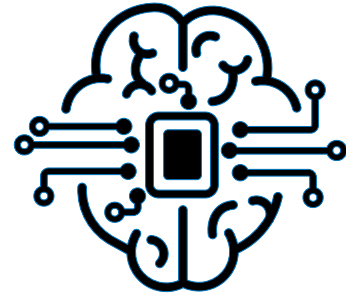




AI in Digital Banking

Jason Loh
AI and Analytics Lead
SAS Asia Pacific



Trust,
the single currency for
ethical and successful AI

Meet John.
John works at the nearby cafe.

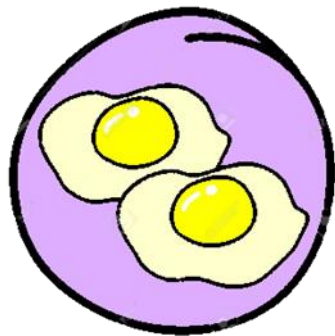


John thinks fast and have a **good memory**.
He offers **great customer service**.



If you are his customer...

You want him to continue his great service –
he knows how you like your eggs done, every time.



But he will not eavesdrop on your chat
about how you are secretly on a diet.

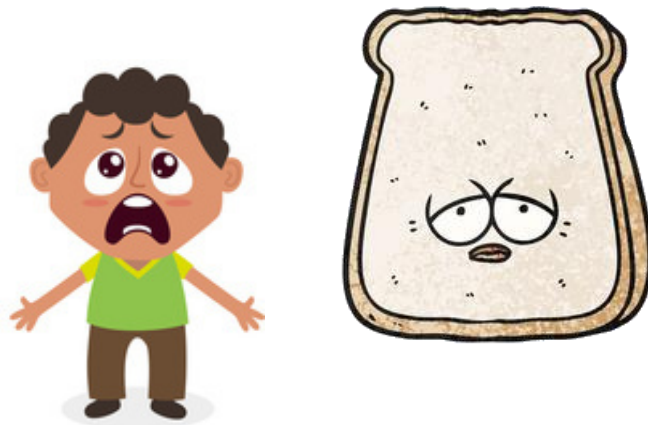


If you are his customer...

You want him to be attentive and respond to your needs - offer a strong coffee when he sees you are tired this morning.



But he will not treat you unfairly,
e.g. giving you stale bread...
just because you likely won't notice.



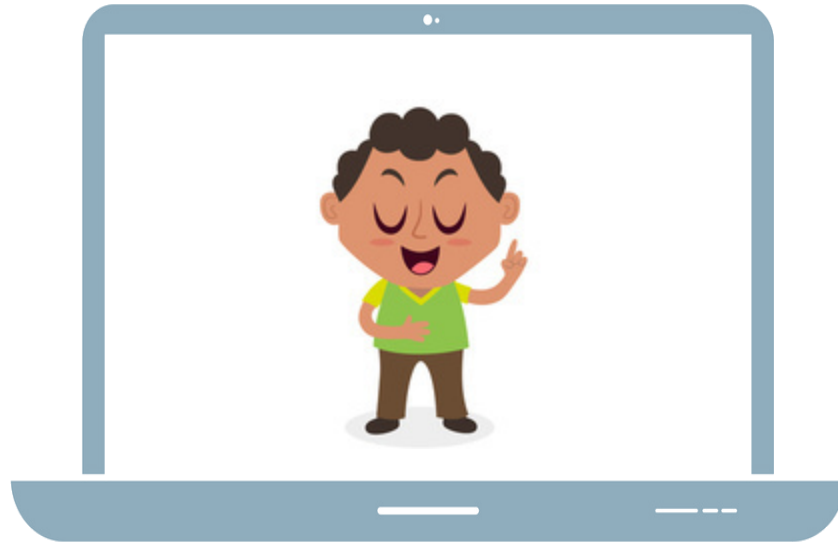
Everyone thinks John is **trustworthy and reliable**
through his thoughts and actions.



What if John is an AI?

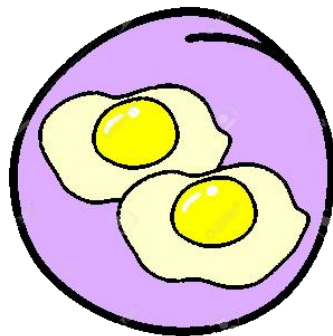
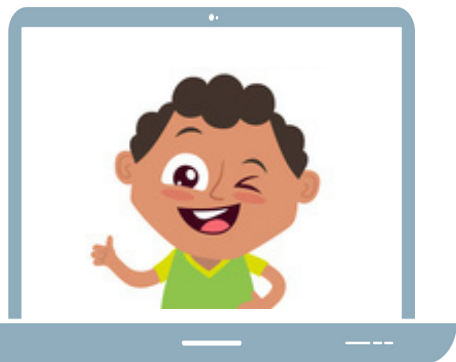
As an AI - how John thinks and acts determines if he is ethical and trustworthy.

The data that John learns from, and his actions, are the **responsibility** of his creators and company.



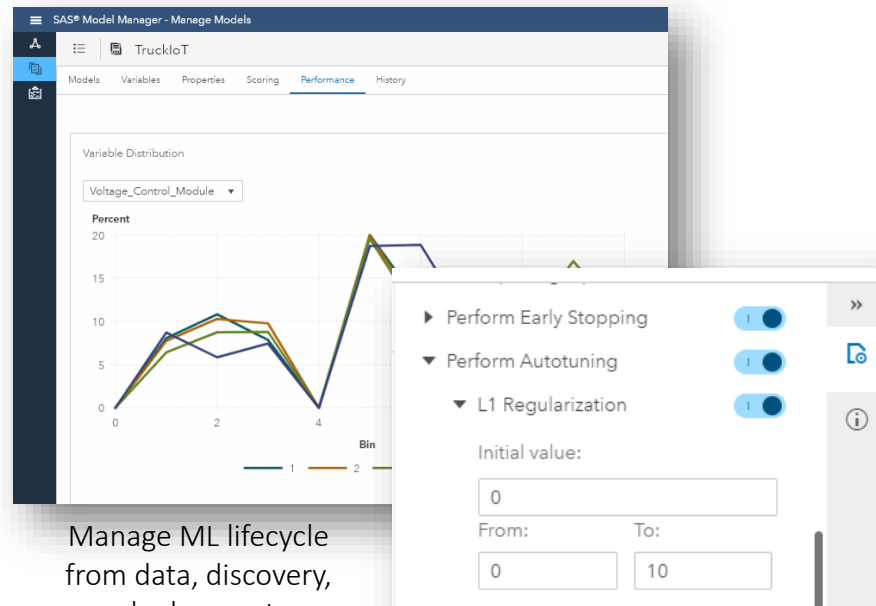
If you are his customer...

