Moody's Analytics Innovation Summit

HOW INNOVATION IS DRIVING CHANGE IN FINANCIAL SERVICES

TUESDAY APRIL 30, 2019 | 1:30-4:30PM | 7 WORLD TRADE CENTER, NYC

MOODY'S ANALYTICS
ACCELERATOR

WELCOME TO

Moody's Analytics Innovation Summit

MOODY'S ANALYTICS

Helping Customers Make Better, Faster Decisions

- Credit Research, Ratings & Risk Measurement
- Economic & Consumer Analytics
- Private Company Data
- Structured Finance Analytics & Valuation

- Credit Assessment & Origination
- Portfolio & Capital Strategy
- Asset & Liability Management
- Regulatory Reporting

- Learning Solutions
- Professional Development & Accreditation
- Business Process Outsourcing

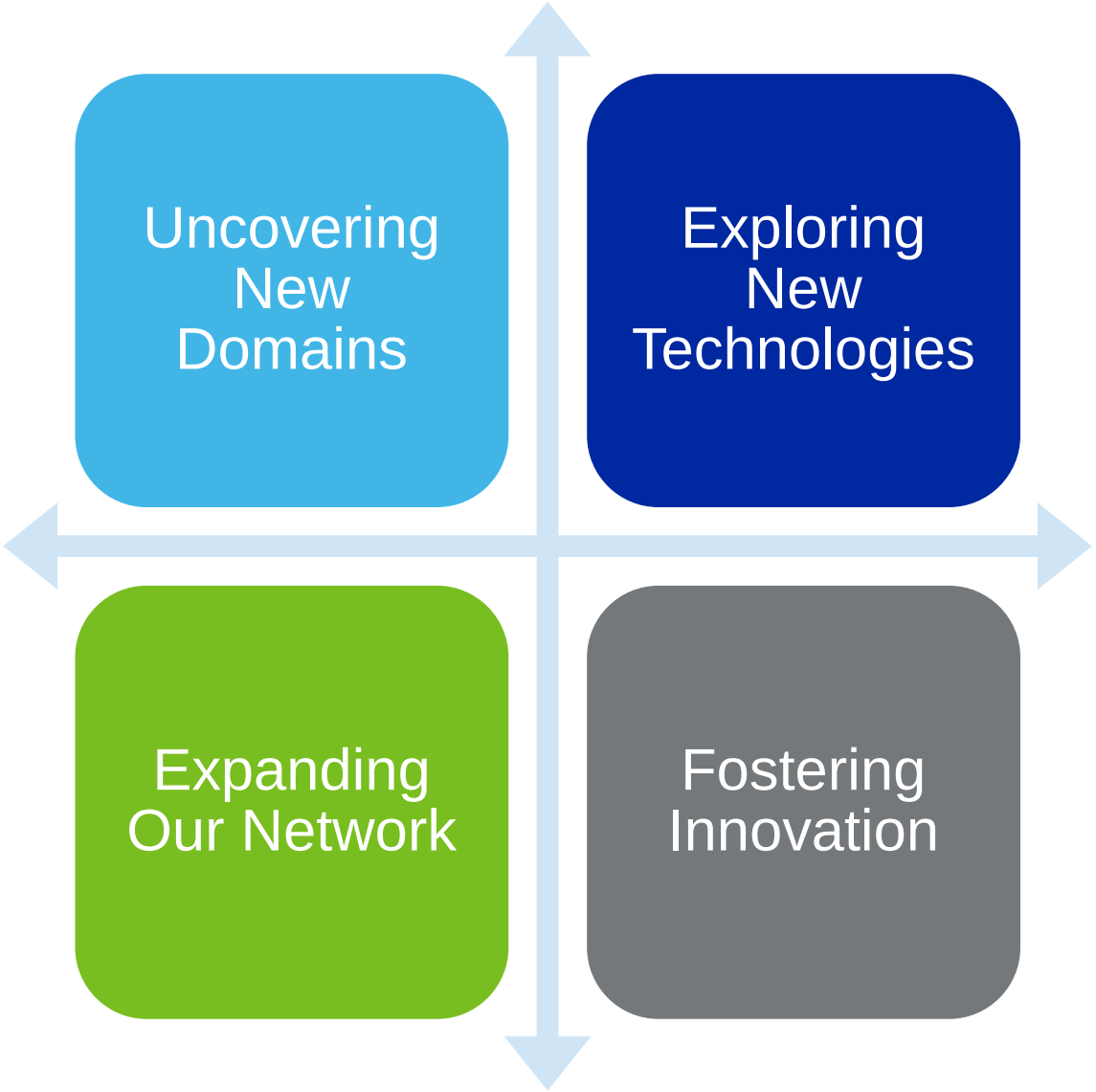
MOODY'S ANALYTICS

Helping Customers Make Better, Faster Decisions

Innovation at Moody’s Analytics

The Moody’s Analytics Accelerator fast-tracks innovation and leverages emerging tech to build the next generation of Moody’s Analytics solutions

MA Accelerator - Agents of Change



Event Overview

- Keynote
- Lightning Pitches
- Getting Smarter with Every Spread
- Ready Lender One
- Innovation in Enterprise
- Networking Reception

WELCOME TO

Moody's Analytics Innovation Summit

Tuesday, April 30, 2019
7 World Trade Center, NY

MOODY'S ANALYTICS ACCELERATOR

Fast-tracks innovation and leverages emerging technologies to build the next generation of Moody's Analytics solutions.

Scan the QR code if you are interested in partnering or starting a conversation.

Connect with Us

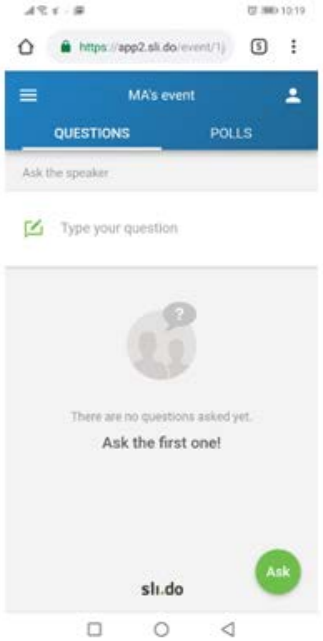
Take the conversation online

Ask Speakers Questions via Slido

1. Log into Slido at **www.slido.com**

2. Type in **MATECH**

3. Enter your question



Follow us on Social Media

Take the conversation online. Use #matech when mentioning today's event.

@MoodysAnalytics

Moody's Analytics

Keynote Address - slides not included

Sean Belka, Managing Director, Fidelity

Lightning Pitch ⚡

Quantifind

Nick Veltri, Quantifind

Discovering Unknow, Unknows

Revenue Drivers and Financial Risk

Nick Veltri
Manager, Financial Analytics
nick@quantifind.com

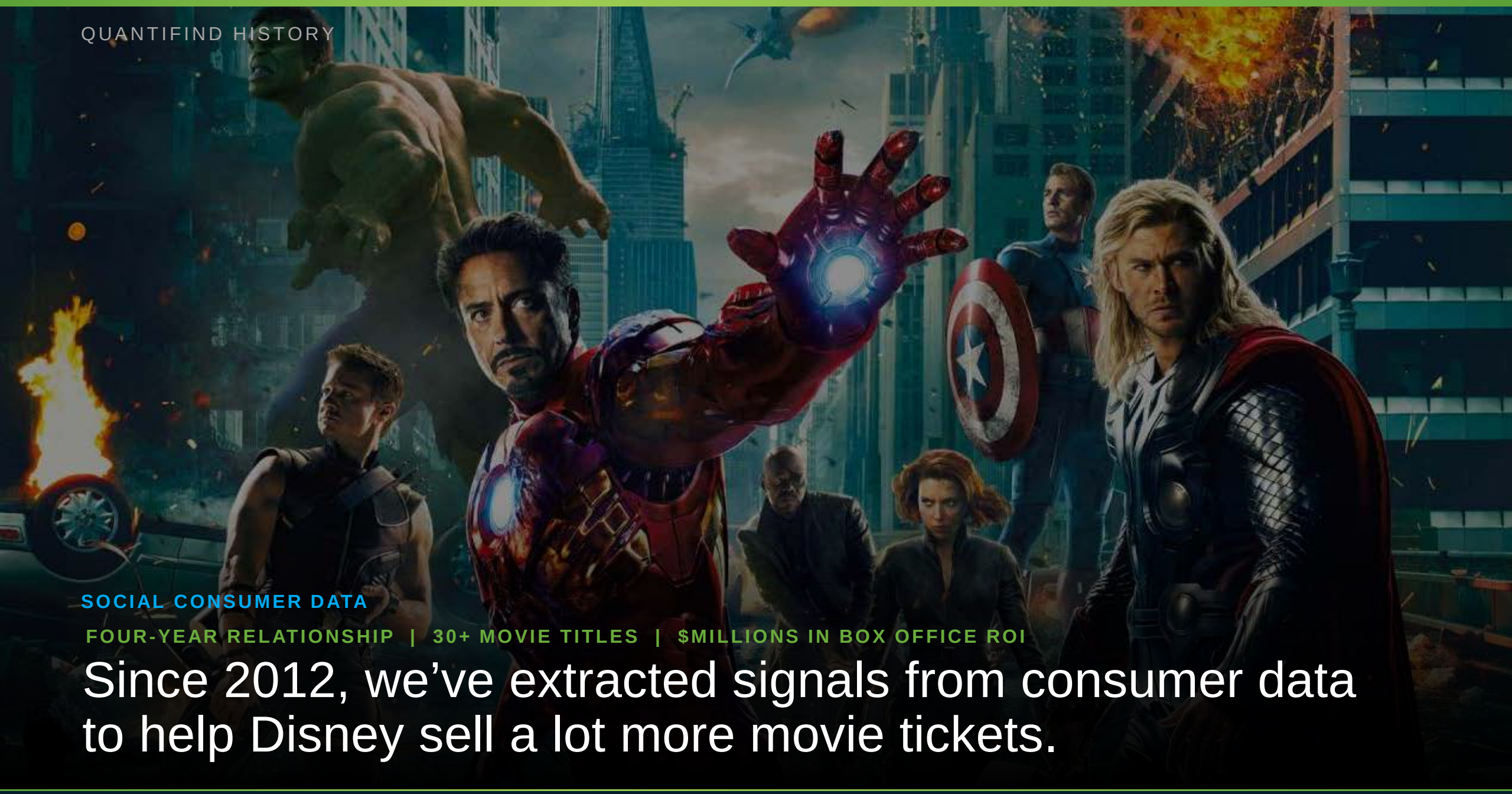
April 30, 2019

QUANTIFIND

REUTERS NEWS FEED | SOCIAL DATA

ROOTS IN ATOMIC PHYSICS | DEFENSE CONTRACTOR RESEARCH | INTELLIGENCE

We extracted signals from Reuters news feeds that helped identify terrorist operations in Peru.



