

# Measuring What Matters

Renowned expert Doug Hubbard talks applied information economics and measuring intangibles, risks and value.

**Michelle Dennedy:** If data truly is a business asset and we assert that it is indeed, then we need to start running our businesses differently from the way we measure value to the way we manage risk and make investment decisions. But how do you measure something as intangible as better data privacy? Hope is not a strategy, people. It's time to get the quants in the room.

Cybersecurity, data protection, privacy. You like to stay ahead of the curve and listen to experts who are leading the way in deriving greater value from data with a more organized approach to data privacy. You're like us. Just a few deviations past the norm. You are a Privacy Sigma Rider.

Dollars, Euros or Data: Is Data the New Currency? In one of our first episodes, Robert Waitman and I discussed the concept of treating data just like any other asset on the balance sheet. Robert is the director of Data Valuation at Cisco and joins us again to continue our conversation and dig deeper into how best to measure the value of data and the return on our data protection and privacy investments. Welcome, Robert.

**Robert Waitman:** Thank you, Michelle. Thrilled to be here.

**Michelle Dennedy:** Back again.

**Robert Waitman:** I love it.

**Michelle Dennedy:** See Doug, you'll see that once you come on the show we're a little bit Hotel California. You won't ever--

**Doug Hubbard:** Okay.

**Michelle Dennedy:** --want to leave again. Also here, and I'm very starstruck by our guest, to help us measure the immeasurable is Doug Hubbard. Doug is a world-renowned expert in measuring intangibles, risks and value -- especially IT value.

His AIE method, hard to say "Applied Information Economics" has been successfully applied to dozens of Fortune 500 and venture capital IT investments, military logistics, aerospace and environmental issues.

Doug founded Hubbard Decision Research and is the author of the bestseller, *How to Measure Anything: Finding the Value of Intangibles in Business*. Doug, there are more books and you've got some more exciting news about your books. Why don't you introduce yourself and let us know about those?

Doug Hubbard: Hi, well, thanks for having me. Yeah, I've written four books. The last book I co-authored and the first one was *How to Measure Anything, Finding the Value of Intangibles in Business*. The next two were *The Failure of Risk Management: Why it's Broken and How to Fix it*, and that obviously focuses on risk management, risk analysis. The third one was *Pulse: The New Science of Harnessing of Internet Buzz to Track Threats and Opportunities*.

It's really all about using publicly available data from websites and API's and social media to track major trends in society. Things like consumer confidence and political approval ratings and so forth, even unemployment levels and where flu outbreaks are going to happen. So, there's a lot of interesting research in that space as well.

My latest book is *How to Measure Anything in Cyber Security Risk* and is really meant to be the first of what I hope to be a few spinoffs on how to measure anything.

Michelle Dennedy: It's really incredible, and as I told you briefly when I met you in person the other day, I wish I had had it with me. I had your original book, *How to Measure Anything: Finding the Value of Intangibles in Business*, even before I got into privacy. Before I was in privacy I was in intellectual property, particularly, patent litigator, and finding what damages are when intangible property, some of which isn't really built yet or instantiated, is really a tricky thing.

When I turned my hand to privacy I reinvestigated that book and it really was a very big influencer. If any of our listeners has looked at *The Privacy Engineer's Manifesto*, I purposely put some of those concepts into Chapter 13. A little tongue in cheek for the bankrupt because in privacy, not a lot of measurement in intangibles.

So Doug, let me turn it over to you to ask, how did you morph measuring anything intangible and get into cybersecurity and data risk?

Doug Hubbard: Well, I've always been interested in hard measurement problems and of course, cybersecurity ranks as one of those. It is a very topical issue as you can imagine. Every big news event about a major breach creates a new interested audience about the issue of cybersecurity. But really, it also fell into one of those areas where a lot of the professionals currently involved in it believe it is intangible and immeasurable and are stuck with using some methods that have already been researched to show that they actually add error or at least don't help in making informed judgements.

I chose cybersecurity as really the first of spinoff series on *How to Measure Anything*. I just accepted it as a challenge that, hey, I really think this is quantifiable. This is measurable and we don't really even have to reinvent statistical methods or quantitative analysis about this or risk analysis in general and apply it to cybersecurity.

