

SOCIETY FOR HUMAN RESOURCE MANAGEMENT

+ + + + +

WEBCAST:  
TALENT ANALYTICS IN THE NEW ERA  
OF COGNITIVE COMPUTING

+ + + + +

THURSDAY  
JUNE 11, 2015

+ + + + +

SPEAKER:

JACKIE RYAN  
Director of Product Management for IBM's  
Smarter Workforce Portfolio

This transcript done from audio  
provided by the Society for Human Resource  
Management.

## P-R-O-C-E-E-D-I-N-G-S

(time not provided)

MODERATOR: Hello. And thanks for joining us for today's webcast Talent Analytics in the New Era of Cognitive Computing.

This program is part of SHRM's webcast series. You can see a list of available and upcoming events at [www.shrm.org/webcast](http://www.shrm.org/webcast).

Before we introduce today's speaker, we want to provide you with some information about this presentation. First, SHRM would like to thank IBM for sponsoring today's program and making it available to the HR community.

We have some tips for you on using the webcast interface. On the bottom of your webcast screen, you should see a dock with icons. Those buttons control each of the windows on your screen. They work as toggles. If you click one, it will either open or close the corresponding window. And if you click it again, it will do the opposite action. Keep that in mind, if you accidentally or intentionally close one of the

1 windows on your screen.

2 You can reposition the window  
3 displaying the slides by clicking and dragging  
4 it. You can also change the size of that display  
5 window by dragging it from the bottom right, or  
6 you can click the large square sizer in the upper  
7 right of the slides window to make it full  
8 screen.

9 A PDF version of the presentation  
10 slides is available in the program resources  
11 window, just below the SHRM logo on the left side  
12 of your screen. We have two versions of the same  
13 content on one. There is one slide per page.  
14 The other has two slides per page to save on  
15 paper and ink, if you are printing out.

16 We will have time at the end of the  
17 presentation for a question and answer session  
18 with our speaker. Under the program resources  
19 box there is an area for you to submit questions.  
20 You can type in your questions at any time during  
21 the program, or copy and paste them from another  
22 app if you prefer, and then click Submit. That

1 gets the questions to us. We will hold all  
2 questions until our presenter has finished  
3 speaking, and we'll get to as many questions as  
4 time allows.

5 In today's program, you are going to  
6 learn about cognitive talent analytics and how  
7 they can be used to grow HR's impact on your  
8 organization.

9 We are pleased to welcome Jackie Ryan  
10 from IBM to lead this program. Ms. Ryan is the  
11 Director of Product Management for IBM's Smarter  
12 Workforce Portfolio. In that capacity, she is  
13 responsible for the strategy and new product  
14 offerings for workforce analytics.

15 With over 20 years of experience in  
16 information management, analytics, and big data  
17 technologies, Ms. Ryan has led worldwide software  
18 development, product management, and marketing  
19 teams that have led the market in client value  
20 and innovation. Most recently, she has led  
21 innovations in Cloud software as a service,  
22 workforce analytics solutions, that enable HR

1 professionals to interact with self-learning,  
2 cognitive analytic systems through natural  
3 language.

4 We have a full agenda and a full room  
5 today, so with introductions complete I am  
6 pleased to get today's events started by turning  
7 things -- the webcast microphone over to our  
8 speaker, Ms. Jackie Ryan.

9 MS. RYAN: Great. Thank you very  
10 much, and hello, everyone. As was mentioned, I  
11 am Jackie Ryan, and I lead our Science and  
12 Analytics Portfolio within IBM's Smarter  
13 Workforce. And I am hoping that today's session  
14 will be both fun and informative as we explore  
15 the wild world of cognitive computing and how  
16 this can fundamentally change talent analytics  
17 for the HR professional.

18 So in this session we will cover three  
19 topics -- the evolution of cognitive, to give a  
20 perspective and history on how cognitive has come  
21 to be. We will talk about applying that very  
22 specifically to the new objectives of

1 transforming HR. And then, third, we will cover  
2 how to get started, the way ahead.

3 So, with that, let's start with the  
4 evolution of cognitive computing. So I want to  
5 take a look here that for -- for decades, science  
6 fiction visionaries have shared, you know, their  
7 renditions of intelligent machines and computers  
8 that could learn and function as humans.

9 Intelligent machines have since moved beyond that  
10 of a science fiction story, and today they are a  
11 reality thanks to the breakthroughs in cognitive  
12 computing.

13 Cognitive computing is here, and this  
14 innovative capability is increasingly becoming  
15 woven into our everyday lives and fundamentally  
16 changing how we engage and interact with  
17 information and information systems.

18 An example here, for those of you who  
19 are techies, if you look on the left-hand side  
20 here, the intelligent-speaking computer on the  
21 bridge of the USS Enterprise on the show called  
22 Star Trek. Today, many of these capabilities are

1 now a reality made possible through breakthroughs  
2 in cognitive computing and are being implemented  
3 by pioneering organizations to help solve some of  
4 society's greatest challenges.

5           While tremendous breakthroughs and  
6 advancement have been made over the past 50  
7 years, we have only yet begun to scratch the  
8 surface of the potential of this innovative and  
9 exciting technology.

10           So moving forward here, I'm going to  
11 give kind of an overview of cognitive over the  
12 past 50 years here. And I promise you I won't go  
13 through 50 years of history, but just calling out  
14 some of the very specific events that have  
15 transformed cognitive to where it is today.

16           The earliest history of cognitive  
17 computing can actually be traced back to the  
18 fourth century B.C. and Aristotle's invention of  
19 the first formal deductive reasoning system.

20 Other innovative discoveries and breakthroughs  
21 over our history, such as Charles Babbage's  
22 analytical engine, have also laid the groundwork

1 for the modern history of artificial intelligence  
2 and cognitive computing.

3 Several significant events have  
4 influenced how this capability has evolved to  
5 where we are today. So, for example, in the  
6 '50s, Turing published the Computing Machinery  
7 and Intelligence and introduced the Turing test  
8 as a way of operationalizing a test of  
9 intelligent behavior.

10 In the mid-'60s, a Stanford team led  
11 by Ed Feigenbaum created Dendrol (phonetic), and  
12 this was the first expert system or program that  
13 was designed to execute the accumulated expertise  
14 of specialists. Dendrol applied a battery of  
15 if/then types of rules in chemistry and physics  
16 to identify the molecular structure of organic  
17 compounds.

18 And then, in the '80s, this was  
19 actually seen as the boom in artificial  
20 intelligence, due to advances that were made in  
21 expert systems, and, again, further advancements  
22 in Dendrol.



1           Moving into the late '90s, this is  
2 where IBM's Deep Blue defeated Garry Kasparov in  
3 the -- who was the world chess champion.

4           And then, moving closer to home here,  
5 in 2011, IBM's Watson defeated the top two  
6 Jeopardy champions. And that wasn't cheating  
7 either by being hooked into the internet.

8           And then, just recently, in the last  
9 year, in 2014, IBM announced the formation of a  
10 new business unit to focus on commercialization  
11 of cognitive computing solutions such as Watson.  
12 And also, Google acquired Neth Labs, who make  
13 learning home devices.

14           So with advancements over the past 50  
15 years really coming to fruition, we are entering  
16 into a new era of computing. The cognitive  
17 computing era follows the eras of programmable  
18 and tabulating systems and represents a huge leap  
19 forward. This is a new era because there is a  
20 fundamental difference in how these systems are  
21 built and how they interact with humans.

22           Additional programmable systems are

1 fed data, knowledge, and information, and they  
2 carry out and return results of processing that  
3 is pre-programmed by humans. In the programmable  
4 systems era, humans do most of the directing.  
5 The cognitive era, on the other hand, is about  
6 thinking itself and how we gather information,  
7 access it, and make decisions.

8 Cognitive-based systems learn and  
9 build knowledge. They understand natural  
10 language, and they reason and interact more  
11 naturally with human beings than traditional  
12 programmable systems, while the term "reasoning"  
13 refers to how systems demonstrate insights that  
14 are very human-like.

15 So cognitive systems are able to put  
16 context into -- or put content into context.  
17 They are also able to quickly find that  
18 impossible needle in a haystack, identify new  
19 patterns and insights. Cognitive systems extend  
20 the capabilities of humans by augmenting human  
21 decision-making capacity and making us make sense  
22 of the growing amount of data that is

1 accumulating here and that we have access to  
2 these days.

3 So we see these broad areas of  
4 capability -- so we see broad areas of  
5 capabilities for cognitive systems which directly  
6 relate to the way people think. In the future,  
7 we will see systems with higher orders of  
8 cognitive capabilities.

9 So to go through these, to highlight  
10 what these are, engagement, the capability --  
11 this capability fundamentally changes the way  
12 humans and systems interact, and really extend  
13 the capabilities of humans by using their ability  
14 to -- using their ability to provide expert  
15 assistance and to understand.

16 These systems provide expert  
17 assistance by developing deep domain insights and  
18 bringing this information to people in a timely,  
19 natural, and usable way. Here cognitive systems  
20 play a role of an assistant that can consume vast  
21 amounts of structured and unstructured  
22 information. They can reconcile ambiguous and

1 even self-contradictory data, and they can learn.

2 So in this partnership the two --  
3 human and machine -- are more effective than  
4 either one alone. Much like the human brain,  
5 these systems begin to build models of themselves  
6 and the world around them. These models include  
7 the contextual relationships between various  
8 entities in a systems world that enable it to  
9 form hypotheses and arguments and discover  
10 patterns.

11 If we look at decisions, these are --  
12 these systems have decision-making capabilities  
13 to the degree that humans can trust and rely on  
14 their judgment. Decisions made by cognitive  
15 systems are bias-free. However, certain  
16 standards are required for humans to fully trust  
17 their decisions.

18 Currently, cognitive computing systems  
19 perform more as advisors, by suggesting a set of  
20 options for humans who ultimately make the final  
21 decisions based on insights and options being  
22 surfaced. Confidence in a cognitive systems

1 ability to make decisions autonomously, without  
2 humans, will depend on the ability to query and  
3 have a traceable -- traceability to audit why a  
4 particular decision was made, as well as improve  
5 confidence scores.

6 If we move to discovery, discovery is  
7 the epitome of a cognitive capability. These  
8 systems can discover insights that perhaps could  
9 not be discovered before by even the most  
10 brilliant human beings. Discovery involves  
11 finding insights and connections and  
12 understanding the vast amounts of information  
13 that is available around the world.

14 With increasingly more volumes of  
15 data, there is a clear need for systems that can  
16 help exploit information more effectively than  
17 humans can on our -- you know, on our own.

18 So moving on, the foray with  
19 intelligent question and answer systems began in  
20 the '60s. One of the most famous early  
21 implementations in this area was ELIZA, which was  
22 written by MIT by Joseph Weizenbaum in the early

1 '60s, or between '64 and '66. And it mimicked a  
2 psychotherapist who could run a dialogue with a  
3 human patient.

4 And even though it provided an  
5 illusion of an expert system, ELIZA did not have  
6 any cognitive power. It used to trick the human  
7 user by using some early natural language or NOP  
8 techniques, such as string substitution and stock  
9 answers that were based on keyboard matching. So  
10 much has happened since then, and intelligent  
11 expert systems that can handle questions from  
12 human users in natural language started to come  
13 up.

14 And two of the most recent examples  
15 that are shown below, and one is Next IT  
16 Olney (phonetic), and this system can be trained  
17 with a set of frequently asked questions on a  
18 particular domain. And when a human user asks a  
19 similar question using natural language text, the  
20 system responds.

21 So Olney is deployed actually in  
22 Navigator, which is a secure website for members

1 of Aetna, and it is trained to handle the  
2 frequently asked questions about the registration  
3 problem a member may face to register in the  
4 website.

5 More advanced systems, though, are  
6 solutions such as IBM Watson and Engagement  
7 Advisor. IBM Kenexa Talent Insights, which uses  
8 IBM Watson Analytics. These systems can be  
9 trained on a particular domain. When a user asks  
10 a question, the system tries to answer it based  
11 on the knowledge base it is trained with, and  
12 ontologies to uniquely tailor to the language of  
13 the business.

14 So it is more powerful than Olney in  
15 a sense that Watson is not dependent on a pre-  
16 defined set of questions. It attempts to answer  
17 any question that is posed to it.

