Analytics "yield of dreams"

If you build it, insights will come

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Turn analytics into captured value

Few would deny the importance of using analytics-derived insight to make smarter, faster business decisions. Data-based analytics can reveal client preferences, reduce operational costs and increase marketing effectiveness. However, turning analytics into captured value (return on investment) is no easy task. Good data science is a necessary foundation for every analytics project, yet many projects still fail to achieve their full potential. Analytics value is not just derived from obtaining data volume and variety any more—now critical value drivers are led by veracity (trustworthiness) and velocity (speed to action).[1]

Executive summary

Through years of trial and error IBM has tested how analytics can most effectively drive business outcomes. As a result, we have found that cultural and human factors (buy-in, accountability, trust) weigh just as heavily, if not more, as structural and functional factors, such as financing, process and tools.[2]

Our experience working with a number of IBM business units has enabled us to identify four critical success factors that can help optimize the outcomes of business analytics endeavors (see Figure 1).

Figure 1

How analytics can most effectively drive business value when set within an iterative business system incorporating four critical elements

1. **Prime the field**
   - Identify / vet viable data sources
   - Work with stakeholders to agree to the optimal sources, however imperfect
   - Communicate / mandate use of choice

2. **Ease their pain**
   - Align with business need / pain points to inspire immediate action
     - Design analytics tools for easy use
       - Leverage early adopters to "go viral"

Achieving a "yield of dreams"

4. **Expect improvements**
   - Review and refine the data inputs
   - Test and learn
   - Build a culture of experimentation

3. **Go the distance**
   - Build a breadth and depth of stakeholder support
     - Anticipate and mitigate business disruption
   - Invest in long-term resources

Source: IBM Institute for Business Value.

The analytics "yield of dreams" requires incorporating four critical elements.

Prime the field
Select data sources based on the potential for acceptance, rather than initial perceived perfection.

Ease their pain
Provide relevant insights that are easy for users to quickly understand and act upon.

Go the distance
Mandate the integration of analytics into the business-as-usual workflow.

Expect improvements
Incorporate feedback mechanisms to cleanse data and foster new stages of future analytics.

Figure 1 illustrates how analytics can most effectively drive business value when set within an iterative business system incorporating four critical elements.

By employing this framework within projects at IBM, we have achieved better data quality, produced more effective analytics and realized exponential value.

Prime the field: Aim for consistency over perfection

Obviously, we all want perfect, trusted, well-maintained and accurate data sources—that's ideal. It's also a myth. Even getting close to perfection can be an arduous and expensive process, especially when combing multiple, disparate sources with millions of data points.

That said, more than 50 years after the term "garbage in, garbage out" was coined, we at IBM still grapple with issues of non-standard tool acceptance and source use, leading to errors that technology solutions (i.e., automation) cannot fully mitigate.[3] For example, two employee attrition reports can be pulled from the same automated system, but if there has been no agreement on the timing of when report should be pulled, the two data sets may vary.

Without careful attention, even seemingly trusted sources can be flawed. In one recent example, we were involved in an initiative to reduce our sales cycle time by introducing improvements such as hand-off reduction, automation and non-essential step elimination. To measure baseline cycle time, deals were tracked in a pipeline tool maintained by IBM sellers. This source was agreed upon at the project onset, and results measured by tracking improvements in the average time that deals moved through the pipeline. We were able to estimate an accurate impact to win-rate and revenue improvement—initial results matched projections almost exactly. Executives reviewed our methodology and supported the findings. Given our success in the United States, we quickly moved on to Europe and eventually to Asia.

Seller pipeline reporting in the United States is mandated, resulting in an extremely high rate of participation. However, participation rates vary significantly by country. By the time the initiative rolled into Asia, pipeline use—and, thus, accuracy—fell dramatically. Results became much less reliable, and our data crept from trusted towards "garbage" with each new geography (see Figure 2).

Figure 2

One lesson learned from IBM internal projects is to recognize how usage and policies may vary across geographies, regions or offices

Success factor 1: Prime the field
Aim for consistency over perfection

Source: IBM Institute for Business Value.

The lesson learned was that gaining broad-based buy-in and standardized use of a data sources is imperative to success. However, if a source isn't universally accepted or used consistently by stakeholders, an analytics project will not optimize the otherwise possible results.

Commonly, data is structured — e.g., defined, managed and maintained — differently across departments, and tools/procedures don't extend the same way across the global organization. As a result, it's rare to start an analytics project with a universally accepted dataset, but it is critical to get there.

