



*High performance. Delivered.*

## Synthesizing data for actionable decision-making

An excerpt from an Accenture CIO roundtable: “How leaders use information to out-think the competition”

• Consulting • Technology • Outsourcing

## Introduction

Accenture recently held a gathering of leading CIOs in Boston to discuss the decision-making process in today's organizations and how analytics can help to improve business decisions and ultimately generate a competitive advantage.

The moderators were:

- **Bob Thomas**, Executive Director of the Accenture Institute for High Performance Business
- **Tom Davenport**, who holds the President's Chair of Information Technology and Management at Babson College, and is the author of, "Competing on Analytics: The New Science of Winning"
- **Howard Gardner**, the John H. and Elisabeth A. Hobbs Professor of Cognition and Education at the Harvard Graduate School of Education, and a world-renowned psychologist and author of more than 20 books translated into 27 languages

The panelists included:

- **Jerry Grochow**, Vice President for Information Services & Technology at the Massachusetts Institute of Technology
- **John Glaser**, Vice President & Chief Information Officer, Partners Healthcare
- **Dan Wakeman**, Vice President & Chief Information Officer, Educational Testing Service
- **Ravi Kalathil**, Chief Information Officer, Fresenius Medical Care

In this podcast, we'll listen to Howard Gardner, author of *Five Minds for the Future: An Exploration of Different Modes of Thought and Analysis*, describe his ground-breaking idea of synthesizing. Then we'll listen to the panel explore the notion of synthesizing and how it can be used to organize and interpret data to enhance their organizations' ability to make actionable decisions.

**Bob:** Howard is the John H. and Elizabeth A. Hobbs Professor of Cognition and Education at the Harvard Graduate School of Education. He's received numerous honors over the course of his career including the MacArthur Prize in 1981. Perhaps best known for his theory of multiple intelligences, Howard recently published, *Five Minds for the Future: An Exploration of Different Modes of Thought and Analysis* with, I think, great implications for management.

Howard, I was particularly interested, both as I read *Five Minds* and then did a little bit of searching on your biography, that you are a synthesizer, a self-professed, self-claimed, self-admitted synthesizer. And synthesizers represent an important mind for the future. I was curious if you could give us—and I realize this will do violence to your own arguments—but if you could just give us a thumbnail version of the "five intelligences" and why you think that synthesizer is so important.

**Howard:** OK. Sure. Nice to be here. I saw this book around so I guess people can get more details there. The five minds are: the disciplined mind, the synthesizing mind, the creating mind, the respectful mind and the ethical mind. Disciplined mind means knowing something extremely well, being an expert, and having the discipline to keep your expertise at the cutting edge. Synthesizing involves taking the collative information that we're all inundated with and trying to make sense of it. And creating is raising new questions, coming up with new answers. My one quip is that [the] creating mind means thinking outside the box. But you can't think outside the box unless you have a box! And the box is the discipline, knowing something well, and the synthesis [is] kind of being up to date on how to organize that information.

In trying to explain why I was interested in synthesizing, it comes from two very different sources. One was an offhand comment made to me by Murray Gell-Mann who was a Nobel Prize winner, and one of these really smart people, one of these people who you say, "I'm glad I didn't know them when I was young." It just overwhelms you. A hundred languages and so on. He said, "In the 21<sup>st</sup> century the most important mind will be the synthesizing mind." That caught my attention. It's been 10-15 years ago.

The other thing is, I grew up in the pre-Web era, and it was a time when you could look to certain sources and certain people as being authorities. The *Encyclopedia Britannica*, *The New York Times*, Walter Cronkite—they kind of told you what to believe and it saved a lot of time! But once the Web became part of all of our lives, I realized there was an infinite amount of information available. So I think of synthesizing as figuring out what's important and what to pay attention to. And you need to have criteria for those. Unless you simply say, "Well, I'm going to pay the most attention to No. 1 in Google and then

second-most to No. 2, etc.” Then, how to put it together in a way that makes sense to you? Because if it doesn’t make sense to you, you’re not going to be able to hold onto it. And unless you are a hermit—and all of you seem to work with other people—how do you take the results of this synthesis and communicate it to other people? So to me, that’s the essence of the synthesizing mind.

Just to throw out a few things that are a bit more concrete ... you’ve got to begin with knowing why you are synthesizing. What’s your goal? Then you have to spend some time trying to find out what are the current extant syntheses, unless you really want to start from scratch. And, you talk to knowledgeable people. Then—and this is really the key part—you have to develop a method for your own synthesis, which doesn’t have to be you alone—you can be working with a team—in terms of not only what to pay attention to, but how to organize it.