You want him to continue his great service –
he knows how you like your eggs done, every time.



John the AI –

Needs to be highly reliable,
Providing offers or decisions with accurate
and well maintained predictive models.



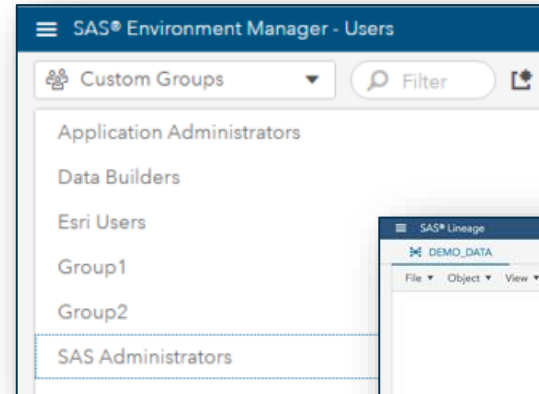
Manage ML lifecycle
from data, discovery,
deployment

Auto-tune models
for high accuracy

But he will not eavesdrop on your chat
about how you are secretly on a diet.



John the AI –
only obtain and use your data,
in the ways that you permit him.



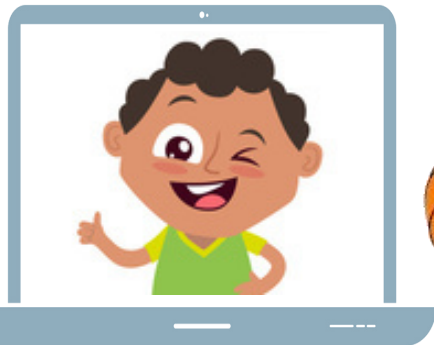
Manage data, users
and resources across
ML lifecycle



View Data Lineage –
Where is the ML
training data from?

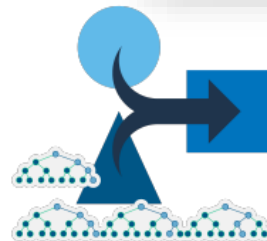
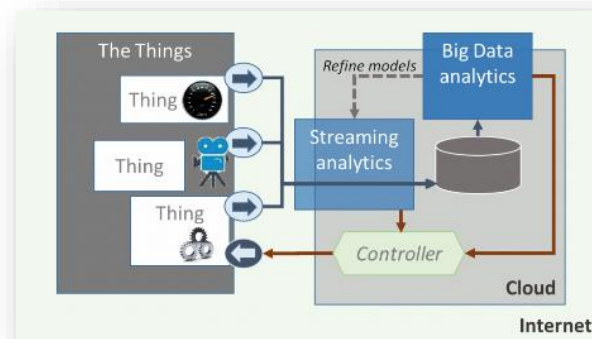
If you are his customer...

You want him to be attentive and respond to your needs - offer a strong coffee when he sees you are tired this morning.

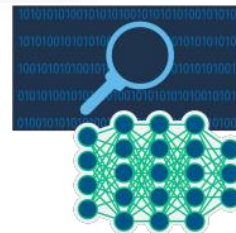


John the AI –

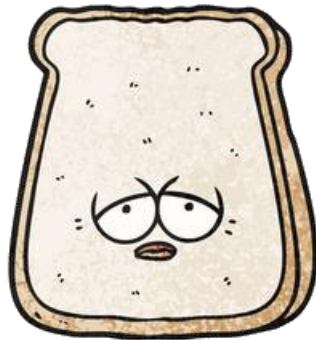
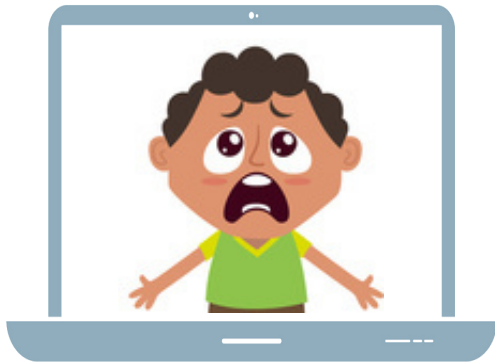
will learn from your choices and preferences and able to adapt to suit your needs in real time.
(with your permission)



Apply
Machine Learning,
Deep Learning,
Streaming Analytics

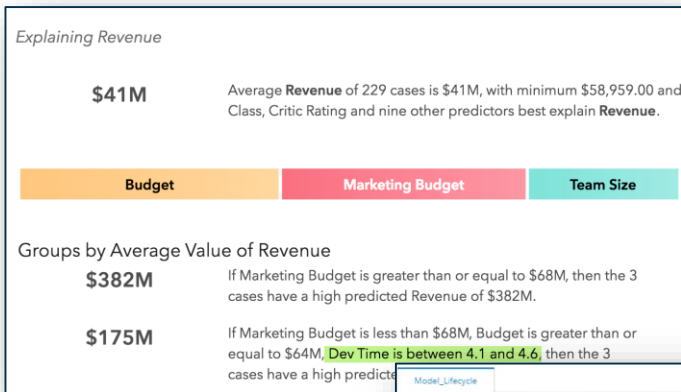


But you don't want him to treat you unfairly,
e.g. giving you stale bread...
just because you likely won't notice.

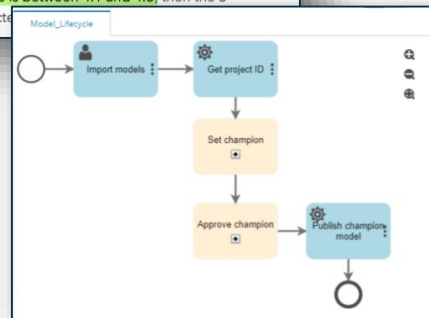


John the AI –

should not make bias decisions,
and actions should be monitored well.



