

Empathy

Inspire, Fulfill, Live



Carlos Díaz
VP DDM & Innovation EMEA South
Villa D'Este, Cernobbio, Como Lake
March 16th, 2017



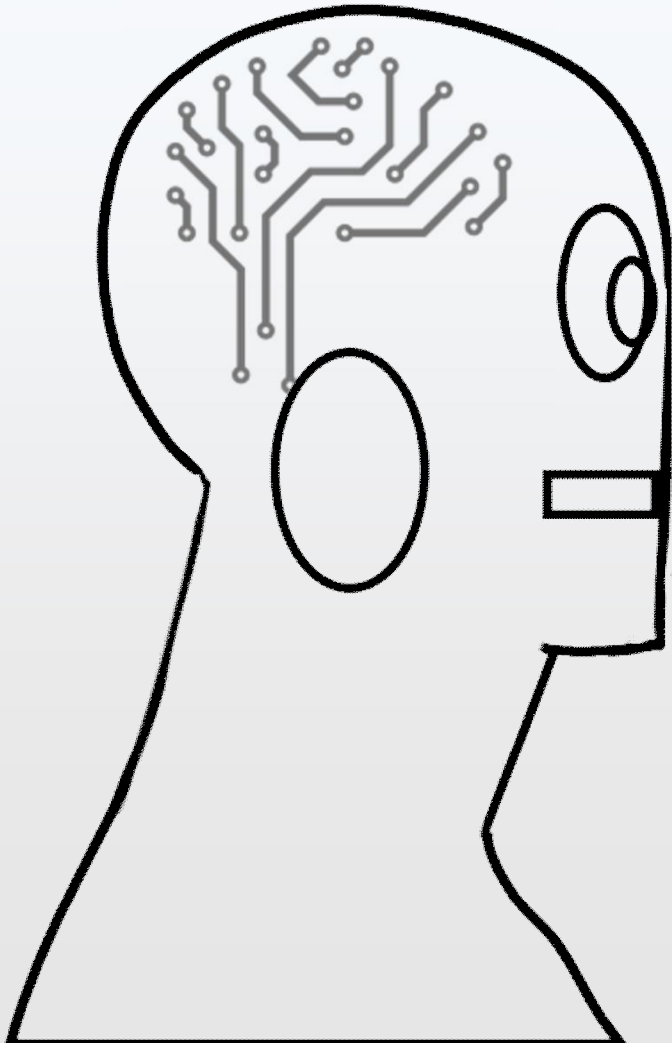
Deep Learning
Blockchain
Algorithm
Intelligent Business Assistant
Chatbot
MACHINE LEARNING
Precision Marketing

Data Lake
API Economy
Microservices
IoT
Beacon
Startup

“A digital organization is an organization able to create **Empathy** with the customer .”

Carl Zaid

Artificial Intelligence



Human Intelligence



AI will **NOT IMITATE** Human Intelligence

It will **ENABLE** Human Intelligence

A.I. Domains

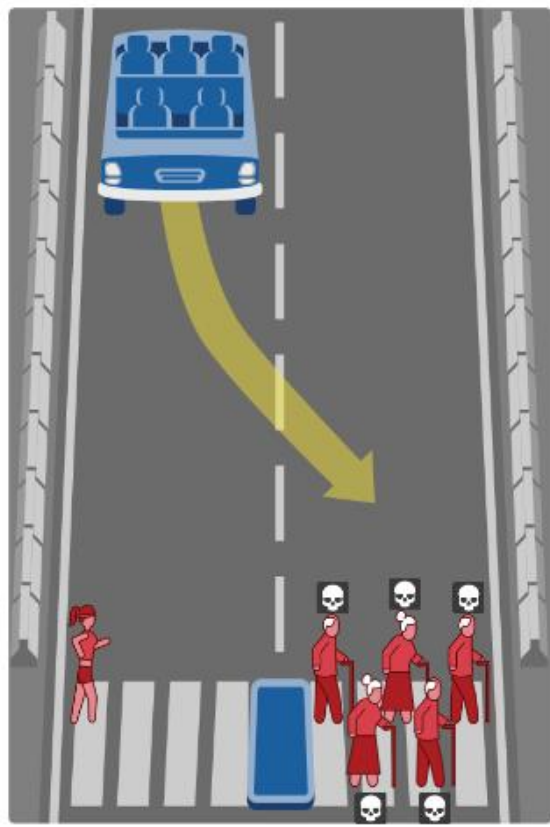
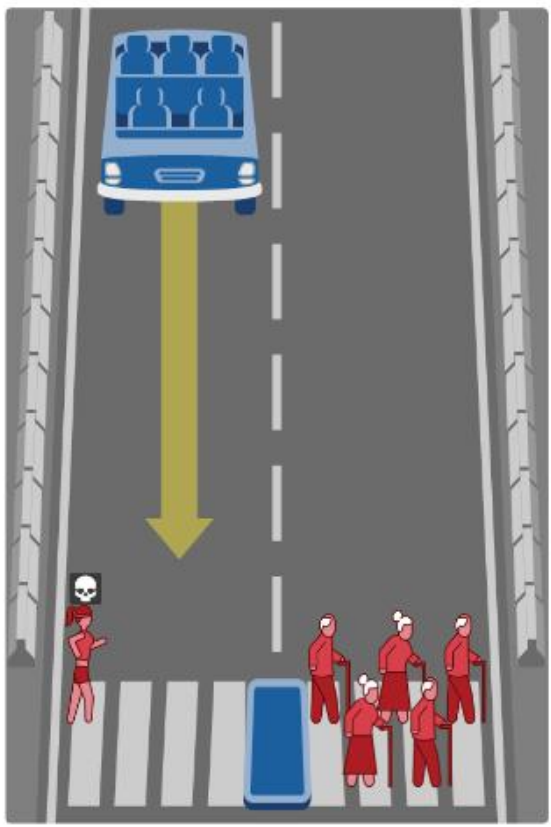


- Data Capture
- Processing Power
- Reasoning
- Making Choices
- Ethics
- Empathy



Hardest decision of my life

Share Link 0 Likes Random



From IQ to EQ



- Data Capture
- Processing Power
- Reasoning
- Making Choices
- Ethics
- Empathy



“Empathy is about standing in
someone else’s shoes,
Inspiring someone else's dreams,
Fulfilling someone else's desires,
Helping someone else Live.”