Michelle Dennedy: I like that math is always in fashion.

Doug Hubbard: Yes, it is. In fact, I just found out something about my latest book. I co-authored it with Richard Searson, by the way, and he was the SISO At Twilio and was previously the general manager of privacy and cybersecurity at both Kaiser Permanente and GE Healthcare. So he's had some large shoes to fill in cybersecurity, and he was my co-author on that, so we had a real cybersecurity person, not just an outside person, writing about cybersecurity.

He contributed that, but I did find out that my fourth book, How to Measure Anything in Cybersecurity Risk is now my third book which is required reading for Society of Actuaries Exam Prep. 2017. My previous two books, How to Measure Anything and The Failure of Risk Management were already required reading, but, in 2018 it's all three.

Robert Waitman: We're going to have to take those courses so that we can go through the whole thing and read the books as well. Doug, it's very interesting how you look at the value of data and one of the things that we're exploring in the theme of these podcasts is what really is the value of data to organizations? I know you have a lot in your book talking about that you really don't need more data than you probably already have and the data that you have can be well valued.

Do you want to talk a little bit about that? I think there are a lot of people that struggle with, how do I think about what my data's worth and how that helps me make better decisions?

Doug Hubbard: To clarify one thing too, what I say is, you probably have more data than you think and you probably need less data than you think. When you do the actual math, what I mean by that is that when we actually do the calculation people may be surprised at what kinds of inferences they could make even when they think their data is limited or messy or even corrupted in some way or biased. You can still make interesting inferences from that kind of stuff.

The reason something like data or privacy in general are relatively abstract- sounding terms, the reason they're measurable, is because they have observable consequences, right? The only reason we care about privacy is because there are observable consequences to it.

I'd like to switch the conversation from the original labels used to describe things and talk about observable consequences because as soon as you figure out how to observe something, you're really halfway to measuring it. The rest is some trivial math.

Michelle Dennedy: And you're not saying observable harm. That's really, really, critical because in many parts of the world it's not the harm of data sharing that is the problem. It's an observable consequence and a consequence can be less efficiency; it can be the consequence can be profit; the consequence can be risk embarrassment and fines. I really wanted to drive home that point.

Doug Hubbard: Right. Well, in a broad sense when you actually look at the term "intangible", technically you're meaning literally not touchable. Things like credit worthiness and time are not touchable, but of course we measure them because they have other consequences which we can observe. That's why we care about these things. So really, all of science and data science is about tracking things that we observe and those are the things you really cared about in the first place. The only reason we are even interested in measuring something is because we think it might matter. If we can't think of any consequence of label, of a thing, an X of some sort, if we can't think of any reason why it should have any bearing on our lives, we're probably not interested in measuring it. It's probably a distraction.

Robert Waitman: A lot of organizations seem to make decisions with perhaps non-quantitative metrics, red, yellow, green and other ways that we try to make decisions and this is bringing discipline and a science of trying using that data to it at least how it strikes me.

I'm wondering if we can take this to some more practical examples. Is there anything that you would want to highlight on stuff you've done with clients where this kind of methodology has allowed them to make better decisions?

**Doug Hubbard:** Well, cybersecurity is part of our business and a growing part of it, but, really we've measured things like drought resilience in the horn of Africa; we've measured the value of saving endangered species; we've measured the impact of exposers of various chemicals to the intellectual development of children. We've measured the value of retirement homes and so forth. We've measured the value of improving safety for major utilities and so forth. All of those would seem like something that you would have a hard time measuring and you can have a lot of uncertainty about those sorts of things, but, we're still faced with the practical consequences of deciding to allocate resources to some things and not others.

As soon as you have that, you're introducing economics whether or not you ever intended to at first even at not-for-profit. We have a not-for-profit client right now and we're still interested in how do we allocate limited resources, and that's where valuation really comes in. That's where it becomes the most relevant is you have so many resources that you can allocate to A, B or C and it's uncertain which one is the highest payoff.

One current client right now is [focused on] how do they allocate resources to reduce high school dropout rates? That's a not-for-profit. Is there a value to that? We think there's a value to it and at a very minimum some allocations of resources. There are limited resources they have will have a bigger impact than others and those are observable consequences.

