



Research Report

Cognitive Scale: Gaining Insight from “Dark” Data

Introduction

Many of us first became familiar with the concept of Cognitive Computing back in 2011 when IBM’s “Watson” played Jeopardy (a television quiz show) and won against two of the series’ all-time champions. Watson has evolved since 2011, and now has many commercial applications ranging from identifying qualifying patients for clinical trials in the healthcare industry to Chef Watson, a digital persona that creates original recipes by using algorithms to pair ingredients in unusual combinations. In addition, other vendors have entered the market, targeting a broad range of applications and industries.

Cognitive computing solutions, by design, think like humans – understanding natural language, learning from past experience, and generating hypotheses based on information that has been ingested, stored and analyzed. As such, cognitive computing is a natural fit for processing “Big Data” applications. With strong growth in the Big Data marketplace, we have seen a corresponding increase in companies focused on analyzing data, as well as businesses specializing in cognitive computing – which goes beyond data analysis to include self-learning and natural language processing.

While at IBM’s recent Interconnect 2015 conference, we had the opportunity to meet with Matt Sanchez, Founder and CTO of Cognitive Scale. This company has taken Cognitive Computing a step further, with the introduction of “Cognitive Clouds, a new class of data interpretation and learning systems that weave cognitive intelligence into business processes and applications”.

Cognitive Scale focuses on “dark” data that is not machine readable, not easily accessible, and not typically leveraged by data analysis tools available today. Dark data contains a wealth of information that, if harnessed and analyzed, can be used to provide data-driven decision making in a range of industries. More informed business decisions help businesses personalize customer experience, create more innovative products and improve efficiency and product quality.

In this *Research Report*, we will look more closely at Cognitive Scale’s company mission, its products, its domain focus, and its partnership with IBM. We will also provide an example of how one customer is using Cognitive Scale technology.

The Company

Cognitive Scale is a 60 person, privately held company based in Austin Texas. Founded in 2013, Matt Sanchez, CTO and Founder of Cognitive Scale, previously founded and led the Watson R&D team at IBM’s commercial Watson Solutions division (known as IBM

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Watson Labs). In that role, Matt was the first to apply IBM Watson cognitive technology to the financial services industry, while also helping Watson move into the healthcare marketplace by forming partnerships with leading cancer research institutes. Manoj Saxena, Executive Chairman at Cognitive Scale, was the former General Manager of IBM Watson and remains an advisor to the Watson team.

Cognitive Scale is also a strategic IBM Watson ecosystem partner. The company uses IBM Watson services in select industry solutions. Other partnerships include Deloitte and Accenture (in process).

Cognitive Scale holds 32 patents with an additional 22 filed. The company offers both horizontal and vertical cognitive clouds solutions, including process clouds for service desk, procurement and billing/claims and industry clouds for healthcare, retail, and financial services. Current customers include MD Anderson Cancer Center, Dell Children's Medical Center of Central Texas, Sports Authority, Cole Haan and Nestle.

Background

During our briefing with Matt Sanchez, he shared some interesting statistics with Clabby Analytics. Every 60 seconds there are: 277,000 tweets, 2.4 million status updates, 11 million instant messages, 4 million Google searches and over 204 million emails sent. In 2015, 90% of data will be this type of unstructured data, but at the same time only 10% of organizations say that "their organization incorporates unstructured data into insights, processes and strategy all of the time".

This wealth of untapped social media data, combined with cloud and mobile technologies provides the opportunity for a new style of IT, based on *Systems of Insight*. Systems of Insight will enable businesses to tap into all this data, to generate profiles patients in healthcare, for example, providing optimized treatment plans. Business functions will benefit as well. For example, in customer care, consumers will have access to self-service and guided answers to improve customer experience. In procurement and billing, data can be used to optimize sourcing decisions and payment. Human Resources managers can make more informed decisions about potential job candidates.

But companies face big challenges as they take on these Big Data initiatives -- related to scalability, access to unstructured data, as well as skills and cost/ROI issues. Cognitive Scale's Cognitive Clouds address these challenges, accelerating the ROI of Big Data initiatives.

