Understanding IBMs Watson Platform

Company Participants

- Anurag Rana, Senior Analyst
- David Schubmehl, Research Director
- Jitendra Waral, Senior Analyst

Presentation

Anurag Rana {BIO 7440273 <GO>}

Good morning, everyone. Hi, my name is Anurag Rana. I'm a Senior Analyst with Bloomberg Intelligence. Welcome to the webinar focused on understanding IBM's Watson Platform. Our guest speaker today, is Dave Schubmehl, Research Director at IDC. We also have Jitendra Waral, Senior Analyst, Bloomberg Intelligence following the Internet sector as our speakers.

So let me just start with some housekeeping notes. Today's presentation will be recorded and available for playback. At the bottom of the slide window, you will notice that you can adjust volume and maximize your screen. Feel free to ask a question by submitting one to the right of your slide; we will address questions at the conclusion of the presentation.

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I'm going to now leave the floor over for David Schubmehl, who is going to talk a little bit about his research practice at IDC.

David Schubmehl

Thank you, Anurag. Good morning, folks. I wanted to talk to you today about Cognitive Software and AI Software in general, and specifically IBM Watson and we'll do that by starting out and talking about what the attributes of cognitive software are. So if you think about it the software has been around for about 20 to 25 years, 30 years and has been around and responds essentially to a set of algorithms.

What we're talking about today in terms of Cognitive and AI software is, where software that doesn't necessarily need to be programmed; where the systems

actually learn on their own and you've seen many discussions about it. People talk about deep learning; they talk about machine intelligence; they talk about artificial intelligence in very general terms; and all of these are essentially synonyms for Cognitive Software technologies.

And some of the technologies that we support are up here on this slide. So for example, we handle a lot of unstructured information. So we handle audio information and textual information, so we can do natural language processing. In some cases, we're actually right, the software can generate human readable sentences and paragraphs, so that's natural language generation. I mentioned the machine learning component already, where the system actually learns and essentially modifies its own algorithms over time by using different types of algorithms. Pattern recognition and automated analytics and predictive capabilities are all part of these Cognitive Software technologies.

At the same time, there is a lot of other technologies evolve too. So there's things like image analytics, the idea of being able to understand semantics and being able to interpret what people are actually saying and how they're saying it, which want to be able to actually understand and create hypothesis and predictions; and it's really all about understanding the various senses that people are looking at. So we've got sensory input processing and also emotion recognition as well.

So if we take a look at this ecosystem, what -- the way that IDC looks at this is that we have all these components that I talked about previously. We have the dialog management; and the APIs, the text analytics, the speech recognition, all of those components. All of those components are usually put together into a Cognitive and AI Software platform. And this is where tools like IBM Watson and some of the other tools, Wipro's Holmes; and TCS ignio; Salesforce's Einstein, these are platforms that people are actually using to develop Artificial Intelligence applications.

Around that we have this white circle around content and data. And I think one of the reasons that we include this circle is that these applications are inherently statistically driven. So they are based on the data. Their actions, the predictions, the recommendations are based on the data that's fed into these systems. So it's very important that content and data feeding into these systems would be correct that it be available, that you have a combination of first-party and third-party and possibly second-party data, so all of these considerations need to go into that.

The other thing that's very important here is that data has become an integral component of these Cognitive and AI solutions, which we'll get to a little further when we talk about IBM strategy. And there was actually a market for third-party data that's beginning to emerge, as part of these kind of applications.

Last but not least, are the different types of applications. So we have process applications that are cognitively enabled. We have the -- we're seeing those in sales. We're seeing them in finance. And we're also seeing industry applications around being able to help healthcare in terms of improving patient outcomes; being able to

do money laundering; being able to come up with the right price for a particular product.

We're seeing business-to-business services in terms of advertising, legal systems, commercial leasing, you know, all of the applications that -- tools like Airbnb and Uber are using to disrupt their industries are based on these kind of Cognitive and AI type of solutions.

