

# The Cognitive Journey

February 2011



Cognitive **BUILD**

January 2016

January 2017



# Building A Predictive Model For An Ice Cream Shop

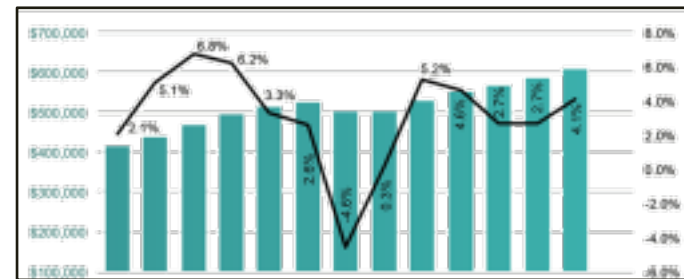


# Traditional Forecasting Models Are Limited

Weak forecasting capabilities limited by the available predictors explain as little as 30% of sales variance



➤ Historical sales data



➤ Calendar (days of the week, holidays)



➤ Current promotions



# Rich Structured And Unstructured Improves Predictive Power

## Weather Forecast



## Local Events



## Social Media Reviews



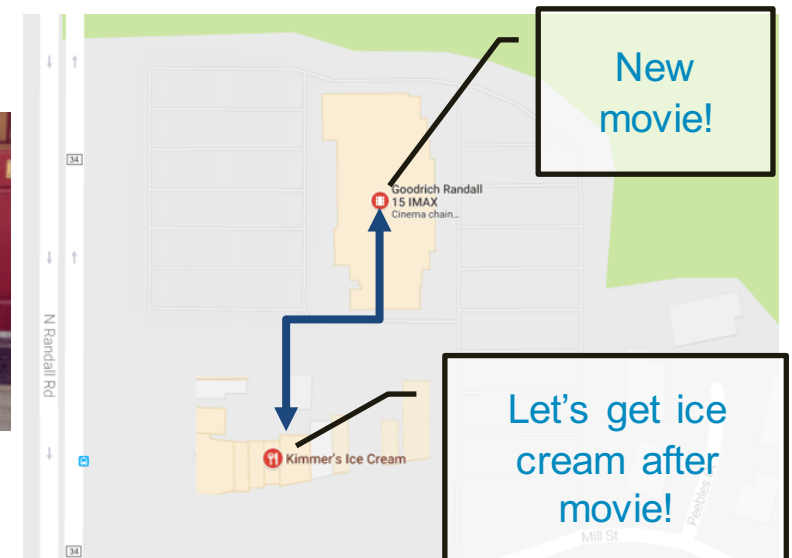
## Competitors' Ads



## Regulatory



## Proximity



## News



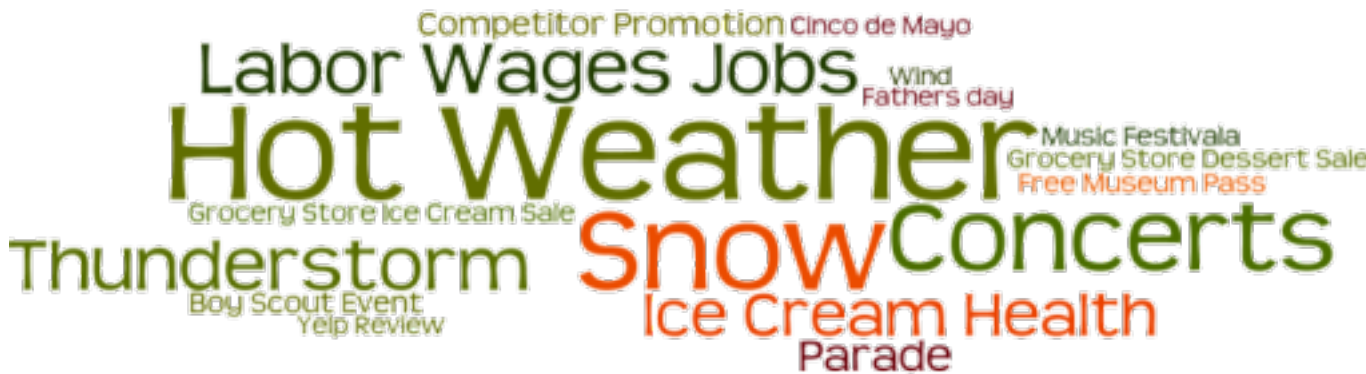
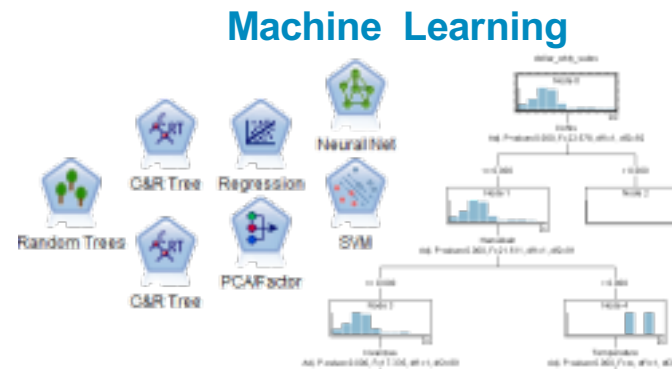