18 So these systems fundamentally change  
19 the way humans and systems interact, and  
20 significantly extend the capabilities of humans  
21 by leveraging their ability to provide expert  
22 assistance and to understand. These systems

1 provide expert assistance by developing deep  
2 domain insights and bringing this information to  
3 people in a timely and natural and useable way.

4 So, again, here the cognitive systems  
5 play the role of an assistant. So currently  
6 cognitive computing systems are performing as an  
7 advisor, where they suggest insights and options  
8 to a human user who ultimately make the final  
9 decision.

10 One example they call out here is the  
11 Watson Oncology Advisor. So IBM, in partnership  
12 with the Memorial Sloan-Kettering Cancer Center,  
13 developed a Watson Oncology Advisor that has the  
14 ability to sift through one and a half million  
15 patient records. That represents decades of  
16 cancer treatment history, such as medical records  
17 and patient outcomes, and provides physicians  
18 evidence-based treatment options in a manner of  
19 seconds for which then they can decide what they  
20 want to do.

21 IBM Watson Discovery Advisor is an  
22 example of cognitive discovery capabilities that



1 combs through massive amounts of data looking for  
2 insights and connections without relying on a  
3 human question initiative throughout the  
4 discovery process itself.

5 So moving forward, and kind of  
6 finalizing -- getting to the conclusion of how  
7 has cognitive computing come to be, I want to  
8 take you through the evolution of cognitive and  
9 how cognitive computing will evolve over five  
10 dimensions.

11 So this is an area that is the art of  
12 the possible and with research underway in each  
13 of these areas. So how these three areas of  
14 cognitive computing evolve is going to depend on  
15 five important dimensions that you see here,  
16 which is the evolution path and rate of  
17 advancements across these dimensions.

18 So current cognitive systems are  
19 predominantly passive, and they require that  
20 human beings initiate the action to generate an  
21 outcome or a response. And often this  
22 interaction is through typed text on a computer

1 or a mobile app or a web portal. Future  
2 cognitive systems will increasingly enable a more  
3 natural interaction with users, including voice  
4 and visualization.

5 Future systems will become  
6 increasingly more interactive and engaging.  
7 Significant advancements have already been made  
8 to better understand users and deliver a  
9 responsible -- responses that are fit for a  
10 user's specific locative and temporal context.

11 Current cognitive systems are not --  
12 are not generic enough to learn and adopt to new  
13 domains on their own, meaning that currently  
14 systems have to be trained. So they are relying  
15 upon humans and domain-specific subject matter  
16 expertise to train them, whether that's training  
17 them with information about a given industry or  
18 information about a given problem.

19 So the exception is with Watson  
20 Analytics whereby data that is modeled is  
21 immediately learned as it is modeled, and you can  
22 start posing questions immediately.

1                   Current cognitive systems primarily  
2 work with natural language text and require  
3 natural language processing capability for a  
4 specific language. In future generations of  
5 cognitive systems, they are going to accommodate  
6 a variety of media beyond text, such as audio,  
7 image, video. So continued advancements in this  
8 dimension will be dependent, obviously, on the  
9 various disciplines of computer science such as  
10 speed and image processing and pattern  
11 recognition, all again of which are underway.

12                   The fourth area here is that cognitive  
13 systems are increasingly being deployed to be  
14 widely available and accessible over web portals,  
15 mobile apps, and the  
16 Cloud. So in the future, as the adoption of  
17 cognitive-based systems increase, they are  
18 eventually going to spread to become ubiquitous.

19                   This feature could include a  
20 marketplace, millions of cognitive agents or  
21 avatars that are driven by the explosive adoption  
22 of mobile devices and an upsurge of machine-to-

1 machine interactions.

2 So tomorrow's -- we believe that  
3 tomorrow's cognitive computing fabric will be  
4 really interwoven into technology, such as social  
5 media, therefore, really touching all of our  
6 lives.

7 And then, finally, cognitive systems  
8 will need to increase in scalability to support  
9 wide applicability, and huge advances have been  
10 made in this way.

11 So compare and contrast. Just in the  
12 past four years, in 2011, the version of IBM's  
13 Watson system that beat the reigning champion on  
14 the U.S. television show Jeopardy, it required 90  
15 IBM Power 750 servers. By 2014, Watson was 24  
16 times faster. It had 2,400 percent improvement  
17 in performance and was 90 percent smaller.

18 So, in the future, cognitive systems  
19 will be offered as a fabric, and IBM has already  
20 made Watson technology available as a platform in  
21 the Cloud, which is opening up new domains and  
22 industry-specific applications such as IBM Kenexa

1 Talent Insights for HR professionals.

2 So moving forward, let's move into the  
3 next section and apply cognitive computing to the  
4 problems that we're trying to address in talent  
5 analytics and transforming HR with cognitive  
6 computing. So the HR profession is undergoing a  
7 major transformation, and this is probably not  
8 news to anyone.

9 You know, given the workforce  
10 challenges that you see on the left here of  
11 shifting demographics, the rise in the  
12 independent worker, social and mobile business,  
13 globalization of organization, and this is  
14 absolutely not intended to be a complete list  
15 here.

16 But this is causing a shift in the HR  
17 professional's imperative to transition to or to  
18 expand further as a strategic business partner  
19 and find new ways for acquiring talent,  
20 developing leadership and the workforce,  
21 optimizing the way in which we do work, looking  
22 at recognition, and retaining top employees.

1           You can't go to any -- any conference  
2 these days on workforce management without  
3 analytics being front and center, talent  
4 analytics as front in center, as the way in which  
5 HR professionals need to start to adopt to help  
6 make that transition.

7           The challenge, though, is that  
8 analytics is really in its early stages within  
9 the work -- in the workforce, in applying to the  
10 workforce. So, as an example, over 40 percent of  
11 organizations are limited still to basic  
12 reporting. This is pretty much where the bulk of  
13 companies, obviously with exceptions, who have  
14 been able to adopt and move into the next realm  
15 of predictive analytics. But for the most part,  
16 we are having to make decisions based on what has  
17 happened in the business currently and in the  
18 past.

19           So, not surprising though, because,  
20 you know, even a simple workforce analytics  
21 project has multiple steps and multiple people  
22 involved, ranging all the way from getting access

1 to data, working with IT to prepare the data,  
2 working with HR data scientists, or working with  
3 the central analytics COC to help analyze that  
4 data and -- analyze and validate the data, derive  
5 certain insights, and collaborate with their  
6 business partners to understand specific actions  
7 and to reflect that in assets such as reports.

8           There are quite a number of different  
9 roles that are involved and quite a number of  
10 steps that are also involved. So this poses a  
11 lot of implementation challenges, such as because  
12 some of the core skills that are needed to -- to  
13 be able to do what we just talked through are not  
14 traditionally part of an HR professional's  
15 background in terms of information management,  
16 analytics capabilities, and so forth.

17           So the current workforce approaches  
18 that we all know and love and have used, and so  
19 forth, are based on a typical path, which is  
20 understanding the state of the business using  
21 descriptive analytics, looking at different areas  
22 that -- based on the data that is available,

1 moving into predictive, to be able to answer  
2 different types of questions of -- propensity  
3 questions to proactively look ahead in the  
4 business to understand what could happen and what  
5 will happen.

6 And then, very importantly, applying  
7 prescriptive analytics, looking at business rules  
8 and other techniques that help to define  
9 specifically actions that can be made. But,  
10 again, this path -- this path is pretty  
11 challenging for a lot of HR professionals, given  
12 the fact that it typically needs computer  
13 science, information management science,  
14 operational research type of background.

15 This will not change in terms of the  
16 need for HR professionals to adopt analytics to  
17 help with that pursuit and expanding the role as  
18 a strategic business partner. There are both  
19 internal drivers and external drivers that are  
20 forcing analytics to be used within the  
21 workforce.

22 So this, in reality, is the perfect



1 storm. It is the perfect place where cognitive  
2 computing can actually power the transformation  
3 in talent analytics. If you think back to the  
4 characteristics that we walked through in terms  
5 of what is cognitive computing, and the  
6 characteristics that cognitive computing has and  
7 can provide, this is fundamentally  
8 transformational.

9 For example, with Watson Analytics we  
10 are able to pull together a unified analytics  
11 experience to bring both descriptive, predictive,  
12 and in the future prescriptive capabilities  
13 without the HR professional having to know how to  
14 do that. All of that capability is embedded  
15 within cognitive computing techniques.

16 The ability to interact in natural  
17 language with a cognitive system, it is very well  
18 with, again -- with, again, the types of analysis  
19 that an HR professional typically wants to work  
20 within and the experience they want to have, and  
21 the ability to have a guided analytics experience  
22 where a system is proposing and surfacing

1 insights that they may not have thought of  
2 initially.

3 So I'd like to give an example here,  
4 and this is using IBM Kenexa Talent Insights,  
5 which is powered by Watson Analytics, and just to  
6 walk through how this actually happens in  
7 reality. So, in this case, what you see is --  
8 within Talent Insights, you have the ability --  
9 the system has determined the starting point  
10 based on the data that it has already learned.  
11 And it is giving me a starting point to start  
12 exploring my questions.

13 I can also -- if I want, I can  
14 specifically type in a question, as you see here.  
15 I have had to take screenshots, because I am not  
16 able to show a video here, but -- had to take  
17 screenshots, but you can see here typed in a  
18 question, and what it will do, then, is it looks  
19 at the question and determines from the data how  
20 to best answer that question. I didn't have to  
21 type it in query language. I typed it in  
22 English.

1           What Talent Insights does, then, is it  
2 looks at, of the data that is available, where to  
3 best start. I didn't have to assess it/analyze  
4 it myself. Talent Insights did that on my  
5 behalf.

6           From this point, after I have typed in  
7 a question, Talent Insights has immediately  
8 surfaced out results, and the results in the form  
9 of visualization that show the relationships in  
10 the data based on the questions that I have  
11 asked.

12           Also, it is also looked at defining it  
13 -- it has also recommended and surfaced a  
14 visualization that best maps to and would help to  
15 answer the question and help me to then take this  
16 and work with my business partners to look at and  
17 understand and explore where to go and what this  
18 was telling us in terms of specific actions, as  
19 well -- in terms of looking at discovery of new  
20 insights, what you see in the top kind of sort of  
21 left, which has been highlighted, is Talent  
22 Insights also -- by understanding and modeling

1 the data, it is recommending and surfacing  
2 additional insights that I can then go in and  
3 explore and connect with what I have already  
4 looked -- explored and assessed.

5 So, in summary, using Talent Insights  
6 as an example, which is powered by Watson  
7 Analytics, we can see -- if you think back to the  
8 three characteristics of cognitive computing  
9 around discovery, and here it is creating new  
10 insights from HR data, it is helping with  
11 decisions by providing, really, a bias-free  
12 recommendation.

13 And, third, the engagement -- you can  
14 see in terms of the interaction, it's through  
15 natural language. It's understanding the terms  
16 and definitions of an HR professional through  
17 both the natural language processing as well as  
18 through customizations that are made through an  
19 HR ontology.

20 So in the last section here, I will  
21 cover how to get started and now to approach  
22 cognitive computing types of projects. And you

1 will see quite a different pattern than if I was  
2 suggesting an approach be used to either build  
3 out, you know, this -- to start an engagement on  
4 using the traditional method.

5           So with the cognitive computing  
6 approach, there are really four phases here. The  
7 first is defining a clear business problem, and  
8 this is so critically important in terms of being  
9 able to shape the questions that you would then  
10 pose. There is no ramifications, having said  
11 that, of changing a question and asking -- you  
12 know, asking cognitive systems something  
13 different that you have -- if you change your  
14 mind. That's kind of the beauty of it.

15           But defining the business problem in  
16 terms of we could pose these questions, but so  
17 what? How is that going to impact the business  
18 in terms of what we are trying to figure out and  
19 why? So from there we define the relative  
20 questions that we want to start to explore.

21           Second is identifying the data, and  
22 this, again, is where advancements in cognitive

1 computing help, and also the application of data  
2 preparation services.

3 So in the traditional manner and  
4 traditional approach, we would understand the  
5 data that we need to be collected, we would apply  
6 a whole series of techniques to profile for, you  
7 know, outliers, understand characteristics in the  
8 data such as the quality of the data, duplicates,  
9 et cetera, we would cleanse the data, we would  
10 transform that data.