Carl Zaid



Inspire



Fulfill



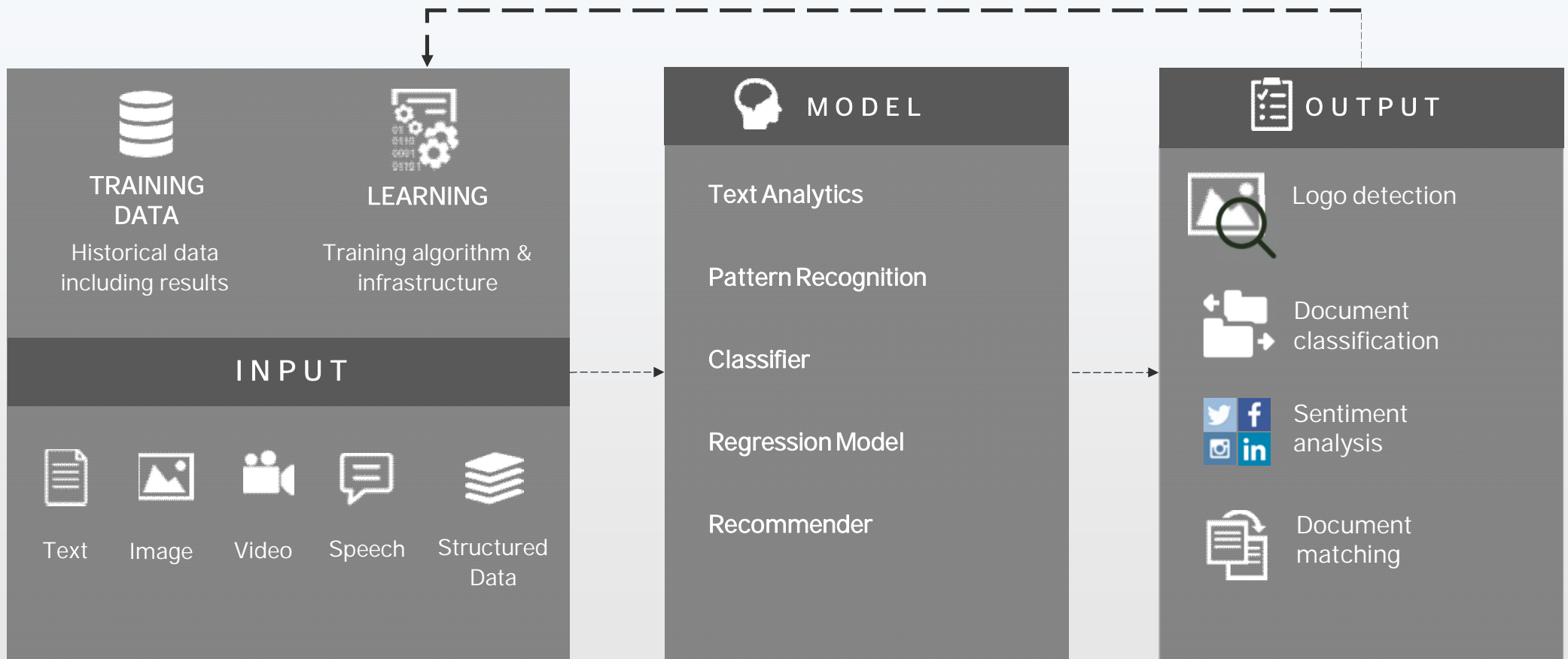
Live

MACHINE LEARNING

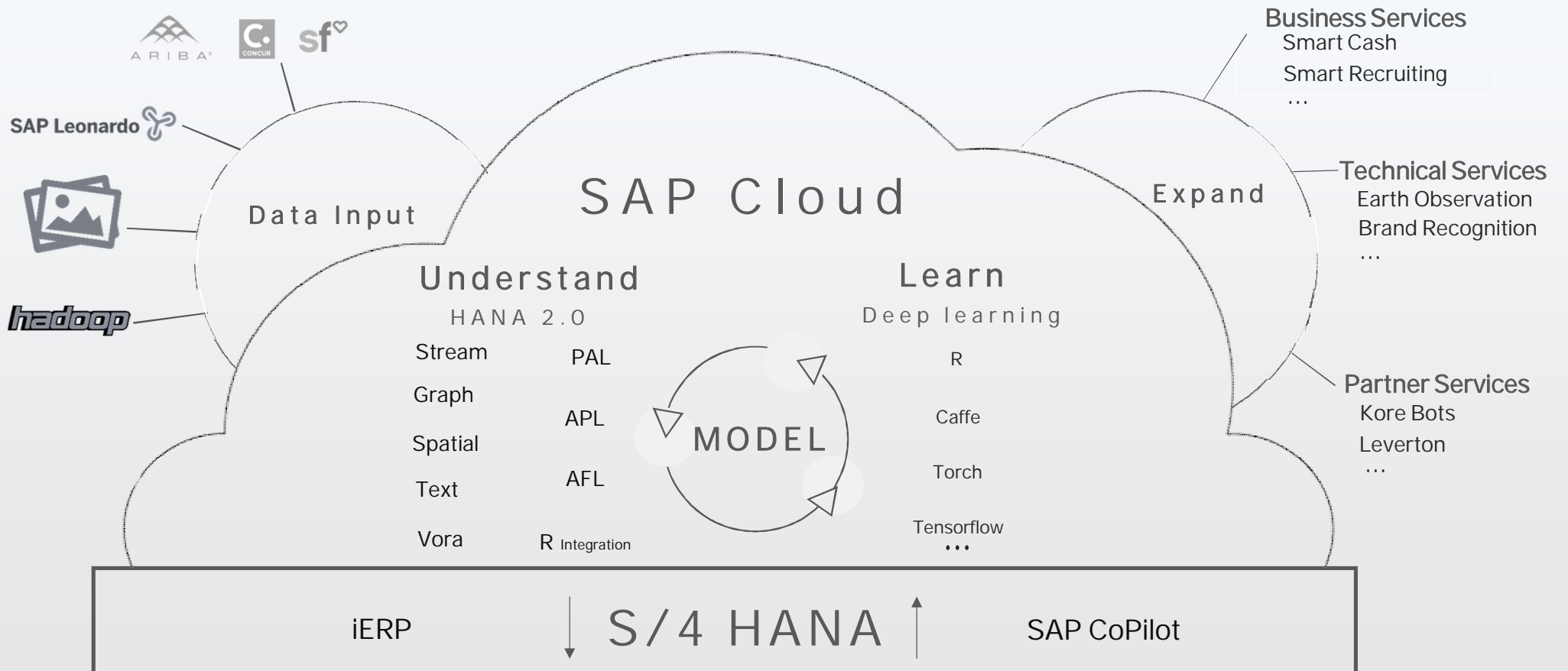
Regression Statistics
Unsupervised Learning Algorithm
SUPERVISED LEARNING
Feature Engineering
Deep Learning

