



# SAP **BANKING SUMMIT**

**Servicios Financieros Inteligentes: Todo el poder de plataformas de innovación para bancos**

*Anton Tomic - Vice president Global Head of Industry Business Development & Innovation SAP SE*



# SAP Banking Summit 2017

## Intelligent Financial Services

Empower your Banking business with Innovation in  
Machine Learning, Blockchain and IoT

Anton Tomic, Vice President  
Global Head of Industry Business Development & Innovation  
SAP SE

Cartagena, 9<sup>th</sup> September 2017

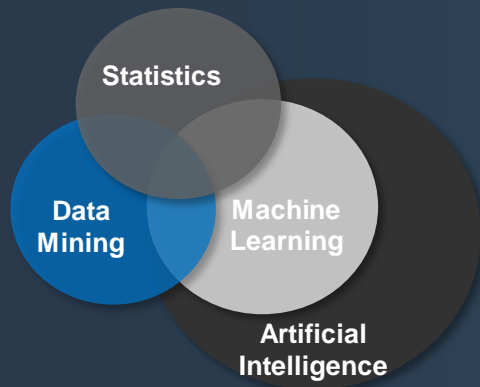




# Machine Learning

# Machines can now do things that were not possible before

## What is Machine Learning?



- **Machine Learning** is an application of Artificial Intelligence (AI) that allows computers to learn without being explicitly programmed to do so.
- It's the product of established statistical theory and more recent developments in computing power.

## Why is it useful?



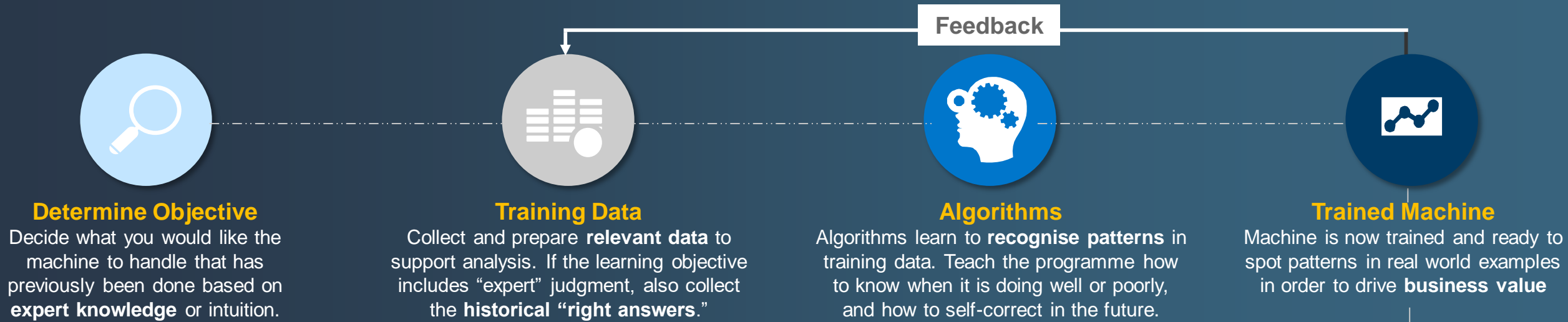
- The volume, variety, velocity and veracity of data is increasing at an exponential rate. Banks and Insurers need to make use of the wealth of data they own.
- Machine Learning allows banks to very quickly draw valuable insight from their data, reducing risks, automating processes and improving customer engagement.

## Why now?



- With falling profit margins, increasing customer expectations and increasing competition from FinTechs, banks need to cut costs and improve their offering.
- The ability to extract value from such vast amounts of data has never been cheaper or more effective.

# How does it learn?



## Supervised Learning

- What?** Output variable *specified*. Algorithm learns mapping function from input to output
- Why?** To make predictions
- Example:** Predicting credit default risk

OR



## Unsupervised Learning

- What?** Output variable *unspecified* so algorithm looks for structure in data
- Why?** To describe hidden distribution or structure of data
- Example:** Customer segmentation and product targeting

# Machine Learning in the Financial Services Sector

## Customer Segmentation

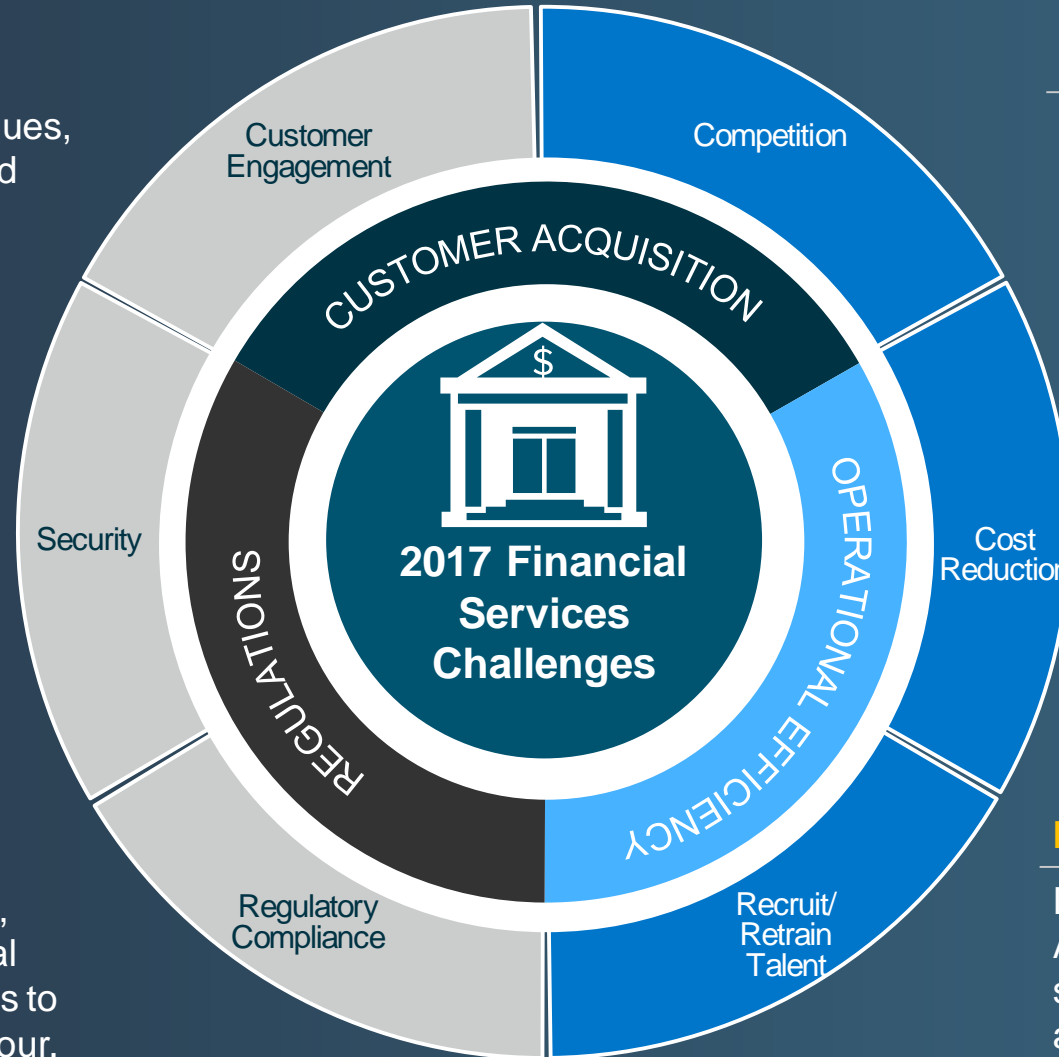
Through unsupervised learning techniques, banks can segment their customers and offer a personalised, targeted product offering.

## Fraud & AML Detection

Machine Learning offers significantly improved fraud, AML (Anti-Money Laundering) and credit risk detection possibilities.

## Compliance

Compliance through automated reports, stress testing solutions, and behavioural analysis of emails and phone recordings to determine suspicious employee behaviour.



## Big Data & Agility

Investment in Machine Learning offers banks and insurers the speed and agility they need to compete with tech-savvy Fintech firms and to make use of Big Data.

## Cognitive Automation

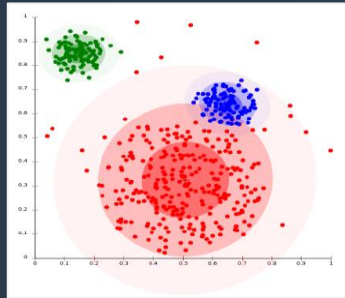
Combined with Robotics, Machine Learning offers the ultimate automation potential with many back office risk, finance and regulatory reporting processes contenders for automation.

