

Smart Analytics Impacts Your Competitive Edge with Predictive OneOffice Capability

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Executive summary

Enterprises need data more than ever in a marketplace where success is inextricably linked to delighting customers, creating disruptive business models, and running smart operations.

As we find ourselves operating is a hyper-connected economy, enterprises need analytics to make strategic and effective use of all the data available today to reach their Digital OneOffice[™] goals of breaking down barriers between their customers their business operations and their supply chains. Organizations that can develop a deep data culture and learning capability to anticipate market changes, customer preferences, supply chain constraints, and competitive pressures are best positioned to respond and seize opportunities for growth.

In partnership with Infosys BPM, HFS conducted a research study to explore this emerging use of data and analytics as strategic assets. This report includes survey findings from 262 enterprise decision makers across the Global 2000. We present a nuanced view into the strategic imperatives around data, advanced analytics, and machine learning; the current and planned use of smart analytics; the main challenges along each step of the evolution; and emerging best practices to developing a true, data-driven OneOffice.

- Organizational success is highly correlated to the use of smart analytics.
 - Analytics is omnipresent, having a significant impact on three-quarters of enterprises.
 Seventy-three percent of enterprise respondents in our survey declare that analytics is making a significant business impact on their respective industry verticals, and 80% see the impact in their companies.
 - Organizations in the highest quartile of financial performance (leaders) demonstrate a higher maturity across the smart analytics lifecycle. Close to a quarter of leaders have highly mature analytics practices, compared to only barely 10% of laggards (those in the lowest quartile of financial performance).
- Smart analytics underpins the Digital OneOffice, making it a C-level priority.
 - Smart analytics improves enterprise decision making by using pioneering computing techniques across a wide range of analytics activities, with the ability to sense,

comprehend, adapt, and recommend. Smart analytics is at the heart of the Digital OneOffice, where the organization's people, intelligence, processes, and infrastructure come together as one integrated unit with one set of unified business outcomes tied to exceeding customer expectations.

- Enterprises are elevating data and analytics to a top priority for market success. Eighty-five percent of enterprises view analytics as one of the top three strategic imperatives for market success, and a strong 81% have executive leadership teams aligned on an analytics strategy.
- The CIO continues to hold the mantle as the decision maker. This is true for over half the organizations (52%) along with the CEO (40%), which only further reinforces the strategic importance and visibility organizations place on data and analytics.
- Top-line growth is the most prominent smart analytics objective. Product and salesoriented improvements and enhancing customer experience are top goals, at 60% and 58% respectively. Enterprises also believe top-line growth to be the biggest area of potential for smart analytics, over and above what traditional analytics has been able to deliver thus far.
- The highest performing enterprises with top quartile financial performance (leaders) are planning and executing smart analytics with a focus on the customer, better aligned business/IT, and a much better integrated use of emerging tech.
 - Leaders are prioritizing customer-centric analytics work. Leaders are prioritizing top-line growth metrics (69%). Laggards singled out inward-looking goals including operational efficiencies and reducing operating costs as their major analytics goals (70%).
 - Leaders are better aligned across business and IT. Over half the leaders (54%) report having excellent IT-business alignment, compared to a mere 12% of laggards.
 - Leaders are significantly more collaborative and integrated across emerging technology initiatives. Fifty-eight percent of the highest quartile organizations are extremely well integrated with other emerging technology groups versus only 20% of laggards.

- Expectations for rapid analytics maturity are sky-high, with low analytics maturity across the Global 2000 being matched with aggressive ambitions. Notably, less than one in five organizations (15% to 18%) believe themselves to have the highest level of maturity across the smart analytics lifecycle.
 - Companies employ different operating models for analytics. Over a third (37%) of organizations have gone on to establish global analytics centers of excellence (CoEs). Only 44% have taken their functional or regional needs and nuances into consideration and created multiple analytics hubs along these lines.
 - Enterprises anticipate analytics will have transformed their operations within one to two years. Forty-three percent say that analytics has already changed job roles and required skill sets as they have become more data-centric. Thirty-four percent expect analytics to affect the redesign of high-impact processes within one to two years.
 - Some respondents have overly-ambitious goals for progressing toward data-driven
 OneOffice goals. Despite their low maturity, 82% to 86% of respondents expect to have made progress toward all smart analytics enablers for OneOffice within three years.
- Advancing smart analytics will need focused investments in technologies and ecosystems, organizational culture and process, and talent development.
 - Respondents indicated that reskilling a multi-disciplined analytics talent base is the most important talent factor. Thirty-one percent consider reskilling to be the most important factor, 27% consider it to be the most mature, and 35% are significantly focused on reskilling, making it the area receiving the most focus. However, most organizations have not used external partners effectively—only 33% fully agree that they have identified partners to deliver on smart analytics goals.
 - Smart analytics culture must come straight from the top. Fifty-nine percent of respondents consider senior-level ownership as the most important analytics change agent for organizational culture and processes.

- Tighter integration of analytics capabilities emerged as the biggest tech focus area. Sixtyfour percent rated it as important or very important. Following close behind is making technology platform investments (60% rated it as important or very important).
 - Data quality rings out unanimously as the central challenge to overcome for current analytics projects. Forty-eight percent of respondents claim that improving the quality of their data is the top priority with current data initiatives.

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Organizational success correlates with the use of smart analytics

Analytics influences financial performance

Smart analytics improves enterprise decision making by using cutting-edge computing techniques across a wide range of analytics activities with the ability to sense, comprehend, adapt, and recommend. Smart analytics uses unstructured and structured data and includes techniques such as machine learning and predictive analytics. It augments human decision making, where humans make final decisions after receiving actionable recommendations from machines that learn and improve over time.

