Center for
Digital Strategies
Tuck at Dartmouth

The Business of (Big) Data: Progress and Potential

A Roundtable Overview

Americas Chapter Discussion

The Business of (Big) Data: Progress and Potential

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Thought Leadership Roundtable on Digital Strategies

An executive roundtable series of the
Center for Digital Strategies at the Tuck School of Business

In February 2013 the Roundtable on Digital Strategies discussed the potential of the (at the time) relatively new and definitely exciting field of Big Data: What could companies do with it, what would be its impact? Would it last, or would Big Data be one of those trends that comes quickly and then fades? Just two years later, the impact of Big Data has been so significant that the Roundtable tackled it again – the fastest repeat topic in the Roundtable's 14-year history.

Members convened at Eastman Chemical in Kingsport, Tennessee for to discuss how Big Data has changed in the intervening 30 months. How are enterprises using Big Data to drive value, both internally and for their customers? What is Big Data pushing and pulling companies to do differently in their products, operations, and IT? This tech trend is clearly not a flash in the pan – but is it evolutionary, or one of those truly revolutionary waves that changes the business landscape? Participants in the session included CIOs and their business partners from Coca Cola Enterprises, host Eastman Chemical, Eaton Corporation, the Hilti Group, Restaurant Supply Chain Solutions, Taco Bell, and Tetra Pak, as well as the Chief Strategy Office of consultancy Adjuvi and Center for Digital Strategies at the Tuck School of Business at Dartmouth College.

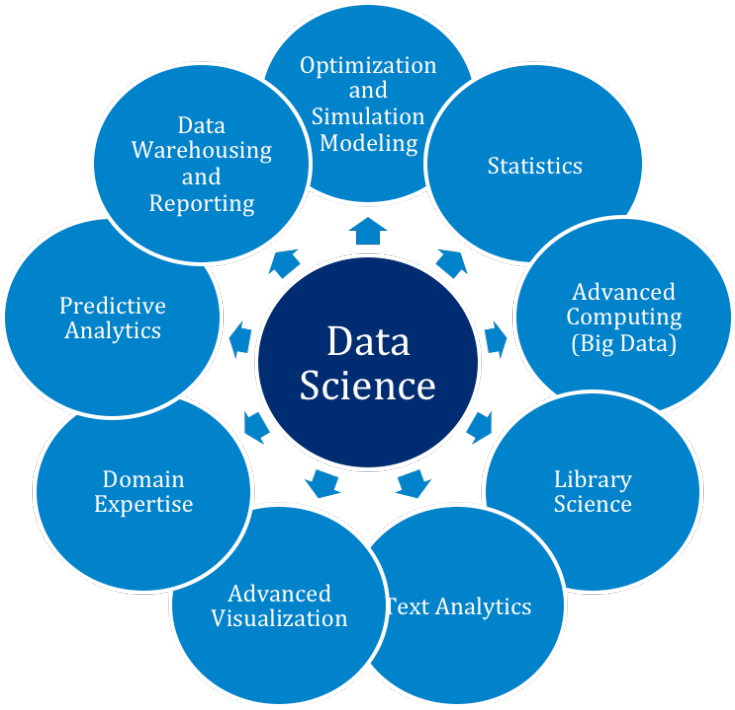
Key Insights Discussed in this Article:

Introduction: Big Data Hits the Big Time

The first technical reference to "Big Data" seems to have been in *Communications of the ACM* in August 1999. In February 2010 the concept was mainstream enough that *The Economist* published a Special Report on Big Data titled "Data, data everywhere.[1]" By the time the Roundtable last discussed Big Data in early 2013, the blogosphere was agog over headline statistics: One million transactions per hour at WalMart.com; 72 hours of content uploaded to YouTube every minute; 35,000 Facebook likes per minute. The gee-whiz stats continue to be updated — YouTube content now grows by 300 hours every minute, and in 2014 there were about 6,000 Tweets and 5,000 Facebook updates per second — but businesses are starting to shift their attention to a different set of observations[2]:

- The volume of business data worldwide, across all companies, doubles every 1.2 years.
- Poor data can cost businesses 20% - 35% of their operating revenue.
- Bad data or poor data quality costs US businesses $600 *billion* annually (italics added).

These kinds of trends show how a quantitative change drives a qualitative shift: Big Data is no longer a science experiment, an interesting curiosity in the back room that might have value. Big Data now matters, in a big way, and the growth of information-based companies in the last few years has been nothing short of phenomenal. Uber now operates in 57 countries and has a market capitalization north of $40 billion; Netflix is projected to have more subscribers than all cable companies combined by sometime in 2016. As this paper will discuss, more mature companies are starting to do well by Big Data, too. What's changed in 30 months?



