

Automating Enterprise Business Processes using AI

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Xu Miao

AI-driven enterprise applications



- Business processes mapped to an AI engine to enable business efficiencies.
- 4 business processes being automated by AI
 - Customer Support
 - Recruiting
 - Content Marketing
 - AdTech
- We will conclude with lessons learned from being very involved in these companies since inception.

But then what is AI? – Lessons Learned



- **AI is a rich source of interesting tools**
 - Lot more than Deep Learning, CNN, Generative Adversarial Networks!!
 - Suite of techniques to evoke intelligence :
 - Categorizers, Regression, NLP, Case-Based reasoning etc.
- **Domain driven rather than technique driven**
 - Let the domain drive the problem solving and which techniques you use from the bag
- **Interesting Data strategies**
- **AI application is like a raisin bread : it is still 90% bread**



Neva

AI-Driven Automation for Service and Support

Why Neva?



Customer service organizations must improve support quality while reducing delivery costs.

Key challenges

- ▶ **Fragmented knowledge** from disparate knowledge sources and enterprise systems, and decentralized change management.
- ▶ **Inefficient decision-making** due to gap between front and back office, frequent changes, and inability to continuously train human agents.
- ▶ **Fractured user experience** due to omni-channel, modern support outside work and inefficient, human-based support at work

Neva ▾

- dan
- # demo
- # general
- # github
- # help_desk
- neva-standup-status
- nevaengineering
- # nevapoc
- # random
- # servicenow

DIRECT MESSAGES (30) +

- slackbot
- dan (you)
- demobot-dev-qs
- john
- john, mohan
- melanie
- melanie, serene
- mohan
- neva_agent**
- sabateserra
- serene
- siva_bimarian
- xumiao

+ Invite people

@neva_agent active | Beth Anglin

My account is locked. How do I reset my password? ← **Question**

neva_agent BOT 8:47 AM
I understand you need to reset your password. I found three knowledge articles that may help.
1) [Resetting your domain password on Mac](#)
2) [Resetting your domain password on Windows](#)
3) [Resetting your password over the VPN](#)

dan 8:48 AM
No, those didn't help. Please create an incident. ← **Issue**

neva_agent BOT 8:48 AM
Thanks for letting me know. Please wait while I create an incident ...
Done! Please use <http://52.42.197.121:3000/#/incidents/45> to refer this issue in the future
52.42.197.121
Neva Incident Management

dan 9:00 AM
I have a visitor in building three. Can you provision WiFi access? ← **Request**

neva_agent BOT 9:00 AM
Yes, no problem. I need a bit more information first. Can you tell me the MAC address of your visitor's laptop?

dan 9:00 AM
Yeah, no problem. The visitor's MAC address is a4:5e:60:d5:ed:bd.

neva_agent BOT 9:00 AM
Thanks! Just one last question: what time should the temporary access expire?

dan 9:00 AM
4:00 PM today.

neva_agent BOT 9:00 AM
MAC address a4:5e:60:d5:ed:bd now has access to building three WiFi until 4:00 PM today. U to help?

servicenow Service Automation

Welcome: fran fernandez

Filter

- Admin
- Asset Management
- CMDB
- ITIL
- Reports
- All

Self-Service

- Live Feed
- Homepage
- Service Catalog
- Knowledge
- Help the Help Desk
- My Task Boards
- Incidents
- Watched Incidents
- My Requests
- Requested Items
- Watched Requested Items
- My Profile
- My Tags
- My Knowledge Articles
- Take Survey
- My Approvals

Incident

Number: INC0010985

Caller: Danette Fostervold

Location: Paradise Road, Richmond, I

Category: Hardware

Subcategory: CPU

Configuration item: MacBook Air 13"

Impact: 3 - Low

Urgency: 3 - Low

Priority: 4 - Low

Short description: How do I reset my MacBook to the factory settings?

Description: This incident was submitted by Neva via Slack at 10:27 AM on August 6.

Neva suggests

Similar answers

- INC03257 | Dave L. | Resolved | 07/23/16 | 83% relevant
- INC03723 | Denise P. | In Progress | 07/11/16 | 72% relevant

Experts

Knowledge graph

Sources

Complicated Data Environment



Structured

Table	Name	Extendable
Change Phase	change_phase	Task
Change Request	change_request	Task
Change Task	change_task	Task
Incident	incident	Task
Kill Submission	kill_submission	Task
Problem	problem	Task
Problem Task	problem_task	Task
Release Phase	release_phase	Task
Request	request	Task
Requested Item	requested_item	Task
Release Task	release_task	Task
Group Approval	group_approval	Task
Ticket	ticket	Task

