

# SAP Leonardo **Machine Learning Foundation** infuse your apps with intelligence

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CUSTOMER

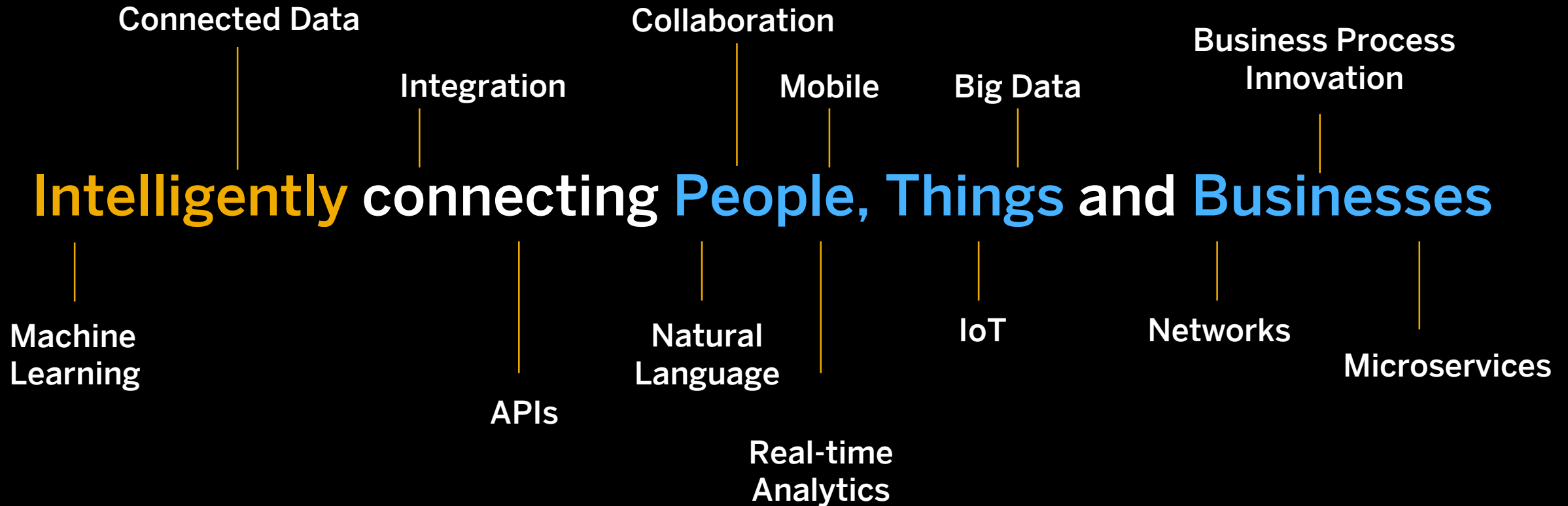
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# Digitization

