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Contributor:

Eric Williams, retired Executive Vice President and Chief Information Officer at Catalina Marketing Corp., spent nearly 20 years directing strategic technology, research and development and new application development; he also held the position of Chief Privacy Officer. During his tenure, Williams led the development of Catalina’s multi-petabyte data warehouse (one of the largest transaction-level databases in the world) and was also instrumental in developing the first Internet-delivered loyalty marketing solution for basket-level data management. Under his direction, Catalina was the development partner and one of the first companies to implement in-database predictive analytics that allowed data mining technologies to operate in the database.

Previously, Williams was Vice President of Research and Development for Catalina Marketing and Vice President of Retail for Catalina’s SuperMarkets Online division. Williams is an inventor with both US and international patents to his name. With more than 30 years of experience and a broad industry perspective, his background includes management, sales, marketing, systems design and development and operations positions with retailers, software development and information technology companies.
Everybody’s Talking About Analytics

Check out the latest IT magazines and analyst reports and you’ll find that everybody’s talking about analytics – predictive analytics, big data analytics and more. Why? Because it promises to give companies breakthroughs in customer and business insights that – when used wisely – can result in significant competitive advantage. As explored in the SAS white paper Game-Changing Analytics: How IT Executives Can Use Analytics to Create Innovation and Business Success, it’s no secret that information technology can help organizations transform and differentiate, accelerate the pace of business, analyze markets and customers and create new revenue opportunities.

At the same time, business decision makers have also witnessed first-hand how breakthrough technologies such as big data, high-performance analytics, cloud technologies, and in-memory analytics and data management can enable innovations that drive revenue, competitive differentiation and business transformation. As illustrated in Figure 1, business managers and analysts, IT professionals and executives, data miners and statisticians, and more are increasingly dependent upon analytics to do their jobs and make informed decisions. So the pressure is on IT executives to deliver more business value through analytics.

Some IT departments believe that they are already doing analytics – for example, because they are running detailed reports on data, or running multiple forms of business intelligence (BI); in many cases, this means using Excel to crunch numbers. But the fact is that these are not examples of true predictive analytics because they are not transforming data into new insights – something that people don’t already know.

BI, reporting and visualization tools are essential components to enabling analytics within an organization. These tools organize large amounts of data and present it as information that helps people see what’s happened in the past – for example, what sold in different markets and at what price, or the cost of those sales.
But historical perspectives alone don't necessarily help decision makers address the realities of today's businesses. For example, they also need a way to:

- Predict who, in the future, will be interested in a new product or service.
- Forecast sales volumes and thus production volumes.
- Predict the effect of lowering the price of a product or service, or bundling items.

These are examples of the kinds of actionable insights that analytics can provide – and it does it through the scientific process of transforming data into fresh insight that helps people make better decisions.

What's the Next Step for IT Leaders?

As an IT executive, you probably get pulled into departmental projects and receive requests for new analytics solutions all the time. Some of your departments may have gone off on their own to start small analytics projects, resulting in many pockets of analytics across the enterprise. If this is the case, you may be looking to take an enterprise-wide approach to analytics – both to control costs and reuse data and applications for greater efficiency. You may also be looking to deliver more strategic value to your business by leading your executive team to adopt analytics-driven planning and decision making. For many CIOs, this is the ideal way to secure your seat at the executive table.

Regardless of what's driving your interest in analytics, there are essential components to successful enterprise analytics strategy, as you need to take into account people, process and technology (see Figure 2). If you are looking to better understand what true analytics are and what’s needed to enable a solid, enterprise-class analytics capability that all of your departments and lines of business can leverage for competitive advantage, this paper is for you. Most importantly, we’ll discuss key components to implementing true analytics, including common pitfalls and best practices for each.

The Many Faces of Analytics

- **Predictive Analytics and Data Mining** – Build descriptive and predictive models and deploy results throughout the enterprise.
- **Visual Analytics** – Enhance analytics effectiveness with dynamic data visualization so you can immediately understand the effects of your different activities or choices.
- **Forecasting** – Analyze and predict future outcomes based on historical patterns.
- **Model Management and Monitoring** – Streamline the process of creating, managing and deploying analytical models so you can quickly monetize the value creation of these analytics.
- **Operations Research and Simulation** – Leverage optimization, project scheduling and simulation techniques to identify the actions that will produce the best results so you can move quickly on those solutions that demonstrate the most value to your organization.
- **Quality Improvement** – Identify, monitor and measure quality processes over time so you can quantify the value generated on these successes and curtail those that are not providing the expected results.
- **Statistics** – Use statistical data analysis to drive fact-based decisions so you can build upon the successes provided by your predictive solutions.
- **Text Analytics** – Maximize the value buried in unstructured data assets.
The Five Essential Components of Enterprise Analytics Initiatives