CLUSTERING

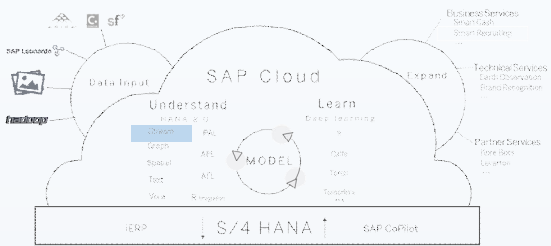
The Steps in Machine Learning



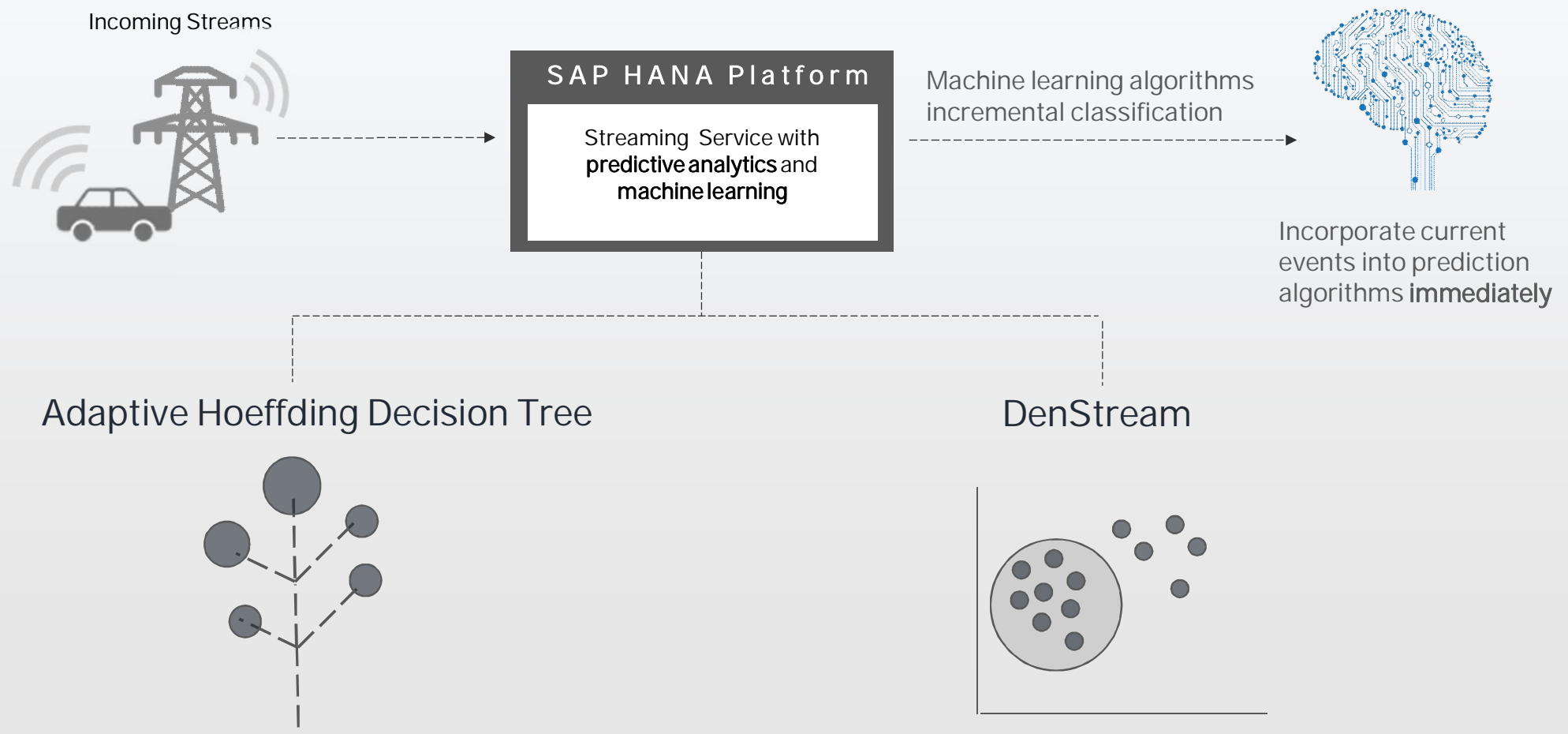
SAP ML Framework



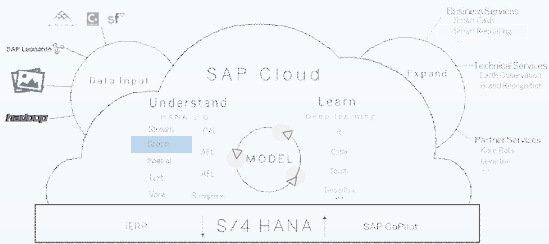
SAP Clea 



SAP HANA- Smart Data Streaming

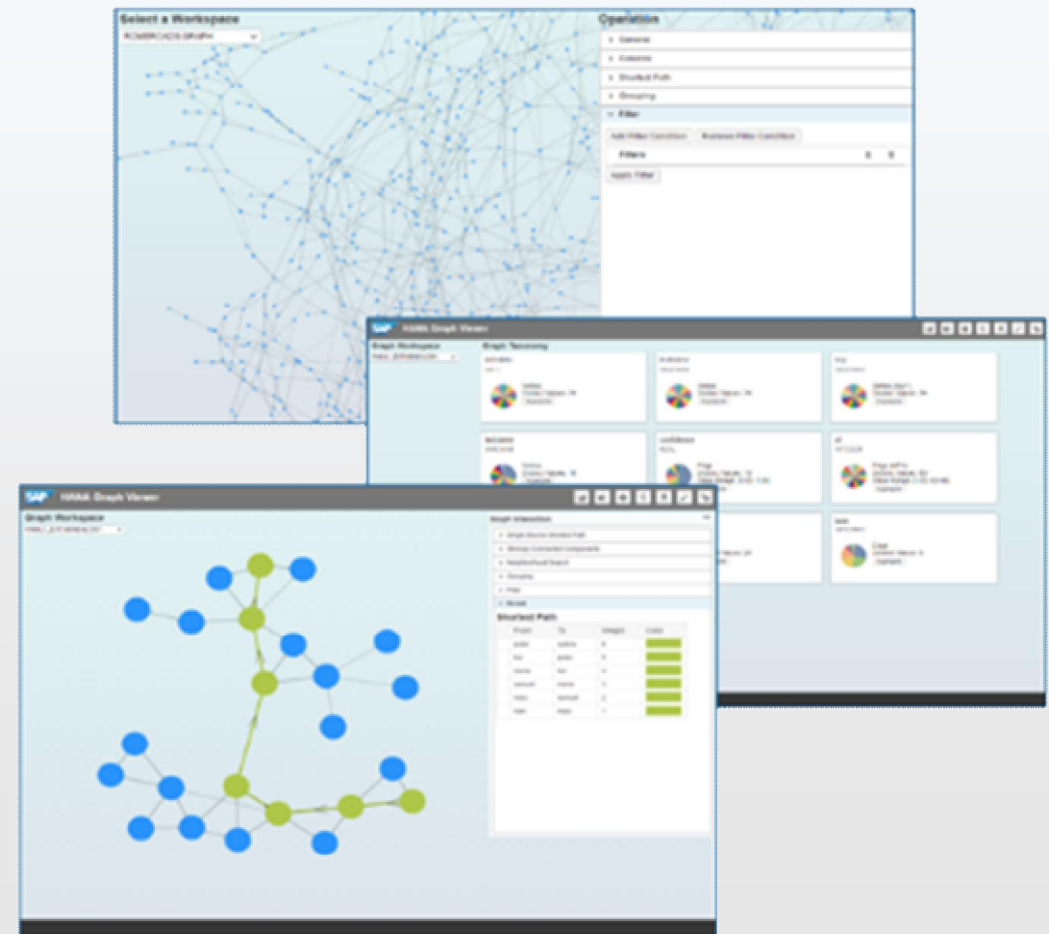


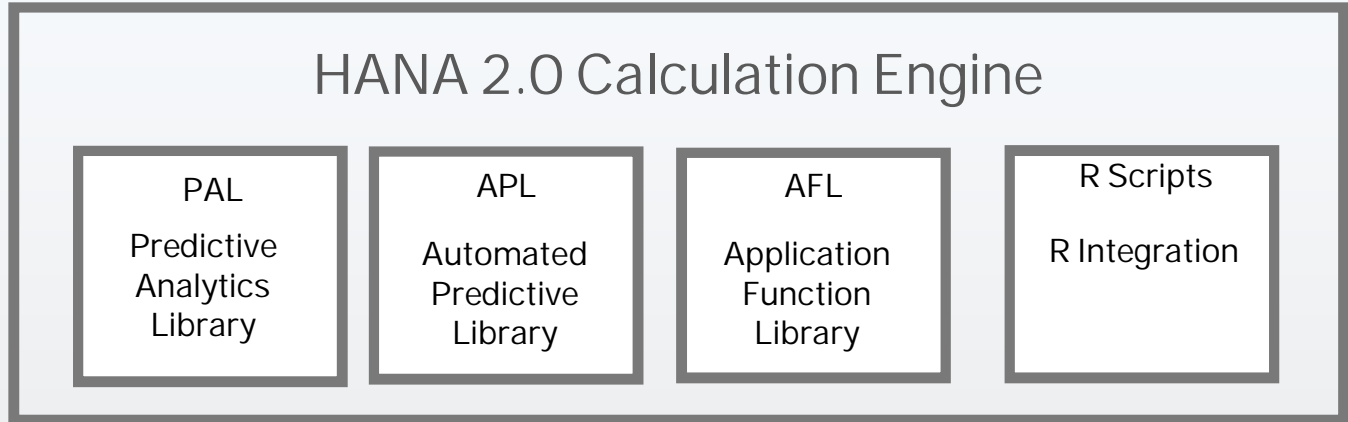
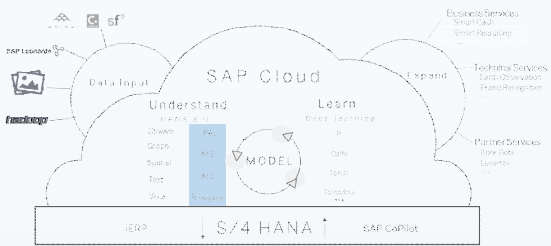
SAP HANA- Graph Engine



Application Areas

- Social networks
- Knowledge graphs
- Business networks (e.g. SAP Ariba)
- Recommendation systems
- Org and project structures (hierarchies / dags)

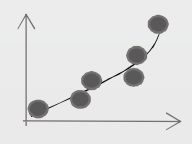




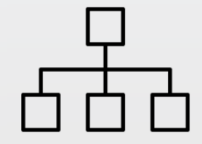
KNN Classification



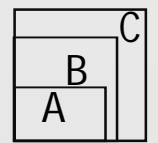
K-means



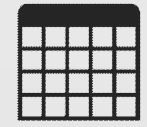
Regression



C4.5 Decision tree



ABC Classification



Weighted score tables



Associate analysis:
Market Based

SAP HANA In-Memory Predictive Analytics

PAL algorithms in SAP HANA 2

Classification Analysis

- CART
- C4.5 Decision Tree Analysis
- CHAID Decision Tree Analysis
- K Nearest Neighbour