Automated Analysis
of actions/ decisions

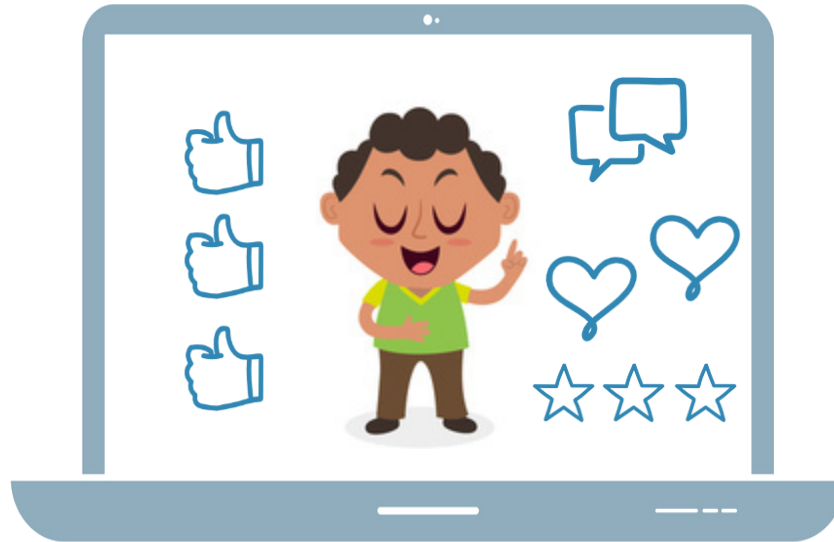


Manage AI model
development workflow

So... if John is an AI...

We would love John to be ethical, even if laws do not dictate so.

His company or his creators are still responsible for his actions,
and stand to gain in many ways, if John proves to be trustworthy and reliable.



To do so –

AI must be created with

Transparency – from data, discovery and deployment

Choice – diverse ML approaches to develop best models

Control – governed workflow of stakeholders and processes
throughout the machine learning lifecycle.

Personal Data
Protection



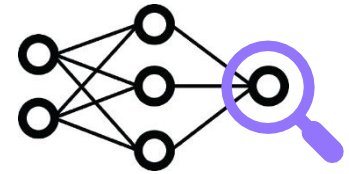
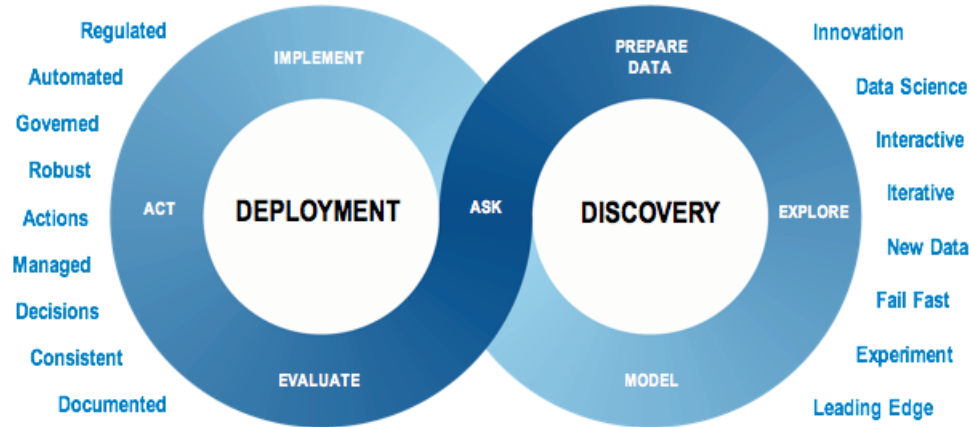
Microdata
Anonymization



Data Governance/
Data Lineage

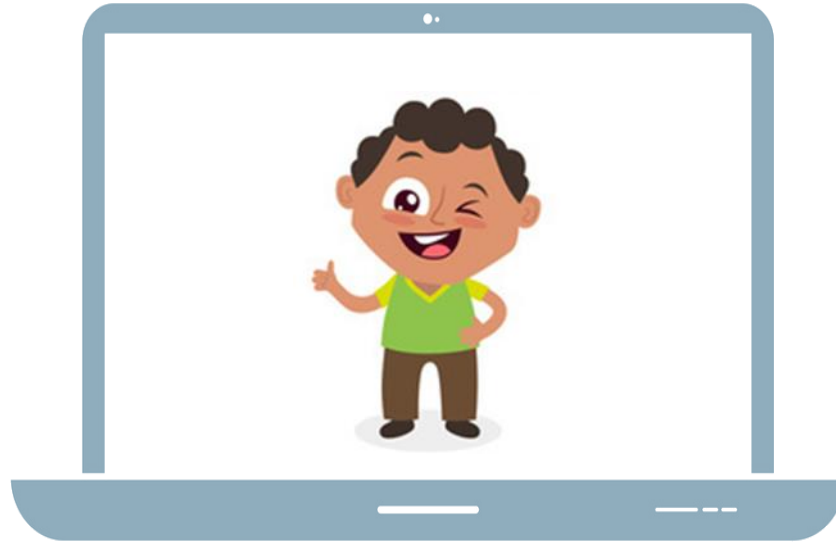


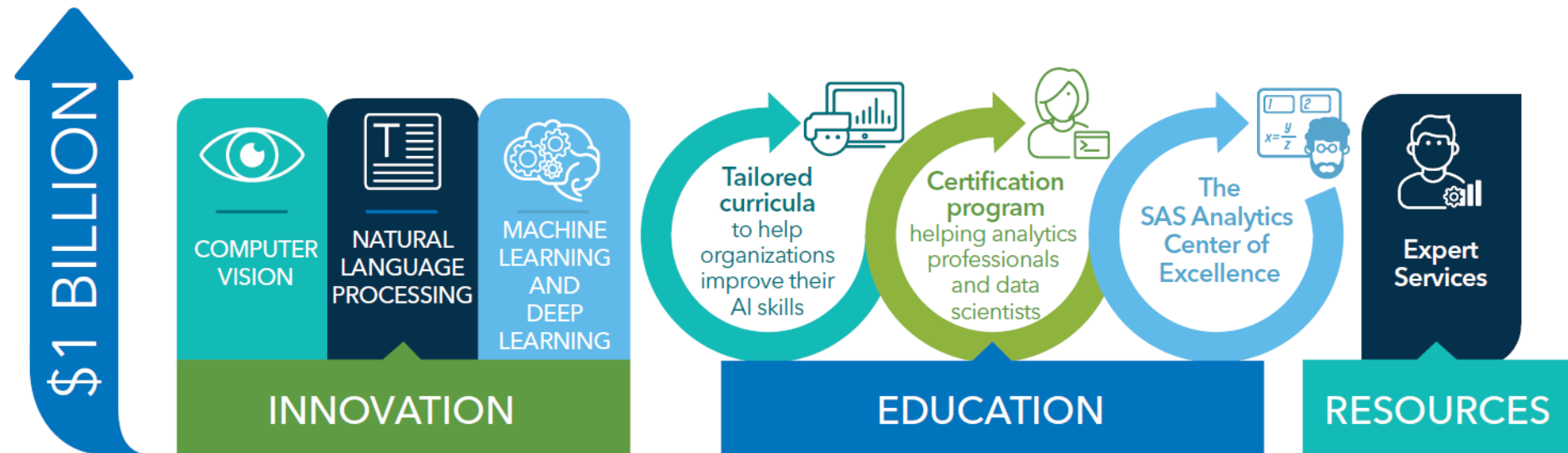
Automated Analysis
& Peer Review
of scoring results



Model Interpretability
Post Modeling Diagnostics

Wouldn't it be great if **every AI** is like John?





