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https://www.abe-eba.eu/media/azure/production/1352/eba_antitrust_policy_20170602_final_clean.pdf



The forum is an open group, where interested stakeholders can discuss and exchange information on industry-wide topics.

The content of the slides presented and the views expressed in the context of the activities of the forum are those of the respective participants in the forum, and do not represent the views of the Euro Banking Association (EBA).



Open Forum on Digital Transformation

Innovation through Technology; Leveraging AI, Cloud and Platformization to create the new normal!

9 February 2021 Online Conference

Confidential

Proposed Agenda

- Welcome and opening remarks by Thomas Egner, Euro Banking Association
- Setting the scene and housekeeping by Kate Pohl
- Presentation: Digital Technology 4.0: Driver of the New Finance 4.0 Ecosystem by Prof. Dr. Hans-Gert Penzel, ibi research an der Universität Regensburg
- Presentation: Product to Platform to Ecosystem supported by the Cloud & APIs by Erol Bozak, Treasury Intelligence Solutions
- Presentation: Event Streaming: The Strategic Data Source for Modernisation and Increased Efficiency by Ben Stopford,
 Confluent
- Presentation: Don't Panic! After all it's only technology (Artificial Intelligence) by Kenza Ait Si Abbou, Deutsche Telekom
- Panel Discussion: Innovation through Technology; Leveraging AI, Cloud and Platformization to create the new normal!
- Break-Out Sessions
- Presentation: From Artificial Intelligence to Artificial Enlightenment by Vanessa Colella, Citigroup
- Wrap-Up



Euro Banking Association, <u>Thomas Egner</u> Secretary General



Euro Banking Association, Kate Pohl Facilitator



ibi research an der Universität Regensburg, Prof. Dr. Hans-Gert Penzel







Prof. Hans-Gert Penzel ibi research an der Universität Regensburg GmbH



Digital Technology 4.0: Driver of the New Finance 4.0 Ecosystem

EBA Open Forum on Digital Transformation Frankfurt am Main, 09 February 2021

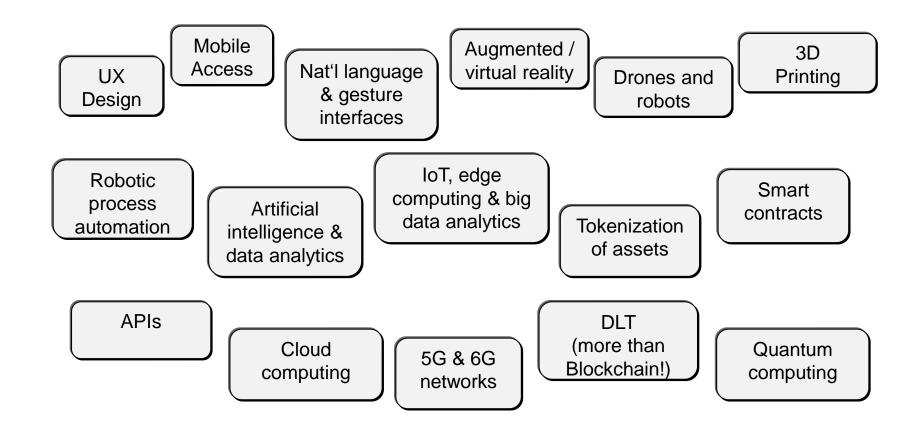
an der Universität Regensburg GmbH

Agenda

- Digitalization 4.0: the key driver for change
- How Industry 4.0 will shape finance in terms of products & services
- What Industry 4.0 will teach finance in terms of process design
- Outcome: Two types of sustainable business models
- Conclusions

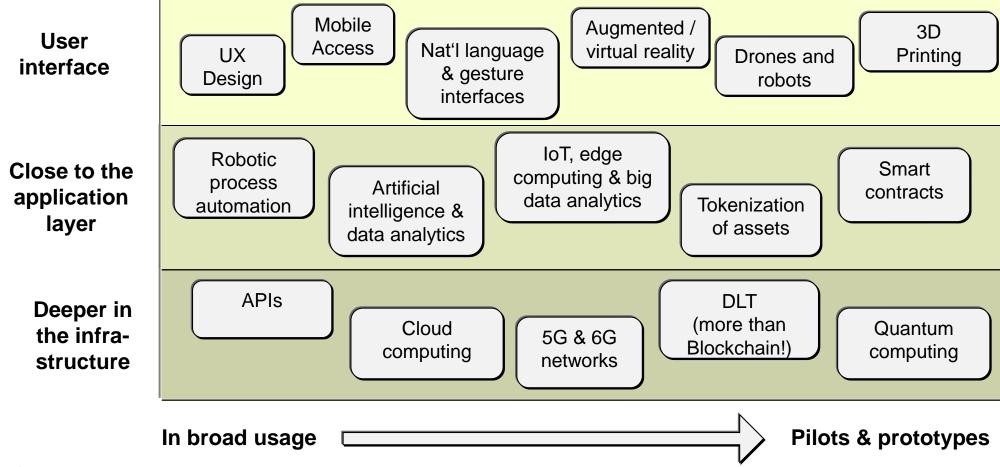
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Digitization buzzwords - don't miss them in your presentation!



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Digitization buzzwords - don't miss them in your presentation!



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Looking at digitalization more systematically: Four generations of digital solutions

4.0 Today: Digital mirroring of the physical world

Digital twins of machines and humans and their private and working environment (via big data and AI)

3.0 1990s: Global communication and transactions on the web

Internet (Web 1.0, Web 2.0 ...), wireless communication (WLAN, NFC), ubiquitous intelligent devices (Wearables, Smartphones. ... Cloud-Servers)

2.0 1960s: Local work with (centralized) computers

Central electronic processing and storage of information

1.0 Originally: Formal explanation

Conversion of (numerical) values and symbols into binary code

Based on (1) Becker, J.: Die Digitalisierung von Medien und Kultur, Springer VS, Wiesbaden 2013 and (2) on Keuper, F., Hamidian, K., Verwaayen, E., Kalinowski, T. (Hrsg.): Digitalisierung und Innovation: Planung – Entstehung - Entwicklungsperspektiven, Springer Gabler, Wiesbaden 2013.

research an der Universität Regensburg GmbH

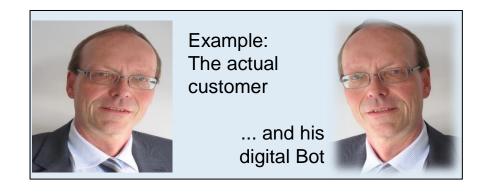
Digital twins of humans will become the core elements of "Consumer 4.0"

 Today: Rather comprehensive representation on social networks



Outlook 2025:

- Advisory-Bots as digital twins: Reduce work stress but 24/7 availability
- Customer-Bots as digital twins: Reduce private stress & optimization free time



- Bots will talk to each other and pay attention to emotions
- By law humans will (hopefully) always remain accountable

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Digital twins of machines and production networks will become the core elements of Industry 4.0

- Digital twins of physical objects, machines, production networks
- Continuous collection of all relevant information + decentralized storage (IoT + Edge Computing)
- Detailed data analysis of past data and performance status: production cycles, usage, wear and tear, maintenance requirements, ...
- Prediction of future performance, including life expectancy
- Highly flexible and automated control of production processes in real time

This is not future but reality - see pilots using Basys 4.0 reference architecture (Fraunhofer IESE)



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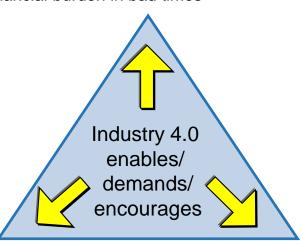
Industry 4.0 will require new product and service offerings

Payments: "Pay as you go" for machines and production networks

- Much lower liquidity required for machine operators
- · Higher, but manageable financial burden in good times
- Low financial burden in bad times

Funding: Big data based loans

- Loans are being based on big data, with precisely understood collaterals
- Therefore lower risk margins and cet.par. higher net earnings



Financial Investments: Big data based machinery funds

- Portfolios of machines are being securitized
 - Attractive form of investment for institutional and private investors

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Deep dive on payments: Transition towards "pay as you go"

What is it?

- Operators don't buy and finance machines (and consumer don't buy durables).
 but pay them off continuously through production cycles or use cycles.
- Machine producers or intermediaries (banks, investors) remain the owners of the products and keep them on their books.

Why is it technologically feasible?

- Machines provide detailed operating data (i.e. production cycles) to their digital twins.
- Machines get wallets and trigger payments based on digital twin data.