2015 Eastman Chemical, used with permission.

As described by Matt Looney, Director of Data Science and Enterprise Architecture for host Eastman Chemical, Big Data is now part of the 'Data Science' umbrella term that covers various fields emerging as organizations work to extract insight from data — learning to leverage the huge amounts of information that are now available, for improved decision making, competitive intelligence, and breakthrough innovations."

Looney's colleague CIO Keith Sturgill described what this definition means for Eastman.

[1] "A Very Short History of Big Data," Gil Press in *Forbes*, May 9, 2013. http://www.forbes.com/sites/gilpress/2013/05/09/a-very-short-history-of-big-data/
[2] "A Comprehensive List of Big Data Statistics," Vincent Granville, October 2014. http://www.bigdatanews.com/profiles/blogs/a-comprehensive-list-of-big-data-statistics

Ingesting Data Exhaust

"The mission of our Data Science organization," he began, "Is to improve the quality and speed of decision-making at Eastman."

> And that's not just in the C-suite. We are talking about decisions at every level of our company. The frontline customer service rep needs to be able to provide answers about our ability to meet increased demand on the spot, not two or three days later. We believe that Big Data can give us an edge in improving the speed and quality of the decisions that we make at every level, every day.

"Sometimes complexity just happens, and people just can't work their way through," Looney continued. These are the scenarios where the Data Science team can step in, to build models and create what-ifs and help people wade through their options."

Building on Sturgill's vision of the promise of Big Data, Restaurant Supply Chain Solutions' (RSCS) Vice President of Business Technology Dickie Oliver gave an example of how new data capabilities have enabled faster and better decisions in the restaurant industry:

> Food safety is paramount in our business. If we have a recall, how do we stop that product from flowing through the entire supply chain? Data is the answer: You scan the barcode before you cook it, and if it's out of date or has a recall, the fryer shuts down, and you're not allowed to cook that product. That *solves* the food safety problem. Data can get you that far.

Bill Blausey, CIO of Eaton Corp, described a third implementation of Big Data technologies:

> We average over one billion hits per year on Eaton.com. We know 70 percent of those are after product. We match their behavior on the site with social behaviors, with databases of customers — which are themselves 86 million records — with existing sales and affinity analysis. We're bringing together diverse sets of information in ways that we never could before, simply because of the power of the machines and the analytical tools.

Eaton's colleague Brandon Ekberg, Director of Engineering for the Software and Communications Center of Excellence, described a Big Data initiative in the completely different domain of customer-sensing in the field:

> For almost ten years we've remotely monitored uninterruptable power supplies ("UPSs"). We store the data, and for the last nine years we've given customers monthly trends reports. Now we have data scientists digging into that repository, and finding times they could have predicted battery failures in those UPSs, as much as a week in advance. If you correlate revenue with customer-delivered value, we're being paid millions of dollars to give better insight into the performance of UPSs.

"I've been monitoring industrial devices for 20 years, and predicting failure has always been nirvana," Ekberg finished. "We're just starting to see it come to fruition now. What we haven't quite figured out is how often we can save a service call. If we can knock *those* down by better analytics, then there's also a cost savings to the tune of millions of dollars per year."

"We could never do those kinds of analytics in the past," Blausey reiterated. "We're just scratching the surface in terms of what we can do with the Internet of Things ("IoT") in the field, but that's a typical kind of application, where we can now sell a service to manage and monitor the equipment."

Exploring the Business

"So what's new about the analytical capabilities?" CDS Executive Fellow and moderator Steve Plume asked, following up on Blausey's comment. "We have all this real-time transactional data, and customer data, and external data sources. What's changed in how we can analyze them?"

Andreas Wagner, Head of the Process Competence Center, Global IT for Hilti North America, suggested that the difference between traditional business intelligence ("BI") and new advanced analytics helps to explain why these new applications are emerging. "In traditional BI," he proposed,

> You have predefined business logic and pattern-based analytics, and you define what you want to see before you start. In data analytics you usually don't know the pattern, so you try to find it. That's quite a big difference. But even so, this is evolution, from BI towards data science. We have been using statistics for hundreds of years, so this is not a completely new way of seeing things.

"Advanced analytics won't replace BI," clarified Fredrik Ohlsson, Program Director for Business Intelligence at the Tetra Pak Group. "BI will always try to deliver the single source of truth, so that everybody will have access to the same information. But in advanced analytics, in business exploration, it's about *trust* instead. There are a lot of dark data sources: The key is to make sure that we trust the data."

"And *that's* why we see Big Data as transformational," stressed Siobhan Smyth, Vice President of Information Technology Leadership for Coca Cola Enterprises (CCE).