And then, last but not least is the cognitively enabled consumer services and products; and we're seeing a wealth of these come into the marketplace. Everything from the retail systems that help you pick and choose, what kind of coat you want to wear, to being able to help you identify, where the best place to travel at the best price, all those kinds of things are becoming what we call cognitively enabled.

So if we look at some of the most popular used cases, we're seeing obviously that healthcare and manufacturing, finance, government and retail are some of the most popular used cases we're seeing. In terms of IDC's cognitive spending guide research, we're seeing that finance is one of the most advanced areas, where people are spending the most money initially; and we're seeing healthcare following that closely; and then retail right after that.

Manufacturing and government are a little bit more behind, but I think, where we're seeing these opportunities is really -- the entire gamut of cognitive applications running through all of the industries and running through all of the different used cases. So almost everything that we can think about in terms of software is going to be or will be cognitively enabled at some point; and it's probably the near future i.e., the next 5 to 10 years.

So in terms of IBM Watson, we were -- I was asked by Anurag to kind of what is IBM Watson? Well, it's really a technology platform. Their definition it's a technology platform that uses natural language processing and machine learning to reveal insights from large amounts of unstructured data and really that gets to the heart of what we're talking about here. Taking all of this sensory input, taking all of this text, taking all of this different type of data and making sense of it and being able to help, augment and improve workers' decisions and predictions based on that data.

So what are some of the components of the IBM Watson portfolio? Well, first and foremost is the Watson Developer Cloud. IBM set this up in 2013; and they've got over a 100,000 developers and hundreds of partners. In addition, they also have a venture capital fund, where they are funding various partners; and also providing seed money to help companies with innovative ideas make use of the Watson Developer tools. There is -- a number of tools, those Watson Developer Cloud is available via Bluemix. Some people can get access to it easily and then they can start working with that.

So that's one of the primary areas is the Watson Developer Cloud. At the same time, there is other areas, so Watson Explorer is really their search and discovery

application, which includes Cognitive and AI components in it; and is being able to help organizations to find and locate that information and then make use of that information to the decision-making processes.

IBM has also created a number of Watson business units. Watson IoT, which is looking at combining Cognitive and AI technologies with the IoT urgence or the IoT areas that's growing out there. They've also created a Watson Health by acquiring a large number of companies and combining the healthcare aspects with the Cognitive and AI technology. So this is an area that that IBM has been in -- since Watson first got started just after the Jeopardy's challenge. There is a Watson Solution for cancer diagnosis and cancer care based on data coming from Sloan Memorial Kettering.

At the same time, Watson is also creating some new business units; and they just recently made the announcement that they're going to acquire Promontory Group, which is all around financial compliance. So I think it's safe to say that we'll probably see a Watson financial compliance business unit coming up in the near future.

At the same time, there is a number of other tools. Watson analytics is really IBM's answer to try to reinvent the business analytics workspace and to make Watson analytics that tool, again a cloud-based tool, where you can upload your data, start playing with it, automatically you get use predictive modeling and predictive discovery to be able to identify different aspects of your particular data.

And then last but not least are the Watson Solutions that we see out there, Watson Engagement Advisor, Watson Discovery Advisor, there is a new one called Watson Conversations for being able to hold Conversational User Interface; we're seeing those kind of things out there as well.

So if we look at Watson Health, the Watson Health is really all about that data and knowledge. And if you notice, I talked a few minutes ago about how content and data is very important to these kind of applications. Well, IBM has been acquiring companies that have lots and lots of data. Merge has 30 billion images; Phytel and Explorys has 100 million patient records; Truven has 250 million claims records. And then, then you've got the generic one, you've got the weather company including 3 billion reference point.

So all of this data is out there. Using that data in concert with the cognitive applications is really what provides the insight around how well these organizations actually can make use of these kind of Cognitive and AI Solutions. So it's the combination of the data with the Cognitive and AI Solutions that really help to drive all of the stuff in the market.

So as we mentioned that Watson Health insights is really driven by data. And I think this is just a good example of how to think about Watson's different business units in general. They're combining their data, but they're either acquiring or getting through partnerships. They're taking their Cognitive and AI technology solutions;

and they're combining the two together with services and other aspects to really deliver the insight that companies are looking for in terms of being able to transform their businesses in that digital transformation that we're starting to see in the marketplace.