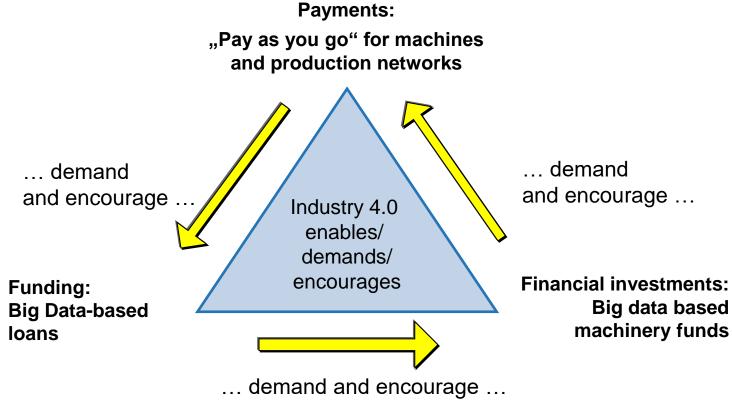
Why is it economically attractive?

- The operator does not have to worry about funding issues.
- During ongoing production times, the operator will accept higher costs per unit compared with proportional funding costs because sales revenues are attractive.
- The operator is exempt from fixed payments if there is no production going on.

Where is the problem?

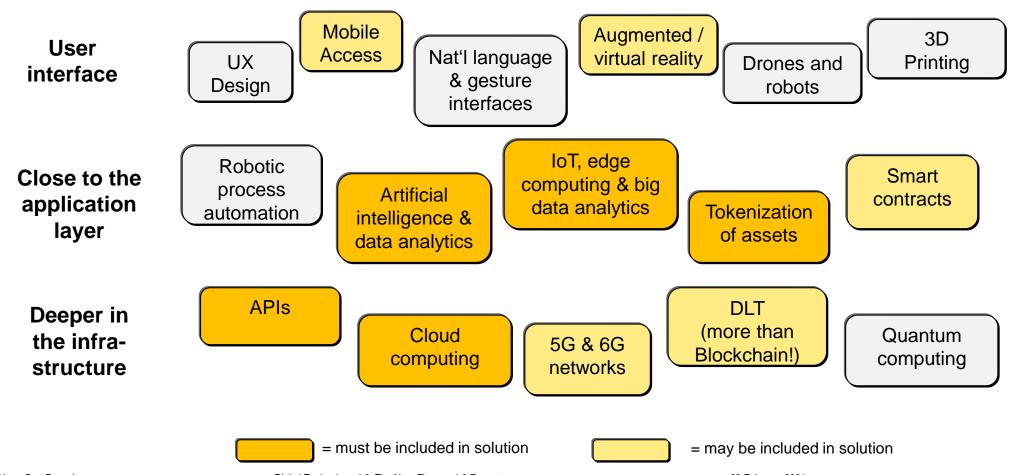
Who will keep machines on their books in the future – and what will motivate them?

A self-accelerating process towards new products and services



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Finance 4.0 solutions require combinations of several digital technologies



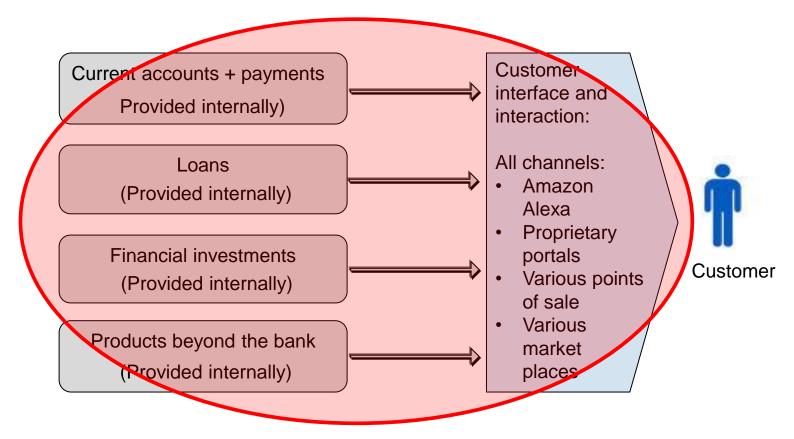
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Agenda

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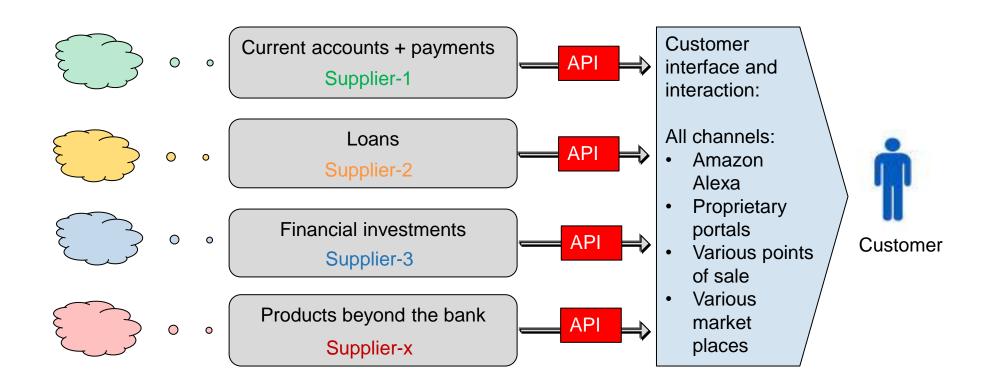
Historically, banking was based on the understanding that all value added should come from proprietary sources



This was one bank with a long proprietary process chain!

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Dismantling of customer interface versus product delivery: From one bank to many banks



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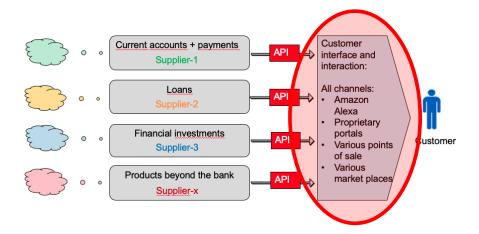
Agenda

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There will be two types of sustainable business models:

1. Integrators with superior distribution skills within the ecosystem



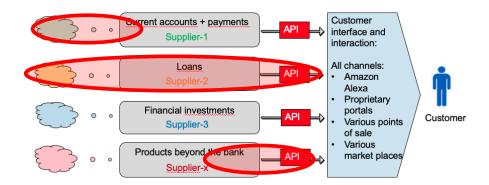
Core Competencies

- 1. Unlimited aspiration to satisfy customer needs
- 2. Profound understanding of the customer
- Expansion of product portfolio far beyond classic banking
- 4. Ability to present and bundle offerings attractively
- 5. Absolute routine + speed in purchasing third-party products
- 6. Consequence: Ability to strengthen customer trust

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There will be two types of sustainable business models:

2. Specialists exploiting economies of scale within the ecosystem



Core Competencies

- Superior in-depth knowledge about products, processes, and related abilities
- Digital competencies in product developments and operations
- 3. Speed in developments and operations
- 4. High economies of scale and scope
- 5. Private label as well as white label offerings

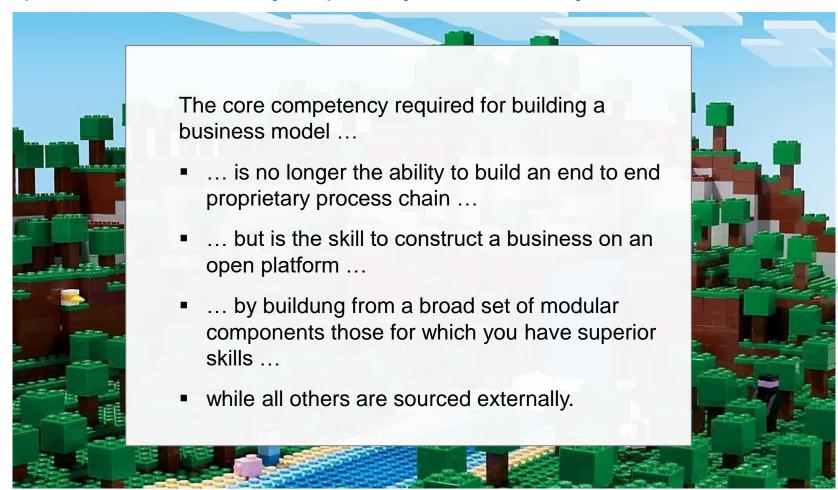
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Radical change in business model design: Open market platforms on which you place your tree - or your waterfall



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Radical change in business model design: Open market platforms on which you place your tree - or your waterfall



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Conclusions

- Industry 4.0 und Consumers 4.0 are in urgent need of new solutions
 - > There are huge opportunitites for Finance 4.0 applications
 - > ... but most of them are cross product, not pure payments
- Digital technologies are essential for implementation
 - It is not about choosing one or another technology
 - ... but about using proper combinations
- Digital technologies will form a new (public) infrastructure
 - It is not about competitive advantage through proprietory technology
 - but about using widely accepted standard platforms
- The competitive advantage results from shaping superior applications
 - This is based on a superior business understanding

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Thank you for your interest



Prof. Dr. Hans-Gert Penzel E-Mail: hans-gert.penzel@ibi.de



Treasury Intelligence Solutions, <u>Erol Bozak</u> CPO & Co-Founder





PRODUCT TO PLATFORM TO ECOSYSTEM SUPPORTED BY THE CLOUD & API

YOUR WORLD OF PAYMENTS. ONE LOGIN.