SOCIAL CONSUMER DATA

FOUR-YEAR RELATIONSHIP | 30+ MOVIE TITLES | $MILLIONS IN BOX OFFICE ROI

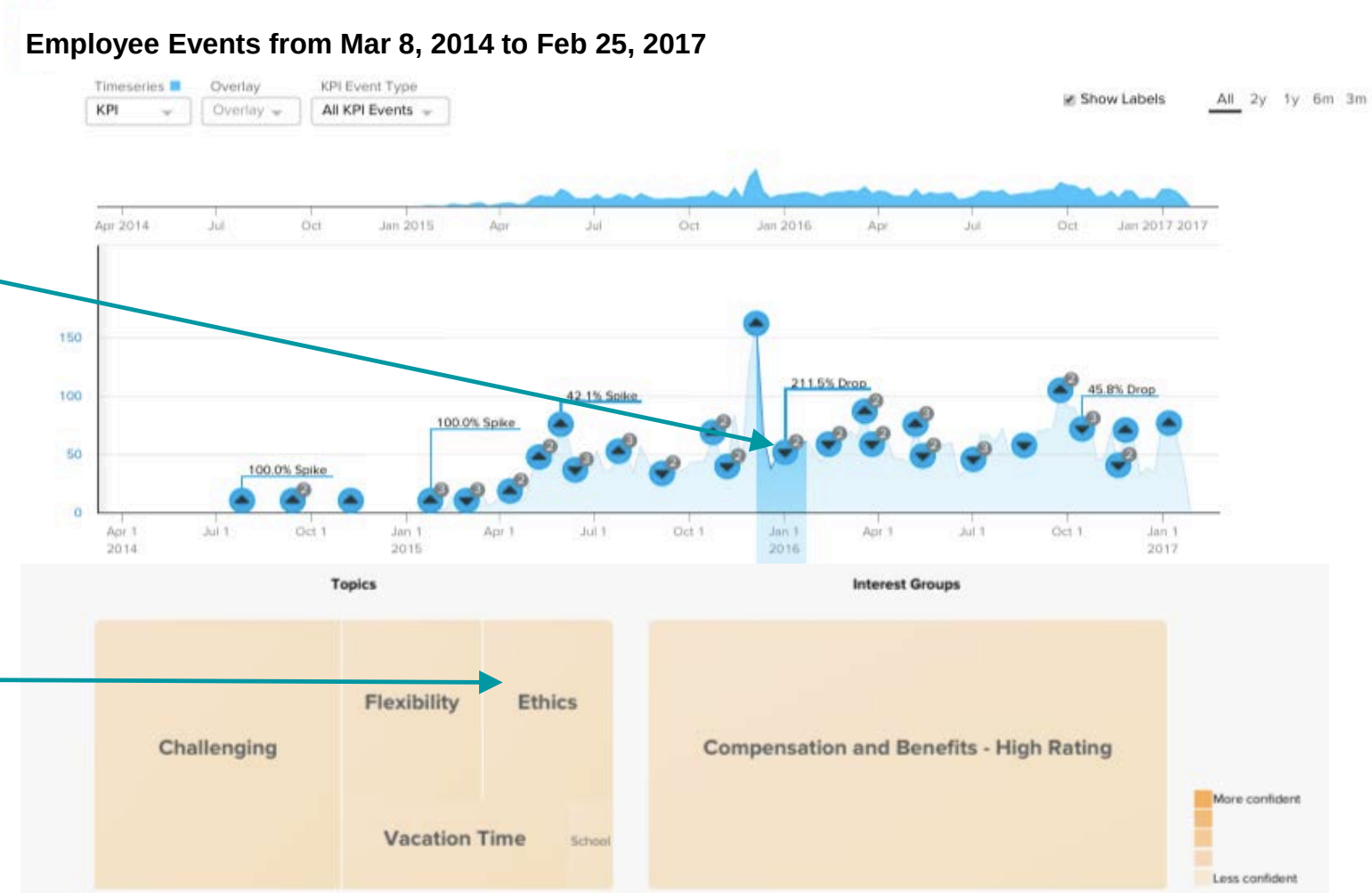
Since 2012, we've extracted signals from consumer data to help Disney sell a lot more movie tickets.

Case Study: **Fraudulent Accounts**
Uncovering Unethical Behavior from Employee Churn Models

Automatically identifies spikes of employee churn in early 2016.

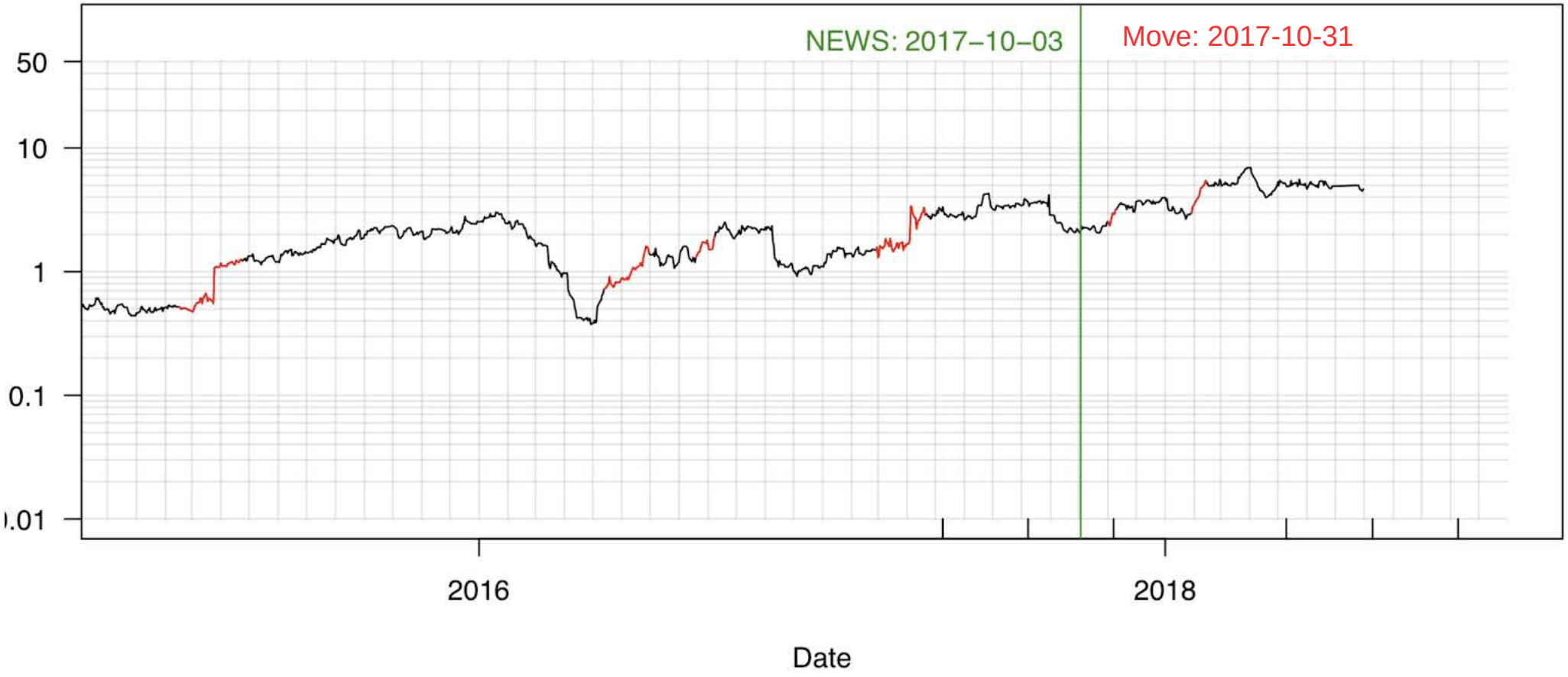
Discovers “Ethics” as emerging explanation.

“Ethics” topic drill-in provides verbatims for management pressure for fraudulent account openings from Twitter and Glassdoor.



Using News Data to Predict and Explain Risk Metrics

- **John Stanik** to retire as **Ampco−Pittsburgh** CEO; 28 day lead time



Thank you!

Getting Smarter with Every Spread

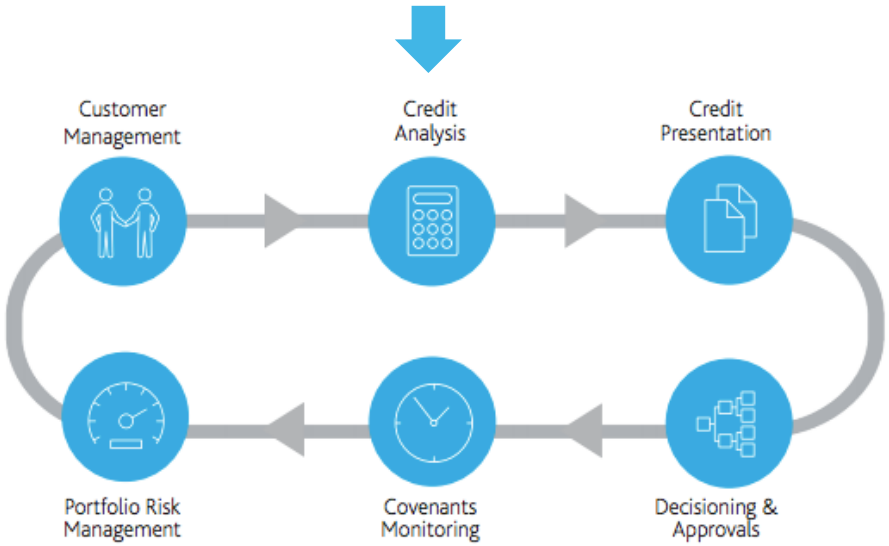
Inside the innovation journey to build QUIQspread

Eric Grandeo, Product Manager, MA Accelerator
Miguel Romao, Business Development, MA Accelerator

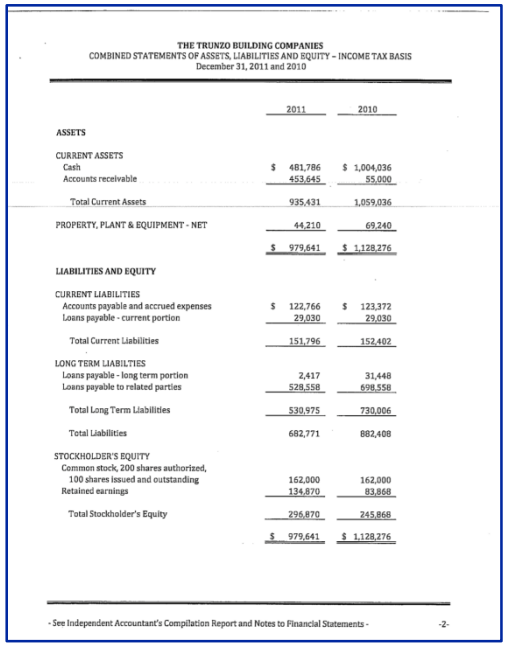
Spreading is a critical element of originating a loan

Credit Analysis

Financial Data Spreading



Financial Statement: Balance Sheet, Income Statement, & Notes



THE TRUNZO BUILDING COMPANIES
COMBINED STATEMENTS OF ASSETS, LIABILITIES AND EQUITY – INCOME TAX BASIS
December 31, 2011 and 2010

	2011	2010
ASSETS		
CURRENT ASSETS		
Cash	$ 481,786	$ 1,004,036
Accounts receivable	453,645	55,000
Total Current Assets	935,431	1,059,036
PROPERTY, PLANT & EQUIPMENT - NET	44,210	69,240
	$ 979,641	$ 1,128,276
LIABILITIES AND EQUITY		
CURRENT LIABILITIES		
Accounts payable and accrued expenses	$ 122,766	$ 123,372
Loans payable - current portion	29,030	29,030
Total Current Liabilities	151,796	152,402
LONG TERM LIABILITIES		
Loans payable - long term portion	2,417	31,448
Loans payable to related parties	528,558	698,558
Total Long Term Liabilities	530,975	730,006
Total Liabilities	682,771	882,408
STOCKHOLDER'S EQUITY		
Common stock, 200 shares authorized, 100 shares issued and outstanding	162,000	162,000
Retained earnings	134,870	83,868
Total Stockholder's Equity	296,870	245,868
	$ 979,641	$ 1,128,276

- See Independent Accountant's Compilation Report and Notes to Financial Statements - -2-

Middle Market Accounting Standard (MMAS) Template

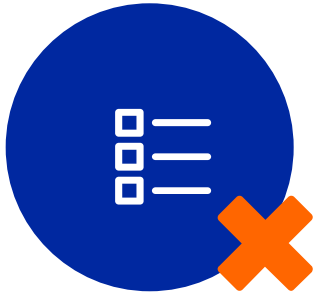
1 Statement	12/31/2017
Periods	12
Audit Mthd	Unqualif'd
Accountant	
Analyst	
Stmt Type	Annual
Accounting Standard	
Status	Draft
Consolidation	Unconsolidated
Currency	USD US Dollar
Restated	
Reconcile To	NONE
Total Assets	180,837
Total Liabs & Net Worth	0
Difference	180,837
Current Assets	180,837
Cash	129,846
Time Deposits	1
Marketable Securities	1,345
Accts/Notes Rec-Trade	666
Bad Debt Reserve (-)	6,481
Loans to Related Co - CP	2
Due from Related Co - CP	54,354
Accts/Notes Rec-Other	131
Income Tax Receivable	45
Def Inc Tax Recover - CP	1
Raw Materials	54
Work in Process	0
Finished Goods	89
Other Inventory	784
Supplies	0
Total Inventory	927
Costs in Excess of Billings	0