In our work with thousands of companies, we’ve identified five essential components to a successful enterprise analytics initiative:

- Get the right data together and manage it efficiently.
- Make data accessible so people can play with it freely and innovate.
- Identify analytics tools and structures for the enterprise.
- Create a culture of analytics that’s built on reproducible processes.
- Measure how analytics is changing your business.
#1: Get the Right Data Together and Manage It Efficiently

The foundation of any successful analytics initiative is unified, consistent, regularly updated and relevant data from trusted sources. When everyone runs analytics using the same set of data, everyone works from a single view of the truth. This facilitates rapid, collaborative problem solving and decision making. As you start to pull together data, talk with business users about the final business outputs they need and make sure you have the right – and relevant – data available to you to meet their requirements. In some cases, this may mean gaining access to departmental data stores and securing buy-in on the best data source for various types of information. All data sources must be reproducible sources that get updated regularly.

The problem is that most companies have disparate data sets scattered across the enterprise, created and maintained by different departments. They have to deal with redundant and inconsistent data (for example, customer data), data that’s not updated at the same time and other inconsistencies. This leads to analytical results (as well as BI and reporting results) that are inconsistent as well – and do little to bring clarity to decision making at the management and executive level.

Pitfalls to avoid

Some companies fall into the trap of thinking that in order to do analytics, they have to invest in an enterprise data warehouse (or EDW) – a massive and costly undertaking that involves bringing all enterprise data warehouse into one physical location. But in reality, few companies need to make this investment in order to fully leverage even the most advanced analytics. In addition, companies run the risk of being overwhelmed by the scale of such an initiative; in some cases, they never complete it due to cost and resource issues – and as a result, never implement analytics. There are other excellent and much lower-cost solutions that enable you to bring together the right data for your analytics needs.

In addition, don’t fall prey to the “square peg in round hole” problem. For example, you may be tempted to try to use an existing EDW designed for BI and reporting for analytics purposes. But technically, this is impossible. You can’t run analytics efficiently if data tables are too long, for example. The structures are simply not designed for it.

Best practices for success

Work with business users and executives to determine exactly what data you need to address their needs and get it from the same, best sources every time. At the same time, choose an infrastructure for storing this data that will minimize data movement and support what the business wants to accomplish from an analytical perspective.

Tip: Don’t Over-Cleanse Your Enterprise Data

Managing data also means ensuring quality by normalizing the data. But be careful that you don’t cleanse away the analytical value of the data itself. For example, you can cleanse away anomalies that analytics would identify and use to reveal something potentially very important.

Tip: Plan for the Future Now

Ensure that what you choose will be flexible and future-proof; the needs of your business will change and you’ll need to make room for more data – and different kinds of data – over time.

Tip: Production Data Must Be Protected

Don’t build analytics on top of your production data. While it’s technically possible, it’s difficult and adds unnecessary complexity. With older data warehouses with significant legacy attachments, it can take too long to generate reports, load secondary tables and export larger data volumes. Since the cost of a standalone data mart has dropped so significantly in recent years – and you don’t want any analytics-related testing or changes impacting your production systems – it’s best to build a copy of your key data elements and keep analytics and production systems separate.
Both a centralized EDW approach and a decentralized approach (for example, the creation of an analytics sandbox) can work well, depending on your IT landscape, and neither will jeopardize your operational systems and data. A sandbox is often referred to as an “analytics data warehouse” – but don’t get hung up by the “warehouse” name and worry this will be one more data source your IT department needs to control. An analytics sandbox is totally separate from your production EDW. You can choose to pull data from your production EDW into it for formatting purposes, but you can’t merge data or risk corrupting your enterprise data. And it’s more affordable than you may think; it used to cost tens of millions of dollars, but now it typically costs $750,000 to $1 million for an analytics warehouse, or sandbox.

#2: Make Data Accessible So People Can Play with It Freely and Innovate

Businesspeople are hungry for insight – so if you build them a solution that can give them the insights they need, they will come. But often, getting to valuable insights requires experimentation on their part. So it’s important to empower people to safely “play” with your enterprise data. Innovative experimentation uncovers “gold” buried in your data – new opportunities and paths to improvements, trends, predictions and more. So make enterprise data readily available, approachable and give people a well-rounded set of analytical tools so they can unearth valuable insights.