Leading cloud platform for managing corporate payments and cash flows.

INTRODUCTION



EROL BOZAK

Co-Founder and CPO of TIS



About Erol

- 23+ years experience Cloud Technology and Payments in various positions, including CPO, CTO, Solution
 Manager, Head of Engineering and Chief Architect
- MBA, Computer Scientist, Physicist
- 43 granted US patents in cloud computing, virtualization and system management software

TIS Journey

- 2010 Product development
- 2018 TIS as a Platform

 100 clients, ~5 partners to complement the solution
- 2020 TIS as an Open Ecosystem
 ~200+ clients, 10+ technology and product
 partners, partner mindset







13,000,000 COUNTERPARTIES

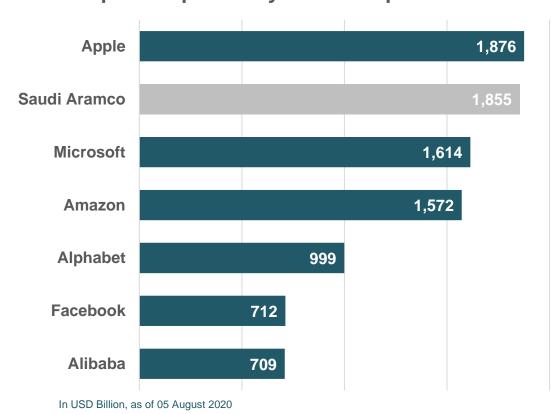
ISO 27001, SWIFT, SOC 1, SOC2, TISAX certified

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SIX OF THE WORLD'S TOP SEVEN COMPANIES ARE ECOSYSTEM COMPANIES

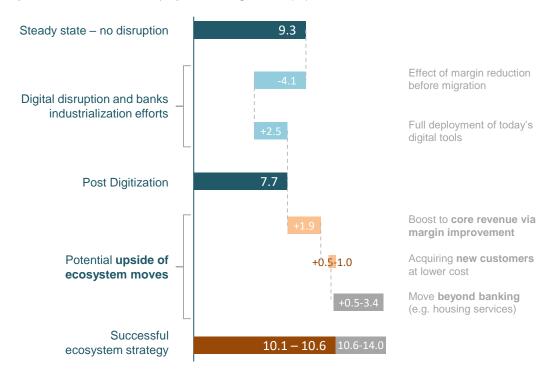


Top 7 companies by market capitalization



Banks that execute a successful ecosystem strategy could restore their REO to double digits

Projected 2025 return on equity for average bank (%)



Average results across sectors and geographies, generally more severe in consumer finance, payments and asset/ wealth management sectors (up to -20% or more in UK and Japan)

Source: S&P Global Market Intelligence, Global Banking pools and Panorama by McKinsey

Source: S&P Capital IQ, McKinsey

ECOSYSTEMS ARE ABOUT WIN-WIN-WIN

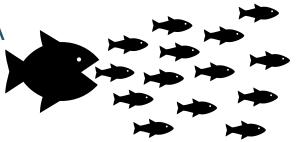


ECOSYSTEM AS A SOURCE OF CAPABILITIES & **INNOVATION**

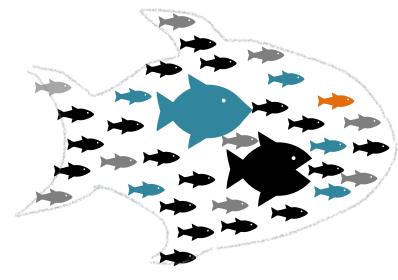
SOURCE OF

CUSTOMERS







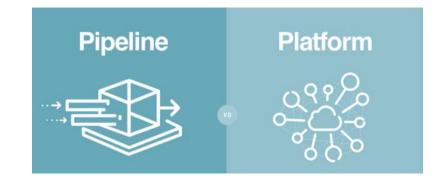


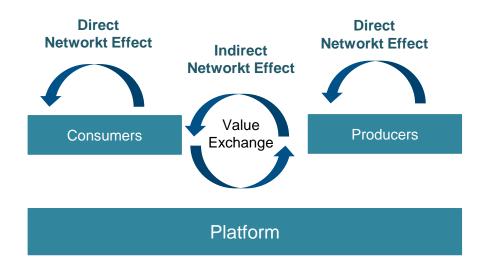
- All parties collaborate
- Flexible/ modular value chain
- More than just sum of all parts
- Additional value through better customer experience

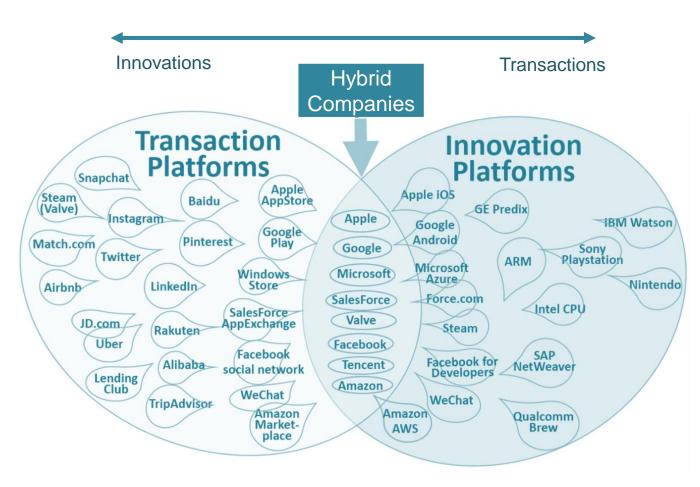
CONSIDER WHERE YOU SEE YOUR OWN INSTITUTION AT THIS POINT

PLATFORMS









Van Alstyne, M.W.; Parker, G.G.; Choudhary, S.P.: Pipelines, Platforms, and the New Rules of Strategy; Harvard Business Review, April 2016

Cusumano, M.A., Gawer, A.; and Yoffie, D.B.: Platform versus Non-Platform Company Performance: Some Exploratory Data Analysis

THREE ELEMENTS ENABLE ECOSYSTEMS



BUSINESS MODEL

TECHNOLOGY

- Based in the cloud
- Connected via APIs
- Designed as Platform architecture



- Open to partnering
- Digitized processes
- Flexible revenue streams

PEOPLE

- Driven by business
- Diverse capabilities
- Agile culture

API AND CLOUD TECHNOLOGY AS FOUNDATION





MATURITY

SIMPLICITY

AVAILABILITY OF NEW APIS

DIVERSITY

GLOBAL REACH

AVAILABILITY (24/7)

SECURITY

VALUE ADDED SERVICES



TECHNOLOGY AS SOURCE TO SCALE

1st Generation RPCs (70s – 80s)



2nd Generation Web APIs (90s – 00s)



3rd Generation Cloud APIs (00s – 10s)



GRID COMPUTING

- Parallel computing to solve large problems
- Global Alliance

UTILITY COMPUTING

- Computing resources as metered service
- Virtualization capabilities

SAAS & CLOUD COMPUTING

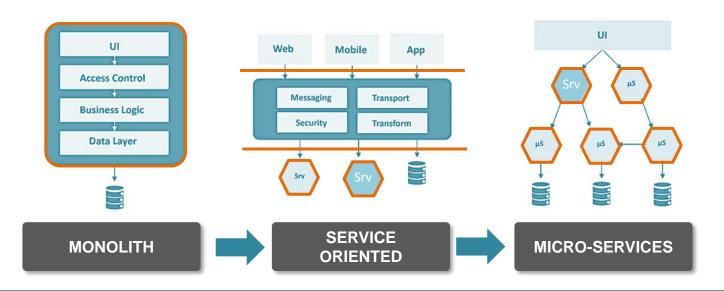
- Network based software services
- Next gen. internet computing
- Next gen. data centers