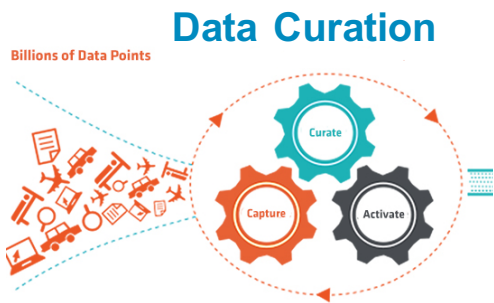
Roll Me Some makes ice cream in front of your eyes by pouring cream and toppings onto a below-freezing surface. Then they roll it up. **Aleksandra Konstantinovic** - The Fresno Bee

BETHANY CLOUGH MAY 08, 2017 11:45 AM  
New Yorkers wait in line three hours for this ice cream. Now it's coming to Fresno

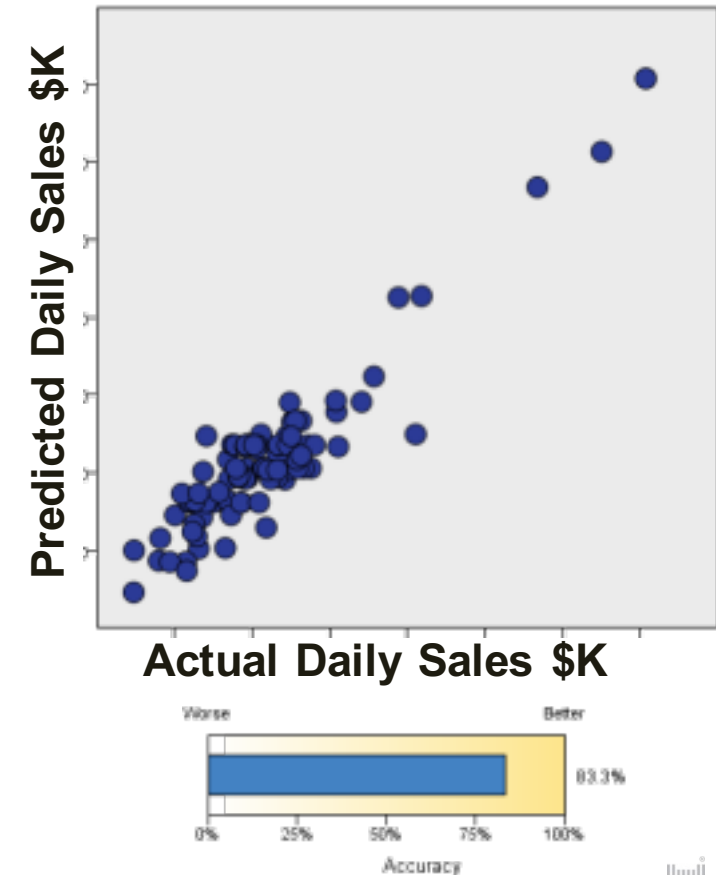
## Sentiment Indicators



# A Rich Set Of Data Increases Predictive Ability To $> 0.95$



\*\* Font size corresponds to predictor importance  
 \*\*\* Robustness demonstrated at the binary flag, frequency and density level



# The Cognitive Enterprise

Steward the transformation of IBM to a world class Cognitive Enterprise

Create a scalable approach to enterprise transformation with cognition at the core