Moody's spreads thousands of financial statements annually

- Spread thousands of rated entities quarterly (over 100K spreads)
- 50K-100K spreads in our BvD business annually
- Spread >400K statements each year for customers in our Knowledge Services business

Four key challenges with spreading

Highly Manual Process often taking days to complete spreads

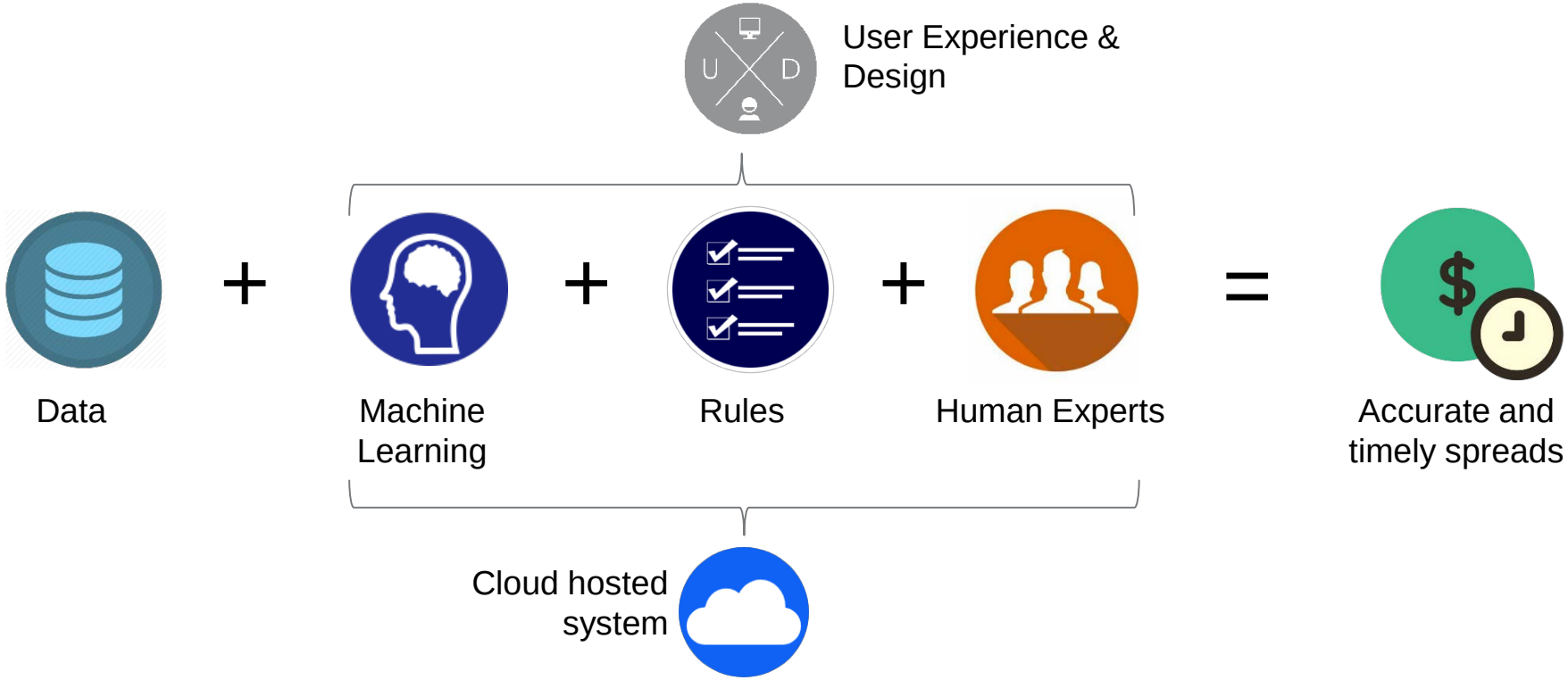


Lack of industry standards & consistency

Highly variable quality & complexity of inputs

Previous attempts failed to achieve meaningful efficiencies

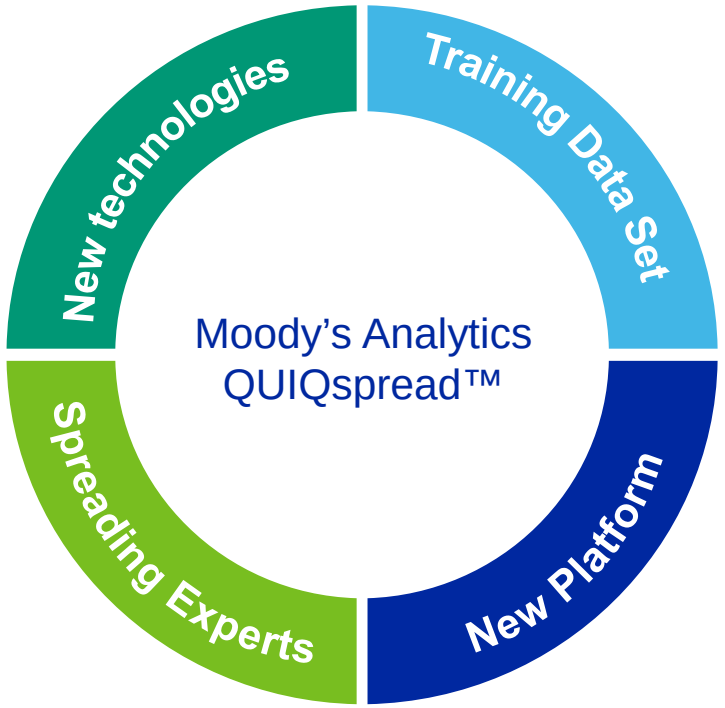
Applying machine learning to the spreading process



Moody's Analytics is uniquely positioned to solve this challenge

AI
Team of Machine Learning Scientists

Credit & Spreading Experts



22M
Private Company Data

CreditLens™

Results that we've achieved through deploying QUIQspread

≥ 50% **Quicker Spreads**

Reduce cost per spread by 40-60%

100% **accuracy** with QUIQspread

Substantial reduction in loan decisioning time

More loans, more revenue

Demonstration

Q&A

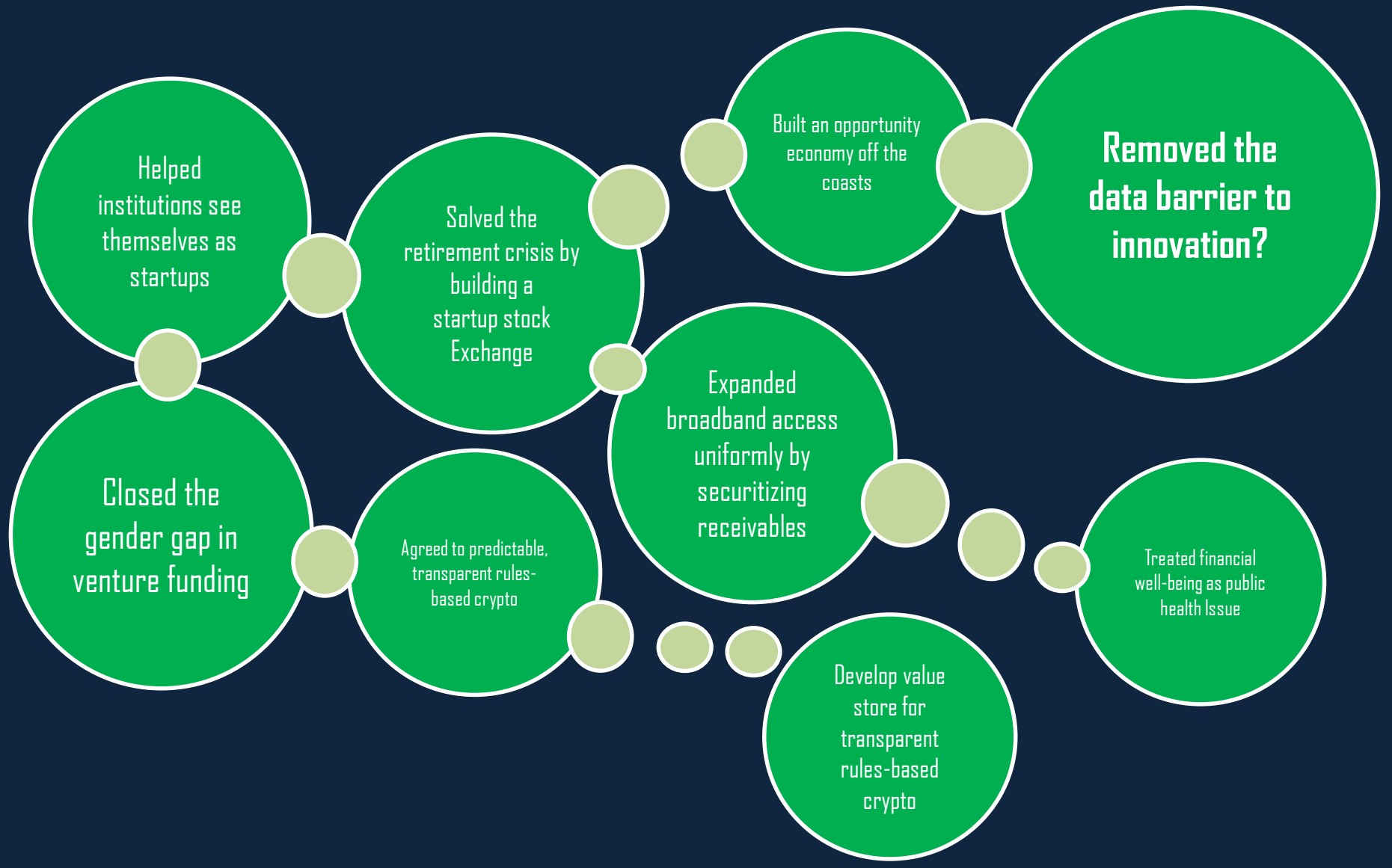
Lightning Pitch

FinTech SandBox

Jean Donnelly, FinTech SandBox

FinTech
SANDBOX

What if we....


Helped institutions see themselves as startups
Solved the retirement crisis by building a startup stock Exchange
Built an opportunity economy off the coasts
Removed the data barrier to innovation?
Closed the gender gap in venture funding
Agreed to predictable, transparent rules-based crypto
Expanded broadband access uniformly by securitizing receivables
Treated financial well-being as public health Issue
Develop value store for transparent rules-based crypto

Mission

We enable financial technology entrepreneurs to build robust products by providing access to **free** data, development tools and community. We promote the adaption of FinTech innovation globally through a structured program of engagement between the startup, data partner, and enterprise

How?