Every company to become a software-driven company by

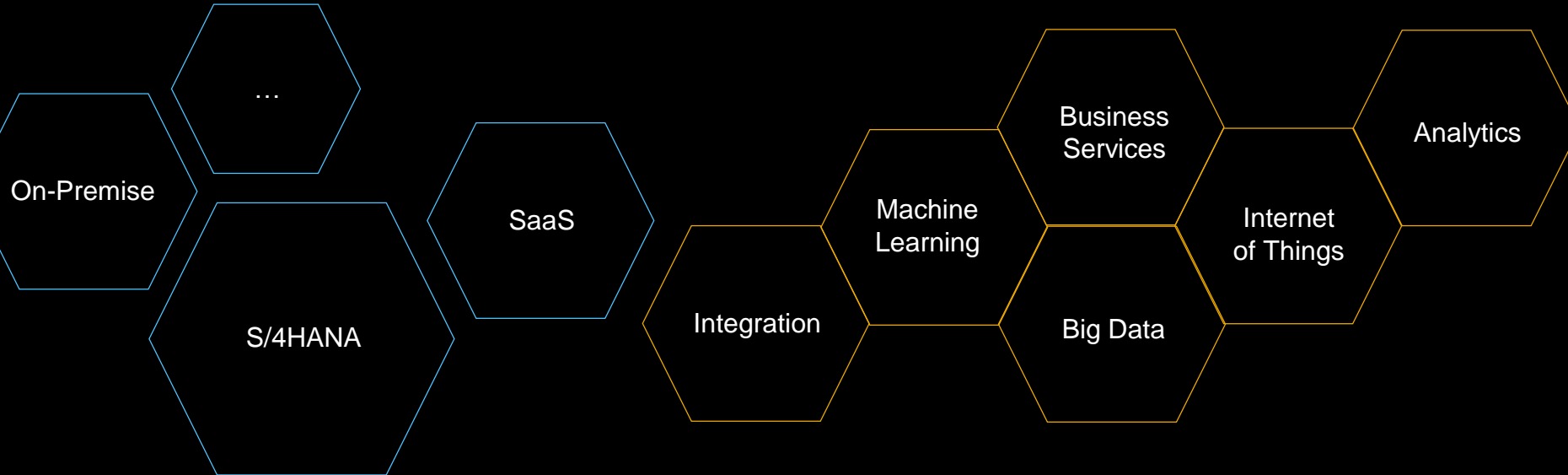


# SAP Cloud Platform

Development  
Tools / APIs

Operations  
Cockpit

Commerce  
Marketplace



CLOUD **FOUNDRY**

Open Platform – Flexible Runtimes – Microservices

Multi-Cloud  
Infrastructure

SAP Data Center



Microsoft Azure



Build



Extend



Integrate

# Software is getting smarter and becomes part of our daily life



Personal Assistants



Games



Self Driving Cars

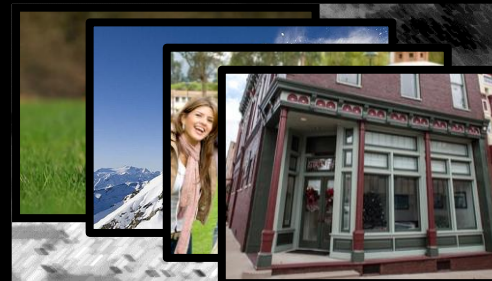


Image search

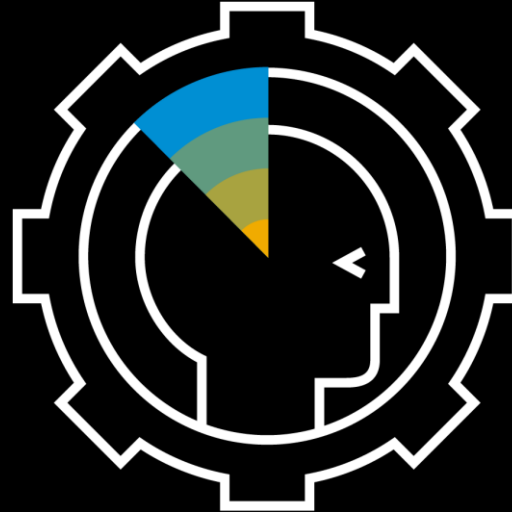
By 2020, the average person will have **more conversations with bots than with their spouse.**

Source: Gartner, Top Strategic Predictions for 2017 and Beyond: Surviving the Storm Winds of Digital Disruption

# Machine learning is the reality behind artificial intelligence

## What is machine learning?

- Computers learn from data without being explicitly programmed.
- Machines can see, read, listen, understand, and interact.



## Why now?

- Big Data (for example, business networks, cloud applications, the Internet of Things, and SAP S/4HANA)
- Massive improvements in hardware (graphics processing unit [GPU] and multicore)
- Deep learning algorithms

# Example: Computer vision is surpassing human abilities

Automated captioning

Performance on image DB "ImageNet"