ARCHITECTURE EVOLUTION MEETS CLOUD EVOLUTION



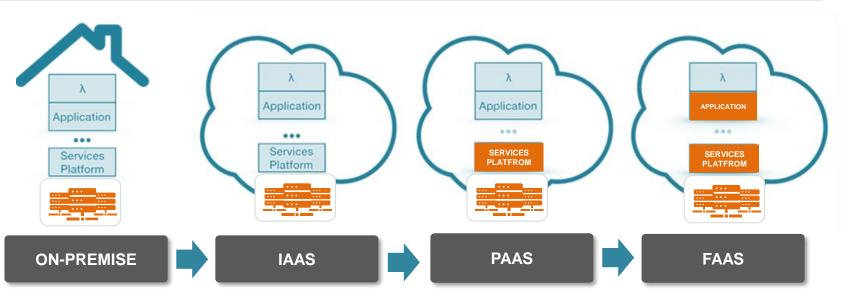
Evolution of Architectures

API's become fine grained and modular



Evolution of Cloud

Cloud Service become fine grained and modular



BEST-OF-BREED ECOSYSTEMS ESTABLISH ALONGSIDE TRADITIONAL TMS MONOLITHS



Last 20 years:

Innovation through Treasury Software providers

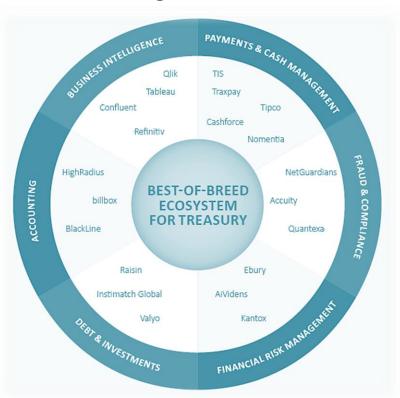


Since 1-2 years:

Innovation through best-of-breed collaboration







Enabled by:

- SaaS business model
- Cloud architecture
- API technology

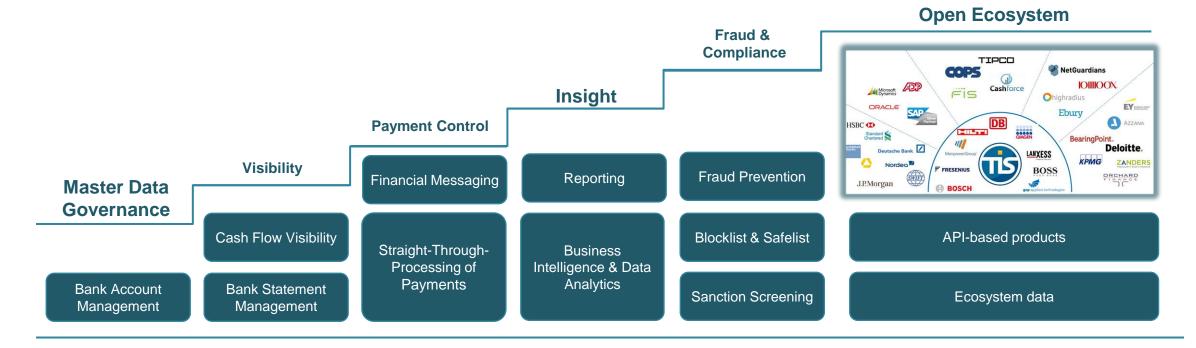
Source: TIS whitepaper 2020, The Next Gen Architecture for a Digital Treasury

MORE CHOICE > MORE INNOVATION > BETTER CUSTOMER EXPERIENCE

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TIS JOURNEY: FROM PRODUCT TO OPEN ECOSYSTEM





Since 2010: CLOUD BAM & PAYMENTS

Since 2018:

CONNECTIVITY PLATFORM

Since 2020:

OPEN ECOSYSTEM

BUSINESS MODELS RE-IMAGINED

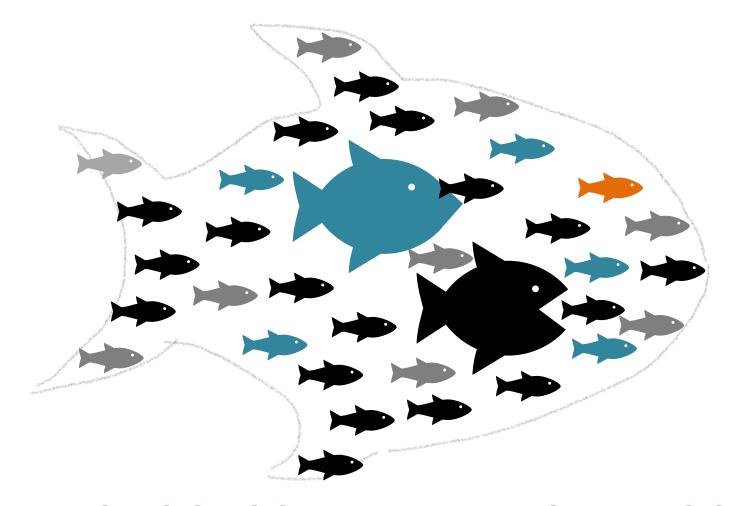


- ECOSYSTEM IS THE NEW SUPPLY CHAIN
- NETWORK EFFECT IS THE ECONOMY OF SCALE
- COMMUNITY MANAGEMENT IS THE NEW CUSTOMER SERVICE

• TRUST AND REPUTATION ARE THE NEW QUALITY CONTROL

ARE YOU READY....





... TO BE SUCCESSFUL WITH YOUR ECOSYSTEM?



THANK YOU!

EROL BOZAKCO-FOUNDER, CHIEF PRODUCT OFFICER

erol.bozak@tis.biz

TIS



Confluent, Ben Stopford Lead Technologist, Office of the CTO





Event Streaming:The Strategic Data Source for Modernisation and Increased Efficiency

Ben Stopford Lead Technologist, Office of the CTO, Confluent

Feb 09, 2020







What enables this transformation?





Cloud



Machine Learning



Mobile



Event Streaming

Rethink Data Centers Rethink Decision Making

Rethink User Experience

Rethink Data

The New Business Reality





Technology is the business Innovation required for survival Yesterday's data = failure Modern, real-time data infrastructure is required.



Weak Form

Companies are
USING MORE SOFTWARE

Strong Form

Companies are BECOMING SOFTWARE

Stores become Software







Cars become Software







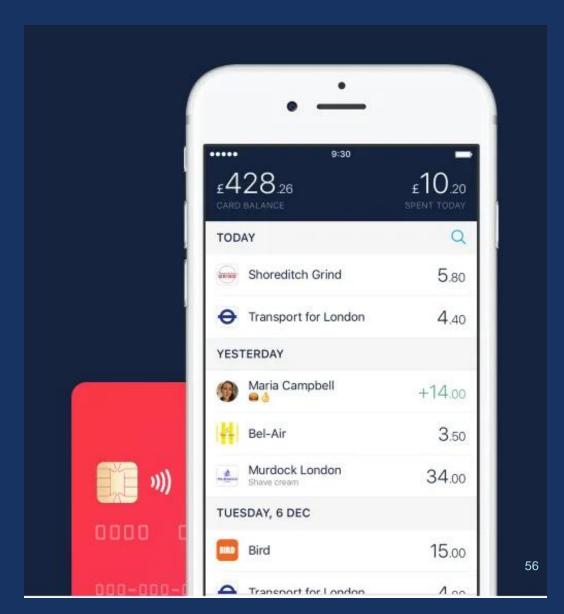
Banks become Software





STARLING BANK

N26



Loan Application Using Software





Loan Application Using Software





Loan Application In Software





Loan Application In Software





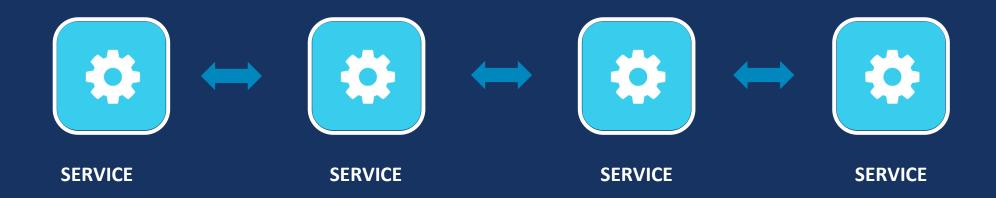
Using Software: Classical Application Architecture





Becoming Software: Services based architecture (24x7)





CUSTOMER DRIVER REQUESTING A RIDE BUSINESS BUSINESS EVENTS EVENTS GEOSPATIAL ROUTE RE-PLANNING MATCHING

THE USER OF SOFTWARE

IS MORE SOFTWARE



What does this mean for data?





