## Natural Language Processing

Digital skills are in short supply in FS. Algorithms can evaluate CVs of successful employees and search for and identify online candidates with similar traits and experience.

# Deep Dive: Front Office

## Customer Segmentation



- Through cluster analysis, an unsupervised learning technique, banks and insurers can discover distinct groups in their customer base and see similarities over several dimensions.
- Unlike supervised learning, they do not need to define what characteristics the computer should be looking for.
- This way, banks and insurers can segment in ways traditional analytics would not allow.

## Product Targeting



- Customer segmentation discoveries can be used to build predictive, supervised models.
- Algorithms produce personalised views of the most suitable products for each customer, helpful for cross-selling and up-selling.
- Since algorithms learn, they recognise changes in customer preferences in real-time and therefore automatically adjust product recommendations.

## Benefits



- Personalised, improved customer offerings.
- Speed of service - banks recognise change in behaviour and respond in a timely manner.
- Revenue can increase from successful identification of cross-sell and up-sell opportunities.
- Automated – reduced human involvement.

# SAP Leonardo



**SAP** Leonardo

*The **digital innovation system** that enables you to **innovate at scale** to confidently redefine your business.*



# How can SAP help with SAP Leonardo on ML/AI?

SAP Leonardo is a holistic digital innovation system. It integrates today's transformational technologies with SAP experience, deep process and industry knowledge, and advanced design thinking methodology. From the cloud platform to the apps themselves. SAP Leonardo is open, extendable and ready to be woven into every business facet..

## Internet of Things

*Connecting things with people and processes*

## Analytics

*Insights that enable transformative actions*

## Big Data

*Manage vast amounts of data*

## Machine Learning

*Intelligence enabled by learnings from data*

# Intelligently connecting People, Things and Businesses

## Cloud Platform

*SAP Cloud Platform as foundation for Leonardo*

## Blockchain

*Blockchain services embedded into business apps*

## Design Thinking

*Innovative, engaging methodology*

## Data Intelligence

*Put data into business context*

# SAP Leonardo Machine Learning-applications available



Cash  
Application



Resume  
Matching



Brand  
Impact



Service  
Ticket  
Intelligence



Customer  
Retention  
Insights

> 70 Cross Industry Use Cases  
+ 20 Machine Learning  
Financial Services specific use cases

# Example: Brand Impact

Optimize your marketing ROI through brand intelligence and sponsorship insights

Select the brands to monitor

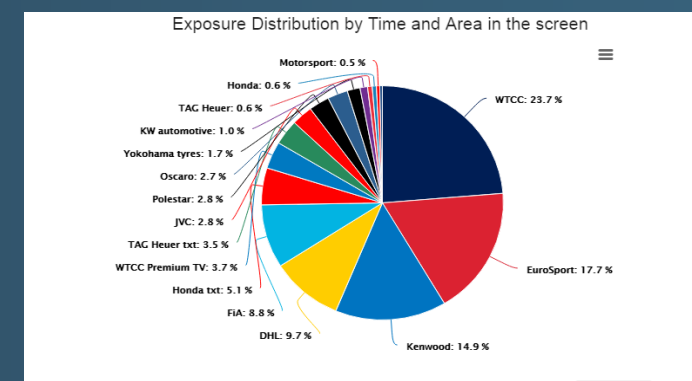
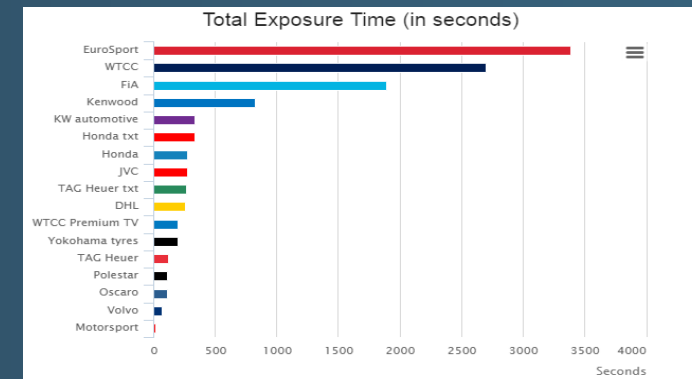
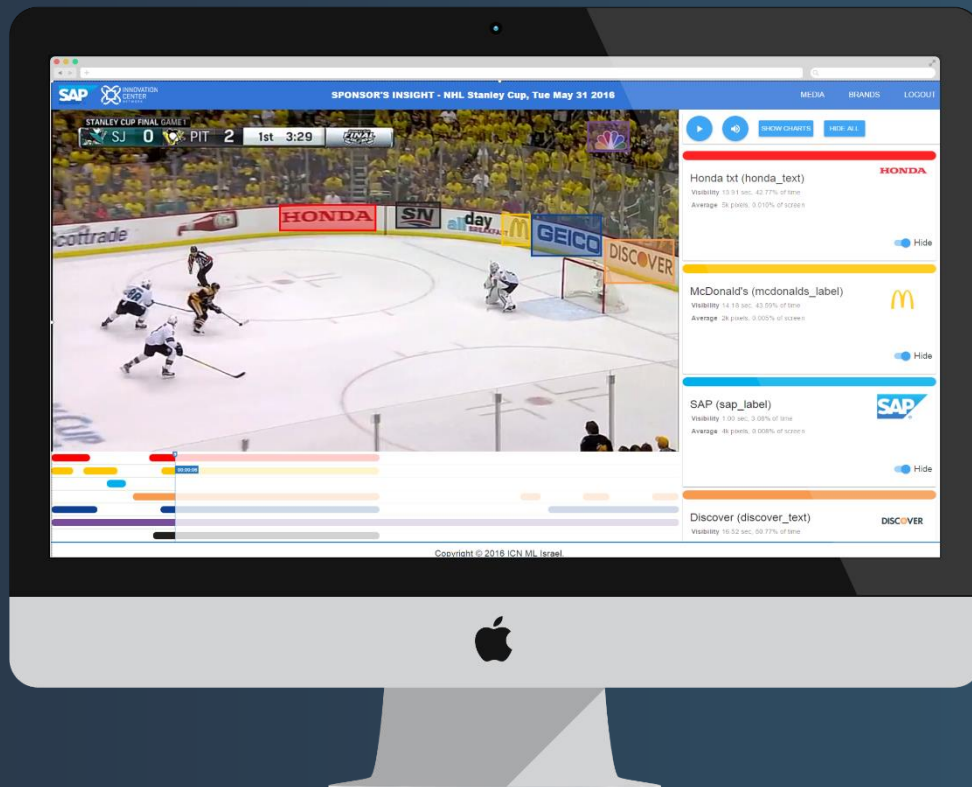
Select the brand attributes you would like to monitor and the media they appear in

