EPISODE 28: HECTOR GUERRERO – PAST, PRESENT, AND FUTURE OF BIG DATA

Ken White

From the College of William & Mary in Williamsburg, Virginia. This is Leadership & Business. The weekly podcast that brings you the latest and best thinking from today's business leaders from all across the world. We share the strategies and tactics that can make you a more effective leader, communicator, and professional. I'm your host Ken White. Thanks for listening. For the past few years, it's been the hot topic in business, and it's not going away. In fact, it's becoming more important than ever. Big data. Companies of all sizes are embracing big data, and businesses are seeking qualified candidates who are trained in the discipline. To assist, business schools are adding programs in big data and business analytics to get students and professionals up to speed. It's the future and an area of opportunity for job seekers, professionals, and companies and organizations. Dr. Hector Guerrero is a Professor of Operations and Information Technology at the College of William & Mary's Raymond A. Mason School of Business. Prior to joining William & Mary, he taught at the business schools at Dartmouth and Notre Dame. Guerrero has worked with a wide range of clients, including IBM, Lockheed Martin, Arthur Andersen, and countless others. He's been teaching statistics and business analytics for decades and has a unique perspective on this rapidly growing field. It's past and future and especially what it means for you. Here's our conversation with Professor Hector Guerrero.

Ken White

Hector, we can't pick up a newspaper or read a web story, listen to a newscast without hearing the words big data, or for the novice and for so many people who are confused about what this means. What does it mean? What is it?

Hector Guerrero

Well, it's a very complex term, a very mysterious term, but in general, it's about the acknowledgment that the world now can capture huge amounts of data, and people are beginning to ask the question. Now that we've captured this data, what do we do with it? How do we find power in it? How do we find profit or cost reduction? What is it that we can do with the data once we've captured it?

Ken White

You've been teaching this literally for decades. What was the beginning? Where did it all start?

Hector Guerrero

Well, very, very humble beginnings. Let me tell you I remember the first stats course that I taught as a graduate student at the University of Washington where I was getting my Ph.D., and you know, the mothership, so to speak, of all this stuff is traditional probability and statistics and probability and statistics eventually evolved into just statistics because the word probability was a bit offensive to a lot of people in the sense that it was complicated. But in those days, what we could do with analysis and analysis of data were these little miniature little things that we could do on the board with a piece of chalk and a lot of time spent on one example simply because of the mathematics required you to spend time doing the calculations. Lo and behold, the personal computer becomes available. And at first, it had limited power, but it was certainly much more power than a piece of chalk and a blackboard.

Ken White

Sure.

Hector Guerrero

So we began to do things with data that were far more interesting than they had been before. And there was more time for real application as opposed to just talking about the theory as the laptop, and personal computers became even more omnipresent. The things you could do began to really expand quite dramatically. Then about 15 or so years ago, when the first classroom technology hit, then it was a marriage between classroom technology and the personal computer. It wasn't enough for everyone to have a personal computer in the room and me to say well, here's some data. Let's analyze it. What did you get? What did you get? When classroom technology became available, then we were all participating in it at one time on a big monitor in front of us. And over time, personal computers became more powerful, more capable, and we were able to take larger chunks of data and do more interesting things with them to where today we are able to process massive amounts of data and find interesting predictive sort of things in that data, and we can do it real-time in the classroom. A couple of professors and I have developed this thing we call a pressure cooker in a classroom. And a pressure cooker is a real-time event where we give students a large body of data, and we ask them a few questions, and they can literally go to work on the data real-time and present what they get in 10 15 minutes.

Ken White

Wow. Yeah. So back at the beginning, when you were literally teaching probability and statistics, were companies able to use this when people graduate with an MBA or a business degree? How were they able to use this at work?

Hector Guerrero

Well, usually that kind of activity took place in a department. Often the IT group. Why? Because they were the keepers of the keys to the kingdom. They had the computers.

Ken White

Right.

Hector Guerrero

And so you needed to know something about big computers and programming and the like to be able to analyze data. So you went to them hat in hand asking them to do something, and maybe they would do it, maybe they wouldn't do it, but in general, what has happened is that that wall has been knocked down, and you don't need to ask anyone any longer to do these things for you you can do it yourself. So to answer your question more directly. We've always had these techniques. They were harder to use because of access to computing power. Today the expectation is that any MBA that comes out of a program, any good undergraduate that comes out of a business school program, will have top-notch analytical skills that they can use on a desk-based machine without having to go anywhere to ask anyone for help of any sort.

Ken White

And what kind of programs if someone is a novice and wants to learn what kind of software. What kind of programs might they use?

Hector Guerrero

Well, the ubiquitous software, of course, is excel. And I'm a big big fan of excel. Excel has its limitations, but certainly, you can do very sophisticated data analysis on excel. There are also add-in packages that you can add in there. What's become popular of late when we begin to talk about data science and some of our students actually becoming data science scientists is that there are there's freeware there's available software out there that anyone can have. For example, there's a program called R which is a very powerful language for doing data analytics and it's kind of a build-your-own sort of a system you learn a number of commands you write this language, you know, we're going back to that era of computing but with much easier interfaces to work with than ever before. Of course, you can buy big statistical packages like SaaS, for example, that are available and you can become very clever in using that software. We try to introduce students to statistical

packages. I use a package called Minitab in the classroom, which is a very powerful package that's very easy to use. And students find that they can begin to do fairly large-scale analysis very quickly.