11 With cognitive computing, it is doing  
12 that on your behalf in terms of profiling the  
13 data and surfacing out what the characteristics  
14 of that data are. So you can make decisions on  
15 what to do from that point.

16 Third, you interact and explore, and  
17 this is truly the fun part of it where you ask  
18 questions. Interact with the system. You're not  
19 programming the system. You're not programming a  
20 model. You are interacting with the system, and  
21 basically jointly working through a problem.

22 And then, fourth is looking at the

1 actions that need to be taken thereafter. And  
2 those actions can be taken in the form of or can  
3 be created in the form of collaborating with  
4 other business partners or working with those who  
5 have a workforce science background and can bring  
6 the best practices and skills and proven methods  
7 of action definitions to bear here in looking at  
8 specific actions.

9 Other recommendations that I have  
10 here, I'm looking at pitfalls to avoid when  
11 working through an analytics project. The first  
12 one is actually not being too HR-centric. And  
13 this may sound funny based on, you know, what I  
14 just finished mentioning, but one of the  
15 transformations from -- in talent analytics is  
16 connecting the workforce to the business in terms  
17 of what changes, what things need to happen in  
18 the workforce to really improve the business.

19 So this really causes us to look  
20 beyond the boundaries of the data that we  
21 typically have and how we typically look at  
22 programs that support the workforce, but,

1       instead, look at it from the business  
2       perspective.  What are the business objectives?  
3       How does the business make money?  What are the  
4       clients that the business serves?  And using that  
5       perspective in analytics projects.

6               The second is -- relates to data.  So,  
7       of course, there is the term that we all know and  
8       love around garbage in garbage out.  But you can  
9       get stuck in that too quickly, meaning there is a  
10      degree of -- to which we look at the quality of  
11      data.

12             Working through a project where you  
13      get to a point where the data is perfect, you  
14      will have missed the point of interaction in  
15      making the decisions.  But starting with data  
16      that you are not sure of can also lead to not --  
17      you know, to incorrect results in the analysis.  
18      So the point being, understand the  
19      characteristics of the data and understand when  
20      enough is enough that can get you started using -  
21      - can get you started in asking questions with a  
22      certain degree of confidence on the data.



1           Third is, you know, not putting -- the  
2           intention here is not to position analytics as a  
3           substitute for human judgment. And this, again,  
4           is -- this is a good example of where cognitive  
5           analytics and systems employ -- like Talent  
6           Insights that use talent -- that use cognitive  
7           computing can act as an advisor and as a -- you  
8           know, a sponsor here in working through different  
9           problems to suggest recommendations. Ultimately,  
10          you have the -- you make the decision based on  
11          what you are seeing.

12                 And then, moving forward, a couple of  
13                 others that I will suggest here as well, which  
14                 have been themes in what I have recommended  
15                 earlier, is link to the business strategy. This  
16                 is so important and is the reason why -- called  
17                 out the first stack around understanding the  
18                 business problem, because undoubtedly there are  
19                 tons and tons of different problems that we can  
20                 address.

21                 And, you know, again, it is a bit --  
22                 you can get from Point A to Point B very quickly

1 using cognitive computing. However, you have to  
2 keep asking the question of, so what? And the  
3 "so what" relates to the business strategy.

4 The other element that I would -- or  
5 other recommendation I would call out is  
6 demonstrating repeated ROI, meaning incremental  
7 ROI. Working through a problem, look at the --  
8 what does the result show, what does it mean, and  
9 what actions can be taken, and using the outcomes  
10 of those actions to feed into the next set of  
11 analysis. This can be very quick or it can take  
12 some time, but important to look at the impact of  
13 the decisions and the actions that are made in  
14 terms of influencing what next to take on. And  
15 also, really importantly, to show the return on  
16 investment to partners, so that you move from a  
17 push model to a pull model in terms of insights  
18 on the workforce.

19 So one last slide, I will just -- that  
20 I will quickly go through here is that we  
21 recently announced IBM Kenexa Talent Insights as  
22 part of our Kenexa open HR initiative, and we

1 announced this yesterday at the talent analytics  
2 summit in New York City. And our open HR  
3 initiative refers to both open talent management  
4 and open talent analytics.

5 So open talent management, opening it  
6 up for partners to be able -- recognizing that  
7 our clients are working in a heterogeneous  
8 environment. And the SAP alliance is an example  
9 of this, where we are able to, through the use of  
10 connectors and user interface APIs to be able to  
11 connect in different capabilities from those two  
12 portfolios.

13 And the same is true for open talent  
14 analytics, again, based on cognitive computing  
15 and being able to provide services that  
16 complement the cognitive computing capabilities,  
17 such as HR data services and workforce consulting  
18 services.

19 So with this, I -- this is the end of  
20 the session here, and I believe I will turn it  
21 back to you, Mike, for questions.

22 MODERATOR: Thank you. Before we turn

1 to our audience questions, and we do want to  
2 encourage you, if you have questions, go ahead  
3 and ask them now. We do have a couple of  
4 announcements.

5 First, SHRM wants to, again, thank IBM  
6 for sponsoring today's program. IBM's talent  
7 analytics and survey data help drive business  
8 outcomes. To learn how IBM Kenexa Solutions can  
9 help you create a smarter workforce, visit the  
10 IBM Talent Analytics and Survey home page by  
11 following the links in the webcast player, or on  
12 the webcast page on SHRM online, or visit  
13 [www.ibm.com/smarterworkforce](http://www.ibm.com/smarterworkforce).

14 So I want to go ahead now and take the  
15 first of a couple of questions. Let's start here  
16 with an audience member who asks, "For companies  
17 that adopt systems such as the ones you've  
18 described, what have been the clear outcomes, and  
19 how long before such outcomes are realized?"

20 MS. RYAN: Right. So that depends,  
21 too, on the type of cognitive system that is put  
22 in place. Now, as I mentioned that there is a

1 learning phase that cognitive systems will work  
2 through.

3           So if you are using cognitive  
4 capabilities from, for example, Watson Advisor,  
5 there is a learning phase where if you think of  
6 the oncology example, where all of that  
7 information is essentially made available and  
8 ingested into Watson, and it learns -- literally  
9 learns every stitch of text that you give it.  
10 And there is a learning phase, essentially like  
11 taking it to school, where you pose questions and  
12 look at the answers and help to guide it.

13           Once it graduates, once it finishes  
14 that learning phase, then that is typically when  
15 people put it into production. So it depends on  
16 the type -- the content and the type of  
17 information.

18           The math version of Watson, which is  
19 Watson Analytics, which Talent Insights uses, is  
20 pretty instantaneous in terms of the learning  
21 phase, and "instantaneous" in quotes meaning it  
22 depends on the amount of data that is being used

1 within those systems.

2 So as in the case of the math version,  
3 you send it data, it will immediately model that  
4 data, and apply the HR ontology to understand the  
5 relationship and the correlations and the  
6 information about that data that has been  
7 ingested, and then you start.

8 MODERATOR: Another audience member  
9 asks, "Do you believe this type of technology  
10 will replace the current HRIS function?"

11 MS. RYAN: I think it will replace the  
12 current HRIS system, but it will complement it,  
13 absolutely. So existing systems are fit for  
14 purpose. They have a very specific role, and we  
15 hope -- you know, and in a lot of cases a very,  
16 very good role.

17 And the amount of data that gets  
18 created by the applications that are used, that  
19 data is reusable, and that data is what can be  
20 used in cognitive systems. That is kind of one  
21 of the beauties of cognitive systems where you  
22 can bring in massive amounts of data and it will

1 go to work over it. So I don't think those  
2 systems -- I do not believe those systems go  
3 away. I believe that cognitive systems  
4 complement them.

5 MODERATOR: Continuing with audience  
6 questions, another audience member asked, "For  
7 the type of solutions that you have been  
8 describing, what size company will reap the" --  
9 I'm sorry. I just stumbled over that. "For the  
10 type of solutions you have been describing, what  
11 size company works best?"

12 MS. RYAN: Yes. So I would -- two  
13 thoughts on that. I would give a very different  
14 answer today than I would have been able -- than  
15 I would have given probably, you know, four years  
16 ago, four or five years ago. Because of the  
17 advancements in processing, computing technology,  
18 price of hardware, and just advancements we have  
19 made in understanding how to apply cognitive,  
20 that -- you know, you can pretty much get started  
21 now, which opens it up for companies of a wide  
22 range of size.

1           So, as an example, in the Talent  
2           Insights case, we are working with companies that  
3           have less than 1,000 employees. We are also  
4           working with clients who have thousands of  
5           employees, hundreds of thousands of employees.  
6           So it is -- really, the -- you know, the factor,  
7           the driving factor is less of the size of the  
8           company, but more so where -- you know, the  
9           understanding that people have about what is the  
10          art of the possible, and their ability to look at  
11          things and how to do things differently, because  
12          the technology is there now today to do things  
13          differently, and costs have gone down  
14          substantially with systems now available in the  
15          Cloud of Cloud SaaS services.

16                 If you think back to the -- you know,  
17                 the Jeopardy example, and I gave, you know, some  
18                 pretty specifics on the changes there, that was  
19                 all unprimmed (phonetic). Now, a lot of that  
20                 technology and the technology we are using in  
21                 Talent Insights is Cloud SaaS-based.

22                         MODERATOR: I have a couple here, just



1 on -- let me put them together -- on the type of  
2 background of someone in this area. One audience  
3 member asks, "With talent analytics, does the  
4 analyst need to understand sequel and  
5 databasing?" Another audience member asks, "What  
6 professional development opportunities would you  
7 recommend for HR professionals to become more  
8 involved in data science?"

9 MS. RYAN: Okay. Great questions.  
10 Well, take the first one, which is on the skills  
11 needed to do this. So the skills are very  
12 different for -- if you were to build this --  
13 your own using a traditional method versus if you  
14 are to use a cognitive computing approach.

15 So if you think back to the example  
16 that I showed where I typed -- I showed through  
17 the screenshot, essentially I had typed in a  
18 question, Talent Insights surfaced a  
19 visualization that represented a response. The  
20 skills that are still needed are, you know,  
21 analytical thinking, and looking at the response  
22 and comparing it and assessing relative to what

1 the -- you know, what is seen in the business and  
2 what would be a reasonable answer.

3 So it is not necessarily saying  
4 vetting out, but using the information to look at  
5 and analyze what do you do next. Didn't have to  
6 build any models, didn't have to work through  
7 data integration methodologies, didn't have to  
8 build a warehouse, didn't have to build data  
9 markets. That is -- all of that is encapsulated  
10 in cognitive systems and cognitive services, for  
11 example, which Talent Insights uses.

12 So that is kind of what I would look  
13 at for -- you know, for cognitive systems. If  
14 you are to build on your own, you would  
15 absolutely need to have created those -- all  
16 those skills that I just mentioned, data  
17 integration skills, data warehousing skills,  
18 and/or rely on your IT group for that.

19 But quite often what has happened over  
20 the -- you know, at least the last three to five  
21 years, or probably more five to eight years,  
22 depending on the type of organization, HR groups

1 have built up their own shadow database systems.  
2 So they have had to bring in, you know, DBAs and  
3 folks who understand how to manage -- deploy and  
4 manage and run database environment.

5 So the skills -- I guess the net is  
6 the skills that you would need, if you were to  
7 build on your own, are very different. They are  
8 typically in information management, operations  
9 research, analytics processing, i.e. everything  
10 that is encapsulated under today's data scientist  
11 role.

12 The cognitive systems -- like I said,  
13 you still need deductive reasoning. You still  
14 need analytical thinking to look at a response  
15 and figure out, what next?

16 I think the other part of the question  
17 is any recommendations on where to go next to  
18 continue learning. And there are -- I would  
19 recommend, there are sites that we can make  
20 available through SHRM to cognitive computing  
21 learning online, and that would probably be my  
22 best recommendation. There are probably a couple

1 of different sites that I would recommend that  
2 have specific courses that can be taken.

3 MODERATOR: Continuing with audience  
4 questions, an audience member asks, "Is this  
5 system currently used in hiring? And is it being  
6 used for pinpointing talent matches?"

7 MS. RYAN: Right, right. Those are  
8 the scenarios that we are working with our  
9 clients on is exactly that. And I want to tie  
10 this actually to the earlier question about, you  
11 know, existing systems. And I know the question  
12 then was very specific to, you know, the existing  
13 HRIS type of system.

