterprise data model, and delivers data for analytics via a column-oriented data warehouse appliance. It also includes photos as a data source to facilitate consumable reporting.

The company offers a wide array of BA tools (e.g., ad hoc queries, BlackBerry reports, web-based dashboards and GMobile) to its executives, designers and merchandisers across the globe. The IT team uses agile development methods and user shadowing to identify business requirements, and leverages a graphic designer, app developer and strong vendor relationships to deliver leading-edge applications that maximize the device used for delivering BA to users.

Business users adopt BA because the tools are easy to use and useful to their work processes; the tools also facilitate collaborative decision-making processes. The GMobile iPad app further engages users by offering an enjoyable experience. The business-savvy IT team and strong IT/business relationship keep the BA efforts aligned with real business needs, resulting in transactional, informational and strategic benefits for GUESS.

Recommendations for Maximizing Value from BA Investments

The following five recommendations—two concerned with speed to insight and three with pervasive use—will help IT leaders maximize the value from their BA investments.

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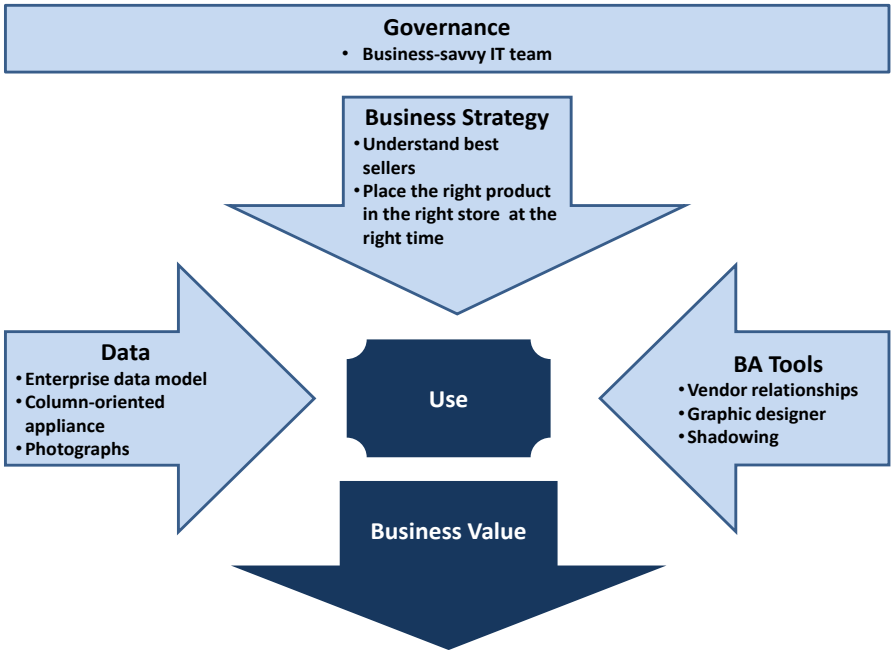
Figure 5: GUESS's Enterprise BA



Recommendations to Drive Speed to Insight

1. Create an Optimized Ecosystem of Advanced and Traditional Data Technologies. Organizations should incorporate a variety of database technologies into data architectures as BA techniques evolve and new sources of data become available. There is no longer a "one-size fits all" technology for BA. Thus, after identifying unique data processing needs, IT leaders should invest in a set of technologies to address those needs. The future data architecture will be an ecosystem of technologies that can concurrently process unstructured data, streams of real-time data and large volumes of historical events. Speed to insight will correlate with the IT group's ability to match processing needs with processing capabilities.

2. Develop Data Standards, Even if it Means Creating a Standards Layer on Top of Diverse Systems. Standardizing data at an enterprise level will only get harder as data architectures increasingly evolve to the federated, ecosystem approach. A federated architecture, however, does not reduce the need for data standards. In fact, a data standards layer becomes even more important for automating data integration and data-quality processes to achieve fast speed to insight. If standardized data sources are not possible, consider enterprise data models, an enterprise platform system (e.g., PLM at GUESS) or a master data management initiative.

Recommendations to Drive Pervasive Use

3. Invest in Business-savvy IT Staff. Business-savvy IT professionals are particularly important in BA for two reasons. First, they ensure that business requirements are met; research shows that meeting business requirements drives usage. Second, business-savvy IT professionals ensure that the business requirements correctly address the company's real business needs. Some IT groups are fortunate to have staff with long organizational tenures and deep business knowledge. Those that do not should consider investing in rotation or training programs to develop business-savvy abilities.

4. Encourage User-intensive Development Practices. Even the most business-savvy IT professionals may neither understand exactly what business users do each day nor how and when they make decisions. Practices that help developers understand user work styles and behavior, such as shadowing, agility and co-location, can improve BA development outcomes. This is likely a key reason behind the sharp rise

in agile development methods for BA projects over the past few years. The more time that developers spend with users, the more nuanced their understanding of how to shape BA to make tools and applications more useful and easier to use.

