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2020 ANALYTICS PREDICTIONS AND PRIORITIES

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Introduction

Each year, the International Institute for Analytics ends the year with a look at the latest analytics trends and the most pressing analytics challenges currently facing organizations. Our predictions are based upon our day-to-day work supporting and advising analytics leaders and organizations. We take advantage of the breadth of expertise and cross-industry perspectives we encounter every day from our clients, partners, and members of the IIA expert network.

This is our 10th annual look toward the upcoming year, and our annual Predictions and Priority research brief and the associated webinar have become among IIA's most popular content of the year. This year, we've stuck with our approach of augmenting each of our predictions with a specific priority for leaders to focus on as they attempt to address that prediction. As a result, **each priority provides specific guidance as to how to best prepare for, and adapt to, its corresponding prediction.**

IIA's Predictions and Priorities for 2020

PREDICTION 1: SPECIALIZATION OF ROLES WITHIN ANALYTICAL WORKFLOWS ACCELERATES

In the early days of analytics, one individual would often execute an analysis from end to end. This included data acquisition, data cleansing and preparation, modeling, and whatever type of deployment was required. As we all are aware, the demand for analytics has increased massively in recent years. At the same time the breadth and volume of data has exploded, as have the types of analytics being requested. As a result, **it is nearly impossible for any individual to truly be an expert in all aspects of an analytical workflow.** As [IIA has discussed](#) previously, increasing levels of specialization are becoming common. Specialization is occurring across the various analytics workflow phases, as well as within each phase.

Let's first look at how people are specializing across phases of the analytics workflow. For example, analytic translators help up-front with scoping and problem formulation and on the back end with adoption and value creation. Similarly, data engineers focus on data acquisition and preparation, data scientists focus on the modeling and analysis, and analytic application developers and user interface / user experience specialists focus on interfaces.

There is also specialization within any given workflow phase. For example, some data scientists now focus on traditional machine learning, some focus on deep learning, and some focus on language processing. **Instead of a single person, we now have a team of people who come together to make each component of an analytical process be as good as it can be.** This trend will continue to accelerate in 2020 as organizations continue to adopt internal organizational structures and hiring processes that embrace this new division of labor.



PRIORITY 1: MODERNIZE YOUR ORGANIZATION'S ROLE DEFINITIONS AND HIRING PRACTICES

It is no longer optimal, or even sufficient, to have only a few very broad job roles within an analytics and data science organization. If your current talent architecture only includes broad roles such as “analyst” or “data scientist,” then you risk not effectively covering all the bases you need to cover.

Update your talent architecture to account for the specialization that your organization must embrace both across the phases of an analytical workflow and within them. Many companies have adopted the role of data engineer, fewer have embraced analytics translators, and fewer still have incorporated an analytical interface developer.

It is also important today to acknowledge that not all data scientists are alike. Seek a mix of skills and specialties from deep learning to classic predictive modeling. In the end, your data science team needs to evolve much [like the medical field has evolved](#) in the past few decades. **This same type of sub-specialization is also going to occur with other roles.** For example, developers who specialize in cloud-based analytical interfaces and those who specialize in traditional interfaces. Or data engineers who specialize in streaming pipelines and those who specialize in pipelines that integrate multiple traditional data sources. Now is the time to accept and adapt to the trend of specialization as it is a trend that is here to stay.

PREDICTION 2: THE CONFUSION OVER ANALYTICS EXECUTIVE DUTIES CONTINUES

As analytics has become a major strategic focus, very senior analytics roles have become common. Not long ago, many companies did not have even a director-level manager focused exclusively on analytics. Today, vice-president-level analytics roles are nearly pervasive among large organizations, and C-level roles are now the rule rather than the exception. Unfortunately, **there is still little agreement as to which C-level roles tied to analytics are most needed.** Worse, there is much inconsistency in how organizations are defining the responsibilities of the same title.

Chief Analytics Officer (CAO), Chief Data Officer (CDO), Chief Data & Analytics Officer (CDAO), Chief Digital Officer (CDO): these are all roles that have become common yet have been implemented in different, and often overlapping, ways. Who wouldn't be confused by the fact that the term “CDO” applies to more than one role? To add to the confusion, how do these newer roles then fit with existing roles such as Chief Technology Officer (CTO), Chief Information Officer (CIO), and even Chief Marketing Officer (CMO)?

Some companies started by chartering a CDO (chief data officer) first, others chartered a CAO first, and yet others have tried to cover everything at once with a CDAO. **Scan job postings and you'll quickly see that how each of these roles is defined can vary greatly by company. There is no industry standard yet and so organizations are doing their best to figure out what works for their unique situation.** IIA's experience with a diversity of organizations and related titles has shown us that the “perfect” role description does not exist. This is not an ideal



situation because it makes coordination difficult and effort may be duplicated. It also makes it harder to learn from what other organizations are doing. Unfortunately, this situation is likely to continue until organizations or external bodies clarify the different roles and responsibilities in these titles.