SAS Invests \$1 Billion in AI

Empowering the next generation of AI possibilities

https://www.sas.com/en_us/news/press-releases/2019/march/artificial-intelligence-investment.html



TOHOKU
UNIVERSITY

HONDA



innovation marketing group



**Royal Bank
of Scotland**



Bank of Tokyo-Mitsubishi UFJ

Daiwa
Securities



swisscom



OhioHealth



SMBC SUMITOMO MITSUI
BANKING CORPORATION



NongHyup



WildTrack
Non-invasive Wildlife Monitoring
Footprint Identification Technology (FIT)



KONICA MINOLTA

SCISPORTS

sas



Bank of Tokyo-Mitsubishi UFJ

Mitsubishi UFJ Bank introduced SAS Viya for their “Data Democratization Platform”.

They aim to promote analytics culture with the next generation “Open Analytics Platform”

As a first step, MUBK started PoC for sophisticated ALM using AI/Machine Learning



- Every employee can make decisions based on data without relying on IT skills
- Consolidate and share analytics and knowledge within companies





Using Artificial Intelligence to better engage with customers.

SAS AI technology helps predict next-best communications and offers.

We want our customers to have peace of mind that they can access us, and we'll be there for them.

Understanding the customer and streamlining their experience with the use of technology, including AI, is essential to our commitment.

Osamu Hasegawa,

Director of the Artificial Intelligence Office Daiwa Securities





SAS for Digital Banking

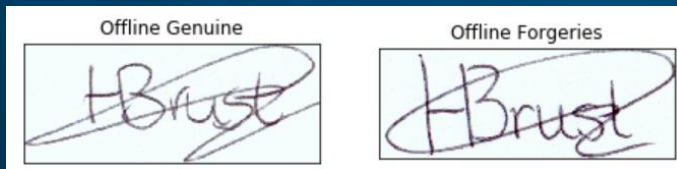
AI/ ML use cases

Fintech Banking App Demonstration

1. 2FA Face recognition
2. Dining recommendations –
text Reviews + dining habits
3. Mobile visualization app/ SDK
4. News recommendations –
investment habits + portfolio + news
5. Peer investment analysis
6. Investment chatbot



Deep Learning Application: Computer Vision



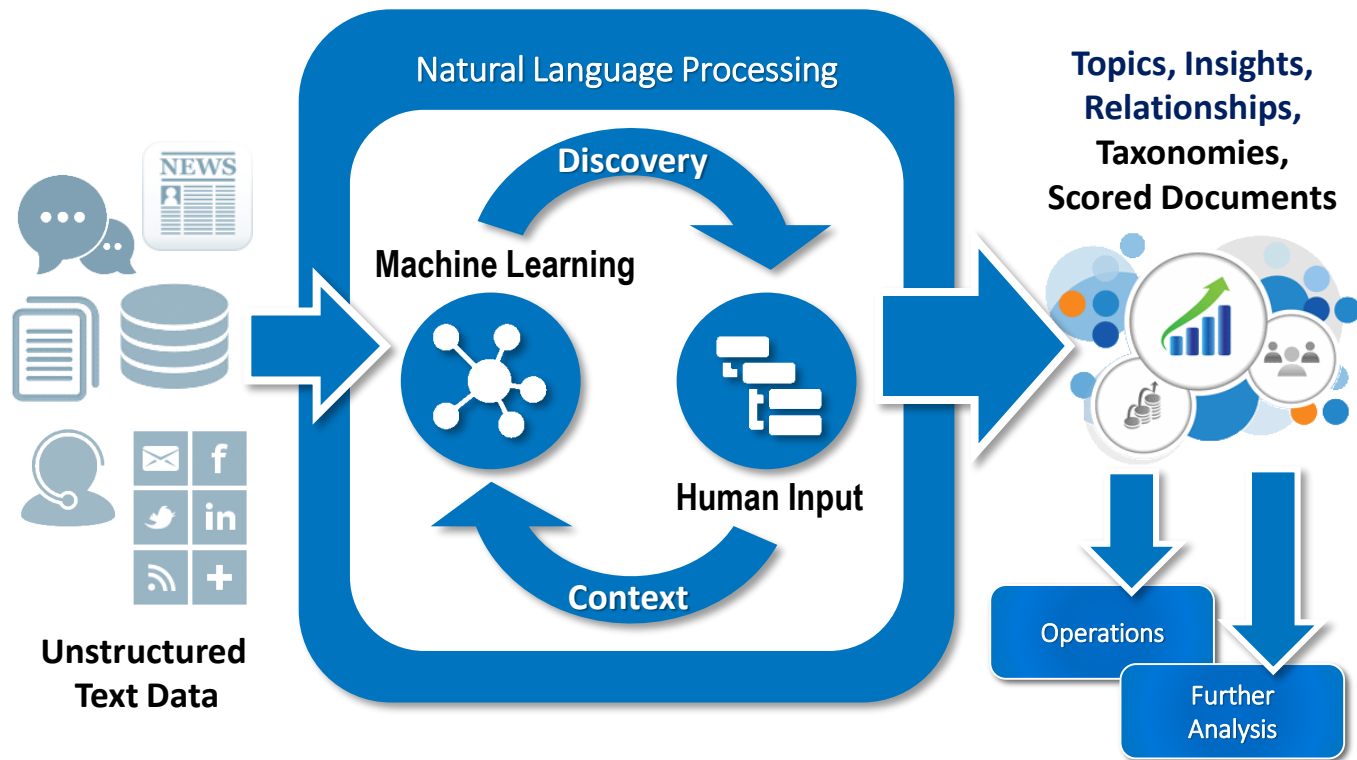
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SAS Natural Language Technologies

Native Support for 30 Languages

- Arabic
- Chinese
- Croatian
- Czech
- Danish
- Dutch
- English
- Farsi
- Finnish
- French
- German
- Greek
- Hebrew
- Hindi
- Indonesian
- Italian
- Japanese
- Korean
- Norwegian
- Polish
- Portuguese
- Russian
- Slovak
- Slovene
- Spanish
- Swedish
- Tagalog
- Turkish
- Thai
- Vietnamese

- ✓ **Structured + unstructured**
- ✓ **Supervised + unsupervised learning**
- ✓ **Human + Machine**



