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Companies Are Failing in Their Efforts to Become Data-Driven

February 5, 2019

By Randy Bean and Thomas H. Davenport

Becoming "data-driven" has been a commonly professed objective for many firms over the past decade or so. Whether their larger goal is to achieve digital transformation, "compete on analytics," or become "AI-first," embracing and successfully managing data in all its forms is an essential prerequisite. Consistent with these goals, companies have attempted to treat data as an important asset, evolve their cultures in a more data-oriented direction, and adjust their strategies to emphasize data and analytics.

We knew that progress toward these data-oriented goals was painfully slow, but the situation now appears worse. Leading corporations seem to be failing in their efforts to become data-driven. This is a central and alarming finding of NewVantage Partners' [2019 Big Data and AI Executive Survey](#), published earlier this month. The survey participants comprised 64 c-level technology and business executives representing very large corporations such as American Express, Ford Motor, General Electric, General Motors, and Johnson & Johnson.

Here are some of the alarming results from the survey:

- 72% of survey participants report that they have yet to forge a data culture

- 69% report that they have not created a data-driven organization

- 53% state that they are not yet treating data as a business asset

- 52% admit that they are not competing on data and analytics.

Further, the percentage of firms identifying themselves as being data-driven has declined in each of the past 3 years – from 37.1% in 2017 to 32.4% in 2018 to 31.0% this year.

These sobering results and declines come in spite of increasing investment in big data and AI initiatives. 92% of survey respondents reported that the pace of their big data and AI investments is accelerating; 88% report a greater urgency to invest in big data and AI; and 75% cite a fear of disruption as a motivating factor for big data/AI investment. In addition, 55% of companies reported that their investments in big data and AI now exceed $50MM, up from 40% just last year.

Further, companies are building organizations to manage their big data/AI initiatives, with a rise in the appointment of Chief Data Officers from 12% in 2012 to 68% of organizations having created and staffed this role in the past 7 years.

Yet critical obstacles still must be overcome before companies begin to see meaningful benefits from their big data and AI investments. An eye-opening 77% of executives report that business

adoption of Big Data/AI initiatives is a major challenge, up from 65% last year. Executives who responded to the survey say that the challenges to successful business adoption do not appear to stem from technology obstacles; only 7.5% of these executives cite technology as the challenge. Rather, 93% of respondents identify people and process issues as the obstacle. Clearly, the difficulty of cultural change has been dramatically underestimated in these leading companies — 40.3% identify lack of organization alignment and 24% cite cultural resistance as the leading factors contributing to this lack of business adoption.

There are a variety of other possible explanations for the failure of large firms to achieve the goal of data-driven organization. Perhaps the pursuit of short-term financial goals pushes longer-term objectives like data-based cultures to the back burner. It may also be that the failure of some high-profile digital transformations has led company leaders to be wary of transformational initiatives. Many business executives that we speak with have shared their frustrations that they are hoping to see greater agility from the technology organizations that support them. In response, many firms have established hybrid organizations, which include centers or excellence, analytic sandboxes, or innovation labs in efforts to derive benefits more rapidly from their data investments. A number of leading organizations are constructing these new functions with a combined team of business leaders, data scientists, and data engineers/architects, operating as internal "swat" teams to drive rapid results.

At a recent executive breakfast that we organized and hosted to discuss the survey results, chief data and analytics officers from many of the participating companies commented that senior leaders who strongly advocate for data and analytics within their organizations are incredibly valuable, but more the exception than the rule. Several steps to address the issue were mentioned by the executives in attendance. One suggestion was not to focus on overall data-driven transformation in a large enterprise, but rather to identify specific projects and business initiatives that move a company in the right direction. Another executive indicated that he had built a "Data Science University" with 400 students. This executive was undertaking a variety of communication initiatives to promote the successes of the program. Another was trying to implement agile methods in key programs, while avoiding terms like "data governance" that have a negative connotation for many executives. In spite of these efforts, none of the executives at the breakfast expected that these efforts would deliver rapid improvements in their firms' data cultures.

Whatever the reasons for the failure to achieve transformational results from data initiatives, the amount of data continues to rise in business and society. Analytical decisions and actions continue to be generally superior to those based on intuition and experience. The companies in the survey are investing heavily in big data and analytics. In short, the need for data-driven organizations and cultures isn't going away. Firms need to take a hard look at why these initiatives are failing to gain business traction, and what actions must be taken to reduce the cultural barriers to business adoption. Many companies have invested heavily in technology as a first step toward becoming data-oriented, but this alone clearly isn't enough. Firms must become much more serious and creative about addressing the human side of data if they truly expect to derive meaningful business benefits.

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Big Companies Are Embracing Analytics, But Most Still Don't Have a Data-Driven Culture

February 16, 2018

By Randy Bean and Thomas H. Davenport

For six consecutive years NewVantage Partners has conducted an annual survey on how executives in large corporations view data. Each year the response rate increases, and the reported urgency of making effective use of data increases as well. This year the results are both more encouraging and more worrisome than in the past.

Six years ago, the primary focus of questions and answers in the survey was big data, which was relatively new on the business scene. In the 2018 survey, the primary attention has moved to artificial intelligence. AI is now a well-established focus at these large, sophisticated firms. There is both a stronger feeling that big data and AI projects deliver value and a greater concern that established firms will be disrupted by startups.

The survey includes senior executives from 57 large corporations. The industry group with the most firms represented in the survey is one of the most data-intensive: financial services. Companies from the life sciences, manufacturing, telecom, and online industries also participated. The actual respondents are changing somewhat from the first surveys: It has always involved a high proportion of C-level executives responsible for data, but this year chief data officers are 56% of the respondents, up from 32% last year. Only 12% of firms in the 2012 survey had even appointed a chief data officer.

While AI gets the headlines here and elsewhere in the world, the survey addresses both big data and AI. Terminology comes and goes, but the constant is a data explosion and the need to make sense of it. Big data and AI projects have become virtually indistinguishable, particularly given that machine learning is one of the most popular techniques for dealing with large volumes of fast-moving data. It's also the case that statistical approaches to AI — deep learning, for example — are increasingly popular. Therefore, we view traditional data analytics, big data, and AI as being on a continuum. Virtually all of the respondents (97%) say they are investing in these types of projects.

Perhaps the best news in this survey is that companies continue to believe they are getting value from their big data and AI projects. 73% of respondents said they have already received measurable value from these initiatives. That number is half again higher than in the 2017 survey, which suggests that more value is being achieved as companies grow familiar with the technologies.

The types of value received are perhaps consistent with other previous types of technology. Consistent with our view that big data and AI are extensions of analytical capabilities, the most common objectives — and those most likely to achieve success — are "advanced analytics/better decisions." Thirty-six percent had that as their top priority, and 69% of those had already achieved success with the objective.

Better customer service and expense reduction are also common objectives. Just over one-quarter of firms (27%) are pursuing some combination of innovation and disruption, speed to market, or data monetization initiatives. Data monetization programs had the lowest priority and the lowest percentage of success (27%).

One of the greatest issues for concern in the survey for large enterprises is the risk of disruption from new entrants. Almost four in five respondents said they feared disruption or displacement from firms like those in the fintech sector or firms specializing in big data. The technology judged most disruptive is AI — by far. Seventy-two percent chose it as the disruptive technology with the most impact — far more than cloud computing (13%) or blockchain (7%).