PRIORITY 2: RATIONALIZE YOUR ANALYTICS EXECUTIVE ROLES AND RESPONSIBILITIES

Whichever of the executive roles your organization has in place, focus on gaining clarity and agreement as to how each person fits, what each person should be doing, and how they each add value. While only the most senior executives in an organization can formally provide this clarity and mandate its implementation, there is progress that can be made, nonetheless.

Within the analytics organization, work to define and clarify as much as possible how the analytics-oriented executives relate to each other. Having some general guidelines for the extended team is better than leaving them in the dark. Have your CAO, CDO, CDAO, and others offer their interpretations of how their role fits with the others. Each of their respective teams, therefore, will at least know what their leader is striving towards.

It is easy to assume that just because someone is the senior leader of a function everyone knows exactly what the role is chartered to do and how it fits with other related players. In reality, there is often ambiguity among the executives themselves. And, of course, they have much more information than the broader team does. Therefore, focus on providing as much clarity as possible even if full clarity isn't available.

PREDICTION 3: ETHICAL ANALYTICS BECOMES AN EXTERNAL DIFFERENTIATOR, NOT JUST AN INTERNAL POLICY

In 2019, IIA predicted that ethics in the world of analytics and AI would see a major increase in attention and visibility. This has certainly been the case. Virtually every major analytics and AI focused conference in 2019 featured talks on ethics, if not an entire ethics track. In addition, there were multiple incidents that led to mass media reports of ethical concerns around how analytics are being used today (see [here](#), [here](#), and [here](#)). This attention will certainly continue.

IIA predicts a new trend to emerge in 2020 that takes ethics to the next level. **As opposed to simply having strong internal policies and procedures to ensure that analytics, artificial intelligence, and data are being used ethically, some organizations will make their commitments public in order to differentiate themselves from the competition and garner public support.**

There are already organizations, such as Apple, that strongly position their commitment to providing security and privacy to their customers. With analytics becoming so pervasive and many large companies (especially social media companies) coming under fire for tactics and policies deemed unethical, the market is ripe for some companies to step up and offer a clearly ethical alternative.

PRIORITY 3: DECIDE IF YOUR ORGANIZATION SHOULD COMPETE ON ETHICS



The IIA client base is overwhelmingly committed to competing on analytics. After all, we were founded to help companies do just that, and our clients look to us to help them reach that goal. Competing on analytics now requires, at minimum, an internal focus on the ethical issues that can arise across the entire analytics workflow. Hopefully, most of you saw substantive progress last year within your organization with respect to taking ethics more seriously. If not, just browse both industry and mass publications to see new stories almost every week of another company in trouble for a perceived ethical violation. That should be a wakeup call because falling behind in this area has immense consequences.

In 2020, consider whether your organization should take that commitment to ethics public and make ethical analytics a cornerstone of the value proposition for your customers. It is hard to imagine a downside in terms of public opposition to such a stance, but it is easy to imagine a huge upside as customers concerned about how their data is being gathered, analyzed, and used flock to organizations they believe they can trust.

Of course, you shouldn't go public too hastily if your policies and procedures aren't yet robust enough to back up the talk and survive public scrutiny. However, even if it will take some more time to be ready to go public, simply setting this as a goal can help drive faster and more focused progress with analytics ethics.

PREDICTION 4: NEW DEPLOYMENT TECHNOLOGIES WILL ENABLE SIMPLICITY AND SPEED

The deployment of analytical processes and outputs has always been an Achilles heel when it comes to

value realization. Most successful and high-potential prototypes never become broadly used. The lack of deployment success is driven by two totally distinct issues. First is the challenge of needing to disrupt existing business processes and procedures. This challenge isn't a technical one, but rather an organizational and change management one. Second is the technical challenge of deploying an analytics process at scale.

While the organizational concerns are as hairy as ever, tremendous progress has been made on the technical side, and this will continue to accelerate in 2020. **With the advent of containerization technologies, many of the hurdles of the past related to deployment either go away or are much easier to handle.** Using containers enables an analytics process to be developed with whatever operating system and software versions are desired. Then those same versions can be used as-is when deployed instead of having to reconcile different versions and settings with the production environment. **In other words, no more recoding a finished process** so that it can operate in a production environment that is different from the development environment.

Other developments such as [serverless technology](#) help to reinforce and enhance the impact of more mature technologies like containerization. Methodologies like [MLOps](#) include deployment as an important stage in the analytics/AI process and facilitate production and ongoing model management. As these new capabilities are widely adopted in 2020, it will become easier and cheaper than ever before to develop and deploy analytics.



PRIORITY 4: EMBRACE THE NEWEST DEPLOYMENT TECHNOLOGIES . . . TODAY!

