

White paper

Getting to know you: How to use deeper individual insights to drive innovation

Part 2 of a 2-part series



Watson

IBM

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Executive summary

In a market where industries are converging, competitive upstarts are challenging established stalwarts, and disruption is the norm, organizations are increasingly under pressure to innovate. In today's world of mobile devices, cloud services, and democratized content creation, this innovation imperative is focused squarely upon creating and enhancing the consumer's digital experience.

Organizations often focus on personalization, but find creating a truly individualized experience challenging. Traditional means of innovation are often not suitable for today's quick-paced and lean business environment. For that reason, many organizations are looking to outside resources to provide the all-important launch pad for their own ingenuity.

With the advent of the application programming interface (API) economy, organizations can relatively easily and efficiently cull data from a variety of sources to build a comprehensive base of digital intelligence. Advancements in cognitive computing have made it possible to analyze and interpret vast amounts of unstructured data that was once "dark" to organizations, quickly and at massive scale. At the intersection of these powerful forces, Watson™ is helping organizations seize opportunities with a comprehensive suite of cognitive APIs that deliver deep insights into individuals using a seemingly inexhaustible resource: their own unstructured content.

With Watson Personality Insights, Emotion Analysis, and Tone Analyzer services, organizations can drive innovation by:

- Personalizing interactions with approaches tailored to the individual's predicted personality
- Making informed (and influential) recommendations based on the needs and values which motivate the individual's actions
- Connecting with empathy through a fine-grained understanding of an individual's emotions
- Communicating more effectively by ensuring the tone and tenor are representative of the brand and tuned for the situation

These services are part of the Watson Developer Cloud, a suite of flexible, cognitive APIs backed by the latest advancements in machine learning.

The innovation imperative

Industries are converging and the boundaries between them are eroding. A challenger who today isn't even a blip on the radar, could tomorrow be a significant disruptor in the market. So technology leaders must embrace.

According to a recent survey conducted by IBM, most CxOs anticipate changing the way their organizations engage with individuals, with 66 percent reporting they're especially interested in creating more digital, personalized experiences.¹ However, achieving true innovation when it comes to deepening relationships with individuals is no easy feat.

Missed part 1? Read it now
at ibm.biz/gettingtoknowyou1

Organizations looking to innovate can often be hindered by:

- **Limited resources.** If the time between an investment and its return is lengthy, companies may have little else available to support other parts of the business, which risks opening gaps for competition to fill.
- **Limited expertise.** Innovators are rare and can be difficult for organizations to recruit and retain, especially if the organization is located outside of a major city or tech hub.
- **Limited agility.** Staying abreast of change, discerning trends from subtle signals, and then re-aligning innovation efforts as market dynamics shift can be difficult for even the nimblest organizations.

Many organizations find that conventional approaches to innovation are not well-suited to the realities of today's rapidly changing marketplace. According to the same IBM survey, more than half of all CxOs are looking for additional innovation from outside sources to help them seize opportunities before their competition.² One way organizations are doing this: Leveraging APIs, which enable applications to “hook” into a variety of data sources on the web with relative ease.

By adding their own ingenuity to existing APIs, organizations can derive novel insights from the data they possess, the data outside their firewall, and the increasing amount of data from sensors and devices. This digital intelligence can then be used to advance critical business initiatives.

Traditional versus cognitive computing

Traditional computing systems are based on rules that shepherd data through a series of predetermined processes to arrive at outcomes. While they are powerful and complex, they are deterministic—thriving on structured data, but incapable of processing qualitative or unpredictable input.

Cognitive systems are probabilistic, meaning they are designed to adapt and make sense of the complexity and unpredictability of unstructured information. They can “read” text, “see” images, and “hear” natural speech. And they interpret that information, organize it, and offer explanations of what it means, along with the rationale for their conclusions.³

Use cognitive APIs to create individualized experiences

For companies seeking ways to deepen relationships with individuals without the upfront costs, delays, and staffing challenges associated with conventional methods, cognitive APIs are a promising alternative.