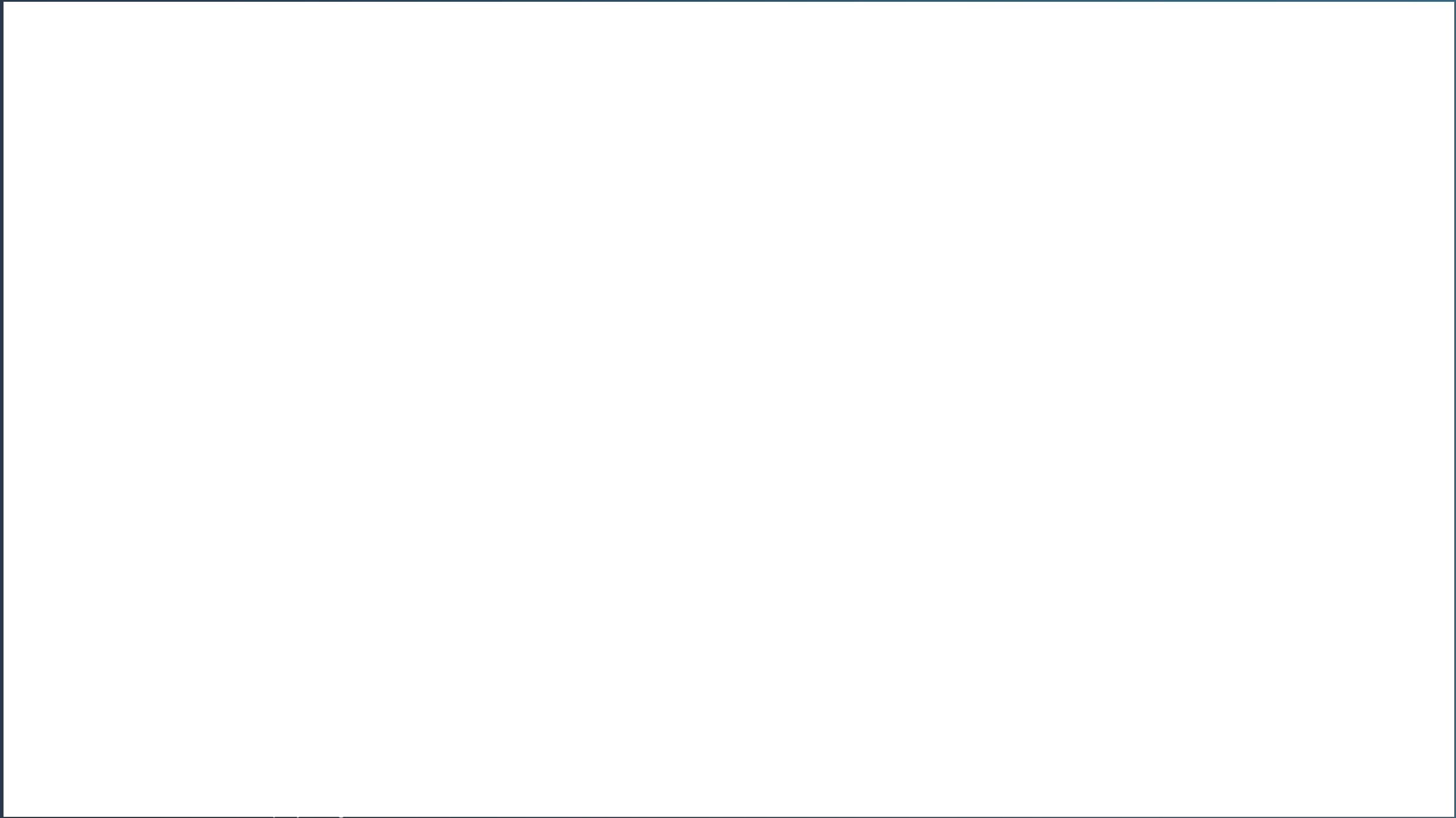
View analysis in the interactive tool

View the statistics and compare to the other brands

Estimate your brand exposure ROI

Estimate ROI in sponsorship contracts and optimize logo placement for maximum exposure

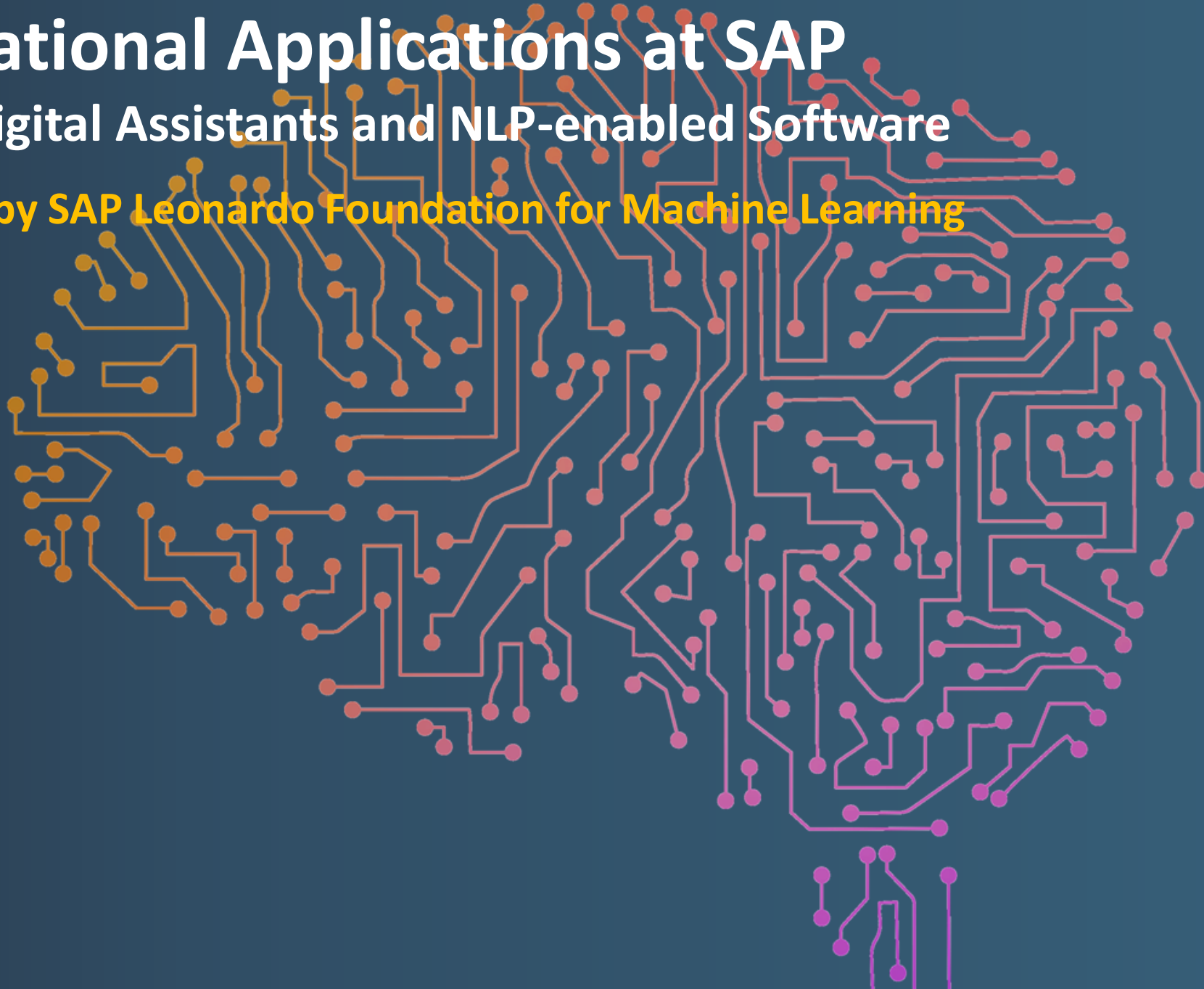




# Conversational Applications at SAP

Chatbots, Digital Assistants and NLP-enabled Software

powered by SAP Leonardo Foundation for Machine Learning



# Human-like interactions with business systems, powered by machine learning

## Why now?



Usage of messenger apps is increasing



Machines learn to understand and act



Language networks and infrastructure is growing



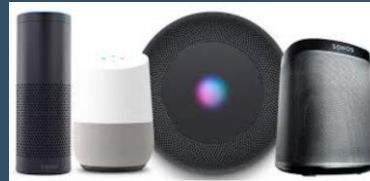
# From Enterprise Bots to Enterprise AI

Envisioning Future Business Applications



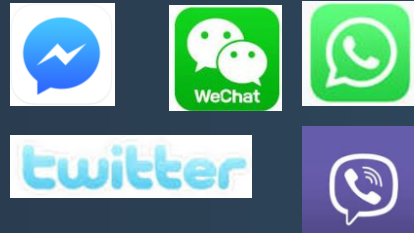
## Enterprise AI

- (Super-) Human understanding within **enterprise systems**
- **Autonomous** personalization based on **patterns, context and history**
- System **acts proactively**, and **enables users** to focus on high-value work



## Digital Assistants

- System **self-improves** human-created rules
- Ability to recommend:
  - Follow-up actions,
  - Machine-to-Machine automation
- Omnipresent **integrated NLP & cognitive capabilities**

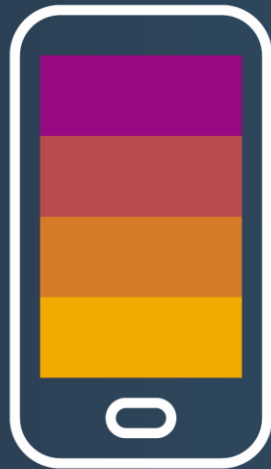


## ChatBots

- Access **business functions** using **natural language** (text)
- **Focus on:**
  - Retrieving information
  - Getting alerts
  - Executing light-weight tasks

# SAP CoPilot

The digital assistant for the live enterprise



SAP CoPilot - One digital assistant with one personality across all products and solutions, industries and lines of business



## Business context awareness

Understanding the business context, and pro-actively suggesting solutions using predictive functionality