Startup + Data Provider = Data Access to Build Product

Partner Success Stories

REFINITIV
THOMSON REUTERS

Co-Development
Thomson Reuters co-developed new product with FinTech Sandbox alumni Elsen, successfully

Data Simply

Data Commercialization
Sandbox alumni Data Simply created the first alternative data products for institutional investors, which startups

STATE STREET

Branding & Culture
Engaged over 200 employees at State Street with external innovation through BUILDBeta program &

FRANKLIN TEMPLETON
INVESTMENTS

Proof of Concepts
Exposed 60 leaders within the Investment Management Division at Franklin Templeton to five curated which are now in commercial agreements with two more in proof of concepts

S&P Global
Market Intelligence

Strategic Investment & Acquisition
S&P Global provided capital funding and eventually acquired inaugural FinTech Sandbox alumni

FinTech
SANDBOX

FinTech Sandbox Startup Success 170+ startups to date

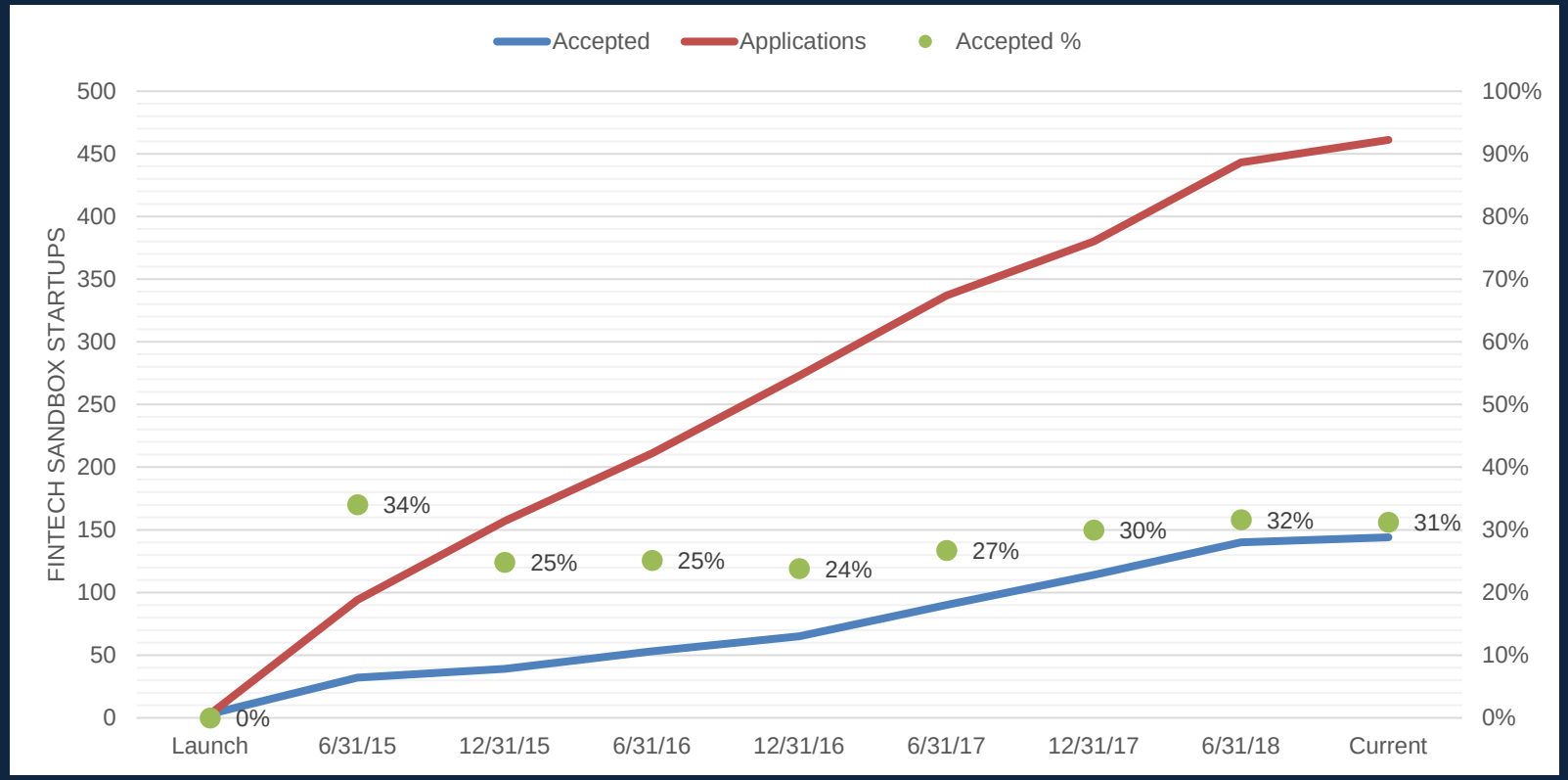
$200K
saved per startup data & costs

70%
participate in POCs partner institutions

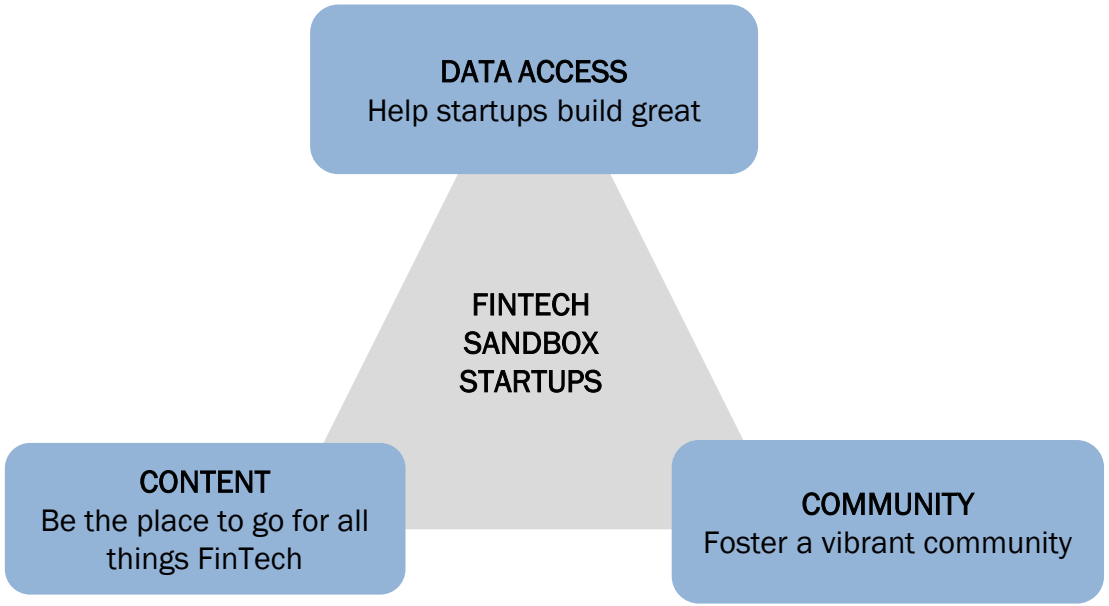
10
successful

600+
jobs created

$520 M +
in capital post Sandbox residency



FinTech Sandbox Model



We provide

- Access to data feeds for development and streamlined licensing process
- Free compute infrastructure and PaaS
- Access to network
- Community events

Our entrepreneurs provide

- Feedback to data providers and other entrepreneurs
- Ongoing and documented learnings
- Contributions of non-proprietary code and APIs to GitHub repository
- New innovative products

Sponsored By

REFINITIV F/PRIME GOODWIN FidelityLabs

FRANKLIN TEMPLETON INVESTMENTS STATE STREET intel amazon web services EY Building a better working world

FinTech SANDBOX

Data Access Program

MARKET DATA				
Refinitiv	FactSet	SIX Information	S&P Global	Xignite
BarChart	Euromoney	Quandl	Intrinio	Estimize
TagniFi	CME Group	Morningstar	IHS Markit	ACTIV Financial
7Chord	S&P Down Jones	Best Credit Data	Moody's Analytics	Exchange Data International

CONSUMER DATA	
Yodlee	Plaid / Quovo

CREDIT DATA		
Experian	Dun & Bradstreet	TransUnion

ALTERNATIVE DATA		
InfoGroup	Accuweather	Benzinga
TradeBlock	FinMason	Associated Press
SageWorks	EDGAR Online	Data Simply
Stocktwits		

INFRASTRUCTURE	
AWS	OpenFin
Tradier	TradeIt

Signature Events

BOSTON FINTECH WEEK 2018

- 47 events
- 3,000 registrants
- 120 partner organizations, 200 speakers
- 22 venues
- 16 sponsors
- 17 articles (news orgs and community posts)

Boston FinTech Week 2019 Sept 9-13th!

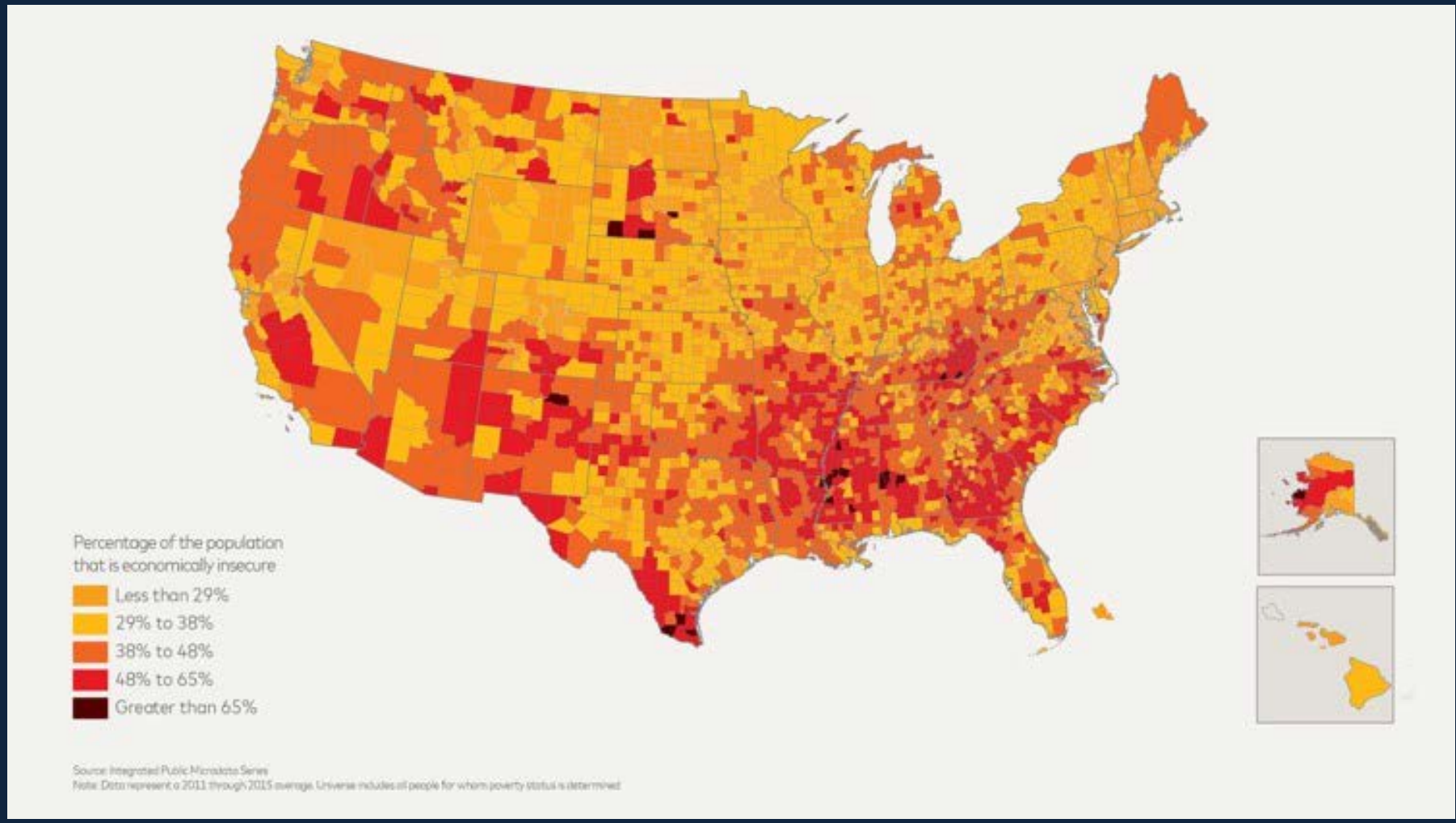
Demo Day 6.0

- NYC FinTech Week
- 330 Attendees
- 9 presenting startups
- 4 sponsors

FinTech SANDBOX

What if we...

decided everyone's financial security matters?