Turning data into insight is a complex and multi-phased process for most organizations (see Exhibit 1). Multiple teams and departments are typically involved in each stage from the initial collection of data to the final consumption of analytical insights by business users. Similarly, multiple technology platforms and tools need to come together to deliver on the promise of smart analytics.



Exhibit 1: Smart analytics lifecycle

Source: HFS Research 2018

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Business and technology groups must continuously iterate over each stage and explore new ways to improve efficiency and results. This is critical given that technologies are constantly evolving across data assimilation, insight generation, insight dissemination, and last mile adoption. HFS sees a promising opportunity for enterprises to use modern automation and analytics tools to create tighter feedback loops, better self-service, and more firmly embedded insights in business workflows, processes, and systems.

Enterprises in our study are at various stages in the smart analytics lifecycle. During our analyses, we segmented respondents based on each organization's overall financial performance, including revenue growth and profitability. What emerged is an incredibly insightful distinction between the Leaders (those in the highest quartile of financial performance) and the Laggards (those in the lowest quartile of financial performance). Organizations in the highest quartile of financial performance have a correlation with higher maturity across the smart analytics lifecycle.

Exhibit 2: Smart analytics lifecycle maturity for leaders and laggards

Rate your current maturity for the following activities in the analytics lifecycle. [Rating: 1-Nonexistent, 5-Mature]



Source: HFS Research 2018, n= 153 Global 2000 Enterprise Leaders

The Laggards are far less confident of their analytical maturity compared to the Leaders. Between 20% and 23% of Leaders rate themselves as a 5 (mature) across the lifecycle stages, compared to only 7% to 9% of Laggards. This begs the question: Are the Leaders simply expressing hubris, or are they truly more mature in running analytics?

Comparing investment levels, we find that the Leaders are planning on significantly increasing investments at the last stage of the lifecycle—last mile adoption. Fifty percent of Leaders plan to increase investment at this stage, compared to only 9% of Laggards. In fact, most Laggards (91% to 93%) do not plan to significantly increase investments across any category. This suggests a vicious cycle of low investments and low results that Laggard organizations have not been able to exit because of their unique strategic priorities. Simply said, the level of analytics maturity is correlated to an organization's financial performance, which further determines the level of discretionary budgets that can be funneled towards analytics. We chart other differences between the Leaders and Laggards later in the report to further dig into this theme.

Smart analytics drives a Digital OneOffice not only to respond to customers in real-time, but also to predict their future needs even before they occur

At HFS, we view the ideal end state of enterprise operations as the Digital OneOffice, where the organization's people, intelligence, processes, and infrastructure come together as one integrated unit, with one set of unified business outcomes tied to exceeding customer expectations. It allows an enterprise to collapse the barriers between the front, middle, and back offices through enabling technologies that unify all stakeholders across the organization: the customers, partners, and employees. In today's progressive enterprises, barriers between the front, middle, and back offices are collapsing, and operations are simply becoming OneOffice.



Collaborative, Unified, Dynamic, Intelligent, Responsive, Simple

Source: HFS Research 2018

To achieve this OneOffice vision, enterprises need to evolve their traditional data analytics capabilities into what we call smart analytics. In fact, smart analytics is at the heart of the OneOffice organization of the future, where it will be used strategically to drive better customer experiences, design more intelligent operations, and create structurally new business models.

In short, early-phase digital OneOffice initiatives were centered primarily on enterprises responding the needs of their customers as those needs occurred, to be responsive and effective at satisfying customers in a real-time fashion. As digital business models have quickly evolved in recent years the onus is moving to the most successful digital enterprises being able to anticipate the needs of their customers even before they occur, by access data outside of the enterprise across the supply chain, or economic and market data that can help predict changes in the market, or emerging offering that customers will want to purchase.

The applicability of smart analytics goes across the dimensions of the Digital OneOffice. The essential smart analytics components across the OneOffice enablers include:

- 1. Digital underbelly: Unification of data, moving to data lakes, creating data availability, and harnessing unstructured data.
- 2. Intelligent support functions: Creating a data-centric mindset, disseminating insights across all functions of the enterprise rather than keeping them in silos, and creating more straight-through ability to act on insights.
- 3. Predictive digital insights: Exploring deep learning across pressing business problems and designing and implementing ML and AI-based processes.
- 4. Digital front office: Focusing on enabling real-time personalization of products and services and more intelligent interactions with customers.

These goals encapsulate the most common thematic investments that enterprises can make along the smart analytics lifecycle toward becoming data-driven OneOffices. For example, focusing on smart analytics for the digital front office will help businesses get closer to their customers, whereas the digital underbelly initiatives will prioritize foundational capabilities to make data and analytics initiatives more scalable and sustainable.

Smart analytics has become a C-level mandate

The growing prominence of data and analytics is being recognized across global marketplaces. In fact, the broad applicability of analytics is well understood and experienced. Seventy-three percent of cross-industry respondents in our survey declare that analytics is making a significant business impact on their respective verticals, and 80% see the impact in their companies (see Exhibit 4).

In response to the growing importance of analytics, 85% of enterprises view analytics as one of the top three strategic imperatives for market success, and a majority 81% have executive leadership teams aligned on an analytics strategy. Having executive sponsorship and buy-in is one of the critical ingredients that can make analytics initiatives succeed. The high confidence expressed by our research respondents indicates that most organizational levels are elevating analytics to a top priority for market success.

Exhibit 4: Broad views on analytics

Q. How much you agree or disagree with these statements?



Source: HFS Research 2018, n= 262 Global 2000 Enterprise Leaders

When it comes to executive sponsorship, the CIO continues to hold the mantle as the decision maker for over half the organizations (52%) (see Exhibit 5). Interestingly, for 40% of respondents, the CEO emerges a key decision maker for analytics, which only further reinforces the strategic importance and visibility placed on data and analytics today. Other leaders such as LOB directors, CMOs, or CFOs are not as directly responsible for analytics decision making. However, their influence is equally high, demonstrating the wide-ranging demand for data and analytics from these functional leaders. As enterprise analytics expands with more functional dissemination, we expect a greater level of decision-making ability to gradually shift to functional leaders and line-of-business owners.