To do this you must:

1. Identify and vet all viable sources that are currently used by stakeholders
2. Work toward agreement on the optimal sources for the future, however imperfect
3. Communicate and mandate use of the choice.

While each of these best practices was borne out of experience on multiple projects within IBM, we'll use one project to illustrate their relevance and interconnectivity in priming the field for success. Within IBM, we've established consensus on data sources in a variety of ways. Early in 2014, we conducted a project to integrate and automate several centralized data sources to provide refreshable visualizations to marketing executives. Data included financials, headcount and market opportunity — each maintained by a different IBM unit.

Identify and vet all viable sources currently used by stakeholders
In the process of identifying these sources, we found that each contained caveats that executives had learned to work around, supplementing elements from their own manual files in some cases. This lengthy, ad-hoc, error-prone process of data supplements provided

incremental improvements to the data; however, these modifications could not easily be automated and didn't align with our need for quick refresh and frequent use. To address this, we opened communication channels with these executives to discuss standardization across all existing data sources.

Work toward agreement on optimal sources for the future, however imperfect
While the significance of data accuracy should not be ignored, a more important early success factor is universal acceptance of the data source(s) by the end-users. For weeks, we documented feedback and clarified use cases. We logged potential data sources, as well as gaps where the dataset was misaligned with business goals. Project leadership and several super-users reviewed our recommendations about the data source options. Ultimately, they agreed that selecting compatible data sources to meet 80 percent of their immediate needs was the best approach. Their preference was to be "precisely inaccurate" as a group, rather than "completely disaggregated" by incorporating local data sets with no standardized quality control. They moved forward with three data sources, understanding that improvements would be made to these sources over time.

Communicate and mandate use of the choice
Post stakeholder agreement, the optimal sources were consolidated and aligned. We immediately documented gaps and planned for the next generation of improvements. End-users understood the mandate to leverage the analysis and visualizations generated by the analytics tool to answer key business questions. With global stakeholders aligned, reports developed consistency and executives received visibility into a common set of metrics to support informed decision making. In the past, getting close to this point required two weeks of manual work by a single individual; this process has now been transformed into an hour of seamless data refresh based on an agreed set of data sources and assumptions.

Communications channels were opened to discuss data standardization across all sources.

Ease their pain: Reveal insights to drive action

Business analytics in a vacuum cannot drive value. Engagement from business leaders is critical for adoption, but these professionals are extremely busy and already inundated with information.

At IBM, we confronted adoption hurdles first-hand when we developed a sophisticated analytics model that extrapolated patterns from historical purchase data to optimize future revenue growth. Our intended end-users were sellers across the globe, and the project had full support of IBM worldwide executives. When the model was completed and packaged into an interactive tool, it was deployed to regional sales management teams. We scheduled a few brief training calls to explain the analysis; however, attendance was low.

In retrospect, we should have engaged the local sales teams from the beginning. As they are closest to our customers, we could have gained valuable insights and incited buy-in for the model from the onset.

We also didn't allow enough time to explain the analytics and train users. As workloads increase and deadlines loom, executives need to be mindful of the time required to understand and adopt new analytics. For example, our project was deployed in November, when sellers are under pressure to close deals before the end of the year. Naturally, the timing was ill-conceived for smooth adoption.

Last, we learned the importance of strong design principles, which help ensure the analytics are delivered in a user-centric, clear and intuitive way. Organizational budgets vary in analytics solutions. In our case, we leveraged internal statistical tools and packaged the findings in a desktop tool that was easy to navigate, but required physical distribution (versus a server-hosted environment). While desktop platforms are generally low-cost and easily accessible to internal stakeholders, they are also more limited in their design and raise challenges about version control, timely refresh and compatibility with earlier software platforms. The latter was a particular hurdle for our project, as we learned that sellers used an earlier version of software than what was used to package our findings. This resulted in additional iterations.

For adoption to take hold, business leaders need to be armed with tools and data that align with their needs and integrate seamlessly into their daily business behaviors. With an emphasis on enabling speed to action, the following three tactics are vital to drive adoption:

1. Align with business need and stakeholder pain points to inspire immediate action
2. Design analytics tools and visualizations for easy use and comprehension
3. Leverage early adopters to "go viral."

Recently, we applied these lessons to a related project within IBM that enabled sales and marketing managers to track weekly pipeline development against commitments. Our meticulous approach, from design to launch, ensured that our analytics solution was rapidly consumed and leveraged for action.