A dog with ball in its mouth



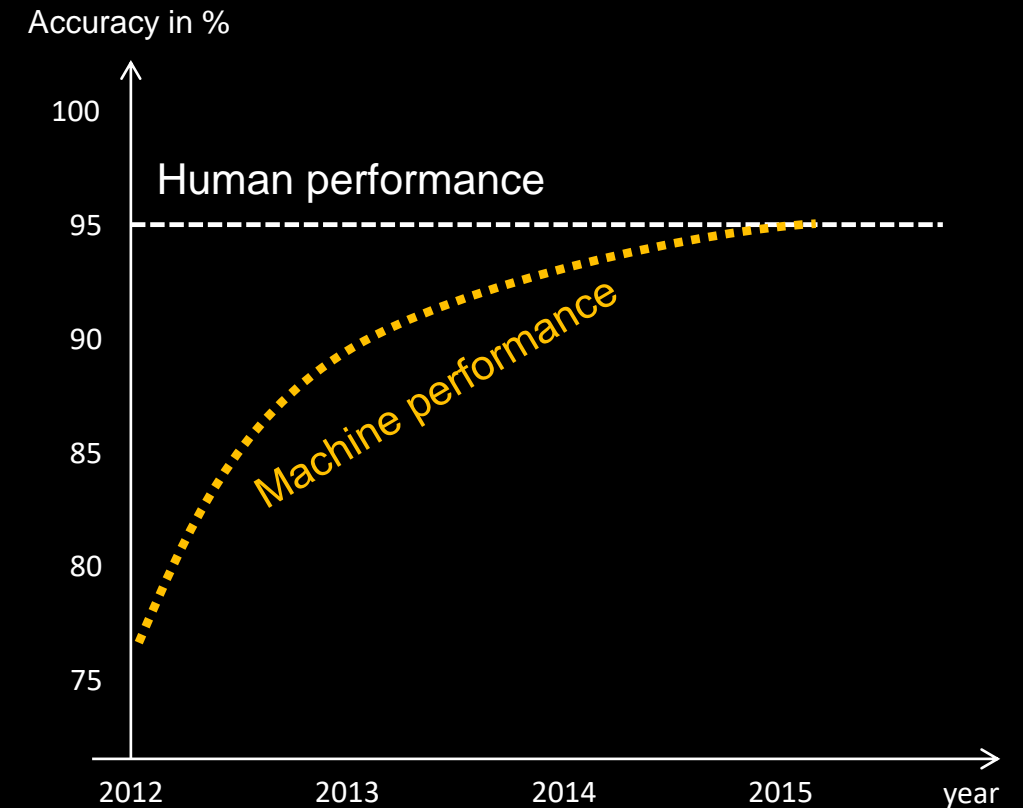
Group of seven people



Late 19<sup>th</sup>-century  
architecture



A skier is jumping over  
snow covered hill



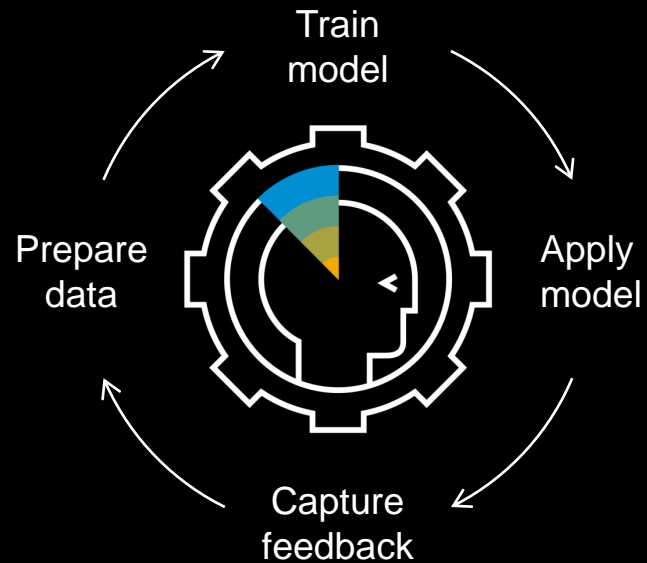
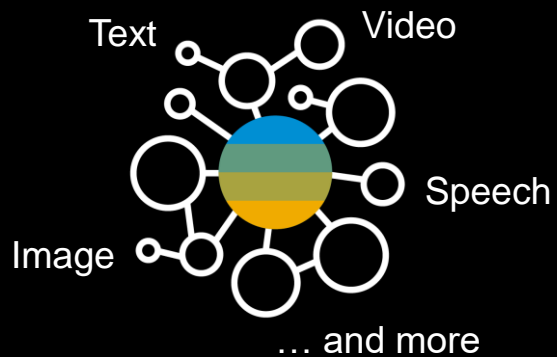
# How enterprise data is transformed into business value

