Research Brief

The Democratization of Analytics

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Introduction

Analytics are everywhere – managing business processes, shaping customer interactions, embedded in our smart phones and the apps we use. Through our experiences both as consumers and employees, we are becoming more aware of what data and analytics can do for us. We’re more attentive to the data we’ve got, and we use it differently. We become more curious, asking for more and better data, assuming that answers must be obtainable somewhere. We’re asking smarter questions, and the answers create business value.

We call this trend the “democratization of analytics.” No longer the exclusive province of statisticians and specialists, analytics are for all of us as we become more data-driven and analytical in our thinking and our work. Leading the way are people Gartner terms as “citizen data scientists.” They can’t do everything the PhDs can, but they are highly analytical – capable of sourcing data, using more sophisticated tools, and communicating to the PhDs what else they need. They make the people around them more analytical. Most importantly, they follow through and put their analytics to work in their decisions and actions.

Ten years ago, “forecasting” often meant the budget process. And if you said “predictive analytics,” people’s eyes might glaze over. Today, we recognize what analytical models can help us do – anticipate customer responses, predict customer or employee attrition, optimize allocation of resources of all kinds, make smarter decisions faster. We may not be able to build the complex models and simulations ourselves, but we can appreciate and capitalize on the outputs of advanced analytics.

Figure 1. Democratized Analytics: Helping Business Users become Citizen Data Scientists
This democratization of analytics is a person-by-person phenomenon. However, collectively these grassroots analysts are changing how enterprises function, and changing them in ways that the enterprise cannot directly control. This is happening whether enterprises like it or not. Leadership’s role is to encourage and enable citizen data scientists, steer them a bit through challenging goals, and empower their creativity and impact. The democratization of analytics makes for interesting times and enormous business opportunity.

Data Everywhere

Have you noticed that people aren’t talking about “big data” quite so much anymore? We’ve all seen the charts depicting the enormous amount of data being generated, and we’ve come to terms with it. We know that data is big, and we want to use it. Go back a few years, and people were saying, “I’m drowning in data. There’s too much of it. Screen it for me, clean it for me, summarize it for me. Just give me what I need to know.” Now you hear a lot more people saying, “Give me as much data as possible, and let me work with it.” The mindset has completely changed. People crave more data.

Enabling people to access data is one thing. But empowering them to do something intelligent with the data, that’s democratization of analytics. That’s saying, “I don’t want you to look just at total sales by product by region. I want you to determine which combinations are the most profitable. What’s the forecast? What can you change to improve sales?” That just described elements of descriptive, predictive, and prescriptive analytics. How are we doing, what’s likely to happen, and what should we do to get to the best place possible?

In addition, we can now bring more of the vast amount of unstructured data into the analytical mix. That data has always been there, but now we can work with it. What customers say to our call center representatives, what tech support are writing down as they work, what people are posting on social media – that’s all unstructured text with potential richness of information. Now we can work with it through text analytics, sentiment analysis, and predictive modeling.

Today we’re hearing a lot about the Internet of Things: it drives a new wave of data volume, orders of magnitude more data than before. Devices that are part of everyday business operations and everyday life are equipped with sensors and tracking all kinds of things in full detail. They are becoming more intelligent, and that data can be farmed and used. We can monitor and control our homes remotely – climate, security, appliances. Corporations can optimize the performance of heavy equipment, distribution networks, energy supply. These capabilities are still emerging, and they offer immeasurable opportunities for citizen data scientists to learn from and act upon all that new data.
Technology to the Rescue

With all the data being generated, it feels like technology has advanced just in time. It’s impossible to overstate the impact of new technologies on data management and analytics. Chief among them, Hadoop is a game-changer; enabling enterprises to work with unprecedented volumes of data, both structured and unstructured. With Hadoop we can store and manipulate, very economically, lots and lots of data that doesn’t have to be structured as in a conventional database. Hadoop democratizes data of all kinds, and Hadoop clusters are becoming part of the production infrastructure.