Cognitive Scale Insights Fabric – A Closer Look

According to Sanchez, there are three cognitive computing capabilities that form the foundation of the Cognitive Scale platform:

- The ability to harness dark data;
- Augmentation of human intelligence; and,
- Learning and adapting continuously.

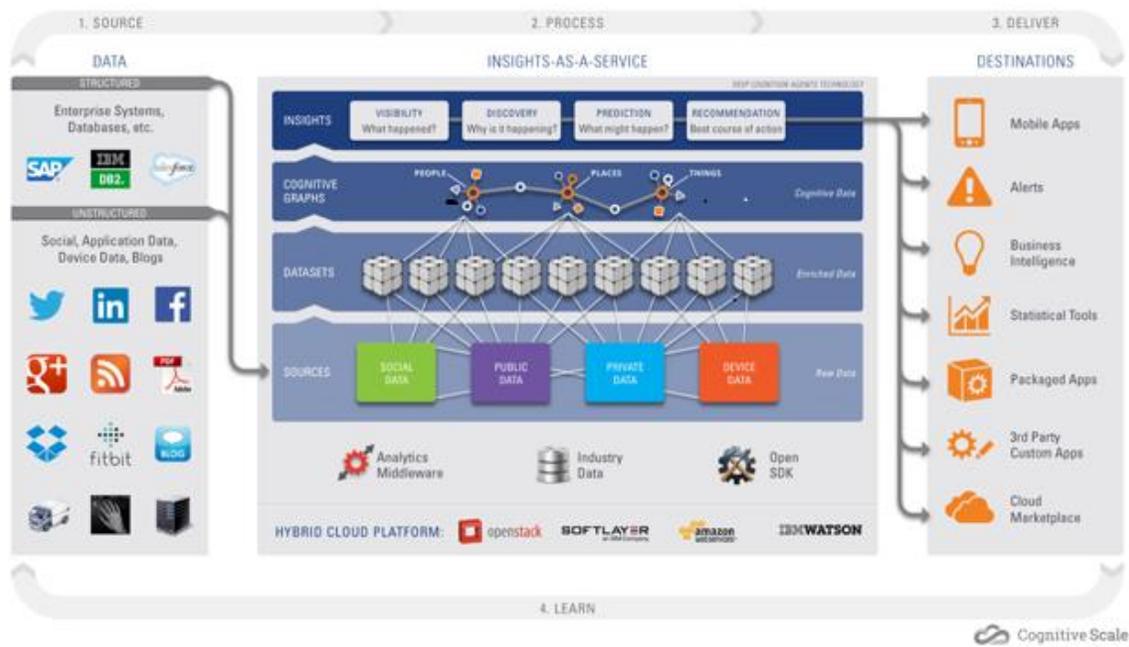
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Cognitive Scale's Insights Fabric is a standards-based cognitive cloud platform that delivers "insights-as-a-service" from multi structured data including text, images and video to generate actionable insights from dark data—data that is not machine readable, not easily accessible, or not typically leveraged.

The Architecture

The platform includes *sourcing agents* for a range of structured and unstructured data, *data sets* that provided a structured row/column view of source data specific to a particular use case, *analytical models* that include insights agents and the models used to develop insights, and the *cognitive graphs* that provide visualizations of observed and inferred concepts and relationships across the entire range of data streams. (See [Figure 1](#), below)