Exhibit 5: Executive sponsorship and decision making for analytics

Q. How are executive sponsorship and decision making for analytics organized? [Highlighting decision-makers with >50% majority]

Manufacturing	Retail and CPG	Telecom	Travel	Utilities
 CIO or IT Director (44%) CFO or Finance Director (34%) Management Board (34%) 	 CIO or IT Director (58%) Internal panel of experts or business leaders (55%) Chief Marketing Officer (48%) 	 Chief Data Officer or Chief Analytics Officer (50%) CFO or Finance Director (45%) CIO or IT Director (45%) 	 Chief Data Officer or Chief Analytics Officer (65%) CIO or IT Director (65%) CEO (55%) 	 CIO or IT Director (55%) Management Board (40%) CEO (35%)
Banking and financial services	Energy	Healthcare	Insurance	Other services- based industry
 ClO or IT Director (62%) CEO (50%) CFO or Finance Director (44%) 	 CIO or IT Director (55%) CEO (45%) CFO or Finance Director (40%) 	 CIO or IT Director (50%) CFO or Finance Director (37%) Chief Marketing Officer (37%) 	 CEO (55%) Chief Marketing Officer (45%) CIO or IT Director (45%) 	 Management Board (50%) CEO (41%) CIO or IT Director (36%)

Source: HFS Research 2018, n= 262 Global 2000 Enterprise Leaders

Lessons from the Leaders: how to plan and execute on smart analytics

Leaders focus on customer-centric analytics

Analytics has wide-ranging applications, depending on the types of data available and business use cases explored. But, when organizations are strategically evaluating the potential of this technology, one dimension clearly wins out. The primary objectives of many analytics initiatives today revolve around topline growth (see Exhibit 6). Product-oriented and sales-oriented improvements and enhancing customer experience are top goals, at 60% and 58% for all respondents, respectively. This is followed by bottom-lineoriented objectives such as operational efficiencies (56%) and risk management (49%). Significantly, enterprises also believe top-line growth to be the biggest area of potential for smart analytics, over and above what traditional analytics have been able to deliver thus far.

Exhibit 6: Top-line growth emerges as the primary data and analytics objective

Q. What are the primary objectives of your data and advanced analytics activities today?



Source: HFS Research 2018, n= 262 Global 2000 Enterprise Leaders

When we apply our financial quartile data in Exhibit 6, we can see that the Leaders are taking a far more outward, or front-end focused strategy than the Laggards for leveraging data and advanced analytics. Their primary analytics objectives are gaining speed to market, increased sales, better product innovation (69%), and improving customer experiences (69%).

On the converse, the Laggards singled out improving operational efficiencies and reducing operating costs as their major analytics goal (70%), followed by managing risk as a distant second (55%). This presents a far more insular or inward-looking approach to using analytical insights. While several other factors may influence overall financial performances, this distinction between the two groups suggests a fundamental difference in organizational culture and attunement towards or away from customer-centricity.

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As a fast-growing company, we took the decision a few years ago to build or source analytics competencies, which we view as critical capabilities. Our DNA is cross-selling: How do we do more business with our existing customers? We said analytics should essentially drive business...how to create customer "pull," build out customer lifecycle models, and create intelligent product recommendation engines for each of our customer's life stages.

-SVP at one of India's largest consumer finance companies

Leaders are far more aligned between IT and business groups

Between the CDO and CIO, the IT organization clearly has a strong decision-making role to play on data and analytics for most organizations. However, it is often the business operations leaders and departments that have the most critical needs around analytics. The level of coordination and collaboration between IT and business stakeholders thus becomes crucial for analytics project success. Our study finds that over a third of respondents (35%) consider their IT-business alignment to be excellent. Alignment includes working together on common objectives and understanding business objectives and technology capabilities.

When we dig deeper into the Leaders with the highest financial performance versus the Laggards, another distinction emerges. Over half the Leaders (54%) report having excellent IT-business alignment, compared to a mere 12% of Laggards (see Exhibit 7).

Exhibit 7: Varying levels of IT-business alignment along the financial quartiles

How would you rate the level of alignment between business and IT stakeholders when it comes to analytics objectives and priorities?



Excellent IT-business alignment

Source: HFS Research 2018, n= 153 Global 2000 Enterprise Leaders

The Leaders group features business leaders that look to their IT organizations not only to serve as an aligned partner but also to drive new business value. As the SVP in an Indian consumer finance company related —analytics must drive business. Developing a culture for data-driven innovation and continuously seeking ways to improve top-line growth represent winning IT-business strategies for data and analytics.

Leaders foster collaboration between all emerging technology initiatives

HFS sees value in enterprises working across a confluence of emerging technologies to solve their business problems instead of making siloed investments. The <u>HFS "Triple A Trifecta"</u> (see Exhibit 8), for instance, shows the intersection of robotic automation, smart analytics, and artificial intelligence. These technologies are emerging change agents for clients to optimize, renovate, or transform their business operations.

The HFS Triple-A Trifecta: Automation, Analytics and AI



In our view, the Trifecta elements intersect with each other. While each element of the Trifecta has a distinct value proposition (RPA drives efficiency, smart analytics improves decision making, and AI can solve business problems), there is increasing convergence between the three elements.

Exhibit 9: Integration with other emerging technology initiatives







With this context, it is easy to envision the benefits of coordinating analytics initiatives and CoEs with investments in other emerging change agents such as artificial intelligence (AI), robotic process automation (RPA), and intelligent automation (IA). Comparing organizational approaches, we find that best-in-class Leader enterprises are significantly more collaborative and integrated across emerging technology initiatives (see Exhibit 9). More than half (58%) of the highest quartile organizations are extremely well integrated, with joint strategies and collaboration on execution efforts of analytics and other technologies. In sharp contrast, only 1 in 5 Laggard firms reports this approach. In fact, 1 in 10 Laggards is functioning in a silo, completely unaware of investments and progress of other emerging technologies in their organizations.