Ready Lender One

How Moody's Analytics is Making Unstructured Data Usable

Ashit Talukder, Head of Machine Learning, MA Accelerator
Nakul Kapoor, Director for Strategy & Innovation, MA Accelerator

1

Background on Unstructured Data

The unstructured data explosion at a glance…

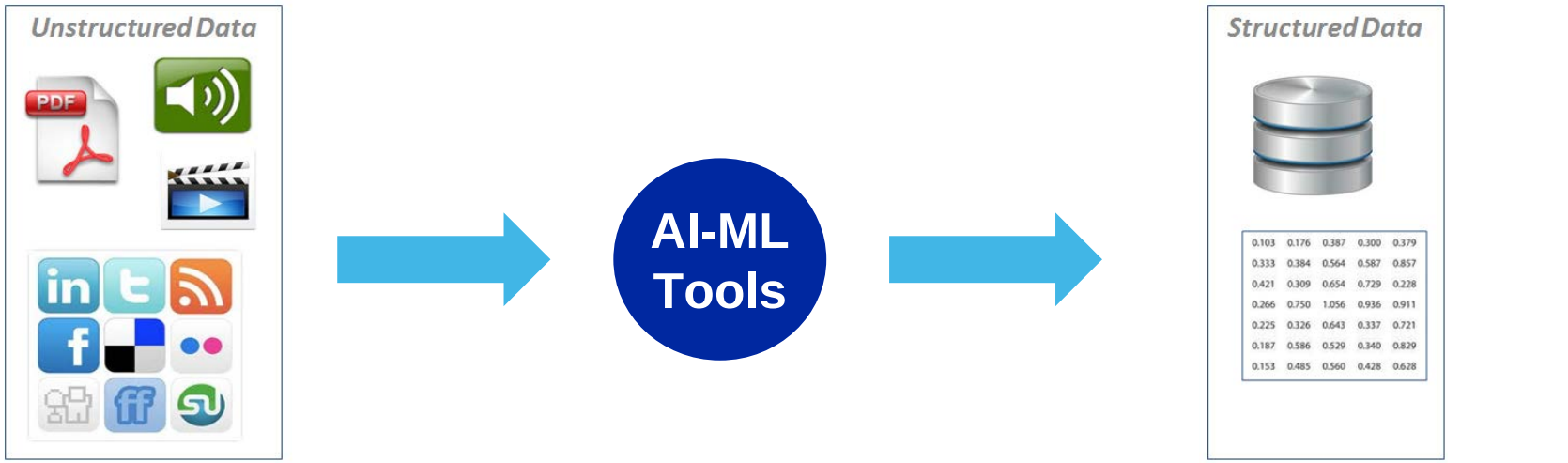
Unstructured data will account for 80% of all data by 2020

300 million photos are uploaded in one day

600 edits are made to Wikipedia every minute

Automation For Unstructured Data

- AI-ML that *assist* (& collaborate) with humans in decision-making
- AI-ML tools provide *new products, capabilities* not possible before
  - Extract new, timely & better knowledge, insights from alternate data sources (previously not used)



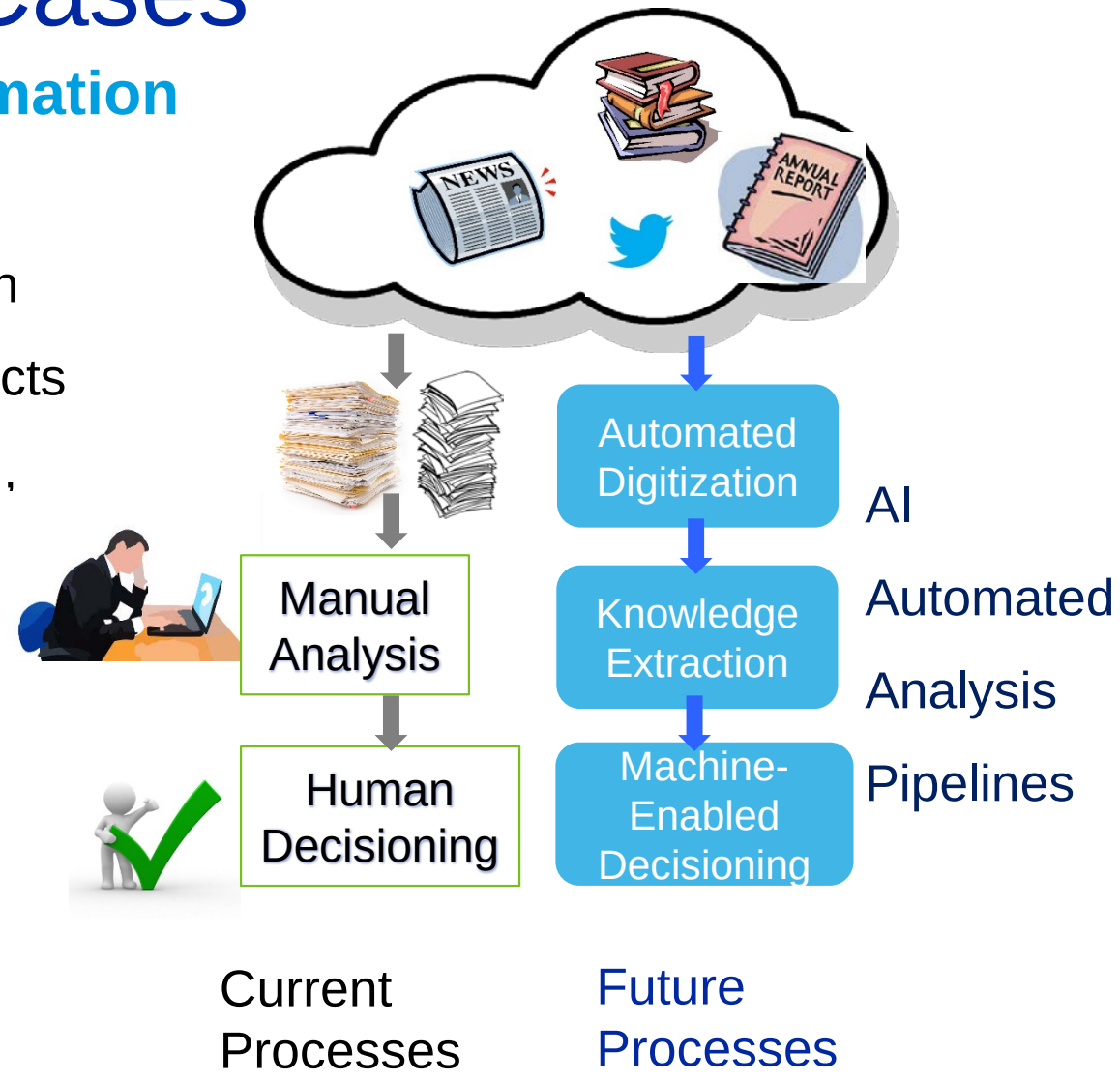
Unstructured, Alternate, Multimodal Data with no machine-identifiable structure

Knowledge that fuels insights for better decision making

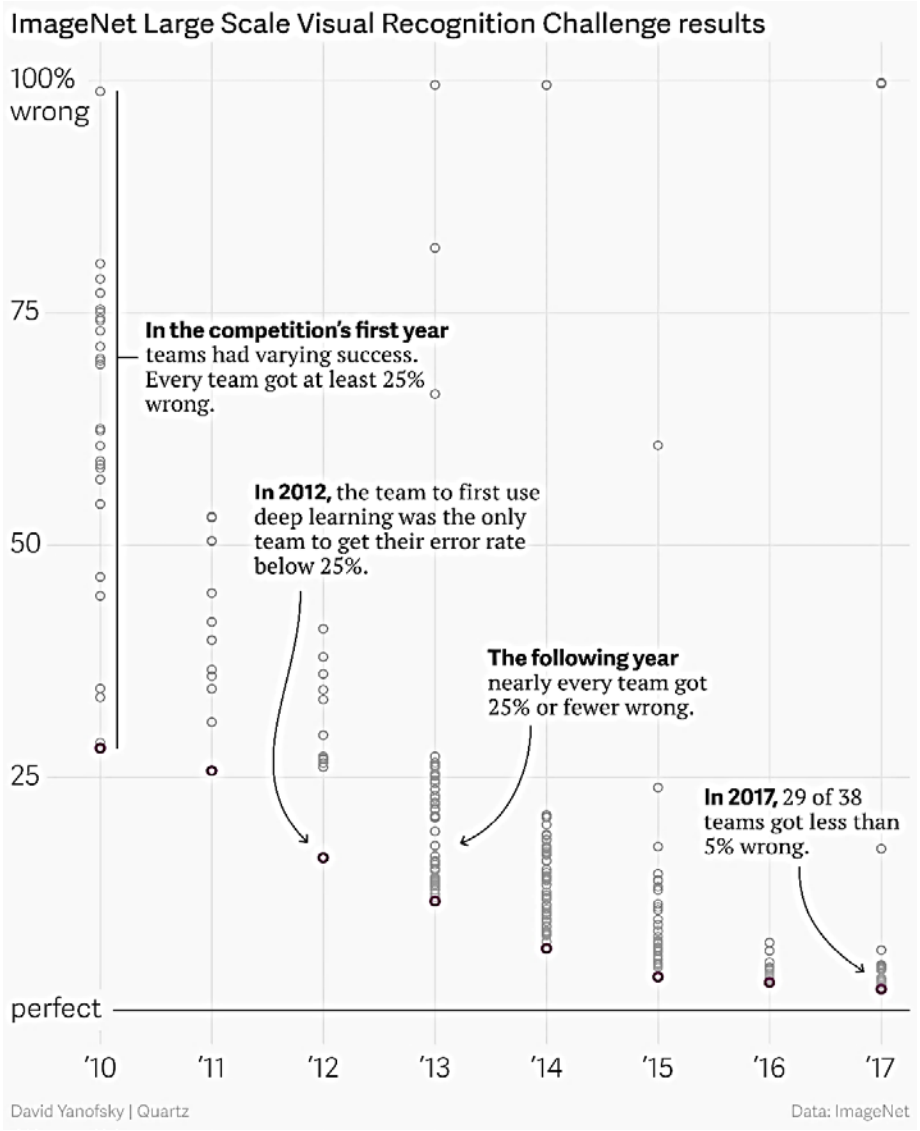
Financial Automation Use-Cases

Existing Manual Processes Ripe for Automation

- Compliance and risk monitoring
  - Manual review requiring time-consuming research
- Paper document processing for Risk, Legal, Contracts
  - Manual analysis of paper documents in risk, legal, contracts
  - Covenant monitoring
- CRE research and analysis
  - New construction and resale of properties
- Financial research and analysis (M&A, investment)



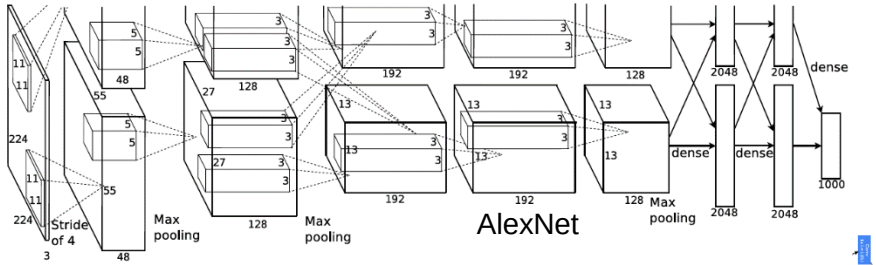
Deep Learning in Computer Vision

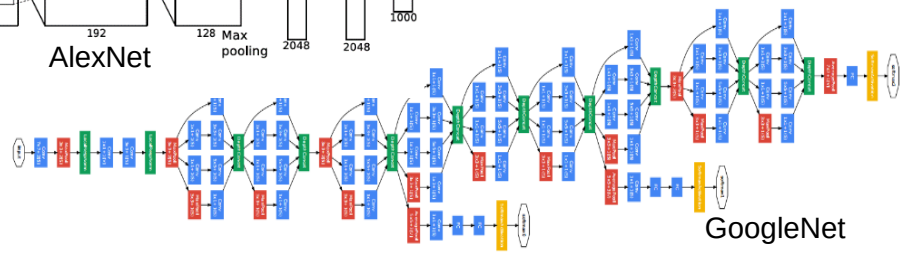


More Data

Source: ImageNet Site

Better Models (Deep Learning)



