



Build the Intelligent Enterprise with **SAP Leonardo Machine Learning**

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CUSTOMER

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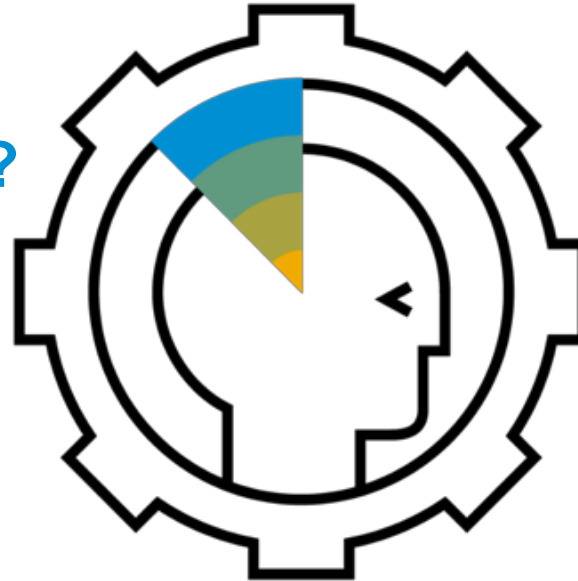
For all recent and planned innovations, potential data protection and privacy features include simplified deletion of personal data, reporting of personal data to an identified data subject, restricted access to personal data, masking of personal data, read access logging to special categories of personal data, change logging of personal data, and consent management mechanisms.

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)