Connected World // Voice of Customer Analytics



SONY
make.believe



HUAWEI Ascend G6



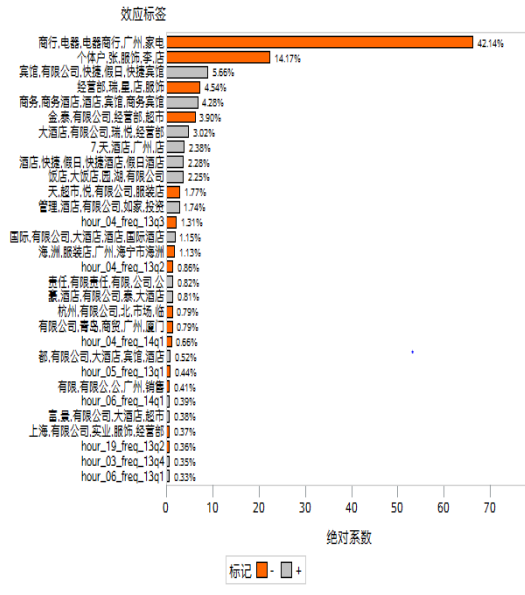
Transaction Signature Profiling

B2B recommendation / card fee fraud detection

Machine learning with abstract data

(cross platform data) understanding payments, lifestyle, community, trends.

Predictive models based on
structured & unstructured data



Lifestyle Recommendation/ Outing finder

Solution Design/ Demonstration

Image of MDS / MDSのイメージ

The map (100-D), is represented by a three-dimensional space above it to a different location

場所別に空間上 (100次元) にマップ、それを3次元で表現

ABC ramen / ABCラーメン
Ramen DEF / ラーメンDEF
G HIJ ramen / GラーメンHIJ
KLM ramen/ KLMラーメン

Ramen OPQ / ラーメンOPQ

XYZ ramen
Ningyo-cho Brothers
(Hamburger)
XYZラーメン
人形町ブラザーズ
(ハンバーガー)

I'm going to taste
味いいに行っている

Purpose is different with
the same hamburger
同じハンバーガーでも目的が違う

Seeking Wi-fi and power
電源やWi-fiを求めて

Seeking exhibition
(The depths of space)
展示を求めて
(空間上の奥)



ABC線の駅
線の駅DEF
G線の駅HIJ
KLM駅

on the way
通りすがり



Station OPQ / 駅OPQ
RS Station T / RS駅T

UV station of line/ 線の駅UV
Full XYZ Line Station / XYZ線の駅



KLM Museum / KLM博物館

ABC Museum ABC博物館
博物館DEF

art museum OPQ 美術館OPQ
HIJ Museum / G博物館HIJ

RS美術館T

Art museum UV/ 美術館UV

XYZ art museum / XYZ美術館

To be something else in its place
And in that it is the purpose
Cafe and Museum is similar to
(It is close space)
その場所で別のことをすることが
目的である点で
美術館とカフェは似ている
(空間上も近い)

ABCエクセルシオール
エクセルシオールDEF
GエクセルシオールHIJ
KLMマクドナルド

McDonald's OPQ / マクドナルドOPQ

RS McDonald's T / RSマクドナルドT

Excelsior UV/ エクセルシオールUV
XYZ Excelsior/ XYZエクセルシオール

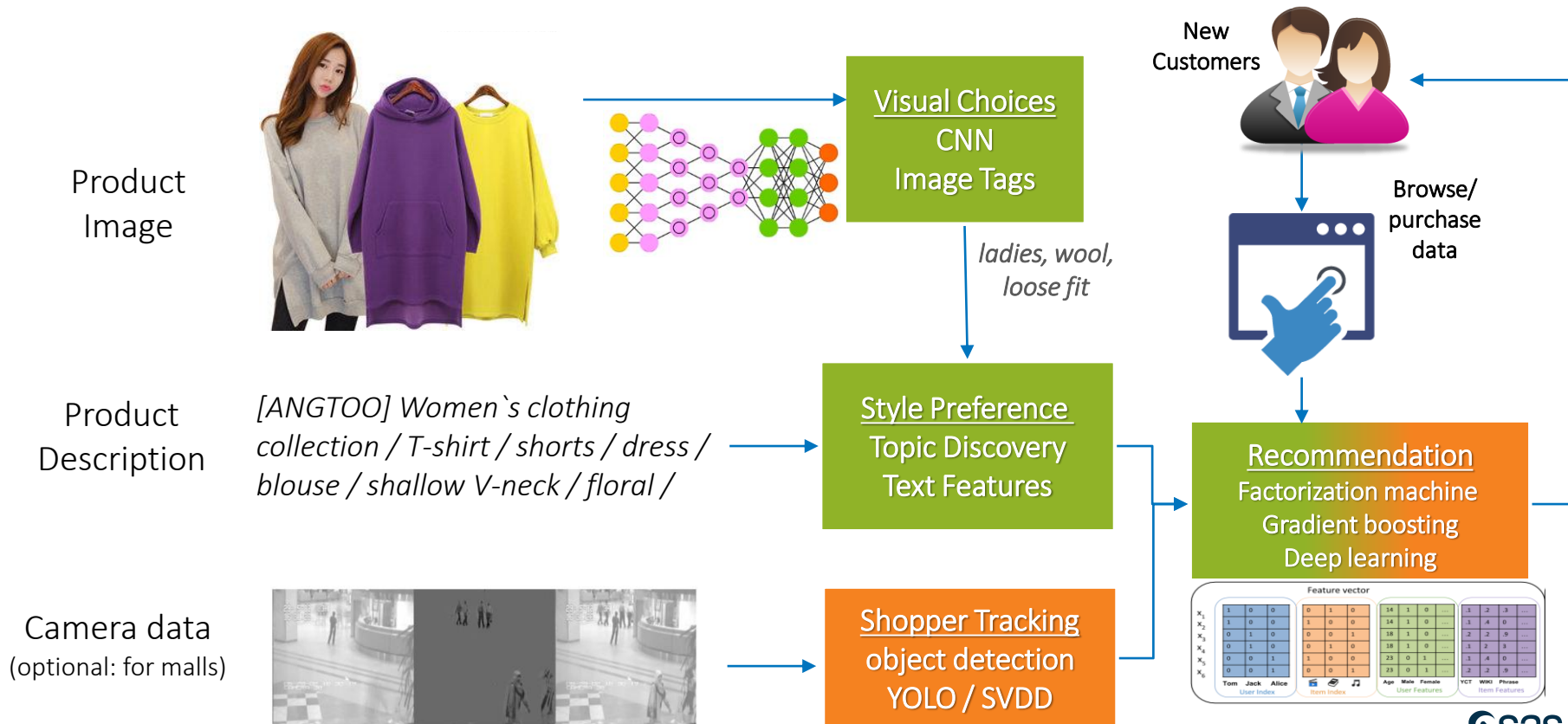
ABC Starbucks/ ABCスターバックス
Starbucks DEF/ スターバックスDEF
Starbucks G HIJ/ GスターバックスHIJ
KLM Starbucks/ KLMスターバックス