- Logistic Regression Elastic Net
- Back-Propagation (Neural Network)
- Naïve Bayes
- Support Vector Machine
- Random Forests
- **Gradient Boosting Decision Tree***
- **Linear Discriminant Analysis (LDA)***
- Confusion Matrix
- Area Under Curve (AUC)
- Parameter Selection / Model Evaluation

Regression

- Multiple Linear Regression Elastic Net
- Polynomial, Exponential, Bi-Variate Geometric, Bi-Variate Logarithmic Regression
- **Generalized Linear Model***
- **Cox Proportional Hazards Model***

Cluster Analysis

- ABC Classification
- DBSCAN
- K-Means
- K-Medoid Clustering
- K-Medians
- Kohonen Self Organized Maps
- Agglomerate Hierarchical
- Affinity Propagation
- Latent Dirichlet Allocation (LDA)
- Gaussian Mixture Model (GMM)
- Cluster Assignment

Time Series Analysis

- Single/Double/ Brown /Triple Exp.Smoothing
- Forecast Smoothing
- Auto - ARIMA/ Seasonal ARIMA
- Croston Method
- Forecast Accuracy Measure
- Linear Regression with Damped Trend and Seasonal Adjust
- Test for White Noise, Trend, Seasonality
- **Fast Fourier Transform (FFT)***
- **Correlation Function***