> Data is an asset in our organization, but we found that we don't have the right analytics tools to answer business questions really well. So shadow organizations exist throughout CCE that create Excel reports against all kinds of different data sources, and the executives don't know which version of the truth they need to be looking at.
>
> As we embark on the Big Data opportunity, we're also revamping what we do for basic analytics, and we've realized there's a huge opportunity compared to the BI tools that we've been working with. This is the first time in my IT career that there's been such a strong pull from the business to advance in these areas. So we're also going to spend time to really nail the look-and-feel, so that when we serve up the analytics, the execs say, "I totally get it, the insights are popping out at me."

Smyth's colleague Esat Sezer, CIO of CCE, picked up her theme:

> The more we looked at external data sources, the more we recognized that our internal data is not good enough, it doesn't give us the insights we need. But if our approach to data can be transformed, then Big Data can be very revolutionary. We can highlight a problem, and then go after that problem with analytic data.

> For example: Five years ago the juice business was booming and the water business was tanking. Today, the juice business is decreasing, and water is growing so fast that we don't have enough capacity to supply demand. Where was the point that the consumer trend shifted? We missed it, and that's a problem. But the bigger problem is, what new trend is brewing today for the future?
>
> When you state the problems like this, you start to think about what sources of data you need to find the trigger points and predict changes in consumer trends. Now you are making a meaningful difference in your investment decisions. That's the huge value we see coming out of Big Data.

"We do spend too much time on solutions versus defining the problem we're trying to solve," Oliver agreed.

> We get caught too much in "Let's get a tool, let's get a process, let's throw barcodes on it." Well, what's the problem we're trying to solve? Let's start with that basic concept. Now, where do we need to go to get the data? Maybe barcoding is the right answer, but maybe it's not, because to make a change that large and that wide takes years and millions of dollars. Maybe we can analyze theoretical usage from point-of-sale data, and then we don't have to barcode everything in the store. Big Data lets us think about how to rise above immediate showstoppers and try to solve the problem in another manner.

"Analytics applications are becoming the breakthrough way of operating," Sezer concluded. "We used to build apps to transact, but when the salesperson walks into the outlet, wouldn't it be great if all the data on that specific outlet, their previous sales and performance, was right in front of him? And if they could make different decisions, together, that would be game-changing for our customer, as well."

Share and Share Alike

Lynn Hemans, Senior Director of Business & Social Intelligence at Taco Bell, described an example of how new capabilities to ingest and integrate data from external sources with internal data are creating real business benefits:

> There are certain things we can't tell from our internal data. So in our case, we use social data to understand real-time customer narratives. We also use it to mine the fuzzy front end of cultural insights for developing trends. We've linked social data to top-line sales data, so we can get in-the-moment understanding of what's happening in our markets.
>
> We take all the brand comments and tweets and re-tweets and boil them down to just consumer narratives. Then within those narratives we can isolate "I love Taco Bell," "I want to go to Taco Bell," "I'm watching Netflix and eating Taco Bell." And within those conversations we can read the topics, and when we can read the topics, we can see what's driving sales. In addition, we can identify the passionate consumers of Taco Bell, isolate exactly who they are, and serve them a digital ad. Then we can flip it around, see who they are and what they do, get a persona off that, and create different types of ads. It's affirming strategies that we currently have, and it's showing us white spaces that we haven't seen before.

"We don't have it solved," she finished. "We're just scratching the surface. We've tapped into maybe one percent of the possibilities."

"We also are seeing non-traditional ways that we could reach out and find data that matters for our business," Sezer reflected.

> We sell our products through millions of outlets, and some of these close and others open every day. We need to know if they're still in business, and are they growing? How can we find them, in real-time? Through credit card data. And that data gives consumer behavior and outlet existence and outlet location. Call that level of granularity "Small Data," that helps transform your master data approach.

"We are probably a great source of data for you," suggested Mark Meyer, Head of Global IM for the Tetra Pak Group. "We sell over 180 billion packages a year all around the world and we know what's going into them. That's quite a dataset, with lots of potential. We probably know if juice is going down and water is going up. But is that our data, or your data?"

"We're confronting this issue with one of our large customers," Smyth affirmed. "They realized they have data more valuable to CCE even than Nielsen data. So they want to sell access to us, while we are thinking, 'Isn't there a co-creation model that would drive even more value than forcing us to pay?' And yet there *is* value in the data. It's an interesting time we live in, in terms of how much data do we share. How do we create a mutual benefit, so that their data becomes more accessible to us?"

"As an example," Smyth continued, "There's a trend in Europe where more consumers are shopping for just a small amount of product at one time, and when they do that, they don't pick up our products. How can we find out what's happening with those shoppers while they're in the store, so that we can provide promotions to drive revenue? By sharing data with our customers. But some customers have sent us data for years, and we've done nothing with it; others won't share the data."