Figure 1- Cognitive Scale Insights Fabric



Source: Cognitive Scale 2015

Major Features – Insights Fabric

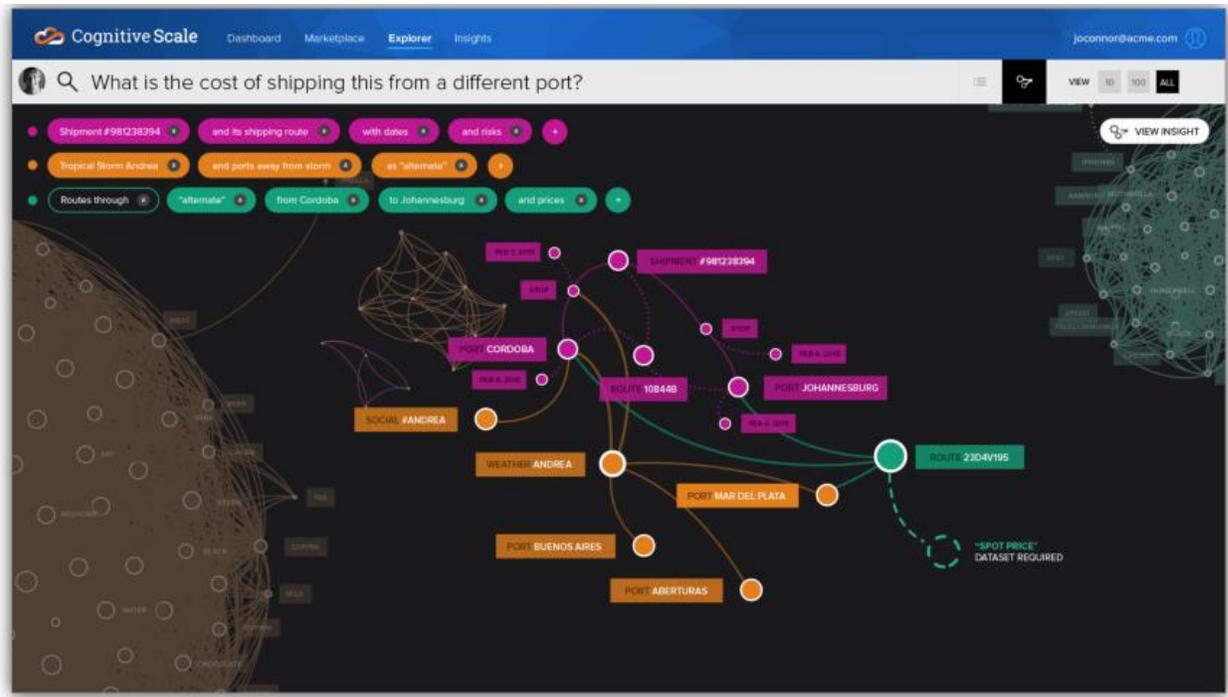
Major features of Cognitive Scale's technology include:

- Support for Amazon, Google and IBM BlueMix, Open Stack
- Pre-integrated into multiple analytics services including Watson, Google Analytics and Wolfram Alpha
- Includes analytics services composition environment that streamlines the process of creating analytics applications
- Sources from multi-structured public, private, and social (Twitter, Facebook yelp, device data etc.) while preserving data sovereignty and security
- Uses source data to create industry-specific cognitive graphs containing declared, observed and inferred concepts, entities and relationships across source data streams for contextualized foresight and insight (See [Figure 2](#), next page)

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- Portable cognitive cloud stack with big data lifecycle management, security and sovereignty
- Documentation and training for design, management and delivery of cognitive applications
- Available as a managed SaaS offering and includes domain specific content, skills and training

Figure 2 – Cognitive Scale Knowledge Graph



Source: Cognitive Scale 2015

By combining Cognitive Scale’s Cognitive Computing platform, Insights Fabric, with a cloud delivery model, customers have cost-effective, scalable access to data from both structured and unstructured data (text, tweets, blogs, images, videos, emails, public datasets, device data). The platform uncovers semantic patterns from these largely untapped data sources across the Web and on mobile devices, to provide contextual, actionable, business insight.

The environment “self-learns” as more data is collected and customer usage illustrates patterns and trends in the data. Insights are available within minutes and are adapted with new information. Code, models and content are securely stored in a private cloud container.

The “Cognitive Garage”

Cognitive Garages are available to help customers develop and launch Cognitive Scale Cognitive Clouds. These forums include the FastTrack 10-10-10 method platform, skills gained through collaboration with a community of cognitive computing experts, classroom training including detailed steps and methods at “Cognitive University”, as well as a

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content catalog and marketplace with thousands of content sources and pre-built sourcing agents, and built-in cognitive and analytics technologies.