I have shown in a space the nature of the content
It is out in space facilities that were similar as a result is close
Content is near If space is close at different facilities
コンテンツの特徴を空間に示している
結果として似通った施設が近い空間に出ている
異なる施設で空間が近い場合は内容も近い

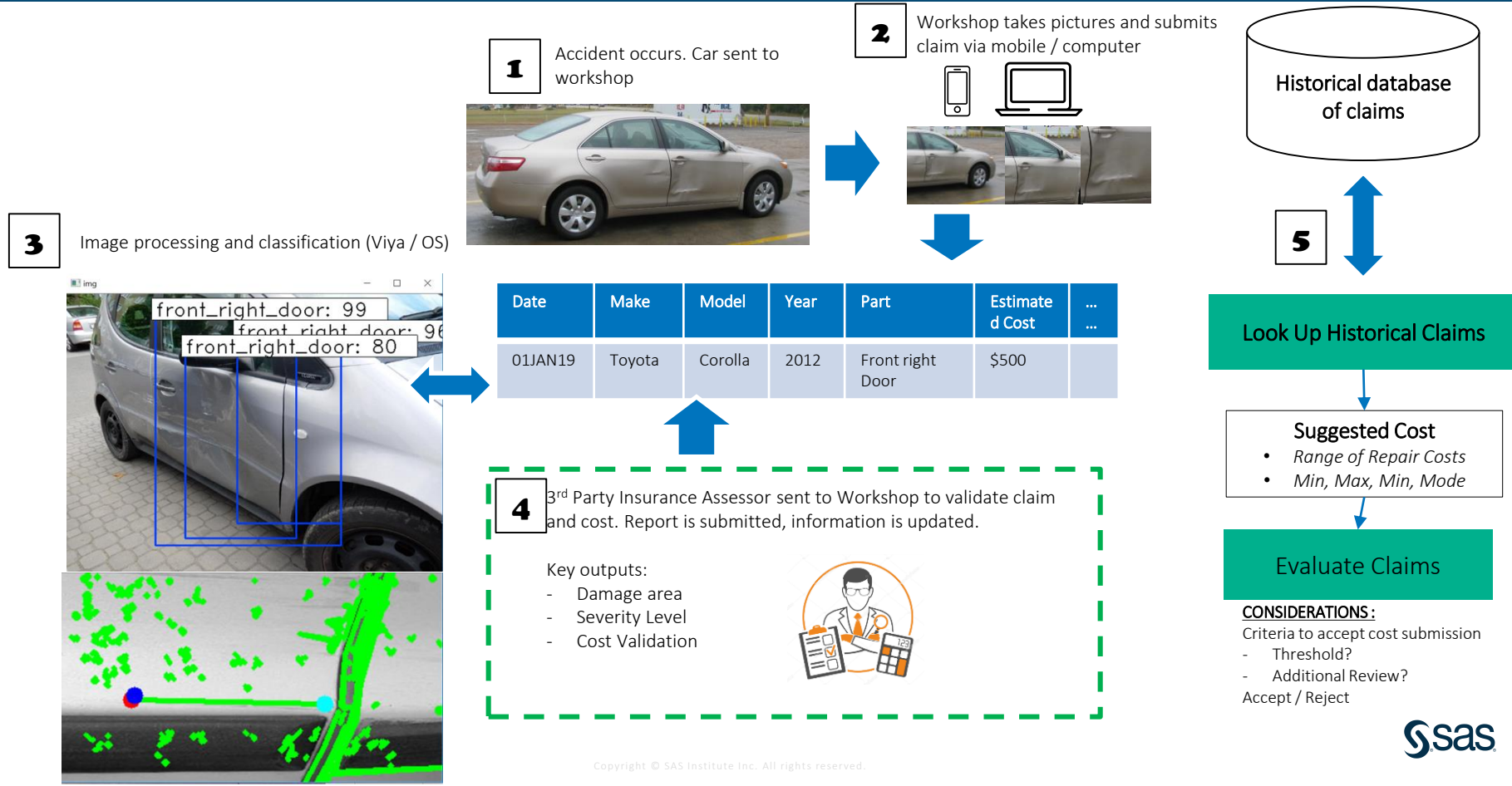


Recommendation Engines – what to consider?

Text x Image x Behavior = **Synergy!** // **Batch** vs **Realtime**



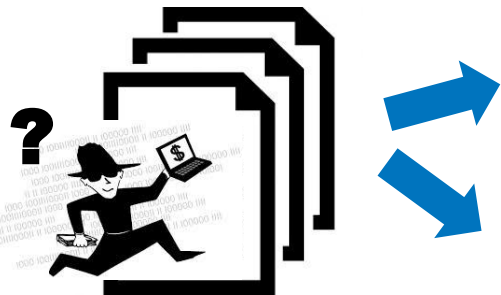
Insurance Claims Assessment



Suspicious Transactions Analysis

NLP + Deep Learning + network detection

Suspicious transaction records



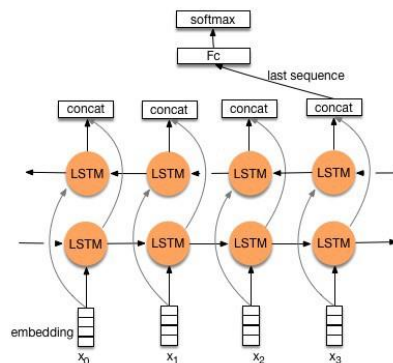
Automatically find names of
people, places, relationships,
and organizations in text

31 matched strings

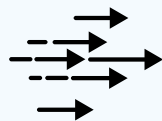
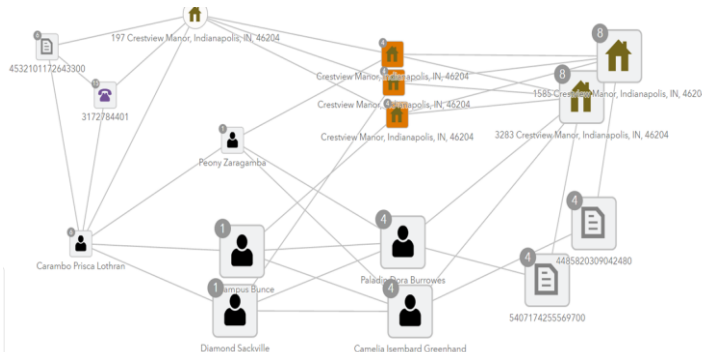
"In a letter dated 17 April 2007, **Greenfield Bank** wrote to **Redfern Bank** to understand the comm 4 wires, totaling US\$1 234 949 00, transferred by **Big Deal** Making Co Ltd ("**Big Deal**") into the (a/c 54321) of **Small Fry Organization** ("**Small Fry**").