14 But if you think about the ATS systems  
15 that are in place, data generated from those ATS  
16 systems can be used in conjunction with cognitive  
17 systems like Talent Insights to help with the  
18 hiring process and provide another level of  
19 insight that you may not necessarily get through  
20 the ATS system. So we are very much -- that  
21 scenario is a very real scenario that is being  
22 used.

1                   MODERATOR: Another audience member  
2 asks, "Which areas" -- I'm sorry. "Do you have"  
3 -- the question is, "Do you have any applications  
4 that work for selecting candidates for global  
5 mobility assignments?"

6                   MS. RYAN: Well, you can -- that is a  
7 realistic scenario that could be used. When you  
8 look at global mobility, it would be a matter of  
9 -- you know, again, if you think through the  
10 process that you would use to work through a  
11 global mobility decision, in identifying what is  
12 the data that would be relevant for making the  
13 decision, and then looking at the results that  
14 would be -- that would surface.

15                   So it's, you know, the whole four  
16 steps of identify the problem, what really of  
17 global mobility are we trying to look at, what  
18 problem specifically are we trying to look at, is  
19 it the cost, the -- or is it the -- you know, the  
20 eligibility of employees for global assignments.  
21 There is a lot of different factors. So really  
22 getting specific about the problem, identifying

1 the data, posing the questions, and looking at  
2 what do you do.

3 It is -- I realize I am giving an  
4 approach versus a very specific answer, but that  
5 really is the way in which you start off on these  
6 types of, you know, analysis is that -- it kinds  
7 of forces that process that I mentioned.

8 But the good news is you get to, you  
9 know, information and insights a lot quicker than  
10 if you were to have to build everything up.

11 MODERATOR: For our audience members,  
12 before you close today, we hope you'll take a  
13 moment to give us your thoughts about this  
14 webcast. The icon on the right of the dock on  
15 the bottom of your screen, it's a reddish one  
16 that looks like a checklist with a checkmark,  
17 points to an evaluation form. You can bring that  
18 up by clicking the icon or it will pop up on the  
19 screen when we wrap up in just a few minutes  
20 here. Your input helps us assess today's program  
21 and plan for future events, and we really  
22 appreciate it.

1           At this time, if you have been with us  
2           for most of the program, you can now download a  
3           certificate of your participation. You can use  
4           this as proof of attendance if you are asked to  
5           provide that by either SHRM or the HR  
6           Certification Institute in an audit.

7           You do not need to have the  
8           certificate to claim the credit. If you don't  
9           have the certificate, we can still provide you  
10          the information you need in the case of an audit.  
11          But if you would like to download it, click the  
12          icon on the left of the bar at the bottom of your  
13          screen. It's the purple one and shows a speaker  
14          in front of a classroom.

15          Continuing here with audience  
16          questions, audience member asks, "Based on your  
17          review of the Watson engagement advisor, can it  
18          be inferred that the advisor can handle a  
19          training session and take questions based on the  
20          scope of the knowledge base?"

21                 MS. RYAN: Hmm. That's a great  
22          question, and I would see no reason why it

1       couldn't. I guess that's the kind of short  
2       answer.

3               MODERATOR: All right. And continuing  
4       with questions on knowledge base, another  
5       audience member asks, "The knowledge base that  
6       powers these systems, what is the source of the  
7       data that it contains? Is it captured from other  
8       sources, or is it manually or specifically  
9       entered into the system?"

10              MS. RYAN: Yes. The source is what  
11       you bring. So the source of -- and just kind of  
12       expanding that out, what you bring can be from  
13       systems like transactional systems, it can be  
14       from sources of information that you handcrafted,  
15       it can be from sources of data that has been  
16       exported from the data management component of  
17       other applications. It literally can be from  
18       anywhere.

19              It can be from surveys, it can be from  
20       assessments, and for -- you know, specific to,  
21       you know, the workforce. If you think of the  
22       oncology example that I mentioned earlier, all of



1 that data for which the Watson Corpus was built  
2 was based on literature very, very specific to  
3 oncology and surrounding material.

4 So in the workforce example with  
5 Talent Insights, those systems that I mentioned  
6 are common -- are examples of where you could  
7 source data and bring that data. So this is an  
8 area where the data integration -- so getting  
9 data from Point A to Point B continues to be  
10 automated as a service -- over time as a service  
11 within the cognitive systems.

12 And not only getting the data in but  
13 working through that hard stuff I mentioned about  
14 understanding the state of data, so you get to a  
15 level of confidence in knowing what is that state  
16 of data, so that when you look at the  
17 visualizations you've got confidence in what  
18 you're looking at and/or you see anomalies that  
19 you can go back to and quickly look at how you  
20 might change things. You might need to modify  
21 or, in most cases, correct the data.

22 MODERATOR: Let's see if we can

1 squeeze in just a couple more questions in our  
2 minutes remaining. Let me put together a couple  
3 from the audience. One audience member asks,  
4 "How well do cognitive systems work in companies  
5 with overseas offices or with a workforce with  
6 several languages represented?" Another audience  
7 member asks, "How do cognitive computing systems  
8 adjust to a diverse workforce? Is it sensitive  
9 to language, culture, and other differences in  
10 people?"

11 MS. RYAN: Okay. Yes. So, again,  
12 these are all great questions. This -- the short  
13 answer is currently cognitive systems, like  
14 Talent Insights, the natural language processing  
15 capability is in English. And the reason why  
16 it's in English right now and there absolutely  
17 are plans, at least within the -- you know,  
18 within our Watson family of products to most  
19 definitely expand out to other languages.

20 The tricky thing, the thing that is  
21 different with natural language processing than  
22 with text, say, if you were just typing a

1 question on, say, Google, right, where you type  
2 in a question and you can do conversions, you can  
3 convert it into different languages, and so  
4 forth, or when you do a translation of an  
5 application into a different language to work  
6 within a different country.

7           The difference with natural language  
8 processing is it's actually looking at the  
9 context of what you are typing in, and that is  
10 the hard part. That is the hard part for -- from  
11 the, you know, computer science perspective.

12           So every time we look at a new  
13 language, it is not just a matter of us -- you  
14 know, of Watson having to figure out how to  
15 translate, but really understand the context of  
16 phrases and meaning of terms used together, words  
17 used together in a different language.

18           I mean, we can all point to probably  
19 our own examples of where, you know, a direct  
20 translation from one language to another just  
21 didn't quite work and you didn't quite understand  
22 what really the gist of it was. So that's kind

1 of the backdrop -- you know, the backdrop to the  
2 short answer, which is English today, so in those  
3 countries that have English as a primary language  
4 or as a business language, these systems can  
5 absolutely work.

6 MODERATOR: And the final question an  
7 audience member asks, "Are there any other HR  
8 analytics solutions that leverage cognitive  
9 computing?"

10 MS. RYAN: There are not, is the short  
11 answer.

12 MODERATOR: All right. With that  
13 question and answer, we --

14 MS. RYAN: Insight --

15 MODERATOR: Sorry about that. I  
16 didn't mean to interrupt.

17 With that question and answer, we are  
18 going to bring to a close today's webcast.

19 As we close, a couple of final thanks.  
20 First, to our presenter, Jackie Ryan, for the  
21 insight she provided in today's program; and,  
22 finally, our thanks to you in the audience for

1 participating today and for choosing SHRM for HR  
2 webcast.

3 That concludes today's program.

4 (Whereupon, the above-entitled matter  
5 went off the record.)

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

**A**

**ability** 11:13,14 13:1,2  
15:21 16:14 25:16,21  
26:8 40:10  
**able** 10:15,17 22:14  
23:13 24:1 25:10  
26:16 29:9 35:6,9,10  
35:15 39:14  
**above-entitled** 53:4  
**absolutely** 21:14 38:13  
42:15 50:16 52:5  
**access** 10:7 11:1 22:22  
**accessible** 19:14  
**accidentally** 2:22  
**accommodate** 19:5  
**accumulated** 8:13  
**accumulating** 11:1  
**acquired** 9:12  
**acquiring** 21:19  
**act** 33:7  
**action** 2:21 17:20 31:7  
**actions** 23:6 24:9 27:18  
31:1,2,8 34:9,10,13  
**additional** 9:22 28:2  
**address** 21:4 33:20  
**adjust** 50:8  
**adopt** 18:12 22:5,14  
24:16 36:17  
**adoption** 19:16,21  
**advanced** 15:5  
**advancement** 7:6  
**advancements** 8:21  
9:14 17:17 18:7 19:7  
29:22 39:17,18  
**advances** 8:20 20:9  
**advisor** 15:7 16:7,11,13  
16:21 33:7 37:4 47:17  
47:18  
**advisors** 12:19  
**Aetna** 15:1  
**agenda** 5:4  
**agents** 19:20  
**ago** 39:16,16  
**ahead** 6:2 24:3 36:2,14  
**alliance** 35:8  
**allows** 4:4  
**ambiguous** 11:22  
**amount** 10:22 37:22  
38:17  
**amounts** 11:21 13:12  
17:1 38:22  
**analysis** 25:18 32:17  
34:11 46:6  
**analyst** 41:4  
**analytic** 5:2  
**analytical** 7:22 41:21  
43:14  
**analytics** 1:3 2:4 4:6,14

4:16,22 5:12,16 15:8  
18:20 21:5 22:3,4,8  
22:15,20 23:3,16,21  
24:7,16,20 25:3,9,10  
25:21 26:5 28:7 31:11  
31:15 32:5 33:2,5  
35:1,4,14 36:7,10  
37:19 41:3 43:9 52:8  
**analyze** 23:3,4 42:5  
**and/or** 42:18 49:18  
**announced** 9:9 34:21  
35:1  
**announcements** 36:4  
**anomalies** 49:18  
**answer** 3:17 13:19  
15:10,16 24:1 26:20  
27:15 39:14 42:2 46:4  
48:2 50:13 52:2,11,13  
52:17  
**answers** 14:9 37:12  
**APIs** 35:10  
**app** 3:22 18:1  
**applicability** 20:9  
**application** 30:1 51:5  
**applications** 20:22  
38:18 45:3 48:17  
**applied** 8:14  
**apply** 21:3 30:5 38:4  
39:19  
**applying** 5:21 22:9 24:6  
**appreciate** 46:22  
**approach** 28:21 29:2,6  
30:4 41:14 46:4  
**approaches** 23:17  
**apps** 19:15  
**area** 3:19 13:21 17:11  
19:12 41:2 49:8  
**areas** 11:3,4 17:13,13  
23:21 45:2  
**arguments** 12:9  
**Aristotle's** 7:18  
**art** 17:11 40:10  
**artificial** 8:1,19  
**asked** 14:17 15:2 27:11  
39:6 47:4  
**asking** 29:11,12 32:21  
34:2  
**asks** 14:18 15:9 36:16  
38:9 41:3,5 44:4 45:2  
47:16 48:5 50:3,7  
52:7  
**assess** 27:3 46:20  
**assessed** 28:4  
**assessing** 41:22  
**assessments** 48:20  
**assets** 23:7  
**assignments** 45:5,20  
**assistance** 11:15,17

15:22 16:1  
**assistant** 11:20 16:5  
**ATS** 44:14,15,20  
**attempts** 15:16  
**attendance** 47:4  
**audience** 36:1,16 38:8  
39:5,6 41:2,5 44:3,4  
45:1 46:11 47:15,16  
48:5 50:3,3,6 52:7,22  
**audio** 1:20 19:6  
**audit** 13:3 47:6,10  
**augmenting** 10:20  
**automated** 49:10  
**autonomously** 13:1  
**available** 2:7,13 3:10  
13:13 19:14 20:20  
23:22 27:2 37:7 40:14  
43:20  
**avatars** 19:21  
**avoid** 31:10

**B**

**B** 33:22 49:9  
**B.C** 7:18  
**Babbage's** 7:21  
**back** 7:17 25:3 28:7  
35:21 40:16 41:15  
49:19  
**backdrop** 52:1,1  
**background** 23:15  
24:14 31:5 41:2  
**bar** 47:12  
**base** 15:11 47:20 48:4,5  
**based** 12:21 14:9 15:10  
22:16 23:19,22 26:10  
27:10 31:13 33:10  
35:14 47:16,19 49:2  
**basic** 22:11  
**basically** 30:21  
**battery** 8:14  
**bear** 31:7  
**beat** 20:13  
**beauties** 38:21  
**beauty** 29:14  
**becoming** 6:14  
**began** 13:19  
**begun** 7:7  
**behalf** 27:5 30:12  
**behavior** 8:9  
**beings** 10:11 13:10  
17:20  
**believe** 20:2 35:20 38:9  
39:2,3  
**best** 26:20 27:3,14 31:6  
39:11 43:22  
**better** 18:8  
**beyond** 6:9 19:6 31:20  
**bias-free** 12:15 28:11