IBM extrapolated patterns from historical purchase data to optimize future revenue growth.

Alignment of interests and methods was facilitated by frequent meetings with data providers and stakeholders.

Align with business need and stakeholder pain points to inspire immediate action
Frequent meetings with data providers and stakeholders from the onset helped to align our interests and methods. We engaged the sales management teams to prevent any conflicts in our methodologies and identify pain points. Specifically, we focused on resolving issues of insufficient data granularity and the exclusion of divisional pipeline goals. When we encountered challenges with data granularity, we proceeded with modeled assumptions based on available data, while pursuing additional data for the future. When we learned that divisional pipeline goals were documented inconsistently across each region, we structured an approach for standardization and incorporation into the analytics. To inspire action, our analytics solution was closely aligned to business needs and end-user perspectives.

Design analytics tools and visualizations for easy use and comprehension
We constructed a dashboard of data visualizations. We also graphically depicted account-level insights on purchase history, market opportunity and competitive footprints. The visualizations were easy to understand and the tool intuitive to use (see Figure 3). As the dashboard neared completion, we scheduled office hours by region, providing training and demonstrations. By accommodating a broad range of schedules and learning styles, training sessions were well attended and more effective.

**Leverage early adopters to "go viral"**
To help make sure that end-users knew how they could use the analytics for strategic planning, we scheduled individual calls with selected early adopters. We tailored each session and discussed tactical scenarios for translating insights to decisions and actions. When we finally launched the dashboard for global deployment, early adopters offered personal testimonies about how they used the analytics to drive value.

By hearing from their own team, marketing managers paid attention, and we benefited from increased credibility. Leaders also shared their enthusiasm by speaking about the value that this resource would drive for the business. This top-down excitement went viral. Global managers wanted to explore the analytics and see what the buzz was about. As a result, the dashboard has continued to gain momentum and is enabling real-time strategic decision-making.

Figure 3

The simple and intuitive layout that enabled IBM business managers to digest the insights and quickly translate findings into actions (illustrative)

Success factor 2: Ease their pain
Sales and marketing analytics dashboard

CAMSSS   Key Plays   Brand   NA CAMSSS   NA Growth   Notes   NA Acct
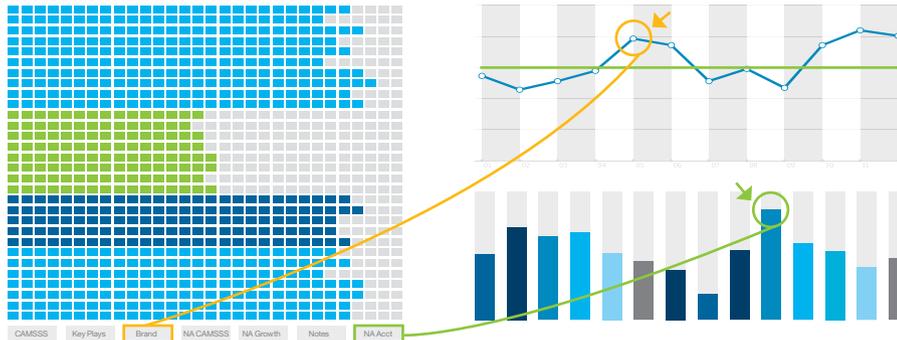
Source: IBM Institute for Business Value.

Go the distance: Adopt and embed analytics throughout the organization

The completion of an analytics project is a noteworthy milestone, but for organizations to successfully transform the way they make decisions, analytics must be adopted and embedded into everyday business processes. If this is not done properly, it is easy for managers to file away a one-time data analysis and continue with their busy schedules.

At IBM, we initiated an analytics project to simplify the incentive structure for commission-eligible employees. We carefully studied each of the 35+ rules for revenue uplift opportunity and measured the impact of these incentives on seller behavior. Given the resources and time required to calculate the existing incentive methodology, we were eager to learn of any ineffective rules that could be eliminated. At the conclusion of the project, we presented a comprehensive analysis of our findings, including recommendations for rules that should be modified or removed.

The sponsors of this study were now prepared to approach business leaders within IBM's sales organization to discuss incentive changes. However, the proposed changes were never made.

Why did this case for change fall short of actually driving change? From the start, this project did not have sufficient organizational backing. The intent was to use the study to gain support from key stakeholders and build momentum for action, but stakeholders, we discovered, had their own hypotheses that could have informed our approach. Furthermore, they did not like being handed an answer without being asked a question. It takes time to build strong support throughout the organization.