Expectations for rapid analytics maturity are sky-high, with low analytics maturity across the Global 2000 being matched with aggressive ambitions

Less than 1 in 5 organizations in our analysis (15% to 18%, see Exhibit 10) rate themselves as having mature capabilities across the smart analytics lifecycle. The consumer analytics head of a global sportswear brand shared his iterative progress, "We are no doubt investing in improving [our analytics lifecycle]. One of the main workstreams is ETL storage, visualization, and dashboarding. It used to be old school manual work done slowly by analysts. Infosys is helping us make the leap into the start of automated reporting."

Exhibit 10: Maturity across the smart analytics lifecycle



Q. Rate your current maturity for the following activities in the analytics lifecycle?

Source: HFS Research 2018, n= 262 Global 2000 Enterprise Leaders

While overall maturity is low, the next step in the evolution of enterprise analytics is still expected to be a short to medium term transition. Business leaders expect very few areas of investment and change to take longer than three years (see Exhibit 11). Enterprises are already accepting that job roles are changing, and they will have to retain and retrain resources to keep up. The pace is unprecedented—almost half of the respondents (43%) say that analytics has already changed job roles and required skill sets as they have become more data-centric. The rise of analytics is predicted to continue changing job roles, with 51% expecting a transition time of one to two years. Clearly, talent development is expected to have the most immediate impact of analytics on enterprise operations.

Exhibit 11: Enterprises expect operations to absorb the impact of analytics within one to three years



Timeframe for future impact of analytics on enterprise operations?

Source: HFS Research 2018, n= 262 Global 2000 Enterprise Leaders

Just over a third of respondents (34%) expect analytics to affect the redesign of high-impact processes within one to two years, enabled by embedded insights. Similarly, almost half the respondents (47%) expect data-driven processes to impact organizational structures within a year. These goals seem ambitious, as restructuring a business requires a thorough examination of perspectives and stakeholders, with considerations and implications on customers and employees.

In the future, most enterprises are hoping to further advance smart analytics toward the Digital OneOffice. Despite the low maturity of today's operations, 82% to 86% of respondents believe that within three years, they will have moved toward all the main enablers of OneOffice from a smart analytics perspective. In particular, 62% of respondents believe they will have matured capabilities for the digital front office within two years. In close second are both the digital underbelly and predictive digital insights, with 58% of respondents believing they will both be matured within two years.

Data swamps are holding back progress on smart analytics projects

We live in a world that some researchers say generates a "tsunami of data." Global estimates suggest that 2.5 quintillion bytes of data are created every day and that 90% of global data was generated in the last two years alone. Enterprises have always struggled to manage internal data and are now hard-pressed to respond to this digital data explosion happening inside and outside company walls. While enterprise-wide demand for analytics and AI has skyrocketed, quality data remains the Achilles heel.

Exhibit 12: Which challenges are data initiatives addressing?

What challenges are you trying to address with current data initiatives? [Ranked 1-5, with 1 being the top challenge]



Source: HFS Research 2018, n= 262 Global 2000 Enterprise Leaders

In this scenario, it is unsurprising that everybody wants to improve the quality of their data. Forty-eight percent of respondents (see Exhibit 12) claim that improving the quality of their data is the top priority with

current data initiatives. Ten percent of respondents said it was their second priority; over half of respondents ranked it in their top two priorities. While some enterprises are struggling with improving data granularity and variety, data quality rings out unanimously as the central challenge.

Case study highlight: reducing mortgage funding leakage for a USbased bank through curability analysis

<u>Client brief</u>: A leading US-based super regional bank operates 1,500 branches in 12 southeastern states with over 400 approved correspondent lenders; it buys mortgage loans from its designated correspondent lenders.

<u>Business challenges:</u> The bank purchases loans based on specific guidelines issued by the FHA, VA, Fannie Mae, and Freddie Mac, but the loan rejection rate for the mortgage loans provided by correspondent lenders over the last two years increased month over month, leading to an annual opportunity loss of US \$366 million for the bank, on an average. The client wanted to identify the reasons behind the opportunity loss and have complete visibility on the loan approval and rejection process by identifying the most useful performance indicators.

Solution approach:

Infosys designed the solution in three steps:

- Execute detailed due diligence on the bank's historical data going back 11 months.
- Create a look-alike mapping of the rejected and funded loans on various parameters such as debtto-income ratio (DTI), FICO score, loan-to-value ratio (LTV), and cumulative loan-to-value (CLTV) to identify any trend or systematic pattern. The look-alike mapping approach plotted these parameters and compared different risk groups to identify loans with similar characteristics across rejected and funded loans.
- Perform a quadrant analysis of the rejected loans to identify the degree of curability of the rejected loans. The team analyzed 60+ variables such as customer and lender information, risk factors, and rejection reason codes and 350,000+ rows of cumulative mortgage deals to identify data patterns.

Analysis results:

- Infosys identified missed opportunities where rejected loans had good risk rating: The look-alike mapping helped identify 700 rejected loans (about 60% of total rejections) where the customers had very good risk ratings (high credit scores) that were comparable to profiles with approved loans.
- It also identified loans rejected for minor reasons: About 30% of the total rejected loans had been rejected for minor reasons such as mismatched information, missing documents, incomplete information provided or had been withdrawn in error. Analysts determined that the rejected loans in this set were "Highly Curable" or "Curable."