**big** 4:16  
**bit** 33:21  
**Blue** 9:2  
**boom** 8:19  
**bottom** 2:15 3:5 46:15  
47:12  
**boundaries** 31:20  
**box** 3:19  
**brain** 12:4  
**breakthroughs** 6:11 7:1  
7:5,20  
**bridge** 6:21  
**brilliant** 13:10  
**bring** 25:11 31:5 38:22  
43:2 46:17 48:11,12  
49:7 52:18  
**bringing** 11:18 16:2  
**broad** 11:3,4  
**build** 10:9 12:5 29:2  
41:12 42:6,8,8,14  
43:7 46:10  
**built** 9:21 43:1 49:1  
**bulk** 22:12  
**business** 9:10 15:13  
21:12,18 22:17 23:6  
23:20 24:4,7,18 27:16  
29:7,15,17 31:4,16,18  
32:1,2,3,4 33:15,18  
34:3 36:7 42:1 52:4  
**buttons** 2:17

**C**

**call** 16:10 34:5  
**called** 6:21 33:16  
**calling** 7:13  
**cancer** 16:12,16  
**candidates** 45:4  
**capabilities** 6:22 10:20  
11:5,8,13 12:12 15:20  
16:22 23:16 25:12  
35:11,16 37:4  
**capability** 6:14 8:4 11:4  
11:10,11 13:7 19:3  
25:14 50:15  
**capacity** 4:12 10:21  
**captured** 48:7  
**carry** 10:2  
**case** 26:7 38:2 40:2  
47:10  
**cases** 38:15 49:21  
**causes** 31:19  
**causing** 21:16  
**center** 16:12 22:3,4  
**central** 23:3  
**century** 7:18  
**certain** 12:15 23:5  
32:22  
**certificate** 47:3,8,9

**Certification** 47:6  
**cetera** 30:9  
**challenge** 22:7  
**challenges** 7:4 21:10  
 23:11  
**challenging** 24:11  
**champion** 9:3 20:13  
**champions** 9:6  
**change** 3:4 5:16 15:18  
 24:15 29:13 49:20  
**changes** 11:11 31:17  
 40:18  
**changing** 6:16 29:11  
**characteristics** 25:4,6  
 28:8 30:7,13 32:19  
**Charles** 7:21  
**cheating** 9:6  
**checklist** 46:16  
**checkmark** 46:16  
**chemistry** 8:15  
**chess** 9:3  
**choosing** 53:1  
**City** 35:2  
**claim** 47:8  
**classroom** 47:14  
**cleanse** 30:9  
**clear** 13:15 29:7 36:18  
**click** 2:18,20 3:6,22  
 47:11  
**clicking** 3:3 46:18  
**client** 4:19  
**clients** 32:4 35:7 40:4  
 44:9  
**close** 2:19,22 46:12  
 52:18,19  
**closer** 9:4  
**Cloud** 4:21 19:16 20:21  
 40:15,15,21  
**COC** 23:3  
**cognitive** 1:4 2:5 4:6  
 5:2,15,19,20 6:4,11  
 6:13 7:2,11,15,16 8:2  
 9:11,16 10:5,15,19  
 11:5,8,19 12:14,18,22  
 13:7 14:6 16:4,6,22  
 17:7,8,9,14,18 18:2  
 18:11 19:1,5,12,20  
 20:3,7,18 21:3,5 25:1  
 25:5,6,15,17 28:8,22  
 29:5,12,22 30:11 33:4  
 33:6 34:1 35:14,16  
 36:21 37:1,3 38:20,21  
 39:3,19 41:14 42:10  
 42:10,13 43:12,20  
 44:16 49:11 50:4,7,13  
 52:8  
**cognitive-based** 10:8  
 19:17

**collaborate** 23:5  
**collaborating** 31:3  
**collected** 30:5  
**combs** 17:1  
**come** 5:20 14:12 17:7  
**coming** 9:15  
**commercialization**  
 9:10  
**common** 49:6  
**community** 2:13  
**companies** 22:13 36:16  
 39:21 40:2 50:4  
**company** 39:8,11 40:8  
**compare** 20:11  
**comparing** 41:22  
**complement** 35:16  
 38:12 39:4  
**complete** 5:5 21:14  
**component** 48:16  
**compounds** 8:17  
**computer** 6:20 17:22  
 19:9 24:12 51:11  
**computers** 6:7  
**computing** 1:4 2:5 5:15  
 6:4,12,13 7:2,17 8:2,6  
 9:11,16,17 12:18 16:6  
 17:7,9,14 20:3 21:3,6  
 25:2,5,6,15 28:8,22  
 29:5 30:1,11 33:7  
 34:1 35:14,16 39:17  
 41:14 43:20 50:7 52:9  
**concludes** 53:3  
**conclusion** 17:6  
**conference** 22:1  
**confidence** 12:22 13:5  
 32:22 49:15,17  
**conjunction** 44:16  
**connect** 28:3 35:11  
**connecting** 31:16  
**connections** 13:11 17:2  
**connectors** 35:10  
**consulting** 35:17  
**consume** 11:20  
**contains** 48:7  
**content** 3:13 10:16  
 37:16  
**context** 10:16,16 18:10  
 51:9,15  
**contextual** 12:7  
**continue** 43:18  
**continued** 19:7  
**continues** 49:9  
**continuing** 39:5 44:3  
 47:15 48:3  
**contrast** 20:11  
**control** 2:17  
**conversions** 51:2  
**convert** 51:3

**copy** 3:21  
**core** 23:12  
**Corpus** 49:1  
**correct** 49:21  
**correlations** 38:5  
**corresponding** 2:19  
**cost** 45:19  
**costs** 40:13  
**countries** 52:3  
**country** 51:6  
**couple** 33:12 36:3,15  
 40:22 43:22 50:1,2  
 52:19  
**course** 32:7  
**courses** 44:2  
**cover** 5:18 6:1 28:21  
**create** 36:9  
**created** 8:11 31:3 38:18  
 42:15  
**creating** 28:9  
**credit** 47:8  
**critically** 29:8  
**culture** 50:9  
**current** 17:18 18:11  
 19:1 23:17 38:10,12  
**currently** 12:18 16:5  
 18:13 22:17 44:5  
 50:13  
**customizations** 28:18

## D

**data** 4:16 10:1,22 12:1  
 13:15 17:1 18:20 23:1  
 23:1,2,4,4,22 26:10  
 26:19 27:2,10 28:1,10  
 29:21 30:1,5,8,8,9,10  
 30:13,14 31:20 32:6  
 32:11,13,15,19,22  
 35:17 36:7 37:22 38:3  
 38:4,6,17,19,19,22  
 41:8 42:7,8,16,17  
 43:10 44:15 45:12  
 46:1 48:7,15,16 49:1  
 49:7,7,8,9,12,14,16  
 49:21  
**database** 43:1,4  
**databasing** 41:5  
**days** 11:2 22:2  
**DBAs** 43:2  
**decades** 6:5 16:15  
**decide** 16:19  
**decision** 13:4 16:9  
 33:10 45:11,13  
**decision-making** 10:21  
 12:12  
**decisions** 10:7 12:11  
 12:14,17,21 13:1  
 22:16 28:11 30:14

32:15 34:13  
**deductive** 7:19 43:13  
**deep** 9:2 11:17 16:1  
**defeated** 9:2,5  
**define** 24:8 29:19  
**defined** 15:16  
**defining** 27:12 29:7,15  
**definitely** 50:19  
**definitions** 28:16 31:7  
**degree** 12:13 32:10,22  
**deliver** 18:8  
**demographics** 21:11  
**demonstrate** 10:13  
**demonstrating** 34:6  
**Dendrol** 8:11,14,22  
**depend** 13:2 17:14  
**dependent** 15:15 19:8  
**depending** 42:22  
**depends** 36:20 37:15  
 37:22  
**deploy** 43:3  
**deployed** 14:21 19:13  
**derive** 23:4  
**described** 36:18  
**describing** 39:8,10  
**descriptive** 23:21 25:11  
**designed** 8:13  
**determined** 26:9  
**determines** 26:19  
**developed** 16:13  
**developing** 11:17 16:1  
 21:20  
**development** 4:18 41:6  
**devices** 9:13 19:22  
**dialogue** 14:2  
**difference** 9:20 51:7  
**differences** 50:9  
**different** 23:8,21 24:2  
 29:1,13 33:8,19 35:11  
 39:13 41:12 43:7 44:1  
 45:21 50:21 51:3,5,6  
 51:17  
**differently** 40:11,13  
**dimension** 19:8  
**dimensions** 17:10,15  
 17:17  
**direct** 51:19  
**directing** 10:4  
**directly** 11:5  
**Director** 1:11 4:11  
**disciplines** 19:9  
**discover** 12:9 13:8  
**discovered** 13:9  
**discoveries** 7:20  
**discovery** 13:6,6,10  
 16:21,22 17:4 27:19  
 28:9  
**display** 3:4

displaying 3:3  
 diverse 50:8  
 dock 2:16 46:14  
 doing 30:11  
 domain 11:17 14:18  
 15:9 16:2  
 domain-specific 18:15  
 domains 18:13 20:21  
 download 47:2,11  
 dragging 3:3,5  
 drive 36:7  
 driven 19:21  
 drivers 24:19,19  
 driving 40:7  
 due 8:20  
 duplicates 30:8

---

**E**

earlier 33:15 44:10  
 48:22  
 earliest 7:16  
 early 13:20,22 14:7  
 22:8  
 Ed 8:11  
 effective 12:3  
 effectively 13:16  
 eight 42:21  
 either 2:19 9:7 12:4  
 29:2 47:5  
 element 34:4  
 eligibility 45:20  
 ELIZA 13:21 14:5  
 embedded 25:14  
 employ 33:5  
 employees 21:22 40:3  
 40:5,5 45:20  
 enable 4:22 12:8 18:2  
 encapsulated 42:9  
 43:10  
 encourage 36:2  
 engage 6:16  
 engagement 11:10 15:6  
 28:13 29:3 47:17  
 engaging 18:6  
 engine 7:22  
 English 26:22 50:15,16  
 52:2,3  
 entered 48:9  
 entering 9:15  
 Enterprise 6:21  
 entities 12:8  
 environment 35:8 43:4  
 epitome 13:7  
 era 1:3 2:5 9:16,17,19  
 10:4,5  
 eras 9:17  
 essentially 37:7,10  
 41:17

et 30:9  
 evaluation 46:17  
 events 2:8 5:6 7:14 8:3  
 46:21  
 eventually 19:18  
 everyday 6:15  
 evidence-based 16:18  
 evolution 5:19 6:4 17:8  
 17:16  
 evolve 17:9,14  
 evolved 8:4  
 exactly 44:9  
 example 6:18 8:5 16:10  
 16:22 22:10 25:9 26:3  
 28:6 33:4 35:8 37:4,6  
 40:1,17 41:15 42:11  
 48:22 49:4  
 examples 14:14 49:6  
 51:19  
 exception 18:19  
 exceptions 22:13  
 exciting 7:9  
 execute 8:13  
 existing 38:13 44:11,12  
 expand 21:18 50:19  
 expanding 24:17 48:12  
 experience 4:15 25:11  
 25:20,21  
 expert 8:12,21 11:14,16  
 14:5,11 15:21 16:1  
 expertise 8:13 18:16  
 exploit 13:16  
 explore 5:14 27:17 28:3  
 29:20 30:16  
 explored 28:4  
 exploring 26:12  
 explosive 19:21  
 exported 48:16  
 extend 10:19 11:12  
 15:20  
 external 24:19