"Some of the most predictive data we've found is free," Hemans pointed out. "Coming out of the recession, we noticed a direct correlation between the Economic Stress Index in a city and our sales in that city. Or we looked at Bureau of Labor Statistics data and learned that an increase in gas prices directly affects our brand. There is some really cool data out there than can help."

Smyth followed up on Hemans' point:

> The challenge with external sources is finding data sources that will provide value when we mash them up. This is where we use weather data, because weather really impacts our sales. It's very difficult to predict in the annual planning cycle. But if you can predict the next 14 days fairly well, then you can improve the mid-month forecasts, and then we can respond with promotions. There's a big business case there to move from diagnostic analytics to predictive analytics to prescriptive analytics.

Looney added another challenge with external sources: "They're certainly not built to answer *our* questions. Systems were built to do one thing, and now we're trying to use the data from them to answer different questions. It will take another level of data science to make sense of all this, but this is why it has the potential to be very revolutionary."

The Death of Nielsen

"Almost always your data is better when it's with other people's data," commented Dion Hinchcliffe, Chief Strategy Officer of Adjuvi. "T-Mobile is a great example:"

> They were circling the drain, and they realized that if they combined their 35 million CRM records with social sentiment on Twitter and Facebook, they could see when people were about to leave, and intervene with just-in-time personalized marketing campaigns. They cut customer defections in half in 90 days, and they saved the company. But they couldn't do it with their own data; they had to combine it with other datasets to get a fuller picture.

Bob Coleman, Senior Director of Financial Planning and Analysis and Oliver's colleague at RSCS, supported Hinchcliffe's point:

> Our core enhancement of customer value is to make sure that no one in the supply chain runs out of product. So we collect a lot of data from our suppliers and our distributors, from the farm to the fork, including all the POS data. We do it in such a way that we're not sharing competitors' businesses, but it's what gives us the insight to know when to have the right supplies at the right distribution centers at the right time.

Like RSCS, said Meyer, Tetra Pak "started with something that's obvious, that you need to do:

> We keep data on how well your machines are performing. So predictive maintenance is the first thing we do. Then, we also know what's being produced — by you and by everybody else in the industry. So now we can begin to talk about trends. And, we're collecting all these signals in your factory, so we can provide an executive graphical overview of real-time operations.
>
> So we're in this explosion moment, where the initial investment is easy, all based on maintenance. But my god, what else are we going to be able to do with all this? It grows into engineering and product development for us, and for the customer we have information they couldn't possibly gather for themselves, that gets more of their product on the shelves, which means they buy more from us.

"We have a consulting service as well," added Meyer's colleague Ohlsson, "That helps you optimize your production. But what's happening is a big change in how we perceive the data. Before we analyzed data to make better decisions; now we are talking more about data as a service."

"Generalized data gathering is going to lose value," assessed Alva Taylor, Faculty Director of the Center for Digital Strategies. "It's going to be the death of Nielsen for many organizations, as structured data gathering to solve specific problems, through social listening or whatever, becomes more important. Organizations can generate data, package it up, and use it as barter: 'We have this data, you have that data, now we can share.'"

"The end game for a lot of this is going to be who has the data supremacy," Hinchcliffe concluded. "It's a data arms race: 'How can I make strategic decisions better and faster than my competitors?' So Big Data is both revolutionary and evolutionary. The evolutionary part is that we can do this faster

than we ever did before, inside time windows we could never imagine before. The *revolutionary* aspect is that we can do what simply wasn't possible before:

> There are too many different data sets and too many sources for us to maintain intellectual control. We will never have enough people and enough capacity to sit down and sort these out. How can we start applying an unblinking eye to evaluate every potential dataset as it comes online, and get it plugged into our decision process before our competitors? It's going to be a brutal operating environment, but I think this is where it's headed.

"So what is it, folks?" asked Hans Brechbühl, Executive Director of the Center for Digital Strategies. "Lightning round, one word: Evolutionary or Revolutionary?" Revolutionary, decided the Roundtable, by a vote of 11 to 6.

Uber Über Alles?

Hemans returned to Hinchcliffe's earlier comments on data supremacy and brutal operating environments:

> The taxi industry in San Francisco is down 70 percent because of companies like Uber & Lyft, in just a couple of years. If it *can* happen to them, it *will* happen to all of us. And when it does, it will be technology-based. So we have been looking at what this means to Taco Bell, both in terms of how companies like Uber are going to disrupt our brand, and to decode why they're doing well — what friction points they are removing for brand engagement so we can migrate our brand today to make sure we compete tomorrow.