To me, the key to synthesizing is how you organize things. Now I’m a word person and a concept person, so my syntheses tend to be in terms of taxonomies, in terms of lists, grids, things like that. Most of you are numbers people, and probably your syntheses would take on forms, schemas that are more appropriate to numerical information. But clearly it’s analogous; it’s not two different universes.

Then, knowing that at a certain point the synthesis has to conclude, so preparing drafts, getting reactions. And the crucial point is you need to get reactions both from people who know as much or more than you do, to make sure you’re not making a fool of yourself, but also from people who don’t know as much, because you have to say, “Is this synthesis going to make sense to the other people who haven’t been immersed in this stuff for weeks or months or whatever?” So, you’ve got to have drafts, so to speak, out for feedback. And then the synthesis is over.

But unless you knew in the beginning why you were doing this, and to relate to Tom, what difference is the synthesis going to make—what difference is the information going to make for your decisions—you could have wasted a lot of time. And I know 80,000 hours seems a lot! But if you don’t have a sense at the beginning about what you’re doing this all for, it’s likely to fall flat on its face. Which is not to say that you can’t change your mind about things along the way, but you have to be very mindful. You have to say, “Well, I thought I was doing the synthesis for this reason but in fact I mis-analyzed. This is more important.” But then you share that and you’re reflected by it. That’s three to four minutes and five minds.

**Bob:** I have to imagine that when you talk about synthesizing you’re not simply talking about objectified data. You’re also talking about other kinds of impressions, other kinds of knowledge. What role do anecdote, emotion, intuition play in the synthesizer’s mind?

**Howard:** I think about that a little bit differently. One of the things which has come out of analysis of history of science is that every scientist has what are called “themata,” which are basic underlying assumptions that are so deep that they can’t even go about doing their work without those assumptions. And typically those are hidden from the scientists themselves. So it’s things like, “Is everything connected to everything else—sort of the great chain of being—or, are things much more chaotic and unconnected and impressionistic?” That’s one kind of themata.

Another kind of themata is, “Is there a first cause of things you need to go back to or is that essentially an old-fashioned idea?”

I think the synthesizer needs to be very reflective about the kinds of underlying assumptions that he or she makes when they enter the enterprise. And that’s often good for kibitzing with people who have a very different point of view. They can say, “Well, Howard, you know you’re an inveterate taxonomist, but taxonomies may not be appropriate here. Maybe we ought to be starting with lists or we ought to be starting with a mental map or something like that.”

I think for me, of course, the things you mentioned—intuition, emotions—there's no way of wiping that out. But I think being aware of those underlying schemata by which we organize our whole mind, our whole way of presenting, our whole way of expressing, and so on...

**Bob:** Is it possible to get people to articulate what those themata are?

**Howard:** You need to have not only contact with people that are very different from you, but people who are willing to talk about the differences in a non-invidious way. I'll give you a very trivial example, but I was 55 before I realized it. I do management of a small research group, and it was only when somebody was talking about me to somebody else that the person said, "You know, Howard always likes to deal with things in writing before you see him." And it was true, but I'd never realized about that before, which in a sense made me very inapt for people who wanted to talk first and then go into writing. So I think you need to have a wife or colleague or somebody that un.masks you.

As an academic and as one who hopes to have influence more in the university—but this book is published by Harvard Business School Press, so clearly, I want to have influence and leadership in management circles—what are the ideas that have really impacted what you do in your work as an information officer, as opposed to just being background music, which we all like when we have nothing better to do?

**Bob:** John and Ravi, I'm curious. You've got your own professionals who you deal with in terms of them thinking through data and making decisions. Is it a similar story in your organizations?

**John:** Some of the more interesting ideas come out medicine itself. I'll give you one example that may be quite profound in a way. If you look at how medicine is organized now, it's largely organized by body part. We've got cardiologists. We've got neurologists. We've got nephrologists. But fundamentally there's this taxonomy that goes back several hundred years that is organized by body part. What's interesting when you look at the genes underneath all of this stuff and you say, "Tell me about the genes that are associated with asthma, Alzheimer's and high blood pressure." There is phenomenal genetic overlap between those things. And you say, "Well, son of a gun. Does that mean that in fact it is this disease, which happens to manifest in the brain or happens to manifest in the lungs or happens to manifest itself in the walls of the cardiovascular system, but it's fundamentally the same disease? It just shows up different places."

And if that's the case, that sort of turns medicine all upside down because it says we shouldn't be organizing by body parts. We should be organizing by clusters of genetic anomalies. In fact, the drug that is used to treat asthma, could it actually solve Alzheimer's issues. So, obviously, pharmaceutical people find this kind of intriguing. It's very early at a level, but that notion that in fact medicine and the way we teach it—I mean, you become a cardiologist, you become a nephrologist—we may be teaching it incorrectly. We may be structuring it incorrectly in very fundamental ways. And that sort of teasing idea at a level is radical and rocks the pure structure of what we have here. So I will stop here.