Operational DBs

Datawarehouse

{ APs }

Enterprise APIs

Unstructured

 Knowledge Articles



Forum Posts

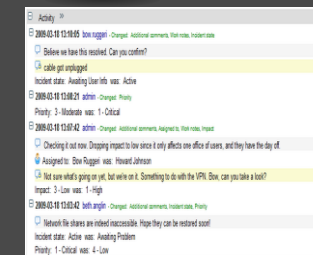


Screen shots

Semi-structured



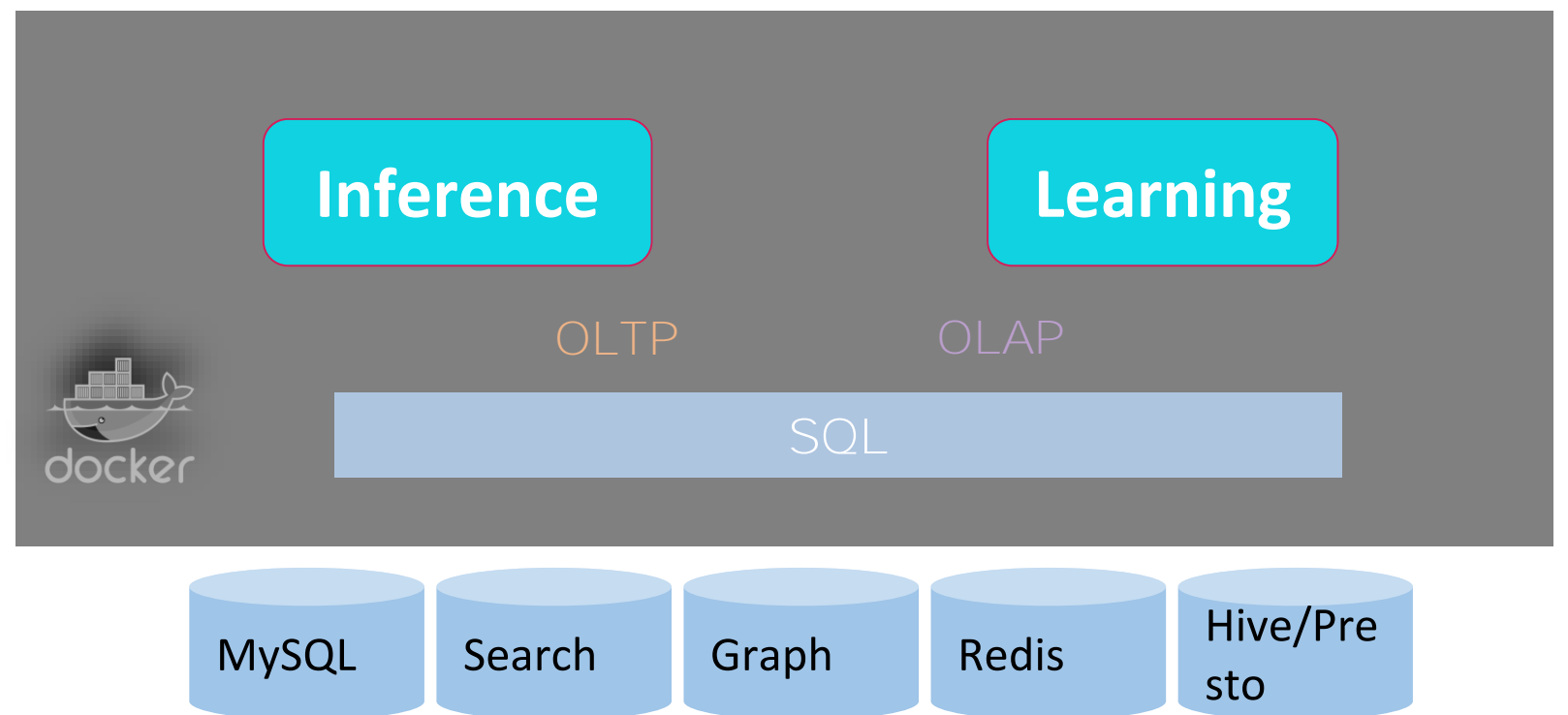
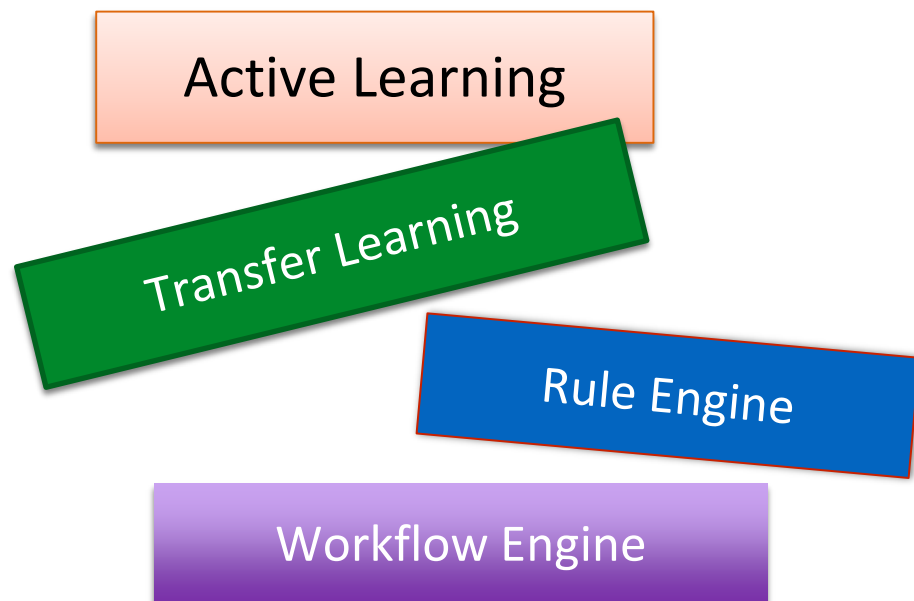
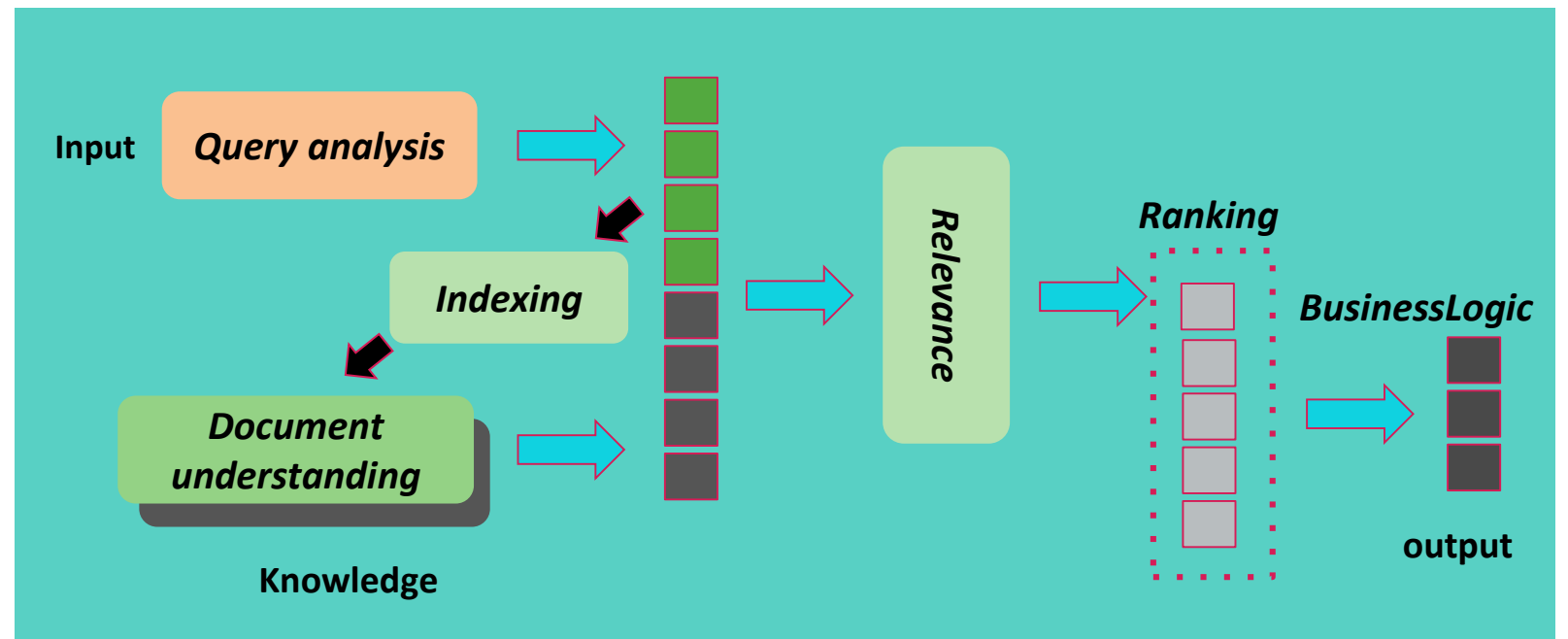
E-mails