"And it's not just technology-based," added Brechbuhl, "It's also information sharing and usage of that information."

> Both Hilton and Airbnb are doing really interesting things with data and digital, but the platforms they operate from are so wildly different. Hilton can check me in online and let me choose my room. But what information can they provide me with to make that choice? There's no context.
>
> Now think of how much more context Airbnb has to provide me to choose an apartment in Zagreb from my office in Hanover. What's it like, what's it near, where's the shopping? It's 100x what Hilton can provide, and only Airbnb can provide it.

"Hilton is coming from a legacy system based on a consumer relationship that's very transaction-based," Hemans replied, "While the new models like Airbnb are very engagement based: 'How can we retain you?' Uber even lets you choose your music. There are limited consumer dollars, and limited business dollars. The companies that really understand this and get after it are going to change where all that cash goes."

"Traditionally variance has big costs," Taylor mused. "So Hilton is 'flat' because long ago they had to standardize rooms, so that you knew what you were going to get when you stayed there. Airbnb has all kinds of variance, but information now allows them to manage variance efficiently. So they can

customize and meet individual customer preferences and still make money at it, because it's reducing the friction in the transaction costs. And that's where the business opportunity comes."

"There's more and more demand for personalization," Smyth agreed.

> The more you can personalize your offerings, the more perceived value there is. Millennials are more liberal with their data sharing than our generation, and have a higher expectation of personalization. We're finding that it's critical that we branch out of our normal role of dealing with our customers, like WalMart and Tesco, and connect more with consumers. Our campaign where you personalize a product with your name had high demand.

"There's a balance, though, between 'That's cool' and 'That's creepy,'" Sturgill objected. "If you know more about me than I'm comfortable with you knowing, and then you expose that to me — *that* becomes creepy."

"The customer needs to give permission," Hemans answered. "With technology you can change the relationship to make that knowledge acceptable. Those who take Uber think nothing of getting into a car with a stranger."

"It's about value," added Oliver. "If I'm walking through an airport and American Airlines wants to call me and tell me there's an earlier flight so I don't have to spend two hours in the lounge, I'm more than happy. I agree with the permissibility aspect, but what makes it connect with the consumer is that you've added value to my life. I'm willing to trade value for a little creepiness."

Don't Look Now, But…

"We've been talking about the disruptive Uber-ization of consumer industries. Is there a similar dynamic in B2B industries, where you're not dealing directly with the end customer?" moderator Plume asked the group.

"The challenge for us," Ohlsson answered, "is that we are very far away from the data that will impact us. People don't tweet about Tetra Pak: They tweet about Minute Maid, and that cascades down to our ability to sell. We have a *lot* of data, external and internal, but it requires a very big mindset change for us to find data sources that we haven't traditionally tapped into."

"In B2B we serve industries with very different clock speeds," Eastman's Sturgill added. "Building a plant might be for a decade-long cycle, but we also serve companies that make components for iPhones, and that industry moves at a very fast clock speed. Their decision-making is very different. We have to be agile in how we deal with these different industries, and data helps us do that."

"But even in industries like ours," countered Eaton's Blausey, "around 55 percent of the buyers do the majority of their research online and through non-traditional channels before they buy."

> What makes this conversation about consumer industries so interesting is that the same principles apply. Take Amazon, the epitome of profiling consumer behavior: We are trying to do literally the

> same thing with prospects and customers. We may be six or ten years behind, but the same principles are manifesting themselves in B2B organizations.
>
> How people behave on the web, the advent of Millennials into the buying workforce with the way they work and how they have grown up, the fact that information is available: These factors *are* impacting the people we target, the engineers in the different customer segments.
>
> So if you look at the core of what we do, it starts with engineering. So might that get disrupted? Probably through some kind of collaboration that allows somebody to do it more effectively, potentially virtually, than we can.

"A really good example is lighting," Ekberg added. "Lighting is moving to a purely digital entity. We are developing lighting where the switch and the occupancy sensor and the fixture are all on wifi. So then lighting becomes just another set of networks in a building, and all of a sudden, a meeting with Cisco becomes really interesting. Do it their way, and they have the upper hand. Do it our way, and we have the upper hand. Who would have ever thought of Eaton competing with Cisco?"

"We've talked a lot about the positive aspects of this evolution versus revolution question," Sturgill mused, "But we also have to think about the risks to our businesses if we move too slowly in this space."

"True, but there are also cases where waiting a bit has helped," Blausey responded. "IoT analytics is a good example. Seven years ago we talked about building an IoT architecture to support our products in the field, and if we had done that, it would be a lead weight around our necks right now. In certain cases if you don't get in you're going to be in trouble, but in others there may be advantage in being a little more deliberate."