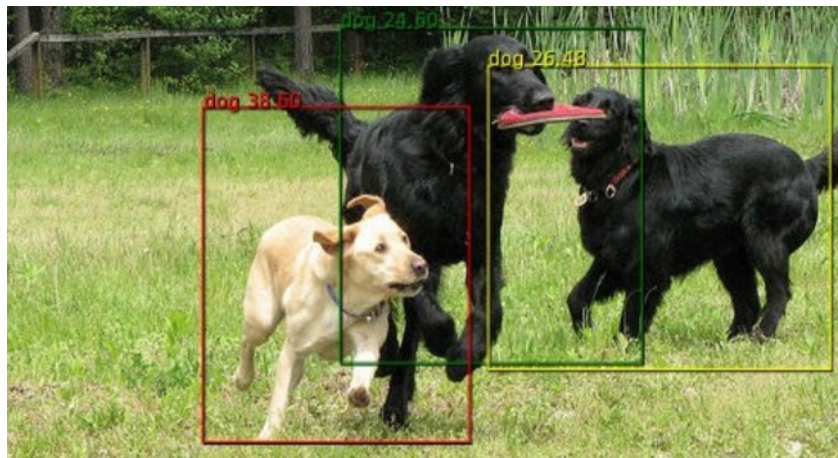
Deep learning algorithms

Technology trends: Computer vision

Computer vision is surpassing human abilities



Water
Travel
No person
Sea
Landscape

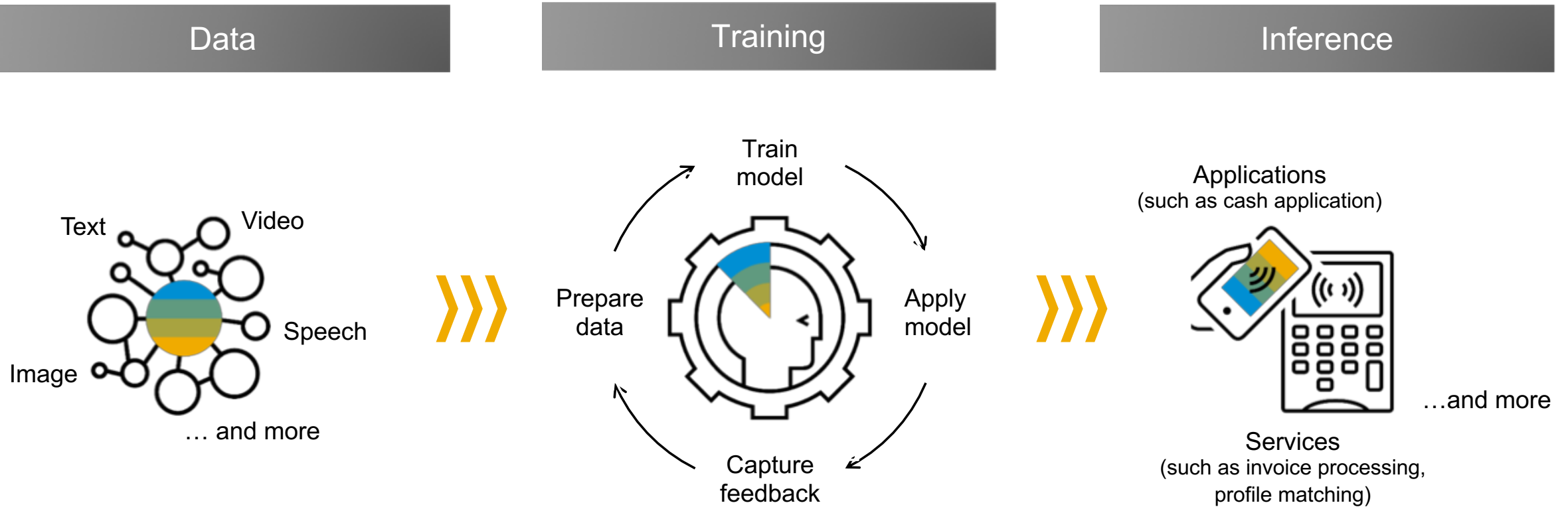


A skier is jumping
over snow
covered hill

Sources: LeCun: The unreasonable effectiveness of deep learning, Zeiler: Visualizing and Understanding Convolutional Networks, <http://www.clarifai.com/>, <http://imageannotator.cs.tau.ac.il/>