Log/message history

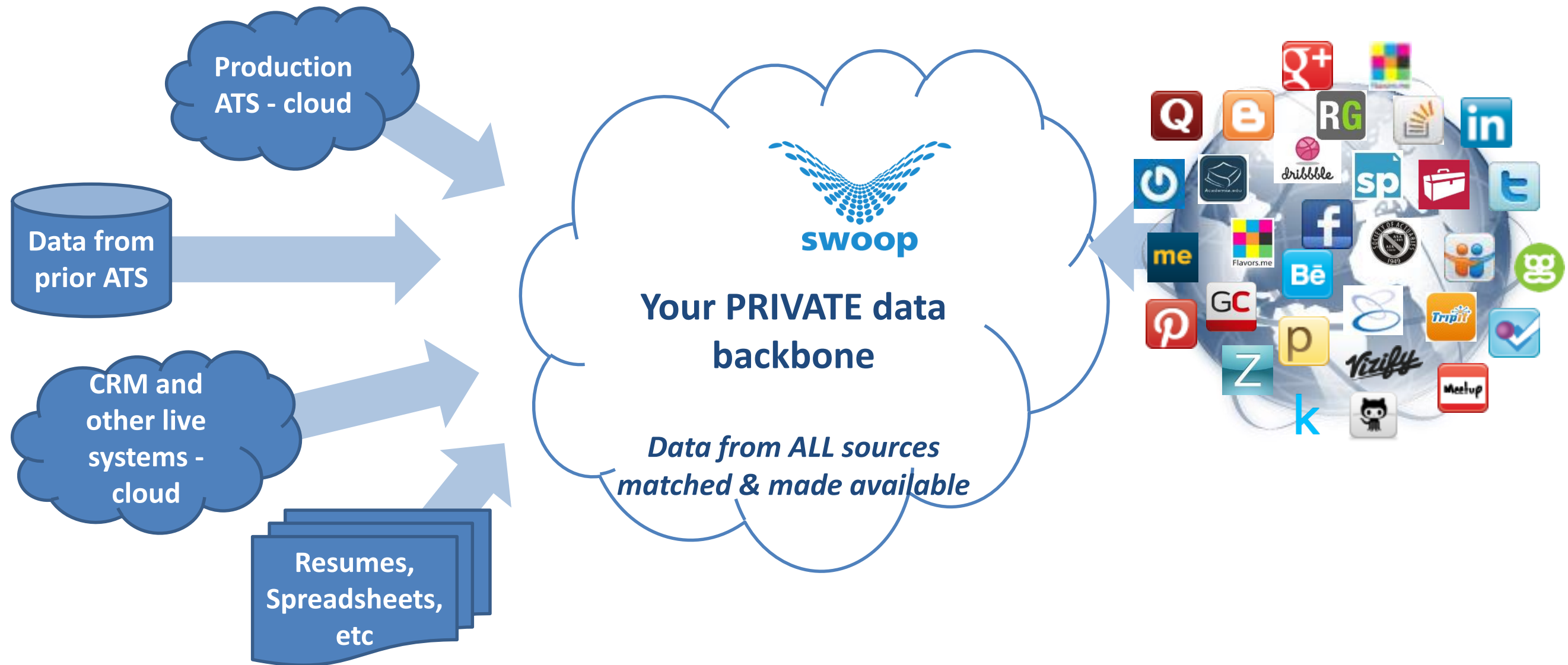
Model Driven Intelligent Data Process

Keras
Spacy
Entity Recognition
LSTM
SkitLearn
CNN
VW
Trees
xgboost
Word2vec



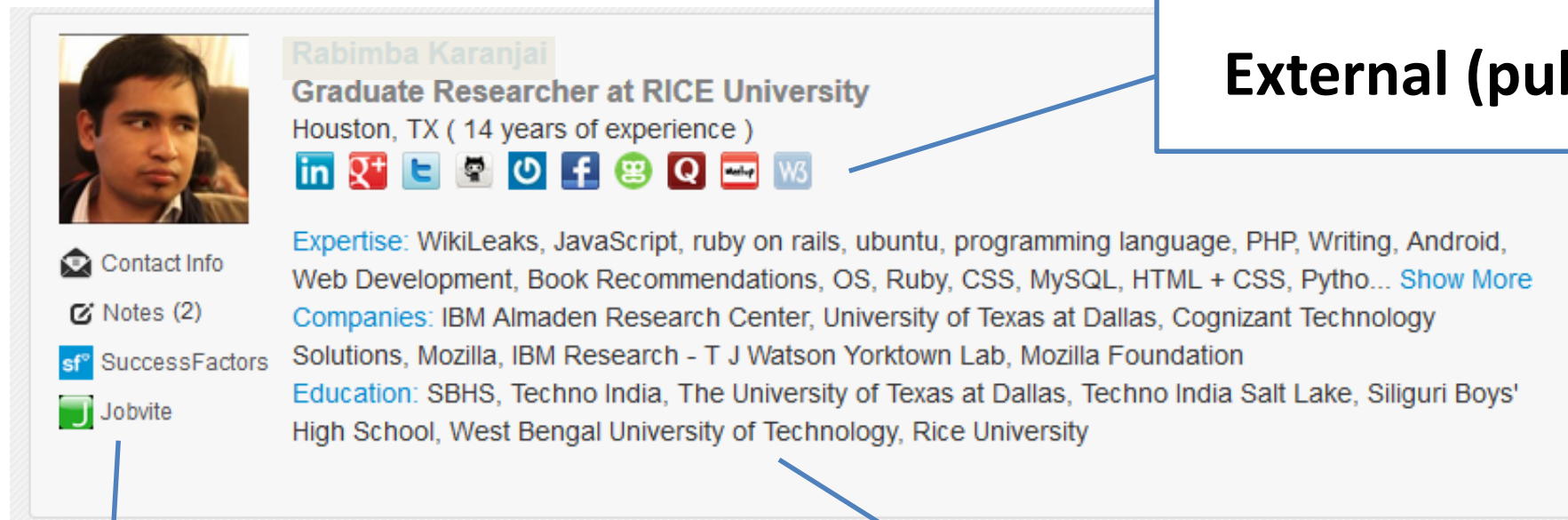
Talent Data Cloud with SwoopTalent

Private Talent Data Cloud



Hundreds of millions of social talent records gathered by Swoop

Candidate Profiles on SwoopTalent



The image shows a candidate profile for Rabimba Karanjai on the SwoopTalent platform. The profile includes a profile picture, a title 'Graduate Researcher at RICE University', location 'Houston, TX (14 years of experience)', and a row of social media icons (LinkedIn, Google+, Twitter, GitHub, YouTube, Facebook, Dribbble, Quora, Medium, and W3). Below this, there are sections for 'Expertise' (WikiLeaks, JavaScript, ruby on rails, ubuntu, programming language, PHP, Writing, Android, Web Development, Book Recommendations, OS, Ruby, CSS, MySQL, HTML + CSS, Pytho...), 'Companies' (IBM Almaden Research Center, University of Texas at Dallas, Cognizant Technology Solutions, Mozilla, IBM Research - T J Watson Yorktown Lab, Mozilla Foundation), and 'Education' (SBHS, Techno India, The University of Texas at Dallas, Techno India Salt Lake, Siliguri Boys' High School, West Bengal University of Technology, Rice University). On the left side of the profile, there are links to 'Contact Info', 'Notes (2)', 'SuccessFactors', and 'Jobvite'.

Rabimba Karanjai
Graduate Researcher at RICE University
Houston, TX (14 years of experience)

[in](#) [g+](#) [t](#) [gh](#) [yt](#) [fb](#) [dr](#) [q](#) [m](#) [w3](#)

Expertise: WikiLeaks, JavaScript, ruby on rails, ubuntu, programming language, PHP, Writing, Android, Web Development, Book Recommendations, OS, Ruby, CSS, MySQL, HTML + CSS, Pytho... [Show More](#)

Companies: IBM Almaden Research Center, University of Texas at Dallas, Cognizant Technology Solutions, Mozilla, IBM Research - T J Watson Yorktown Lab, Mozilla Foundation

Education: SBHS, Techno India, The University of Texas at Dallas, Techno India Salt Lake, Siliguri Boys' High School, West Bengal University of Technology, Rice University