At the same time, we’ve been bringing more structured data into play with in-database analytics, which becomes even more important given the Internet of Things data. If I’m going to deploy a predictive model on millions and millions of rows of data, results come much faster if I don’t have to transport all that data into an analytics platform, but instead can bring the analytics to the database and work on the data where it already resides.

With those technological capabilities available, analytics is adapting to handle data both “in the moment” and “at the edge.” Streaming analytics handles data in real time: capturing new data, instantly combining it with related historical data, and analyzing it on the spot. In the moment, a business can meet the customer’s immediate need, fine-tune the engine’s performance, or reroute the delivery truck around the traffic jam.
The “edge” is where the physical world meets the digital world, where we can record transactions and events. Our phones and their GPS are the edge. So are the cash registers where we pay for our purchases. Not long ago we were doing very little with data generated at the edge, and we took our time doing it. We saved the transaction data and analyzed it later in predictable ways. Streaming analytics embraces the edge, grabs the data, and processes it, sometimes right in the device at the edge.

In short, new technologies have given us the opportunity to rethink what data we can use, how much, and how fast – all in pursuit of more ambitious business goals.

Rise of the Citizen Data Scientist

What is a citizen data scientist? It’s a business person with the right attitude – curious, adventurous, determined – to improve things. Someone who is tired of looking at the same old reports, who wants to get at all the data, who wants to push the envelope and get new answers. Someone who is willing to learn new methods and use new tools. The citizen data scientist often thinks, “I don’t want to ask a statistician. I want to try it myself. How could I get at the answer?”

Figure 3. The Citizen Data Scientist
There are growing numbers of these people in the enterprise, and the enterprise influences how fast they multiply. Does it empower people with data and tools for analysis? Does it recognize and encourage and reward citizen data scientists for their contributions? Does it recognize people with high analytical potential and provide them with training and developmental assignments? Or does it leave the citizen data scientists feeling that they’re swimming against a tide of business as usual?

Democratizing analytics, by giving people access to data and the tools to work with it, can transform the discovery process. With more people actively looking for new answers, discovery becomes more widespread in the organization, a bigger part of the mindset. It is practiced by people in all roles at all levels, not just the R&D and business improvement and analytics staff. Citizen data scientists are thinking differently about data, using technology to explore its patterns and meaning, and drawing fresh conclusions and insights. They know that new discovery is always just around the corner, and it’s part of their job to look for it. They don’t always have to go to the specialists to find the data and do the math, and they don’t have to wait for the analyses to come back.

Discovery is exciting, but you don’t realize business results until you deploy new insights as business decisions and actions. Full-scale deployment may entail embedding models in business processes and workflows, training people to work and make decisions differently based on new information, and putting analytical applications into production with live data sets and all the necessary business governance, controls, and metrics. The sandbox may be fun, but you’ve got to get down to business.

Few individuals are equally strong at discovery and deployment. But in the midst of discovery, the citizen data scientists must be thinking ahead to deployment, how the analytics can become part of everyday work. They have to transition their insights and methods to the team responsible for deployment, and they may play key roles in training business colleagues in using the new analytics. The citizen data scientist is an experimenter, a prototyper, and an anticipator.

Data – discovery – deployment. You need all three to drive business value, but it’s not a strict sequence. You iterate with data and analytical methods in the process of discovery, and you iterate with prototypes to validate the analytics and how they can move into production. And then you close the feedback loop by measuring the analytics in production and refining the models and data feeds as needed.
Watch the Millennials

As the discovery process becomes more pervasive, keep in mind that people discover in different ways. Consider the Millennials. They’re the gaming generation. They expect an instant response. They expect a slick and intuitive interface. Their games send them on quests, where you have to learn as you go, and learn to put new tools to use. Test-and-learn comes much more naturally to them than plan-and-execute. They are attuned to discovery and attuned to speed, and that doesn’t change when they enter the workforce. By most corporate norms, the Millennials have a bit of a rogue attitude. They question business as usual, not just conform to it.

That means many of them have the right attitude and the technological facility to be citizen data scientists, but they may lack experience and context around the business, its customers, and its processes. So team them with more experienced data scientists, and empower them with technology. Then observe how the teams think, work, prototype, and discover together – and how fast they get things done. Enterprises aren’t going to tame the Millennials. On the contrary, the Millennials’ methods are going to prevail, and that includes a gaming approach to analytics.