So one of the questions that I get a lot is, what does the competitive landscape look like? Well, obviously, on the left hand side, we have a large number of Cognitive platforms out here. IBM, we have upped [ph], but obviously there is other companies like Palantir; and Digital Reasoning, IPsoft, and Nuance; startups like CognitiveScale and Numenta are companies that have been acquired. Intel acquiring Saffron Technologies and Nervana Systems. Other companies coming from -- some of the consulting companies like Tata Consultancy Services and Infosys and Wipro, there's just a very wide range of competitors in the marketplace.

Over here on the right hand side are the companies that don't actually have, what I would considered to be Cognitive Software platforms today, but they do have those APIs and services; and are starting to make those available to people. Everybody from Lockheed and SAIC, who are getting involved in this work, and Fujitsu and Baidu to companies like Google and Facebook and Microsoft and Amazon, who offer different types of Cognitive API services, but I wouldn't really characterize those as a complete platform at this point in time.

So last but not least, kind of in summary, we really see, IDC sees that AI is changing the nature of work. These recommendations, assistance and augmentation in terms of it automated advisors is really going to become the norm in almost every field. So every piece of software that you use is going to have some type of augmentation or recommendation capabilities there.

And then I think this is really kind of a once in a generation transformation. I mean, I think the idea of Cognitive and AI Software combined with some of the other technologies that we're seeing in the market is really transforming the way that people will use software over the next 5 to 10 years. And I think that in turn will also transform how companies do business; and that's why we feel that industry structure is going to be changed. To take advantage of these we're going to see disruption. I mean, people talk about Airbnb, people talk about Uber, as disrupting influences. Well, one of the reasons that they're disrupting influences is because they're using Cognitive and AI and machine learning applications to help drive those disruptive businesses and that the machine learning technologies; and the AI technologies are really some of the disrupting components in this.

And from a company standpoint, I would recommend that if you happen to be involved in decision-making at your particular company, you really need to start thinking about how these applications are going to change your business and how you're going to make use of these applications to really get the jump up and get the edge in your particular industry.

With that, I'll turn it back to Anurag.

Anurag Rana {BIO 7440273 <GO>}

Thank you so much Dave for that comprehensive overview. I'm just going to make a request that if you have any questions feel free to ask them by submitting one in the area to the right of the slides. So let me start off with a question and then I'll pass it on to Jitendra to -- we will switch back and forth. So now, Dave you described Cognitive Science as one -- is a generational transformation for the sector. Now among the people that you talk to what is the current level of awareness?

David Schubmehl

I think people are aware of this. The popular press has done a tremendous job in raising the issue, but I think they've also raised a lot of misunderstandings. But I think that the awareness that Cognitive and AI technology is coming and what is going to be able to do for you, I think is fairly common today. What I don't think is common is, whether businesses and organizations have actually thought about how they're going to use Cognitive and AI technologies to be more competitive or to improve their ROI or to improve their sales. I don't think that level of thinking has really yet taken hold.

Anurag Rana {BIO 7440273 <GO>}

So Dave having said that, I mean what would you advise CEOs and CIOs with respect to early deployment of Cognitive Solutions? I mean, where should they start? Should they focus on costs, revenues? Where are some of the best practices you have seen so far as far as early deployment of Cognitive Solutions are concerned?

David Schubmehl

I think it's really interesting. I mean, I think we're seeing companies that are kind of doing every -- a little bit of everything. There were some companies that are looking at reducing costs, we're seeing financial companies, for example, looking at Cognitive and AI Software to do fraud investigation because it -- you can actually do a better job and a quicker job of solving that. We're starting to see people using Cognitive and AI Software for cyber security to help solve those kind of problems.

We're also seeing organizations at the sea level, where they're starting to talk about how can Cognitive and AI technologies disrupt our business, so that we can actually deliver goods faster or that we can drive a new business model from Cognitive and AI hub [ph].