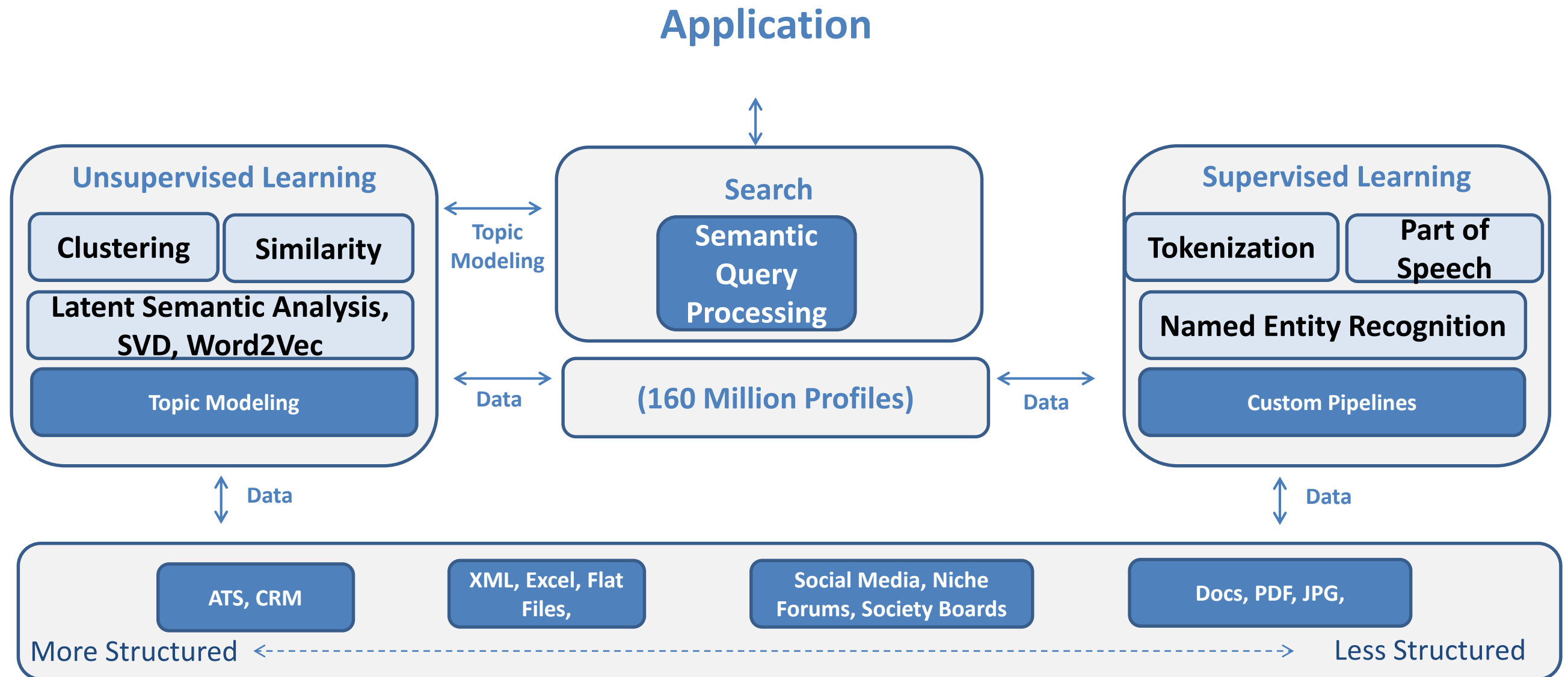
[Contact Info](#)
[Notes \(2\)](#)
[SuccessFactors](#)
[Jobvite](#)