Cognitive computing enables organizations to glean robust, actionable insights into their customers and prospects using digital means, which are more accurate, efficient, and scalable than traditional methods such as focus groups, market research and surveys. Cognitive APIs give developers the opportunity to put those capabilities to work in their own applications just by writing a few lines of code.

Watson is at the forefront of this kind of innovation, with a suite of cognitive APIs backed by the latest advancements in artificial intelligence and machine learning. With these APIs, developers can quickly and easily build applications which understand, reason, learn, and interact naturally with people. Using those capabilities, organizations can get deep insights into various facets of an individual to build personalized digital models personalized to that individual. Those models use individuals' own freely available writings as the source of insights and can incorporate many different aspects of an individual, such as their personality, needs and values, emotions, cognitive style, motivations, and communication style.

Unlike traditional methods of personal understanding, digital models built using cognitive computing can be developed for massive quantities of individuals, quickly, and at relatively low cost. Organizations can develop deeper insights, more quickly and efficiently than ever before, which can then be used to drive disruptive innovation.

Watson API	What it does	How it works
Personality Insights	Predicts an individual's personality characteristics, needs, and values to drive personalization	Extracts and analyzes a spectrum of personality attributes to derive actionable insights about people and entities, and in turn guides end users to highly personalized interactions. The service outputs personality characteristics that are divided into three dimensions: The Big 5, Values, and Needs.
Emotion Analysis (currently part of AlchemyLanguage API)	Discerns the feelings of an individual by analyzing his or her writing	Uses linguistic analytics to measure the emotions implied by a text sample. Each request returns confidence scores for anger, disgust, fear, joy, and sadness.
Tone Analyzer	Describes language tones contained in text	Uses linguistic analysis to detect three types of tones from text: emotion, social tendencies, and language style.

Table 1:
Watson personal understanding APIs and the value they deliver to organizations looking to innovate with digital, personalized experiences.

As with any emerging technology, organizations often wonder exactly what they can do with cognitive APIs focused on individual insights. Here are a few real-world examples and ideas to help you get started.

The Instagram Effect

In a world where individuals snap and upload numerous selfies and pictures of local landmarks daily—to the tune of 80 million photos a day on Instagram alone⁴—the next logical challenge is to derive insights from visual content. “The same way personality influences a person’s writing, it also influences the photos they take and upload,” says Tom Zimmerman, Research Staff Member and Master Inventor in the Computer Science Department of IBM’s Research Division. “Photos are language-independent, so they can be more universally understood. Today we can discern individual insights based on their uploaded images. It could someday be possible to discern the same insights about a person after spending a few minutes with them choosing the photos that appeal to them most,” Zimmerman hints.

Personalize interactions

From customers to patients to employees and beyond, organizations struggle to understand individuals. Watson Personality Insights can deliver insights about people that bridge the gap between business objectives and business results by providing deep insights into individuals’ personalities based on their writings, such as tweets, email, and blogs. With this in mind, companies can tailor outreach directly to individuals, improve message resonance, and use that information to shape future tactics. Here are a few examples of what organizations can do with Watson Personality Insights:

- **Create personalized marketing offers.** Earshot, a precision-based social media marketing platform, leverages the cognitive computing power of Watson to further inform their patent-pending Decibel Level™, a real-time relevancy score that helps marketers instantly discover and win new customers at the right time through social media.⁵ Clients can now “tune” into consumers on social media who have a higher likelihood of conversion and then engage them in 1 to 1 conversations or target them with additional context through precision-based paid media campaigns.
- **Screen job candidates.** Using the Watson Personality Insights service in addition to interviewers’ assessments, employers can make more informed decisions about the qualifications of a prospective employee, such as fit and chemistry.

Learn more about Personality Insights

Visit the Watson Developer Cloud to find out more about the Personality Insights service and see it in action. ibm.biz/PersonalityInsights



“Research has shown us that younger, savvy consumers want authentic conversations and relationships with brands and that social media is the most effective place to make this happen. By leveraging the power of IBM Watson, we can make Decibel Level an even smarter real-time index of relevancy to help our clients acquire and retain new customers at scale.”