Transform enterprise data into business value

From data to insights



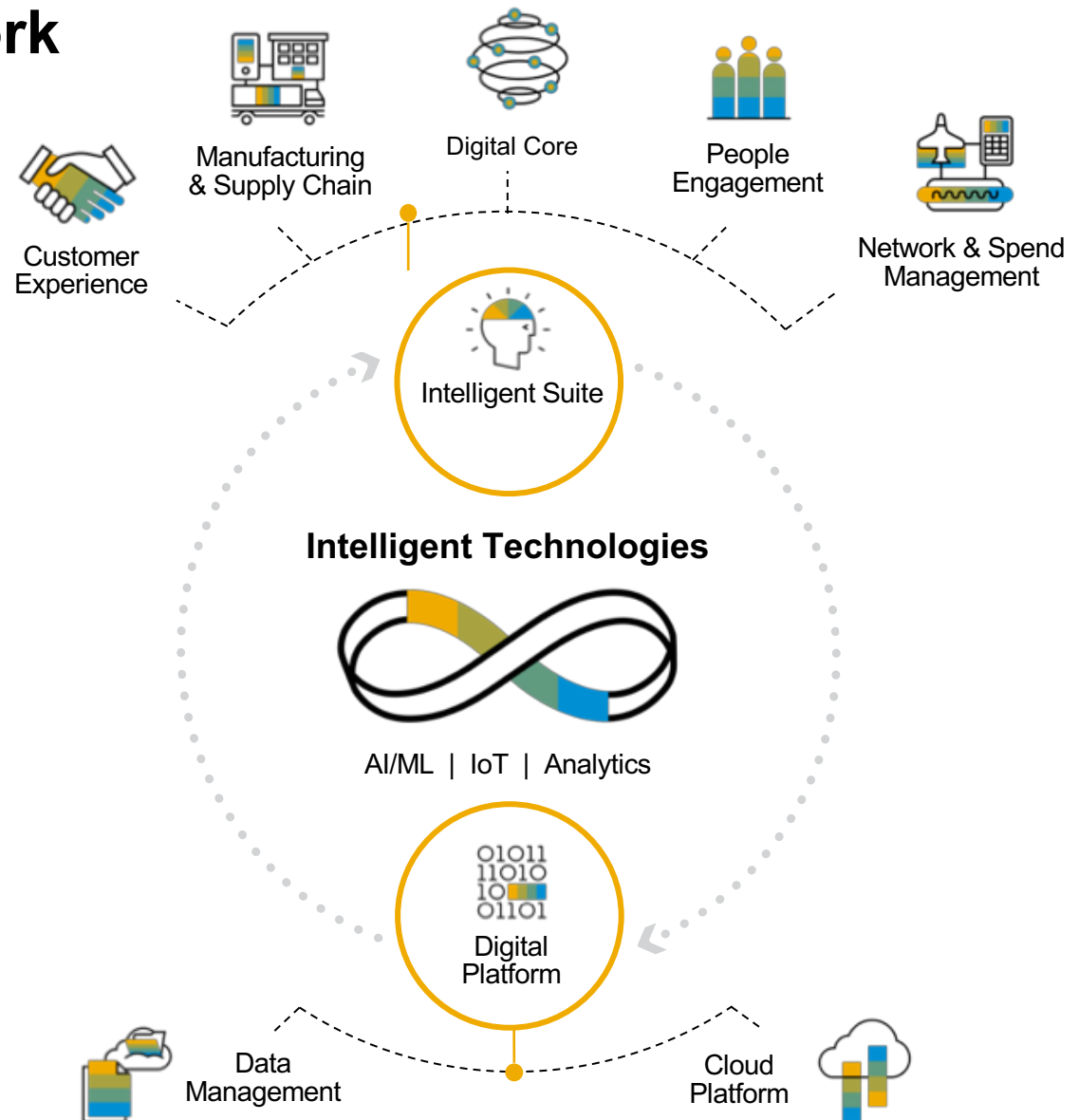
The Intelligent Enterprise Framework

The Intelligent Enterprise features 3 key components:

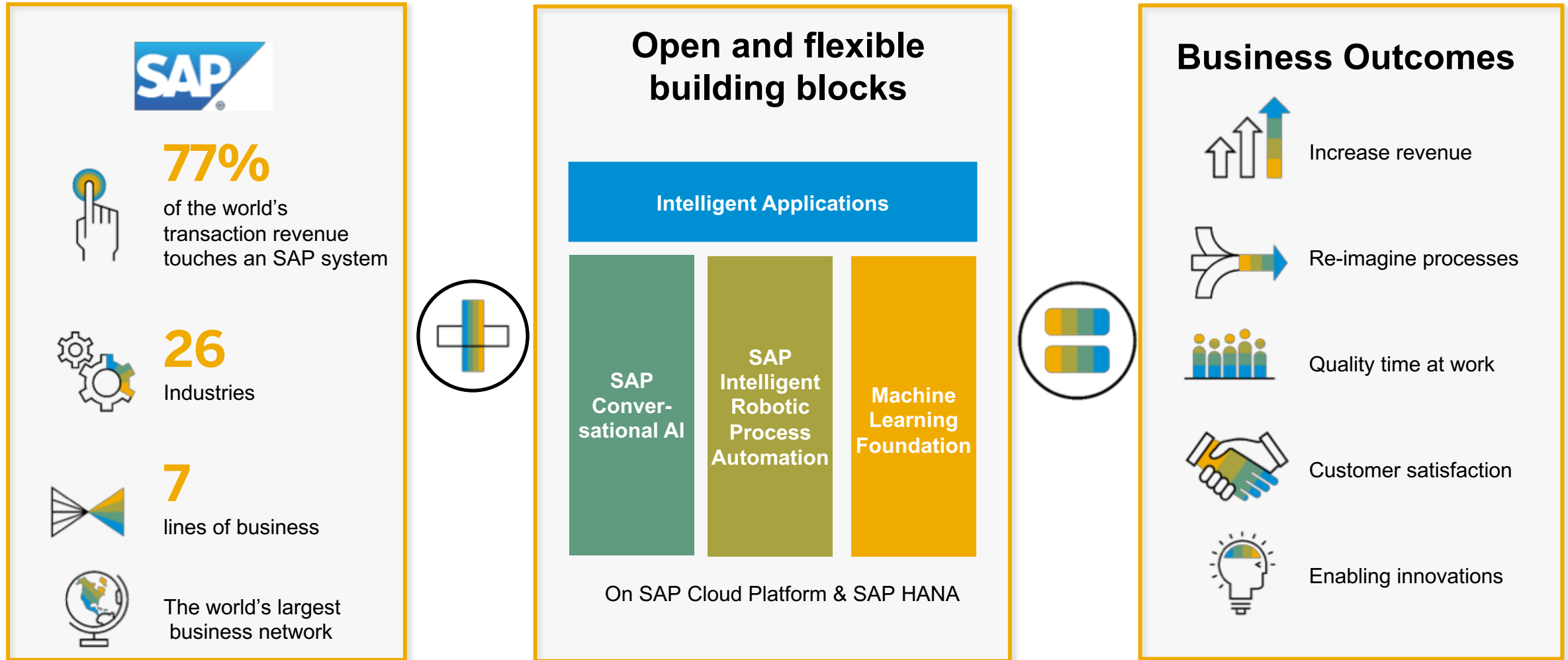
1 Intelligent Suite

2 Intelligent Technologies

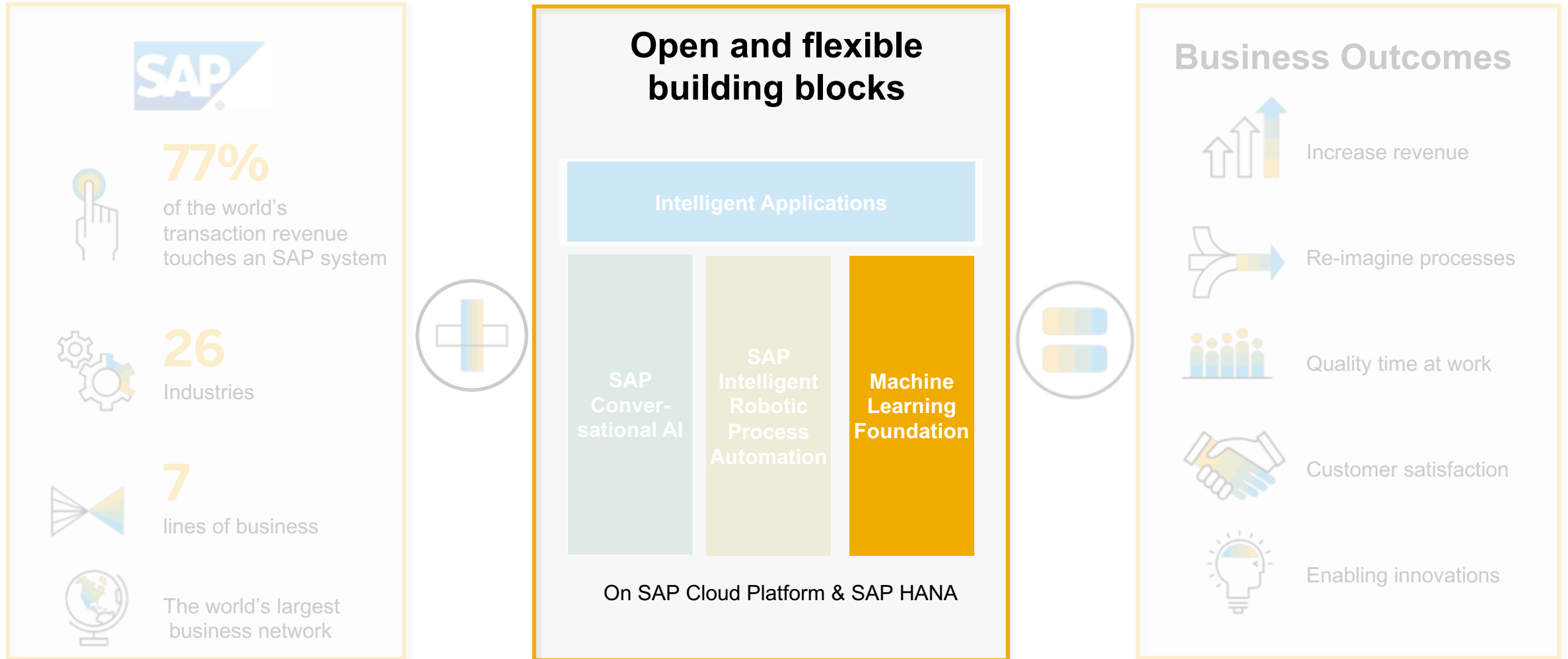
