

The **10x** Medical Device Conference

from the Medical Device Group

Better Decisions with Analytics at SurModics

[10x Medical Device Conference](#), May 2014

[Ken Ritterspach](#): I'm going to start off this part of our program by sharing a conversation that I've had in literally every company that I've led and coached over the years, and I'm guessing it's a conversation that you also have had in your companies in one form or another and that conversation goes like this.

It starts with a request between a senior manager and an IT head. So let's imagine I'm the president of the company and I turn to my IT manager and I say, "You know, I'd like a report and I'd like this report to be on our top 18 customers for the last 12 years, their sales revenue. Can you give me that report?" And of course the IT person says, "Sure, no problem." And I wait some time and the report comes back, and then I look at that report and as I study it I think to myself, "Oh boy, this is good but it's not quite what I want."

So I turn to my IT manager and I say, "You know, instead of the top 18, I need the bottom 18 as well. Can you do that?" And of course the IT manager says, "Sure," a little less enthusiastically this time, but the report comes back a little quicker this time, but it does come back. And I look at it, and as I look at the top 18 and the bottom 18, I realize, "Oh boy, you know, I don't have product information. What I really need are the top 3 products in addition to the 12 years' 18 top, 18 bottom."

But at this point, my meeting is coming up and so I'm not going to go back to IT because I know that they've got a lot on their plate, and so what do I do? I turn to my assistant and I say to my assistant, "Can you give me an Excel spreadsheet that gives me top 18, bottom 18 product information last 12 years?" My assistant says, "Sure, I can do that." And a lot of us remember when we were thrilled because our assistant had this great tool called pivot tables and also a great tool called Crystal Reports, right? We thought, "Boy, this is a great analytical tool."

And sure enough my assistant gives me that Excel spreadsheet and that report and I go into my meeting with my VP of operations and my VP of sales with that report in my hand, and guess what they have in their hands? Their own Excel spreadsheet and their own report, right?

And we spend the first half an hour of that meeting arguing about whose Excel spreadsheet is correct. And, in the meantime, none of that Excel information is correct because the real information, the real data, is buried in our ERP system where it ought to be.

And it's not the responsibility of the IT Department to make sure that my information is correct, right? Their charge is making sure that the systems are in place, that we're running the business, and that the data is secure and the data is correct. But there's a tension between needing our information to manage the business to make decisions and the mandate of IT.

And I'm thrilled that we have today with us Chris Buschmann from SurModics, because Chris is one of those IT managers who gets business and he also gets IT and he has solved that problem. And literally, in the last eight to 10 years, the technology has evolved to the point where we can bridge that gap between the needs of our data on the one hand and the integrity of that data and the requirements of management on the other side to get information out of that data and make their decisions.

And Chris is one of those people who have gone a long way in solving that problem, and it is a journey. We heard from Daniel and from Marty about the future in big data and quite honestly it's a little overwhelming to all of us.

So it is a journey, and what Chris is going to do is describe his journey because it starts with small steps that are still very meaningful, and I'll come back on and I'll talk about ways that we think you can be encouraged to move your journey on beyond to the predictive analytics and the big data. So Chris, excited to have you talk about the SurModics journey.

Chris Buschmann: Thanks, Ken. The first two speakers and Ken gave an introduction and said, "We're talking about the future." I'm going to actually take us back to the present and then lay a little bit of a foundation for everyone in the room because not a lot of people necessarily understand big data for sure, but also just to make sure everyone has the same basis of understanding of analytics and business intelligence. I'm going to give you a little bit of

background in analytics business intelligence, and then talk about SurModics' journey, where we've come to, and then Ken's going to lay out the future for you as he talks about big data and the future of where analytics is going.

But first, a brief introduction for the organization that I work for, for SurModics. Many people haven't heard of the company down here in the southwest corner of the Metro in Eden Prairie. Probably the best thing to do is to give you an example of two different products that we make. How many have heard of the stent? Probably almost everyone in the room, right? The stent and then the drug-eluting stent. Well, I was up at Guidant for 21 years. Guidant, Abbot, Boston Scientific, a lot of different companies, J&J included, were looking at "how do you take a stent," and for those who don't know, stent, angioplasty procedure, right, a balloon into the artery, expands the plaque against the artery to open up that artery, the stent keeps that open, but then we're having restenosis or reclosing of the artery. Put a drug on that in order to keep that open over time. These big companies couldn't figure it out. J&J came to SurModics and said, "What kind of drug and what combination do you put on that will open arteries and keep that artery open?" That's what SurModics figured out. So that's the type of things that SurModics does. We partnered over the last year and a half with IQdecisions in order to roll out the analytics tools that you're going to see today and hopefully looking forward into the future on what we're going to be rolling out as we go over the next couple of years. This really is a journey.