So in terms of the best practices, what I think, we've been asking or we've been telling people to do is really do an assessment of how data-driven your organization is today. And if it's not data-driven, then you really need to get a handle on what your data is? What do you have? What do you own? What do you get from third-party sources? Because the data is really the -- one of the key components that you need to look at. Once you have that data and you have a good handle on what

you've got and what the quality is, then you can start to take a look at, well, how could a Cognitive and AI solution begin to change that mindset?

On the end user side, we're also seeing, there has been -- everything in this press around Conversational UIs, and chatbots and the future is that. So we're seeing a lot of companies being starting to test the waters around. Is it the right time for us to maybe take our customer service and augment it with a conversational AI agent? Or if I have an IVR system, should I think about replacing that IVR system with a conversational AI agent to do a better job and also turnover possibility and to -- and to turning my customer support calls into actual sales?

Anurag Rana {BIO 7440273 <GO>}

Hey, Dave, in our conversations with the technology and software companies, I think the awareness is very high, everyone and their brother is launching some new AI product any -- any given day. But what's kind of the awareness for non-technology companies that are, let's say, somebody in the manufacturing area or metals and minings, I mean, what's they -- do they have any idea of what's happening here?

David Schubmehl

Oh, yeah, I think they do. I mean, if you look at -- if you look at companies like for example, Caterpillar. Caterpillar has been developing autonomous driving mining vehicles for the last several years in terms of being able to reduce their costs and things like that. John Deere is combining Cognitive and AI software with data collection at the point of where the farm implement actually hits the ground to try to improve farmers' yields and things like that. They have been making the tractors and the farm implement actually delivered data that can be then used to develop predictive models.

So I think that -- I think there is lots and lots of opportunities here for all sorts of traditional companies. You just need to think about what kinds of data that you have and what kinds of data that -- that if you could develop predictive models or you could develop recommendation systems, how would that potentially change your business opportunity?

Jitendra Waral {BIO 15423976 <GO>}

Dave, can we go through some of the strategies of companies other than IBM? I mean, everybody else is pitching to AI solutions, obviously Google is top of the hill with the DeepMind acquisition and all the applications they're doing on back of that. How does -- how does -- what is the differentiation with IBM Watson? And you think this differentiation is something that will last longer -- longer term given of what the competition in-store [ph]?

David Schubmehl

Well, I mean, I think that, if you look at how Google has approached this, I mean, Google has been approaching this from a consumer standpoint for the most part. And I think they just recently announced that they're going to add into the Google horizon or I forget what the name of the new product is, but they're adding AI components into their Google for work products.

So they've been focusing on embedding cognitive capabilities into their products and not necessarily creating a complete enterprise platform for building a Cognitive AI solution. I think that's changing, and as Google develops more machine learning services and more APIs, I think they're going to get into that marketplace. But I think, IBM has a -- it has a pretty big head start in that particular area.

In the same way, Microsoft has been developing AI technologies for a long time and most of their AI technologies have been embedded inside SharePoint, their Microsoft Delve product that really offers all those kind of capabilities. They have their Cognitive Services, Microsoft Cognitive Services, but I would -- I wouldn't characterize those as mature as the IBM Watson technologies out there. So in some sense I think, IBM has a head start on this. Also I think IBM has been thinking about this longer as a transformational process involving Cognitive and AI systems than other companies have.

I think Microsoft, Satya Nadella talked about how important AI was at this year's Ignite and how everything is going to be transformed by AI. And I think that's great and I think that's where it is, but the CEO of IBM was talking about that 2.5 years ago. So I think there is that head start that the IBM folks have it -- based on the Watson technologies and their approach to business.

Anurag Rana {BIO 7440273 <GO>}

Fair enough, Dave. Dave, actually look at just the cloud businesses of different companies, whether it's Amazon Web Services or Microsoft, they have been the leaders for some time now. Now, how does Watson help IBM's cloud strategy?