Another important and continuing issue is the slow speed with which these established firms make the shift to a data-driven culture. Virtually all respondents (99%) say their firms are trying to move in that direction, but only about one-third have succeeded at this objective. This gap appears every year in the surveys, and the level of success hasn't improved much over time. Clearly firms need more-concerted programs to achieve data-related cultural change. Many startups have created data-driven cultures from their beginning, which is a key reason why large, established firms fear disruption from them.

One of the approaches that firms have established to deal with data-driven disruption and change is to establish new management roles. However, there is still a lack of clarity about how different data-oriented roles (chief information officer, chief data officer, chief digital officer, chief analytics officer, etc.) relate to each other.

With respect to the chief data officer role, there is substantial disagreement about the major responsibilities of the role and what types of backgrounds are appropriate for CDO jobs. Thirty-nine percent say their CDO has primary responsibility for data strategy and results, but 37% assign that responsibility to other C-level executives, and 24% say there is no single point of accountability for it. In terms of backgrounds, 34% of respondents believe the CDO should be a change agent from outside the company, while 32% believe the person should be a company veteran from inside the firm. Role clarity in senior data-related roles is critical for both leading AI/big data projects and accomplishing cultural change. And while all respondents believed it important, the majority of firms still lack an enterprise data strategy.

This continuing rise in the importance and challenges of big data is one of the most important features of contemporary economy and society. The survey results over time provide interesting and useful documentation of this revolution. The rise of AI is only exacerbating this trend. The keys to success are to determine how your firm should respond, assign clear responsibilities for data strategy and results, and then move ahead to execute the needed changes in a systematic and effective fashion.

Why Fear of Disruption is Driving Investment in AI

Executives are looking to future-proof their organizations with key investments in emerging technologies.

January 25, 2019

By Randy Bean

As we begin 2019, Fortune 1000 companies are accelerating their investment in big data and artificial intelligence (AI) initiatives, with an astonishing 91.6% of the executives indicating that their companies are accelerating the pace of their big data and AI investments. This is a principal finding of the NewVantage Partners 2019 Big Data and AI Executive Survey, which includes 65 Fortune 1000 or industry-leading organizations. C-level executives comprise 97.5% of survey participants, representing companies including American Express, Capital One, Ford Motor Co., General Motors, Johnson & Johnson, Mastercard, and MetLife. When we look at the main drivers for this focus on AI and big data investment, one clearly leads the pack: the fear of disruption.

According to the 2019 survey, Fortune 1000 companies are now recognizing that they must become more adept at leveraging their data assets if they are to compete successfully against highly agile data-driven competitors. Over the past decade, exponential growth of data, coupled with access to much larger data volumes and data sources, has enabled rapid evolution of AI capabilities — with the result that organizations are now able to apply AI capabilities at scale to deliver business value.

Three-quarters of the executives surveyed in 2018 cited fear of disruption as the principal motivating business driver as they enter 2019. This fear has built an increasing sense of urgency across companies and industries — with 87.8% stating there is a greater urgency to invest in big data and AI initiatives now more than ever. In order to continue to compete in a turbulent landscape, an overwhelming majority (91.7%) of executives identified the need to transform their organizations to be nimbler and more data-driven in order to keep pace with competitors.

The dollar investments in big data and AI initiatives are also increasing. The percentage of companies reporting investments of greater than $500 million increased from 12.7% in 2018 to 21.1% in 2019. This increase highlights the momentum that AI investments are gaining in just the past 12 months. At the top end of the range, 8.7% of executives reported investments exceeding $1 billion.

AI as a Force for Disruption

AI is perceived by executives as being a highly disruptive capability at a time when companies are concerned about their own risk. When asked to identify the principle driver of investments in big data and AI, 91.7% of executives cited the need to transform their businesses and become increasingly nimble to face off against highly agile, data-driven competitors.

The survey confirms that there has been a steady increase in investments in AI and machine learning from 2017 (68.9%) through 2019 (96.4%), reinforcing the view that investment in AI has become nearly universal. Similarly, executives identified AI and machine learning as the most disruptive of emerging technologies when looking out across the horizon of the coming decade. Other potentially disruptive capabilities, including blockchain, cloud computing, and digital technologies such as mobile and sensor devices, lagged behind in the single digits respectively.

Importantly, executives are reporting measurable returns from their investments in big data and AI, with 62.2% reporting favorable results. Areas of notable benefit include: advanced analytics (79.8%), which can help improve customer engagement; investment in customer service processes (57.1%) to help companies roll out products and services faster and create customer self-service capabilities; and the low-hanging fruit of expense reduction (59.5%), which encompasses automating processes and tasks.

Improving AI Business Adoption

Tom Davenport and I wrote last year about the problem with AI pilots and some of the challenges to business adoption that companies were facing. In the article, we noted that production implementations of AI technology remained relatively scarce, citing factors such as the changes required to existing business processes, as well as potential skills gaps. These impressions are reflected in the 2019 survey's responses, as 77% of executives reported that business adoption of big data and AI initiatives remains a challenge for their organization. Survey results also reinforce the gap in business processes and human resource skills, with 95% of the executives citing people and business process issues as the primary obstacles to business adoption of these initiatives.

Factors that continue to plague business adoption efforts include lack of organizational alignment and agility (cited by 40.3% of executives), cultural resistance to the pace of change (named by 23.6% of executives), and a lack of understanding of data as a business asset (identified by 13.9% of executives). Companies need to begin to address the cultural obstacles to business adoption if they aspire to be successful. In short, it's not technology that is proving a stumbling block for big data and AI adoption, but rather process and people issues.

The true test of ultimate business value will come in the months and years ahead as organizations leverage AI and data to transform their businesses to successfully compete with their data-driven counterparts.

About the Author

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How Big Data and AI are Driving Business Innovation in 2018

At the intersection of analytics and smart technology, companies are starting to see the long-awaited benefits of AI.

February 5, 2018

By Randy Bean

After years of hope and promise, 2018 may be the year when artificial intelligence (AI) gains meaningful traction within Fortune 1000 corporations. This is a key finding of NewVantage Partners' annual executive survey, first published in 2012. The 2018 survey, published on January 8, represented nearly 60 Fortune 1000 or industry-leading companies, with 93.1% of survey respondents identifying themselves as C-level executive decision-makers. Among the 2018 survey participants were corporate bellwether companies, including American Express, Capital One, Ford Motors, Goldman Sachs, MetLife, Morgan Stanley, and Verizon.

The main finding of the 2018 survey is that an overwhelming 97.2% of executives report that their companies are investing in building or launching big data and AI initiatives. Among surveyed executives, a growing consensus is emerging that AI and big data initiatives are becoming closely intertwined, with 76.5% of executives indicating that the proliferation and greater availability of data is empowering AI and cognitive initiatives within their organizations.

The survey results make clear that executives now see a direct correlation between big data capabilities and AI initiatives. For the first time, large corporations report that they have direct access to meaningful volumes and sources of data that can feed AI algorithms to detect patterns and understand behaviors. No longer dependent on subsets of data to conduct analyses, these companies combine big data, AI algorithms, and computing power to produce a range of business benefits from real-time consumer credit approval to new product offers. Companies such as American Express and Morgan Stanley have publicly shared stories of their successes within the past year.