---

**F**

fabric 20:3,19  
 face 15:3  
 fact 24:12  
 factor 40:6,7  
 factors 45:21  
 family 50:18  
 famous 13:20  
 faster 20:16  
 feature 19:19  
 fed 10:1  
 feed 34:10  
 Feigenbaum 8:11  
 fiction 6:6,10  
 figure 29:18 43:15  
 51:14

final 12:20 16:8 52:6,19  
 finalizing 17:6  
 finally 20:7 52:22  
 find 10:17 21:19  
 finding 13:11  
 finished 4:2 31:14  
 finishes 37:13  
 first 2:11 7:19 8:12 29:7  
 31:11 33:17 36:5,15  
 41:10 52:20  
 fit 18:9 38:13  
 five 17:9,15 39:16 42:20  
 42:21  
 focus 9:10  
 folks 43:3  
 following 36:11  
 follows 9:17  
 foray 13:18  
 forces 46:7  
 forcing 24:20  
 form 12:9 27:8 31:2,3  
 46:17  
 formal 7:19  
 formation 9:9  
 forth 23:16,19 51:4  
 forward 7:10 9:19 17:5  
 21:2 33:12  
 four 20:12 29:6 39:15  
 39:16 45:15  
 fourth 7:18 19:12 30:22  
 frequently 14:17 15:2  
 front 22:3,4 47:14  
 fruition 9:15  
 full 3:7 5:4,4  
 fully 12:16  
 fun 5:14 30:17  
 function 6:8 38:10  
 fundamental 9:20  
 fundamentally 5:16  
 6:15 11:11 15:18 25:7  
 funny 31:13  
 further 8:21 21:18  
 future 11:6 18:1,5 19:4  
 19:16 20:18 25:12  
 46:21

---

**G**

garbage 32:8,8  
 Garry 9:2  
 gather 10:6  
 generate 17:20  
 generated 44:15  
 generations 19:4  
 generic 18:12  
 getting 17:6 22:22  
 45:22 49:8,12  
 gist 51:22  
 give 5:19 7:11 26:3 37:9

39:13 46:13  
 given 18:17,18 21:9  
 24:11 39:15  
 giving 26:11 46:3  
 global 45:4,8,11,17,20  
 globalization 21:13  
 go 7:12 11:9 22:1 27:17  
 28:2 34:20 36:2,14  
 39:1,2 43:17 49:19  
 going 4:5 7:10 17:14  
 19:5,18 29:17 52:18  
 good 33:4 38:16 46:8  
 Google 9:12 51:1  
 graduates 37:13  
 great 5:9 41:9 47:21  
 50:12  
 greatest 7:4  
 groundwork 7:22  
 group 42:18  
 groups 42:22  
 grow 4:7  
 growing 10:22  
 guess 43:5 48:1  
 guide 37:12  
 guided 25:21

---

**H**

half 16:14  
 hand 10:5  
 handcrafted 48:14  
 handle 14:11 15:1  
 47:18  
 happen 24:4,5 31:17  
 happened 14:10 22:17  
 42:19  
 happens 26:6  
 hard 49:13 51:10,10  
 hardware 39:18  
 haystack 10:18  
 hello 2:3 5:10  
 help 7:3 13:16 22:5  
 23:3 24:8,17 27:14,15  
 30:1 36:7,9 37:12  
 44:17  
 helping 28:10  
 helps 46:20  
 heterogeneous 35:7  
 higher 11:7  
 highlight 11:9  
 highlighted 27:21  
 hiring 44:5,18  
 history 5:20 7:13,16,21  
 8:1 16:16  
 Hmm 47:21  
 hold 4:1  
 home 9:4,13 36:10  
 hooked 9:7  
 hope 38:15 46:12



**hoping** 5:13  
**HR** 2:13 4:22 5:17 6:1  
 21:1,5,6,16 22:5 23:2  
 23:14 24:11,16 25:13  
 25:19 28:10,16,19  
 34:22 35:2,17 38:4  
 41:7 42:22 47:5 52:7  
 53:1  
**HR's** 4:7  
**HR-centric** 31:12  
**HRIS** 38:10,12 44:13  
**huge** 9:18 20:9  
**human** 1:1,21 10:11,20  
 12:3,4 13:10 14:3,6  
 14:12,18 16:8 17:3,20  
 33:3  
**human-like** 10:14  
**humans** 6:8 9:21 10:3,4  
 10:20 11:12,13 12:13  
 12:16,20 13:2,17  
 15:19,20 18:15  
**hundreds** 40:5  
**hypotheses** 12:9

---

**I**


---

**i.e** 43:9  
**IBM** 2:12 4:10 9:9 15:6  
 15:7,8 16:11,21 20:15  
 20:19,22 26:4 34:21  
 36:5,8,10  
**IBM's** 1:11 4:11 5:12  
 9:2,5 20:12 36:6  
**icon** 46:14,18 47:12  
**icons** 2:16  
**identify** 8:16 10:18  
 45:16  
**identifying** 29:21 45:11  
 45:22  
**if/then** 8:15  
**illusion** 14:5  
**image** 19:7,10  
**immediately** 18:21,22  
 27:7 38:3  
**impact** 4:7 29:17 34:12  
**imperative** 21:17  
**implementation** 23:11  
**implementations** 13:21  
**implemented** 7:2  
**important** 17:15 29:8  
 33:16 34:12  
**importantly** 24:6 34:15  
**impossible** 10:18  
**improve** 13:4 31:18  
**improvement** 20:16  
**include** 12:6 19:19  
**including** 18:3  
**incorrect** 32:17  
**increase** 19:17 20:8

**increasingly** 6:14 13:14  
 18:2,6 19:13  
**incremental** 34:6  
**independent** 21:12  
**industry** 18:17  
**industry-specific** 20:22  
**inferred** 47:18  
**influenced** 8:4  
**influencing** 34:14  
**information** 2:10 4:16  
 6:17,17 10:1,6 11:18  
 11:22 13:12,16 16:2  
 18:17,18 23:15 24:13  
 37:7,17 38:6 42:4  
 43:8 46:9 47:10 48:14  
**informative** 5:14  
**ingested** 37:8 38:7  
**initially** 26:2  
**initiate** 17:20  
**initiative** 17:3 34:22  
 35:3  
**ink** 3:15  
**innovation** 4:20  
**innovations** 4:21  
**innovative** 6:14 7:8,20  
**input** 46:20  
**insight** 44:19 52:14,21  
**insights** 10:13,19 11:17  
 12:21 13:8,11 15:7  
 16:2,7 17:2 21:1 23:5  
 26:1,4,8 27:1,4,7,20  
 27:22 28:2,5,10 33:6  
 34:17,21 37:19 40:2  
 40:21 41:18 42:11  
 44:17 46:9 49:5 50:14  
**instantaneous** 37:20  
 37:21  
**Institute** 47:6  
**integration** 42:7,17  
 49:8  
**intelligence** 8:1,7,20  
**intelligent** 6:7,9 8:9  
 13:19 14:10  
**intelligent-speaking**  
 6:20  
**intended** 21:14  
**intention** 33:2  
**intentionally** 2:22  
**interact** 5:1 6:16 9:21  
 10:10 11:12 15:19  
 25:16 30:16,18  
**interacting** 30:20  
**interaction** 17:22 18:3  
 28:14 32:14  
**interactions** 20:1  
**interactive** 18:6  
**interface** 2:15 35:10  
**internal** 24:19

**internet** 9:7  
**interrupt** 52:16  
**interwoven** 20:4  
**introduce** 2:9  
**introduced** 8:7  
**introductions** 5:5  
**invention** 7:18  
**investment** 34:16  
**involved** 22:22 23:9,10  
 41:8  
**involves** 13:10  
**it/analyze** 27:3

---

**J**


---

**Jackie** 1:11 4:9 5:8,11  
 52:20  
**Jeopardy** 9:6 20:14  
 40:17  
**joining** 2:4  
**jointly** 30:21  
**Joseph** 13:22  
**judgment** 12:14 33:3  
**JUNE** 1:7

---

**K**


---

**Kasparov** 9:2  
**keep** 2:21 34:2  
**Kenexa** 15:7 20:22 26:4  
 34:21,22 36:8  
**keyboard** 14:9  
**kind** 7:11 17:5 27:20  
 29:14 38:20 42:12  
 48:1,11 51:22  
**kinds** 46:6  
**know** 6:6 13:17 21:9  
 22:20 23:18 25:13  
 29:3,12 30:7 31:13  
 32:7,17 33:1,8,21  
 38:15 39:15,20 40:6,8  
 40:16,17 41:20 42:1  
 42:13,20 43:2 44:11  
 44:11,12 45:9,15,19  
 46:6,9 48:20,21 50:17  
 51:11,14,19 52:1  
**knowing** 49:15  
**knowledge** 10:1,9  
 15:11 47:20 48:4,5

---

**L**


---

**Labs** 9:12  
**laid** 7:22  
**language** 5:3 10:10  
 14:7,12,19 15:12 19:2  
 19:3,4 25:17 26:21  
 28:15,17 50:9,14,21  
 51:5,7,13,17,20 52:3  
 52:4  
**languages** 50:6,19 51:3

**large** 3:6  
**late** 9:1  
**lead** 4:10 5:11 32:16  
**leadership** 21:20  
**leap** 9:18  
**learn** 4:6 6:8 10:8 12:1  
 18:12 36:8  
**learned** 18:21 26:10  
**learning** 9:13 37:1,5,10  
 37:14,20 43:18,21  
**learns** 37:8,9  
**led** 4:17,19,20 8:10  
**left** 3:11 21:10 27:21  
 47:12  
**left-hand** 6:19  
**let's** 6:3 21:2 36:15  
 49:22  
**level** 44:18 49:15  
**leverage** 52:8  
**leveraging** 15:21  
**limited** 22:11  
**link** 33:15  
**links** 36:11  
**list** 2:7 21:14  
**literally** 37:8 48:17  
**literature** 49:2  
**lives** 6:15 20:6  
**locative** 18:10  
**logo** 3:11  
**long** 36:19  
**look** 6:5,19 12:11 24:3  
 27:16 31:19,21 32:1  
 32:10 34:7,12 37:12  
 40:10 42:4,12 43:14  
 45:8,17,18 49:16,19  
 51:12  
**looked** 27:12 28:4  
**looking** 17:1 21:21  
 23:21 24:7 27:19  
 30:22 31:7,10 41:21  
 45:13 46:1 49:18 51:8  
**looks** 26:18 27:2 46:16  
**lot** 23:11 24:11 38:15  
 40:19 45:21 46:9  
**love** 23:18 32:8

---

**M**


---

**machine** 12:3 20:1  
**machine-to** 19:22  
**Machinery** 8:6  
**machines** 6:7,9  
**major** 21:7  
**making** 2:13 10:21  
 32:15 45:12  
**manage** 43:3,4  
**management** 1:1,11,22  
 4:11,16,18 22:2 23:15  
 24:13 35:3,5 43:8

48:16  
**manner** 16:18 30:3  
**manually** 48:8  
**maps** 27:14  
**market** 4:19  
**marketing** 4:18  
**marketplace** 19:20  
**markets** 42:9  
**massive** 17:1 38:22  
**matches** 44:6  
**matching** 14:9  
**material** 49:3  
**math** 37:18 38:2  
**matter** 18:15 45:8 51:13  
 53:4  
**mean** 34:8 51:18 52:16  
**meaning** 18:13 32:9  
 34:6 37:21 51:16  
**media** 19:6 20:5  
**medical** 16:16  
**member** 15:3 36:16  
 38:8 39:6 41:3,5 44:4  
 45:1 47:16 48:5 50:3  
 50:7 52:7  
**members** 14:22 46:11  
**Memorial** 16:12  
**mentioned** 5:10 36:22  
 42:16 46:7 48:22 49:5  
 49:13  
**mentioning** 31:14  
**method** 29:4 41:13  
**methodologies** 42:7  
**methods** 31:6  
**microphone** 5:7  
**mid** 8:10  
**Mike** 35:21  
**million** 16:14  
**millions** 19:20  
**mimicked** 14:1  
**mind** 2:21 29:14  
**minutes** 46:19 50:2  
**missed** 32:14  
**MIT** 13:22  
**mobile** 18:1 19:15,22  
 21:12  
**mobility** 45:5,8,11,17  
**model** 30:20 34:17,17  
 38:3  
**modeled** 18:20,21  
**modeling** 27:22  
**models** 12:5,6 42:6  
**MODERATOR** 2:3  
 35:22 38:8 39:5 40:22  
 44:3 45:1 46:11 48:3  
 49:22 52:6,12,15  
**modern** 8:1  
**modify** 49:20  
**molecular** 8:16