# Mobilization & Collaboration

Executive Advocates from functional area across the enterprise



Sharing Expertise

Understanding, Reason, Learn & Interact

Centralized Repository

Utilize Watson Data Platform

Business Benefits

Inhibitors

Human Resources	Finance	Asset Management	Incentives	Quote to Cash	Sales	Procurement	Support	Development	
Real Estate	Communications	Marketing	Supply Chain	Client Advocacy	Chief Information Office	Mergers & Acquisitions	Legal	Chief Data Office	Operations

# Tools of Reinvention

## Journey Maps

**Cognitive Journey Map Example**

**Future Vision:** Provide a description of the current state and the ideal future state of your functional area. Highlight the disruption which the transformation will create, and the effects of the disruption.

**IBM INSERT FUNCTIONAL AREA Cognitive Journey Map**

**User experience journey**

- Simple easy engagements completed with speed
- Ability to use natural language, unstructured text and digital imagery
- Highly personalized experience that learns over time

**Functional Area experience journey**

- Refined real time data to make quicker more informed decisions
- Maximize preferred suppliers
- Triggers and administrative tasks automated to allow a focus on strategic and relationship management activities

**Strategic Outcomes:**

- Engagement – Client / User / Employee
- Net Promoter Score
- Job descriptions have changed for x% of ...

**Financial Outcomes:**

- Increase Revenue / Profit
- Process Efficiency
- Expense Reduction
- ...

## Cognitive Capability Assessment

**Cognitive Academy** Courses Share Guilds Team News Assessment Search

### Cognitive Capability Assessment

Classify your solution into a helpful scale and gain insights to further improve your applications and use of Cognitive technologies.

**Why take the assessment?**

For a system to be cognitive, it must be able to understand, reason, learn, and interact. Measuring your application across these four pillars will help to find opportunities for further improvement and use of cognitive technologies.

**Start**

## Cognitive Academy

**Cognitive Academy** Courses Share Guilds Team News Assessment Search

### Cognitive Academy

Learn, share, and engage with us to help build a more cognitive enterprise.

For a system to be cognitive, it must be able to understand, reason, learn, and interact.

**Let's get you started**

## Discovery Session



- ✓ Asset Re-use / Development Cost Savings
- ✓ Accelerated IBM Cognitive Transformation
- ✓ Reshaped 'Art of the Possible' vision



# Cognitive Enterprise Portfolio

## Cognitive Enterprise Scorecard 1H 2017

### Portfolio Metrics

Number of projects	144
Backlog	49
Design	29
Pilot	25
Deployed	41
% Journey Map processes with cognition deployed	45%



### Measurements of Success



Cognition embedded percentages



Adoption



Financial benefit (revenue & savings)

Commericalization



# Data Science Profession at IBM

## Data Scientists are Pioneers

- Work with business leaders to solve problems by understanding, preparing, and analyzing data to predict emerging trends