Staving Off Disruption

Survey participants comprised executives representing data-intensive industries, notably financial services companies, which constituted 77.2% of the survey respondents. Financial services companies have long been at the forefront of industry due to the large volumes of transactional and customer data that they maintain, and they have developed robust data management and data governance processes over a period of decades. These organizations have been at the forefront in the use of analytics to manage risk, assess customer profitability, and identify target market segments. Industries such as life sciences, while newer to data management, possess vast repositories of scientific and patient data that have gone largely untapped relative to the potential for insight.

Now, many of these mainstream companies are facing threats from data-driven competitors that have no legacy processes and have built highly agile data cultures. Companies like Amazon, Google, Facebook, and Apple are among the most prominent disruptive threats to these traditional industry leaders.

As mainstream companies increase their investment in big data and AI initiatives, they face a range of issues and challenges as they seek to organize to compete against data-driven competitors. This concern is highlighted in the 2018 survey results.

A clear majority (79.4%) of executives report that they fear the threat of disruption and potential displacement from these advancing competitors. In response to the threat of disruption, companies are increasing their investment in big data and AI initiatives. In the 2018 survey, 71.8% of executives indicate that investments in AI will have the greatest impact on their ability to stave off disruption (in the next decade). Although overall investments in AI and big data initiatives continue to be relatively modest for most large corporations, 12.7% of executives report that they have invested half a billion dollars in these initiatives to date. If the fear of disruption is any indication, this number can be expected to increase.

Driving Innovation through AI

Executives indicate that investments in big data and AI are beginning to yield meaningful results. Nearly three-fourths of executives surveyed (73.2%) report that their organizations are now achieving measurable results from their big data and AI investments. In particular, executives report notable successes in initiatives to improve decision-making through advanced analytics — with a 69% success rate — and through expense reduction, with a 60.9% success rate. Businesses are also using big data and AI investments to accelerate time-to-market for new products and services (54.1% success rate) and to improve customer service (53.4% success rate). Yet, just over one-fourth (27.3%) of executives report success thus far in monetizing their big data and AI investments. This remains an elusive goal for most organizations.

Nearly one-fourth (23.9%) of respondents report that their investments in big data and AI are highly transformational and innovative for their organization, and potentially disruptive for their industry. But 43.8% of executives report that innovation and disruption initiatives involving big data and AI yield successful results for their organizations.

As mainstream companies look to the future, there is a growing consensus that AI holds the key. With 93% of executives identifying artificial intelligence as the disruptive technology their company is investing in for the future, there appears to be common agreement that companies must leverage cognitive technologies to compete in an increasingly disruptive period. Investment in AI can be expected to increase as organizations position themselves to compete in the future. Those companies that prove themselves to be adept at developing and executing initiatives using big data and AI capabilities will likely be the companies that are best positioned to deflect the threats of agile, data-driven competitors in the decade ahead.

About the Author

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The Problem with AI Pilots

AI technology is not just an experiment.

June 26, 2018

By Thomas H. Davenport and Randy Bean

Over the past year or so we've been engaged in an effort to tell the story of how large organizations are deploying artificial intelligence in their businesses. We were encouraged by the response to the 2018 NewVantage Partners executive survey, in which 93% of respondents said their organizations were investing in AI initiatives. Plenty of companies to write about, we thought. These were very large organizations spending goodly sums on AI and with a history of early adoption of other technologies. But when we approached many of these companies to discuss writing some case studies about their work, most of them demurred.

Most said the reason wasn't that they wanted to keep their AI activities secret, but that they weren't actually very far along and hence their projects were not worth discussing yet. They were doing lots of pilots, proofs of concept, and prototypes, but they had few production deployments. When they did have AI systems in production, most were machine learning-based systems that had been in place for many years. This is particularly true in financial services, where large-scale "scoring" has been used to evaluate customers for credit and potential fraud for well over a decade. Some said to us that they didn't really consider these projects to be examples of AI — consistent with the common view of AI that it describes technology that is never really here yet. Others say that they have robotic process automation (RPA) implementations in place, but most are relatively small, and there is also debate about whether RPA is really AI or not.

Why AI Implementation Is Challenging

But there are good reasons why production implementations of AI technology are relatively scarce. One is the maturity — or lack thereof — of the technology. Chatbots and intelligent agents, for example, are getting better all the time, but many companies still hesitate to turn their customers over to them. Instead, they ask their employees to use them for applications in HR and IT. Some make them available to their call center reps to use in the background to help answer customer questions. Eventually, they hope, they will support customer interactions directly.

If the AI initiative actually changes the relevant business process and the skills necessary to perform it, that raises another barrier to full implementation — the old bugaboo "change management." Most AI systems still involve some interaction with human workers, and educating those workers on new tasks and new skills can be time-consuming and expensive. UPS, for example, developed a complex machine learning algorithm for daily routing of its package delivery trucks, and it's still rolling it out 10 years after the algorithm was developed. Getting tens of thousands of drivers to change their behavior isn't easy. Similarly, a new claims process in an insurance company we worked with involves using deep learning models to analyze photos of car accidents. The technology works pretty well, but it doesn't work with all

types of collision damage. The interface of the AI system with existing claims adjusters, who are still needed for most damage assessments, and their existing work processes has been challenging.

Full production implementation also involves interfacing AI with production information systems and architectures. A 2017 Deloitte survey found that the number one obstacle to successful AI deployments was that it was "difficult to integrate cognitive projects with existing processes and systems." New machine learning models may have to be written as APIs or as program code modules within existing systems. Even RPA systems, which are quite easy to implement in small volumes, can become an architectural challenge when adopted in large numbers. Because they act as users of production systems, they are typically impacted by changes in those systems and may have to be reprogrammed.

Making AI Implementation More Likely

There are several ways that companies can increase the likelihood and speed of production AI implementations. Here are some of them:

- Set a time and criteria for deciding whether to go into production before the pilot starts. This will add rigor to the decision process and put pilot project advocates on notice that implementation is an important consideration from the beginning (this should help to address all the challenges mentioned above).

- Adopt technologies that can scale and that can be used by the intended audience. If, for example, it is unlikely that a chatbot will be made available to customers as a primary channel, don't adopt it with vague hopes that it will improve its performance quickly (helps with the technological maturity challenge).

- Adopt AI capabilities that are already embedded within transaction systems. Major transaction system vendors, including Salesforce, SAP, Oracle, and Workday, are adding AI capabilities to their offerings. That typically means that the AI offerings will be somewhat integrated with transaction systems from the beginning, and that they can make use of the data within those systems (helps with the integration challenge).

- If the AI system will be stand-alone, make sure it can create a relatively easy interface with your existing systems — such as an API or generated program code that works with your architecture (also assists in integration).

- Start an AI-related education and skills program now. Even though you may not be sure of the specific needs of your workers for retraining and re-skilling, you can make available education offerings now about how to understand and work with smart machines. Such programs put employees on notice that change in their jobs from AI will happen and that they should begin preparing for it (and helps with the change management challenge).

Implementation of AI projects is the only way that organizations will realize tangible business value from their AI investments. Companies are spending considerable sums on AI technology, and it should not be viewed exclusively as an experiment. It is only when companies step up to production status with AI that it will deliver ROI and productivity for their organizations.

How Big Data is Empowering AI and Machine Learning at Scale

Big Data is powerful on its own. So is artificial intelligence. What happens when the two are merged?