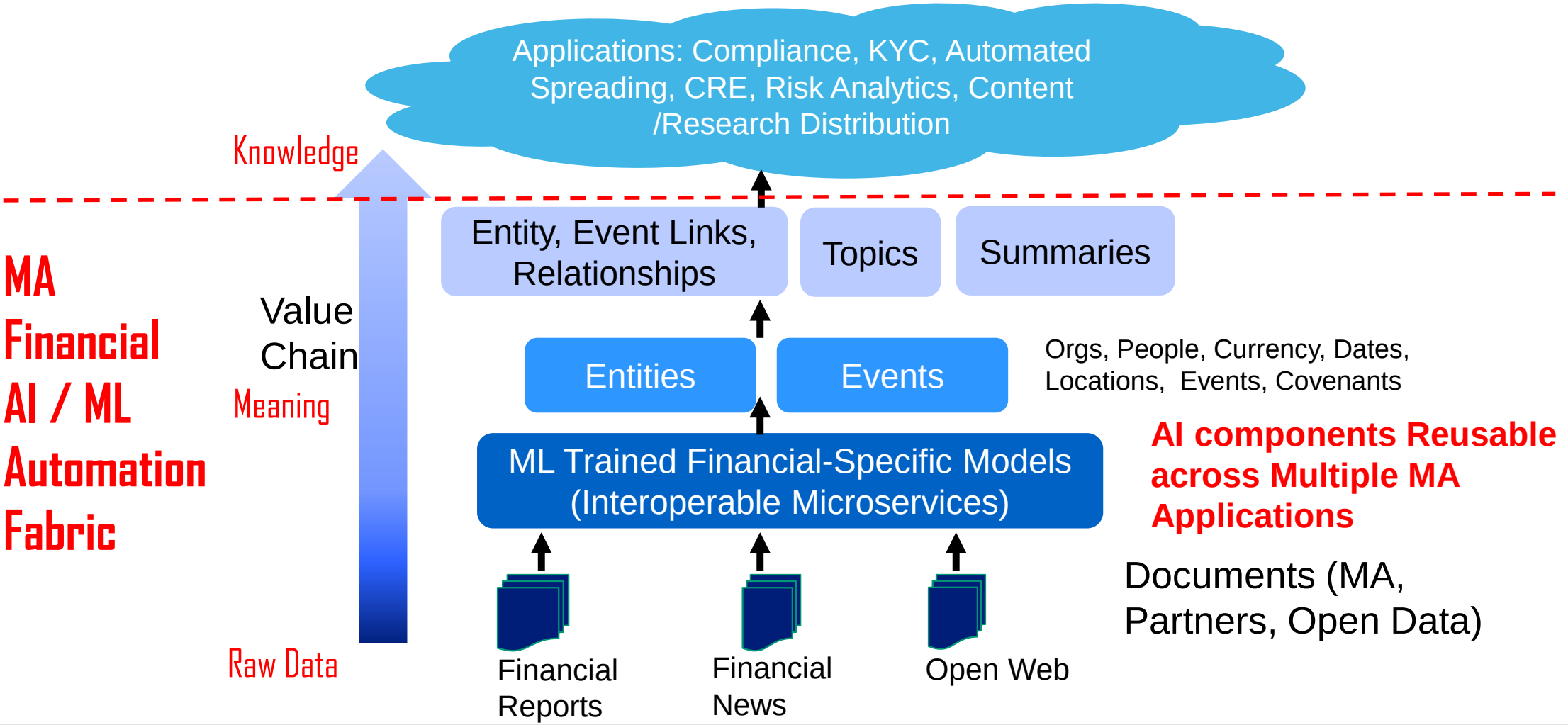


2

The Moody’s Analytics ML Fabric

MA Financial AI /ML Automation Fabric - Goal

Knowledge Extraction and Representation with Foundational ML Solutions – Going up the Value Chain



ML Fabric Services And Deployment

- Rapid development of new AI solutions and pipelines – development to scaled deployment
- Expose AI solutions through ML Fabric as APIs
- Enables continuous model improvements transparent to client
- Different models and services exposed securely to different internal/external clients
- Automated scaling and deployment with ML Fabric

AI Automation Services

.

3

Compliance Use Case

Compliance is a growing cost and risk

Some high profile banks have already been hit with fines

$400B

Total expected company fines by 2020[1]

$2T

Laundered globally – 5% of GDP[2]

$60M

Average company cost for KYC and EDD[1]

ING Group

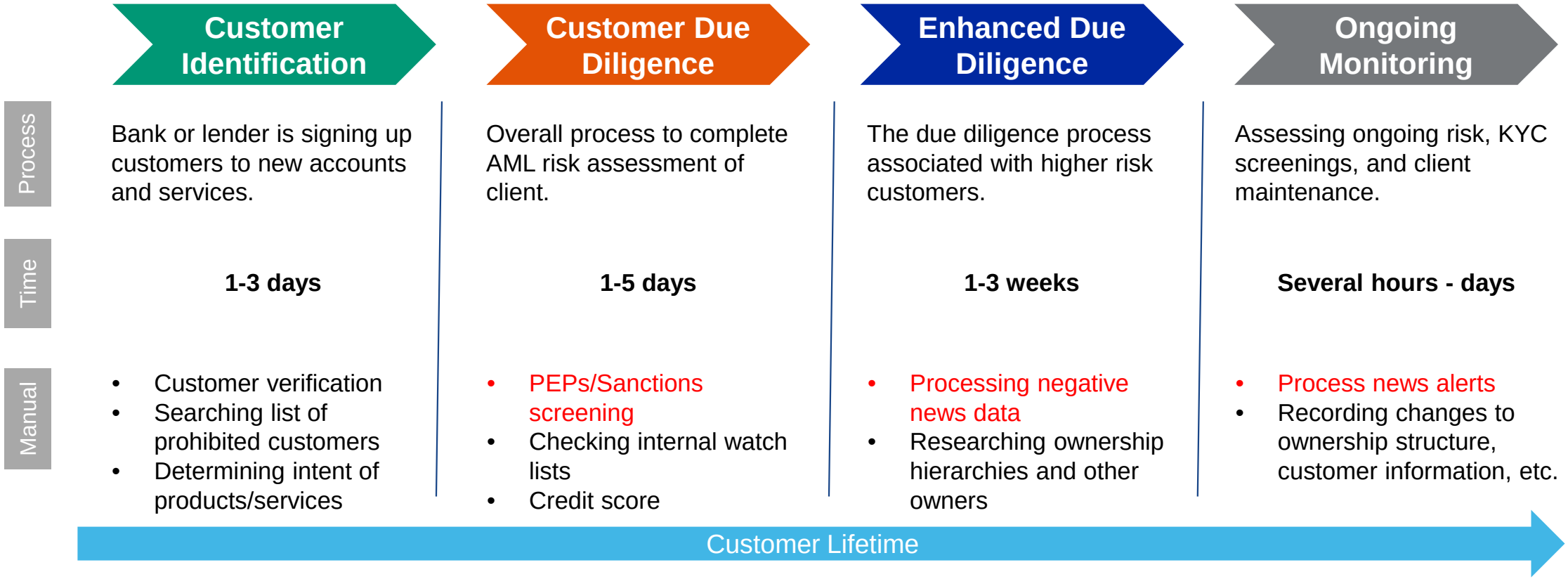
Dutch bank ING fined $900 million for failing to spot money laundering.

Danske Bank

Thomas Borgen – Former CEO

Danske Bank is facing a criminal investigation in the US over its $235 billion money laundering scandal

The KYC process can be very time consuming and manual – there are ways to automate



Example of automation – adverse media detection

Traditional research through search platforms

Google samsung crime

All | News | Images | Shopping | Videos | More | Settings | Tools

About 6,210,000 results (0.43 seconds)

Ethereum [ETH]: **Samsung** planning to create its own ETH-based ...
AMBCrypto - 10 hours ago
Technology giant, **Samsung**, is not new to the field, as the South ... with your fingerprints built into them and going and committing a **crime**." ...

Some of **Samsung's** new folding phones are already breaking
WWMT-TV - Apr 17, 2019
SAN FRANCISCO (AP) — Some of **Samsung's** new, almost $2,000 ... in Virginia pleaded guilty Wednesday to federal hate **crime** charges in a ...

Samsung's Galaxy S10 fingerprint security measure has already been ...
Yahoo Finance - Apr 8, 2019
Samsung's Galaxy S10 – regarded as a revelation in the crypto space ... gloves with their fingerprints to unlock the phone and commit a **crime**.

Samsung Galaxy S10 With Supported Crypto Wallet for Ethereum Gets ...
The Daily Hodl - Apr 7, 2019

Samsung Galaxy S10 sensor reportedly duped by a 3D-printed ...
CNET - Apr 8, 2019

View all

With AI/ML, relevant results will filter through

Samsung Chief Charged With Bribery And **Embezzlement**
NPR - Feb 28, 2017
The acting head of Samsung, Lee Jae-yong, has been charged with bribery and **embezzlement** in connection with the corruption scandal that ...

The acting head of Samsung, Lee Jae-yong, has been charged with bribery and embezzlement in connection with the corruption scandal that led to the impeachment of South Korea's president.

NPR's Elise Hu reported from Seoul that prosecutors announced the indictment after a three-month investigation:

> "Samsung acting head Lee Jae-Yong got ensnared after documents showed Samsung funneled some $36 million to the president's close confidant. Prosecutors say the money was paid to win government support of a controversial 2015 company merger.
>
> "The merger did go through, after a vote of support from the government. In a statement, Samsung says it has not paid bribes or made improper requests to the government. Lee is currently in jail awaiting further proceedings in his case."

Lee was arrested on Feb. 17, two months after President Park Geun-hye was impeached over allegations of corruption, influence-peddling and cult ties, as we reported.

Introducing the AI Compliance solution

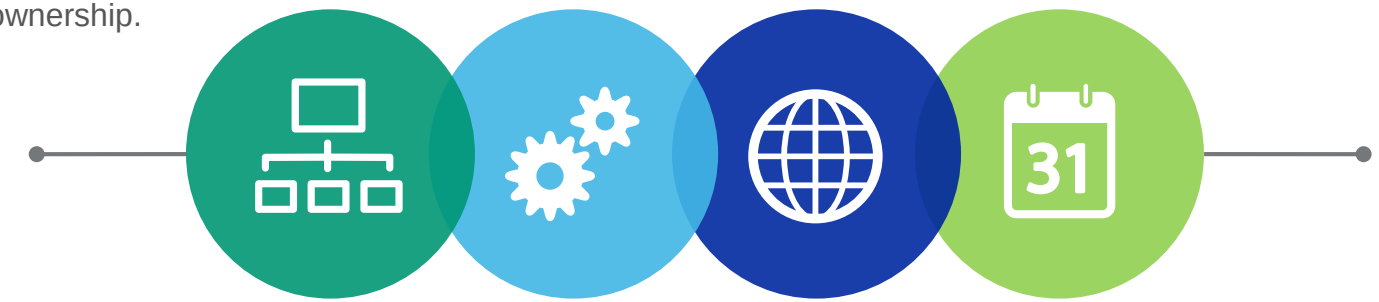
Our differentiators will lead to a more robust KYC experience

Relationship Data

Leveraging the Bureau van Dijk Orbis database, one can uncover deep connections in adverse media using corporate hierarchies and beneficial ownership.

Real-time News

Pure automation allows you to see real-time adverse news without the need for human intervention.



Deep Learning Models

We capture language context and meaning from unstructured text.