Ken White

We'll have more of our conversation with Professor Hector Guerrero on big data in just a minute. Our podcast is made possible by the Center for Corporate Education at the College of William & Mary. If you're looking to expand your business and leadership skills, the center has a program in April for you. A certificate in business management is a five-day program featuring instruction in executive leadership, effective communication, managerial accounting, operational effectiveness, and business strategy. To learn more, go to wmleadership.com. Now back to our conversation with Hector Guerrero on big data.

Ken White

We're starting to hear, in fact, William & Mary is one of those schools, the Mason School of Business, with master's degrees now in analytics and business analytics. Where are these taking this type of program? These type of graduate programs and this type of instruction. What's the effect that's going to have on business?

Hector Guerrero

Well, one of the things we've seen with these programs is that industry is asking for people to be subject matter experts on their way into employment. And so this title that I mentioned earlier, data scientist, is a title that fits within that realm of a data business data analytics program. So people want individuals that can step into a role for doing data analysis at a very high level with very specific sort of training. One year's worth of training generally is what it takes.

Ken White

What type of individual likes that? If our listeners are younger and trying to figure out career-wise, what do I want to do? Like personality wise who are the students who seem to excel?

Hector Guerrero

They seem to be individuals that are interested in technology. One of the reasons for that is that data analytics today is the marriage of kind of applied mathematics and computer science. Computer science has become a very large component of data analytics with something called machine learning, computer algorithms, computer statistics, and predictive statistics of all sorts. So it'll probably be someone that has an interest in mathematics and technology simultaneously. But of course, there's always the application element of it. Someone who is very keen in marketing, for example, and has that kind of

interest will apply it in that area. Someone who's interested in finance or accounting will apply it in a slightly different area.

Ken White

And the jobs are just everywhere. Companies are desperately looking for people who understand big data.

Hector Guerrero

The big programs that are now started fairly recently starting are finding 100 percent rates of employment for their students. Students typically get three or four job offers are paid handsomely right out of these programs. And to some extent, we're beginning to see some MBAs come back and say this is a kind of the last piece of the puzzle that I need. I need this subject matter expertise to marry to my general business acumen, and it will make me far more valuable in an organization.

Ken White

Yeah, no doubt the dual degree. Get the MBA and maybe a one-year masters in analytics. How is it changing business? I mean, you've done this a long time. How is this? It's all we read about. It's all we hear about. How is it changing?

Hector Guerrero

Well, all this data that is being captured is finally being put to use, and people are beginning to ask very difficult questions and are finding that they might be able to find a solution to that. Analytics is all about prediction and about being able to take data and adequately predict behavior. Whether it's with behavior of a consumer behavior of an organization, or individuals in an organization, and so that's what that's always the focus is how can we use this data to help us understand what's going on and then to help us predict what might happen if we take a particular action in our organization.

Ken White

And it doesn't matter the department.

Hector Guerrero

No, it doesn't. No. You're seeing it being used in all areas of business, whether it's human resources or whether it's accounting or marketing certainly gets a lot of attention. Finance operations, all of the traditional silos of business, have a stake in business analytics.

Ken White

You know, it's interesting in doing the podcast and just working here at the college. We meet CEOs and business execs on a daily basis, and when you ask them what are some of

the issues you're facing. What what's top of mind for you? Analytics just comes up time and time again, and it seems when I follow up and say why is that. It seems that a lot of companies aren't quite sure what to do with it and how to get their arms around it, so if you're a business leader, what would you recommend to those business leaders?

Hector Guerrero

Well I mean that's the first thing that happens. You hear all the buzz about data analytics in the background, and you feel you feel a little wary that maybe you're missing something.

Ken White

Yeah.

Hector Guerrero

You don't know something that somebody else knows.

Ken White

Right.

Hector Guerrero

So the first issue is that discovery. There is this thing out there; I need to know what it is. Once I discover what it is, then I can begin to possibly use it in my organization. So I think businesses are well suited by, first of all, trying to get a grip on what data analytics is in their world. For example, if you're an online retailer, you need to find out what kinds of tools and techniques are being used to analyze customer interaction with your website for example and you can do that fairly quickly and get kind of a shallow understanding, but eventually, you're going to have to go more deeply. And if you're going to create a group or a department or get that expertise internally, you're going to have to really become well versed in what was going on in that world because they're going to be commitments to be made in terms of capital equipment and costs for programming or consultants. There is a lot of money that can be spent on this.

Ken White

And I think when we hear when most people hear big data or we read the stories, it always seems to tie into huge companies. Fortune 500 can a medium size a small size business benefit and get into it.

Hector Guerrero

Sure, I work with a small business here in the area that retails Spanish foods online. A company called tienda.com and they're doing a superb job with kind of homegrown sort of data analytics and fairly sophisticated stuff that they are able to purchase from

consultants and outside vendors, and by necessity, they're having to take these tools and do things to make themselves not only more profitable but more cost efficient also.

Ken White

Interesting you use the words by necessity. It's not really an option anymore, is it?

Hector Guerrero

No. If you're not doing it, you will pay a price eventually because your competition will eat you up in terms of their ability to do a more efficient job than you.

Ken White

That's our conversation with Professor Hector Guerrero of William & Mary's Raymond A. Mason School of Business, and that's our podcast for this week. Leadership & Business is brought to you by the Center for Corporate Education at the College of William & Mary's Raymond A. Mason School of Business. The Center for Corporate Education can help you and your organization by designing and delivering a customized leadership development program that specifically fits your needs. If you're interested in learning more about the opportunities at the Center for Corporate Education, check out our website at www.wmleadership.com. That's wmleadership.com. Thanks to our guest this week, Professor Hector Guerrero, and thanks to you for joining us. I'm Ken White. Until next time have a safe and productive week.