Cybersecurity is just I think another example of something that where someone initially started out thinking, that looks really hard to measure or that even looks impossible to measure. Where do we even start?

**Robert Waitman:** So have you ever been stumped by this? You've got three books on how to measure anything, you've been publishing and talking to clients for ten years. Can you really measure anything and talk about what was particularly maybe a hard problem whether it's in cyber security or elsewhere, that in fact you can still measure.

**Doug Hubbard:** Yeah, well, I mentioned a few things that everything I just mentioned were things that somebody thought was really hard to measure. How do I measure the economic impact of restoring the Kabucci Desert in inner Mongolia or whether or not the relative value of investing in roads or school in Haiti, those were two United Nations projects we did actually and those are real world measurements we actually did. Of course, we've done lots of government agencies, military logistics, foreign government agencies, major companies. A lot of them are interested in risk. Risk seems like an intangible to people.

**Michelle Deneddy:** Absolutely and are we measuring it?

**Doug Hubbard:** Immediately effective it's because we've seen things happen elsewhere. We know they're possible here, so just like my life insurance company even though they haven't seen me die yet, or me make some major health claim just yet, they know that other people with my characteristics have so they can still make forecasts about that and so risk management actually is almost the classic difficult measurement problem for people.

- Michelle Dennedy: I like where you're going with this too because you only measure what matters, but, the question is particularly in corporate life or bureaucratic government life and I've heard you say that the biggest risks the least likely people are to actually measure them and measure them incrementally to look for these patterns and look for how are you going to allocate because that seems to be the real question. How are we going to allocate which resources and when on some of these issues and why do you think the biggest of strategic risks are the ones that often get glossed over and not measured?
- Doug Hubbard: Well, I think for the reasons we've been talking about of people just may assume that they're too difficult to measure. You look at let's say an insurance company. They've got actuaries all over the place. There are plenty of quants at an insurance company, but, one of my earliest experiences with measuring risk and IT was at an insurance company where the director of IT said, Doug, the problem with IT is it's risky and there's no way to measure risk. I said, "you work for an insurance company."
- Michelle Dennedy: Yeah.
- Doug Hubbard: I think he was having an epiphany at that moment. Like when I had said that. Yeah, the next floor up is almost all actuaries.
- Michelle Dennedy: Do you bring a flask with you for when people have these aha's?
- Doug Hubbard: I should. I should start recording them. I think what's interesting though is that we sort of get into a convention of declaring certain things as intangibles without really thinking about it further. Once somebody puts a stamp of intangible on something, they don't really have to think about it again.
- Michelle Dennedy: That is what I think. That's my suspicion in a lot of this cyber security, privacy stuff is it's really easy to say it's over or there's nothing I can do until I get hacked because it's hard.
- Doug Hubbard: Right. Yes, well, really we shouldn't have to reinvent much because the very problem you just talked about there is the same kind of problem that actuarial science has had to deal with for quite a while. Even though I've never died, you'll have to take my word for it, but, I have not died yet.
- Michelle Dennedy: It's observable.
- Doug Hubbard: How in the world does my insurance company compute a life insurance premium for me? And how do I even make decisions about say my lifestyle that might improve my longevity? I haven't died yet so I have no data on how things might affect my longevity.
- Michelle Dennedy: I like this example you've alighted on because I'll tell you one of my greatest pet peeves. In the sales palooza cycle right now, now that our law is changing and data protection radically this year, people say, here's a dashboard, Michelle, here's a dashboard, here's some slides and I almost feel like saying to them, so when I get in my car in the morning and I look at my dashboard, can I just get out again and assume that I've made the journey to work and done everything that needs to do for the day? Because I've seen the damn dashboard.

Doug Hubbard: Right.

Michelle Dennedy: What do you do with this? How do you take the quantitative information that you're talking about and actually take it for a drive?

Doug Hubbard: Yeah. Interesting, one of the things that we do in our analysis is we actually compute the value of information and what we often observe is that the high value information is not usually what people seek out. Often they'll spend their time spinning their wheels gathering relatively low value or no value information.