The advent of containers, MLOps methods and tools, and serverless technology has the potential to be one of the biggest enablers of analytics value capture in decades. These tools may be “under the hood” and highly technical in nature, but what they enable for the analytics organization and the enterprise is powerful. The time is now to ensure that your organization is at least looking at these technologies.

Of course, some of these tools require the analytics organization to partner with IT to successfully implement the new protocols because they must be enabled at the system level. Luckily, if you’re working in a cloud environment, every major cloud vendor is set up to make this happen. As a result, the main barrier to adoption will likely be internal legacy systems. **It is fortunate that some of these technologies help all types of applications, not just analytical ones. This means that the benefits will be enterprise wide, which makes it easier to build a case for them.**

The initial transition won’t be free from major effort, but once implemented, a new level of deployment capability will be at your fingertips. Even if you find your IT organization isn’t ready to enable these new deployment technologies today, work with them to develop a plan to enable it sooner rather than later.

PREDICTION 5: CAUSAL MODELS GARNER INCREASED ATTENTION

Most modeling techniques, whether traditional analytics or machine learning-based, are correlational in nature. In other words, they will effectively find

associations between various inputs and outputs and may do a great job of predicting outputs based on inputs. However, they can’t / don’t prove what is causing those relationships to emerge. A classic example is that at a player level, committing fouls in basketball is highly predictive of scoring. Does this mean coaches should encourage fouling? Of course not. Fouls don’t cause scoring. Both fouls and points scored increase as playing time increases. Playing time is the real causal factor. Such spurious correlations have been taught in introductory statistics courses for years, but now experts in AI (e.g., Gary Marcus, Rod Brooks) are arguing that we will never fully understand a domain through tools like deep learning. Instead, it is argued, we need to at least supplement correlational models with causal ones.

Causal models combine traditional and time-series modeling, hypothesis testing, Bayesian networks, business rules, and experimental design in order to drive toward validating the causes of relationships that are found instead of just noting them. This is critically important in areas like healthcare, where cause and effect must be firmly established to enable safe and proper treatment. It is also important in highly-regulated financial services, in which models with a causal explanation are more likely to be viewed as reasonable and ethical by regulators. Even in a marketing setting, it can save a lot of unneeded expense if funds can be spent to pull on the levers that have a truly causal relationship with purchasing.

Causal models require more effort and steps than traditional processes and won’t be worthwhile in all cases. While A/B and other multivariate testing can deliver good results, often time such tests are not ethical (to find out how much exposure to cigarettes causes cancer, you cannot push people to smoke more) or are too difficult to implement well. And firms may not always have the kind of data needed to pursue causal inference in statistical models.



However, as high value problems in areas like healthcare continue to be addressed with analytics and AI, we'll see causal models become more common.

PRIORITY 5: ADD CAUSAL MODELING TO YOUR ANALYTICS PORTFOLIO

Chances are that some problems your organization is tackling today would benefit from a deeper dive into causation as opposed to being satisfied with correlation. If you're not yet using causal modeling, assign some people to become familiar with the various approaches to achieving it, and to look out for projects where those approaches might be relevant. For this effort, classic statistical and experimental design skills are highly relevant. **A large analytics organization will almost certainly already have**

people on staff who have the skills necessary for causal modeling. It is just a matter of directing their skills in the direction of actually doing it.

Aim to have at least one proof of concept executed in 2020 that is focused on causal modeling—ideally one in which the stakeholders would find causal explanations important. Either use causally-focused models like Bayesian networks or time series, or after identifying the usual correlational relationships identified through typical models, go to the next step and design experiments to either confirm or invalidate the hypothesis that there is a causal relationship present. In cases where the direction of causality has important business, health, or risk implications, the additional effort will be well worth it. Causal modeling hasn't yet become mainstream in large businesses, but it is starting to show up more frequently.



About the Authors



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Bill Franks is Chief Analytics Officer for The International Institute For Analytics (IIA), where he provides perspective on trends in the analytics & big data space and helps clients understand how IIA can support their efforts to improve analytics performance. Franks is also the author of the books *Taming The Big Data Tidal Wave* and *The Analytics Revolution*. His work, including several years as Chief Analytics Officer for Teradata (NYSE: TDC), has spanned clients in a variety of industries for companies ranging in size from Fortune 100 companies to small non-profit organizations. You can learn more at <http://www.bill-franks.com>.



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Robert Morison serves as IIA's Lead Faculty member. An accomplished business researcher, writer, discussion leader, and management consultant, he has been leading breakthrough research at the intersection of business, technology, and human asset management for more than 20 years. A McKinsey Award winner, he is co-author of *Analytics At Work: Smarter Decisions, Better Results* (Harvard Business Press, 2010), and *Workforce Crisis: How to Beat the Coming Shortage of Skills And Talent* (Harvard Business Press, 2006).



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