Pitfalls to avoid

Do you tend to think like a data constrainer out of habit? If so, you’re not alone. IT executives are right to have concerns about data accuracy, access and more. Business executives tend to blame IT if numbers don’t add up, so IT often goes to great lengths to vet data before it delivers anything – and when it does, it takes weeks and even months and only in a highly controlled environment. But in the world of analytics, delays giving people access to data can result in poor decisions that hurt the bottom line. Many people spend weeks or even months trying to make sure information being provided to the business is perfect – when in some cases, directional information is all the business needs to make an informed decision.

Best practices for success

Think like a data provider – not a data constrainer – that views data as a true enterprise resource. Consider boldly communicating to the business, “I want to give you faster, easier access to data, but let’s be a team. If something is wrong, let’s fix it together. Keep your feedback constructive and not attacking. And over time, you’ll get more and more of what you want, faster.” This will strengthen your relationship with the business over time – and accelerate time to value on analytics and data investments. In addition, invest in the right mix of analytics tools that will make it easier for people to generate useful insights and knowledge.
Make sure your IT department communicates with the businesspeople making requests to ensure that they are on the same page regarding the timeliness and use of the information. As an example, if the data is only going to provide a trend line to help the business know whether to continue on a specific course, there is no need to provide a single number with three-decimal precision. The process to produce that level of accuracy may take weeks – and the business will have already made a decision and moved on by the time that the analytics team provides the answer. That can be very frustrating to the analyst as well as the business.

**#3: Identify Analytics Tools and Structures for the Enterprise**

Some companies use Excel as their primary BI tool and others have every BI tool known to man. But neither end of the continuum is optimal.

For instance, because Excel is not a predictive analytical tool, relying on it exclusively limits people’s ability to gain valuable insights and improve decision making. Consider the fact that Excel can’t support predictive modeling and forecasting, or automate analytical processes such as automated customer scoring. In addition, Excel is a single-user solution, so people can’t use it to share and collaborate with others in real time; as a result, it tends to foster siloed, departmental views of the business that inhibit collaboration and decision making. And finally, Excel can’t be used as a platform for centrally running other BI apps and making them available to everyone across the business.

The alternative scenario – running large numbers of redundant analytics applications – results in other problems. First, it’s costly to the business and consumes IT resources unnecessarily. For instance, you can’t get volume discounts on software licenses or scale the cost of software training. You also have to ramp up IT staff to maintain each app – and then bear the high cost of day-to-day maintenance and operations. Nor can you scale application-specific knowledge and apps across the enterprise – the key to maximizing ROI for the business. You end up with small pockets of knowledge about different apps – and insufficient adoption to see sufficient returns on investment.

But even more importantly, when people use lots of tools to do the same analytical task, analytical results are not reproducible across departments. Teams will use different software, which will generate different analytical results – even when they are using the same data – because each application uses a different methodology to arrive at the desired outcome. As a result, people will no longer have a single view of the truth.

While SAS is gradually seeing a merging of BI and analytics, it’s true that there’s no single BI or analytical tool that will meet every need. And certain lines of business will naturally prefer a specific tool because it’s what they learned in college. So you will need a mix of analytical tools – but not so many that you lose scalability, cost-effectiveness and a single view of your business.
Pitfalls to avoid
Avoid the “Wild West” approach to analytical tools and structures where everyone is allowed to do their own thing. As stated previously, this approach means analytical results won’t be consistent across departments – and without reproducible results across departments, there’s no single view of the business. People are right back where they started before you implemented analytics – arguing over which data and results are correct. Equally important, these debates make it hard to integrate BI and analytics into your business and decision making processes – the ultimate goal.

Best practices for success
When developing a repertoire of analytical applications for your business, take a consultative IT approach with each department and line of business. Meet with managers to understand their unique needs and goals when it comes to BI and analytics. Throughout the process, you’ll build stronger relationships with key decision makers and influencers with whom you will need to agree on a smaller, yet complete, set of analytical tools that everyone will use – tools that balance process (for cost-efficiency and scalability) and flexibility (so users don’t feel too constrained). Be sure to explain the benefits of your recommendations for them and for the business overall, and especially how everyone will have a single view of the business that everyone trusts.