The second challenge with this project was the lack of long-term structure to implement recommendations. To drive sustainable improvement, organizations need to invest in the infrastructure and resources to support the desired change. The process of aligning incentives and behavior is not a one-time exercise, as new products and priorities emerge over time that impact seller behavior. Data analytics gave us the power to experiment with new inputs and react intelligently. By embedding an analytical approach within this process, and by providing technology and human resources to support it, we could have realized the full benefit of data analytics.

While changing business processes is no small feat, we have found that successful integration of analytics relies on three fundamental steps:

1. Build a breadth and depth of stakeholder support
2. Anticipate and mitigate business disruption
3. Invest in long-term resources.

Build a breadth and depth of stakeholder support
Analytics must be integrated into business processes to realize the potential value. In many cases, business partners bid with margins lower than the real potential value. An analytics team developed algorithms to signal unnecessarily low-margin bid requests, based on factors such as size and content of the bid, historical sales patterns of the partner, route to market and discount on list pricing. By embedding the algorithms into the tools used in the existing IBM business process for handling these transactions, the new analytics measures are now part of IBM's normal workflows.

Data analytics gave us the power to experiment with new inputs and react intelligently.

Broad stakeholder agreement is critical to analytics acceptance and adoption.

Given its impact on the everyday business, broad stakeholder agreement was critical to the acceptance and adoption of the analytics in this initiative. Success began with strong internal alignment among nearly 100 stakeholders. Semi-weekly meetings helped incorporate tight discipline to business objectives and allowed collaboration on problem solving. In addition, frequent status updates to senior leaders ensured that all interests were represented (see Figure 4).

Figure 4

Success began with strong internal alignment among nearly 100 stakeholders. Semi-weekly meetings helped incorporate tight discipline to business objectives and allowed collaboration on problem solving

Success factor 3: Go the distance
Change business as usual

Source: IBM Institute for Business Value.

Anticipate and mitigate business disruption

The challenge of introducing changes to the bidding process, while still aptly responding to sales opportunities, should not be underestimated. Thorough analysis was done to evaluate the delay in bid-response time and how this would impact partners and customers. Additionally, the changes were rolled out through a phased approach to help minimize disruption. Beginning in two pilot countries, the analytics were tested and business impact monitored. These efforts made it possible to enhance business outcomes through analytics, while continuing to accommodate business needs and stakeholders' expectations.

Invest in long-term resources

Initially, these bid reviews were done by existing resources, but we quickly determined that a larger team was required to uphold globally consistent methodologies; IBM executives recognized they needed to invest in sufficient resources to sustain the analytics over time. This led to the recruitment and onboarding of new IBMers. In addition to this review team, several IBM stakeholders from the original analytics development continue to review new data inputs and refine the approach. The business process changes we orchestrated were not easy or quick, but we recognized their critical importance to the long-term value.

Curiosity and analytical experimentation are traits of high-performing organizations.

Expect improvements: Feedback drives future advancements

Execution of the first three success factors lays the foundation for an iterative analytics model that can improve over time. Yet, like any appreciating asset, care must be administered to ensure that the established analytics mature properly.

In an example at IBM, we used analytics to determine the optimal balance between consultant supply and demand, using traditional inventory management principles to a build a model that considered demand fluctuations, lead times and profit implications for unstaffed resources. We defined the appropriate number of resources needed to help maximize revenue (by enabling quick response to opportunities), while minimizing lost productivity (resources underutilized between projects). The model dynamically forecasted demand, based on a direct feed to a "professional marketplace," where sellers indicate the win odds of pipeline opportunities. The operating model allowed business leaders to make resource decisions based on real-time data.

Unfortunately, this feedback loop was never established. By the time the system was ready to launch, priorities had shifted and there was no appetite for maintaining any excess resource supply. Naturally, business objectives can change, but high-performing organizations tend to remain curious and build cultures that value analytical experimentation. In many industries, such as consumer marketing, this practice has become the norm: try something, analyze consumer reaction, obtain feedback, and make critical adjustments (see Figure 5).

Figure 5

Qualitative and quantitative feedback can spur adjustments to future analytics that are in-sync with business realities, and lead to even better outcomes

Success factor 4: Expect improvements
Feedback drives future advancements

Source: IBM Institute for Business Value.