Association Analysis

- Apriori
- Apriori Lite
- FP-Growth
- KORD – Top K Rule Discovery
- **Sequential Pattern Mining***

Probability Distribution

- Distribution Fit/ Weibull analysis
- Cumulative Distribution Function
- Quantile Function
- Kaplan-Meier Survival Analysis

Outlier Detection

- Inter-Quartile Range Test (Tukey's Test)
- Variance Test
- Anomaly Detection
- Grubbs Outlier Test

Link Prediction

- Common Neighbors
- Jaccard's Coefficient
- Adamic/Adar
- Katzβ

Statistic Functions

- Mean, Median, Variance, Standard Deviation, Kurtosis, Skewness
- Covariance Matrix
- Pearson Correlations Matrix
- Chi-squared Tests:
 - Test of Quality of Fit
 - Test of Independence
- F-test (variance equal test)

Data Summary

Data Preparation

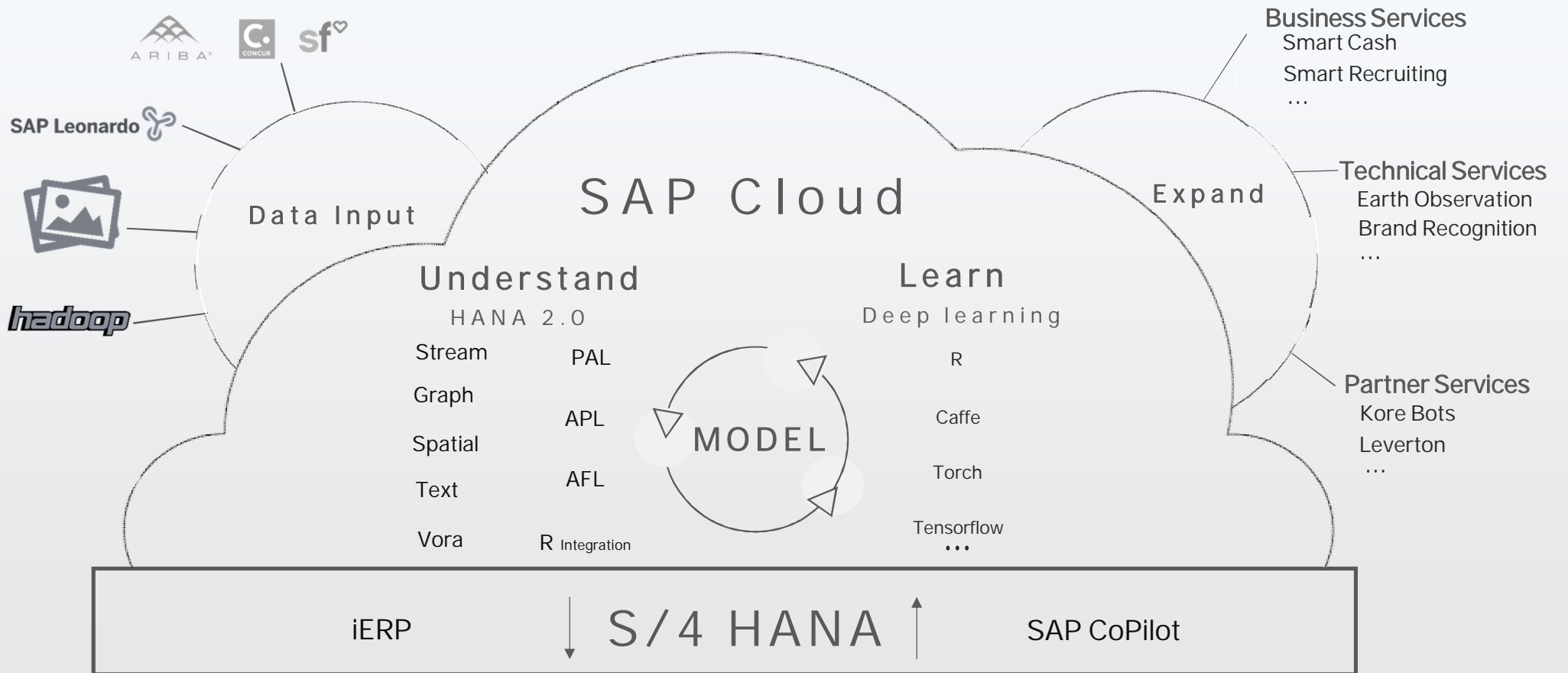
- Sampling
- Binning
- Scaling
- Partitioning
- Principal Component Analysis (PCA) / PCA Projection

