



Predictions for Big Data Analytics in 2016



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5 ways big data, automation, and artificial intelligence will shape the future of business as we know it.

– By Lewis Carr

Science fiction has delivered many irresistible visions of the always-distant future. A nearly ubiquitous feature of them all is the autonomous robot. Whether it's robot servants waiting on us, robot armies trying to enslave us, or something in between, our most popular futuristic visions imbue a single machine with artificial intelligence (AI).

In reality, AI technology is neither a distant prophecy nor a discrete, robot-like machine. AI technology is taking root in the world right now—without robots or avatars—making 2016 the year fact and fiction will start to diverge.

Most notably, the year ahead will deliver many real-world applications of big data. Unlike the self-directed technologies of science fiction, the ability to analyze big data can deliver distributed machine intelligence that complements human ability—ultimately making both humans and machines more effective in addressing a wide range of social and business needs. Through incremental process change, big data analytics will shape a future in which autonomous, intelligent, connected technology will make practical sense.

The slow reveal

One of the most common misconceptions about technology is that people—and their livelihoods—will always be on the losing end of new advancements. It's an easy assumption to make considering the number of past human occupations usurped by machine automation. But the replacement phenomenon isn't linear. There are boundless examples of new technologies that have failed to approximate the value delivered by the humans they replaced.

It's common to apply automation with too broad a brush, asking machines to do things that only humans do well. This includes tasks like answering telephones and reading facial expressions. Meanwhile, in other disciplines, we require humans to complete data-driven tasks that machines do quite well, such as deciding how best to arrange store inventory.

Thanks to big data analytics, we can correct both missteps. Rather than replacing humans in a one-for-one exchange, big data analytics can be added to human-led processes, creating a collaborative hybrid of human and machine. By adding more data at the right moment in a process, big data analytics narrows the situations in which humans must guess the right decisions to make. It feeds humans precise, actionable data so they can be more efficient in doing the things only humans should do.



Making peace with AI

The “10,000-hour rule,” coined by Malcolm Gladwell in his book “Outliers”, contends this is the approximate investment required for a person to develop a deep expertise in a skill. When it comes to competing with machines, this is our downfall. Machines can easily absorb a great deal of the data amassed within those 10,000 hours, and aggregate thousands more hours from thousands more skilled experts.

But there are still some things AI does poorly—even in situations where deep human expertise isn’t required. For example, self-driving cars do an equal job to a human driver in the vast majority of situations, but often fall short in situations where subtle eye contact or gestures are involved, such as at a four-way stop. Humans know how and when to bend the rules, while machines lack the ability to make nuanced decisions that makes rule bending successful.

Such highly interpretive human situations are where collaboration between humans and machines will always deliver benefits. Whether that collaboration is with a human who is an expert or a novice, a human plus AI achieves better results than the machine by itself.

By making it possible to apply automation far more judiciously, big data allows machines and people to collaborate on decisions about processes and policy, leveraging the strengths of each.

Real AI requires human and machine intelligence

A further misunderstanding about many popular AI conceptualizations is that everything will happen in a central “command center.” But a single machine or artificial brain that independently processes information, evaluates choices, then acts on results is the exception, not the rule. Today’s smart machines most often work in concert, and, in the case of big data analytics, develop a distributed intelligence that can be passed on to humans and/or other machines.

The distributed nature of analyzing big data in the real world means these systems are both more robust and more scalable than their robot doppelgangers. For global business, this is a huge advantage because technology can be added and replaced as needed to deliver on whatever intelligence automation the organization needs with near-perfect reliability and continuity.

While large-scale big data analytics installations are already in place around the globe, they have been mostly out of public sight, leveraged for national defense or other confidential, high-value purposes. In 2016 this will change, bringing the analysis of big data front and center in a wide range of business applications.



Here are five critical business benefits we predict big data analytics will begin to deliver in 2016.

1. Optimization of labor

Intuition is a very much a human skill. We all have hunches and “gut feelings” about what to do, what’s right, and what’s wrong. But intuition without hard data to back it up seldom leads to an ideal choice. Optimization happens when data drives a decision and supplements it—at key moments—with human intuition.

For example, nearly 16 million people drive vehicles commercially in the United States (taxis, buses, commercial trucking, and so on). In the past, they relied primarily on intuition and prior experience to guide their decisions about which route to take. When given telematics and route optimization data, people can vastly improve their driving efficiency and use their intuition to problem solve when necessary. These types of process hybrids allow both machines and humans to be their best “selves” and bring optimal value to business processes and customer experiences.

By supplementing human-led processes with more data-driven decision support, big data analytics enables a closed feedback loop that can optimize human processes.

2. Choice in a multichannel world

People have strong preferences about channel. Research shows, for example, that millennials will avoid processes that aren’t offered via mobile or social media, their “native” channels.

Channel diversification is great for user choice, but it creates a challenge for businesses, which haven’t had the technology support to make every channel equal in experience. For example, call center agents use decision support tools to help them resolve issues according to policy, but if the system data and policies aren’t identical to those in other channels, the customer experience splinters. This leads to user frustration and confusion because different channels may yield different results.

Big data analytics can help organizations become channel agnostic. When you’re able to analyze big data quickly and accurately, every channel can draw on the same data sources and policies, giving assurance that all channels work equally well. Moreover, big data analytics can support frictionless cross-channel processes, meaning employees and customers can always choose the channel that is most convenient at any given time.