David Rush, Earshot, Founder and CEO⁶

- **Derive group insights.** Companies can now get insights into individuals within certain self-selected (that is, non-demographic) groups, such as fans of a sports team or donors to a political candidate. “Employing big data techniques in conjunction with Personality Insights, we can analyze the texts of tens of thousands of group members and derive group insights,” explains Haibin Liu, Advisory Software Engineer for IBM Watson. Companies can use that to better understand and focus marketing for the group. Alternatively, a model could be trained on that information to predict certain behaviors, such as major purchases or college dropout.”

Make informed (and influential) recommendations

When an organization has insights into an individual’s personality, it also has the means to understand the individual’s motivations at a deep level. With this understanding, organizations can become valuable and trusted advisors. Consider these approaches:

- **Provide targeted marketing at the point of decision with kiosk systems.** Users can input their Twitter handle (or answer a brief survey), enabling the system to predict their personality and, in the case of a bicycle store, their riding style, and then make smart product recommendations to them. See this concept in action: ibm.biz/Bd4yK6.
- **Advise individuals on sensitive subjects.** The dating app Connectidy uses Watson Personality Insights to help singles figure out what they are looking for in a partner, recommend matches based on those insights, and then guide them on how best to communicate with their matches (using another IBM Watson service, Tone Analyzer).⁷ See the app in action: ibm.biz/Bd4vAP.
- **Recommend brands and companies.** Brand insight services could be used as a basis for recommending products to consumers, targeting companies for job seekers, or even conducting efficient competitive analysis as a basis for marketing campaigns that resonate with consumers. See an example of this at work in a designer recommendation app by Roztayer: ibm.biz/Bdrcxc.

“Brands have personality because people tend to associate human attributes with brands,” notes Anbang Xu, Research Staff Member at IBM Watson User Technologies. “We are developing new models that automatically predict the perceived brand personality based on social media data.” (See Figure 1.)

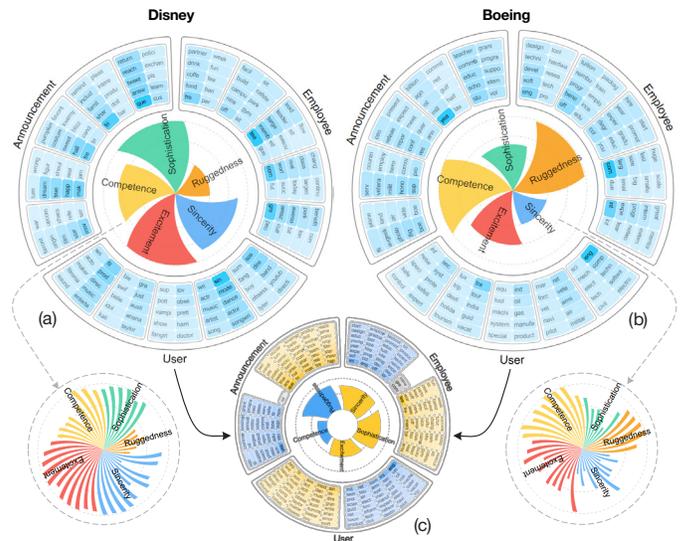


Figure 1:
An early prototype of Socialbrands, a research project that focuses on predicting the “personality” attributes of brands to inform consumer recommendations and assist with decision-making.

Learn more about Emotion Analysis

Visit the Watson Developer Cloud to find out more about the Emotion Analysis service, currently part of AlchemyLanguage, and see it in action.
ibm.biz/EmotionAnalysis



Connect with empathy

Personality and motivations are considered permanent, and relatively immutable aspects of an individual. However, they are not the only aspects of an individual that are important for organizations to understand. In every interaction with an organization, individuals expose their emotions and expect a commensurate and empathetic response.

IBM Watson Emotion Analysis (currently part of the AlchemyLanguage API) can provide the fine-grained analysis needed to better understand an individual’s emotions. By knowing the individual’s emotion at the point of interaction, organizations can then tune responses appropriately, helping to deliver productive and positive outcomes which deepen relationships.