External (public) records

Internal ATS records

**Combined data: rich, fresh,
searchable, analyzable**

Swoop AI Layer

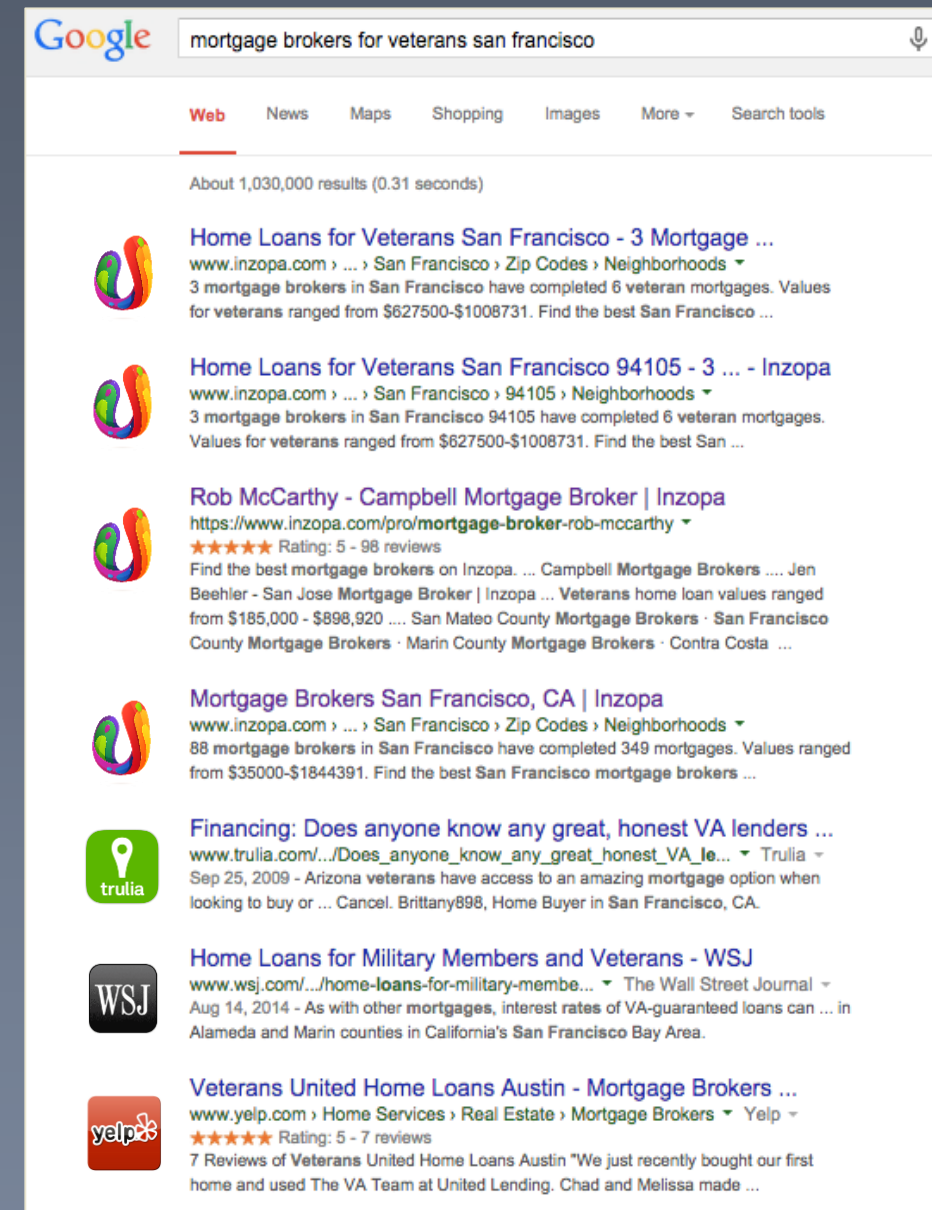
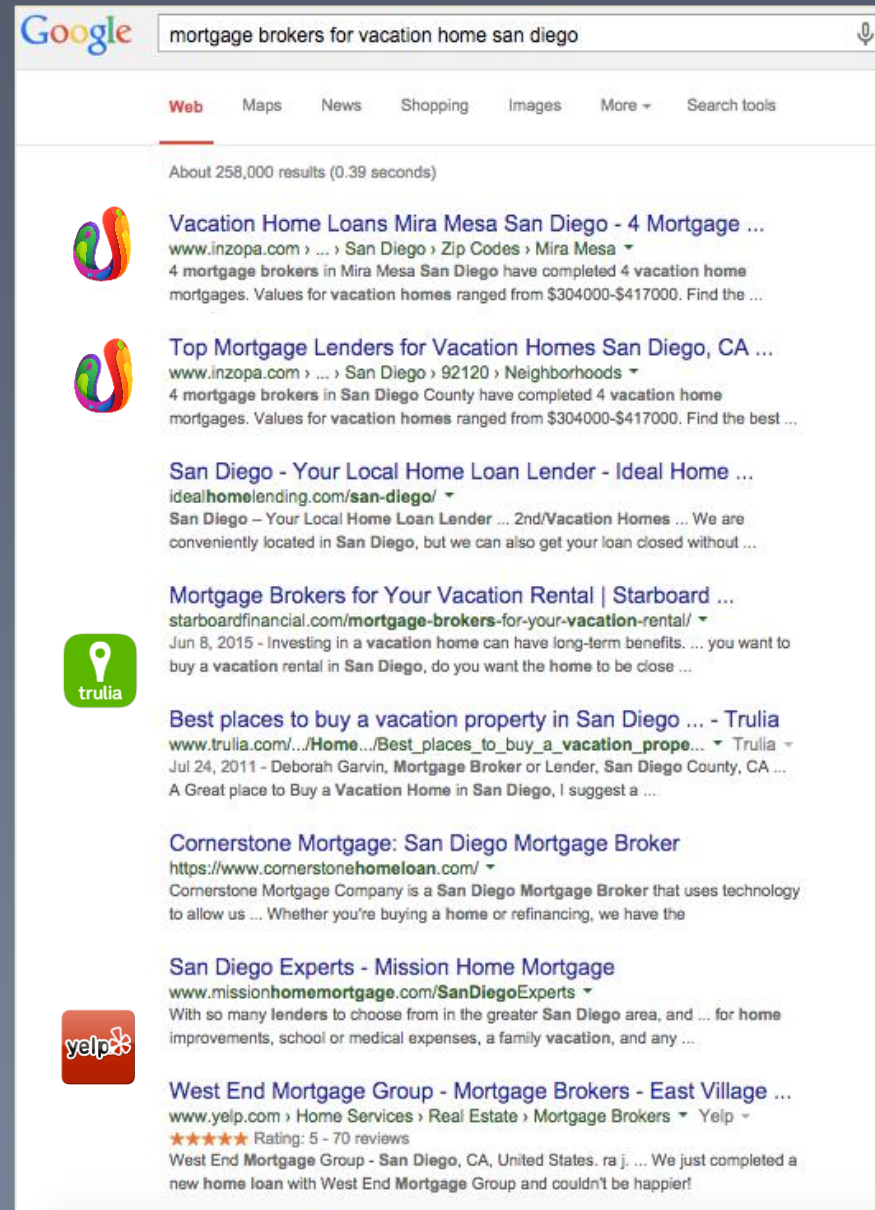