How many people have worked on analytics projects or business intelligence at your organization or past one? How many of you are happy with the business intelligence? You know what, even less than the one in five of companies satisfied here courtesy of Accenture. There are a lot of analytics projects. We have a new CEO as of a couple of years ago and he came from a world that was using a look at data warehouses and data cubes, and they spent hundreds of thousands of dollars and got a result that wasn't very beneficial for them. The 21 years up at Guidant, we didn't get very far, but as far as where things are at today, in the last seven years, really things have transformed quite a bit.

So let me talk about the stages of analytics and where analytics is going. So first of all, I'll start with pre-analytics or reporting. That was kind of the introduction that Ken gave. We go back to the time where we're pulling static reports out of systems. We're using Excel spreadsheets,

using Access databases to do reporting, maybe getting into a little bit bigger databases like Oracle.

But that's the background, you have a flattened report. You're able to bring that report in and that's the first comparisons that people did. Then you get into analytics' early stages where it's data warehousing, cubes, linear predefined reporting paths, and I'm going to talk about that in a second so you can understand a little bit more of how analytics had to work and the world that Ken described as well. That's why there were multiple versions of the truth and multiple versions of data.

Then the next stage, today's analytics. Now, you'll see a difference here. There's a check mark in the first one. That's where SurModics was two years ago. We actually skipped past the analytics' early stages and that's the opportunity that everybody in this room has, is to do the exact same thing and **jump forward to the user-driven analytics**.

So it's no longer in the hands of the IT organization and IT department. Ken had mentioned that I have business and an IT background. I've been in human resources, mergers and acquisitions, engineering, RND, so I understand the business and what the business areas need as well as understanding IT, and they really need it to be user-driven so the user can go in and say, "Here's how I want to look at the data," not "I want to look at the data the way ITs programmed it for me to take a look at."

This diagram actually gives you an idea of that. On the left-hand side is a traditional VI. So you start off with the region, you drill into a state. So now we're in the Midwest, now we're in Minnesota, I look at a particular product and then I look down to a salesperson. If I want to look at another person, I have to drill up in that chain back to product, and then drill down to the next salesperson. But now I want to look at what other states did that salesperson have sales in. I'm not able to do that in the traditional VI model, which existed until the last several years. I'd have to drill back up in the report up to a new region, and then I'm starting to compile data and type it out of all these reports into an Excel sheet so I can go on to the meeting Ken talked about and argue whose data is correct.

The new world and where things are going—QlikView is one of those products, but there are quite a few others as well too—is business discovery. Once I've identified a salesperson, I can look and say, "What states does that salesperson sell and what products do they sell? How have they performed against their plan? How have they performed against last

year?” And I have a lot of flexibility. It gives me the ability to look and answer questions that I didn’t even know I had, and that’s what SurModics really figured out over the course of our journey.

In regard to then the next stages of analytics, this isn’t where SurModics is at yet but where SurModics is going, is looking at big data and looking at prescriptive analytics. So let me frame that as well into a paradigm for you.

So the objectives of the workforce are changing. We’re looking hindsight into insight and then into foresight. You look from descriptive analytics to diagnostic, predictive, and prescriptive analytics.

All of those terms have been introduced today by the earlier speakers, but what do those really mean? If you take a look at it, you’ll say, “What happened?” So I’m looking back at the past, what happened? You look then, why did that happen? Now you’re getting into more the present, what will happen? So based on the past data I’m looking into the future, predictive analytics, what will happen, and the most important thing then is, how can we make it happen? That’s taking these vast volumes of data, analyzing them, pulling them together, not just from an individual company but now from competitors, peers. This is business data, and what Ken’s going to talk a lot about is medical data and how do we take that and how do we actually turn it into something real.

So really brief on SurModics journey and I’ll give a little demonstration of the tool we put together as well. Phase one, replace some manual reporting. We have what we call the flash report that was generated in about two or three hours every week by the Finance Department. It was sent out in Excel. It was a manual report that’s generated out of a 66,000-row spreadsheet. We found out what the limitations of Excel are when we were doing this because there are limitations in Excel even though it now can accommodate a little bit of big data. We call that application insight revenue, and we took that historical data—the 66,000 real spreadsheet—because that was spot. That’s not our presenter there on the bottom left corner. That’s the single version of the truth.

