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RESEARCH NOTE

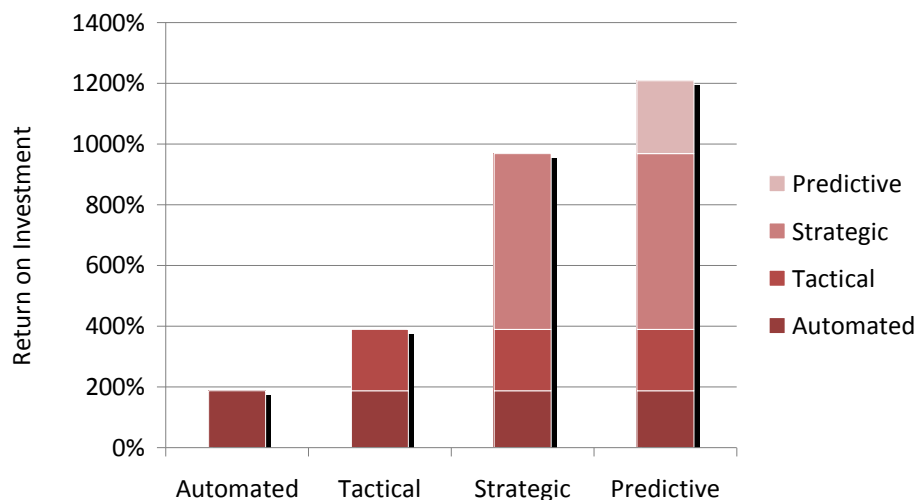
THE STAGES OF AN ANALYTIC ENTERPRISE

THE BOTTOM LINE

In its extensive look at business intelligence (BI), performance management (PM), predictive analytics, and supporting data-management technologies, Nucleus has found there are significant returns from becoming an Analytic Enterprise. By examining 60 analytics deployments, Nucleus determined that the more an organization spends on these technologies, the higher the returns on those investments will be. Organizations with analytics deployments focused on just automation earn an average ROI of 188 percent, while companies with analytics deployments that enhance organizational strategy and extend beyond the firewall earned an average of 1,209 percent.

THE BENEFITS OF BEING ANALYTIC

Having performed in-depth ROI analyses on 60 analytics deployments, Nucleus analysts have identified three important trends in organizations that deploy analytic technologies such as BI, PM, and predictive analytics:



- Organizations earn high rates of return on even small initial deployments.
- Beyond report automation, companies can use analytics to drive continuous improvements to business processes and decision making.
- As organizations become more analytic, they earn increasing rates of returns on their investments in analytics.

In our analysis of these stages, Nucleus identified a special type of organization, the Analytic Enterprise. An Analytic Enterprise is an organization that improves its competitiveness and operating results by continuously broadening and improving its use of analytics.

The ROIs included in this study were calculated based on data gathered during extensive examinations of 60 deployments, including interviews with end users. During these discussions, analysts gathered all data points required to quantify the benefits and costs of a deployment over a 3-year period.

THE ANALYTIC ENTERPRISE

As organizations become more analytic, they go through a significant evolution. Employees' work practices change as they increasingly embrace analytics as a way to make better decisions and incorporate more data into their analyses. Decision making improves as analytics is embedded into more processes and enables employees to base their conclusions on data rather than intuition. Data management also changes as organizations acquire the capabilities to build assets such as data cubes and access a growing variety and volume of structured and unstructured data sources. Nucleus has identified four stages that organizations typically proceed through as they become more Analytic Enterprises:

- **Automated.** Enterprises at the Automated stage use analytics to automate report building and achieved benefits that included increased productivity for data analyzers and reduced workloads for IT departments. Data management capabilities at this stage typically included the construction of data warehouses and data cubes. As a result of productivity improvements and the ability to dramatically expand reporting capabilities without new staff, the average ROI for analytics at this stage was 188 percent. Organizations at this level examined by Nucleus included a credit union that used analytics to avoid new hires for report building and a hospital that reduced fines by using analytics to improve regulatory reporting accuracy.
- **Tactical.** Organizations at the Tactical stage have multiple analytics deployments and have begun using these technologies to improve decision making, rather than just increase productivity. Tactical users of analytics typically have expanded their data management capabilities to include data migration, data integration, and better data quality control. Nucleus found the average return on analytics investments for companies at this stage was 389 percent. Drivers of higher returns at this level included the additions of new end-user groups and capabilities to existing deployments and increases to the bottom line resulting from better decision making. For example, a major retailer examined by Nucleus increased the returns on its analytics investment from 122 percent to 348 percent by expanding the goals of its reporting-focused deployment to include improved decision making and reduced inventory levels.
- **Strategic.** Enterprises that used analytics strategically deployed the technology across most of the organization and used analytics to align daily operations with the goals of senior management. Strategic analytics organizations typically have advanced data governance tools and practices. These organizations also use metadata to ensure that data is interpreted with uniformity across the organization. With average returns on analytics investments of 968 percent, organizations at the strategic level achieve higher