3 Digital Platform



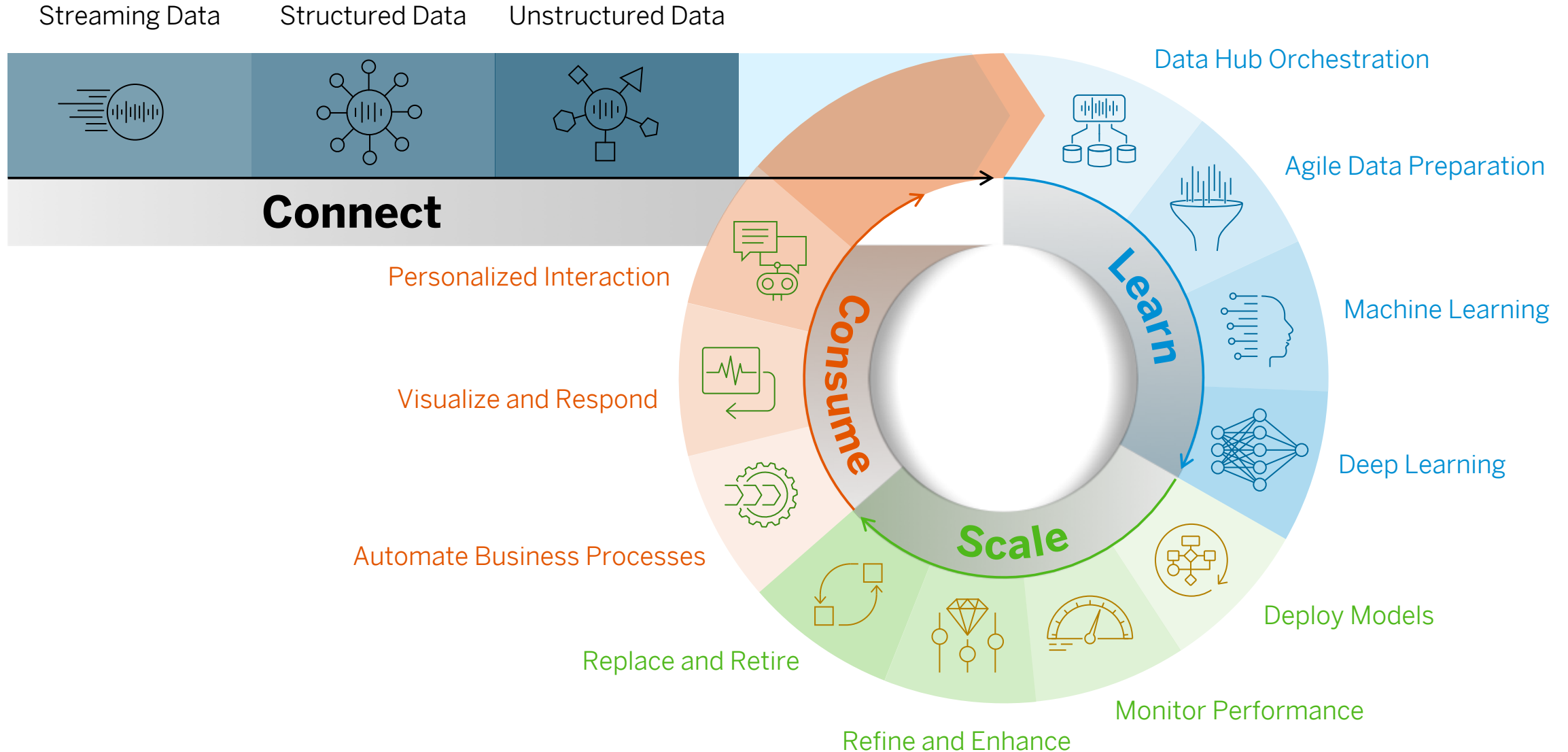
How SAP Leonardo ML helps to deliver the Intelligent Enterprise