Things that are statistically unlikely to improve decisions. That's where they allocate their resources. This happens so often we call it The Measurement Inversion. Now, in the case of dashboards, when you look at the information presented on dashboards, do you think someone deliberately selected that information because they thought, I've worked out in advance what kinds of decisions I would make differently that are highly uncertain right now and when these sets of conditions arise on my dashboard, I will execute plan X or plan Y, etcetera. That's not usually how they came up with the dashboard. They sort of listed the things they thought they would like to know and they hope they'd know what to do when they see the conditions arise. That's what they usually do.

Michelle Dennedy: Well, and sometimes it's just like having a sticker chart. It's like, look, gold star and it's not helping me on what happens tomorrow. It's just that I said I was going to do this and I went and I did that and I was very busy, so, I think a lot of the measurement inversion seems to be exactly as you said. It's not measuring the journey to an objective or an observable consequence. Instead, I think a lot of times we spend a ton of time measuring percentage of completion of X task, also not designed strategically to get to the end to get that desired outcome.

Doug Hubbard: Exactly. In fact, a decision leg, it's sort of a signal recognition leg in a lot of our decisions. When you look at a dashboard, maybe some decision becomes optimal when three metrics on that dashboard align a certain way. Maybe that's it. Am I supposed to be able to know that subjectively, intuitively in advance or should I have done some math with this? Should I have tried to anticipate the kinds of decisions I would make?

Now, I certainly see the value in just being situationally aware of my business. Our clients like to be situationally aware. In the military they call that situational awareness. Is there a value to that? Can we really anticipate every decision that we could make with new information? I don't think we have to, but I think some decisions are consequential enough that we should try to work out in advance what the information is that would inform it and what I would do when those particular signals arise. That signal recognition is often the hard part because some of the signals can be subtle. Often the way dashboards work is assuming that information is even relevant to the decisions you would have to make with it. Assuming that's the case, often the decision to act is only after the signal is strong enough that we can't avoid seeing it.

We could have actually seen it earlier if our signal processing was a little bit more advanced. We could have seen the right condition start to arise. You guys have seen big projects fail, right? You've seen things like that.

Robert Waitman: Sure.

Michelle Dennedy: Absolutely.

Doug Hubbard: When they failed, can you go back and look at how far back all the signals were saying it was probably likely to fail? There's usually a lag there. So that's the other side of the economics of information is how soon we're even going to recognize a decision when we don't actually work out the conditions in advance.

Robert Waitman: Doug, it sounds like these methodologies would be very powerful on some of the most critical decisions that we have to make. These are things that organizations should look at and probably benefit from and be healthier and stronger as a result of this kind of analysis. Do you think people are getting better at this?

Doug Hubbard: Well, I hope so. It's not like risk has gone down. If anything, you have certain kinds of risk has increased. I'm really happy to see that the risk in commercial air travel have greatly diminished. 2017 was a great year for commercial air travel in terms of deaths attributed to it, but, there are plenty of other big areas where risk can only increase and unfortunately I do think that there is an inertia to convention and what we call best practices.

It's kind of hard to unwind that once you put that out there and that's kind of what we're fighting against to a certain degree. There are better methods and when I say better methods I don't just mean labeling it best practices or it's my opinion or somebody else. I'm talking about empirical research based on observations about the performance about different estimation methods. Which ones perform better and there have been large clinical trials on these sorts of things so we should start with methods that have shown empirically in large clinical trials that they actually measurably outperform alternative methods.

Michelle Dennedy: I've heard you talk about this before of the relationship between the era of over confidence which most people and probably and very senior people fall into that trap and how we can and this is the phrase that you use that I just fell in love with, how do we create the equation that reduces the inconsistencies to solve for the known era of over confidence and become better data bookies so we can predict the flow and get the real signal out of the noise, and into the hands of the decision makers who know what to do with that data. How do we invert the equation? Get rid of the over confidence and become a data bookie?

Doug Hubbard: Well, there's been a lot of interesting research on this that looks like training alone is sufficient to get most of the population to be what we call well calibrated. That means when they subjectively assess probability to be 90 percent and I tracked all the times you said you're 90 percent confident in 2018, about events that would happen in 2018, by the end of 2018 I go back and look at those 100 events and about 90 out of the 100 would have come true within a statistically allowable error.