Up IQ

Autonomous Marketing™

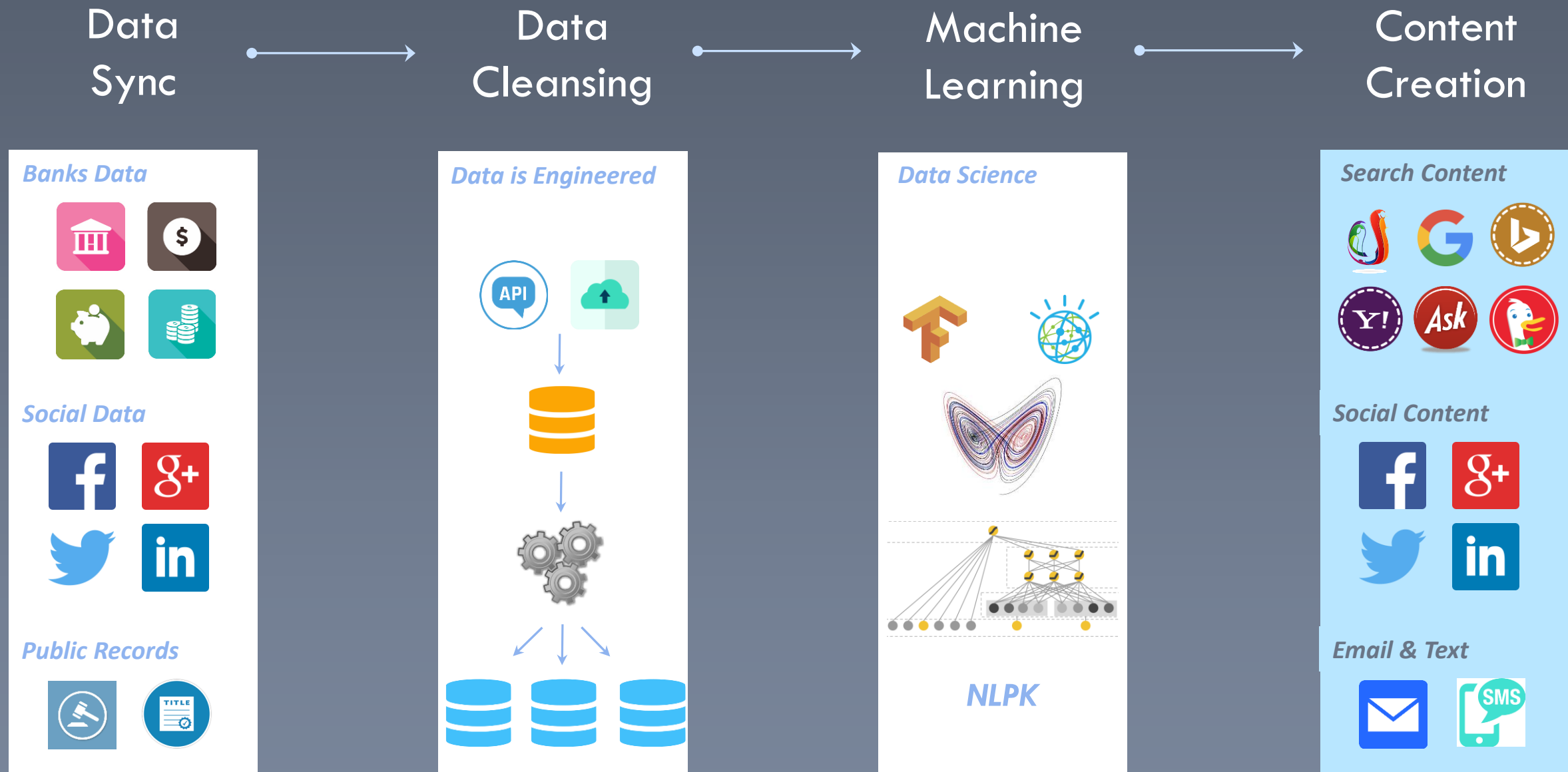
Automatically generates statistically relevant marketing content that is highly personalized



10x better conversion rates
for organic search




Enterprises Journey to Autonomous Marketing




- Markovian Modeling



Up IQ to Power Banks: SEM Campaigns, & Landing Pages



Mason-McDuffie
Mortgage Corporation
Since ~ 1887



Speak to a Mortgage Advisor Now!
916-999-1920

Mortgage Brokers in Sacramento, CA

The Sacramento metro area has seen a dramatic upward surge in housing demand over the recent years. Home Sales, mortgage refinancing, Military VA loans and FHA loans are being serviced by 112 licensed brokers in the Sacramento metro area. Here are the top three brokers who have extensive experience and knowledge of this geo to help you with your needs.

Connect With a Professional

First Name


Last Name

Email

Phone

Please Select..

GET STARTED




Debbie Sundlie
Sacramento Mortgage Broker


- Debbie Sundlie has completed **507 mortgages in California**
- Home loan values in California: **\$4,800 - \$896,000**
- Credit scores were between **587 and 840** for consumers.
- Self-Employed mortgages: **17**
- Veteran mortgages: **178**

Debbie Sundlie - **NMLS# 247830**

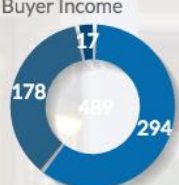
Loan Type





Loans by City



Buyer Income



GET ADVICE 

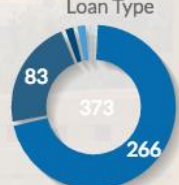


David Whiteside
Sacramento Mortgage Broker

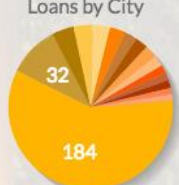
- David has completed **293 mortgages in Sacramento**
- Home loan values in Sacramento: **\$2,610 - \$720,000**
- Credit scores were between **537 and 832** for consumers.
- Self-Employed mortgages: **16**
- Veteran mortgages: **7**