"And five years ago the technologies required to build Big Data platforms were very confusing," Sezer recalled. "Now we have purpose-built platforms available, and which one we invest it depends on what problem we want to solve."

"In technology industries, we tend to overestimate the impact of something in the short term, but underestimate its impact in the long term," Hinchcliffe countered. "With organizational readiness and maturity factors, it could take years to get the right skills in place, and millions of dollars in infrastructure. That's a big tax to pay down if you wait too long."

The Biggest Issue of Our Age

"There's a dark side here that we need to cover," said Sturgill, launched into a new topic:

> We've done a lot of work protecting against the outsider coming in and stealing who we are. But the biggest risk in terms of protecting our information is the motivated insider. There are tools that allow you to do a pretty good job of assessing individual employee behaviors and activities. And it's a big data problem: When you start monitoring individuals, it creates terabytes of information to interrogate.

> So the dark side is, how much is too much? Pretty soon you get to NSA levels of monitoring employees that will harm productivity if you go over the line. But our Board wants us to protect our intellectual property — even if that means going to the level of monitoring the desktops of Ph.D. scientists. In terms of privacy and liberty it's not that different from the discussion we had about citizens in the public domain.

"A key question is," Hemans asked, "Is what are the most valuable assets that we have? Are they the patents, or the employees? Because doing something that has an impact on employee engagement would be very detrimental."

It's an inevitable problem, Hinchcliffe suggested,

> As pervasive data breaks down silos to make sure that data is going from where it is to where it needs to be. It's now easy for someone to download the entire customer database onto a thumb drive and walk out the door. Compartmentalization works in the military, but we don't have good compartmentalization in the private sector. Usually there have been two networks: one where the really important stuff is, and one for everything else.
>
> And now wifi and BYOD have blasted a salvo into compartmentalization. So we've pushed the *really* important things deeper into the network. But this is a new frontier: We want to put all of our data assets to use, yet we have to protect our customers and protect ourselves. No one's got any answers yet, but the starting point may be understanding what's truly important to compartmentalize. Then we can open up a lot of things that we're probably over-protecting, and over-spending to protect.

"Data privacy is going to be the biggest issue of our age," Hinchcliffe finished. "Security and privacy of all this data is going to be the next really big challenge."

"We don't monitor individuals," Eaton's Blausey commented, "But we do use Big Data technology to consolidate logs and traffic and look for anomalies. That may lead to 'Uh-oh, someone looks like he's misbehaving,' but I have to prove it, and get approval, to really look at what you specifically are doing."

"Understand what your crown jewels are, and really protect those," Sturgill nodded. "And avoid the 'just because you can' monitoring scenario — it doesn't mean you should. The opportunity with Big Data technologies is being able to detect what's not normal, or part of a normal behavior pattern, and makes you want to dig deeper."

Steven Gebben, VP of Compensation and Benefits for Eastman, raised a different question around Big Data and employees:

> I wonder about using data to predict success in a particular role, or to manage talent. We have a lot of data, but there's not really a way that I can collect it, analyze it, and use it in ways that tell us more about our workforce. For example, could we use data from our different retirement vendors to help with workforce planning?

> We have a performance reward system, and yet it seems to be a challenge to pull the information together, and it takes a great deal of time. And are we really accomplishing what we're trying to achieve, with differentiated rewards for high performers? Wouldn't it be nice to have that level of insight at the time that leaders are making decisions about rewards? The data is there; applying the right analytics is a bit of a challenge.

"Our HR team is very interested in what they can do with Big Data and analytics," Smyth agreed. "They run a lot of reports, but they never really provide insights back to the business. If you're lucky as a business unit you get a report twice a year, but nowhere does the information live in front of you, so you can drill in and see what you did last month. So they're working with our team to figure out what insights the businesses want, and how to provide them in a new portal."

Taco Bell's Hemans illustrated another example:

> A large part of the U.S. workforce makes minimum wage, and now minimum wage is changing in states and counties across the board. And other retailers are raising their pay rates. How do we solve all the variables, because if a brand is late to the game in understanding the implications, they could lose a lot of great employees, and once they're gone, they're likely not coming back. There hasn't been this much disruption in wages in a long time, and the solution is going to come from Big Data.

A Not-So-Secret Garden

"So if we're able to get this much more data in all these areas, then we still face the fact that the chokepoint is human analysis," Brechbühl declared.

"Just like the Economic Stress Index, we should create an Analytic Stress Index," Hinchcliffe proposed.

> We now have this tremendous ability to analyze data sets, but we don't have the decision-making structures in our organizations to turn opportunities into value. Most of the insights these tools generate can't be absorbed well enough or fast enough to actually *do* anything with them. This puts a big onus on leadership. The machines are getting ahead of how we are structured, and that's what's really going to hold us back.