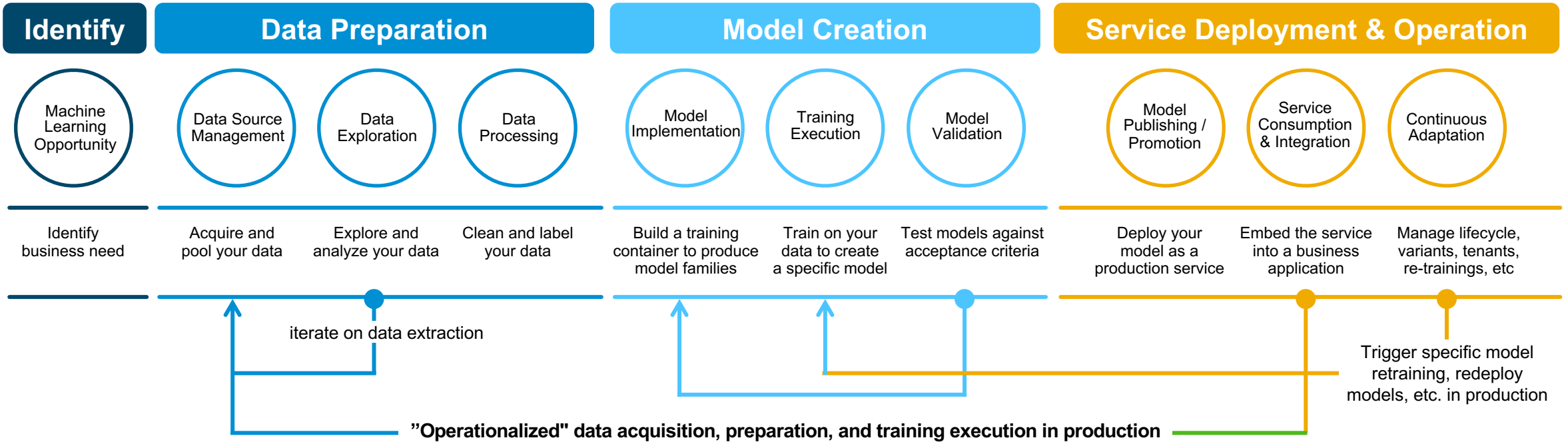
How SAP Leonardo ML helps to deliver the Intelligent Enterprise