## Background

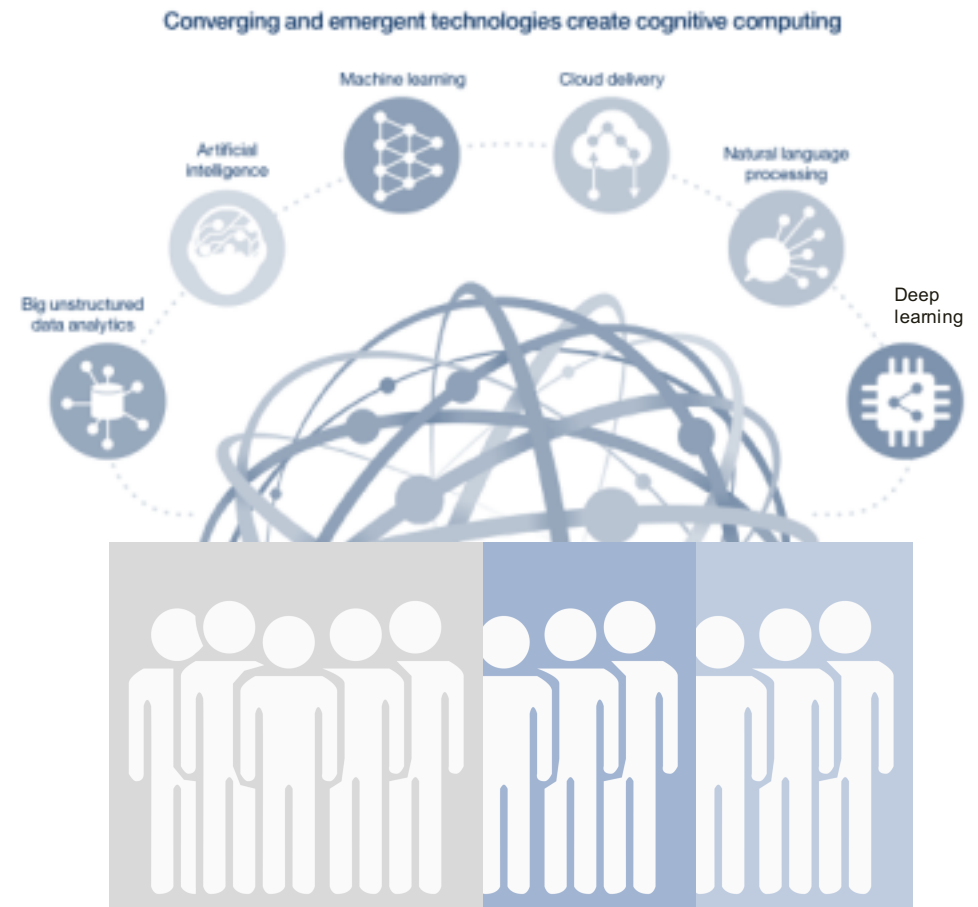
- Critical role of data science talent recognized