**Bob:** Ravi, I'm curious. What are your thoughts?

**Ravi:** I think Howard calls it the creative part, thinking outside the box. To me the key issue with analytics is we have to take it one step further and make it actionable. And what I mean by that is when I got into my job about five years ago, I thought the place where I'll find the biggest weakness would be the area of greatest strength. So, I generally walked around and asked my IT group, what is that you're most proud of? And they gave me this 500-page book that they give every month to our clinical managers and our medical directors per clinic saying, "Hey, here are your outcomes." I mean they're trending everything! They're trending hematocrits with albumen with hemoglobin with nutrition with mortality, and you can look at everything and figure out what's happening to a patient. And it's fundamentally useless.

So, what I want is a world where I want to get rid of those analytics. I want a physician or a clinician to come in and get a simple work list that says, "Here are your problems." Because the situation is analytics are telling you how are things trending, what's happening, and so on. But, I think what we need to do is go one step further and put some kind of a rules engine in place that can synthesize that data and very clearly tell you, "Look, you need to do XYZ," as opposed to giving you a huge set of very user-friendly graphics or dashboards, and then have you try to find out what the problem is. So, to me, that actionability of analytics is extremely important.

And today, from a technology perspective, if you see where workflow engines are going, for example, what you can do is you can start taking it. In most cases we know exactly how to read an analytic. There's an aspect of collecting it, that's absolutely true. There's an aspect of mining it, predictive-modeling it, decision-supporting it. I mean, you put any dimension of analytics to that world, and you can slice and dice the data whichever way you want to. But what's happening is that it's giving you this huge abundance of information from which you have to synthesize very specific, actionable points. That's one thing. And the second thing that's extremely important is that you have to put those action points on some kind of a supervisory escalation routine. Because it's not good enough for me to tell you. It's bad enough for me to give you a bunch of data and say, "Go make your practice better." But I think the next thing is, if I tell you, "Don't do that, don't look at that. Let me tell you what you need to do." Then the third thing is, I've got to make sure you do it, because otherwise this whole issue of the right care to the right patient, the right time, just simply does not happen. That rightness comes from an escalation of that aspect.

Now, the other thing that is a minor nuance point I want to make is if you tee off John's issue about Vioxx, and the aspect about analytics, the work flow engine, work list, there's still a problem in that world, particularly in healthcare, which we need to acknowledge. And that is that you are monitoring outcomes. And the moment you say you're monitoring outcomes, you've brought in the concept of retroactive behavior, of post-hoc reactions. And that is you have to wait for a time for the data to collate, to go back and say, "X amount of months or years later Vioxx is not working." Or in my case, X amount of time later, "This particular drug therapy or this particular practice by these sets of physicians did not work."

Now, I know you've collated that data for about three months. You make absolutely clear that you've come up with a crisp decision and time has gone by. And I think the difference in terms of where we could go with analytics is to not monitor outcomes, but to monitor behavior. So, for example, what we do very often is we have approximately 16,000 physicians whose outcomes we're monitoring. So what does that mean? We let them not treat patients properly for six months and go, "Ah ha! Here's a problem." And what we need to do is take analytics as well as technology to a point where you have set up certain best practices. You can call them evidence-based or whatever. And then you observe behavior to see where is the divergence from that best practice. And then you come back and say, "Why are you doing this?" And in many cases what you could do is you could therefore catch something ominous before it becomes a trend. And the second thing that you can do perhaps is in some cases where there is divergence—it could be for the good—and then you want to formalize and memorialize that behavior. So, a couple of concepts about how analytics...

**Bob:** But that assumes that you're actually in a position to be able to track that behavior.

**Ravi:** And there are lots of technologies to be able to do that. All I'm saying is that it takes the role of technology from a number-crunching perspective to something slightly different. And there are controversial aspects of it. I mean, I constantly am told by physicians not to tell them how to practice medicine. But again, the thing is that the way our medical advisory boards think, and the moment we talk about the fact that there's something called evidence-based medicine, to some extent what that means is that just on a Pareto basis that even 20 percent of that stuff is doing 80 percent of what happens. And there's no reason that we cannot formalize that into a set of rules and then capture departure from it as opposed to capturing departure from a regression point, which is what outcome analysis really does.