From data to insights

Input

Machine learning

Output



Applications  
(such as cash application)



...and more

Services  
(such as invoice processing,  
profile matching)



# SAP's vision for enterprise machine learning

## SAP Leonardo Machine Learning

Create your own intelligent infrastructure

### Automate Knowledge Work



- Transformational **HR** services



- Lights out **finance** operations

SAP S/4HANA



- Self-driving customer **service**
- Conversational **sales** bots
- Customer **retention** insights

### Do the Impossible



- Image-based Ariba **commerce**
- Contextual Concur **travel** concierge



- Video-aware **marketing**
- Visual **store execution**



- Drone and satellite-based **asset management**



- Vision-enabled **manufacturing**
- Contextual **logistics**

SAP S/4HANA

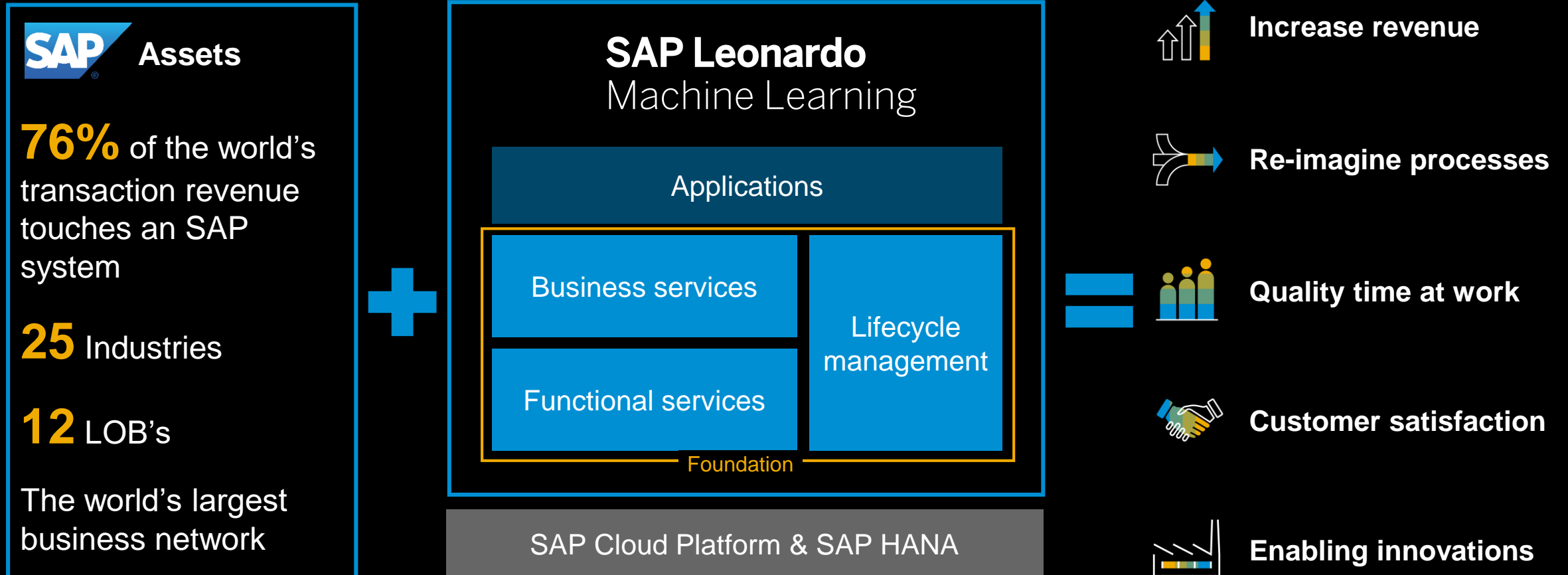
**based on SAP Cloud Platform and SAP HANA**