Users can launch a live virtualized cognitive cloud stack in any open stack cloud platform in 10 seconds, source data and build a reference application in 10 hours, and securely save, share and modify the environment using you data in 10 days

Industry and Process Optimized Clouds

Cognitive Scale's Cognitive Clouds drive data-driven decisions across industries as well as enabling horizontal business applications. In Financial Services, data collected can help guide investors or identify fraudulent activity. Retail Cognitive Clouds learn shopper's behaviors and preferences based on past activity and social media content, enabling retailers to present customized offers in real-time.

The Healthcare Cognitive Cloud gathers individual patient data (diet, exercise, medications, doctor notes etc.) as well as gathering information from public sources including medical journals, scholarly research articles, social media etc. to provide advice and insight in order to optimize patient treatment plans. This information can be used to develop horizontal cognitive applications and provide context to business applications (claims processing for example).

Domain Content cartridges specific to process or industry include all the required sources, data sets, analytical models and cognitive graphs to support that domain. For example, Healthcare contains 150+ sources, 1000+ data sets, 100+ models and 10+ cognitive graphs for chronic conditions, all geared toward improved quality of care and reducing costs associated with hospitalization.

- Industry clouds include Healthcare, Retail and Financial Services;
- Process clouds include Billing/Procurement, HR/ Recruiting, Finance/Operations, and Sales/Marketing; and,
- Business solutions include Guided Care (Healthcare), Guided Commerce (Retail), Guided Procurement, Guided Service Desk, and Guided Claims and Billing

Customer Example-MD Anderson Cancer Center

Cognitive Scale has a multi-channel sales approach including direct sales and delivery partners such as Deloitte and IBM, in addition to working with design partners who build on the Insights Fabric platform. We'll look more closely at MD Anderson, who is an example of a design partner.

MD Anderson uses Cognitive Scale's Care Concierge (built using Insights Fabric) to gather data including patient records, EMRs, lab and imaging systems results, physicians' notes, medical science data, and streaming feeds from social media. Because of the large amounts of both historical and real-time structured and unstructured data from a broad range of

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sources, it can be difficult for doctors and other health care professionals to effectively correlate these data points to gain insight or identify trends and patterns.

Patients with chronic conditions need to make decisions about diet and medications. Care managers are focused on patient comfort as well making treatment plans more personal and more effective. Care Concierge takes individual data points, correlating and analyzing that data to provide personalized recommendations. Care Concierge is being integrated into myMDA, a unified portal for patients to connect with health care professionals as well as track appointments, diet, test results and prescriptions. As with all cognitive applications, as more information is added to the system, a more detailed personal profile can be created, improving care.

Summary Observations

When Watson rolled out of IBM Research several years ago with its Jeopardy challenge, it was difficult to imagine commercial applications for the technology. With the growth of big data, structured and unstructured, social and device data, customers in a range of industries recognize data as a valuable resource that can be used to gain insight, and as a result, competitive advantage. But as the “Internet of Things” proliferates, even more data sources are added into the mix, increasing complexity and exacerbating challenges related to collecting and analyzing data.

Cognitive Computing enables customers to collect and correlate data from a wide range of sources to augment our own natural intelligence. For example, how can a doctor possibly keep up with new research in medical journals, a patient’s detailed medical history, test and lab results, social media, and device data from patient medical devices? As the “connected patient” becomes even more connected, Cognitive Computing tools will tap into all these data sources, finding patterns and relationships to help healthcare professionals do their job more effectively. These same principles apply to other verticals and to horizontal “siloes” business applications.

Cognitive Scale provides a standards-based Cognitive Computing platform that includes both industry and process clouds with built-in data sources, analytics and cognitive graphs, “Cognitive Garages” that support customers in developing and launching new applications, and a set of customers with a range of applications across Healthcare and Retail. For businesses that are launching Big Data and/or Cognitive Computing initiatives, employing Cognitive Scale solutions will enable them to “hit the ground running”.

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