Implications for the Enterprise

Having a growing cadre of citizen data scientists around will cause some organizational adjustments. Let me highlight three specific places: the professional analytics group, the IT organization, and the leadership of the enterprise.

Professional Analysts. With the democratization of analytics, does it mean we won’t need as many statisticians and data scientists anymore? Quite the opposite. As organizational maturity with analytics rises, people understand what analytics can do. They want to explore more sophisticated questions, and they envision analytical models far more advanced than they can build. They need the data scientists to work with them, push the envelope even more, and validate what they are trying to do. The overall demand for analytics and analytics professionals rises. Because you are going to have more citizen data scientists, you’re going to need more professional data scientists to collaborate with them. And that’s good for business.
IT Organization. Citizen data scientists also place new and different demands on the IT organization. They want more data, including more unfiltered data. They want transaction data to work with and business performance information that isn’t summarized and denatured. They also need computing environments in which to experiment with data and analytics and to prototype models and applications. Sometimes those environments need large scale and processing power. And the citizen data scientists want to be empowered with up-to-date tools and technologies (and they’re probably not shy about supplying their own if readily available in the marketplace). IT must recognize and cultivate this new class of “power user.” The citizen data scientist is a harbinger of things to come as technologies of many kinds are democratized.

Business Leadership. My advice to business leaders starts with the simple fact that they’ve got to embrace the democratization of analytics. It’s happening, it’s going to be pervasive, and it’s good. But it’s not something that you’re going to control. So don’t try the top-down approach: “We’re going to appoint and train citizen data scientists.” Instead, teach your managers to recognize and reward those who emerge. Note where you have pockets of citizen data scientists, most likely in finance, manufacturing, and marketing. Find ways to spread the wealth, through collaboration or rotation, to functions underserved by analytics.

Leaders should create the environment where citizen data scientists can flourish. On one hand, give them time and license to experiment. On the other hand, challenge them: “Show me things that I don’t know about my own business.” Pay special attention to the younger ones, with their experimenting and gaming mentality, and see what you can learn. Let the citizen data scientists influence others and you’ll see the organization’s analytical maturity rise. Perhaps spend part of your time with them.

Advice to Citizen Data Scientists

Let’s conclude with a few words of advice and encouragement for the citizen data scientist:

- First, educate yourself on analytics and what they can do for your business. Learn about the data on hand, and deepen your knowledge of your business domain, largely through its data and transactions.
- Second, push to be enabled and empowered. Ask your management, “Give me tools. Give me access to the data. Let me try analyzing and doing things differently.”
- Third, challenge the status quo. Challenge the ways people look at problems and the ways business decisions are made in your organization.

A good place to start challenging the status quo is in the world of legacy business intelligence — all those reports that are produced automatically, convey little, and fail to engage the
imagination. When you ask, “Why are you producing that report?” the answer is almost invariably, “Because we have always done it.” And when you ask, “What do you do with the information?” The answer is often something like, “Sometimes I’ll see a trend here or a problem there, and so I need to keep reviewing it.” Introduce the alternative: start with the trends and problems of interest. How can you use analytics to spot them earlier or even predict them? That’s a constructive form of challenge, and a simple place to start the conversation about what analytics can do. Inject an analytical mindset, influence others, add value, and be proud to wear the badge of citizen data scientist.

Additional Information

To learn more about this topic, please visit [sas.com/va](http://sas.com/va).

About the Authors

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**Robert Morison** serves as Lead Faculty for IIA’s Enterprise Research Subscription. 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. He is co-author of *Analytics At Work: Smarter Decisions, Better Results* (Harvard Business Press, 2010), *Workforce Crisis: How to Beat the Coming Shortage of Skills And Talent* (Harvard Business Press, 2006), and three Harvard Business Review articles, one of which received a McKinsey Award as best article of 2004. He holds an A.B. from Dartmouth College and an M.A. from Boston University.