5. Exploit the "in" Technology. IT leaders should embrace the new technologies that come to market as a way to excite and engage BA users. Since each device has both unique capabilities and constraints, consider hiring specialists who can exploit the capabilities and mitigate the constraints of a specific technology. For example, to leverage an iPad device, consider hiring app developers and graphic designers skilled in shaping the technology's visual experience to incorporate geospatial awareness and/or photographic images in workflows. At the same time, the iPad's technical limitations and security risks need to be addressed with appropriate BYOD policies and other controls.

Concluding Comments

The Enterprise Business Analytics Capabilities Model offers an approach for articulating key practices that build and shape BA capabilities. Our research suggests that once BA capabilities are established, business value is maximized by using practices that drive speed to insight and by making BA usage pervasive across the enterprise.

The benefits from BA will be both tangible and intangible, ranging from very tangible productivity improvements (such as less paper-reporting and time spent in report preparation) to intangible benefits (such as improved company reputation and deeper strategic business understanding). All of these benefits are important for maximizing BA value.

The experience of GUESS with GMobile shows what can be achieved. Having established enterprise BA capabilities over the past decade, GUESS is now focused on reducing the time it takes to transform data into usable information (i.e., speed to insight) and deepening the usage of BA across the enterprise (i.e., pervasive use). Further, as BA capabilities evolve to incorporate new trends, such as big data sources and cloud-based architectures, CIOs should monitor how these trends can be leveraged specifically to drive speed to insight and pervasive use to maximize value from business analytics.

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Appendix 1: Practices that Facilitate Speed to Insight[10]

Company	Project	Speed to Insight Practices
Healthcare	• On-boarding and standardizing new data sources; ongoing data quality control	• Configurable, metadata-driven platform • Ability to self-configure field-level quality control levels • Automated business rules repository
Automotive	• Agile, iterative development for data warehousing	• Automated testing to enable real-time feedback of development changes
Transportation	• Data validation and certification process for on-boarding and sharing data	• Data standards • Business rules engine to manage industry-level data sharing
Financial Services	• Daily data processing performance improvement	• In-database processing • Parallelism
Aerospace	• BI report development	• Lean framework adapted for agile BI • BI competency center • Dedicated/co-located teams
Healthcare	• Enterprise data integration architecture, which supports metadata management and service-oriented architecture	• Model-driven, wizard-based data services • Data standards • Metadata
IT	• Data mapping for integration processes	• Automated data-mapping process • Integration center of excellence
Insurance	• BI reporting	• Agile development process (e.g., co-location, story cards and four-week roll-outs)
Financial Services	• Data integration and delivery	• Virtualization architecture • Data standards • Metadata • Data services
Energy	• "Live" operational dashboards	• Complex event-processing technology • Business activity monitoring • Visualization
Internet	• Data warehousing and reporting on Internet data	• Hadoop[11] solution to process large volumes of unstructured, real-time Internet data
Financial Services	• Compliance reporting	• Metadata-driven reporting architecture that automatically adjusts to complex changes to reporting requirements
Healthcare	• Dashboard reporting methodology	• Dashboard delivery process for highly visual, standardized reporting • Center of excellence • Dashboard design catalog, which promotes visualization best practices
Insurance	• BI reporting	• Agile methodology • High business user involvement
Pharmaceutical	• Master data management	• Master data management platform

10 This table lists the practices from companies that applied to The Data Warehousing Institute's 2011 and 2012 best practices competition in the emerging trends category.
11 A software framework that supports data-intensive distributed applications under a free license.

Appendix 2: Practices that Facilitate Pervasive Use[12]

Company	Project	Pervasive Use Practices
Aerospace	• BI reporting	• Graphical delivery • Dashboards • Prompt-based reports • MDX[13] functions
Insurance	• Campaign management	• Automated model scoring • Excel interface • Sandbox environment
Call Center	• BI reporting	• Advanced visualization • Dashboards • Mobile delivery • Collaboration supported by having users rate, comment on and discuss dashboard content
Healthcare	• BI reporting	• Mobile delivery • Advanced visualization • Geographic-specific reporting based on location awareness
Financial Services	• BI reporting	• Parameterized reports • Key performance indicator wizard to generate custom dashboards • Advanced visualization • Gamification framework that wraps a game layer around operational reporting
Restaurant	• BI reporting	• Self-service • Data standards
Biotech	• BI reporting	• Mobile delivery • iPads • Mobility center of excellence • Video training clips
Internet	• BI reporting	• Self-service • On-line portal • Knowledge management, allowing user to share, discuss and rate analytics practices

12 This table lists the practices from companies that applied to The Data Warehousing Institute's 2011 and 2012 best practices competition in the emerging trends category.
13 MultiDimensionalEXpressions—a multidimensional query language.

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