## Data Science Profession Board Established

- Ensure World-Class Data Science Profession Skills for the Cognitive Era

## Skills Evolving in Cognitive Era

- Open Badges, Cognitive Academy and Your Learning



# “Decision Support” Exponentially More Difficult than “Discovery”

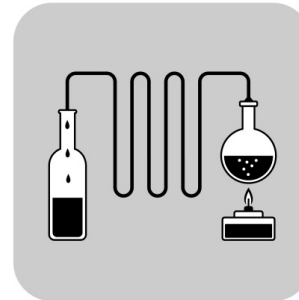
## Discovery



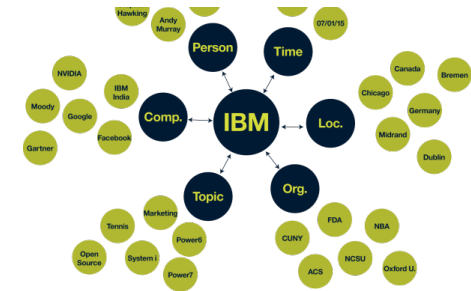
## Find



## Distill



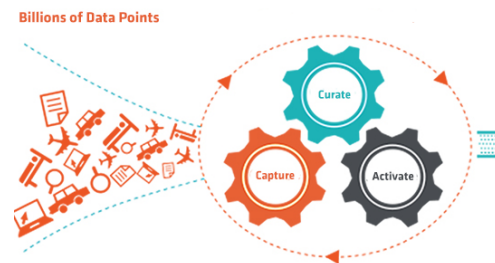
## Rank and Display



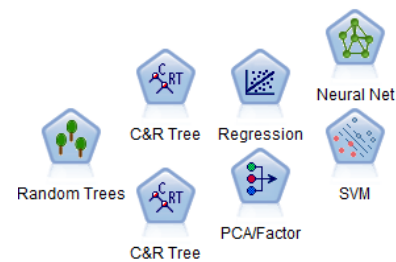
## Decision Support



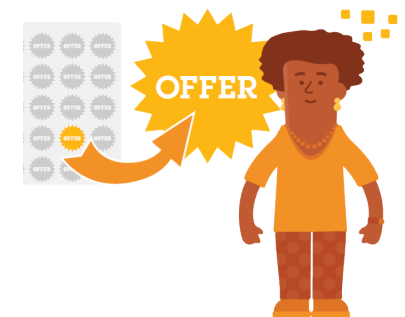
## Curate Everything



## Machine Learning



## Decision



# Three Fundamental Building Blocks

**Cognitive computing** defines the **end user experience** of interacting with an intelligent system

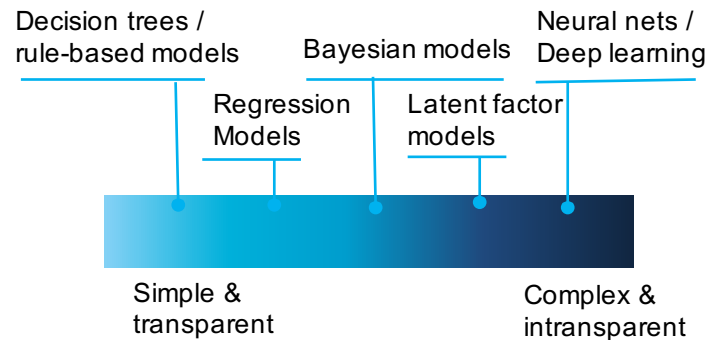
## Data ingestion\*

Unstructured data  
(text, images, audio)

Natural language processing  
Image recognition  
Speech recognition

Structured data  
(can be used as input of ML model)

## Machine learning (ML) / reasoning\*\*



## Digital - human interface\*\*\*

*New ways of interaction with computing systems*

- Ask questions in written language to gain insights (Google)
- Talk to the system (Siri, Amazon Echo)
- Convert the system output into spoken language



# An Ocean of Curated Data for Decision Support, an Iceberg for Discovery



# Cognitive Pricing Advisor



COPRA recommends prices that optimizes business results, which enables quicker price approval and reduces bid iterations

**Client Problem:** Sellers require assistance balancing profits against win probability

**Solution:** Apply advanced pricing algorithms to provide an optimal discount

- **Phase 1:** Machine learning for maximizing profit; product sentiment in news data for pricing dashboard
- **Phase 2:** Competitiveness and market event insights

**Value Creation:**

- Increased revenue and profit
- Reduction in cycle time
- Increased productivity
- Improved partner and seller satisfaction

**The Big Disruption:** Provides benchmark price using historical records of wins & losses to guide sellers to determine a transaction price. Future enhancements will add new cognitive elements to enhance the price recommendation.



# Cognitive Recommendation Engine



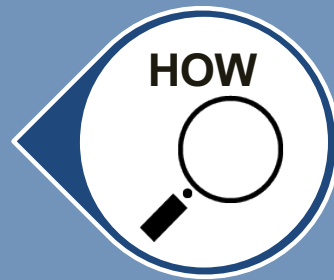
- Sellers need to **grow their opportunities**
- New opportunities are not easily accessible due to **absence of dynamic & real-time intelligence through easily consumable tools**
- **Best-of-breed data and analytics** addresses the new opportunity generation challenges
  - Identify **high propensity offerings/solutions** for given clients
  - Identify **high propensity clients** for given offerings

**The Big Disruption:** Cognitive recommendation engine based on best-of-breed data and analytics supports our sellers identify new opportunities for growth.



# Cognitive Lead Passing

- Integrate cognitive models to improve lead passing recommendations
- Enable lead passing capabilities through an API
- Implement machine learning feedback loop



**Client Problem:** Traditional sales opportunity passing from opportunity identifiers to opportunity owners has been a slow and manual

**Solution:** Implement a seller-trusted system for automatically passing eligible leads

**Value Creation:** Improve both revenue and profit by ensuring opportunities are passed faster to the most appropriate route-to-market

**The Big Disruption:** Cognitive Lead Passing will increase IBM's profitability by ensuring more leads are passed faster through the most appropriate route-to-market.





# Cognitive Sales Assistant Demo

# Become a Cognitive Enterprise

## Transforming into a Premier Cognitive Enterprise

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Reinventing business models

Disruptive business value



## Data + Cloud + Cognitive = Breakthrough Insights

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Cloud-based solutions with Watson on a single trusted platform

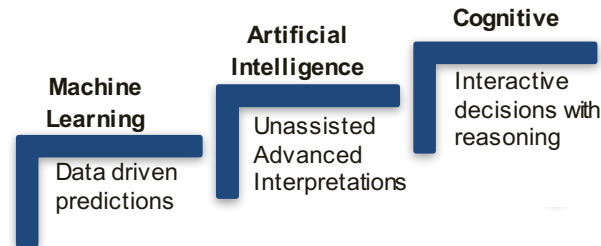
Unique insights are your competitive advantage



## The Power of Cognitive

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Cognitive advances beyond machine-learning and AI provide interactive decision support over deep domain models with evidence based explanation