Exhibit 13: Look-alike mapping of funded and rejected loans

Source: Infosys 2018

Business impact:

- Infosys identified a potential mortgage funding leakage opportunity of US \$61 million.
- The analysis provided the bank with an interactive Tableau dashboard showing a comprehensive view of metrics throughout the loan process lifecycle such as the ratio of approved to rejected loans, loan status, time span, reason code analysis, and lender's rating.

Exhibit 14: Quadrant analysis of rejected loans by degree of curability



Source: Infosys 2018

The emerging roadmap for advancing analytics

Despite the heavy lifting on cleansing and creating high-quality data, organizations are progressing quickly on advanced aspects of smart analytics. Comparing these focus areas, we can view a multi-year journey as horizons of enterprise analytics adoption (see Exhibit 15). These horizons give us a good view into how business leaders are choosing among multiple competing analytics priorities to advance the field incrementally.

Exhibit 15: Three horizons of smart analytics focus areas

What is the current focus of your biggest analytics project?



Source: HFS Research 2018, n= 262 Global 2000 Enterprise Leaders

In Exhibit 15, we've charted HFS' three time horizons for navigating the future of smart analytics:

• Horizon 1—Act now: Focus areas for companies in the first horizon include mainstream analytics initiatives that are already underway for several organizations.

- Enterprise leaders in the largest group are trying to create more easily consumable data visualizations as their highest priority (25% ranked it first) in a bid to expand enterprise analytics adoption beyond IT and analyst teams. The advancements and mainstream adoption of self-serve business intelligence (BI) tools like Microsoft PowerBI and data visualization tools such as Tableau and Qlikview are driving adoption.
- Text analytics is the second most explored analytics project today (22% ranked it first), as enterprises try to extract content out of multiple kinds of business documents such as invoices and contracts and out of communication channels such as email content. The drive to automate and create straight-through processes underlies the attention on text analytics.
- Social network analytics has gained prominence in recent years, primarily explored by marketing and PR departments seeking customer sentiment analysis after new product launches, marketing campaigns, and event-related and incident-related communication management.
- Horizon 2—Watch out: This horizon includes emerging themes and focus areas that are likely to become mainstream in the next one to two years.
 - Machine learning falls into this second horizon, with 11% of organizations currently ranking it as the top priority of their biggest analytics project. Market advances in machine learning technologies are creating demand for select use cases in machine learning and deep learning techniques. HFS expects enterprises to continue to invest in machine learning pilots and POCs over the next few years, leading to mainstream adoption in the medium term.
- Horizon 3—Investigate: Horizon 3 includes concepts that show tremendous potential but are still too nascent for many organizations to practically test.
 - Ten percent of organizations are currently investing in predictive systems as their highest priority. We expect this space to intensify over the next few years, particularly as machine learning creates opportunities in advancing self-learning systems in Horizon 2. This horizon

holds the biggest potential of smart analytics—augmenting human decision making, where humans make final decisions after receiving actionable recommendations from machines that learn and improve over time.

 Applying analytics algorithms on larger datasets is another medium-to-long term-goal for several organizations (7% rate it as a high priority focus area today). Deriving insights from larger datasets will become an imperative as businesses play more in the API economy, with access to curated datasets from a host of external partners. Additionally, this field will advance as data management technologies become more adept at handling different kinds of unstructured data.

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Several years ago, people started realizing that monitoring data was an arms race. You can store infinite data today with the cloud. It's not necessarily about having the most data, but the right data. In assessing what the right data is, enterprises need to focus on the biggest questions that need answering—new insights and old business problems.

We found that a lot of that data already exists in the organization...just in different silos. You need a place to access and share that data to make better use of it. It's no longer about storing all the data together, as there can be challenges with sifting through noise as well. For us, it's thinking about what business is looking to accomplish and how data can help.

-Head of Data Governance and Strategy at an American financial, retirement, investment, and insurance company

Case study highlight: improving spending visibility and savings for a global pharmaceutical company by developing a CPO dashboard

<u>Client brief:</u> A UK-based fortune 500 global healthcare company with commercial operations in over 150 countries, manufacturing sites and R&D centers in 36 countries; it makes over 6 billion consumer healthcare products, sells around 2 billion packs of pharmaceutical medicines and about 800 million vaccines protecting people in over 160 countries annually.

Business challenge:

- The company was managing a huge supplier base of about 4,000 suppliers per \$1 billion spent. An industry benchmark showed top performers with about 2,000 suppliers per \$1 billion spent.
- More than 15% of spending was moving through non-preferred vendors, causing low policy compliance.
- Less than 35% of PO transactions were going through catalogues, causing low contract compliance, a poor shopping experience, and high order processing time.



Exhibit 16: Business challenges for a global pharma client

Source: Infosys, 2018

Solution approach:

The company brought Infosys in to design a solution for these three imperatives:

- Imperative 1: Make performance reporting more agile, real-time, and proactive.
- Imperative 2: Automate the manual reporting process to address quality and time-related issues.
- Imperative 3: Upgrade the system to function as a decision support system, bringing in the elements of spend analytics and business insights and enabling the procurement leadership to make informed decisions.

Infosys deployed its proprietary automation platform, Nia for data, as the CPO's dashboard. It replaced the manual dashboard creation process with data cubes and QlikView-based online interactive dashboards. With features such as drill-down and sensitivity analysis, these dashboards have four fundamental components:

- A detailed and well-executed data ingestion process from multiple sources;
- A data transformation process through data modeling and cross-referencing;
- Compelling visualization to present data in dashboards;
- Embedded analysis, insights, and simulations to support dynamic decision making and highlight spend-related risks promptly.

Business impact:

- Better decision-making and strategy formulation by bringing together insights from multiple systems coupled with the ability to simulate with "What if?" and "Should I?" scenarios;
- Over £60,000 in cost savings annually by automating the manual process of creating dashboards, checking quality, and vetting processes;
- An 80% improvement in reporting speed by reducing the turnaround time for dashboards to two days from over two weeks;
- Enhanced customer experience for procurement leaders and category managers;
- A low-cost, and self-funded model because Nia for data is available on a subscription model;
- Agile and proactive procurement performance management with Nia's web-based platform enabled with self-guided analytical capabilities.