That was our single version of the truth, the 66,000-row spreadsheet. We did pivot tables. We extracted data from it. We then had different people extracting the data and comparing it in those medians, and they weren’t able to come to the same conclusions because even though we started with the single version of the truth, by the time they manipulated it and sorted it

out and filtered it, it now had multiple versions of the truth. Then we supplemented it with real-time data from our current ERP system. So now you have up-to-date information about what's happening in the organization.

I'll just flip over instead of showing you a couple of PowerPoints and show you the tool itself alive and in action. So, this is our executive snapshot. It gives you the ability to take a look at different timeframes. And here we're looking at 2013. You can see the revenue versus plan was 107%, 124% versus the prior year—it was a good year of growth—and you can break it down here on the lower right corner as to what the percentages were for each of the different revenue types that we have in the organization.

You then have the ability, as we mentioned before, to associate data. You can actually say, “Okay we have two business units, In Vitro Diagnostics and the medical device. I want to just look at In Vitro Diagnostics, and now I want to look at stabilization sales.” Stabilization sales were 106%. They grew 30% from their prior year. Pretty easy way to click in, look at data, and search data.

You can also then look in and say, “How do we break down the data? What types of stabilization sales are there?” There's liquid, dried, [00:13:52] reagents. You can click into those and we can see the different product codes. You may start recognizing a couple of the parent companies and customer names. Those are not SurModics customers. We don't want to make anyone insiders here. The companies are the S&P 500 and actually a lot of the presenting companies here today.

So we're able to drill down and see different data, then we're able to look and see over time. How did we do over time? The last five years, pretty steady growth of that particular product on a quarter-by-quarter basis. Are there any quarter-by-quarter trends? How do we compare it to last year? Those are all different ways you can look at the data. That's pretty basic QlikView analytics tools that you're able to take a look at and view.

Then we said, “We really want to enhance the reporting.” That first look was for the Finance Department, who said, “Can we do that?” I actually released that application in three months with all the capabilities I showed you and quite a bit more that I've pulled out for purposes of demonstration today. So we got into enhanced reporting. So the sales group now wants to take a look and say, “How's our performance?” Red, yellow, green, quick

glance at things. How are customers doing against last year? Look at geography and how we're doing across geographies, and then a customer and product sales analysis, what Ken mentioned, those top 20 customers or the bottom 20 customers. The top 5, how have they done over time? What about for this different product type?

So then, in addition to it, we included forecasting in this. That's something that is not quite on the bleeding edge. A couple years ago, we started to be able to enter data into the analytics tools and then use that data to compare two of the analytics to say, how are you doing in comparison to forecast? How are you doing in comparison to outcomes as you start looking at the medical outcomes?

Put that back to the demonstration, we're going to take a look here, and you're going to see a lot more color actually in here because it provides a lot more information by taking a look at things and breaking it down in different ways and giving you indicators. So, one of the things is customers by revenue type, but also then you have reds and yellows. Well, of course, we're looking at the whole year for 2014, so you're going to see a lot of reds and yellows in comparison to last year as comparison to these pluses out here. But if we look at the first quarter, then you look quite a bit better in relation to last year and you can see what are the companies where we're close to plan, above plan or below plan, and you have a lot of visual indicators and can break it down by the different business units in order to see what's the data out there and how does that look.

Now, then you can go and you can select, "I just want to look at the top five. I don't want to look at everything. I can select those top five." Now, the data in the rest of the system now is analyzing just those top five, and imagine you're analyzing data about patients, analyzing data of patients with different conditions, in this case it's business data, and looking at those top five, and now I can jump over and do a time comparison and see how those top five customers have done not just looking at all of the customer base; I can sort it obviously down, pick out customers by any different criteria. Up on the upper right corner here, I have device segments, so I'm able to see what the angioplasty or coronary stenting patients look like and do a reselection on those based on the selections that I've already done.

I can also do analysis that's pretty common for our executive team to take a look and see what do those top customers do, how are they doing year-to-date against how they did last year, and then also looking and saying in

the different market segments how are those growing and shrinking over time? It gives you a great perspective on how's the business doing, how is it doing in different areas, and how do those compare not just over time but what customers have moved in and out, what customers are in the top 15 this year, and what ones have moved out of that top 15?

The additional capability I mentioned as well too then is getting into forecasting. So with that, I'm going to turn it over to Ken to talk about big data and back into the future now.

Ken Ritterspach:

Okay, so big data. Marty talked a little bit about the definition of big data. For a lot of us it's a very confusing term, and thinking about coming this morning I was excited to be here, and then I thought, "Boy, I'm going to be in front of a room of people who are probably a lot smarter than I am, talking about a topic that is eminently confusing, and following a discussion about Watson that's probably got more information than any of us could ever even begin to get our arms around." So it is a daunting task to get into this whole world of big data.