**moment** 46:13  
**money** 32:3  
**move** 13:6 21:2 22:14  
 34:16  
**moved** 6:9  
**moving** 7:10 9:1,4  
 13:18 17:5 21:2 24:1  
 33:12  
**multiple** 22:21,21

---

**N**


---

**natural** 5:2 10:9 11:19  
 14:7,12,19 16:3 18:3  
 19:2,3 25:16 28:15,17  
 50:14,21 51:7  
**naturally** 10:11  
**Navigator** 14:22  
**necessarily** 42:3 44:19  
**need** 13:15 20:8 22:5  
 24:16 30:5 31:1,17  
 41:4 42:15 43:6,13,14  
 47:7,10 49:20  
**needed** 23:12 41:11,20  
**needle** 10:18  
**needs** 24:12  
**net** 43:5  
**Neth** 9:12  
**new** 1:3 2:5 4:13 5:22  
 9:10,16,19 10:18  
 18:12 20:21 21:19  
 27:19 28:9 35:2 51:12  
**news** 21:8 46:8  
**NOP** 14:7  
**number** 23:8,9

---

**O**


---

**objectives** 5:22 32:2  
**obviously** 19:8 22:13  
**offered** 20:19  
**offerings** 4:14  
**offices** 50:5  
**Okay** 41:9 50:11  
**Olney** 14:16,21 15:14  
**once** 37:13,13  
**oncology** 16:11,13 37:6  
 48:22 49:3  
**ones** 36:17  
**online** 36:12 43:21  
**ontologies** 15:12  
**ontology** 28:19 38:4  
**open** 2:19 34:22 35:2,3  
 35:4,5,13  
**opening** 20:21 35:5  
**opens** 39:21  
**operational** 24:14  
**operationalizing** 8:8  
**operations** 43:8  
**opportunities** 41:6

**opposite** 2:21  
**optimizing** 21:21  
**options** 12:20,21 16:7  
 16:18  
**orders** 11:7  
**organic** 8:16  
**organization** 4:8 21:13  
 42:22  
**organizations** 7:3  
 22:11  
**outcome** 17:21  
**outcomes** 16:17 34:9  
 36:8,18,19  
**outliers** 30:7  
**overseas** 50:5  
**overview** 7:11

---

**P**


---

**P-R-O-C-E-E-D-I-N-G-S**


---

2:1  
**page** 3:13,14 36:10,12  
**paper** 3:15  
**part** 2:6 22:15 23:14  
 30:17 34:22 43:16  
 51:10,10  
**participating** 53:1  
**participation** 47:3  
**particular** 13:4 14:18  
 15:9  
**partner** 21:18 24:18  
**partners** 23:6 27:16  
 31:4 34:16 35:6  
**partnership** 12:2 16:11  
**passive** 17:19  
**paste** 3:21  
**path** 17:16 23:19 24:10  
 24:10  
**patient** 14:3 16:15,17  
**pattern** 19:10 29:1  
**patterns** 10:19 12:10  
**PDF** 3:9  
**people** 11:6,18 16:3  
 22:21 37:15 40:9  
 50:10  
**percent** 20:16,17 22:10  
**perfect** 24:22 25:1  
 32:13  
**perform** 12:19  
**performance** 20:17  
**performing** 16:6  
**perspective** 5:20 32:2,5  
 51:11  
**phase** 37:1,5,10,14,21  
**phases** 29:6  
**phonetic** 8:11 14:16  
 40:19  
**phrases** 51:16  
**physicians** 16:17

**physics** 8:15  
**pinpointing** 44:6  
**pioneering** 7:3  
**pitfalls** 31:10  
**place** 25:1 36:22 44:15  
**plan** 46:21  
**plans** 50:17  
**platform** 20:20  
**play** 11:20 16:5  
**player** 36:11  
**pleased** 4:9 5:6  
**point** 26:9,11 27:6  
 30:15 32:13,14,18  
 33:22,22 49:9,9 51:18  
**points** 46:17  
**pop** 46:18  
**portal** 18:1  
**portals** 19:14  
**Portfolio** 1:12 4:12 5:12  
**portfolios** 35:12  
**pose** 29:10,16 37:11  
**posed** 15:17  
**poses** 23:10  
**posing** 18:22 46:1  
**position** 33:2  
**possible** 7:1 17:12  
 40:10  
**potential** 7:8  
**power** 14:6 20:15 25:2  
**powered** 26:5 28:6  
**powerful** 15:14  
**powers** 48:6  
**practices** 31:6  
**pre** 15:15  
**pre-programmed** 10:3  
**predictive** 22:15 24:1  
 25:11  
**predominantly** 17:19  
**prefer** 3:22  
**preparation** 30:2  
**prepare** 23:1  
**prescriptive** 24:7 25:12  
**presentation** 2:11 3:9  
 3:17  
**presenter** 4:2 52:20  
**pretty** 22:12 24:10  
 37:20 39:20 40:18  
**price** 39:18  
**primarily** 19:1  
**primary** 52:3  
**printing** 3:15  
**proactively** 24:3  
**probably** 21:7 39:15  
 42:21 43:21,22 51:18  
**problem** 15:3 18:18  
 29:7,15 30:21 33:18  
 34:7 45:16,18,22  
**problems** 21:4 33:9,19

**process** 17:4 44:18  
45:10 46:7  
**processing** 10:2 19:3  
19:10 28:17 39:17  
43:9 50:14,21 51:8  
**product** 1:11 4:11,13  
4:18  
**production** 37:15  
**products** 50:18  
**profession** 21:6  
**professional** 5:17  
25:13,19 28:16 41:6  
**professional's** 21:17  
23:14  
**professionals** 5:1 21:1  
22:5 24:11,16 41:7  
**profile** 30:6  
**profiling** 30:12  
**program** 2:6,12 3:10,18  
3:21 4:5,10 8:12 36:6  
46:20 47:2 52:21 53:3  
**programmable** 9:17,22  
10:3,12  
**programming** 30:19,19  
**programs** 31:22  
**project** 22:21 31:11  
32:12  
**projects** 28:22 32:5  
**promise** 7:12  
**proof** 47:4  
**propensity** 24:2  
**proposing** 25:22  
**proven** 31:6  
**provide** 2:10 11:14,16  
15:21 16:1 25:7 35:15  
44:18 47:5,9  
**provided** 1:21 2:2 14:4  
52:21  
**provides** 16:17  
**providing** 28:11  
**psychotherapist** 14:2  
**published** 8:6  
**pull** 25:10 34:17  
**purple** 47:13  
**purpose** 38:14  
**pursuit** 24:17  
**push** 34:17  
**put** 10:15,16 36:21  
37:15 41:1 50:2  
**putting** 33:1

---

**Q**


---

**quality** 30:8 32:10  
**query** 13:2 26:21  
**question** 3:17 13:19  
14:19 15:10,17 17:3  
26:14,18,19,20 27:7  
27:15 29:11 34:2

41:18 43:16 44:10,11  
45:3 47:22 51:1,2  
52:6,13,17  
**questions** 3:19,20 4:1,2  
4:3 14:11,17 15:2,16  
18:22 24:2,3 26:12  
27:10 29:9,16,20  
30:18 32:21 35:21  
36:1,2,15 37:11 39:6  
41:9 44:4 46:1 47:16  
47:19 48:4 50:1,12  
**quick** 34:11  
**quicker** 46:9  
**quickly** 10:17 32:9  
33:22 34:20 49:19  
**quite** 23:8,9 29:1 42:19  
51:21,21  
**quotes** 37:21

---

**R**


---

**ramifications** 29:10  
**range** 39:22  
**ranging** 22:22  
**rate** 17:16  
**real** 44:21  
**realistic** 45:7  
**reality** 6:11 7:1 24:22  
26:7  
**realize** 46:3  
**realized** 36:19  
**really** 9:15 11:12 20:4,5  
22:8 28:11 29:6 31:18  
31:19 34:15 40:6  
45:16,21 46:5,21  
51:15,22  
**realm** 22:14  
**reap** 39:8  
**reason** 10:10 33:16  
47:22 50:15  
**reasonable** 42:2  
**reasoning** 7:19 10:12  
43:13  
**recognition** 19:11  
21:22  
**recognizing** 35:6  
**recommend** 41:7 43:19  
44:1  
**recommendation** 28:12  
34:5 43:22  
**recommendations** 31:9  
33:9 43:17  
**recommended** 27:13  
33:14  
**recommending** 28:1  
**reconcile** 11:22  
**record** 53:5  
**records** 16:15,16  
**reddish** 46:15

**refers** 10:13 35:3  
**reflect** 23:7  
**register** 15:3  
**registration** 15:2  
**reigning** 20:13  
**relate** 11:6  
**relates** 32:6 34:3  
**relationship** 38:5  
**relationships** 12:7 27:9  
**relative** 29:19 41:22  
**relevant** 45:12  
**rely** 12:13 42:18  
**relying** 17:2 18:14  
**remaining** 50:2  
**renditions** 6:7  
**repeated** 34:6  
**replace** 38:10,11  
**reporting** 22:12  
**reports** 23:7  
**reposition** 3:2  
**represented** 41:19 50:6  
**represents** 9:18 16:15  
**require** 17:19 19:2  
**required** 12:16 20:14  
**research** 17:12 24:14  
43:9  
**Resource** 1:1,21  
**resources** 3:10,18  
**responds** 14:20  
**response** 17:21 41:19  
41:21 43:14  
**responses** 18:9  
**responsible** 4:13 18:9  
**result** 34:8  
**results** 10:2 27:8,8  
32:17 45:13  
**retaining** 21:22  
**return** 10:2 34:15  
**reusable** 38:19  
**review** 47:17  
**right** 3:5,7 36:20 44:7,7  
46:14 48:3 50:16 51:1  
52:12  
**rise** 21:11  
**ROI** 34:6,7  
**role** 11:20 16:5 24:17  
38:14,16 43:11  
**roles** 23:9  
**room** 5:4  
**rules** 8:15 24:7  
**run** 14:2 43:4  
**Ryan** 1:11 4:9,10,17 5:8  
5:9,11 36:20 38:11  
39:12 41:9 44:7 45:6  
47:21 48:10 50:11  
52:10,14,20

---

**S**


---

**SaaS** 40:15  
**SaaS-based** 40:21  
**SAP** 35:8  
**save** 3:14  
**saying** 42:3  
**scalability** 20:8  
**scenario** 44:21,21 45:7  
**scenarios** 44:8  
**school** 37:11  
**science** 5:11 6:5,10  
19:9 24:13,13 31:5  
41:8 51:11  
**scientist** 43:10  
**scientists** 23:2  
**scope** 47:20  
**scores** 13:5  
**scratch** 7:7  
**screen** 2:16,18 3:1,8,12  
46:15,19 47:13  
**screenshot** 41:17  
**screenshots** 26:15,17  
**second** 29:21 32:6  
**seconds** 16:19  
**section** 21:3 28:20  
**secure** 14:22  
**see** 2:7,16 11:3,4,7  
17:15 21:10 26:7,14  
26:17 27:20 28:7,14  
29:1 47:22 49:18,22  
**seeing** 33:11  
**seen** 8:19 42:1  
**selecting** 45:4  
**self-contradictory** 12:1  
**self-learning** 5:1  
**send** 38:3  
**sense** 10:21 15:15  
**sensitive** 50:8  
**sequel** 41:4  
**series** 2:7 30:6  
**servers** 20:15  
**serves** 32:4  
**service** 4:21 49:10,10  
**services** 30:2 35:15,17  
35:18 40:15 42:10  
**session** 3:17 5:13,18  
35:20 47:19  
**set** 12:19 14:17 15:16  
34:10  
**shadow** 43:1  
**shape** 29:9  
**shared** 6:6  
**shift** 21:16  
**shifting** 21:11  
**short** 48:1 50:12 52:2  
52:10  
**show** 6:21 20:14 26:16  
27:9 34:8,15  
**showed** 41:16,16