"It's about becoming more agile as a company, isn't it," Sturgill suggested. "Recognizing a trend or an opportunity before a competitor does, and being able to enhance the judgment of that human chokepoint for those highly critical decisions."

Throughout the day Blausey and Ekberg had given examples of how their business silos — IT and Engineering — had changed culture, processes, and operations to help Eaton become more agile, more nimble, and more responsive. "Help me understand how that's worked for you," Sezer asked them, "Because we are finding it difficult to connect the different groups. There's power in connecting them, but there's a lot of resistance from the operational technology people, focused against the product development and information technology people."

"It's taken us a year to get on the same page," Blausey admitted. "We generally live in two different camps, but we each have knowledge to bring to the other party. We know about security and enterprise systems, and they know agile, and how to build products. We may be more methodical than the Engineering team in how we build and think about applications, but the best of both brains coming together is what created the power."

"We're also at the beginning of figuring out how to make Engineering and IT really talk," Meyer chimed in.

> Everything internal was IT, and anything customer was their world, and we didn't recognize that it was *all* IoT for quite some time. And there are the cultural differences of structured development and deployment versus agile. 70% of internal IT is running the business, and we build everything with servicing in mind. So a win is for Engineering to teach us how to move faster, and for IT to teach them how to build things that can be maintained over time."

"There are a lot of interesting things you learn," Ekberg agreed. "Releasing something into the datacenter in the last five days of the month: We never thought it was a big deal. Then Engineering starts working with IT, and we realize, you *never* mess with the datacenter in the last five days of the month."

"You really need to create a sandbox," Ekberg continued.

> Because with agile, you're going to pivot constantly, you're going to change, you're going to learn. We also set up firewalls in the datacenter where these 'rogue' engineers could be put away from day-to-day operations. That helped a ton: It gave us a place to fail. Because in agile you fail early, and you fail often. You need to create a walled garden for the product team to play in, which causes no trouble on the 7x24 datacenter side of the world. Never attempt to put them together. They are just two completely different worlds. In the garden you can build rapid prototype IoT applications and launch businesses in months, in weeks.

"So then where do the data scientists reside," CCE's Smyth asked. "Do they reside in IT? Does the organization evolve to the point where they reside in the key business areas? Is it both?"

"At Eastman," Sturgill answered, "They report to the CIO, but they're set up as an independent center of excellence, with the idea of proliferating into the broader organization."

Looney provided additional detail: "It's a federated model, with analytics professionals in Finance and Pricing and other areas. The core Analytics group acts as a hub that specializes in the advanced things, which the business units come to with the really difficult problems. The business units might do more traditional BI, and look to the team for creating new predictive models, for example."

"We have taken a front-end/back-end approach," Ohlsson added. "We have centralized the acquisition and storage of data, because we want that to have strict governance and access control and data integrity processes. But we decentralized application development, so that is done in the line of business, by people trained on the same tool sets as we use in the back-end."

"We divide the IT spend into two main buckets," Ohlsson's Tetra Pak colleague Meyer continued.

> There's a business transformation funding pot that is discretionary for all applications. Then we keep all infrastructure development separate from that. On the infrastructure side, all projects are classified as one of Deploy, Develop, or Explore — so that there's always a diversified portfolio to make sure that we are always thinking about what might be the next big thing. On the business side, there's nothing like that: no funding unless we know what it's going to return. Does anyone have an exploratory piece on the IT side?

"At IBM they created an internal Kickstarter-type platform called Go Fund IT," Hinchcliffe volunteered. "Anyone can vote with their budget, so you try to convince more than one area of the organization to commit and can meet your number. Lots of projects are getting funded — it allows you to organically unleash the organization."

"We set aside a seed fund for innovation a number of years ago," Smyth replied. "We used it for experimentation on different Big Data technologies, and saw a lot of value in it. But it doesn't really have a connection, or any champions, on the business side."

> This year we took it a step further, and actually opened an office in Georgia Tech's Innovation Center. We moved three agile/Big Data teams down there. We felt it would give these ideas more oxygen to let them survive outside of the existing culture. Now we have 15 students working with us as well. You feel the energy when you walk into the office, and we have startups and vendors constantly visiting us and running workshops. It's gotten our teams out of the traditional corporate environment, and put them in an environment where a lot of external ideas seep in, and people are creating a whole new culture.

Late, for a Very Important Date

Plume asked the group in another lightning round, "What is the single biggest obstacle to the growth of Big Data applications?" Various answers came back: Change management; mindset; willingness to be wrong; leadership; breaking with the past. "They're all variations on a theme: Culture," Coleman asserted.

"That's been the brick wall for us," Sturgill lamented.