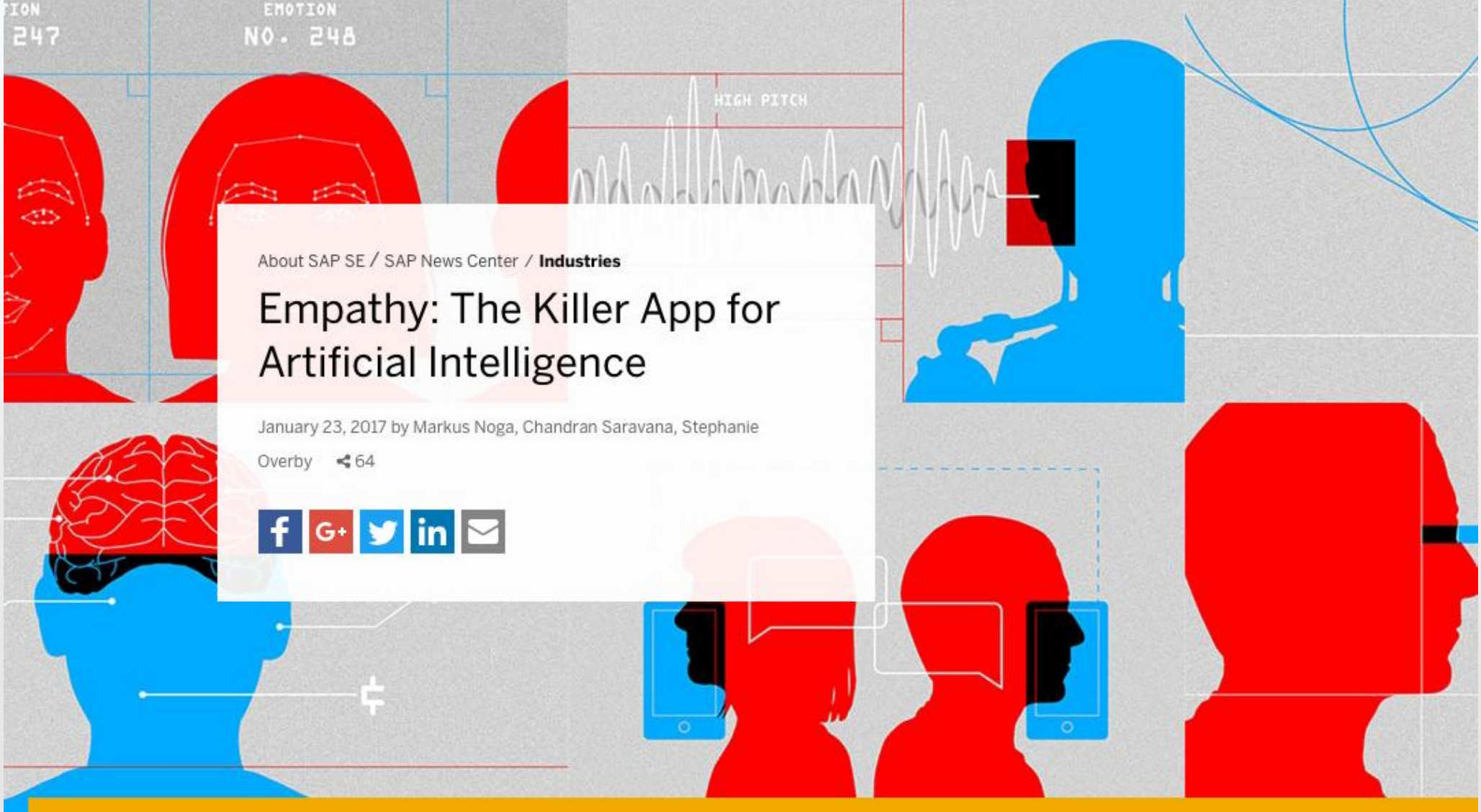
Other

- Weighted Scores Table
- Substitute Missing Values

* New in SAP HANA 2 SPS0

SAP ML Framework





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Empathy: The Killer App for Artificial Intelligence

January 23, 2017 by Markus Noga, Chandran Saravana, Stephanie

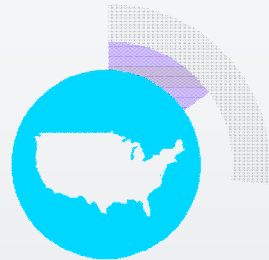
Overby ↵ 64



AI Can Double Economies' Size

Number of years for the economy to double in size
(a full circle represents 100 years)

United States



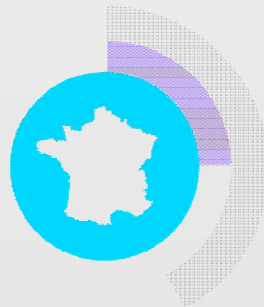
United Kingdom



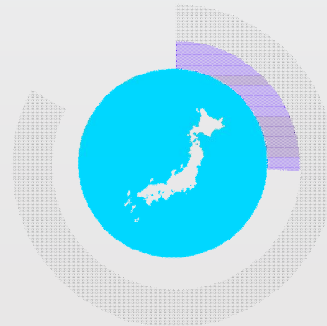
Germany



France



Japan



Italy



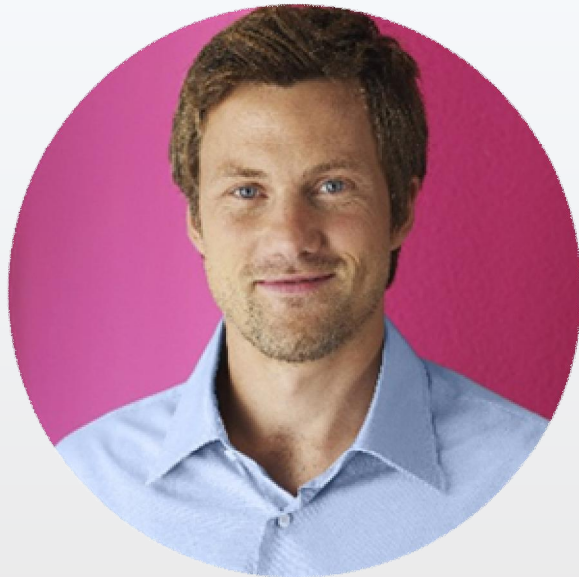
Baseline AI steady state

YOU MUST START THE ML
CONVERSATION



Inspire

Digital Twin



Big Data



IoT



Customer Behaviour



Talk with the Consumer

SAP Enterprise Bots

Conversational User Interfaces for SAP Applications



Inspire the Consumer
(Recommendations Engine)

Products

Product...

Tabasco Habanero Pepper Sauce 60ml

Condiment >

Dev. Tabasco Pepper 57ml, Green

Condiment >

Dev. Tabasco Pepper 57ml, Red

Condiment >

Shopping time

Morning



During the week



Shopping cart



No data

€0.99

INSTEAD OF €1.19

German best quality

€0.99

INSTEAD OF €1.2

Fruit / Vegetables

€1.72

INSTEAD OF €1.99

SWM Birkland Cream

€1.71

INSTEAD OF €1.99

Bin Toast three-grain

€0.49

INSTEAD OF €0.83

GEILD. FATRACK



Fulfill

“Everything will be done through models and algorithms. That’s the message.”

Hasso Platner SAPPHIRE 2014

i ERP (intelligent ERP)