Business leaders can be rewarded with self-improving analytics systems by incorporating three steps:

1. Review and refine the data inputs

2. Test and learn

3. Build a culture of experimentation.

A few years ago, we launched a project to understand if some of IBM's products and services could be priced more aggressively. This undertaking illustrates these steps in practice.

Review and refine the data inputs

By exploring historical deal data, including win rates, margins, competitive factors and discounts applied, we found that the price-setting process successfully determined discounts to win the business, but lacked mechanisms to increase the price if the sales representative could win at a higher rate. We realized that sellers didn't have visibility and were not incented correctly to win business at the highest price possible.

Given the enormous business implications, it was easy to secure management buy-in to review and adjust seller incentives. For the first time, partners were compensated on gross profit rather than signings and revenue alone.

For two years following this change, the data inputs were carefully examined. Business performance was continuously fed back into the analytics to inform sellers when a deal could lead to a higher-than-average price point. An automated pricing tool presents sellers with real-time metrics including client history, past win rates, market factors and demand elasticity. This data set continues to improve as additional deal data is gathered, and opportunities for upward revenue growth have been identified with greater accuracy.

Test and learn

We initiated a test and learn cycle. Successful employees learn from their mistakes, which is why tenured employees are generally considered more valuable to their organizations. Similarly, analytics benefit from a track record of experience. In this case, our immediate results were significant: margins increased by 7 percent during this two-year period. While the initial analytics project lasted only three months, the ongoing review of margins is still underway. Perhaps there is an opportunity to grow margins even more. Qualitative and quantitative feedback can spur adjustments to future analytics that are in-sync with business realities and lead to even better outcomes. By restlessly improving our data and analytical approaches, we aim to optimize their potential long-term value.

Build a culture of experimentation

An important truth of business analytics is that it will never be perfect. Business decisions are rarely black and white, and it's not reasonable to expect analytics to sort through the gray areas before you do. But, that shouldn't cause paralysis. The key is to start simple with a manageable scope, then move to more complex solutions as needed. If done right, the process should reinforce itself—as you obtain more data, the analysis can be refined and insights improved. By fostering an experimentation culture at IBM, we have gained insights that have ultimately led to better business decisions.

Insights can be gained by fostering a culture of experimentation.

Conclusion

Figure 6

An iterative approach within each step moved projects forward to create sustainable analytics practices that enabled the organization to optimize the targeted business outcomes
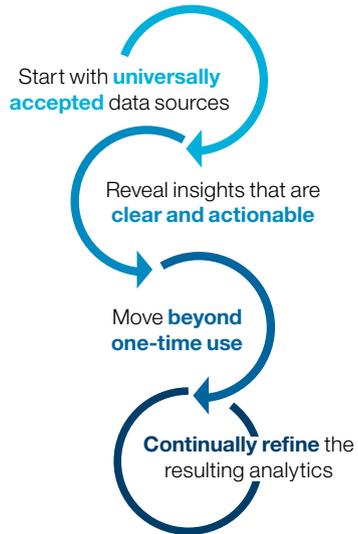
In 2013, IBM CEO Ginni Rometty predicted that in the coming years, "many more decisions at your company or entity will be based on predictive analytics and not your gut instinct or experience." Our recent project work has validated Rometty's hypothesis, as our internal partners are demanding data-driven guidance to inform their critical business decisions.

Start with **universally accepted** data sources

Reveal insights that are **clear and actionable**

Move **beyond one-time use**

Continually refine the resulting analytics

As the volume and speed of data continues to grow exponentially, business organizations need to fine-tune their practices to sustain robust data analytics for the future. An obvious prerequisite of this mandate is that an organization has the necessary cultural and human and technical resources to support work in data science and data management. Once these resources are in place, the establishment of strong business analytics practices will pave the way for leaders to capitalize on the vast potential of data to identify and capture competitive advantage.

Ready or not? Ask yourself these questions

1. Consistency is more important than perfection. What are you doing to create data standardization in your organization?
2. How is your organization making analytics tools and processes easy to use and understand for all who use them?
3. How are those tools and processes being embedded into the "business-as-usual" work flow?
4. Where do opportunities exist for feedback loops to help with continuous data improvement?
5. In what ways is your organization fostering a culture of experimentation?

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3 The term was brought to prominence in the late 1950s as a teaching mantra by George Fuechsel, an IBM 305 RAMAC technician/instructor in New York (Source: Butler, Jill; Lidwell, William; Holden, Kritina (2010). Universal Principles of Design.)