May 8, 2017

By Randy Bean

Big data is moving to a new stage of maturity — one that promises even greater business impact and industry disruption over the course of the coming decade. As big data initiatives mature, organizations are now combining the agility of big data processes with the scale of artificial intelligence (AI) capabilities to accelerate the delivery of business value.

The Convergence of Big Data and AI

The convergence of big data with AI has emerged as the single most important development that is shaping the future of how firms drive business value from their data and analytics capabilities. The availability of greater volumes and sources of data is, for the first time, enabling capabilities in AI and machine learning that remained dormant for decades due to lack of data availability, limited sample sizes, and an inability to analyze massive amounts of data in milliseconds. Digital capabilities have moved data from batch to real-time, on-line, always-available access.

Although many AI technologies have been in existence for several decades, only now are they able to take advantage of datasets of sufficient size to provide meaningful learning and results. The ability to access large volumes of data with agility and ready access is leading to a rapid evolution in the application of AI and machine-learning applications. Whereas statisticians and early data scientists were often limited to working with "sample" sets of data, big data has enabled data scientists to access and work with massive sets of data without restriction. Rather than relying on representative data samples, data scientists can now rely on the data itself, in all of its granularity, nuance, and detail. This is why many organizations have moved from a hypothesis-based approach to a "data first" approach. Organizations can now load all of the data and let the data itself point the direction and tell the story. Unnecessary or redundant data can be culled, and more indicative and predictive data can be analyzed using "analytical sandboxes" or big data "centers of excellence," which take advantage of the flexibility and agility of data management approaches. Apostles of big data have often referred to their approach as "load and go." Big data enables an environment that encourages data discovery through iteration. As a result, businesses can move faster, experiment more, and learn quickly. To put it differently, big data enables organizations to fail fast and learn faster.

Big Data and AI at MetLife

Pete Johnson is one of the most experienced executives working in the field of big data and AI within industry today. Having worked in the field of artificial intelligence for a generation dating back to his academic career at Yale University, Johnson now leads big data and AI initiatives as

a fellow at MetLife. Johnson previously held positions as senior vice president for Strategic Technology with Mellon Bank and served as the executive vice president and chief technology officer of Cognitive Systems Inc. (CSI), an early artificial intelligence company specializing in natural language processing, expert systems, case-based reasoning, and data mining. CSI was founded by several members of the Yale University faculty in 1981, when Johnson completed his MS in computer science.

Johnson, whom I've known for over a decade, is a regular participant in a series of executive thought-leadership breakfasts that I host for senior industry executives to share perspectives on topics in big data, AI, and machine learning among their peers. Participants in the most recent executive breakfasts have included chief data officers, chief analytics officers, chief digital officers, chief technology officers, and heads of big data for firms including AIG, American Express, Blackrock, Charles Schwab, CitiGroup, General Electric (GE), MetLife, TD Ameritrade, VISA, and Wells Fargo, among others. As a long-suffering expert in the field of artificial intelligence, Johnson observes three critical ways in which big data is now empowering AI:

1. **Big data technology** — We have the ability now to process huge quantities of data that previously required extremely expensive hardware and software, or "commodity parallelism."

2. **Availability of large data sets** — ICR, transcription, voice and image files, weather data, and logistics data are now available in ways that were never possible in the past; even old "paper sourced" data is coming online.

3. **Machine learning at scale** — "Scaled up" algorithms such as recurrent neural networks and deep learning are powering the breakthrough of AI.

Johnson notes a number of ways in which MetLife is employing AI that have been enabled by big data:

1. Speech recognition has enabled vastly superior tracking of incidents and outcomes as a result of highly scaled machine learning implementations that indicate pending failures. An example is the ability to analyze doctor's reports that originated as written forms. This is enabling recognition of disease progression, improving treatment efficacy, and formulation of "return-to-work" strategies — all issues that are important to insurers.

2. Back-office effectiveness is delivering cost savings and improved customer service through more efficient claims processing as a result of claims models that have been enriched with unstructured data (like the doctor's reports). This enables the insurer to improve patient health from a preventive perspective, as we can recognize anomalies sooner and take action faster.

3. The holy grail will be the ability to execute automated underwriting, a practice that is becoming fairly common in areas such as property and casualty insurance. The next steps will be applying AI and machine learning to general health and wellness.

Johnson sums up his experience, "We have now reached critical mass. When you put these things — big data, AI, machine learning — together, we are starting to see better solutions for a number of classic problems. It will take longer for products with much longer tails involving health/wellness and life. But it's coming."

A Decade of Disruption at Scale

AI empowered by big data is accelerating the potential for disruptive change. The ubiquitous proliferation of data, combined with the means to capture and analyze massive volumes of data with agility and speed at scale, is driving innovation that extends far beyond traditional data and analytics functions. The ability to make informed decisions based on up-to-the-moment information is rapidly becoming the mainstream norm.

The figure below is from NewVantage Partners' annual Big Data Executive Survey, which was published in early 2017 and reflects the outlook of top executives for the coming decade. In my January *MIT Sloan Management Review* article, "Companies Brace from Decade of Disruption from AI," I noted that executives reported believing that AI would be the "single most disruptive" new capability over the course of the next decade. Additionally, these executives also noted that AI is first among all new capabilities that executives believe will have a disruptive impact on their firms — with an astounding 88.5% of executives reporting that they expect AI to have an impact on their firm (See "AI Is 'Most Disruptive' New Capability Over the Next Decade").

AI Is "Most Disruptive" New Capability Over the Next Decade

NewVantage Partners' annual Big Data Executive Survey reveals that 88.5% of top executives surveyed believe that AI is first among all new capabilities that will have a disruptive impact on their companies.
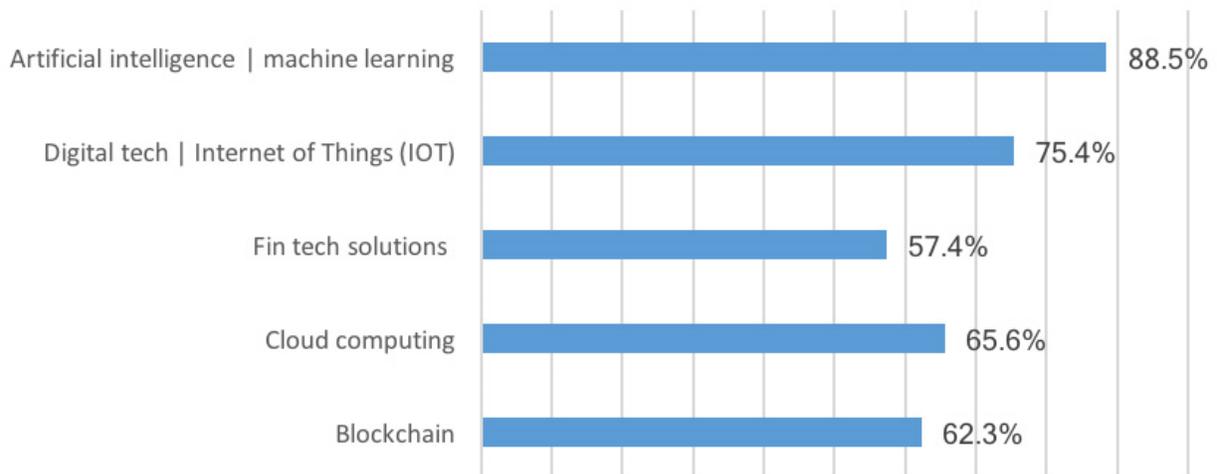
The impact of big data goes well beyond simple data and analytics. Big data and AI in combination are providing a powerful foundation for a rapidly descending wave of heightened innovation and business disruption. While the first wave of big data was about speed and flexibility, it appears that the next wave of big data will be all about leveraging the power of AI and machine learning to deliver business value at scale.