So, let's just talk about it a little bit. First, a couple of examples. The two that we put up there, one is from Amazon, one is from Boston's Beth Israel, and they're great examples of big data and how it's being used today in real time. Forgetting about the future, what's going on with big data right now?

And in the example of Beth Israel there, you know, what they were able to do is give caregivers access to 200 million data points from about 2 million patients, and what they were able to do then is to adapt their delivery to the experience of those patients. So, it wasn't just taking 100 or 150. Can you imagine the power of taking the data from 2 million data points from 2 million people?

It boggles the mind when you think about having access to that kind of information in real time, and for Chris at SurModics, they're able to do that kind of analysis that they need for their business decisions in real time. So that's the business application. But in the medical field and in retail especially, there are some powerful examples even today.

So, what does the term big data mean? Marty, you talked about this a little bit. Let me just go through that definition again, the volumes of data. So when you think about big data, it does include orders of magnitude, more data just in terms of the amount of information that comes through now, and the velocity, how quickly we're getting that data that we get it in real

time on an ongoing basis. The next is the variety. It's both structured and unstructured. It used to be that we think about data in a pre-prescribed format. Now, when you think about big data, it comes in a whole variety of sources – text, voice, video, sense data. And finally, the last point that Marty also mentioned is the veracity, because a lot of that data is messy and not trustworthy. So the question is, how can you filter out and how can you apply algorithms such that you can begin to trust the data?

And I think the question that the reporter asked in the back is right on target, you know, when he said, you know, what happens when a physician, in his or her opinion, chooses an option that maybe wasn't even in Watson's five? And I think there is a substantive difference because that data is out there available for everybody to see. You know, in the old days, when Marty was talking about pulling those articles, the articles that that librarian didn't give him, nobody really knew about. Now everybody knows about it because that data is out there and it's present, and I think that does present a real dilemma for people.

Okay, so why big data? Well, big data is simply here. It's not like somebody decided a while ago, "Boy, we need to create big data." **Big data almost has a life of its own and for most of us it's out there in the future somewhere, but it's going to come and it's a like a tsunami.**

There is no question about if, just when, and you'll either be creating it or using it or both. And today, it's for the Facebooks, the Amazons, the Yahoos. Daniel talked about the future stuff that startups and other companies are working on, but what strikes me is that, remember when a website was just an interesting option? That wasn't very far along when people decided, "Well, I guess we ought to have a website because a lot of people are doing it," and now obviously you need a website to be in business.

So, the key target areas. We listed here a number of those for you to be thinking about, because what I like to do is bridge the gap between where you might be now and where you can go in the future. So these are six areas that you need to think about for your business, and I'm just going to touch on one and that's the second one there, the consumerization. It used to be that they could monitor a heart with a pacemaker by taking a device and putting it over the heart and that connected to a modem, and that modem then communicated with a computer and that computer may have printed out a report that the physician got, right? Well, imagine that if you were the manufacturer of that device that measured what was going on in

the heart and that conveyed through the modem back to the printer. Now today, they can take an iPhone and put it up to your heart and transmit in real time. So what happened to that manufacturer of the device that measured it, right?

So that's an example of consumerization that there are going to be devices out there that are in the hands of the consumer that can do perhaps what your products can do today and it can do it faster and better and probably more cheaply.

And the bottom one there, the electronic health records. That's a reality mandated in I think it's 2015. And so now instead of conveying that information and the data is printed out for the doctor, now that data will go immediately into an EHR for that doctor to have access to it immediately. So those are that little checklist we'd like for you to take away and think about, what are the target areas that might apply to my business as you think ahead to big data?

So, the business benefits, another checklist for you to think about. The outcome benefits, the third one, using processed data from a medical device to directly benefit physicians, patients, or caregivers. Current incredible opportunities there because of the mandate of EHRs.

And then the last one, the operational efficiency, pretty straightforward for most of you in this room, right? How can you make your operations more efficient by the use of big data? Walmart now requires that every single pallet that comes into a Walmart facility has to have an RFI tag or they get penalized, and so all of a sudden **the mandate is, if you're going to do business with Walmart, you've got to adapt that technology**, another example of an application of big data right now.

So, the key, the message for us today is that wherever you are in your journey, be it where SurModics is and has come from, there are benefits that you can reap right now with the technology that is available, and the heads up is that you can use that technology then to map your path for the future. So if you think about where you might go, what your next steps are, some suggestions – the first one is educate. So you think about in the bottom there with your current analytics, what kind of return are you getting on your current analytics, where are you in terms of the SurModics journey?