# Cognitive Sales for the Enterprise

Individual

Client Insight

Market

Directory

## Marketing Responses

▲ Individual	◆ Company	◆ Marketing Program	◆ Response Date	◆ Interest score
<a href="#">David Garwood</a>	<a href="#">Bank of America</a>	Analytics	Nov 2, 2016	80%
<a href="#">David Garwood</a>	<a href="#">Bank of America</a>	Systems	Oct 9, 2016	60%
<a href="#">Opal Glenn</a>	<a href="#">Baylor Healthcare</a>	Analytics	Jul 2, 2016	60%

## Event Trigger

▲ Event (In the News)	◆ Company	◆ Date
<a href="#">Bank of America hires chatty virtual robot</a>	<a href="#">Bank of America</a>	Nov 12, 2016
<a href="#">Bank of America launches AI chatbot Erica</a>	<a href="#">Bank of America</a>	Oct 24, 2016
<a href="#">Bank Of America's Digital Transformation: Where IT Fits In</a>	<a href="#">Bank of America</a>	Oct 27, 2016
<a href="#">Baylor Scott &amp; White Health Hosts First-Ever Digital Summit</a>	<a href="#">Baylor Healthcare</a>	Jun 20, 2016

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Client Insight

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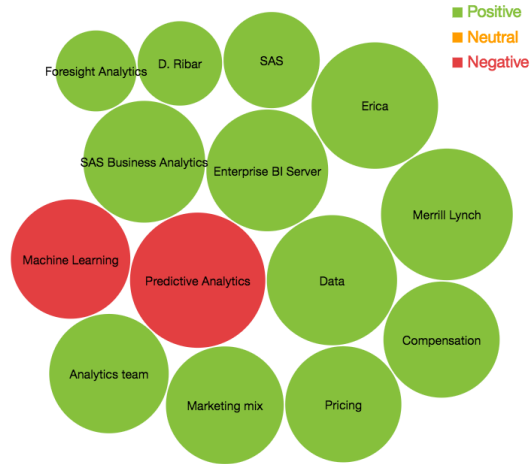
Directory

## Bank of America

- < News Insight
- Client Network
- Opportunities
- Offering Recommendation
- Pricing
- Historical Revenue
- >

### News Insight for Bank of America and IBM

- Social
- Analytics**
- Cloud
- Commerce
- Systems
- Watson
- Leadership Agenda
- Cross Events



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Lead (Opportunity Detail Key)	Business Unit	Offering	Value (\$)	Date Created	Sales Stage	Opportunity Identifier	Opportunity Owner	Contact	Leads Pass To	Optimal Price
21685753	Analytics	SPSS	125K	Nov 15, 2016	Validated	Marketing	--	--	Optimal Team	--
21606952	Analytics	SPSS	200K	Nov 12, 2016	Validated	Brand Sales	--	--	Optimal Team	--
21269665	Commerce	WebSphere	1090K	Oct 15, 2016	Validated	Brand Sales	Field Sales	Michael Bush	--	G→
21547600	Analytics	Customer Insight	1050K	Sep 11, 2016	Won	Face to Face	Field Sales	Marian Carson	--	--
21442783	Cloud	Bluemix	33K	Aug 1, 2016	Conditional Agreement	Face to Face	Field Sales	Homer Joseph	--	--
21399712	Analytics	Watson Analytics	625K	Jul 13, 2016	Lost	Brand Sales	Field Sales	Julio Ramsey	--	--
21280944	Analytics	Analytics Tools	10K	May 24, 2016	Lost	Business Partner	Business Partners	Alberto Stanley	--	--
21126987	Analytics	Kenexa	8K	Apr 5, 2016	Lost	Marketing	Field Sales	Sabrina Morales	--	--
21098326	Systems	Storage	4300K	Mar 28, 2016	Qualified	Brand Sales	Field Sales	Ebony Copeland	--	--
20968558	Systems	Power	74K	Feb 14, 2016	Won	Brand Sales	Field Sales	Peter Hampton	--	--