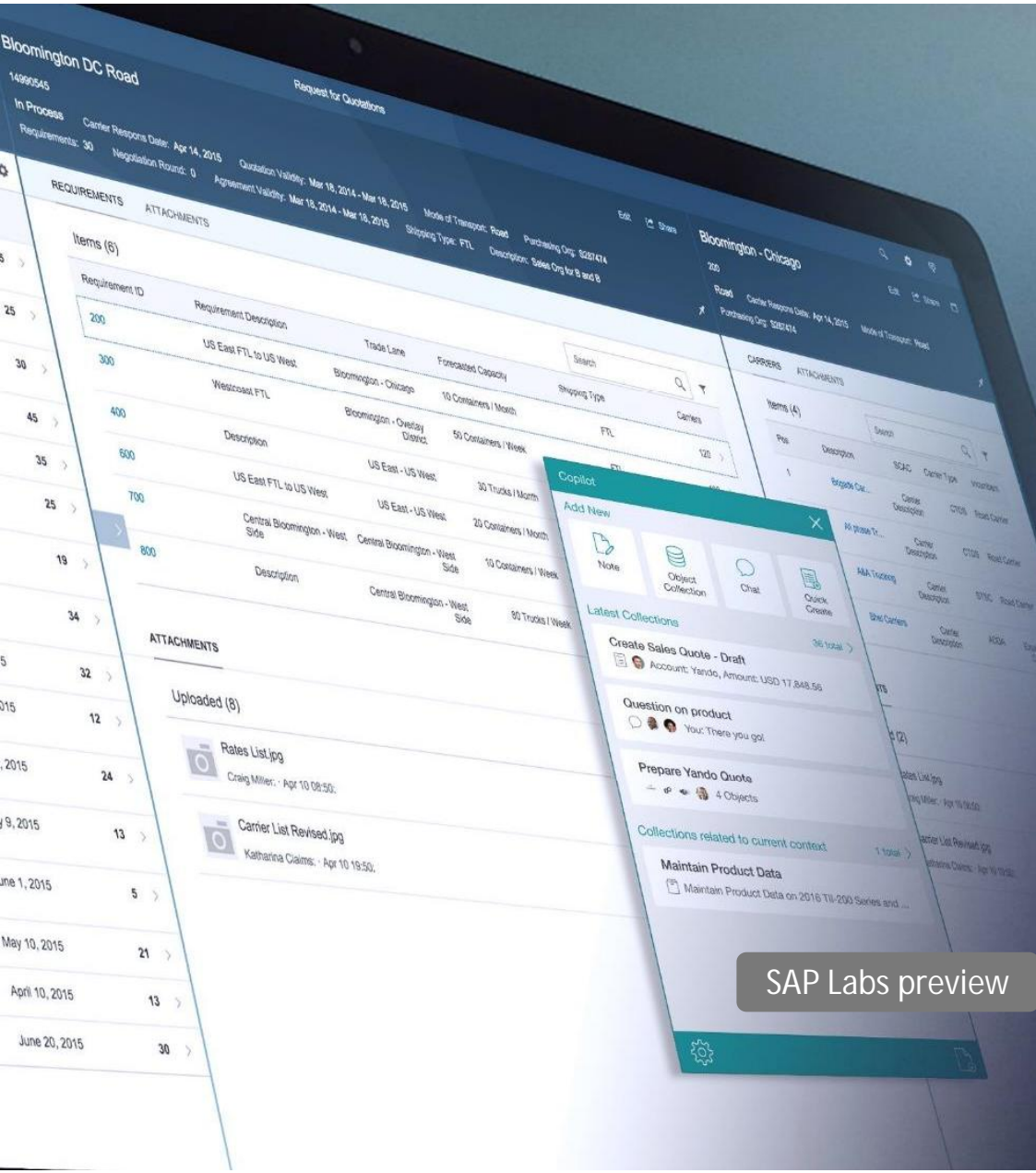
The background of the entire image is a silhouette of a man on the left and a robot on the right, both facing each other as if in conversation. They are set against a bright, hazy sunset sky with a low sun on the horizon. The man's silhouette is dark, while the robot's silhouette is a reddish-brown color. The robot has a boxy head with a single antenna, a segmented neck, and a cylindrical body with a hose-like structure at the bottom. The man's silhouette is a simple dark outline of a person's head and shoulders.

About SAP SE / SAP News Center / **Mobile**

The Human Touch: SAP Introduces a Digital Assistant for the Enterprise

October 14, 2016 by [Esther Blankenship](#) ↵ 362





SAP CoPilot

Empowers you, not just responds to you

- Digital Assistant for SAP Applications
- Conversational (Multi-Modal) UI
- Business Context Awareness
- Quick Actions
- Learns and Recommends

SAP Labs preview

Manage Products

My Products * basic

Editing Status: All Availability: Price Range: Category: Supplier:

Products (10)

Image	Product ID	Category	Sub-Category	Supplier	Availability
	Notebook Basic 15 HT-1000	Computer Systems	Notebooks	SAP	<input checked="" type="checkbox"/> In Stock
	Notebook Basic 17 HT-1001	Computer Systems	Notebooks	Becker Berlin	<input checked="" type="checkbox"/> In Stock
	Notebook Basic 18 HT-1002	Computer Systems	Notebooks	DelBont Industries	<input checked="" type="checkbox"/> In Stock
	Notebook Basic 19 HT-1003	Computer Systems	Notebooks	Talpa	<input checked="" type="checkbox"/> In Stock
	Flat Basic HT-1035	Computer Components	Flat Screen Monitors	Anav Ideon	<input checked="" type="checkbox"/> In Stock
	Laser Basic HT-1041	Printers & Scanners	Laser Printers	Compostela	<input checked="" type="checkbox"/> In Stock
	Fabric bag professional HT-1114	Computer Systems	Computer System Accessories	Anav Ideon	<input checked="" type="checkbox"/> In Stock



Supplier selection dropdown menu:

- JANEBOT
- MF Michael Falk** (Selected) D037537
- IG Ioannis Grammatikakis D022368
- IL Ingmar Lemke I811939
- TR Thomas Reiss D019093
- MS Martin Steiner I803970
- JW John Wandrocke I804074