We have hundreds of databases...







































FUNDAMENTAL ASSUMPTION DATAIS PASSIVE











viariand











Fundamental Assumption: Data is Passive





Good for building:



Web Applications

Synchronous Communication

Databases are designed to help us!





In today's digital natives data is constantly moving around



Event Streaming is the data technology that addresses this.





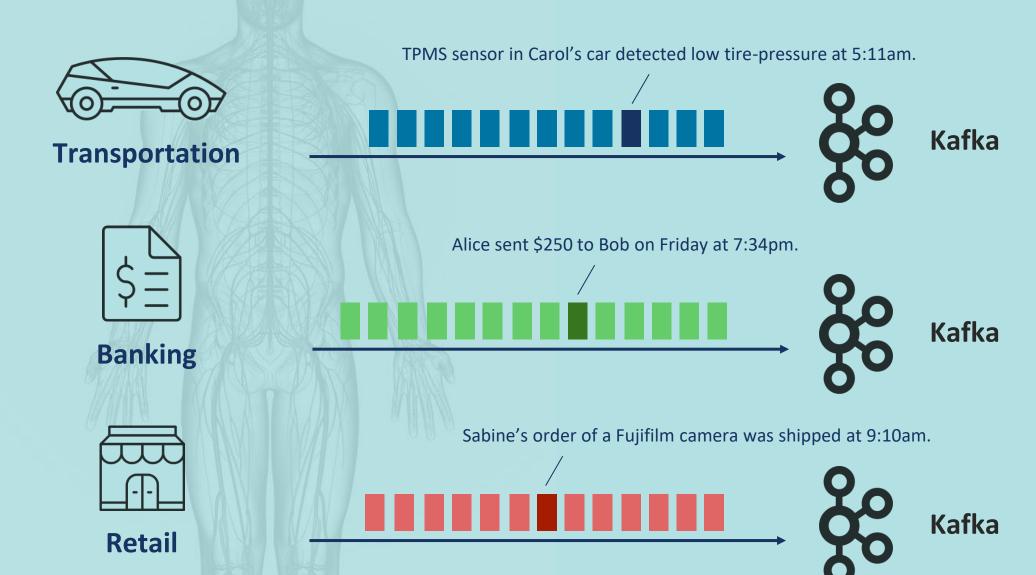


Event Streaming is the Central Nervous System for today's enterprises.

Apache Kafka® is the technology.

'Event' is what happens in your business





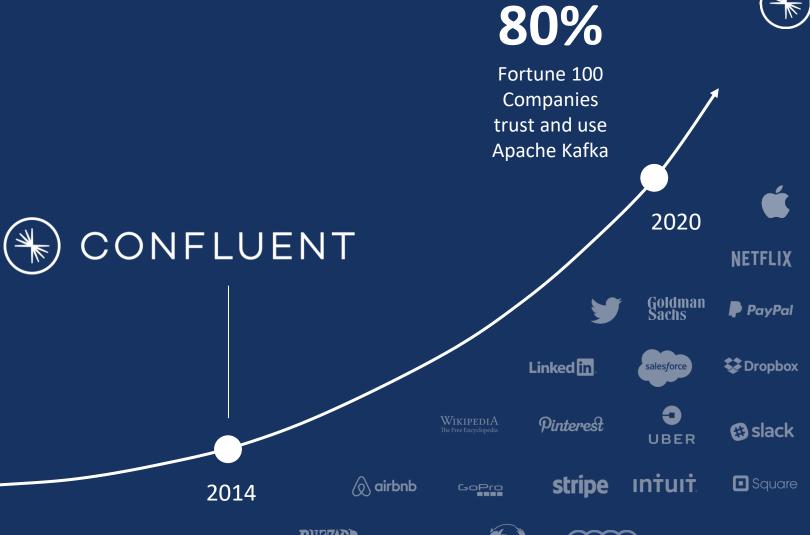
Central Nervous System



Your Business as Streams of Events, powered by Kafka



The Rise of Event Streaming





Apache Kafka

created at LinkedIn by Confluent founders









Tencent 腾讯

Kafka & Confluent







Confluent pioneered Event Streaming

Confluent founders are **original** creators of Kafka

80% of Kafka software commits, has over 1M hours technical experience with Kafka, and operates 5,000+ clusters

Confluent Platform completes

Apache Kafka and turns it into a secure, enterprise-ready platform

Confluent Cloud

is the only multi-cloud, fully managed, pay-as-you-go event streaming service in the world

AWARDS



Partner of the Year

Google Cloud







Morgan Stanley

CTO Innovation
Award Winner

2019

JPMORGAN CHASE & CO.

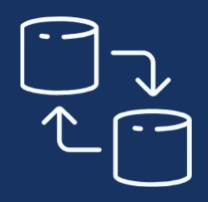
Hall of Innovation

BANK OF AMERICA

Enterprise Technology Innovation

Kafka: The Trinity of Event Streaming





Publish & Subscribe
to Streams of Events



Storeyour Event Streams

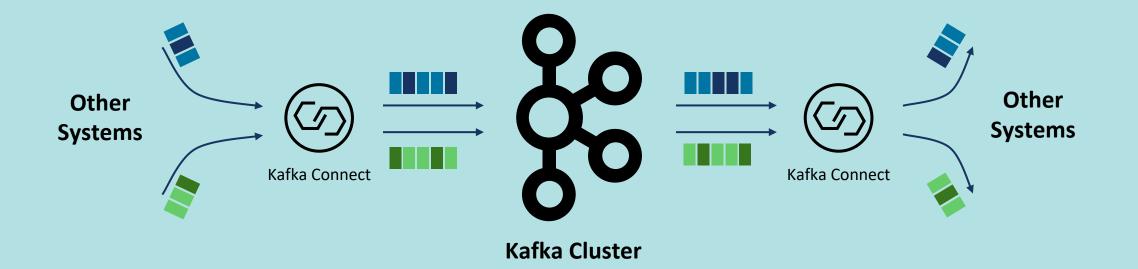


Process & Analyze
your Events Streams



Kafka Loves Your Existing Systems.









Kafka Stores Your Data Durably.



The New York Times

Kafka is the source of truth.

Powers NYTimes.com, and stores
all articles ever published since 1851.



September 30, 1851, Page

Confluent Cloud

√ Infinite Storage

Confluent Platform

√ Tiered Storage (e.g., AWS S3)

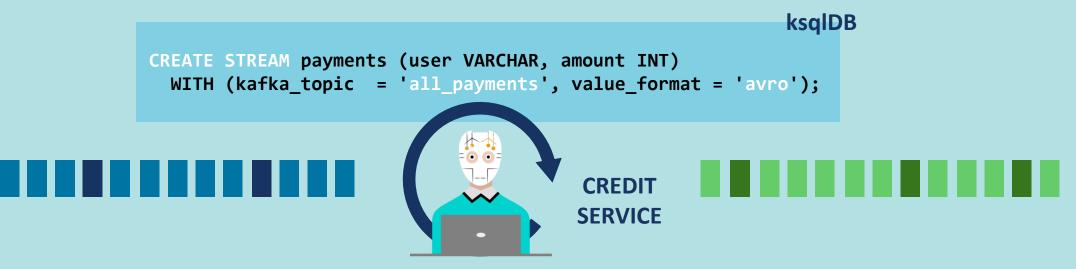
Apache Kafka

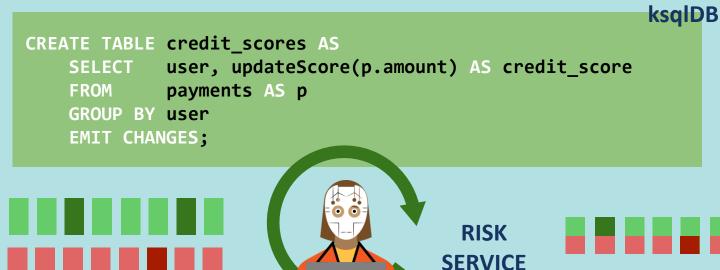
Tiered Storage upcoming



Kafka Makes Your Business Real-time.