Entity/ Relationship Detection

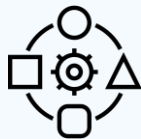
Word Vectors, NLP processing,
Bidirectional deep LSTM



Suspicious Entity/ Relationship Network alerts



Score in-stream
and on GPU



Text model
management and
decision support

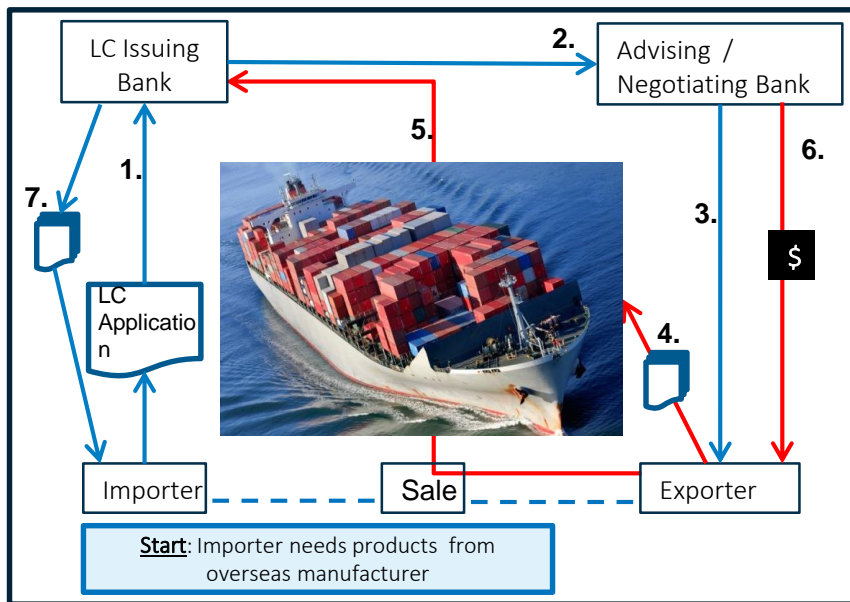


Supports multiple
languages

Trade finance Analytics

Relies heavily on manual processing due to its complexity

Trade finance is more complex to monitor than other lines of businesses within a bank due to banks serving as intermediaries in international trade arrangements. As a result of the nuance and complexity of the parties involved it has become a prime medium for money laundering, terrorist financing, or violations that are set forth by the U.S. Treasury Department.



Summary of terms: LC – Letter of Credit, IB – Issuing Bank, AB – Advising Bank



Treasury and Trade Solutions

[Return to Press Room](#)

April 29, 2019

Citi Global Trade Uses AI to Digitize Compliance in Next Generational Project

EY and SAS Collaborated to Improve Risk and Compliance Processes

New York, NY April 29, 2019 - Citi announced today a next generational project, with EY and SAS, using artificial intelligence (AI) to develop an advanced risk analytics scoring engine. The initiative was created to help streamline the time-consuming, highly manual processes associated with reviewing high volumes of global trade transactions while ensuring regulatory compliance.

"By leveraging innovation, we continue our strategic journey to drive digitization throughout our worldwide operations," said John Ahearn, Global Head of Trade for Citi's Treasury and Trade Solutions (TTS). "We





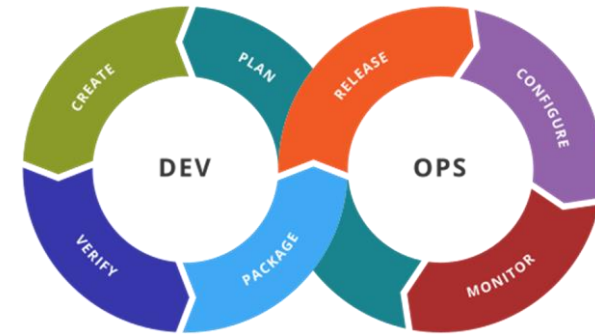
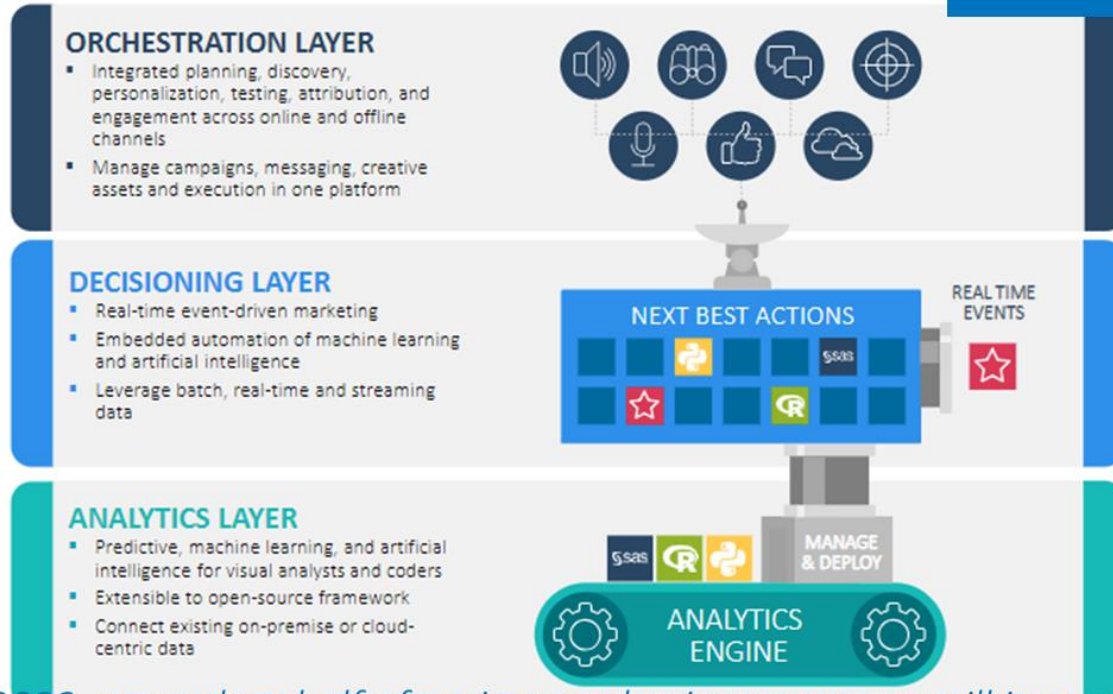
SAS for Digital Banking

Gartner Top Trends –
Data & Analytics Technologies

“Customers expect Adaptive & Intimate Digital Banking”

Gartner Top 10 Data and Analytics Technology Trends: **Continuous Intelligence**

Trend No. 3: Continuous Intelligence



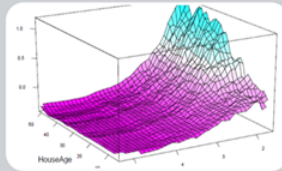
Continuous Integration,
Continuous Delivery,
Continuous Deployment

“By 2022, more than half of major new business systems will incorporate continuous intelligence that uses real-time context data to improve decisions.”