#4: Create a Culture of Analytics That’s Built on Reproducible Processes

Why do programmers develop a requirements document for each new software project to specify what functionality should be coded? One reason is that it empowers any developer to pick out a piece of functionality and work on it – and in the end, the company still ends up with a cohesive, functional piece of software.

There’s power in having a structure and process to developing software – and that applies to custom analytical models. When you use a consistent structure and process for creating models, it’s easy for people to understand how they work – even those created a long time ago using a complex mix of different tools. Analysts have the insights needed to reproduce models and evolve them as business needs change. And when people ask, “How did you build this model? Why should I trust the results?” analysts can explain with confidence. This is essential to integrating analytics deeper into your organization.

Pitfalls to avoid
Too often, IT departments do not establish a coordinated structure and process for developing analytical models, integrating their use into the business and facilitating the sharing and reuse of models across the enterprise. This failure leads to poor business-IT alignment, resulting in models that don’t meet the needs of decision makers. As a result, your organization never realizes the full value of analytics.
In addition, many companies fail to use past experience when developing models to predict future events. Rather than learning from what worked – or didn’t work – before, they start from scratch each time they develop an analytics model. This wastes time and resources – and prevents learning from experience and the development of best practices.

**Best practices for success**

Build on successes and learn from failures so that the structures and processes you use for developing analytical models evolve and deliver more value over time. These structures also enable users to attack the same business problems using multiple analytical techniques and then measure the success with specific business questions. For example, if you build a model to identify possible consumers who might be interested in a new product or service, be sure to gather data about the consumers who respond to the promotion or advertisement and add that knowledge to the model; this will make the model more efficient and accurate.

At the same time, work to create a “culture” of analytics that encourages the discipline needed to use analytical tools well. For many organizations, this means creating a center of analytical excellence. For example, rather than having a separate data mining team in each business group that works independently and never shares what they learn, you can have a center of excellence that includes a team of data mining experts shared by all business groups. This centralized team is responsible for sharing best practices, reusing what’s created, assessing the success and failure of different initiatives and more to save time and resources and accelerate time to value.

**#5: Measure How Analytics Is Changing Your Business**

Finally, it’s important to measure the effectiveness of your investments in analytics and understand how they are improving your business. For example, talk with business executives to understand and document how analytics is helping them make better decisions, develop more effective strategies, identify and capture new opportunities, and more. If you can’t prove what has changed and improved through the use of analytics, it just gets harder to drive adoption across the enterprise and secure ongoing funding for future investments.

**Pitfalls to avoid**

If you are not seeing measurable changes and improvements in your business as you roll out analytics, it may be due to common barriers such as:

- Insufficient training and education of decision makers so they understand how they can use analytics to make better, smarter and more profitable decisions.
- Lack of technical support to help users fully leverage the analytics available to them.
- Failure to measure the right thing. For example, don’t measure the time it takes to produce something if what you are after is better quality.
• Often, analytics ultimately leads to new behaviors and new ways of decision making. Measure on an ongoing basis if the desired behavior is achieved with embedded analytics in decision making.

Best practices for success

As you make plans to invest in new analytical tools and models, conduct a survey of business decision makers early for their input and feedback. For example, find out whether they think your plans will help them – and if so, how? And ask how you can tailor planned investments to better meet their needs.

Equally important, define the criteria for analytical effectiveness so you can measure and drive improvements over time. For example, define metrics to capture:

• The extent to which people are using the analytics you are supporting.
• Whether you are producing what people need and use and whether it provides insights that people can act on.
• Who is using apps and requesting reports and analysis – and whether these requests are increasing over time.
• The extent to which people are making buying decisions based on forecasts built on data versus “gut instinct.”

And finally, develop a communication plan that educates and informs people about how internal leaders are using analytics to make better, smarter decisions. Success stories can educate, inform and inspire faster adoption of analytics.

How SAS Can Help

Are you ready to develop an enterprise strategy that helps your organization fully leverage analytics? For example, what if you could transform data in ways that tell key business decision makers something that they don’t already know? This would, for example, empower executives to make more strategic business decisions by enabling them to simulate the future consequences of different choices and scenarios and make the choice that will result in the best improvements in KPIs. And line managers could be more tactical by optimizing how they use human resources, equipment and time by leveraging the ability to forecast and predict. The manager can balance the demand and supply to obtain sustainability, growth and profitability.

The opportunities and potential for business impact are huge – so what are you waiting for? To learn more, visit SAS online at sas.com/software/it-cio-enablement/.
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