David Schubmehl

I mean, I think it helps their cloud strategy in terms of being able to make the AI components available via the cloud. I think, they've done a lot in terms of delivering the Watson Developer Services, as part of the Bluemix platform; and I think that's helped advance the usage and popularity of the Bluemix platform. And so I think from that standpoint, I think it's been a -- it's been a win-win situation for them in terms of the fact that they have all these Cognitive and AI services and they're making available via Bluemix.

Jitendra Waral {BIO 15423976 <GO>}

That's great. So can we talk about like what -- how do you -- we think about the market size over here because obviously the impact seems to be very widespread,

how do we size the market? How do you look at how much this is worth and how these guys monetize it?

David Schubmehl

So we -- yeah, I mean, we're sizing it in a couple of different ways. One was, as part of our spending guide research, we're looking at the spend available on those. And in terms of the software side, I mean, well, there is actually multiple different technologies. There's obviously the hardware side and for that we're seeing increases in GPUs; and we're seeing increases in compute power coming from different folks.

On the software side, we see there is -- there is kind of two differentiations; one is these Cognitive Software platforms that we -- that I've talked about, which is a business that's going to grow quickly, but it's a tools business, all right. As opposed to the cognitively enabled applications business, which is really, I'm going to add AI into a piece of enterprise software or I'm going to develop a new piece of software to do something; and it's going to be cognitively enabled. We see the totals of these -- of all these technologies being something like a $30 billion business -- $30 billion opportunity by 20 -- I think its 2019 right now is what we've got.

And then the growth rate is something on the order of 50% to 55% CAGR, Compound Annual Growth Rate for these types of applications.

Now, one of the things I'm going to caution people about is that we're also seeing enterprise software companies adding AI components into their standard enterprise software; and in some cases, they're probably not going to charge for those. So for example, the version of SharePoint that includes that Delve technology that I talked about is, it doesn't cost any more than just regular SharePoint. It's just part of the package. And we're going to see some percentage of these applications that actually going to embed AI functionality; and there's not going to be any additional revenue for the software vendors, but it will help to sell more copies of their packages.

So in those particular cases, we won't count that as -- as a AI revenue or a Cognitive Software revenue, we'll count it as ERP revenue or CRM revenue or what have you.

Questions And Answers

A - Anurag Rana {BIO 7440273 <GO>}

Thanks, Dave. Dave, we have some questions from the audience. The first one is, are there any specific AI companies in healthcare that you would highlight as being ahead of the curve?

A - David Schubmehl

I mean, there is a number of Watson partners and people that have been out there. I mean, I'm not really an expert in the healthcare area. But I mean, there is a company

like Modernizing Medicine that I thought was quite innovative based on their partnership with IBM. There is other companies out there that are doing interesting things and our Health Insights Group is probably the people to ask specifically about the healthcare environment.

A - Anurag Rana {BIO 7440273 <GO>}

Great. So the next question is could you discuss the extent to which Watson is -- are being used to fight cyber-crimes or attacks?

A - David Schubmehl

The -- I don't believe if there has been any announcements about IBM Watson in terms of cyber security and things as of yet. I'm not really -- that's not my particular area, but I don't -- I'm not really aware of it. What Watson has been used for is really that fraud analytics and compliance analytics that we're seeing in the place. I think there is also some work going on with IBM Watson under DoD work and things like that that we're not really aware of officially, but I think it's a safe bet that IBM is working closely with the federal government to try to -- to try to analyze and understand different types of threats.

A - Anurag Rana {BIO 7440273 <GO>}

Great. Just one -- another one is, what businesses are -- what do you think, what businesses are at the risk of being obsolete as Cognitive computer replaces their services. When you look down the list, what areas come first to your mind?

A - David Schubmehl

Well, I mean, I think -- I think people need to be thinking about how different types of technology are going to be changed and impacted. So if you think about the fact that you may have a Cognitive or AI program available to you and do you need Records Management Software, do you need Content Management Software, if you have a smart agent automatically finding that information and providing you with that information on a regular basis. So I think -- so I think, certain categories of software are potentially at risk, as you have automated solutions available out there to do that.