Neural Machine Translation

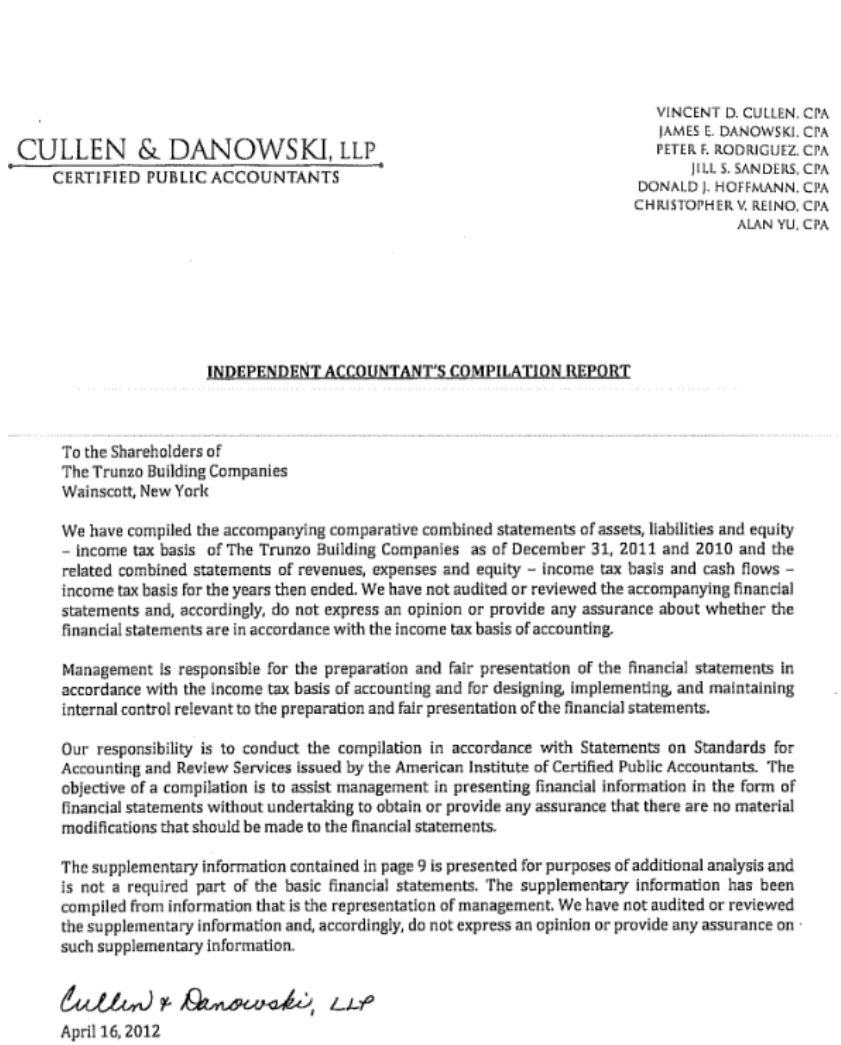
Through NMT, detect adverse news via multi-lingual sources.

4

Other use cases in development

Automated Extraction from Documents at Scale

- Goal: Automate and scale paper document processing and analysis
- OCR scanned documents
- Extract knowledge from documents using advanced NLP
  - Document understanding
  - Covenant monitoring for legal, compliance
  - Contract monitoring for procurement, compliance



CULLEN & DANOWSKI, LLP
CERTIFIED PUBLIC ACCOUNTANTS

VINCENT D. CULLEN, CPA
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JILL S. SANDERS, CPA
DONALD J. HOFFMANN, CPA
CHRISTOPHER V. REINO, CPA
ALAN YU, CPA

INDEPENDENT ACCOUNTANT'S COMPILATION REPORT

To the Shareholders of
The Trunzo Building Companies
Wainscott, New York

We have compiled the accompanying comparative combined statements of assets, liabilities and equity – income tax basis of The Trunzo Building Companies as of December 31, 2011 and 2010 and the related combined statements of revenues, expenses and equity – income tax basis and cash flows – income tax basis for the years then ended. We have not audited or reviewed the accompanying financial statements and, accordingly, do not express an opinion or provide any assurance about whether the financial statements are in accordance with the income tax basis of accounting.

Management is responsible for the preparation and fair presentation of the financial statements in accordance with the income tax basis of accounting and for designing, implementing, and maintaining internal control relevant to the preparation and fair presentation of the financial statements.

Our responsibility is to conduct the compilation in accordance with Statements on Standards for Accounting and Review Services issued by the American Institute of Certified Public Accountants. The objective of a compilation is to assist management in presenting financial information in the form of financial statements without undertaking to obtain or provide any assurance that there are no material modifications that should be made to the financial statements.

The supplementary information contained in page 9 is presented for purposes of additional analysis and is not a required part of the basic financial statements. The supplementary information has been compiled from information that is the representation of management. We have not audited or reviewed the supplementary information and, accordingly, do not express an opinion or provide any assurance on such supplementary information.

Cullen & Danowski, LLP
April 16, 2012

VINCENT D. CULLEN PERSON, CPA
JAMES E. DANOWSKI PERSON, CPA

CULLEN & DANOWS KJ, LLP ORG
RODRIGUEZ PERSON, CPA
PETER F.

JILL'S. SANDERS ORG, CPA
CERTIFIED PUBLIC ACCOUNTANTS
HOFFMANN PERSON, CI
DONALD J.

CHRISTOPHER V. REINO PERSON, CPA
ALAN YU PERSON, CPA

INDEPENDENT ACCOUNTANT'S ORG
COMPILATION REPORT

EVENT To the Shareholders of
The Trunzo Building Companies ORG
Wainscott, New York

EVENT We have compiled the accompanying comparative combined statements of assets, liabilities and equity - income tax basis of The Trunzo Building Companies ORG as of December 31, 2011 DATE and 2010 DATE and the related combined statements of revenues, expenses and equity - income tax basis and cash flows - income tax basis for the years DATE then ended. We have not audited or reviewed the accompanying financial statements and, accordingly, do not express an opinion or provide any assurance about whether the financial statements are in accordance with the income tax basis of accounting.

Management is responsible for the preparation and fair presentation of the financial statements in accordance with the income tax basis of accounting and for designing, implementing, and maintaining internal control relevant to the preparation and fair presentation of the financial statements.

Our responsibility is to conduct the compilation in accordance with Statements on Standards for Accounting and Review Services ORG issued by the American Institute of Certified Public Accountants ORG. The objective of a compilation is to assist management in presenting financial information in the form of financial statements without undertaking to obtain or provide any assurance that there are no material modifications that should be made to the financial statements.

The supplementary information contained in page 9 CARDINAL is presented for purposes of additional analysis and is not a required part of the basic financial statements. The supplementary information has been compiled from information that is the representation of management. We have not audited or reviewed the supplementary information and, accordingly, do not express an opinion or provide any assurance on such supplementary information.

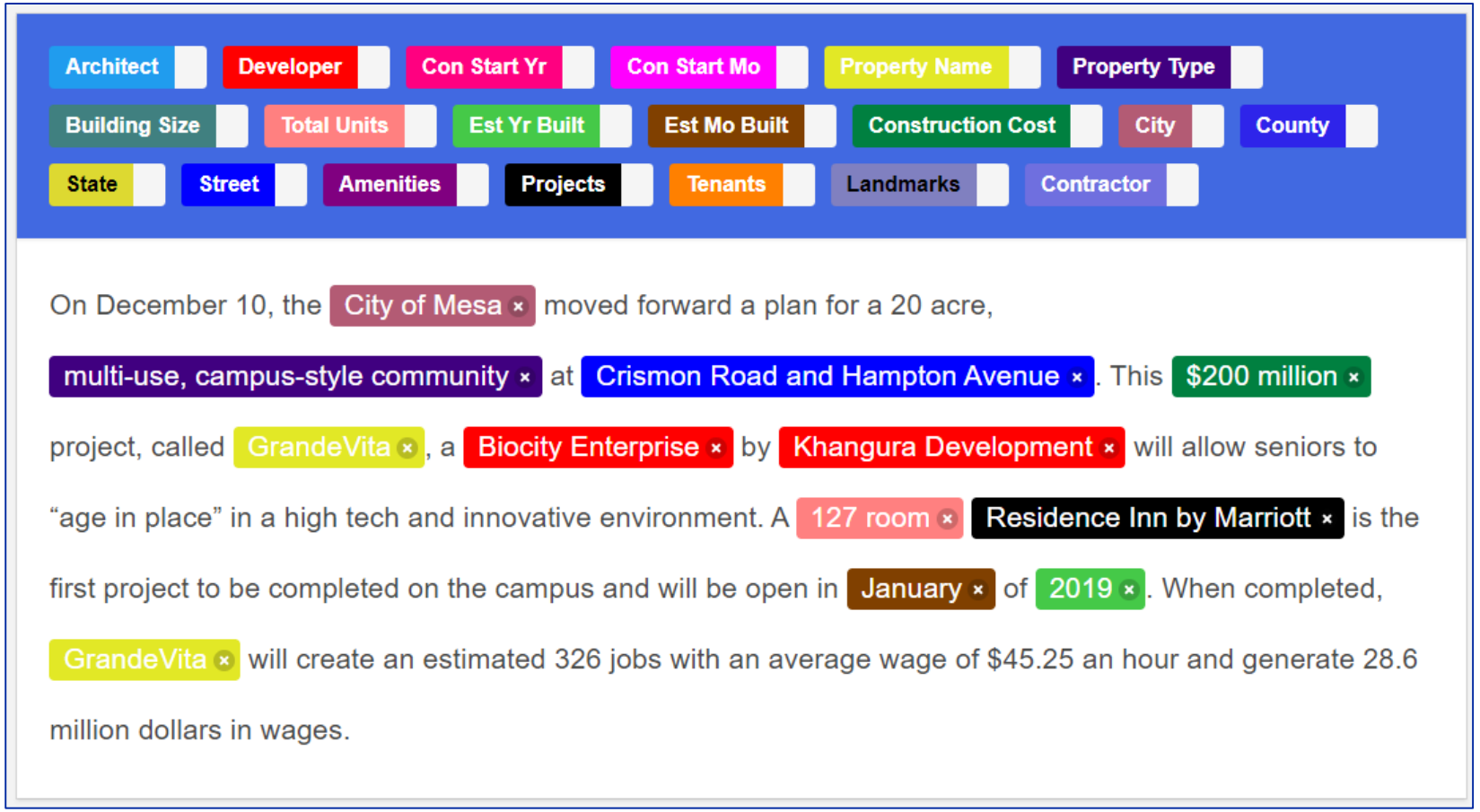
CRE New Construction Lead Generation Automation

- Automate and scale CRE lead generation for new construction
  - Retrieve, Rank, Information about CRE new construction from unstructured

pubdate	title	url	content	rank_score
2019-02-28T06:15:11Z	Groundbreaking Ceremony for Branson Aquarium	http://bransonhotelmap.com/groundbreaking-ceremony-for-branson-aquarium/	BRANSON, Mo. – City leaders gathered on the strip Wednesday morning, for the groundbreaking ceremony of the long-awaited "Aquarium at the ...	0.694
2019-03-03T11:00:29Z	Groundbreaking Ceremony Held at Strike Middle School	http://cadencemcshane.com/groundbreaking-ceremony-held-at-the-new-little-elm-isd-strike-middle-school-in-the-colony-texas/	The project began with an official ground breaking ceremony hosted by the district on February 4th. Keynote speakers at the event included Little Elm ...	0.67
2019-02-28T22:18:45Z	LU to break ground on School of Engineering building this fall	http://www.liberty.edu/news/?MID=312334	Liberty University is set to begin construction this fall on a new three-story School of Engineering building across from DeMoss Hall, next to the ...	0.62
2019-03-05T17:26:15Z	Steppenwolf Theatre breaks ground on $54M construction project	https://wgntv.com/2019/03/05/steppenwolf-theatre-breaks-ground-on-54m-construction-project/	CHICAGO – The Steppenwolf Theatre is taking on a major construction project. The theater in Lincoln Park is breaking ground Tuesday on a new ...	0.604