3. Orchestration of processes and policy management

In any business, policies and processes are inextricably linked. A process must operate within the policies set by the business, and, in turn, we must review policies periodically to make sure they have not become out of date or needlessly hinder the business. In short, policies and processes have a workflow, and changing one will often have downstream effects on the other.

When processes and policies are implemented through technology, breakdowns in process-policy alignment become evident through business outcomes. Odd as it may seem, this is a good thing because when a process results in an unexpected outcome, it creates an exception, which tells us exactly where process or policy improvements need to be made. For example, if a customer abandons an online shopping cart in favor of a service rep or call center, this indicates an area ripe for improvement.





Big data analytics provides the means to track and analyze these interdependencies, thus avoiding the problems they can cause. When we change a policy or improve a process, we often don't immediately recognize the downstream gaps we create. For example, look for big data analytics to enable automation of exception handling in 2016, helping IT avoid unintended negative consequences of change.

In addition to helping more effectively manage change, big data analytics will help reduce the overall cost of business process operations. For instance, big data analytics can help organizations reduce exceptions that cause costly escalations by identifying situations that fall outside of automated process handling.

4. Automated personalization

We tend to give personalization tasks to people. This made sense in the past, as machines have not traditionally been very good at making subjective—what are often called “squishy”—decisions. These include human communication cues such as nonverbal behavior, facial expressions, and tone of voice.

In 2016, companies will begin pushing the leading edge further in terms of allowing machines to simulate squishy data. Big data analytics makes this possible by assimilating vast amounts of information, including the types of data that were too slow and expensive to collect and analyze in the past, such as communications and case records for knowledge workers. As the machines get better at interpreting a variety of data types (so-called “unstructured” data) and collating it with vast quantities of structured data, they can begin to improve and accelerate both employee-owned business processes and customer-facing experiences:

- **For employees:** An employee's work can be recorded and compared with what is considered ideal. Employees can then receive personalized decision support so they can execute their tasks faster and more effectively.
- **For customers:** Big data analytics enables a frictionless experience in customer service, providing full issue context and history with every point of contact and increasing customer satisfaction. Agents can also tap into decision assistance based on a customer's level of distress.

Machines will begin to replicate human decision making, which human operators can oversee and deliver. But simulation enabled by big data analytics requires better instrumentation and linkage between all machines and humans.



5. Greater instrumentation of data

The role of big data analytics as the “closed feedback loop” that ultimately makes all processes and interactions more efficient requires ongoing diligence in data collection. After all, the value of a data-driven decision depends on the quality and quantity of the data and whether you are able to deliver the insight to the right decision maker at the right time. This isn’t just about including all our data silos. We have to think more broadly and gain a better understanding of how everything is interconnected.

To collect intelligence from as-yet-untapped data sources, organizations will need to implement more precise instrumentation of the actions of and interactions between humans and machines. What does this mean? For humans, it means collecting and analyzing clickstreams on everything we do online, from shopping to order entries on the job. It can also involve offline data, such as when we order takeout or how we navigate while driving. For machines, it means adding more sensors and meters to large capital equipment—everything from jet engines to cameras—to provide a richer set of data to be mined. In both cases, more data can lead to a better understanding of actions and behavior—as well as the domino effect that behavior has with respect to policies and processes.

As we begin to trap and utilize this data, we will begin adding another “sense” to our big data systems, enabling new types of intelligence that will create downstream innovation. For example, adding pedestrian pressure sensors at busy intersections could enable intelligent traffic lights that don’t disrupt traffic needlessly. Companies are already using clickstream analytics to help optimize new employee training and identify and remove ambiguity that slows processes down.

The greater the instrumentation, the greater the intelligence, and the better you can model and improve human and machine productivity.



Creating a big data analytics strategy

The improvement of technology is, of course, an incremental process. Over the long haul, technology does not change in step functions. But for humans, who are far more sensitive to disruptive changes than merely helpful ones, it can certainly feel that way. For example, autonomous cars might have seemed to come out of left field, but in reality their development was a slow progression, starting with a few microcontrollers and, more recently, 32-bit microprocessors that alert drivers to cars in blind spots, schedule their own maintenance, and even communicate status to their owners via text message.

For business leaders, the lesson is not to wait for a perfect opportunity—the so-called “killer app”—to leverage big data analytics and advanced automation. There are undoubtedly myriad opportunities throughout your organization where big data can supplement human processes.

These best practices can help guide you through a successful automation initiative using big data analytics:

1. Look for places to embed intelligence into human and machine workflows, finding areas to improve their interactions with each other.
2. Locate opportunities to inject automation in both expert- and novice-led workflows. You can improve both with better data instrumentation.
3. Once a process is identified, model it thoroughly and schedule ample time to absorb the end-to-end process change and weigh the net value of both direct and indirect change.
4. Pay careful attention to the outcomes at each stage of the process to make sure an improvement to one aspect does not mask unintended consequences elsewhere.
5. Be extra diligent when replacing a human-led task with a machine function. The subtle benefit of human discretion can be easily overlooked.



Avoid the thought errors that have plagued science fiction for decades. Specifically, don't go looking for a gaping dysfunction in a human process and then attempt to replace it with a machine. Big data analytics is not going to give us Rosie the Robot. It will give rise to distributed intelligence that can improve most anything humans do, but without a thunderclap of change. By taking a holistic view of integrated intelligence, you will be primed to reap all the advantages of our nonfiction future.

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