I think there is -- one of the things I've been talking about with my marketing automation counterparts here at IDC is, what is the future of marketing? Given that you may have AI based assistance in the future onto your phone and onto your PCs that are actually helping to filter information, are they going to filter ads? Are they going to filter marketing tent? How is the intermediation of your automated agent going to work with vendors marketing agent? What's the intermediation going to look like? Will advertising potentially go away at least in the sense that we know it today, in terms of targeting and things like that? I think those are all interesting questions. And is that going to change the landscape for how people consume information?

A - Jitendra Waral {BIO 15423976 <GO>}

Thanks, Dave. You've briefly touched on automated advisors, where are we on the evolution curve of that? I mean, if you look at consumer application Facebook is trying to pilot chatbots. There are -- there are examples that work; there are some that don't. So how far are we in terms of these automated advisors being ready for prime time?

A - David Schubmehl

I mean, I think -- I think it's early days, right now. I mean, I think we're starting to see everybody continuing to push that. I mean Microsoft's Cortana and Google Assistant, Apple Siri, all of these phone based ones continue to get smarter.

I think the question is, will you have something that's intimately tied to your phone, into a vendor or is there going to be somebody that provide some kind of a general purpose assistant that really becomes your advisor and that you pay to have that kind of automated advisor like the x.ai that helps you to schedule or some of the other personal assistant technologies that are out there. I think the form and the factor of those are kind of up for grabs right now.

And the other question is, who gets to own your data? Obviously, you as the consumer would like to own your data. But right now, if you use Google Assistant, or you use Gmail, your data is read by Google to try to improve things, but that also improves the targeting and marketing. Apple owns your data, if you're using an Apple iPhone and Siri. I mean, they say that it's all yours, but obviously there is some interaction there. And then, obviously Microsoft is in the same boat, as it uses -- as you use Cortana, there is certain things that that it's going to be aware of.

So the question is who owns that data? Who is responsible for that data? And how -- when you go in and look at that data and work with that data? And then are you going to want a third-party AI advisor out there or are you going to want a one that's based on your phone and be for free. I think those things are all kind of yet to be determined. And I think to some extent, I think everybody is doing a stepwise improvement in this automated advisor area until something really takes hold with the consumers.

A - Anurag Rana {BIO 7440273 <GO>}

Dave, thanks. Dave, let me ask you the last question; and then we should wrap it up. One of the things you talk quite a bit about was buying data or everybody how data is going to be very important to them; and obviously after Microsoft bought LinkedIn we have heard a lot about Salesforce trying to say that they will -- might not get access to something like this. Now, is this going to become a bigger issue? Will for example IBM down the road say well, we are not going to give data for let's say the assets of The Weather Company to anybody else out there or will this become kind of an anti-competitive thing going forward?

A - David Schubmehl

I don't -- I think the companies like Microsoft buying LinkedIn data and IBM buying The Weather Company, I think their -- I think their business models right now include

sharing that data with third parties. And I think everybody would be -- if they started to hold that data and say they wouldn't share it. I think obviously the world's governments would be out after these folks, in fact, it's -- to some extent it's already happening.

But I do believe that here you're going to see this land grab continue of companies trying to acquire data and have access to data and the data process and the data integration capabilities of those; and then they're going to be first and foremost. So I think IBM will continue to look for good acquisitions of data like what they did with The Weather Company, like what they did with Merge, I think Microsoft is going to do the same thing with LinkedIn. Salesforce did this a couple of years ago with Data.com.

So I think there is lots and lots of opportunities. I mean, Oracle is doing something similar with the Oracle Data Cloud, the company they bought BlueKai and they bought some other companies that they've integrated it into a real data provider. I do believe that this -- there's going to be increased competition for data companies; and I wouldn't be a bit surprised if other large data companies get acquired by the software technology companies over the next 12 to 36 months.

A - Anurag Rana {BIO 7440273 <GO>}

Great. Dave, thank you so much on behalf of the Bloomberg Intelligence team for -- from your help here. You can access all of our research on the terminal. Jitendra and I have done a comprehensive report on Artificial Intelligence. Please email us, if you need a copy of that report; and we will send it to you. But once again, thanks for your time and have a great day.