## Conversational (multi-modal) UI

Conversational UI using Natural Language Processing functionality with a focus on the next-gen UX to create a human-like experience



## Cross Applications

Allows seamless transition across platforms; start a task on a mobile device and continue later, on a desktop or vice versa



## Self Learning

Using machine learning functionality to gain knowledge based on historic data, experience, and take action in response to new or unforeseen events



## Simple Access to Enterprise AI Platform

Integration to SAP and Non-SAP Solutions  
Simple access to Natural Language Processing and Machine Learning functionality via APIs



# How to make Machine Learning work?



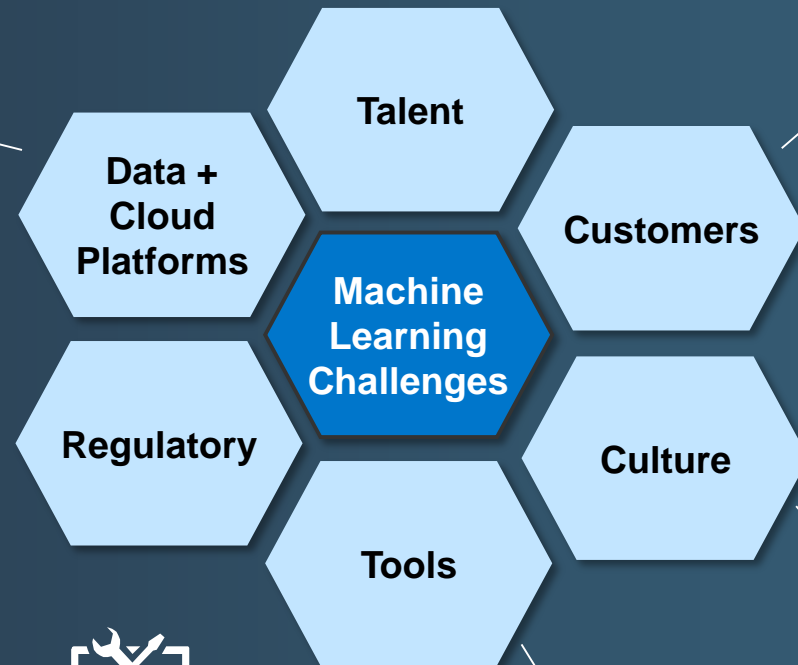
- Introducing Machine Learning to a business requires a **shift in skillset requirements** from operational management to analytics and data science.



- Older generations and less tech savvy customers prefer **human interaction** to communication with robots. An education/marketing piece may be required to highlight the benefits to the customer.



- **Judgement currently often trumps insights in firms** – a cultural shift will therefore be required.
- **Democratisation** of use of analytics required – there should be incentives to encourage data sharing between business divisions.



- There is a vast array of **new and evolving** Machine Learning technologies. A thorough consultation process with digital specialists is recommended ahead of starting programs.



- Banking data is often **poor quality and inaccessible** as it is stored in siloes on multiple legacy systems.
- Algorithms thrive off easily accessible, large data sets. The integration of data sources, ideally onto to a cloud platform, is therefore key.



- Some self-learning models cannot be **traditionally validated** and therefore may be deemed insufficient by the regulator. Thorough research into regulatory requirements is recommended ahead of implementation.



# Blockchain

**Blockchain started all with ...**



# What is Blockchain and its impact on Financial Services?

Blockchain simply said is about . . .

## 1 Business Networks

## 2 Assets & Value

## 3 Contracts

**Blockchains** are an emerging technology pattern that can radically improve banking, supply-chain and other transaction networks, giving them new opportunities for innovation and growth while reducing cost and risk.

Economic transactions on a distributed ledger can be programmed to record virtually anything of value: your identity, a will, a deed, a title, a license, intellectual property, and also almost any type of financial instrument.

“How seriously should we take this? I would take it as seriously as we should have taken the concept of the Internet in the 1990s.”

—Blythe Masters, DAH <http://bit.ly/1JENob4>

# The 3 Key Areas

## Business Networks

- **Businesses don't exist in isolation**
  - Connected to customers, suppliers, banks, partners etc. through Business Network
  - Networks cross geography & regulatory boundary
- **Wealth is sum total of value of goods & services across business network**
  - Growth constrained if silo'd or inefficient
- **Flow goods & services across business network is a Market**
  - OPEN (fruit market, outcry commodities, or
  - CLOSED (supply chain financing, bonds)

## Assets & Value

- **A participant is a member of a business network**
  - Customer, Supplier, Government, Regulator
  - Usually reside in an organization
  - Have specific identities and roles
- **A transaction is an asset transfer between two or more participants, for example**
  - John gives a car to Anthony (simple)
  - John gives a car to Anthony, Anthony gives money to John (more complex)
- **A contract is set of conditions under which transactions occur, for example**
  - If Anthony pays John money, then car passes from John to Anthony (simple)
  - If car won't start, funds do not pass to John

## Contracts

- **Anything that is capable of being owned or controlled to produce value, is considered an asset**
  - can be tangible or intangible
  - value can be converted into cash.
- **Cash also an asset.**
- **Asset examples:**
  - Cars, value clothes (physical)
  - Bonds, securities, repurchase agreements (intangible)
  - Licenses & patents (intangible assets)
  - Music, video, games (intangible, digital)

# Blockchain in a nutshell overview

Append-only  
system of record  
shared across  
business network

**Shared  
Ledger**

**Crypto  
graphy**

Ensuring secure,  
authenticated &  
verifiable  
transactions

All parties agree  
to network verified  
transaction

**Consensus**

**Shared  
Contract**

Business terms  
embedded in  
transaction  
database &  
executed with  
transactions

# Where to adopt Blockchain in Financial Services?

## Financial Instruments

Payments – Cross Border, P2P,  
Corporate and Interbank

Private Equity

Bonds

Derivative commodities

Trading records

Spending records

Mortgage/Loan records

Microfinance

Servicing records

## Stack of Processes

Clearing Networks

International Transfers

Clearing and Settlement

auditing, reconciliation, reporting,  
settlement

Asset Ownership

# Why is it difficult to be successful on Blockchain?

There are two options for building private network for businesses 1) Reconfigure a public network fabric for private use, or 2) Build on top of a untested private network fabric that's available

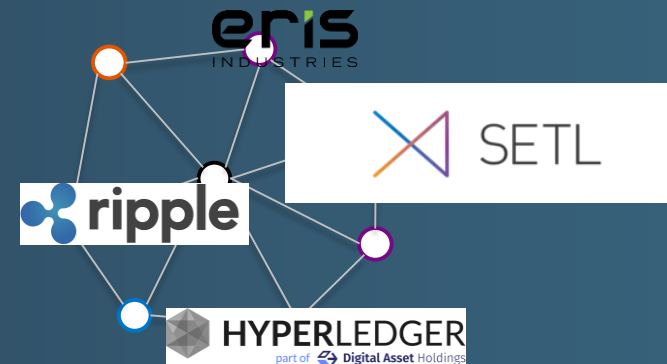
## Public Network Fabric



### Business Adoption Challenges

1. Designed for public network
2. Slow and inefficient
3. Built-in virtual currency
4. Difficult to push upgrades
5. Heavily forked
6. Lack enterprise support

## Private Network Fabric



### Business Adoption Challenges

1. Incomplete & usually untested
2. Usually too simple & inflexible
3. Still lack critical enterprise features such as identity management system
4. Generally lack community support
5. Not standardized



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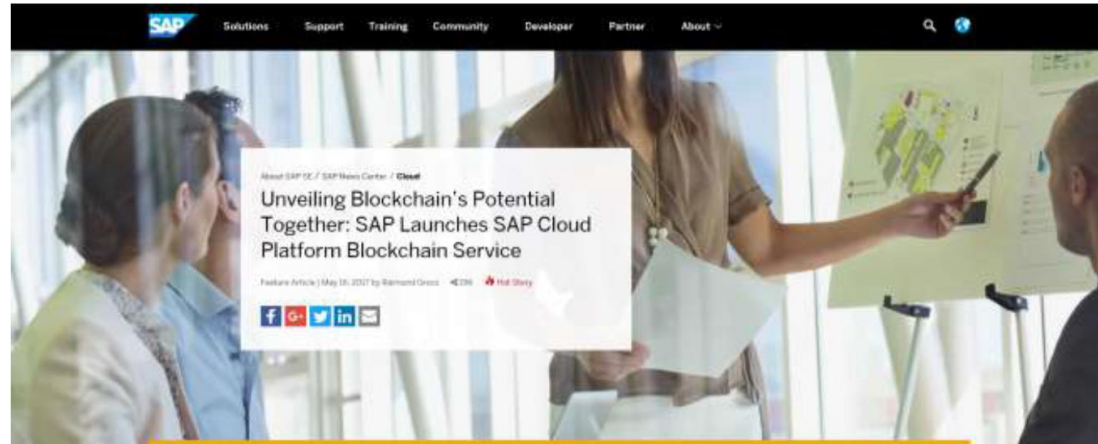
## Design Thinking