Because what SurModics has done is immediately available to everybody, you know. Where is big data being used currently in my business? To look out and educate yourself around that.

What partners might be out there for you to incorporate in your business by looking at your competitors? Who are they using? What are the resources available?

The next one is to explore possibilities. What is a key benefit you might get? Where are some key target areas and where are you now? How do you assess your strengths and weaknesses in terms of analytics today?

And third, to engage, to do a pilot, to bite something off. It seems a little daunting, but there are great resources in the room. That's why Joe puts together this group.

There are great resources in terms of your colleagues that you can learn from them about what they're doing, and to validate those goals and to measure the ROI in what you're doing.

And finally, to execute, to refine and to put into process. It is a process and that's an iterative process, so you can start with wherever you are now with available tools, measure that and then move forward.

So our message is not to be daunted by this whole motion of big data and not to feel like it's way out there and I don't have to worry about it.

You do have to worry about it but you can do it in increment amount of steps.

Jorge Ochoa:

Thanks very much for bringing this up. In academic circles as well as within our firm, 600 engineers and scientists, you can imagine how fun that can get. We're having a big discussion about, with limited resources, **what is the most important big data, to attack the volume or to attack the ability to integrate multi types of data?** I know that they both have to be done, but with limited resources do we work on finding a way to getting the different types of data collated and working together or to work on the volume and the speed?

Ken Ritterspach:

Chris may have an opinion on this. My own thought is that it's almost neither. To me, it's the integrity of the data that's key. So that probably leans more toward the integration of the data that because as we work with companies, it's messy data out there. And forget about that veracity of big data. **You just need to make sure you got your data in your company now**

that's clean that everybody trusts. So I almost tackle the integrity. Chris any...?

Chris Buschmann: To give you an idea of where we're going into the future as we do a lot of scientific research. So we have thousands and thousands getting to millions of data points and images that was brought up in a couple of questions earlier as well, too, and one of the biggest things that we're trying to do is we're actually taking the second piece of what you said, which is that integration of the data, trying to figure out all the different sources and bringing that together, and then by bringing it together, what are the patterns that emerge from that and what questions are we able to ask and that get answered in relation to it as well?

Joe Hage: Vaughn.

Vaughn Cook: Are the products available? Are they essentially open source? Can you load any data into any field and then bring it up and analyze it in a specific way? I don't know if that makes sense, but if I've got millions of data points and I want to draw a line through it, can I draw the line in any direction?

Ken Ritterspach: Yes. The short answer now is yes, that you can access in our system where data were source-agnostic, ERP-agnostic, and the answer is with the technology changes in the last 10 years you can draw that line and redraw it and redraw it.

Chris Buschmann: One of the great advantages of the tools today, QlikView is one of them but as the other tools too, is you can actually download most of those for free. QlikView admits that they hook you on it like a drug. They actually let you use it for free on an individual basis, but the moment I want to share it with Ken or anyone else in the room then I need to start buying licenses. And licenses aren't that expensive either, but you can actually download QlikView, Tableau or some of the other tools and actually hook them up to your databases, take a look at the data, and start seeing the different patterns in that data for free, on your desktop with the full functionality of the tool, and that as you see the value for your business that actually leads to more and more capabilities as you go forward.

Joe Hage: Alright, and we have time for one more question. Gary.

Gary Saner: Hi, quick question on some of the public data available through FDA. There are a lot of databases. There are a lot of vocabulary resources that are publicly available. Has your tool or anyone thought about pulling some

of that data down and looking for interactions in other type of meaningful data, some data mining that could be done?

Chris Buschmann: I can take that. Yeah, QlikView is a pretty extensive tool. I actually sit on a board of a company that we're looking at electronic health records and how do you take the electronic health record data and what's stored out in the public domain. So you can actually attach to websites, you can attach to data stored on those websites. There are some applications out there for those of you who are golfers out in the audience here that you can hop on and look at all of the results from all of the golf tournaments over the course of the last 25 years into a QlikView application that's built out there. That gives you an idea of it's searching multiple databases and multiple different sources to pull that information together, and if you want to see an individual golfer you click on that one and see what's happening. We'll apply that to the medical world. If you want to see cancer and what data is out there available for cancer, cardiac conditions, all of those, the sources are pretty much agnostic and almost all of these tools do hook up to all the databases.

Joe Hage: Ken Ritterspach, Christopher Buschmann, thank you very, very much for joining us today.