Here are just a few of the ways an organization could put this technology to work:

- **Shape plans for caregivers.** Recently, SimpleC completed a proof of concept of an application that uses Watson Emotion Analysis. The application tracks the emotions of family members or clinical users discussing and describing the care recipient. By analyzing and understanding the level of stress in a family member’s or patient’s voice,

SimpleC gains insight into the severity of family circumstances and can adjust care plans or therapies accordingly. Read more about SimpleC's approach: ibm.biz/cs-simplec.

- **Enhance security at large events.** Security personnel can use Emotion Analysis services to discover and monitor the emotions of the audience based on specific entities or keywords posted in social media. If aggregate emotions start to score angrier, additional security precautions can be put in place.
- **Gauge employee response to corporate initiatives.** Organizations can use Emotion Analysis to evaluate internal response to new employee plans and programs, and then use those results as benchmarks for future initiatives.

Learn more about Tone Analyzer

Visit the Watson Developer Cloud to find out more about the Tone Analyzer service and see it in action.

ibm.biz/ToneAnalyzer



More ways to communicate more effectively

Communication can be tuned to an individual using more than just tonal cues. Richard Gabriel, a researcher for IBM Watson working on systems that generate natural language—with a twist—explains: “Many natural language projects tend to focus on information transfer: trying to convey bits of information in a coherent way. But by failing to pay attention to variables like word choice and phrase structure—factors that convey something alongside the emotion—such a system misses the opportunity to focus on or de-emphasize concepts,” he says. “Watson natural language generating systems will improve upon this by tailoring all aspects of communication to the target.”

Such a system could be put to work in customer service or marketing scenarios based on the target individual's emotion and/or personality, making the individual more apt to listen and respond to the message.

Communicate more effectively

For organizations that want to use individual understanding to build better relationships with people, insight only goes so far. Eventually, the organization must communicate with the individual. It makes sense for organizations to ensure their communication is effective.

With IBM Watson Tone Analyzer, organizations can analyze their writings to assess the emotional, social, and linguistic impressions being conveyed within the writing. If the intended and actual tone aren't aligned, writers can fine-tune the writing until they are satisfied that the verbiage accurately represents their position and brand.

An organization could put this kind of analysis to use in many ways:

- **Calibrate marketing communications to the objective.** Make marketing campaigns spanning multiple, diverse communication channels such as websites, email, and social media more effective by using Tone Analyzer to review content and recommend tonal revisions.
- **Facilitate effective performance reviews.** HR teams can embed Tone Analyzer within online employee review tools to ensure managers and employees are communicating in productive tones.
- **Shape positive customer service communications.** Organizations can use Tone Analyzer to analyze communications from actual service and support calls, and then script positive responses for representatives to use.

Transforming research into a cloud-based service

The infrastructure behind an API may be considered its unsung hero. Without sound infrastructure, researchers' models could not be reliably brought to life as a cloud-based service, nor could organizations rely on those cloud-based services as a foundation for their application.

"Taking models and putting them into production [as a cloud-based service] entails many things," says Mateo Nicolas Bengualid, Staff Software Engineer for Watson. "In addition to fulfilling the technical requirements of the model, we also have to ensure the service performs fast enough to make it synchronous — delivering responses within about a second. And it has to achieve that performance at scale, handling hundreds of thousands of requests a month."

Watson engineers are constantly monitoring services. Says Hernan Badenes, Senior Software Engineer for Watson. "The engineering team can determine within minutes if something is not working as it should be. That speed enables us to give customers the highest quality service possible."

With Watson engineering teams focused on ensuring fast, accurate, and reliable services, organizations and their developers are free to focus on what they do best: innovating and creating value for the business.

Watson helps companies innovate faster

Innovation has to be fast and effective. So hundreds of organizations worldwide and across diverse industries are using Watson Developer Cloud to build innovative and transformational applications, powered by cognitive computing.⁸

Watson Developer Cloud takes the complexity out of infusing cloud-based applications with artificial intelligence and machine learning. Using Watson APIs, any software developer can deploy commercial-ready cognitive applications in days, not months. The array of cutting-edge technologies underlying Watson APIs make the process of building new cognitive applications or enhancing existing applications seamless.