*Innovative, engaging methodology*

## Data Intelligence

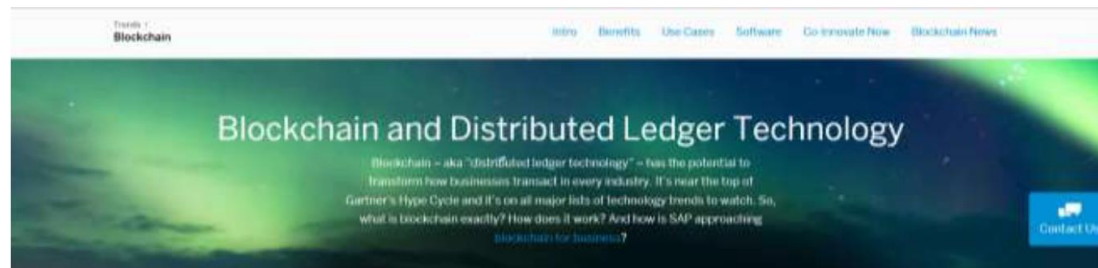
*Put data into business context*

# SAP announced Blockchain as a Services in May 2017



<http://news.sap.com/sapphire-now-sap-cloud-platform-blockchain-service/>

CEI program: <https://influence.sap.com/2017269>



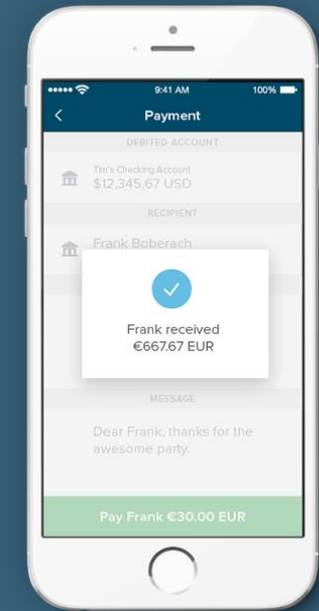
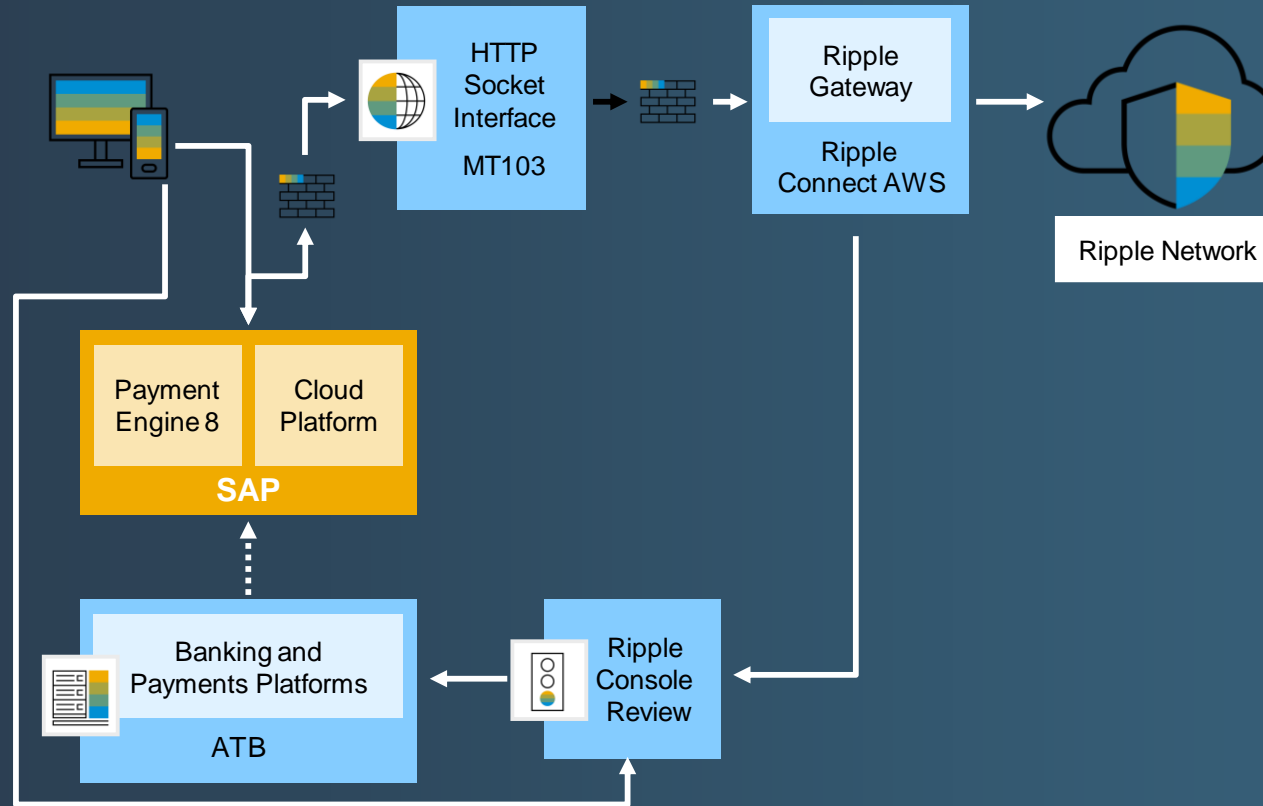
All the benefits of the [blockchain technology](#) are available now in [SAP Cloud Platform Blockchain service](#) which is a part of [SAP Leonardo](#). The work in multi-party processes and business networks becomes easier, more trustful and transparent, and more fast with simultaneous operations validation.

Want to know what is [blockchain technology](#) and how can the enterprises [benefits](#) from it? All information is on [our official page](#), explained in a simple manner with the real business [use cases](#) examples.

# Ripple and SAP – Cross Border Payments



ATB Financial



**Overseas payment process took 20 sec instead of 3 days**

Ripple technology is an open-source system based on Internet protocols, permitting domestic and international payments in any combination of currencies to be settled directly between the parties without the need for central clearing houses or correspondent banks.

# Bonded Loans Management in a Blockchain

Open up a 75 Billion Euro market with a distributed ledger platform

## Challenges:

- Time consuming bonded loans servicing processes (multiple days)
- Cumbersome, costly investor acquisition and management

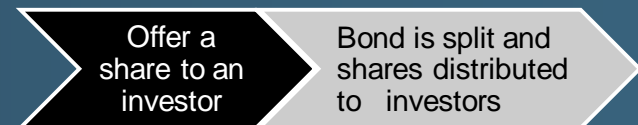
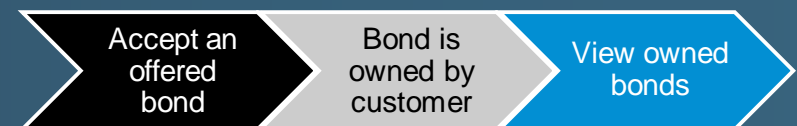
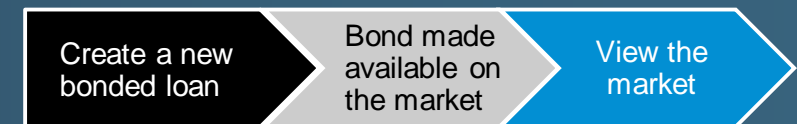
## Proof-of-Concept Objectives:

- Show feasibility of an integrated SAP Loans Management application working with S4/HANA software with a distributed ledger network (Ethereum Blockchain@Deloitte) to a holistic Bonded Loans management scenario
- Leverage SAP Cloud Platform integration capabilities to seamlessly integrate distributed ledger technology with SAP applications

## Benefits

- From days to intraday: Reduce processing duration of placement and servicing transactions for bonded loan contract execution
- Increase attractiveness for investors: Enhance insight, transparency and fungibility in bonded loans operations and constellations via a trust providing platform