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Show  entries

Recommended Products:	Confidence	Top Range Opportunity Value
+ <a href="#">SW: Spectrum Storage</a>	90%	\$134K
+ <a href="#">Services: Security Services - Infra &amp; Endpt</a>	89%	\$360K
+ <a href="#">SW: Maximo Asset Management</a>	88%	\$130K
+ <a href="#">Services: MOBILITY (Outsourcing)</a>	88%	\$619K
+ <a href="#">Services: RESILIENCY (Outsourcing)</a>	87%	\$933K
+ <a href="#">Services: Cloud Managed Services</a>	87%	\$844K
+ <a href="#">Services: IBM MobileFirst Network Services</a>	86%	\$125K
+ <a href="#">Services: Cloud Services - SoftLayer Synergy</a>	86%	\$182K
+ <a href="#">SW: Kenexa Survey on Cloud</a>	85%	\$193K

Showing 1 to 9 of 9 entries

Previous  Next



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See your client purchase history

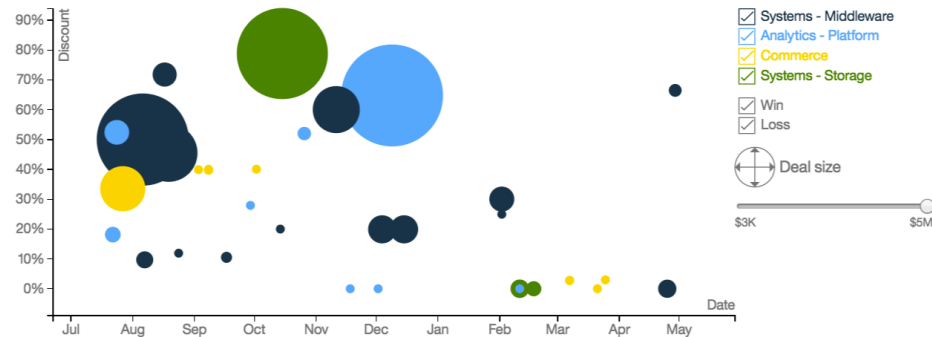
See how sellers priced similar deals

Where you should set your price

Product sentiment in the news

### See other purchases your client has made in the past year

This Bubble chart shows the historical purchases of your client in the past 12-month. You can filter the data by deal size, brand, and win/loss.



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See your client purchase history

See how sellers priced similar deals

Where you should set your price

Product sentiment in the news

### See how other sellers have priced similar deals in the past year

The Average Discount for a similarly configured quote (similar deal size, same brand) is calculated based on 12-month historic won transaction data. The range of the bar represents 85% of all similar transactions, and the color gradient shows distribution of discount.

#### Quote

**D1D68LL**  
IBM Sterling Commerce

Average Discount: 58.24%

**D1D64LL**  
IBM Sterling Commerce

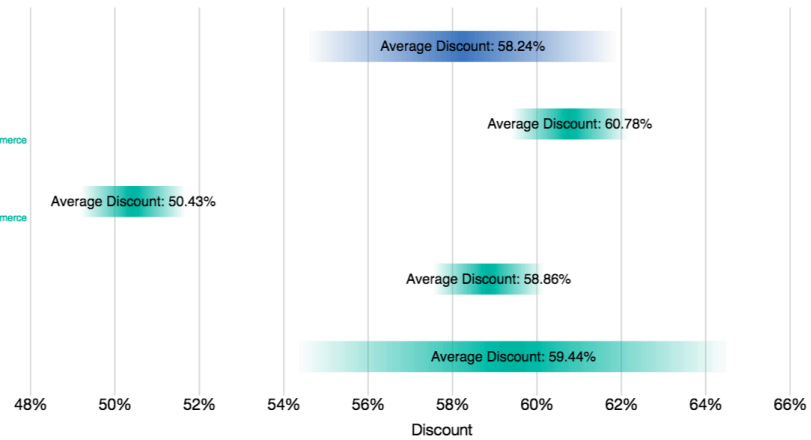
Average Discount: 50.43%

**D53VGLL**  
IBM Websphere

Average Discount: 58.86%

**D55WVLL**  
IBM Websphere

Average Discount: 59.44%





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See your client purchase history

See how sellers priced similar deals

Where you should set your price

Product sentiment in the news

### See how discount influences IBM revenue and where you should set your price

This curve shows how your discount influences the expected revenue of a \$1M, Cognitive Engagement (Commence) deal. Expected revenue is defined as the product of price and win rate. For your particular deal, the Optimal Discount to maximize expected revenue is 55%.