**Tom:** Can I just say something about the synthetic mind that relates to Ravi's point? I was talking last week with a guy, a really interesting CIO, who is head of IT for a fast-food restaurant chain. And he was telling me, "Yeah, I was a computer science major in college. I learned a lot about how computers work and so on. But a lot of my recent reading has been in cognitive science." Because to Ravi's point about needing to make information actionable, he thought that unless you understood the principles of cognitive science, you didn't even know what information people would be able to absorb, much less act upon. And he said, "So, I've created our system such that I don't present too much information to them. I try to constantly simplify. I try to show trends, as Ravi said, instead of static activity. I try to have movement in the graphics so people understand which way things are going." But I thought it was really interesting that I think today to really focus on how people use information, you have to understand a lot of things that most CIOs would have said were kind of out of the profession altogether. I don't know whether anybody else is seeing that, anybody else is reading books on cognitive science, but I was pretty impressed by this guy's approach.

**Dan:** I've seen great synthesis or synthesists, whatever the noun is. I don't know how that happens. And you can see it in the brilliant physician who looks at a patient and says, "I know what's going on." And where in the world did that come from? And at times they can be incredibly articulate about whatever set of cues, set of numbers, visual appearance of the patient, recency of other experiences. Where that came from is not obvious. I mean you see it in business too, people who see things. I always use the words, "They see structures where there are none for others." And I don't know how that happens. It has to be at the level of a gift. Like a Michael Jordan gift or a number of Olympic athlete gifts.

**Ravi:** Yeah, and I'm fundamentally always suspicious about characteristics that people insist cannot be measured. Because in many cases, there is always in every activity ... there's a certain aspect of stuff that cannot be measured. And in a way you cannot tell why someone did little better and so on and so forth. But I think you have to look at situations and try to get them to a point where something is measurable, because otherwise, as John pointed out, you let away stuff that's really egregious to get by. And that's simply not correct for the patient. Or like in the educational system. When I keep looking at it, I keep thinking of all the problems that we run into when we look at public school education here. People just say it's so hard to measure a teacher, and standardized tests—don't do that. And then what you end up with a problem that just is very hard to get your arms around. So, I would be very resistant to aspects that we're not being able to measure, with the acknowledgment that it's never exhaustive. There's always something more. But what measurement can do is establish a baseline. And that should not be negotiable. At least that's my hard-line stance on that.

**Bob:** Jerry, I'm interested in something in that respect. I actually pulled a quote from some place about you. You said, "We've got 1,000 faculty, talking about MIT, and each is an entrepreneur and doing their own thing. Plus we've got 10,000 students, all dreaming up new things. If you're the CIO of a Fortune company you need to look three years into the future, I need to look a lot further ahead." Now that quote, while I find fascinating, also is contradicted by the behavior of most faculty, which is that they tend to each have their own universe in which they operate. And so you may be good at looking a lot further ahead, but at the end of the day, they'll contradict you, arguably they'll veto you every time. I'm particularly interested from the point of view of something about which MIT and other schools gather a lot of information, and that's faculty performance and student evaluations. It strikes me that no matter how much information you collect about student evaluations, it never has an impact on faculty.

**Jerry:** It is interesting. We gather data, but in listening to you, Ravi, about all the data you gather, I realize we don't gather very much at all. And, in fact, discussion of how you gather data on performance of faculty is an interesting one—let me use that word rather than some other words I might use to describe it—but one of the things that in fact MIT does take note of, and I'm reminded of this in a number of different ways, is what the students think of the faculty teaching the course. This may not be well understood, but it is certainly true that at MIT they're all very good researchers and some are good teachers in the classroom. Some are not such good teachers in the classroom, to some of the points that

have been made about doctors and so on. And we measure that and we measure that typically by student reactions.

And, believe it or not, when faculty members come up for tenure, those kinds of things are discussed. Now, I can't tell you how much weight goes into that person's other things, but they are certainly discussed, and I know they're discussed at the level of the department heads. "Oh, wait a minute. We can't have that faculty member teaching that course because the students are going to all stop coming." And that's not good for them or the teacher. So, again, the decision-making criteria involve many things, but that data coming into it is most definitely important to the extent that we are now spending what is for us a significant amount of money to improve our data collection on that and to make it easier for more students to participate in evaluating more courses with an online system they can go to and things like that.

**Closing:**

This is the end of our CIO roundtable discussion on synthesizing data for actionable decision making. The panelists shared many interesting ideas around synthesizing and how it can help further the ability to get answers out of terabytes of data. One stimulating idea was to go beyond trending and leverage data to provide specific actions. To better support the use of actionable data, there was also the notion that CIOs may want to focus on ways people use data. One example was of a CIO taking classes in cognitive science.

If you are interested in other materials related to analytics or information management, be sure to visit [www.accenture.com/cio](http://www.accenture.com/cio).