returns as a result of more pervasive use of analytics, the embedding of analytics capabilities into non-analytic processes, and deployment enhancements such as competency centers and governance. For example, Nucleus examined a not-for-profit regional healthcare provider that created a competency center to support its various analytics deployments. By actively supporting the use of analytics and dedicating staff to the propagation of best practices, report building costs were reduced, user adoption was increased, and productivity was improved, resulting in an ROI of 1,185 percent.

- **Predictive.** Predictive analytics deployments achieve higher returns by tapping into what is commonly referred to as “big data,” data sources that are large, contain a broad variety of data sets, and change rapidly. Predictive deployments also reach beyond the traditional limits of internal enterprise data to the Web, customers, vendors, and partners. With an average ROI of 1,209 percent, organizations at this level achieved higher returns with projects such as Web-based customer sentiment tracking and demand forecasting as a result of data integration with distributors. Another driver of higher returns was the use of non-proprietary data sources. A resort analyzed by Nucleus dramatically improved its scheduling practices, reduced labor costs, and increased the ROI on its deployment from 90 percent to 1,822 percent by integrating its analytics deployment with publicly-available weather data sources.

WHY RETURNS ON ANALYTICS INCREASE

Nucleus examined deployments at different stages in the development of an Analytic Enterprise to determine why organizations earned high returns on their analytics investments and how those returns were increased over time. Drivers identified by analysts included the ability to achieve new benefits from sunk costs and the ability to make employees’ decision making more fact based and proactive. Analytics also improved the capabilities of employees completing highly complex tasks such as fraud detection.

New benefits from sunk costs

A significant driver of the higher ROIs earned by Analytic Enterprises is the fact that once analytics adoption is underway, new benefits can be achieved using existing assets such as data cubes and data warehouses. With lower costs required to achieve new benefits such as better decision making for a new end-user group, the ROIs of individual follow-on projects and deployments are typically higher than initial deployments. For example, a chemical manufacturer examined by Nucleus earned an ROI of 1,060 percent when it expanded an analytics deployment focused on operational reporting to include the finance department, leading to faster financial closes, avoided accounting headcount, and lower audit fees.

Acquisitions and mergers can present significant opportunities to extend returns on analytics investments. Nucleus examined the broadening of a deployment at a rapidly growing company that creates molecular modeling and simulation tools. Although the company did not have an analytics deployment, one of its recent acquisitions did. After broadening the focus of its acquired analytics deployment to include the entire product offering and the company’s financial data, the company was able to perform highly granular analyses on all of its products. By performing lifecycle and gross-margin analyses on all of the products, managers were able to increase the company’s bottom line by identifying which products should be sold

more aggressively, which should have pricing changes, and which should be discontinued. The resulting improvement to the revenue mix was a significant driver of the 586 percent ROI earned on the deployment.

Decisions based on data, not guesses

The migration from decision making based on intuition and bad data to decision making that is based on facts and trusted data is one cause of the high incremental ROIs for tactical and strategic deployments. In most organizations without analytics deployments, so little information is available to managers and employees that they service the wrong customers, sell the wrong products, and pursue the wrong projects. When Nucleus examined deployments at the tactical, strategic, and predictive levels, analysts identified analytics capabilities that rapidly delivered information to a variety of knowledge workers, enabling them to make decisions that led to increased revenues or lower costs. Nucleus's analytics-related deployment data set has examples of improvements achieved at a variety of points along the enterprise. Some of these included:

- **Product mix.** By using analytics to identify slow-moving products, companies were able to increase their revenues and gross margins while also reducing inventories and financing costs. At a not-for-profit zoo examined by Nucleus, analytics was used to identify stale inventory at gift shops and concession stands, leading to higher revenues and lower inventory carrying costs.
- **Pricing.** The ability to be more price aggressive was a benefit of many of the deployments examined by Nucleus. The more salespeople knew about the pricing determinants of their products such as demand, labor costs, and COGS, the better able they were to select cost-effective price points. Better pricing had two benefits for companies. First, better pricing led to more wins, increasing the top line. Second, better granularity of cost data enabled decision makers to be more selective in pursuing business opportunities, leading to higher gross margins. An apparel merchandiser examined by Nucleus used analytics to incorporate licensing costs into pricing and product-mix decisions. With more information about the company's cost of goods sold, many products were discontinued, enabling the company to pursue higher margin products and increase the bottom line.
- **Customers.** With more knowledge about an organization's customers, including what they buy and why, employees can make better decisions in areas such as promotions, pricing, and product placement. Customer-service decisions can also be modified. By identifying the high-margin customers who should receive cross selling, upselling, and higher levels of service, an organization can improve its gross margin mix and customer retention. For example, increased prospecting activity, higher customer retention, and increased cross selling wins were all benefits identified by Nucleus when it examined a global operator of document storage sites that used analytics to examine its billing and invoicing databases.

Analytics makes employees proactive

One driver of high returns on analytics was end-user driven applications of analytics that were unanticipated by deployment teams. Many of the analytics deployments examined by Nucleus included end-user driven capabilities such as interactive reports and ad-hoc querying. While one benefit of these capabilities was the achievement of deployment objectives, additional operational improvements were achieved when end users analyzed data entrepreneurially and

found opportunities to increase their operation's revenues or reduce its costs. For example, Nucleus examined an analytics deployment at a resort designed to support sales activities and improve financial reporting. Although revenues and report builder productivity were increased, the resort also reduced costs when analytics was used by a mid-level manager to examine utilization rates of rental equipment and avoid unnecessary purchases of new equipment.

Analytics automates highly complex decisions

When large data sets are combined with predictive analytics in a systematic way, companies can improve large volumes of complex decisions and processes. Fraud detection at financial institutions and the identification of customers most likely to respond to upselling efforts are examples of processes that cannot be done well without automation; there are simply too many data points for decision makers to analyze and too many variables to consider changing. By using predictive analytics to eliminate guesswork, as well as decision makers' biases and capacity for error, organizations can improve the outcomes of these highly complex processes. When Nucleus examined the use of predictive analytics at the claims department of an auto insurance provider, analysts identified benefits that included better identification and processing of fraudulent claims, reduced claims payments, and improved productivity for call-center operators and claims adjusters.

Large wins can be achieved with initial deployments

Although higher returns on analytics are best achieved by adding new functionality to existing deployments, Nucleus found organizations were also capable of high ROIs with initial deployments that were tactical, strategic, or even predictive in nature. The creation of interactive financial reports designed to help line-of-business leaders align their decisions with senior management's goals is an example of an initial deployment at the strategic stage. By creating a data cube of accounting data from the finance department, companies can expose the information that decision makers need to improve processes and identify the highest-margin customers and products. For example, Nucleus examined an initial deployment at the predictive level which enabled a packaging manufacturer to acquire data from its suppliers to learn more about its vendor relationships. When it was discovered that too many vendors were used and buying power was not leveraged, the company reduced the frequency of its purchases and the number of vendors. The resulting increase in volume discounts and bargaining power led to decreased materials costs.

ANY ENTERPRISE CAN BE ANALYTIC

Nucleus found that organizations of any type were capable of earning high returns on analytics investments and increasing those return rates over time. Federal agencies, local governments, and not-for-profit entities are all examples of organizations Nucleus saw benefiting from analytics. Although managers at these third sector organizations may not think of themselves having competitors or revenues, Nucleus has found any organization can use analytics to learn more about their operations in order to reduce costs or increase their funding sources. For example, Nucleus examined a large social service agency which used analytics to create a single view of its clients and improve data access for case workers. With better information about clients and their activities, the agency was able to reduce benefits overpayments, fraud, and litigation costs. By making it easier to access data, the agency also improved the productivity of case workers.

CONCLUSION

In performing in-depth examinations of analytics deployments, Nucleus found returns on investments such as BI, PM, and predictive analytics were high and tended to increase the more a company spent on these technologies. As analytics technologies become more accessible, both from a financial and usability point of view, organizations that are truly Analytic Enterprises will be best positioned to lead their markets. Companies should assess what stage they are in today and identify the strategic and tactical steps they can take to become a more Analytic Enterprise. Given the multitude of investments available to CFOs and their investment committees, a close examination should be given to analytics. Few investments, financial or otherwise, generate a higher return with increasing levels of investment.