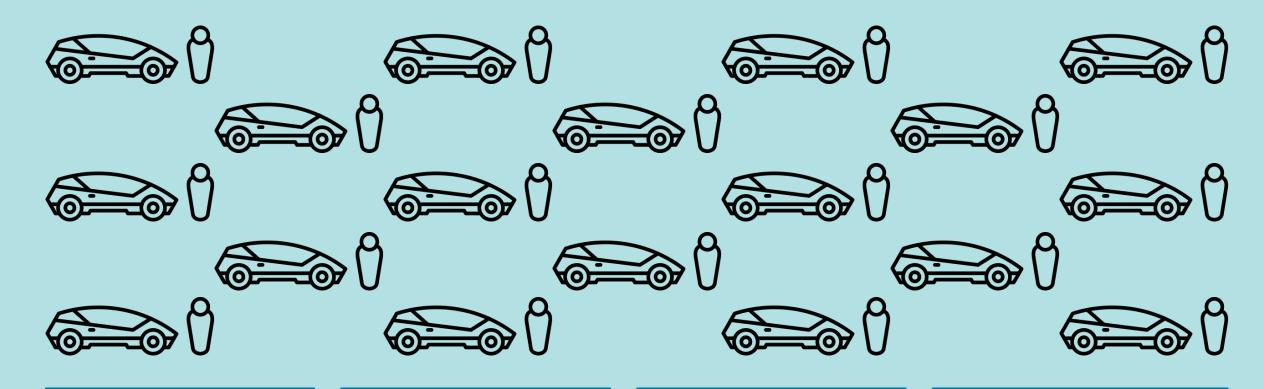






Kafka Scales with Your Business.





Events / sec

20000000

Event Topics

20000

Storage Partitions

3000000

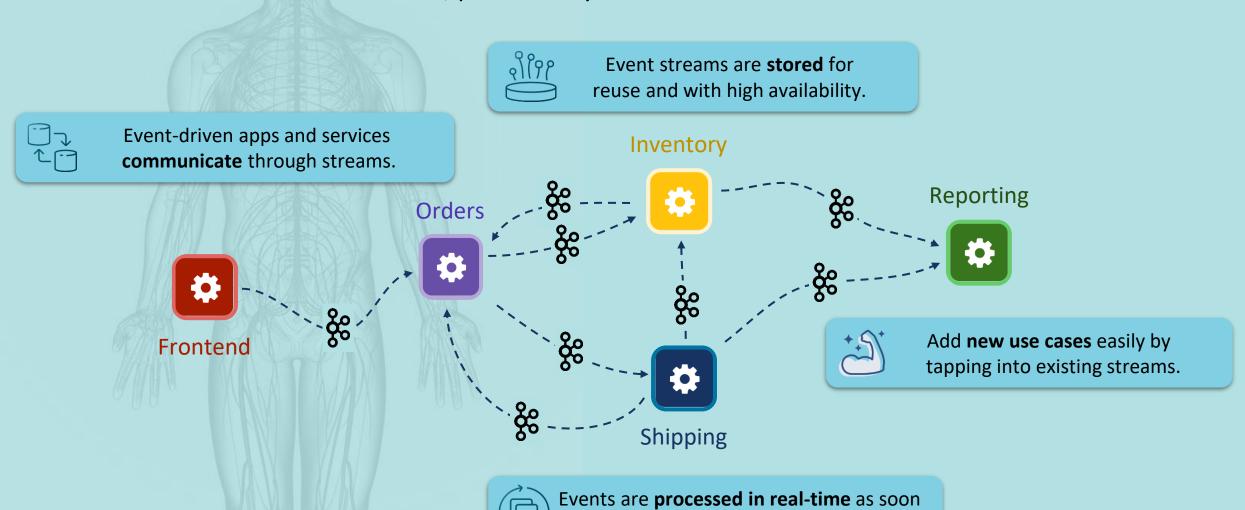
Kafka Servers

3,5500

Central Nervous System



Your Business as Streams of Events, powered by Kafka



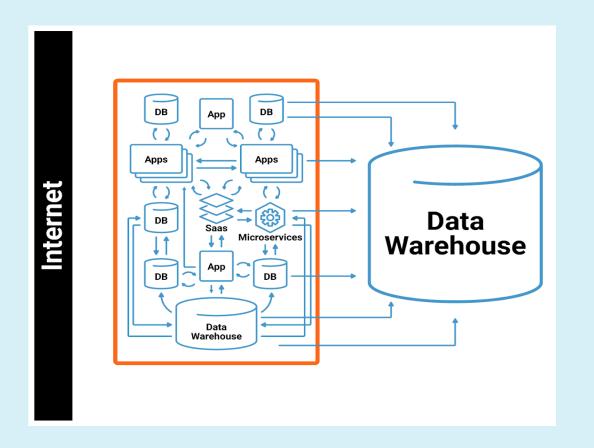
as they happen.

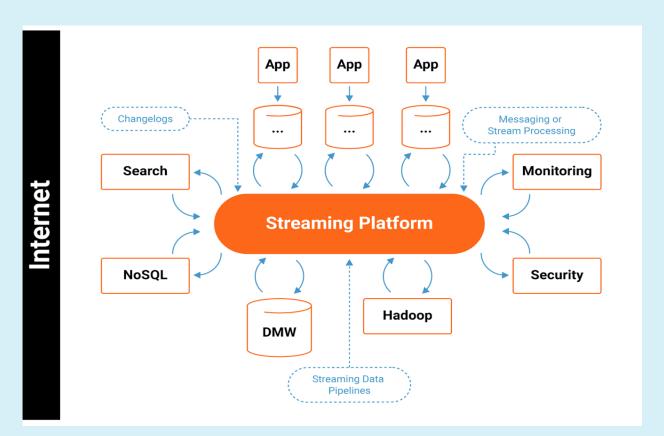


What does this mean for modernization?

Different to traditional data architectures

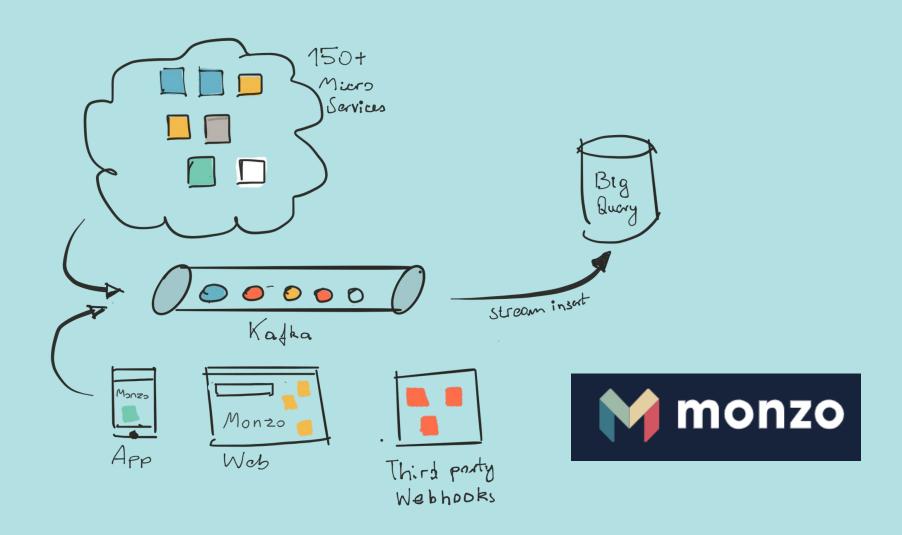






Event Streaming backs the Upstarts

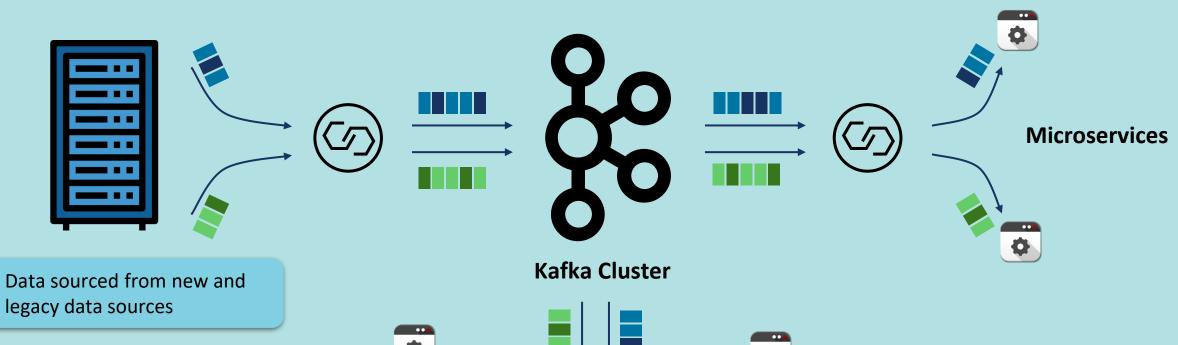


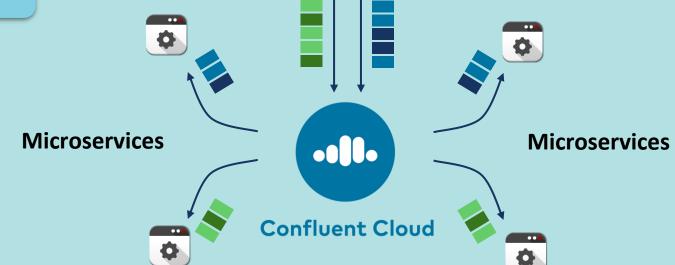




But offers more potential to the incumbents









The future is not one of pure reinvention.