Footer: 1 selected | Ok | Clear | Cancel



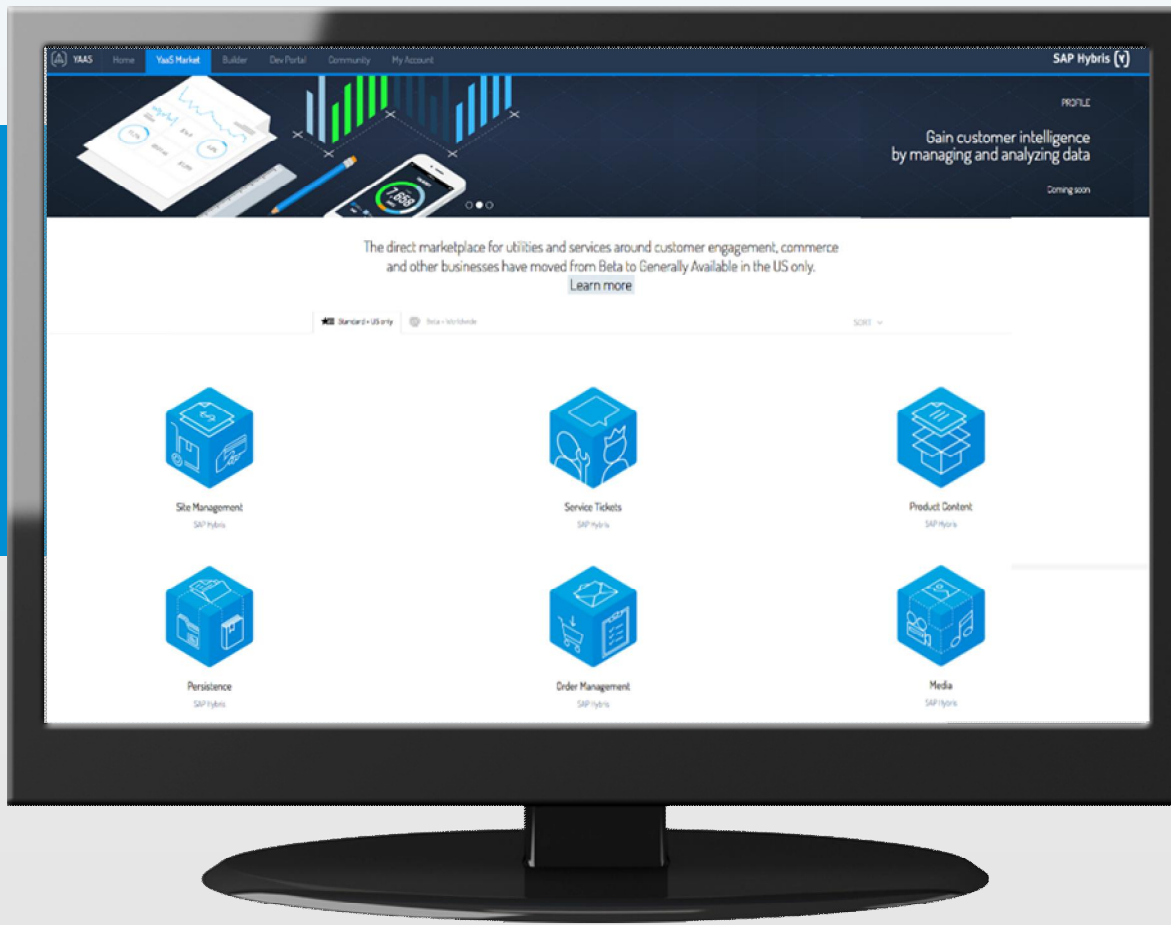
31,00 USD

API Economy

From Muscle Computing to

Consensus Computing

YaaS: The place to be



Leverage SAP Cloud application, database, and technical services for agile cloud apps delivery



Live

Live



Feel



Wear



Trust



Social



Return

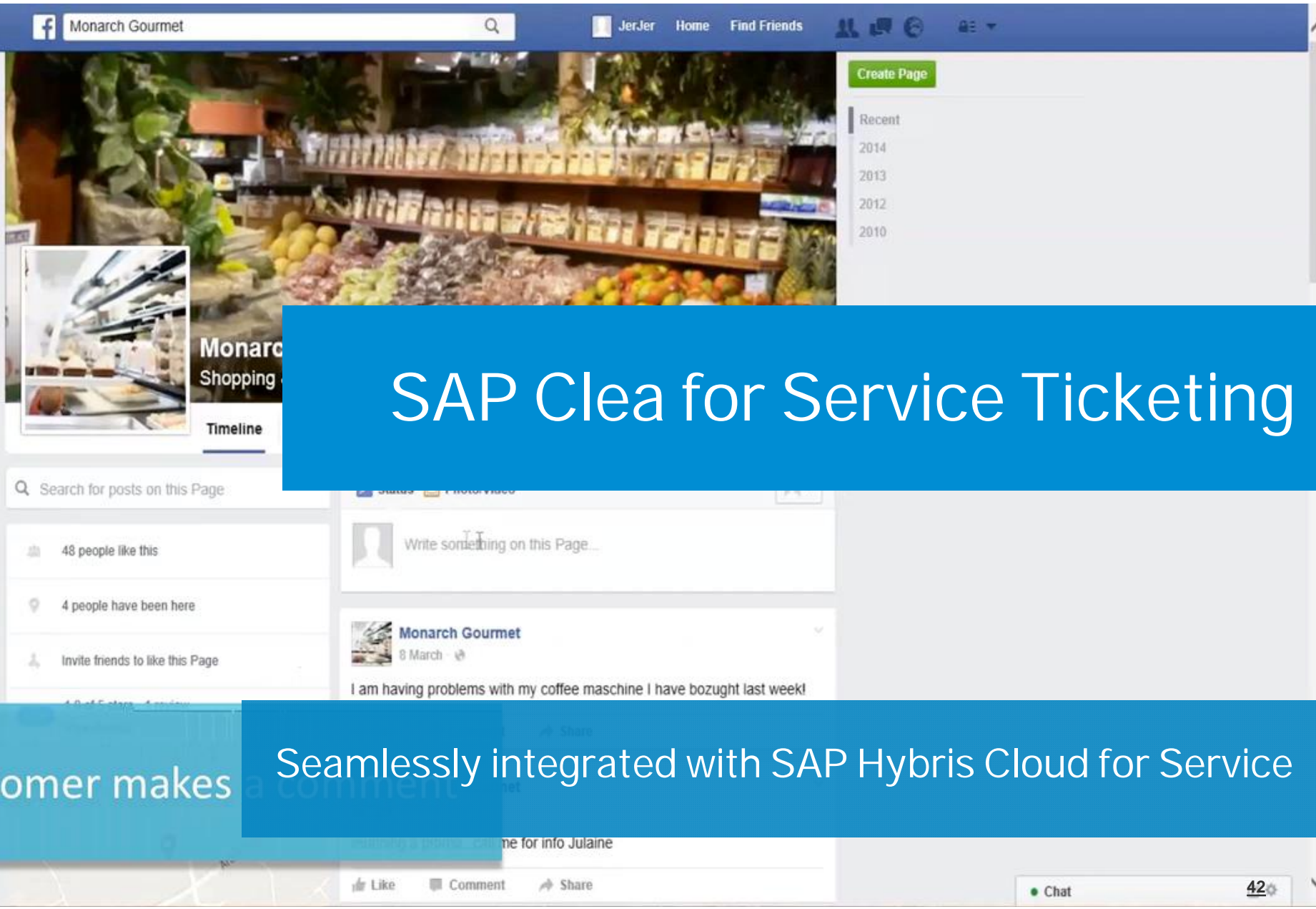


Loyalty



Reputation

Sentiment Analysis on Social Media



SAP Clea for Service Ticketing

When a customer makes

Seamlessly integrated with SAP Hybris Cloud for Service



Inspire



Fulfill



Live



Simplify Everything do Anything

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