“Digital Behavior Models: Complexity Grows + Demand for Transparency”

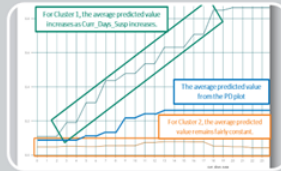
Gartner Top 10 Data and Analytics Technology Trends: **Explainable AI**

Trend No. 4: Explainable AI



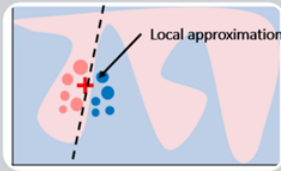
Partial Dependence Plots

depicts relationship between the value of an input variable(s) and the value of the model predictions after the influence of all other variables has been averaged out



Individual Conditional Expectation (ICE)

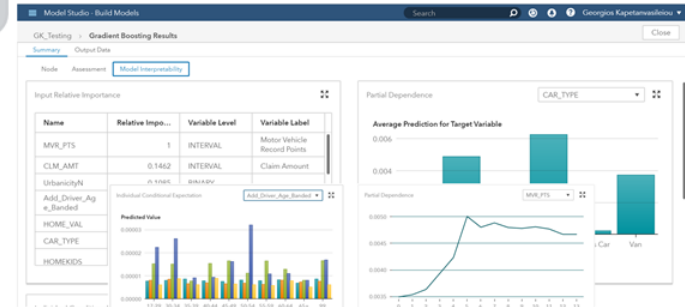
Like partial dependence, but helps identify subgroups and interactions



Local Interpretable Model-agnostic Explanations (LIME)

builds an interpretable model of explanatory data samples at local areas in the analyzed data

Large French Insurer: Model Interpretability Actuarial dept.



“To build trust with users and stakeholders, application leaders must make AI models more interpretable and explainable.”

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“Digital Banking: Chatbots/ Assistants must get much smarter”

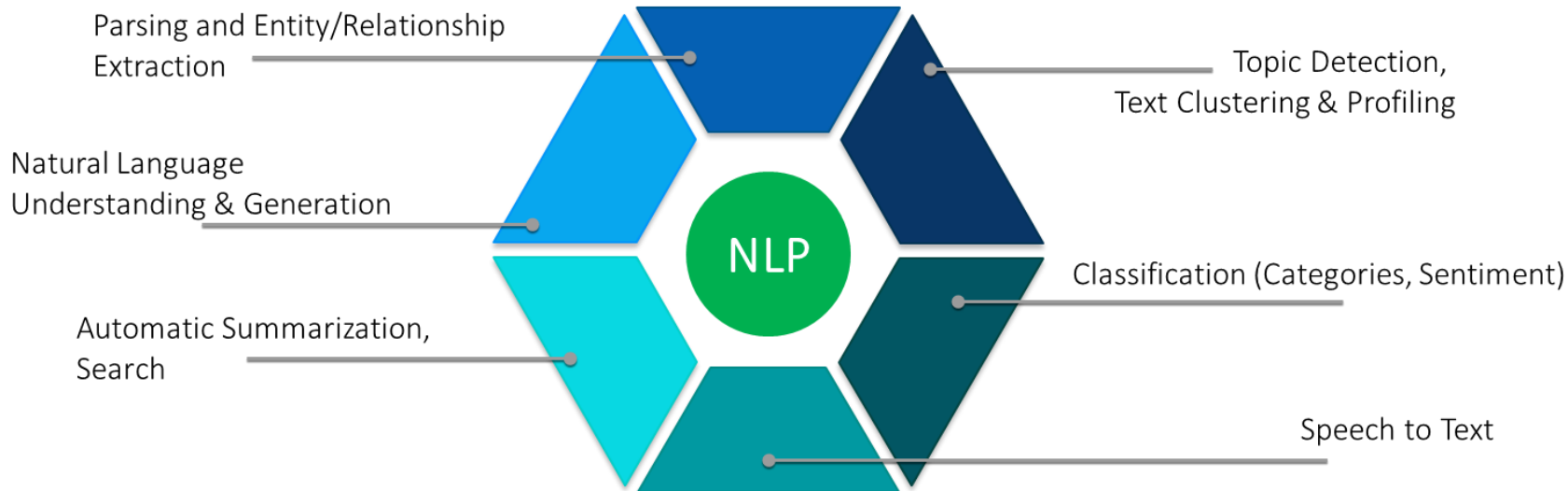
Gartner Top 10 Data and Analytics Technology Trends: **NLP/ Conversational Analytics**

Trend No. 7: NLP/Conversational Analytics

Natural Language Processing (NLP)



A branch of artificial intelligence that helps computers understand, interpret and manipulate human language.



“By 2020, 50 percent of analytical queries will be generated via search, natural language processing (NLP) or voice, or will be automatically generated.”

“AI/ ML Platform must be **Agile, Diverse, Scalable** and enable **Trust**”

Gartner Top 10 Data and Analytics Technology Trends: **Commercial AI and ML**

Trend No. 8: Commercial AI and ML



ACCELERATE

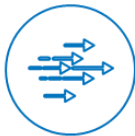
The Analytics Life Cycle

Lineage & Model
Management



Any data complexity,
size or source

Breadth & depth
of analytics



Runtime options

Build once &
deploy anywhere



Faster & easier
model deployment

“By 2022, 75 percent of new end-user solutions leveraging AI and ML techniques will be built with commercial solutions rather than open source platforms.”

Tomorrow's World:

How Will AI
Transform Banking?

- A Report by SAS Banking Experts



[https://www.sas.com/sas/offers/18/
how-will-ai-transform-banking.html](https://www.sas.com/sas/offers/18/how-will-ai-transform-banking.html)

Next Section: Evolve Your Analytics Platform 'Fulfilling the AI in Digital Banks'