Exhibit 17: Business impact across key procurement KPIs



Source: Infosys, 2018

Advancing smart analytics needs focused investments in technologies and ecosystems, organizational culture and processes, and talent development



Exhibit 18: Investments to progress smart analytics adoption

Source: HFS Smart Analytics Blueprint, HFS Research 2018

Our research clearly shows that organizations are at different stages of their smart analytics journey. From the ones that have declared analytics as a strategic imperative to the ones that are just getting started, there is a long road to becoming truly data-driven. Mature enterprises that may have already focused on one or two pillars of organizational change will need to take a multi-pronged approach to succeed in the future (see Exhibit 18).

Smart analytics needs multi-disciplined talent acquisition and retention, process re-design to enable more intelligent decision-making and workflows, broad-based technology modernization, and a cultural reorientation to play within a larger ecosystem of interconnected data, partners, and vendors. In the following sections, we present an analysis of various contributing factors that can help enterprises advance analytics capability growth along these three vectors of talent development, organizational processes and culture, and technology and ecosystems.

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Talent: the number one focus area for smart analytics capability development

Managing analytics talent has emerged as the central pillar to advance smart analytics in the enterprise. Enterprises indicated that reskilling a multi-disciplined analytics talent base is a critical factor: 31% consider reskilling to be the most important factor, 27% consider it to be the most mature, and 35% are significantly focused on reskilling. Reskilling also wins out with the highest score across all categories of talent, process, and technologies. Clearly, the demand for broad-based analytics talent is being met by organizations investing in new training, up-skilling, and certifications for their analytics teams.

The IT product owner at a Danish retailer outlined the company's skills roadmap, stating, "We are now looking into Google Cloud Platform and will require talent with more skill sets in Python and Java to create data backends and move toward advanced analytics and machine learning. We are moving our roadmap in a much faster way than we were able to do before and need new technology skill sets to get us there." Business and analytics leaders are having to continually invest in multi-disciplined teams, including:

- Data engineers with specific platform skills such as MapReduce, Apache Pig, Apache Hive, and Apache Hadoop;
- Data scientists and applied ML engineers from a variety of fields including PhDs in statistics, math, and computer science;
- Data visualization experts with backgrounds in statistics, graphic design, and user experience design;
- Data analysts with experience in different programming languages, increasingly Python;
- Behavioral economics and ethnographic researchers that can add new dimensions to data.

Exhibit 19: Metrics on talent development initiatives

How would you rate the relative importance of the following factors in getting more business value and impact from enterprise analytics?



In addition to these skills, businesses also need subject matter experts with domain knowledge in use cases or processes where analytics is being embedded. With such a long list of constantly evolving skill sets to maintain, it is no wonder that the second-most targeted area for talent development (see Exhibit 19) is developing strategic relationships with external partners to plug talent gaps (58% consider important). We also find that the Leaders group is singling out the importance of the two parameters of reskilling and external partners compared to their peers, at 64% and 63% respectively.

Organizational processes and culture: the glue that binds a "data culture"

Technologies will continue to evolve, and top talent might circulate in and out of an organization, but what persists is a collective culture and ethos. Becoming a data-driven OneOffice is ultimately about a cultural shift, putting customers first and proactively exploring how data and technology can improve the status quo.

As with other company precedents, smart analytics culture must come straight from the top. Our survey respondents agree, considering senior-level ownership the most important factor for organizational culture

and processes (see Exhibit 20). The Managing Director, Automation and Global Risk at a global financial services organization agrees, "You need hands-on executive support to succeed. We are launching an ML pilot...we don't know where it will take us, but we have got executive management supporting it."

Comparing across Laggards, very few of these low-performing organizations have rated their maturity as very high across various organizational process and culture metrics. Instead, they are far more interested in bringing on senior-level ownership for smart analytics (33% consider it most important, 33% are focusing significantly on it). This gives us the sense that without executive attention, a good proportion of Laggard organizations have not been able to develop the requisite cultural changes for smart analytics.

Exhibit 20: Metrics on organizational culture and process change initiatives

How would you rate the relative importance of the following factors in getting more business value and impact from enterprise analytics?



Senior-level ownership for smart analytics

Developing a prioritized top 10 list of use cases where smart analytics can improve high-impact decision making

Ongoing centralized development of governance models for the use of data and analytics

Ongoing training and education to embed a strong culture of insight-driven decision-making across the enterprise

Re-designing those top 10 processes with digital data and analytical insights as native components

Re-inventing roles and responsibilities for top 10 processes

Source: HFS Research 2018, n= 262 Global 2000 Enterprise Leaders

As smart analytics becomes further embedded into the enterprise, underlying processes, job tasks, and responsibilities will surely evolve. The case study highlights in this report provide multiple examples of how smart analytics can bring radical change to organizational processes. It is thus surprising that so few business and IT leaders—18% and 16% respectively—call out the importance of redesigning processes and

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60%

re-thinking job roles. While a good 28% think that developing a prioritized list of use cases is extremely important, they have not fully considered the ripple effects downstream. However, process redesign has been identified by 25% of firms as a focus area for the next year, making it a "work in progress" metric whose importance is not yet calibrated in some organizations.

Understanding effective organizational structures to lead analytics forward

Centralizing data and analytics competencies have come front and center in the last 10 years, as organizations make more investments in enterprise-wide business intelligence, reporting, and analytics platforms. Over a third (37%) of organizations in our sample have gone on to establish global analytics centers of excellence (CoEs). These centralized practices are ideally set up as beacons for promoting best practices, support, training, and research needs for diverse analytics initiatives.