Organizations can access an array of tools for developers, by developers, to jumpstart application development and keep momentum going. From a growing roster of application starter kits and code samples to software development kits and comprehensive documentation, developers are supported at every step of the application development process. If additional support (or inspiration) is needed along the way, developers can find it in the Watson developer community. Organizations can also enlist IBM Watson experts to directly train and mentor their developers.

What about security?

Watson API users don't need to worry about security. "Services like Personality Insight reside on IBM Bluemix, secure in the network behind numerous firewalls. Because the API is separated from the data, organizations don't need to worry about a hacker potentially infiltrating their data through any issue in the code of the API itself," says Hernan Badenes, Senior Software Engineer for IBM Watson.

In addition, unlike others, Watson APIs do not require an organization to share their data — they can keep their private data private. For organizations with enhanced compliance requirements, additional hosting options are available.

How to get started

Companies looking to disrupt their industries by building better relationships with individuals need deeper people insights enabled by advancements in cognitive computing. These best practice strategies can help organizations get started:

- **Get the right support.** Develop a business case based on the way your business currently interacts with customers, research into trends, and potential competitive or market opportunities your company has. Talk with frontline employees as well as managers within various disciplines to get their perspective and buy-in for exploring cognitive solutions.
- **Commit to an experiment or small-scale trial.** Sponsors can validate and refine uses, while giving developers an opportunity to fine-tune and test their approach.
- **Continue to evolve the solution post-deployment.** Once your cognitive-powered application is deployed, track and monitor usage and refine your application according to what is working, and what needs enhancement. Think of ways to add new layers of understanding to your to build the strongest relationships with users.

Start on your path to market disruption today. Visit ibm.com/WatsonDeveloperCloud to learn about these services and sign up for a free 30-day Bluemix trial subscription at ibm.biz/GoCognitive to get started with IBM Watson APIs.

Contributors

Tom Zimmermann

Tom Zimmerman has over 30 years of experience exploring the frontiers of human-machine interaction. His more than 40 patents cover position tracking, user input devices, wireless communication, image and audio signal processing, biometrics and encryption. He received his Master of Science Degree in Media Science from MIT and is currently a Research Staff Member and Master Inventor in the Computer Science Department of IBM's Research Division.

Haibin Lu

Haibin Lu received his Ph.D from the College of Information Sciences and Technology, Penn State University and is currently an Advisory Software Engineer for IBM Watson.

Anbang Xu

Anbang Xu is the leading author of "Predicting Perceived Brand Personality with Social Media," which was published in May 2016 at ICWSM 2016. He has been an associate chair on the CHI, and he is currently the Information Director of ACM Transactions on Interactive Intelligent Systems. He received his Ph.D. in Computer Science from the University of Illinois at Urbana-Champaign and is currently a Research Staff Member at IBM Watson User Technologies.

Richard Gabriel

Richard Gabriel is the inventor of InkWell, a natural language revision program designed to assist creative writers by producing stylistic variations on texts based on craft-based facets of creative writing and mimicking aspects of specified writers and their personality traits, and the author of numerous works, including "in the control room of the banquet." Richard is an Association for Computing Machinery Fellow and recipient of the ACM/AAAI Allen Newell Award. He has a Ph.D. in Computer Science from Stanford, an MFA in Creative Writing from Warren Wilson College, and is currently a Research Staff Member for IBM Watson.

Mateo Nicolas Bengualid

Mateo Nicolas Bengualid is an information systems engineer. He has worked as a software engineer in a variety of fields, such as artificial intelligence, security, mobile, human-computer interactions and, recently, cognitive services for the Watson Developer Cloud. He holds a variety of patents and has co-authored research papers on those diverse topics. He is currently a Staff Software Engineer for IBM Watson.

Hernan Badenes

Hernan Badenes is a senior software engineer with 10 years of experience at IBM. He is currently developing the new Watson Tone Analyzer service and leads part of the SilverGate group, an Argentina-based R&D team working with IBM Watson. He enjoys finding and implementing solutions for real-life problems with computers and algorithms, and believes this can be done from anywhere in the world with the best work-life balance — that is, when he is not hiking up some mountain.

End notes

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Somers, NY 10589

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