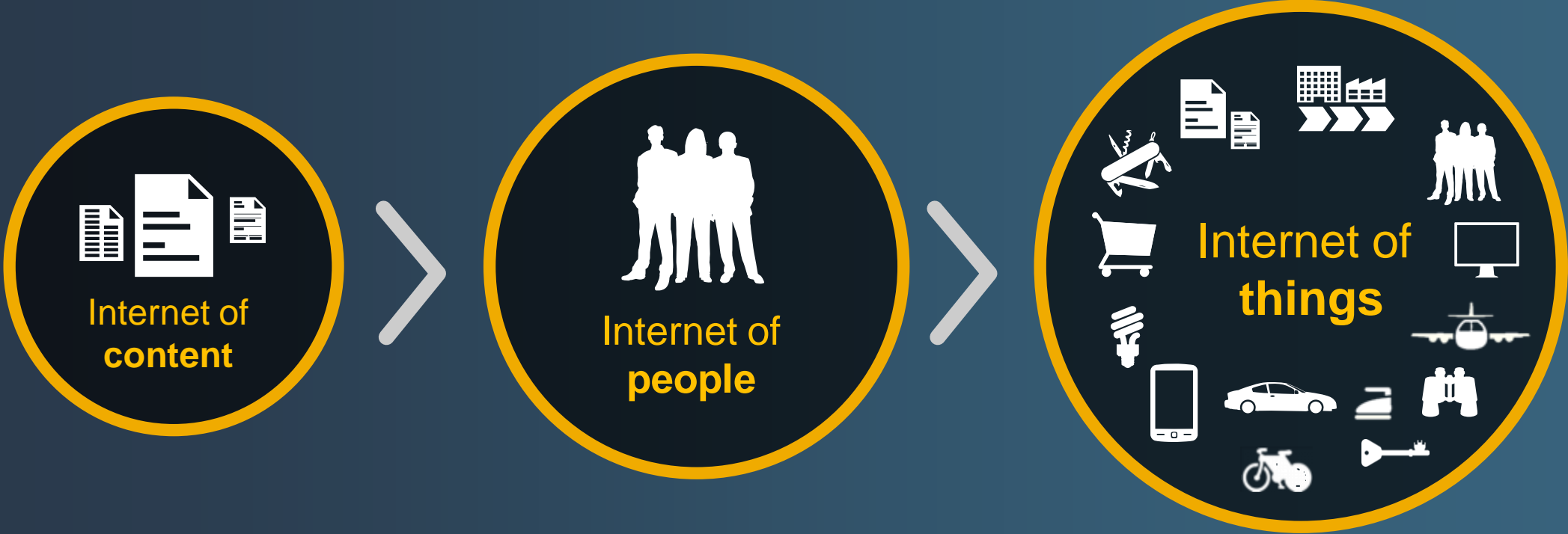
**Deloitte.**





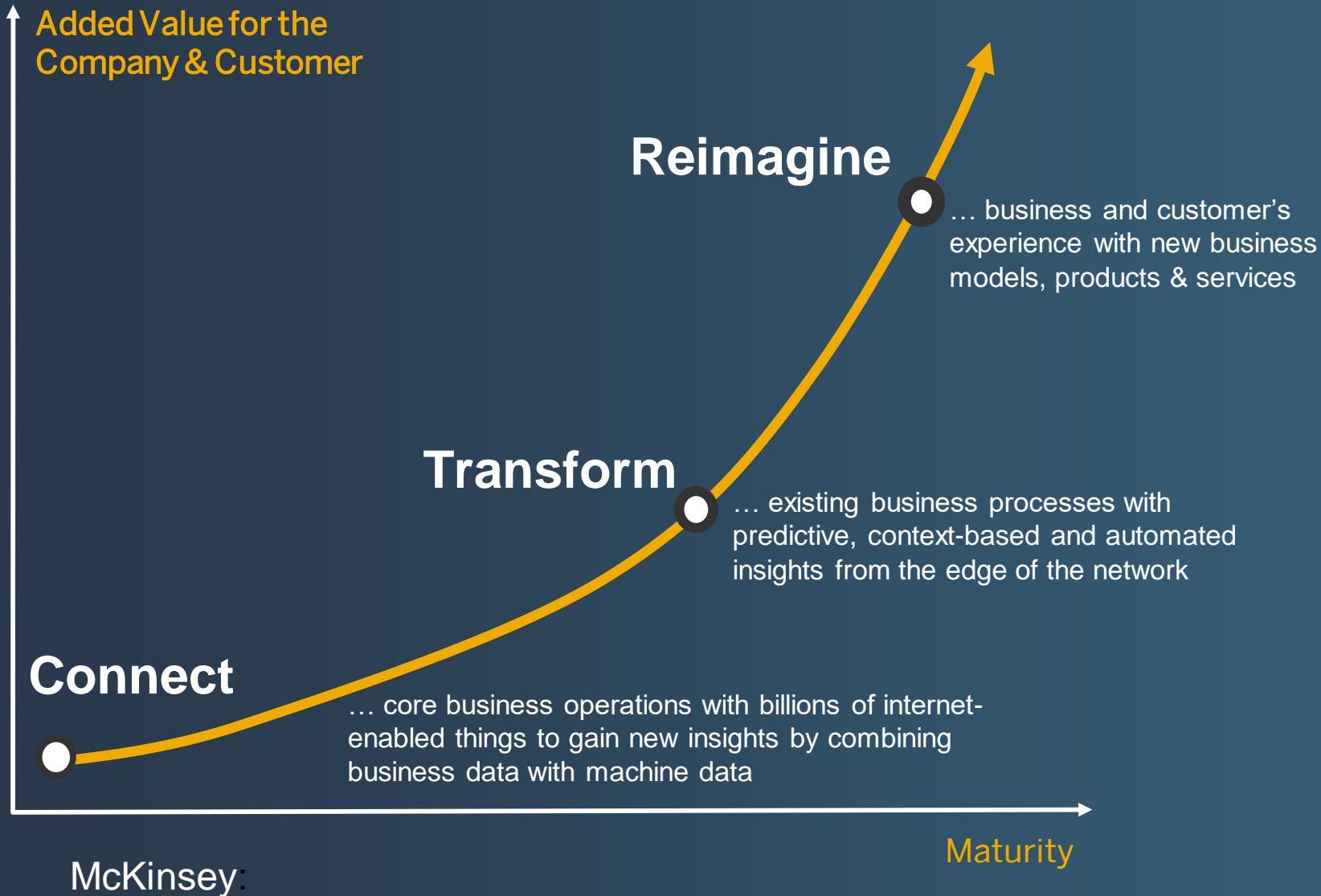
# Internet of Things

# The Internet of Things



Convergence of physical and digital worlds

# What can IoT do for banks?



## Supporting Technologies:

- Big Data
- Cloud
- Mobile
- Analytics
- Machine Learning
- Integration

# Available solutions - SAP Leonardo on Connected Car

## SAP Vehicle Insights

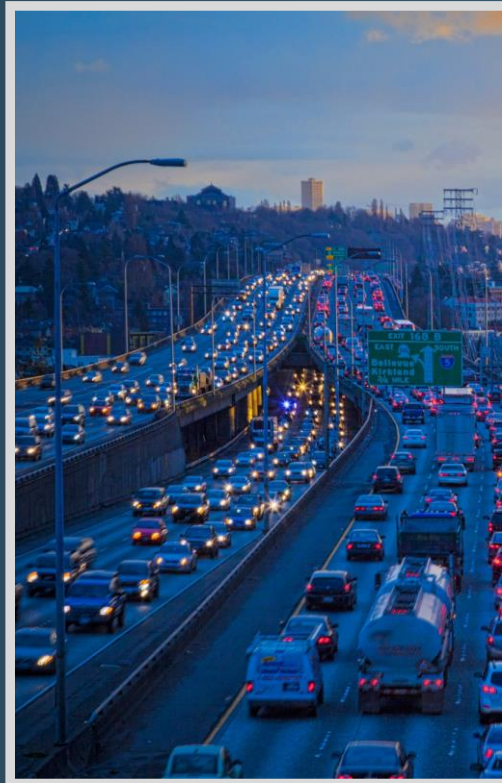


Connected Car Analytics

## TwoGo



Ride Sharing



## SAP Vehicles Network



B2B Marketplace for Connected Car Apps and Services

## SAP Connected Parking



Digitalized Parking Management



# SAP Vehicles Network

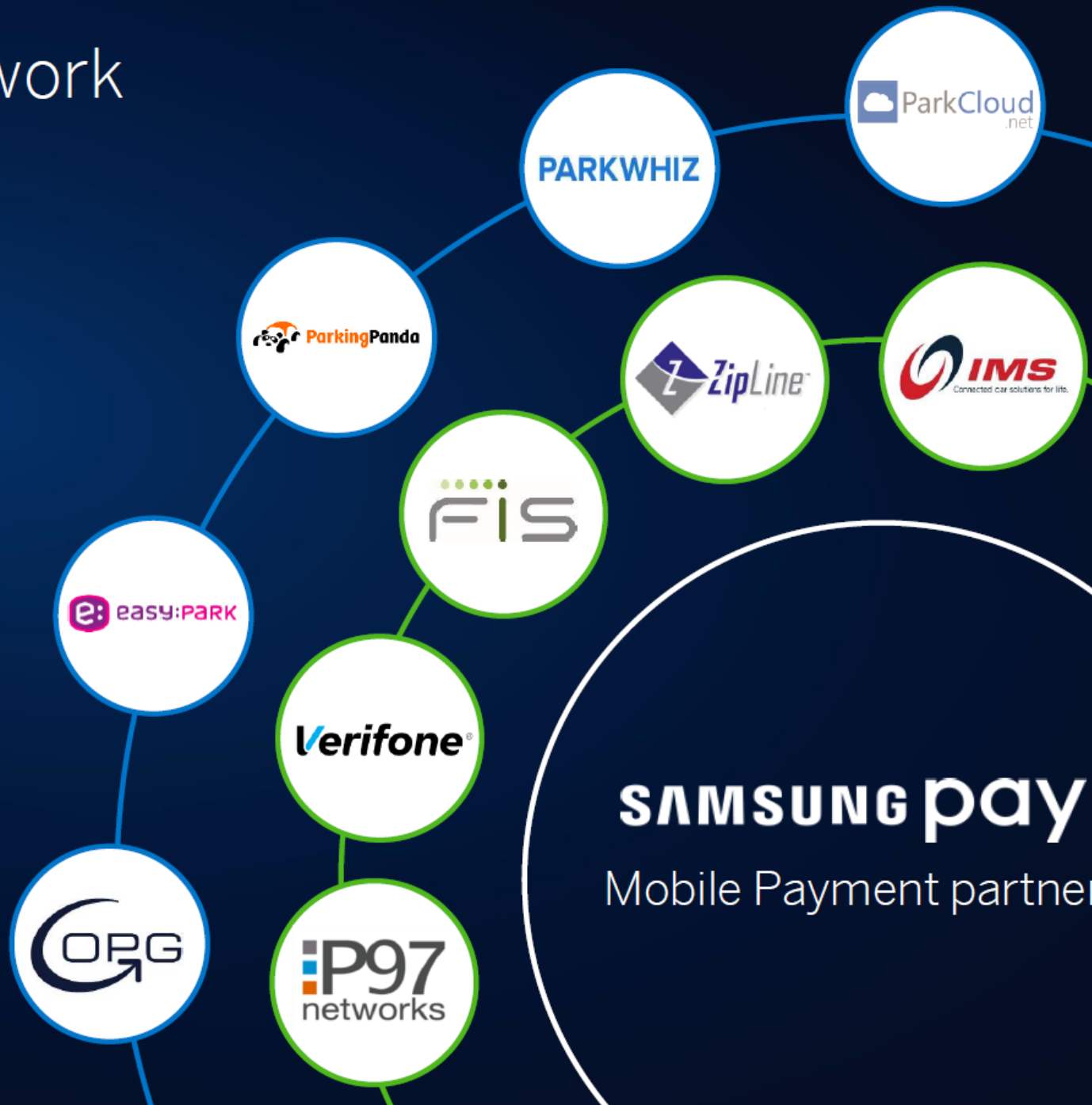


600

Cities; Over 8,500 locations & approx. 3M spaces

20,000