**shown** 14:15  
**shows** 47:13  
**SHRM** 2:11 3:11 36:5  
 36:12 43:20 47:5 53:1  
**SHRM's** 2:6  
**side** 3:11 6:19  
**sift** 16:14  
**significant** 8:3 18:7  
**significantly** 15:20  
**similar** 14:19  
**simple** 22:20  
**sites** 43:19 44:1  
**size** 3:4 39:8,11,22 40:7  
**sizer** 3:6  
**skills** 23:12 31:6 41:10  
 41:11,20 42:16,17,17  
 43:5,6  
**slide** 3:13 34:19  
**slides** 3:3,7,10,14  
**Sloan-Kettering** 16:12  
**smaller** 20:17  
**smarter** 1:12 4:11 5:12  
 36:9  
**social** 20:4 21:12  
**Society** 1:1,21  
**society's** 7:4  
**software** 4:17,21  
**solutions** 4:22 9:11  
 15:6 36:8 39:7,10  
 52:8  
**solve** 7:3  
**sorry** 39:9 45:2 52:15  
**sort** 27:20  
**sound** 31:13  
**source** 48:6,10,11 49:7  
**sources** 48:8,14,15  
**speaker** 1:10 2:9 3:18  
 5:8 47:13  
**speaking** 4:3  
**specialists** 8:14  
**specific** 7:14 18:10  
 19:4 23:6 27:18 31:8  
 38:14 44:2,12 45:22  
 46:4 48:20 49:2  
**specifically** 5:22 24:9  
 26:14 45:18 48:8  
**specifics** 40:18  
**speed** 19:10  
**sponsor** 33:8  
**sponsoring** 2:12 36:6  
**spread** 19:18  
**square** 3:6  
**squeeze** 50:1  
**stack** 33:17  
**stages** 22:8  
**standards** 12:16  
**Stanford** 8:10  
**Star** 6:22

**start** 6:3 18:22 22:5  
 26:11 27:3 29:3,20  
 36:15 38:7 46:5  
**started** 5:6 6:2 14:12  
 28:21 32:20,21 39:20  
**starting** 26:9,11 32:15  
**state** 23:20 49:14,15  
**steps** 22:21 23:10  
 45:16  
**stitch** 37:9  
**stock** 14:8  
**storm** 25:1  
**story** 6:10  
**strategic** 21:18 24:18  
**strategy** 4:13 33:15  
 34:3  
**string** 14:8  
**structure** 8:16  
**structured** 11:21  
**stuck** 32:9  
**stuff** 49:13  
**stumbled** 39:9  
**subject** 18:15  
**submit** 3:19,22  
**substantially** 40:14  
**substitute** 33:3  
**substitution** 14:8  
**suggest** 16:7 33:9,13  
**suggesting** 12:19 29:2  
**summary** 28:5  
**summit** 35:2  
**support** 20:8 31:22  
**sure** 32:16  
**surface** 7:8 45:14  
**surfaced** 12:22 27:8,13  
 41:18  
**surfacing** 25:22 28:1  
 30:13  
**surprising** 22:19  
**surrounding** 49:3  
**survey** 36:7,10  
**surveys** 48:19  
**system** 7:19 8:12 14:5  
 14:16,20 15:10 20:13  
 25:17,22 26:9 30:18  
 30:19,20 36:21 38:12  
 44:5,13,20 48:9  
**systems** 5:2 6:17 8:21  
 9:18,20,22 10:4,8,12  
 10:13,15,19 11:5,7,12  
 11:16,19 12:5,8,12,15  
 12:18,22 13:8,15,19  
 14:11 15:5,8,18,19,22  
 16:4,6 17:18 18:2,5  
 18:11,14 19:1,5,13,17  
 20:7,18 29:12 33:5  
 36:17 37:1 38:1,13,20  
 38:21 39:2,2,3 40:14

42:10,13 43:1,12  
 44:11,14,16,17 48:6  
 48:13,13 49:5,11 50:4  
 50:7,13 52:4

---

**T**


---

**tabulating** 9:18  
**tailor** 15:12  
**take** 6:5 17:8 26:15,16  
 27:15 34:11,14 36:14  
 41:10 46:12 47:19  
**taken** 31:1,2 34:9 44:2  
**talent** 1:3 2:4 4:6 5:16  
 15:7 21:1,4,19 22:3  
 25:3 26:4,8 27:1,4,7  
 27:21 28:5 31:15 33:5  
 33:6 34:21 35:1,3,4,5  
 35:13 36:6,10 37:19  
 40:1,21 41:3,18 42:11  
 44:6,17 49:5 50:14  
**talk** 5:21  
**talked** 23:13  
**team** 8:10  
**teams** 4:19  
**techies** 6:19  
**techniques** 14:8 24:8  
 25:15 30:6  
**technologies** 4:17  
**technology** 7:9 20:4,20  
 38:9 39:17 40:12,20  
 40:20  
**television** 20:14  
**telling** 27:18  
**temporal** 18:10  
**term** 10:12 32:7  
**terms** 23:15 24:15 25:4  
 27:18,19 28:14,15  
 29:8,16,18 30:12  
 31:16 34:14,17 37:20  
 51:16  
**test** 8:7,8  
**text** 14:19 17:22 19:2,6  
 37:9 50:22  
**thank** 2:12 5:9 35:22  
 36:5  
**thanks** 2:3 6:11 52:19  
 52:22  
**themes** 33:14  
**thing** 50:20,20  
**things** 5:7 31:17 40:11  
 40:11,12 49:20  
**think** 11:6 25:3 28:7  
 37:5 38:11 39:1 40:16  
 41:15 43:16 44:14  
 45:9 48:21  
**thinking** 10:6 41:21  
 43:14  
**third** 6:1 28:13 30:16

33:1  
**thought** 26:1  
**thoughts** 39:13 46:13  
**thousands** 40:4,5  
**three** 5:18 17:13 28:8  
 42:20  
**THURSDAY** 1:6  
**tie** 44:9  
**time** 2:2 3:16,20 4:4  
 34:12 47:1 49:10  
 51:12  
**timely** 11:18 16:3  
**times** 20:16  
**tips** 2:14  
**today** 5:5 6:10,22 7:15  
 8:5 39:14 40:12 46:12  
 52:2 53:1  
**today's** 2:4,9,12 4:5 5:6  
 5:13 36:6 43:10 46:20  
 52:18,21 53:3  
**toggles** 2:18  
**tomorrow's** 20:2,3  
**tons** 33:19,19  
**top** 9:5 21:22 27:20  
**topics** 5:19  
**touching** 20:5  
**traceability** 13:3  
**traceable** 13:3  
**traced** 7:17  
**traditional** 10:11 29:4  
 30:3,4 41:13  
**traditionally** 23:14  
**train** 18:16  
**trained** 14:16 15:1,9,11  
 18:14  
**training** 18:16 47:19  
**transactional** 48:13  
**transcript** 1:20  
**transform** 30:10  
**transformation** 21:7  
 25:2  
**transformational** 25:8  
**transformations** 31:15  
**transformed** 7:15  
**transforming** 6:1 21:5  
**transition** 21:17 22:6  
**translate** 51:15  
**translation** 51:4,20  
**treatment** 16:16,18  
**Trek** 6:22  
**tremendous** 7:5  
**trick** 14:6  
**tricky** 50:20  
**tries** 15:10  
**true** 35:13  
**truly** 30:17  
**trust** 12:13,16  
**trying** 21:4 29:18 45:17

45:18  
**Turing** 8:6,7  
**turn** 35:20,22  
**turning** 5:6  
**two** 3:12,14 9:5 12:2  
 14:14 35:11 39:12  
**type** 3:20 24:14 26:14  
 26:21 36:21 37:16,16  
 38:9 39:7,10 41:1  
 42:22 44:13 51:1  
**typed** 17:22 26:17,21  
 27:6 41:16,17  
**types** 8:15 24:2 25:18  
 28:22 46:6  
**typical** 23:19  
**typically** 24:12 25:19  
 31:21,21 37:14 43:8  
**typing** 50:22 51:9

**U**

**U.S** 20:14  
**ubiquitous** 19:18  
**ultimately** 12:20 16:8  
 33:9  
**undergoing** 21:6  
**understand** 10:9 11:15  
 15:22 18:8 23:6 24:4  
 27:17 30:4,7 32:18,19  
 38:4 41:4 43:3 51:15  
 51:21  
**understanding** 13:12  
 23:20 27:22 28:15  
 33:17 39:19 40:9  
 49:14  
**underway** 17:12 19:11  
**undoubtedly** 33:18  
**unified** 25:10  
**uniquely** 15:12  
**unit** 9:10  
**unprimmed** 40:19  
**unstructured** 11:21  
**upcoming** 2:8  
**upper** 3:6  
**upsurge** 19:22  
**usable** 11:19  
**use** 33:6,6 35:9 41:14  
 45:10 47:3  
**useable** 16:3  
**user** 14:7,18 15:9 16:8  
 35:10  
**user's** 18:10  
**users** 14:12 18:3,8  
**uses** 15:7 37:19 42:11  
**USS** 6:21

**V**

**validate** 23:4  
**value** 4:19

**variety** 19:6  
**various** 12:7 19:9  
**vast** 11:20 13:12  
**version** 3:9 20:12 37:18  
 38:2  
**versions** 3:12  
**versus** 41:13 46:4  
**vetting** 42:4  
**video** 19:7 26:16  
**visionaries** 6:6  
**visit** 36:9,12  
**visualization** 18:4 27:9  
 27:14 41:19  
**visualizations** 49:17  
**voice** 18:3  
**volumes** 13:14

**W**

**walk** 26:6  
**walked** 25:4  
**want** 2:10 6:4 16:20  
 17:7 25:20 26:13  
 29:20 36:1,14 44:9  
**wants** 25:19 36:5  
**warehouse** 42:8  
**warehousing** 42:17  
**wasn't** 9:6  
**Watson** 9:5,11 15:6,8  
 15:15 16:11,13,21  
 18:19 20:13,15,20  
 25:9 26:5 28:6 37:4,8  
 37:18,19 47:17 49:1  
 50:18 51:14  
**way** 6:2 8:8 11:6,11,19  
 15:19 16:3 20:10  
 21:21 22:4,22 46:5  
**ways** 21:19  
**we'll** 4:3  
**we're** 21:4  
**web** 18:1 19:14  
**webcast** 1:3 2:4,6,15,15  
 5:7 36:11,12 46:14  
 52:18 53:2  
**website** 14:22 15:4  
**Weizenbaum** 13:22  
**welcome** 4:9  
**went** 53:5  
**wide** 20:9 39:21  
**widely** 19:14  
**wild** 5:15  
**window** 2:20 3:2,5,7,11  
**windows** 2:17 3:1  
**words** 51:16  
**work** 2:18 19:2 21:21  
 22:9 25:19 27:16 37:1  
 39:1 42:6 45:4,10  
 50:4 51:5,21 52:5  
**worker** 21:12

**workforce** 1:12 4:12,14  
 4:22 5:13 21:9,20  
 22:2,9,10,20 23:17  
 24:21 31:5,16,18,22  
 34:18 35:17 36:9  
 48:21 49:4 50:5,8  
**working** 23:1,2,2 30:21  
 31:4,11 32:12 33:8  
 34:7 35:7 40:2,4 44:8  
 49:13  
**works** 39:11  
**world** 5:15 9:3 12:6,8  
 13:13  
**worldwide** 4:17  
**woven** 6:15  
**wrap** 46:19  
**written** 13:22  
**www.ibm.com/smart...**  
 36:13  
**www.shrm.org/webc...**  
 2:8

**X**

**Y**

**year** 9:9  
**years** 4:15 7:7,12,13  
 9:15 20:12 39:15,16  
 42:21,21  
**yesterday** 35:1  
**York** 35:2

**Z**

**0**

**1**

**1,000** 40:3  
**11** 1:7

**2**

**2,400** 20:16  
**20** 4:15  
**2011** 9:5 20:12  
**2014** 9:9 20:15  
**2015** 1:7  
**24** 20:15

**3**

**4**

**40** 22:10

**5**

**50** 7:6,12,13 9:14  
**50s** 8:6

**6**

**60s** 8:10 13:20 14:1  
**64** 14:1  
**66** 14:1

**7**

**750** 20:15

**8**

**80s** 8:18

**9**

C E R T I F I C A T E

MATTER: Webcast: Talent Analytics in the  
New Era of Cognitive Computing

DATE: 06-11-15

I hereby certify that the attached transcription of page 1 to 62 inclusive are to the best of my professional ability a true, accurate, and complete record of the above referenced proceedings as contained on the provided audio recording; further that I am neither counsel for, nor related to, nor employed by any of the parties to this action in which this proceeding has taken place; and further that I am not financially nor otherwise interested in the outcome of the action.

*Neal R Gross*

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701