CRE New Construction Lead Generation– Automated Key Information Extraction

» Extraction of key Information from unstructured data of Interest. AI Extracts and Maps information based on prior learnings



Q&A

Lightning Pitch ⚡

Moody’s Analytics API Developer Portal

Rakesh Parameshwar, Moody's Analytics Accelerator

API Developer Portal

Access to hundreds of APIs putting thousands of data points at your fingertips

Coming in June 2019

Innovation in the Enterprise

How Financial Firms are Innovating with Purpose

Panelists

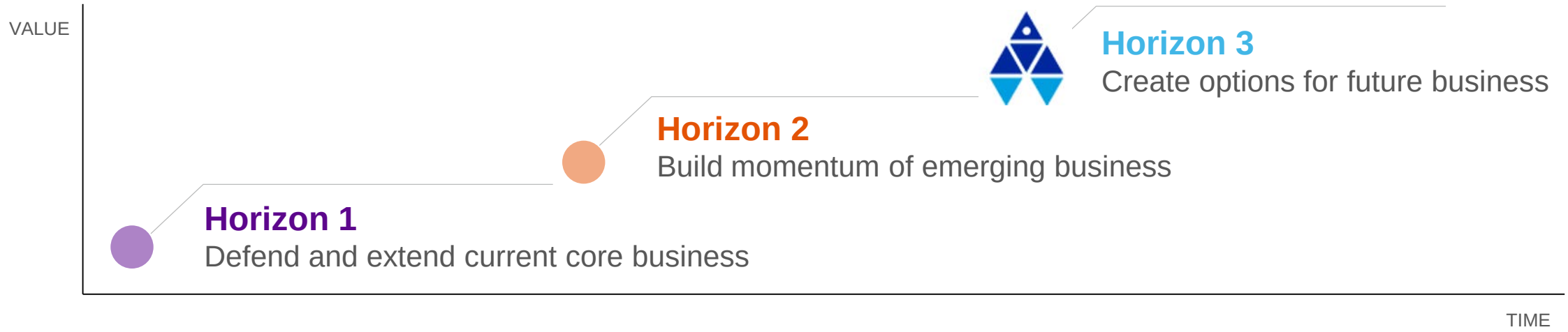
Jean Vernor, Head of Incubator & Regional Analytics Center, Munich Reinsurance

Adrianne Dicker Kadzinski, Group Global Innovation Lead, Credit Suisse

Moderator

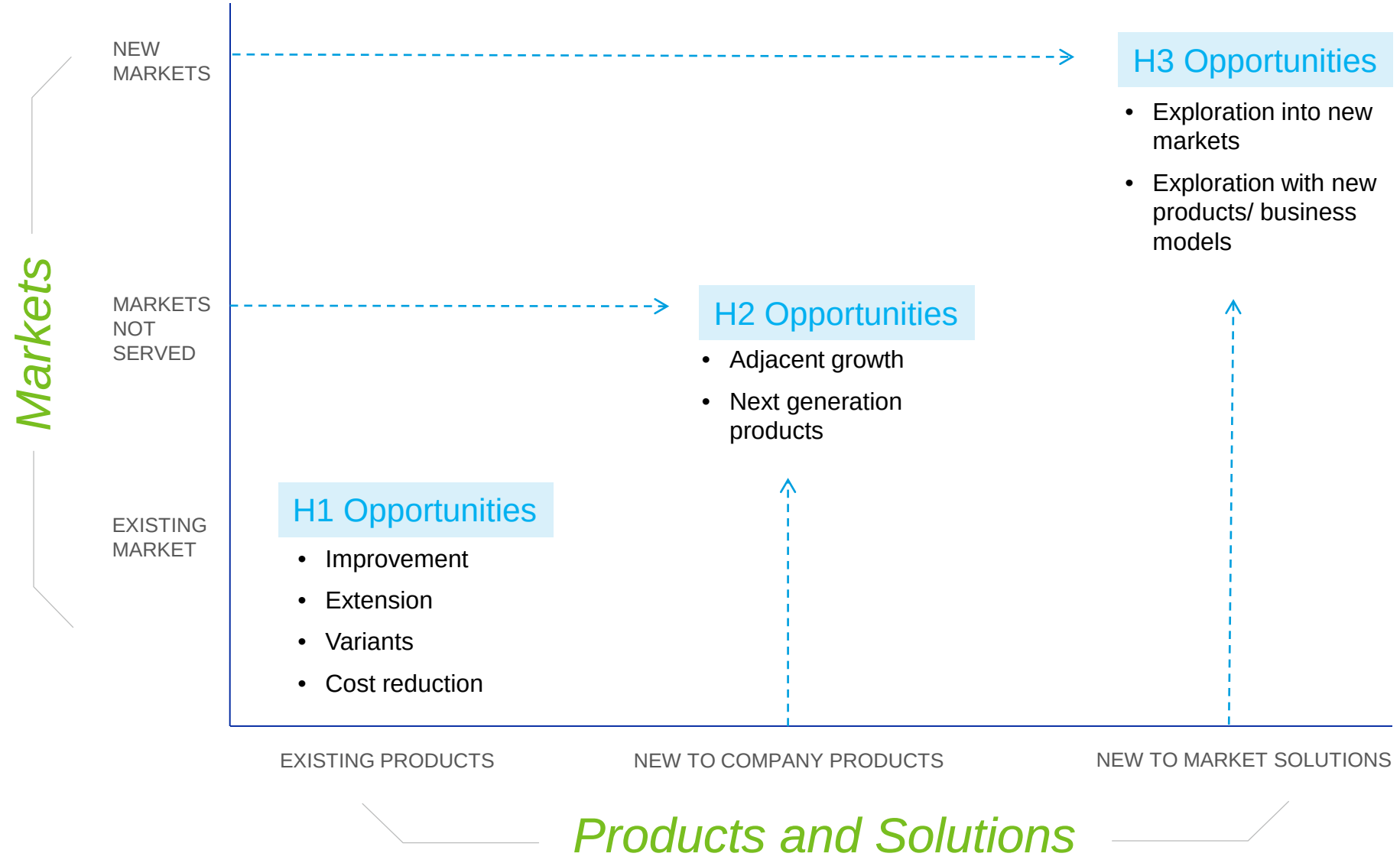
Keith Berry, Head of the Moody's Analytics Accelerator

Defining Growth Horizons



	H1	H2	H3
TYPES OF BUSINESSES	Core businesses most readily identified with MA and those that provide the greatest sales.	Emerging opportunities, likely to generate substantial sales in the future but that could require considerable investment.	Ideas for profitable growth down the road (ideas, R&D projects, pilot programs, or minority stakes in new businesses).
FOCUS	• Incremental growth • Profitability	• Replicate current business model • Assemble required capabilities • Top-line growth	• Source options for future growth • Test viability of business concept
PRODUCT DEVELOPMENT	Investment around core to improve performance and maximize value.	Minimum viable product exists; substantial investment still required for product to reach full potential and/or expand to new markets.	No product, prototype might be available. Substantial testing and development still needed.
RISK PROFILE	Low	Medium	High; only some will succeed

Opportunities on all Horizons



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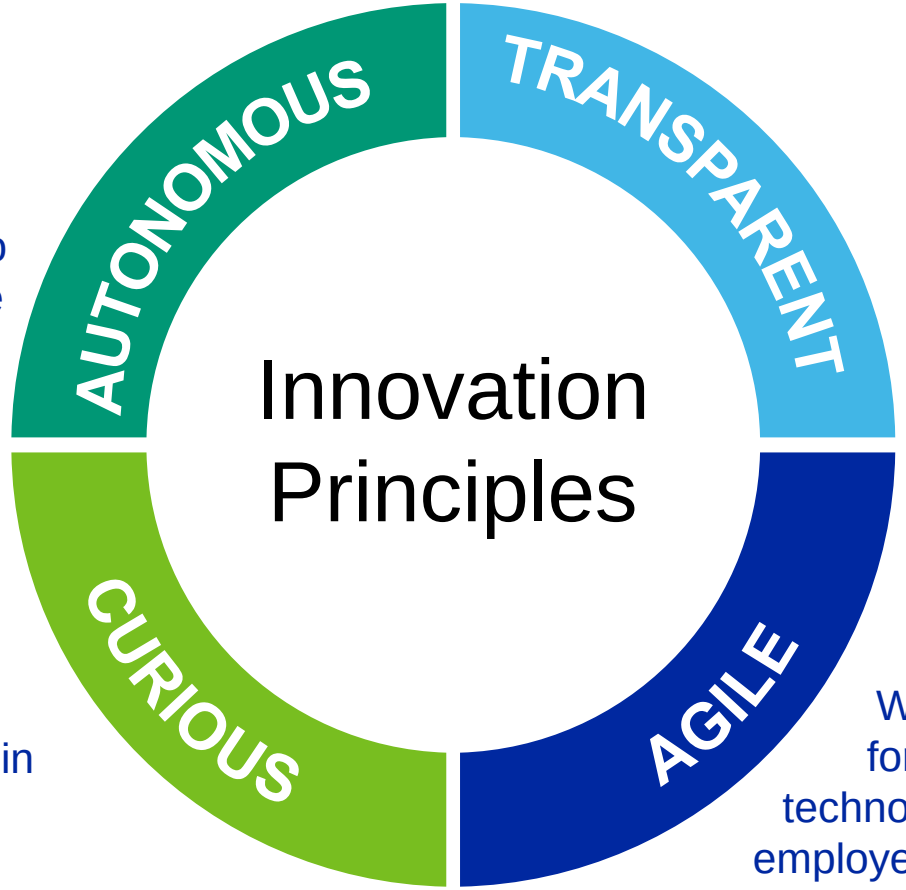
Q&A

MA Accelerator - Agents of Change

We are bold.

We are empowered to discover and incorporate emerging technologies into our solutions. We want each employee to innovate, create and challenge the status quo.



We are customer centric.

Keeping customers at the center of our innovation strategy motivates us to continuously improve our products. We focus on our customers and their needs as a cornerstone of development.

We are collaborative.

We engage in the FinTech ecosystem, leveraging over a century of expertise in credit and risk mitigation to form new partnerships and build the next generation of risk management solutions.

We are lean & fast.

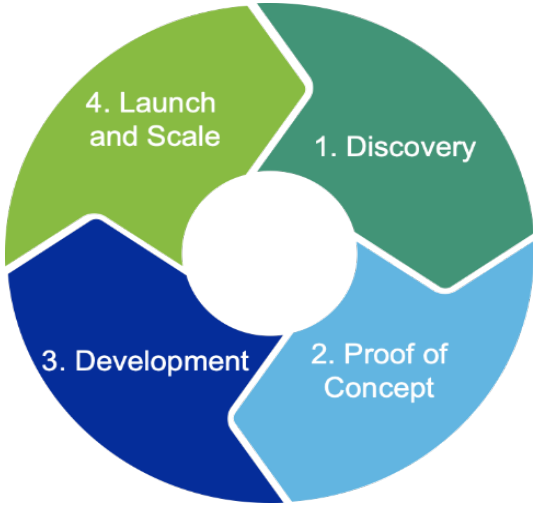
We are driven to build the best solutions for customers. We leverage cutting-edge technology to deliver our ideas. We empower employees to engage in innovation and set the course for Moody's Analytics next 10 years.

Have an Idea?

MA Accelerator Partnership Model

We are in the business of uncovering new opportunities. We leverage a partnership model to engage with customers and cutting edge startups to move great ideas forward.

We utilize a discovery-driven development framework across four distinct phases that allows us to quickly evaluate new prospects and get better solutions in customers hands faster



Accelerate with Us.

Stay in touch

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Thank you

Moody's Analytics Innovation Summit

HOW INNOVATION IS DRIVING CHANGE IN FINANCIAL SERVICES

TUESDAY APRIL 30, 2019 | 1:30-4:30PM | 7 WORLD TRADE CENTER, NYC

MOODY'S ANALYTICS
ACCELERATOR