Forbes

The State of Machine Learning in Business Today

September 17, 2018

By Randy Bean

Artificial Intelligence (AI), Machine Learning, and Deep Learning are all topics of considerable interest in news articles and industry discussions these days. However, to the average person or to senior business executives and CEO's, it becomes increasingly difficult to parse out the technical differences which distinguish these capabilities. Business executives want to understand whether a technology or algorithmic approach is going to improve business, provide for better customer experience, and generate operational efficiencies such as speed, cost savings, and greater precision. Authors Barry Libert and Megan Beck have recently astutely observed that Machine Learning is a Moneyball Moment for Companies.

State of Machine Learning

I met last week with Ben Lorica, Chief Data Scientist at O'Reilly Media, and a co-host of the annual O'Reilly Strata Data and AI Conferences. O'Reilly recently published their latest study, The State of Machine Learning Adoption in the Enterprise. Noting that "machine learning has become more widely adopted by business", O'Reilly sought to understand the state of industry deployments on machine learning capabilities, finding that 49% of organizations reported they were exploring or "just looking" into deploying machine learning, while a slight majority of 51% claimed to be early adopters (36%) or sophisticated users (15%). Lorica went on to note that firms identified a range of issues that make deployment of machine learning capabilities an ongoing challenge. These issues included a lack of skilled people, and ongoing challenges with lack of access to data in a timely manner.

For executives seeking to drive business value, distinguishing between AI, machine learning, and deep learning presents a quandary, as these terms have become increasingly interchangeable in their usage. Lorica helped clarify the distinctions between machine learning (people teach the model), deep learning (a subset of machine learning characterized by layers of human-like "neural networks") and AI (learn from the environment). Or, as Bernard Marr aptly expressed it in his 2016 article What is the Difference Between Artificial Intelligence and Machine Learning, AI is "the broader concept of machines being able to carry out tasks in a way that we would consider smart", while machine learning is "a current application of AI based around the idea that we should really just be able to give machines access to data and let them learn for themselves". What these approaches have in common is that machine learning, deep learning, and AI have all benefited from the advent of Big Data and quantum computing power. Each of these approaches relies upon access to data and powerful computing capacity.

Automating Machine Learning

Early adopters of machine learning are findings ways to automate machine learning by embedding processes into operational business environments to drive business value. This is enabling more effective and precise learning and decision-making in real-time.

Firms like GEICO, through capabilities such as their [GEICO Virtual Assistant](www.newvantage.com), have made significant strides through the application of machine learning into production processes. Insurance companies, as an example, may implement machine learning to enable the offering of insurance products based on fresh customer information. The more data the machine learning model has access to, the more customized the proposed customer solution. In this example, an insurance product offer is not predefined. Rather, using machine learning algorithms, the underlying model is "scored" in real-time as the machine learning process gains access to fresh customer data and learns continuously in the process. When a firm employs automated machine learning, these models are then updated without human intervention since they are "constantly learning" based on the very latest data.

Real-Time Decision Making

For businesses today, growth in data volumes and sources -- sensor, speech, images, audio, video -- will continue to accelerate as data proliferates. As the volume and speed of data available through digital channels continues to outpace manual decision-making, machine learning can be used to automate ever-increasing streams of data and enable timely data-driven business decisions. Today, organizations can infuse machine learning into core business processes that are connected with the firm's data streams with the objective of improving their decision-making processes through real-time learning.

Businesses that are at the forefront in the application of machine learning are using approaches such as creating a "workbench" for data science innovation or providing a "governed path to production" which enables "data stream model consumption". Embedding machine learning into production processes will help ensure timely and more accurate digital decision-making. Organizations can accelerate the rollout of these platforms in ways that were not achievable in the past through techniques such as the Analytics Workbench and a Run-Time Decision Framework. These techniques provide data scientists with an environment that enables rapid innovation, and helps support increasing analytics workloads, while leveraging the benefits of distributed Big Data platforms and a growing ecosystem of advanced analytics technologies. A "run-time" decision framework provides an efficient path to automate into production machine learning models that have been developed by data scientists in an analytics workbench.

Driving Business Value

Leaders in machine learning have been deploying "run-time" decision frameworks for years. What is new today is that technologies have advanced to the point where machine learning capabilities can be deployed at scale with greater speed and efficiency. These advances are enabling a range of new data science capabilities including the acceptance of real-time decision requests from multiple channels while returning optimized decision results, processing of decision requests in real-time through the execution of business rules, scoring of predictive models and arbitrating among a scored decision set, scaling to support thousands of requests per second, and processing responses from channels that are fed back into models for model recalibration. Firms are deploying run-time decision frameworks with embedded and scalable machine learning, and are achieving notable results:

- Establishment of a demand funnel of 90 use cases for a next-generation advanced analytics platform
- Reduction of run time for analytics by more than 90%
- Support for millions of decision requests per day
- 46% more leads measured versus a control group
- $100M+ incremental annual revenue measured versus a control group.

This may sound like data science jargon, but firms are experiencing quantifiable business results. For organizations seeking to compete on data, machine learning has reached the stage of providing a critical business edge.

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Forbes

Will Blockchain Transform Healthcare?

August 5, 2018

By Randy Bean

The Wall Street Journal recently noted that the United States "will soon spend close to 20% of its GDP" on healthcare. While it might not be possible to address the rising costs of healthcare in the immediate future, there are steps that can be taken to address issues of customer service and efficiency to improve the overall healthcare experience, while ensuring the protection of customer privacy. In recent months, there has been a flurry of excitement about the role that blockchain technology might play in the long-term transformation of U.S. healthcare.

I recently spoke with a few individuals who are deeply conversant in the challenges facing healthcare and how solutions like blockchain can be brought to bear. John Halamka is Chief Information Officer of Beth Israel Deaconess Medical Center in Boston, a Harvard University teaching hospital, a position that he has held since 1998. He also held the position of CIO for Harvard Medical School from 2001 through 2012. Halamka recently assumed responsibility as Editor-in-Chief of the new academic journal, Blockchain in Healthcare Today. In the inaugural issue, published in March of this year, Halamka proclaimed his manifesto, "As the Editor-in-Chief of **Blockchain in Healthcare Today**, my goal is to publish high-quality opinion pieces and research papers about use cases that really require blockchain". Halamka continued, "Just using blockchain in healthcare because it's cool does not make sense".

Halamka knows of what he speaks. In his Journal call to action, Halamka goes on to note, "In 2017, I worked on several production blockchain applications, so I have a sense what works and what does not. Blockchain is not meant for storage of large data sets. Blockchain is not an analytics platform. Blockchain has very slow transactional performance. However, as a tamperproof public ledger, blockchain is ideal for proof of work. Blockchain is highly resilient". I asked Halamka about what he sees as the greatest healthcare challenges where blockchain could make a difference. Noting that blockchain is ideal for ensuring data integrity where control is decentralized, Halamka cites three prominent opportunities:

- **Medical Records.** When a medical record is generated and signed, it can be written to the blockchain, which will provide absolute proof and confidence that a medical record cannot be changed. The integrity of the medical record is ensured. The same concept can be applied to clinical trials. This has impact in legal cases as well where the integrity of the medical record is pivotal.