Of all the times you said you were 70 percent confident about 70 percent of those events would come true. That's what been well calibrated really means and our experience because we've actually calibrated over 1000 people in the last 20 years, about 85 percent of the people who go through our training become calibrated. They are statistically indistinguishable from a bookie at putting odds on things.

Michelle Dennedy: I love this.

Doug Hubbard: About three-and-a-half hours of training.

Robert Waitman: I want to be a data bookie.

Michelle Dennedy: Don't we all? I think where I'm most over confident is my ability to measure how much ice cream I'm putting into my body and to calibrate the calorie load and its predictive outcome.

Robert Waitman: That's an easy one. More is better.

Doug Hubbard: Oh yes. Actually, that's another angle of the same thing you just mentioned a little bit ago is that we're also inconsistent, we're not just over confident, but we're highly inconsistent. One of the reasons, we're over confident is because we don't actually track our performance and without data we're very likely to interpret our past performance in the most flattering way.

We know that it really takes three conditions for us to learn from experience. We have to have consistent, immediate, and unambiguous feedback. Kind of like shooting hoops

Michelle Dennedy: Consistent, immediate--

Doug Hubbard: -- on a basketball court. If I get consistent, immediate, unambiguous feedback.

Michelle Dennedy: And unambiguous feedback. Okay, I'm writing it down.

Doug Hubbard: Yes, but is that really the role that most people in risk management including cyber security live in? They make decisions that will be a long time if ever that they find out that that was the right decision because we get only a few signals about the effectiveness of these things.

That's why we have to expand our scope and realize that we have a lot more data. We can be more like actuaries, we can expand the status set that we look at and say, well, what's the frequency of this kind of event and what else do I know about these things? Is there a way I can at least, if I have to really rely on my judgment as an expert, can I at least control for certain kinds of errors? Well, over confidence is one, but, also we can control for inconsistency.

If I make a model that's statistically smooths out the judgements of experts and we do this routinely. This is one of the most common things we do. We build these models, a statistical model that tries to predict the judgment of an expert. Now, what's interesting about this is that the models of experts, this has been shown in a wide variety of applications, the model of an expert seems to outperform the expert and judgement. This seems to be because the expert no matter how many decades of experience he or she has, they can't seem to apply their own rules of thumb consistently.

Michelle Dennedy: It's so true. It's so true and I love this is actually a great takeaway for us to close out the podcast, and thank you so much for your time in particular, Doug and Robert, because I think these three conditions when you talk about privacy and cybersecurity in particular. Consistency, immediate feedback and unambiguous feedback -- all of those things are things that we can think about designing into our systems, and by systems I mean the human interaction with the machines as well, but, also allowing for the metrics that we're building into data-saturated systems to give

this type of feedback so that when we do have an expert who does have inconsistency, at least we have data that we can continually measure to really get to these outcomes.

There's so much to unpack here. I hope that you'll come back as a guest on the show to dive even deeper, Doug, cause, wow. I'm blown away that I've got notes all over the studio. Everyone's looking at all my crazy writings. I look like I have a beautiful mind, but, it's really yours I've stolen.

Doug Hubbard: Well, I appreciate it and I suppose the one parting thought is, there's a lot of this stuff we don't have to reinvent.

Michelle Dennedy: Yes.

Doug Hubbard: This stuff has been tested. Some of this, admittedly, is a little obscure. It's been around for decades and very few people have talked about it or whatever, but, there are methods that measurably outperform other methods and we should at least start with those.

Michelle Dennedy: I love that. That's a perfect takeaway for me because I am a data governance girl. I like things to be boring. I don't like to be blips and stuff that's had the benefit of time and statistics and math, these things are well-calibrated to my kind of outcomes so thank you very much. I had a 100 percent prediction that you were going to be awesome on the show and I will self-judge myself as an expert to say I was 100 percent right.

Doug Hubbard: Well, thanks for having me on your awesome show then.

Robert Waitman: I think that was consistent, unambiguous and immediate feedback.

Michelle Dennedy: Thank you.

Doug Hubbard: Thank you, Bob.

Michelle Dennedy: And thank you Robert as well.

Robert Waitman: Thanks, Doug.

Michelle Dennedy: It's a wrap.

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