# Machine Learning is embedded across the SAP portfolio





	Available now	Wave 2	Wave 3	
<b>Finance</b>	Cash Application	Accounts Payable	Predictive Accounting	...
<b>Marketing</b>	Brand Impact		Customer Behavior Segmentation	...
<b>Sales</b>	Customer Retention	Sales Forecasting	Profile Completeness	...
<b>Service</b>	CoPilot	Service Ticketing	Solution Recommender	...
<b>Human Resources</b>	Resume Matching	Learning Recommender	openSAP Translation	...
<b>Procurement</b>		Financial Advising	Goods & Services Classifier	...
<b>Supply Chain</b>		Forecasting (IBP)	Stock in Transit	...
<b>Platform</b>	Machine Learning Foundation		Model Training Infrastructure	...

# Build your intelligent enterprise now

SAP Leonardo makes machine learning incredibly simple



# SAP Leonardo Machine Learning Foundation: Functional Services portfolio

	 Tabular	 Image	 Text	 Audio/ Video
<b>General availability</b>	<ul style="list-style-type: none"> <li>Time series change point detection</li> <li>Time series forecasting (AA algorithm)</li> <li>Clustering</li> <li>Key influencer analysis</li> <li>Outlier detection</li> <li>Recommendation</li> <li>What-if analysis</li> </ul>	<ul style="list-style-type: none"> <li>Image classification</li> <li>Image feature extraction</li> <li>Earth observation analysis</li> </ul>	<ul style="list-style-type: none"> <li>Topic detection/keyword extraction</li> </ul>	
<b>Alpha</b>	<ul style="list-style-type: none"> <li>Time series forecasting (R algorithms)</li> <li>Similarity scoring</li> </ul>	<ul style="list-style-type: none"> <li>Product image classification</li> </ul>	<ul style="list-style-type: none"> <li>Machine translation</li> <li>Document feature extraction</li> <li>Language detection</li> <li>Product text classification</li> </ul>	
<b>Road map</b>	<ul style="list-style-type: none"> <li>Time-to-failure forecasting</li> <li>Association rule learning</li> </ul>	<ul style="list-style-type: none"> <li>Image segmentation</li> <li>Face detection</li> <li>Document optical character recognition</li> <li>Image text extraction</li> <li>Image NER/extraction</li> <li>Apparel detection</li> </ul>	<ul style="list-style-type: none"> <li>Sentiment analysis</li> <li>Named entity recognition</li> <li>Text classification</li> <li>Hate speech detection</li> <li>File-to-text conversion</li> </ul>	<ul style="list-style-type: none"> <li>Speech-to-text</li> <li>Text-to-speech</li> <li>Voice recognition (speaker identification)</li> <li>Video object segmentation</li> <li>Video classification</li> <li>Video human action recognition</li> </ul>

# Business service: SAP Cash Application

Next-generation intelligent invoice-matching powered by machine-learning



SAP Cash Application intelligently learns matching criteria from your history and automatically clears payments.

Improves days sales outstanding

Integrated with SAP S/4HANA for reduced TCO and time to value

Allows shared services to scale as the business grows

Empowers finance to focus on strategic tasks and service quality

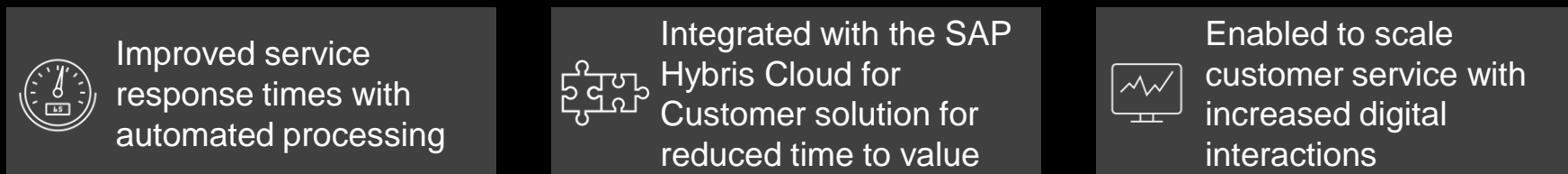
# Business service: Service Ticketing

Enabling **SAP Service Ticketing** to accelerate customer service in omni-channel scenarios