> We're trying to get into our culture that data is going to fundamentally change the way we operate as a company, that we need to use information to speed up the innovation cycle. But people are heads-down, executing, every day, and we've got some heavy lifting to do to convince the organization that what's making us successful today will not make us successful in the next generation. And that next generation is tomorrow. Next year. Next five years, at the outside.

Tetra Pak's Meyer described the dilemma: "As this new frontier of Big Data comes in, there's concern that we'll do a whole lot of stuff, but we might not get any value. There are a lot of great ideas, but before we embark on all of them we want to have a sense of the potential gain."

"It's a constant debate about how much you can spend without having a clear business case," Blausey affirmed. "It's a Catch-22: You need to do enough to play and experiment to get value, but you don't want to open up the bank, either."

"So why can't you turn it around?" Taylor asked. "The whole point is to eliminate the noise, create a better forecast. Make better decisions. Using Big Data, in fact, *reduces* variability. Even in a culture where people are saying they want to reduce variance, they should be saying, 'Let's do more of this!' Can't you sell it that way? Why aren't you getting 'Let's do more of this?'"

"You make it sound so simple," Ohlsson laughed. "We have a thousand people in our sales force, and a lot of them have been with the company for 20 years, and an environment that hasn't changed much in 20 years. Now we're getting a new dimension of competition in our landscape. So we're going through a transformational change. But we still have the same thousand people."

"They have a job," Oliver amplified, "And they've been doing that job. And you ask them to do the job in a different way, but it's going to take time, and they're going to do a job and a half for a while. And some people will embrace it, and realize they'll be more effective and make better decisions if they're data-driven. Others will look at you and say, 'I want no part of that.'"

"It's very difficult to get alignment," Hilti's Wagner agreed. "Our core internal processes support the sales force, and we have a good network with them, but the product people in the business units are more self-sufficient, they have more shadow IT capabilities. So it's more difficult to break into their network and sell our developer position to them."

"But then you wind up with people going rogue in the background," Meyer objected. "Something's wrong if we all have to authorize unauthorized stuff. That *doesn't* mean that we already know enough to start acting completely differently. But it *does* mean that we need to bring others in, with some sort of safety net, some sort of boundaries, and trust that we'll see what happens."

"Because our corporations are *designed* to eliminate variables," Sezer rebutted. "We are extremely focused on operational priorities. What does innovation bring into the equation? Variability. So people are resistant, by nature. *That's* the culture that we are all struggling with. You tackle it by tying into the problems that you want to resolve, not by showing technology."

> I took all our leaders to an Innovation Summit, and we came back with a list of six domains where we would like to innovate. Three of them were Big Data-related. But the leaders don't call it "Big Data" — they call it "revenue growth management." So now we take that priority, we create an agile team, and we dig into analytics and data and insights, because innovation is going to come from those things that you don't already know. This was a big step forward in getting the senior leaders to prioritize and define the problems to go after — and it was a big help in budgeting and resource allocation!

Eastman took a similar tack, Looney said. "We created an Analytics Council, with people from finance, pricing, supply chain, technology innovation. It's been good for people to understand what's happening in the different stovepipes: 'We're doing this over here.' — 'I didn't know you could do that!' And so the value spreads that way."

"So there is hope," Looney continued. "People absorb change every day, if it's change they want: They clamor for the latest iPhone, the latest app. Operating a Fortune 500 company in a dynamic world is complicated, and people are deeply invested. It took a long time to learn how to operate that company, and people take pride in the fact that they know how to do it. If we can create the opportunity to make it simpler for them, then we'll turn from push to pull."

"One of the reasons we don't just jump out and do this everywhere is that there aren't a ton of proven cases where there have been financial rewards just a couple of years into the investment," Ekberg explained. "We are all at the early stages of where we're starting to see tangible benefits start to hit the street. If you ask that question in four more years, you'll get a very different answer."

Oliver brought the conversation back to its starting point in February 2013:

> This is the second time we've had this topic in two years. Last time there was much more question as to the value and understanding of Big Data then there is today. Even though the wins are not huge, the stories around the room today show progress. Having said that, there's still a lot of work to do. But the topic is here to stay.

"Listening to the conversation today," Blausey concluded,

> Out of all the trends and technologies, this is the one that can, in fact, be the most transformational or revolutionary. Do we know how to use all the power of the machines, the way databases should be organized, the technologies around analytics? There's no doubt that we're still trying to figure it all out. But it certainly has the ability to change the way we think, and the ways we make decisions more than any technology I've seen for some time.

"So we'd better stop being proud of what we've done in the past," suggested Meyer, "And get on with the future, before it's too late!"

Participant List

The Business of (Big) Data: Progress and Potential
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