- **Consent management**. In the current healthcare environment where every state has different privacy and consent regulations, blockchain could be used to record patient consent for purposes of data sharing. Any party seeking to exchange medical data about a patient could check the blockchain for permission to do so.

- **Micropayments**. The idea that patients might be incented is gaining traction. If a patient follows a care plan, keeps their appointments and stays healthy, there might be rewards offered through

the blockchain. Similarly, patients might be rewarded for contributing their data to clinical trials and clinical research using the same approach.

Tory Cenaj, founder and publisher of Blockchain in Healthcare Today, adds, "Blockchain technology can elevate care excellence, and enhance the participation of owning one's health and data". Greg Matthews, whose mission is data-centered innovation in healthcare, and is creator of MDigitalLife, a platform for tracking digital trends in healthcare, offers an additional perspective, "Blockchain could make the biggest impact in healthcare in enabling health outcomes that take a 360° view of the patient's genetic profile, their demographic and socioeconomic status, the behaviors that impact their health, and their response to different treatments or combinations of treatments". Matthews continues, "This data exists today in one form or another, but can be tremendously difficult to stitch together at an individual level. Blockchain can enable "profile stitching", and do so in such a way that the patient's identity is protected".

A Blockchain Future?

Halamka observes how blockchain is ideally suited to addressing the challenge of decentralization of medical data. "Most healthcare data is centralized at the level of a corporation, healthcare facility or government registry" notes Halamka. "Blockchain is decentralized and therefore not impacted by the behavior of any one organization.   In the future we might see blockchain as a component of a system in which patients serve as stewards of their own data, rather than relying on any central source". Matthews concurs, "We haven't been able to aggregate patient data in one place and secure it so that only the patient has control of it and can make decisions who they want to share it with".

Matthews envisions a future where blockchain would play an integral role in healthcare improvement. He observes, "By using blockchain in combination with AI and machine learning, we should be able to discover potential solutions to health problems that are devastating to us today". Matthews continues, "The dream of personalized medicine looked like an almost-insurmountable problem 10 years ago because of technical challenges in linking data types and using them to find patterns across massive amounts of data. Today, the dream is more threatened by the harm that personalized medicine could do if the data and insights it yields were improperly used". He concludes, "Blockchain could be at the foundation of the solution, with the patient having ultimate control over their data and how it's used".

Halamka remains cautious however. He notes that technical challenges pose obstacles to the adoption of blockchain initiatives in healthcare. "It's slow, it's awkward to use, the number of steps required to get and put data to blockchain are numerous and complex". There is hope though. "There are emerging "blockchain-as-a-service" products that attempt to solve these problems, but they are very early" observes Halamka.

Matthews and Cenaj note that, in addition to these technical challenges, there are significant cultural obstacles that stand in the way of blockchain adoption as well. "Regulation, policy, and legacy practices hinder the US from assuming a leadership role. Shareholder value does not equal patient value. It may take 10-15 years unless policy changes are implemented rapidly", comments Cenaj. Matthews remarks, "Until we have a policy change at the highest levels of government, I don't think that blockchain will be more than a point-solution for data security. I am convinced however that when we do finally have clarity on who owns patient data, transformation in personalized medicine could happen fast".

In spite of his pragmatism and caution, Halamka is optimistic about the future of blockchain in healthcare. "There are production applications in healthcare using blockchain now, and they will become more commonplace over the next year.

Like any innovation, we'll go through a hype phase, a disappointment phase and eventually achieve broad adoption.   Expect three years before there is universal adoption of blockchain related products". If Halamka is correct, we could see blockchain driving healthcare transformation sooner than expected.

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Forbes

How FinTech Initiatives Are Driving Financial Services Innovation

July 10, 2018

By Randy Bean

It was on this date, July 11, in the year 1804 in Weehawken, New Jersey, that Alexander Hamilton, architect of the American financial system, met his fate at the hands of Aaron Burr.   Some would argue that the financial services industry has changed very little since then. Change has some slowly to financial services, and innovation has proceeded at an evolutionary, some would say glacial, pace. That may be changing however. Recent decades have born witness to the introduction of technology solutions that have accelerated the transformation of consumer experience. Technological advancements such as the Automated Teller Machine (ATM), online banking and bill payment, and mobile banking have enhanced consumer experience in banking and payments, while alleviating costs, increasing convenience, and streamlining processes. The shock of the great recession, coupled with the emergence of new technology applications in self-service, online and mobile banking, machine learning, Big Data, and artificial intelligence (AI) may now be sowing the seeds of financial services disruption.

Fear of disruption is a growing concern for financial services firms. A 2018 executive survey found that nearly 80% of top executives feared that their firms were at risk of disruption and displacement from highly agile, data-driven competitors. Three quarters of the executive respondents represented the largest financial services firms. This rising fear of disruption and potential displacement can be attributed in part to the increasing threat of encroachment coming from the big tech giants – Amazon, Google, Facebook, and Apple. I explored this threat in a Forbes article written last fall, Financial Services Disruption: Gradually And Then Suddenly. There is a new and additional threat as well. As consumers grow to expect greater customization and personalization of their financial services experience, a new wave of innovators is opening up a more expansive vision for financial services. Much of the innovation in financial services these days is being driven by a new set of entrants -- FinTech startups.

The Emergence of FinTech

FinTech (short for Financial Technology) can be characterized as the movement to bring transformative and disruptive innovation to financial services through the application of new and emerging technologies which address consumer needs through automation. Due to factors including consolidation in the financial services industry and regulatory constraints, financial services firms may find themselves constrained from being able to focus their energies on innovation initiatives. FinTech startups have the advantage of not being encumbered by legacy systems and processes. As a result, FinTech firms are generally able to move faster and develop solutions that compete directly with traditional methods of delivering financial services. With customer acquisition costs high, and regulatory hurdles to overcome, financial services firms are faced with a choice whether to build their own capabilities or seek out FinTech partners to help drive innovation initiatives. This opening has provided an opportunity for FinTech firms to provide new applications either directly to customers, or in partnership with large financial services institutions.

Large institutions must consider how they can move quickly to address consumer needs in an industry on the cusp of change, either through partnerships, acquisition, or internal initiatives. Most firms are taking a hybrid approach.

Jean Donnelly is executive director of FinTech Sandbox, a non-profit innovation center that was established in Boston in March 2015 with the mission of bringing to market the latest technologies that will transform financial services. According to Ms. Donnelly, "FinTech Sandbox helps startups obtain critical data to build and test products. We have a network of over 37 data and infrastructure partners (and growing) who will give access to their premium products to startups we work with to develop and test their applications". Ms. Donnelly continues, "We also help get the best solutions in front of our financial institution partners, to explore opportunities for partnership, proof of concept engagements, as well as investment opportunities". Ms. Donnelly notes that sponsors of FinTech Sandox include leaders in market data, technology infrastructure, and financial services that seek to explore the innovative solutions that FinTech startups are developing. Among the sponsors of FinTech Sandbox are financial services stalwarts such as Fidelity Investments, Franklin Templeton, Thomson Reuters, and State Street Corporation. FinTech Sandbox is also collaborating with startup accelerators such as MassChallenge on a new initiative announced last week that will match later-stage FinTech startups with industry leaders. The initiative is intended to accelerate the development of products and service solutions that have the potential to transform financial services.