Rather it will meld the most valuable parts of the now into the technology of our future.

Event Streaming Is The Future Of Data



Cloud

Future of the datacenter

Infrastructure as code

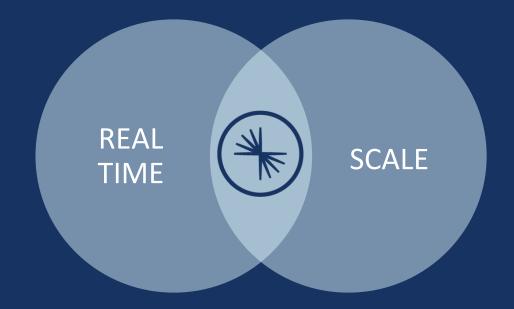
Event Streaming

Future of data

Data as continuous streams of events



Thank you!



ben@confluent.io

benstopford

Deutsche Telekom, Kenza Ait Si Abbou Senior Manager Robotics & Al | Author | Intrapreneur

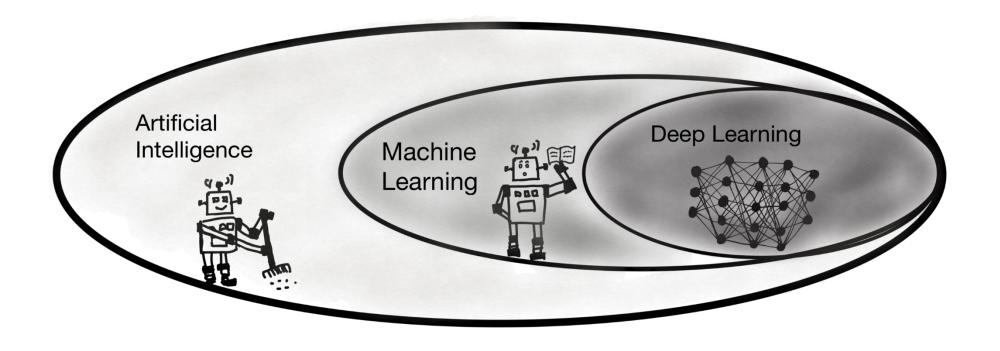




What is artificial intelligence?





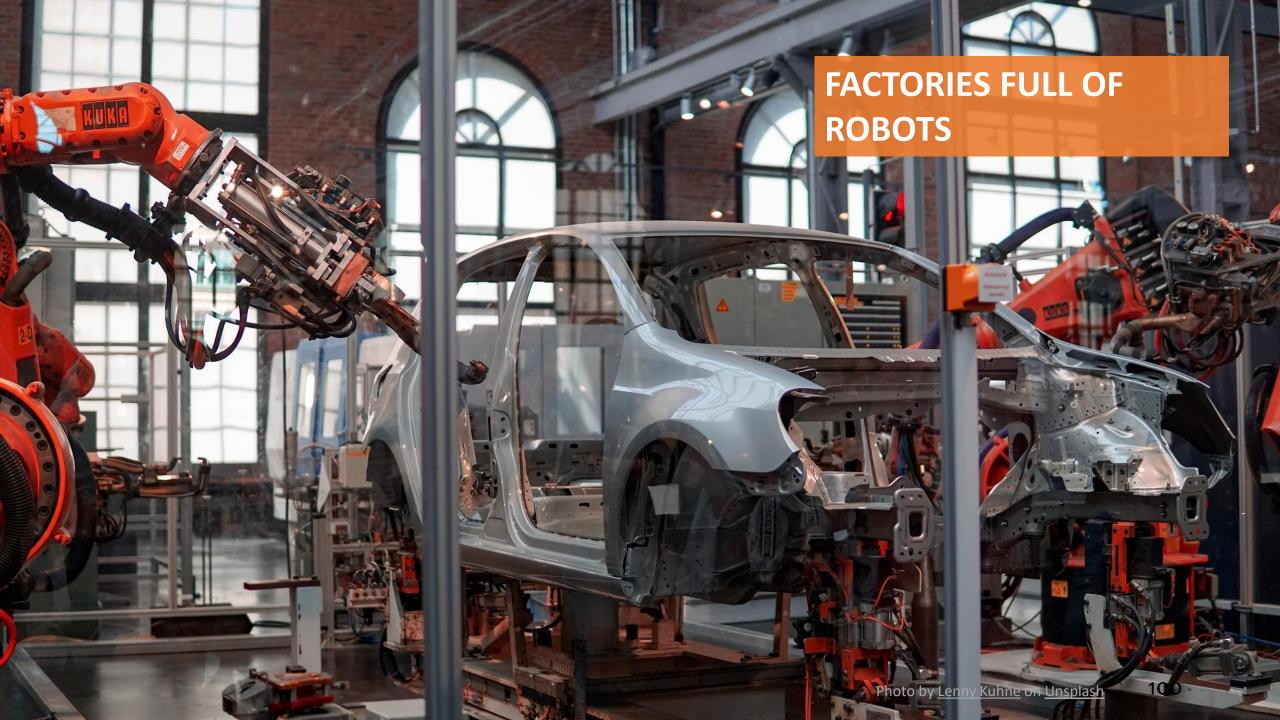




Where is artificial intelligence?



























A Call to Arms

Original Composition for NVIDIA's Keynote at CES 2019

01:32



Aiva Technologies





Which jobs are safe?



NONE



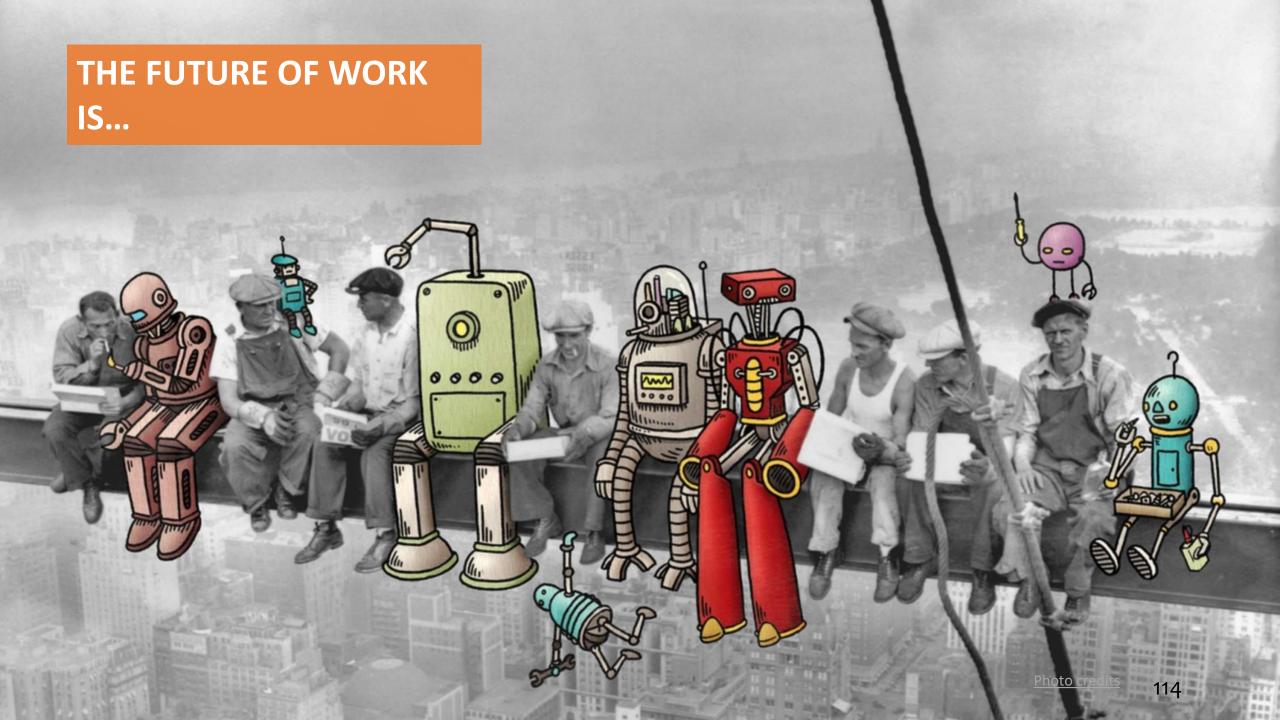
Bottlenecks of Automation:

1 PERCEPTION MANIPULATION

2 CREATIVE INTELLIGENCE

3 SOCIAL INTELLIGENCE









Happy life-long learning, everybody!