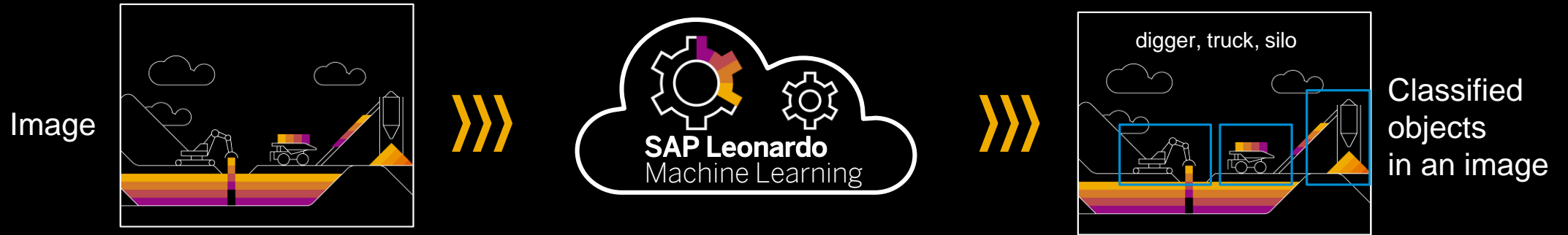


SAP Service Ticketing application processes customer queries automatically to deliver best-in-class customer service.

via **REST API**, the functionality can be integrated in any application



# Functional service: Image classification



Detects objects in an image and classifies them into a fixed set of categories.

via REST API, the functionality can be integrated in any application



Recognize patterns and unlock new insights from images



Exploit knowledge from external sources e.g. images on social media



Improve business processes such as visual quality inspection

# Functional service: Topic detection



Detects topics in a document and provides scores for each topic  
Extracts keywords describing each topic

via REST API, the functionality can be integrated in any application



Unlock insights from  
natural language text



Understand what  
customers are talking  
about you on the web



Improve search and  
organization of text  
contents



# Links and further information



## Websites

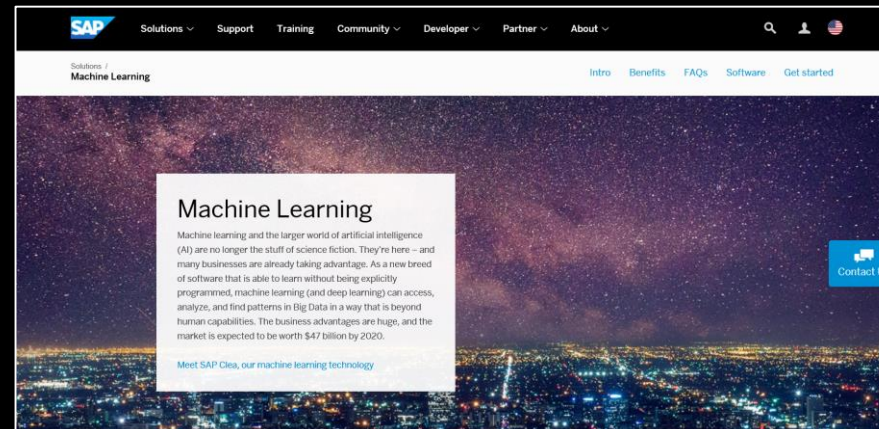
→ For more information check [cloudplatform.sap.com](https://cloudplatform.sap.com) or [sap.com/ml](https://sap.com/ml)

## Education

→ Participate in the openSAP course [Enterprise Machine Learning in a Nutshell](#) (overview course)

## Early adoption and co-innovation

→ Be an early adopter and co-innovate with us for next-wave cases



# Thank you.

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