Innovation at the Edge

 The current FinTech universe encompasses startup firms in addition to initiatives coming from within established financial services incumbents, many of whom have launched Innovation Centers or Excellence. Capital One has been an innovator in financial services for several decades based on the application of data-driven analytics. Cap One has operated a Big Data Lab for several years now as it seeks to continue to apply innovative technologies and approaches to its business. The maturity of FinTech initiatives vary. My colleague Tom Davenport and I have written about AI and machine learning solutions from incumbent firms including Morgan Stanley and Charles Schwab, both of whom have been at the forefront of data and AI-driven financial services innovation in recent years.

A continued topic of debate revolves around who is in the best position to innovate in financial services, and whether that is large incumbents or FinTech startups. FinTech firms have the advantage of not being encumbered by legacy systems and processes, and can therefore move faster to develop custom solutions. Firms like PayPal, Square, and Lending Club are examples of FinTech startups that have successfully grown into leading market competitors. Manish Gupta is founder and CEO of Corridor Platforms, an integrated credit risk management platform which has been designed to enable real-time credit underwriting and customer management. Mr. Gupta was formerly the executive vice president and global head responsible for information management and data products, Big Data, and advanced decisioning at American Express. Mr. Gupta observes, "FinTech companies are better suited to initiate disruption by innovating and improving key drivers in an established financial value chain. They can be more agile, focused, and unencumbered by legacy issues like fixed cost, old infrastructure, and technology". Gupta cites the example of marketplace lenders who have improved customer experience through the generation of multiple counter offers in real-time. He further notes that the initial disruption caused by FinTech startups can accelerate the innovation in established companies and make them rethink their own structure and partnerships. "A mix of FinTech energy and long-term experience from established companies elevate the overall value proposition and value chain" says Gupta.

The Future of FinTech

What does the future hold for FinTech? AI, machine learning, and Big Data are becoming central to FinTech solutions as firms look to new areas of financial services innovation. One area that is ripe for innovation is marketplace lending. Ash Gupta, former Chief Risk Officer and President of Global Credit Risk for American Express, notes, "Fintech and digital lenders have created new excellence in customer experience and have permanently changed customer expectations with regards to speed of credit decisioning and the choice and flexibility available with regards to range of offers and prices". Recent examples of FinTech firms that have found opportunities to innovate include:

- Quantopian – A community of over 100,000 quant users sharing a platform where they can develop and share algorithms and trade them in the market;

- Kensho – An AI engine focused on putting data and analytics at the fingertips of non-technical users to bring data science to a larger financial services audience;

- Elsen – A high performance computing engine that can take the complex models for hedge funds and traders and process results in minutes.

Financial technology provides a foundation for financial services innovation and transformation, yet firms still must overcome the final barriers and roadblocks to widespread business adoption – cultural change. Nearly two-thirds of executives state that business adoption remains a challenge, yet only 1 in 5 executives say that technology represents the barrier to successful adoption. With 4 out of 5 executives pointing to cultural challenges -- people and process -- as the principle barriers to business adoption, financial services firms will continue to face challenges as they seek to leverage FinTech solutions to stave off agile, data-driven competitors.

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Forbes

Getting to Trusted Data Via AI, Machine Learning & Blockchain

June 17, 2018

By Randy Bean

Establishing trust in data is an essential requirement for businesses and entities for whom credible, reliable information is the lifeblood. As enterprises seek to manage data as an asset, it becomes increasingly vital that data sources are trusted and verifiable.

I wrote a few weeks ago about the MIT initiative to establish a framework for trusted data, and the resulting position paper, "Towards an Internet of Trusted Data: A New Framework for Identity and Data Sharing". The authors highlight the criticality and need for "trustworthy, auditable data provenance" where "systems must automatically track every change that is made to data, so it is auditable and completely trustworthy". One of the key recommendations of the study was to improve the process and quality of data sharing. One suggestion was to move the algorithm to the data, explaining "The concept here is to perform the algorithm (i.e. query) execution at the location of data (referred to as the data-repository). This implies that raw-data should never leave its repository, and access to it is controlled by the repository/data owner".

Tom Dunlap has been at the center of issues of data trust, standardization, and normalization for well over a decade. Dunlap most recently served as a managing director at Goldman Sachs, where he was global head of enterprise data strategy and reference data operations during his seventeen-year tenure with the firm. Among other responsibilities, Dunlap served on Goldman Sachs operations data digitization council and financial reform steering group. He also serves as a member of the Financial Research Advisory Committee at the US Treasury Department's Office of Financial Research.

From his catbird seat at the heart of the action in financial services, Dunlap developed some informed perspectives on issues of data trust and data reliability. He sees the financial services industry progressing on a path to enriched data quality and reliability. Dunlap notes, "From the top on down, financial services firms are viewing data as a corporate asset, where data is seen as being foundational to achieving not only compulsory needs with regulatory reporting, but also as improving the client experience and enabling commercial initiatives". Dunlap sites as an example the introduction of Legal Entity Identifier (LEI), which is being employed by financial services firms to manage systemic risk. In addition, financial services firms are tracking data lineage and definitions of data, with the result that data can be traced from production through consumption, to accurately understand the points at which data is being used and how that data is being transformed during its lifecycle. The result, notes Dunlap, is that "data can now be trusted, and verified, from the source, with fewer data quality problems being experienced". The benefit is that higher levels of data quality translate into faster time-to-market for activities including product profiling and pricing, and faster trade executions. The net result is that client experience has improved.

As data has proliferated, so have the variety of new data types under review, including what are known as "unstructured" data sources. Examples would include documents, pictures, texts, and other free-form images. It is in addressing the challenges of managing unstructured data that Artificial Intelligence (AI) and machine learning are enabling breakthroughs. Dunlap cites the example of "derivative contracts",

where formats may differ across financial institutions. AI and machine learning capabilities can be used to look within documents to automatically detect key data elements, such as legal entity names and economic terms. Firms are applying AI and machine learning to search for these data points, perform language translations as needed, match Legal Entity Identifiers, and load the resulting output into categories that have been assigned predictive levels of completeness and accuracy, which are usually quite high. Over time, AI and machine learning algorithms become very good at knowing what key data attributes to look for, where to bucket these attributes across workflows, and delivering recommendations on data enrichment. The result is that data capture and matching processes which had taken a full day to complete have now been reduced to a matter of minutes, even seconds in some instances.

Blockchain offers an alternative model to access data and a different way to imbue trust in data quality. David Shrier has been a trailblazer in the movement to establish trusted data. In addition to serving on the MIT commission which produced the policy paper on trusted data, Shrier is a lecturer and futurist with MIT Media Lab, an advisory member to the Financial Industry Regulatory Authority (FINRA), and an associate fellow at Oxford University, where he is engaged in the delivery of global online Fintech and Blockchain initiatives through Oxford Fintech and Oxford Blockchain Strategy. Shrier observes, "Blockchain is a completely different kind of database, one with the potential for greater transparency into the data for multi-stakeholder environments, and greater cyber-resilience if certain types of Blockchain and other technology are combined". He continues, "The old-school concepts of data lake, data warehouse, and data mart still rely on the concept of having a centralized database which provides for a single point of failure and an attractive attack surface for hackers".