US fuel sites are under contract by SVN member service aggregators



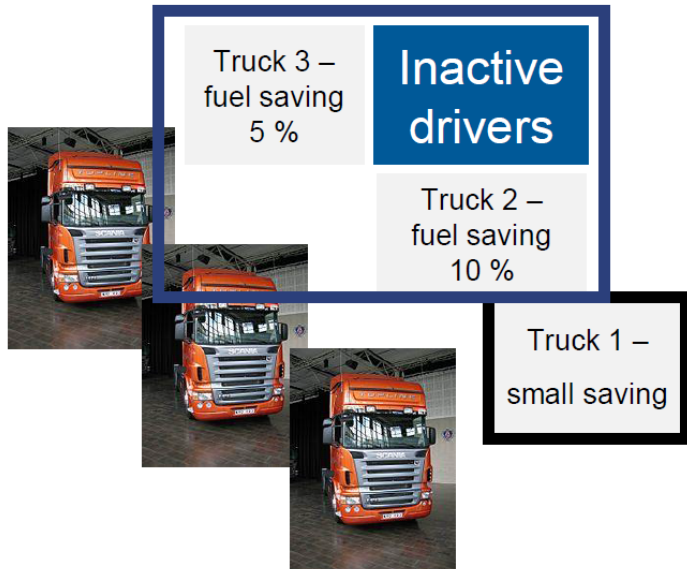
**SAMSUNG pay**  
Mobile Payment partner

# And in the end you will see more and more convergence ...

## Convergence of technologies IoT, AI and Blockchain

**Platooning: Grouping vehicles into platoons is a method of increasing the capacity of roads. It will be general available for trucks in 2020.**

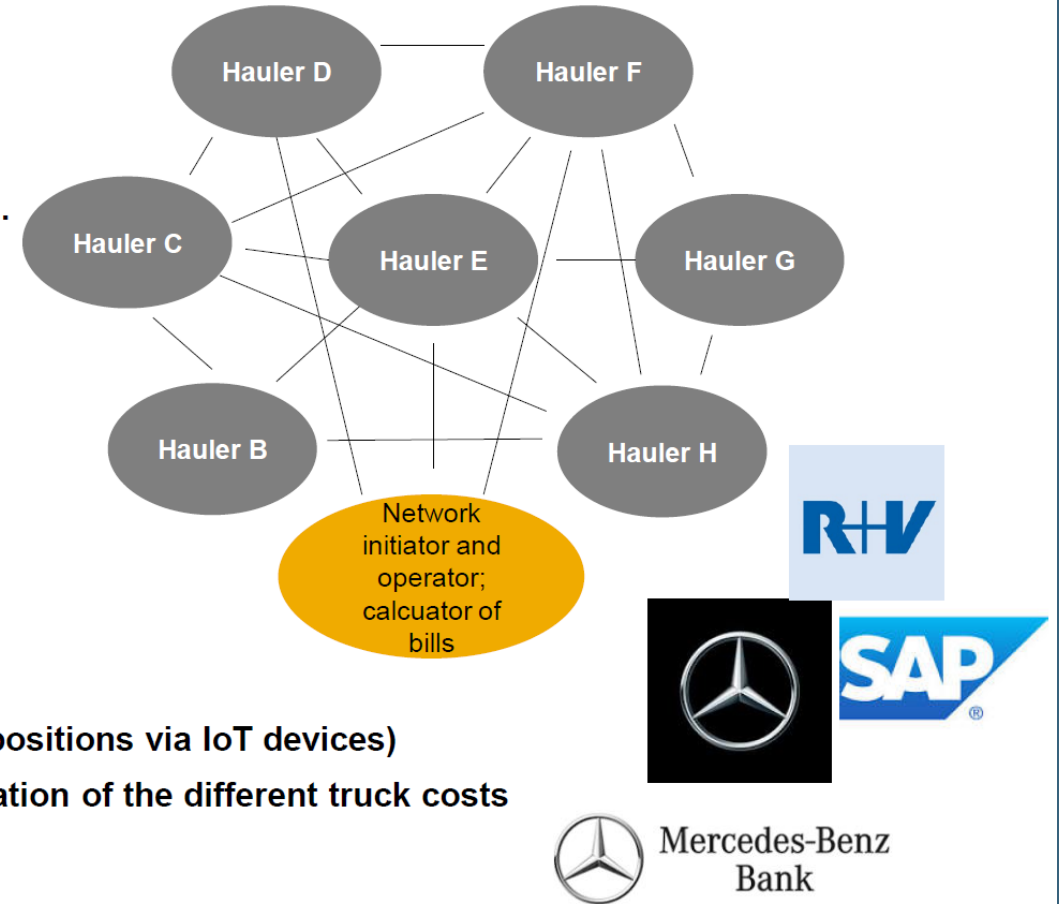
**Platoons decrease the distances between trucks using electronic coupling. This capability would allow some trucks to accelerate or brake simultaneously. This system also allows for a closer headway between vehicles by eliminating reacting distance needed for human reaction. It saves fuel, driver time. It saves costs for the second and third truck.**