David Whiteside - **NMLS# 247866**


Loan Type




Loans by City



Buyer Income



GET ADVICE 

Customers Journey, from Discovery to Acquisition



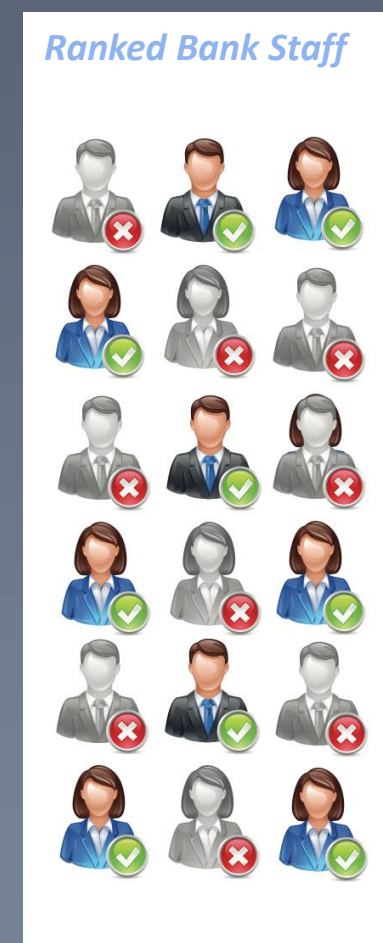
Content
Discovery



Personalized
Banks



Relevant
Bank Staff



- Information Theoretic Scoring
- Sentiment Analysis

Deep Forest Media

a Rakuten Company

Cross Device Graph

Identify users across smartphones, tablets & desktops



Data Collection (cookie-sync, exchanges, ad impression, native sdk, 3rd party data)

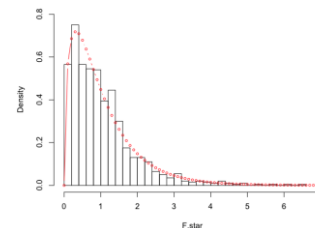
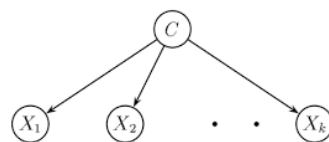


Mozilla/5.0 (Macintosh; Intel Mac OS X 10_10_5) AppleWebKit/537.36
(KHTML, like Gecko) Chrome/55.0.2883.95 Safari/537.36



172.0.0.217

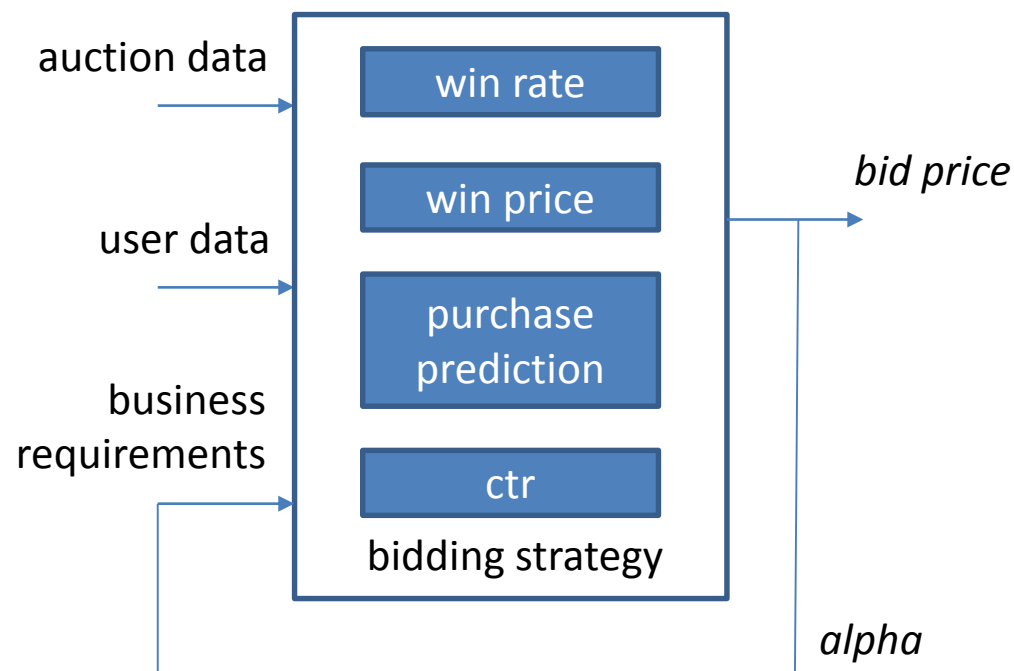
Feature engineering (UID, IP, user agent, referral url, login email etc.)



Machine learning models device graph relationships : naive Bayes modeling & heuristics for pruning.

Bid Price Optimization

- **A dynamic pricing algorithm**
 - maximizes the expected value of gain after winning an auction, or $b = \operatorname{argmax}_b \{E[\text{gain}]\}$
 - adjusts automatically to meet business requirements (ex. CPM margin) using a feedback loop



- **Machine learning models**
 - win rate – binary classification (Random forest)
 - win price – regression
 - purchase prediction – binary classification (Random forest)
 - CTR – binary classification

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 - Categorizers, Regression, NLP, Case-Based reasoning etc.
- **Domain driven rather than technique driven**
- **Interesting Data strategies**
- **AI application is like a raisin bread : it is still 90% bread**

Questions?

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Naghi Prasad
Xu Miao

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