Shrier goes on to note, "We are just beginning to explore the potential of Blockchain to help transform society. Blockchain has given birth to a new model of funding, of distributed capital formation, for businesses called ICOs (initial coin offerings). This is particularly important in Europe, for example, where today 70% of the funding for businesses relies on banks. In the US, most innovation funding is concentrated in Silicon Valley, and ICO's hold the potential to democratize innovation funding if the regulators don't shut it down". He continues, "Consumers can have better digital identity, lower cost financial services, new employment and community models, better control over their assets, and more, through Blockchain systems". Shrier concludes, "It's still very early in the development of applications for consumers. In 1994 internet tech, we had no conception of Airbnb or Uber, and I think we're in a similar stage with Blockchain technology".

The biggest issues surrounding the use of personal data today come from not knowing where this data is stored, who is looking at it, or what is being done with this information. While the new European data protection law, the General Data Protection Regulation (GDPR), begins to address these issues, there is still a need to provide technology infrastructure that will enable trusted data sharing. Blockchain approaches, as described in the MIT Trust Data initiative, provide a path to a trusted data framework which can ensure:

- more secure personal information

- better access to data through a personal data store

- an unchangeable audit trail of who's done what with personal information.

Shrier reflects in conclusion, "Society as a whole can benefit from more reliable, distributed data and information. In this era of fake news and state actor interference in elections, creating technology-driven trust offers the potential to restore faith in our shared institutions".

Forbes

The Chief Data Officer Dilemma

January 30, 2018

By Randy Bean

One of the most encouraging signs that leading corporations are embracing the importance of data as a critical enterprise asset has been the establishment of the Chief Data Officer role. This recognition of the CDO role has been evidenced and confirmed by the results of an annual survey of Fortune 1000 c-executives launched by advisory firm NewVantage Partners in 2012.

While only 12% of executives reported that their firm had appointed a Chief Data Officer when the survey was first conducted in 2012, there has been a sharp and steady increase in adoption of this new c-executive role over the course of the past several years. In the 2018 survey, which was recently released, nearly two thirds of executives – 63.4% -- now report their firm having a CDO. Clearly, the Chief Data Officer has become an established role within a majority of leading corporations.

The annual survey provides a finger on the pulse of those blue chip corporations that are widely viewed as leaders in investing in data initiatives -- ranging from legacy data management to Big Data and data-driven AI initiatives. Financial services firms are heavily represented. These firms have historically maintained a rich history of customer transactions and activity for what can be very high value customer relationships. Leading firms in sectors such as health care, life sciences, media, and manufacturing are also represented. 2018 survey participants included bellwether firms American Express, Bank of America, Capital One, Charles Schwab, CitiGroup, Fidelity Investments, Ford Motors, Goldman Sachs, JP Morgan, IBM, Wells Fargo, and VISA, among nearly 60 industry leaders.

In spite of the common recognition of the need for a Chief Data Officer, there appears to be a profound lack of consensus on the nature of the role and responsibilities, mandate, and background that qualifies an executive to operate as a successful CDO. Further, because few organizations -- 13.5% -- have assigned revenue responsibility to their Chief Data Officers, for most firms the CDO role functions primarily as an influencer, not a revenue generator.

This divergence of opinion on CDO responsibilities, mandate, and importance of the role underscores why the Chief Data Officer may be the toughest job in the executive c-suite within many organizations, and why the position has become a hot seat with high turnover in a number of firms.

Lacking Consensus on Data Leadership

To understand the lack of consensus regarding the Chief Data Officer position, let's delve deeper into the findings. While 39.4% of survey respondents identify the Chief Data Officer as the executive with primary responsibility for data strategy and results within their firm, a majority of survey respondents – 60.6% -- identify *other* C-Executives as the point person, or claim *no single point* of accountability.

This is remarkable and highly significant, for it highlights the challenges that CDO's face within many organizations. It is noteworthy that 15.5% of firms are still committed to the position that the Chief Information Officer is the primary executive responsible for data strategy and results.

Of greatest concern is the finding that nearly a quarter of executives – 23.9% -- report that there is no single point of accountability for data and analytics within their organization. This should not be surprising. Most corporations that have been in existence for decades or longer were not organized around data as an organizing principle, or as an enterprise asset. As firms make the adjustment to become data-driven organizations, and work to forge data cultures, there is bound to be lingering resistance to change, or a profound lack of common agreement on where data responsibility lies, or what it looks like.

Establishing the CDO Mandate

Lack of clarity and common agreement on the nature of the role of the Chief Data Officer extends to disagreement on the CDO mandate. Nearly half of executives -- 44.4% -- indicate that the primary responsibility of a CDO is to *develop* the overall data and analytics strategy for the firm. This implies a strategic role. More than a quarter of executives – 26.7% -- see the primary responsibility of the CDO as being to *coordinate* data initiatives across the firm. A lower percentage of executives – 20% -- view the role as *leading* these initiatives across the firm. There is a strong consensus – 91.1% -- that the CDO should be playing a leadership role when it comes to charting the course of a firm's data and analytics strategy.

The point of disagreement appears to come down to the *scope* of the Chief Data Officer mandate, and whether the primary responsibility of the CDO should be to plan, coordinate, or implement data initiatives. It can be expected that this fine tuning will continue to evolve and will play out as firm's progress on their data journey. Executives need to remember that developing a data-driven organization and culture is indeed a journey. It may be cause for optimism that only 6.7% of executives see the primary responsibility of the CDO as being to ensure regulatory compliance, suggesting that the CDO is steadily moving from defense to offense within most organizations. On the other hand, few executives -- only 2.2% -- see the primary CDO role as building new sources of revenue. It is simply premature and too early for most firms to undertake this in a determined fashion.

Struggling to Define the CDO Role

There was one glaring area of noteworthy and divergent perception in the survey findings. This pertains to the background and qualifications that make for a successful Chief Data Officer, with perspectives varying sharply. While 34% of executives believe the ideal CDO should be an *external* change agent (outsider) who brings fresh perspectives, an almost equivalent 32.1% of executives believe the ideal CDO should be an *internal* company veteran (insider) who understands the culture and history of the firm, and knows how to get things done within that organization. There are notable examples of both flavors of CDO within industry.

Also of note is the significant 22.6% of executives who indicated that the CDO must be either a data scientist or a technologist who is highly conversant with data. An additional 11.3% responded that a successful CDO must be a line-of-business executive who has been accountable for financial results.

Clearly there is a sharp and highly divergent matter of opinion on this topic. When asked about the long term role of the Chief Data Officer, exactly half – 50% -- reported that the CDO should sit on the executive committee, with exactly half – 50% -- disagreeing. Of those disagreeing, 37.1% believed that the CDO should report up to the executive committee, without a seat on the committee.

Perhaps most troubling for incumbent Chief Data Officers are the 12.9% of executives who responded that either the CDO was an interim role which will likely be phased out over time, or that the CDO role is unnecessary and responsibility for data should reside elsewhere.

Looking to the Future

This is the Chief Data Officer dilemma. While the role has emerged as a de facto industry standard and gained broad acceptance as evidenced by the sharp rise in CDO appointments, agreement on responsibilities, mandate, profile, and seniority continue to vary dramatically. The lack of consensus on the Chief Data Officer role aptly mirrors the diversity of opinion on the value and importance of data as an enterprise asset and how it should be managed. The Chief Data Officer can be expect to be near the center of action as firms strive to become data-driven, but should also be prepared to sit in the hot seat during these times of rapid evolution.

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