Exhibit 21: CoEs and analytics hubs well positioned for growth



How are analytics capabilities organized within the enterprise today?

Source: HFS Research 2018, n= 262 Global 2000 Enterprise Leaders

However, the globally centralized COE model sometimes presents challenges in understanding function, LOB, and region-specific business context and being too separated from day-to-day operations. As a result, several other enterprises (44%) have taken their functional or regional needs and nuances into consideration and created multiple analytics hubs along these lines. As the Director for Data Management and Infrastructure at a globally diversified financial institution recounts, "[Our analytics COE] was centralized when it was in its infancy. The centralized structure, however, became too slow to react to internal demand, so the execution of the strategy was pushed down to the regional level."

Whether enterprises choose globally centralized COEs or regional or functional hubs, the ultimate purpose of an analytics operating model is to deliver insights and enable self-serve to the entire company. Organizations that secure senior-level ownership of smart analytics, foster inter-group collaboration and best practice development, and drive a culture of data-driven decision making will be able to make the best use of their analytics groups.

Technologies and business ecosystems: tighter integration is a necessity

Technology touches every aspect of the smart analytics-enabled enterprise. From data ingestion to cataloging, data prep, modeling and analysis, visualization, and final consumption, multiple technologies must come together. The goal for these ever-evolving tools and platforms is to create an almost seamless user experience for each group of stakeholders in the smart analytics lifecycle. This includes data scientists conducting complex hypotheses testing, data exploration, and model building activities; analysts running data analysis; data engineers undertaking data wrangling tasks and managing infrastructure; business users deriving insights using self-service tools; and leadership teams getting proactive insights and data stories pushed to their devices.

Further, most businesses have a raft of technology platforms and tools spread out globally, with each department, region, or business unit often making its own technology selections. The typical organization has created a diverse analytics technology landscape over the years in response to rapid changes. Enterprises must integrate at many layers and become a central capability for smart analytics technologies.

Exhibit 22: Metrics on technology and ecosystem initiatives

How would you rate the relative importance of the following factors in getting more business value and impact from enterprise analytics?



Source: HFS Research 2018, n= 262 Global 2000 Enterprise Leaders

Comparing against technology priorities, we find similar thinking among organizations in our analysis (see Exhibit 22). More intelligent workflows, hand-offs, and integration between business, data, analytics, and IT groups emerge as the biggest focus area (64% rate it as 4 or 5). Following close behind is making technology platform investments (60% rate it as a 4 or 5). Several enterprises are in the midst of technology modernization efforts that can solve the challenges found in fragmented landscapes. Implementing enterprise-wide data visualization platforms, data lake estates, or analytics platforms are some of the biggest priorities today.

As cloud technologies become more pervasive for data storage and analytics workloads, the possibilities of ecosystems also present new opportunities. Traditional enterprise architectures—and potentially business models—are making way for API-led technology ecosystems powered by smart analytics. In the next few years, particularly as machine learning and other AI techniques become more ubiquitous, hybrid cloud environments will become a reality for more global businesses. The opportunities afforded by the "ecosystem" approach in the API economy are closely related to smart analytics. However, this was rated as

having the lowest importance and focused execution by respondents (only 18% consider it extremely important; 21% identify it as a critical focus area).

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We have islands of data and disconnects. We are working on foundational data work that is not sexy, but necessary for us to sprint in 2025. We are digitizing now, but eyeing actual business transformation. We can feel the disruption coming for our industry, but to achieve it, we'll need to embed analytics everywhere, have smart automation, and use our data as a competitive advantage.

As an auto company, we only have telematics data. But as the financial arm, we provide customer data that continues interactions through the customer's lifecycle. As [the auto industry] moves to service-based subscriptions, ride sharing, etc., this will be our opportunity to be customer-centric.

-Head of Enterprise Data Management and BI Governance at the financial services arm of a major car manufacturer

Multiple external partnerships are forming part of the smart analytics ecosystem

The pace of smart-analytics-driven change has been set. When it comes to execution, enterprises don't plan or expect to get there by themselves. As more specializations emerge in areas such as IoT analytics, cloud data infrastructure, and machine learning, businesses are turning to multiple external third-party partners. This further extends the "ecosystem" approach to delivering smart analytics—not just accessing and sharing strategic data assets, but also models, analyses, and industry-advancing IP with many different entities that add different kinds of value to the ecosystem.

Exhibit 23: Views on third-party providers of smart analytics

To what extent do you agree with the following statements describing your approach to leveraging third-parties for analytics?



Source: HFS Research 2018, n= 262 Global 2000 Enterprise Leaders

A resounding 81% of enterprises believe that they can successfully leverage third parties across startups, global IT services firms, technology firms, consulting firms, and data providers. Further, 79% have identified partners to take them forward on smart analytics. Having access to a range of capabilities is necessary, as 71% of respondents agree that no single partner today can be everything to everyone.

Case study highlight: reducing finished goods inventory (FGI) for a leading electronics distributor through analytics-based demand assessment and inventory classification

<u>Client brief</u>: A Fortune 150 electronics giant with operations in 55 countries across 450+ locations, the client is considered the world's number one in stocking and distribution of electronic components and design of customized intelligent IT systems.

<u>Context:</u> The electronic components distribution business is highly competitive and complex – it is characterized by a "long tail" with a typically large SKU portfolio, whose demand is difficult to forecast both in terms of quantity and timing. To win in this game, companies need to focus on maintaining high customer service levels. To do this they need to be able to predict inventory and maintain safety stock across a vast selection of products and deliver to customers with compressed delivery schedules.