**The Network will:**

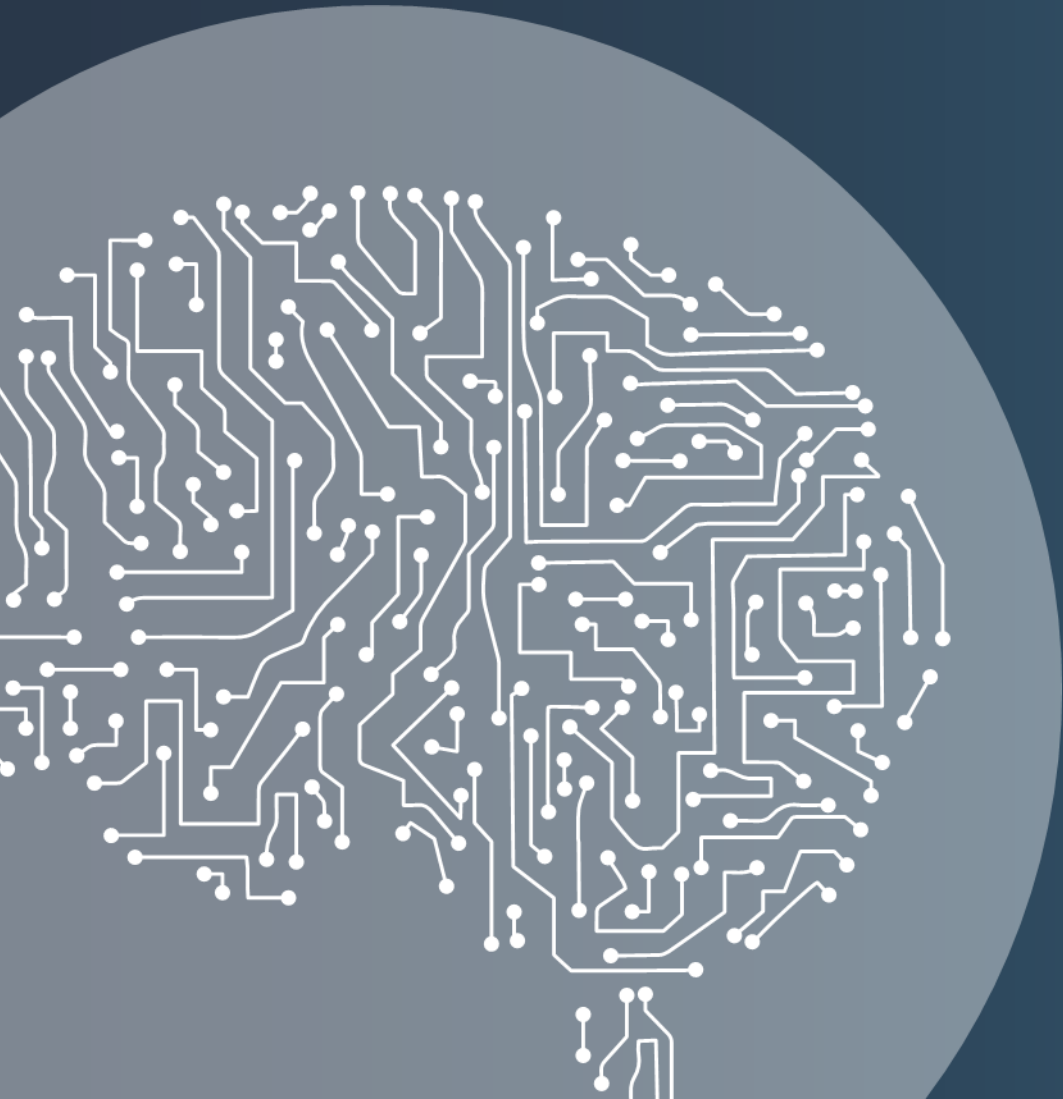
**Manage platoons**

- Creation (3 trucks)
- Manage the routes
- Tracking (distance, positions via IoT devices)
- Billing the compensation of the different truck costs
- Micro insurances



# Summary

This is just the beginning...



New opportunities to **automate** processes, **augment** tasks, and enable **new business models** based on data, insights, and learning in with different market adoption for ML, Blockchain, IoT



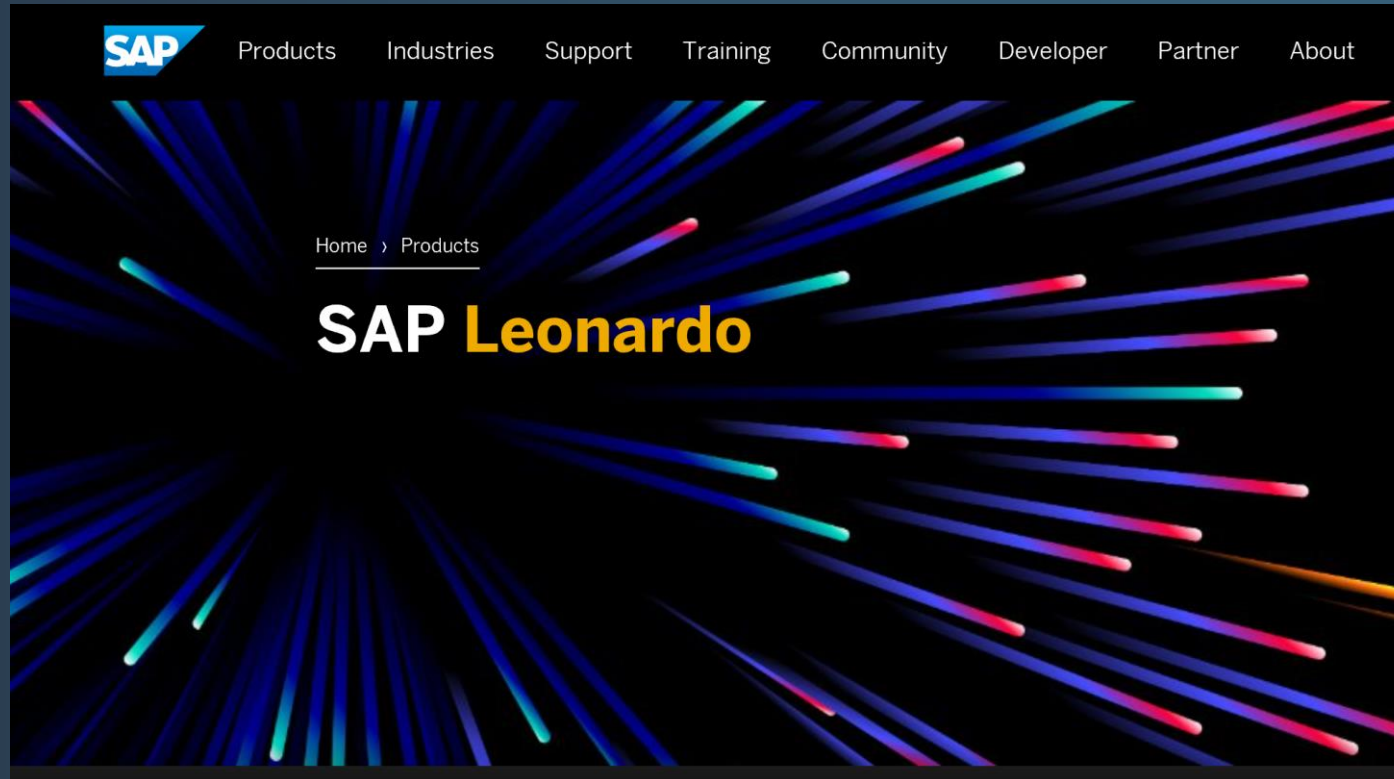
SAP is **more and more becoming an ecosystem and making enterprise applications intelligent** and has productized the first wave of Machine Learning enabled applications, providing SAP's version of Alexa SAP CoPilot to its customers since May 2017



We are looking for customers interested in **co-innovation, exploration, and validation** of new Industry and Line of Business use cases. Joint our **FSI Innovation Summit 11-12 October in New York City** at our Labs

# Questions?

Find out more about SAP Leonardo Foundation for Machine Learning



More information: [www.sap.com/products/leonardo](http://www.sap.com/products/leonardo)



# Thank You!

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**Anton Tomic**  
Financial Services  
Vice President

Global Head of Industry  
Business Development

**SAP SE**