Thank you!



Kenza Ait Si Abbou Lyadini www.iamkenza.de



Kenza Ait Si Abbou



@KenzaAbbou



Citigroup, <u>Vanessa Colella</u> Chief Innovation Officer of Citigroup, Head of Citi Ventures &

Head of Citi Productivity



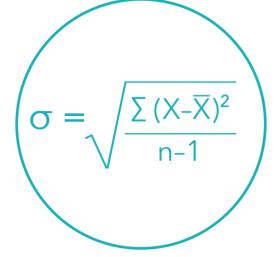
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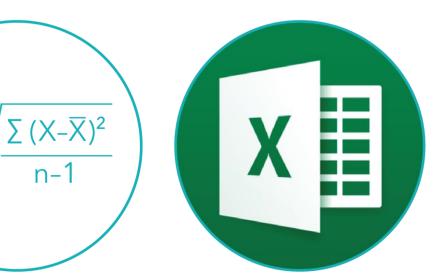
VANESSA COLELLA
CHIEF INNOVATION OFFICER OF CITI
& HEAD OF CITI VENTURES



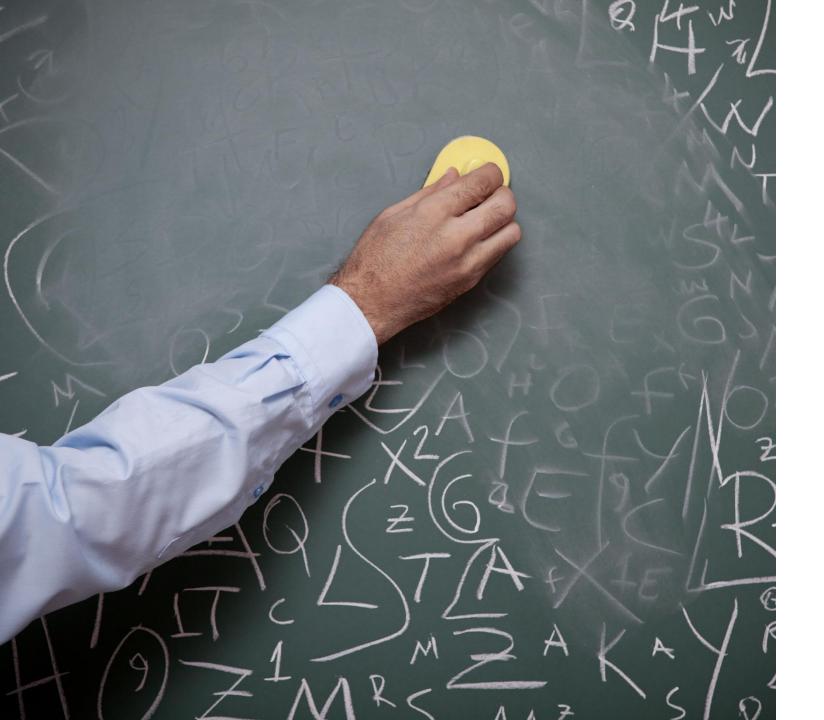


$$y'' + 2y' = 3y$$









= 5

+1.5°C

by 2030

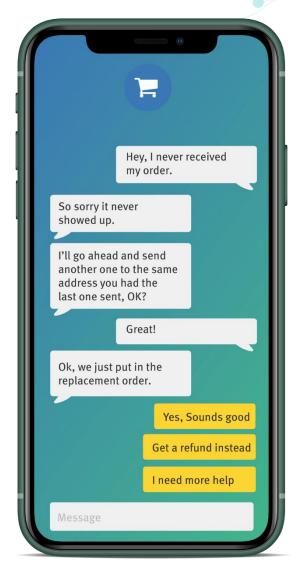


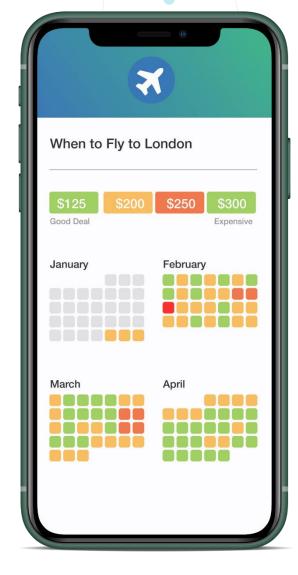
GDP:

+1-2%

Global Growth in Advanced Economies









Automated Customer Support

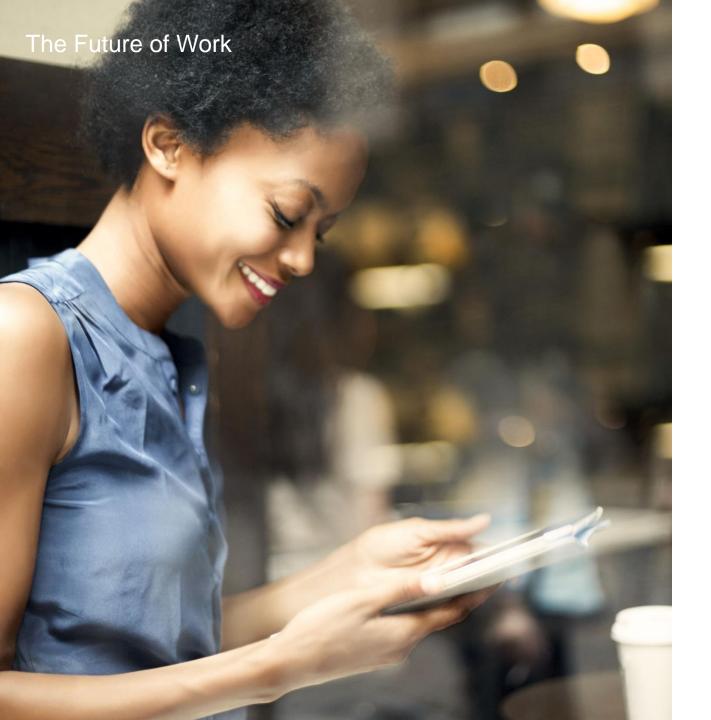
Travel and Navigation

Security and Surveillance



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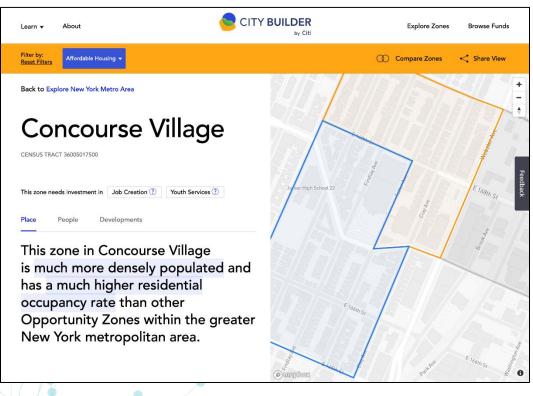
Know your skills.
Grow your skills.
Build your worth.





Place Based Investing













Thank you!



Participants in the forum are reminded of their responsibility to observe anti-trust laws.

The EBA Anti-Trust Policy is available at the EBA website.

https://www.abe-eba.eu/media/azure/production/1352/eba_antitrust_policy_20170602_final_clean.pdf



The forum is an open group, where interested stakeholders can discuss and exchange information on industry-wide topics.

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