Business challenges:

- Inadequate inventory classification schemas: While traditional methods based on a two-dimensional volume-value relationship were being used, they only addressed the problem partially—one large demand event had the potential to distort SKU classification. Offering differential service levels such a naive classification was at best sub-optimal and at other times, downright risky due to potential stock-outs leading to erosion of market competitiveness.
- One-size fits all safety stock strategy: Safety stock estimates were based on plain-vanilla math and rules of thumb under an over-arching normal distribution of demand assumption. This led to observed service levels being less than anticipated owing to non-normal demand patterns.
- Sub-par demand visibility and stock-out prediction: One notable lacuna for the business was the lack of a stockout prediction mechanism, which would allow the company to proactively stock up for impending demand.

Solution approach:

Infosys BPM Analytics, with a combination of analytical rigor and data visualization, assisted its client in electronic components distribution with optimizing its FGI inventory holdings and honing its strategy to improve customer service levels.

- Identified "movers and shakers": Infosys BPM began by first identifying high impact SKU clusters that would significantly impact inventory dollars and customer service levels. It was apparent that about 8% of the SKUs contributed to nearly 80% of sales and 60% of inventory holding value.
- Recognized the nature of demand: Infosys recognized and classified the nature of demand to ensure that the most appropriate safety stock algorithms were leveraged for optimizing inventories based on the demand distribution pattern. Appropriate safety stock algorithms were developed and deployed for each of the different scenarios to provide a far more effective mechanism than a one-size-fits-all safety stock algorithm approach.



Exhibit 24: Infosys analysis for an electronics distributor client

• A robust and scalable analytical hierarchy process (AHP) framework: Combining factors such as the gross margin, lead time, demand pattern, demand variability, and usage value, an AHP framework was developed to derive relative importance scores at an SKU level. Based on the score, a high-medium-low (HML) grid was developed to have a multidimensional classification scheme for the SKU universe.

Business impact:

- The company identified \$21 million in inventory savings across multiple SKU categories.
- A 25% reduction in supply weeks led to improved inventory turns and inventory velocity.
- Instantaneous drill-downs and scenario building promoted agile and exception planning.
- Scalable AHP framework with a host of prescriptive analyses around identification of high-risk suppliers, better demand prediction, and trade-off opportunities.

Source: Infosys, 2018

Bottom line: Amplify your customer-centric OneOffice with smart analytics

Smart analytics must become a core competency for enterprises hoping to survive and thrive in the data economy. Modern applications of data and analytics present a tremendous opportunity for innovation, an imperative for any forward-looking business. Our research has uncovered some fascinating insights into how enterprises are approaching, planning for, and delivering on the promise of becoming data-driven OneOffices.

The best financially-performing organizations have evidently taken a far more strategic view of how data and analytics can help them with their primary objective—top-line growth. This has helped them tie smart analytics initiatives to improving customer experiences, speed to market, and product and service innovations. As a result, these organizations are incentivized and motivated to further invest in progressing their analytical capabilities along multiple dimensions—gradually changing organizational processes and culture, expanding multi-disciplined talent development, and keeping at the edge of emerging technologies and ecosystems.

Developing smart analytics capability will require most organizations to make focused investments and undertake continual change management along all these dimensions with the help of expert partners. The journey will most certainly be a multi-year effort. Our research shows that the payoffs are measurable business outcomes that are propelling businesses well into the data-driven future and beyond.

The following additional recommendations and insights emerged from our research:

- Prepare for data needs in the API economy. The VP of Digital Strategy at a worldwide executive transportation services company shares, "When you start down that path of improving customer experiences, you need new websites, mobile apps, and of course data and analytics. You have to build API stacks to be competitive in the existing digital marketplaces and the ones yet to come. We've seen disruption from the Ubers, and the next level will be from intermediaries. We need to know how to exist in that emerging ecosystem in a scalable way. Think about the next steps."
- Spend 10% of your revenues on white space experimentation. An executive from a global bank
 offered this stratagem that the bank follows. "Spend 10% on new and different things; learning is
 also an outcome. If I am automating a manual process now, what other problems does that

uncover? Can I use the new data generated to think about anomalies? That wasn't a test in my test inventory, but maybe it should be? That's where imagination and analytical creativity comes in."

Don't wait around for the perfect group of data scientists. The VP of a global pharma offers
practical advice on building a smart analytics talent pool. "Data scientist is almost a buzzword;
everyone thinks they are one! We are recruiting young talent and trying to retrain them instead.
For some businesses, it takes decades to learn how to take things from concept to product. We
tried to hire PhDs, etc., but these people don't exist in the quantities the market needs. Domain
expertise beats out tech any day, build around that."

Research methodology

HFS based this study on the responses of 262 enterprise decision makers across the Global 2000, all of whom make or influence advanced analytics investments decisions in organizations with revenues of more than \$1 billion. These respondents are director level or above. HFS conducted the interviews in Q3 2018 via a combination of telephone and online surveys.



Here is a detailed display of data about the survey respondents:

Source: HFS Research, 2018

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About HFS Research: Defining future business operations

The HFS mission is to provide visionary insight into major innovations impacting business operations, including: automation, artificial intelligence, blockchain, Internet of things, digital business models, and smart analytics.

HFS defines and visualizes the future of business operations across key industries with our Digital OneOffice[™] Framework.

HFS influences the strategies of enterprise customers to help them develop OneOffice backbones to be competitive and to partner with capable services providers, technology suppliers, and third-party advisors.

Read more about HFS and our initiatives on www.HFSresearch.com or follow @HFSResearch.





About Infosys BPM

Infosys BPM, the business process management subsidiary of Infosys (NYSE: INFY), provides end-to-end transformative services for its clients across the globe. The company's integrated IT and BPM solutions approach enables it to unlock business value across industries and service lines, and address business challenges for its clients. Utilizing innovative business excellence frameworks, ongoing productivity improvements, process reengineering, automation, and cutting-edge technology platforms, Infosys BPM enables its clients to achieve their cost reduction objectives, improve process efficiencies, enhance effectiveness, and deliver superior customer experience.