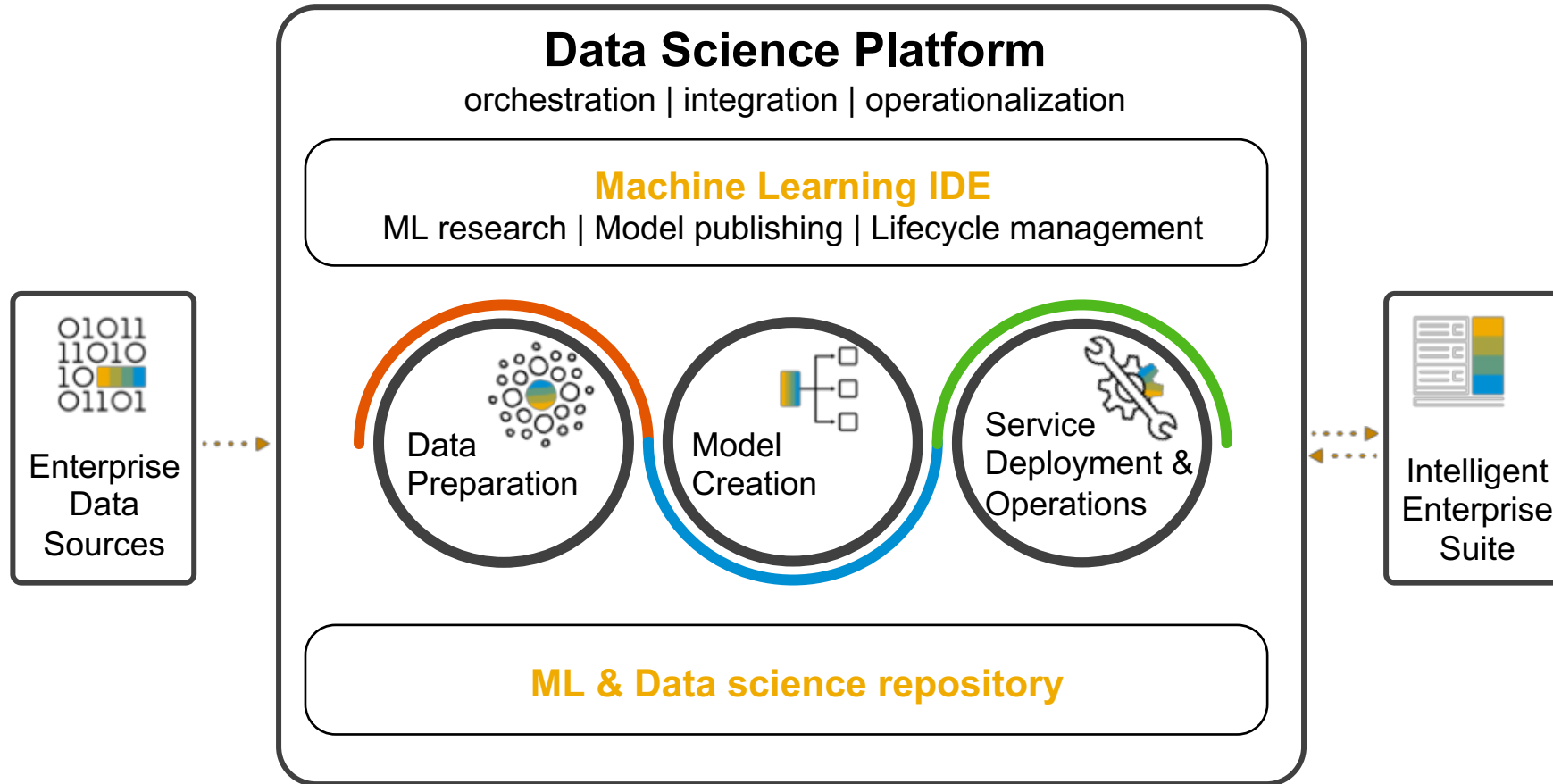
The Machine Learning Assembly Line



Data Science & Machine Learning Lifecycle



Data Science Platform Overview



The foundation of the intelligent enterprise.

- Supporting the entire lifecycle of self-learning software.
- Enabling data scientists and developers to tightly integrate with SAP data and processes
- All Machine Learning technologies.
- Scalable and secure cloud-based platform.

Moving Towards a Unified Data Science Platform



SAP Data Hub

Data sharing, pipelining, and orchestration.
Including data preparation and cleaning.



SAP Predictive Analytics

Operationalization and automation



SAP Leonardo ML Foundation

Deep Learning (text, image, video, audio)



SAP HANA ML

In-database Machine Learning



Open Source Languages and Libraries

R, Python, Sci-kit, Tensorflow

One integrated offering
One data science front end
Full lifecycle management
Integrated with SAP

Making the Data Scientist carefree

Use What You Love

- Use Jupyter Notebooks or GitHub code to get the job done
- Use the most popular Open Source Languages like R and Python
- Use a comprehensive graphic pipeline editor and leverage any of SAP's extensive ML services and libraries

Deploy with Ease

- Hand your models over for rapid and reliable deployment
- A unified environment for data science and IT to Collaborate
- Version control for rapid root cause analysis

Set It and Forget It

- Deployed models retrain automatically
- Debriefing tells you when there is a problem
- Only get involved when automatic retraining fails, and get on with your life

Use cases for **Enterprise** Machine Learning



Product and Spare Part Identification



Product Classification



Detection and reading of labels



Analysis of legal documents



Visual identity checks



Master Data Matching

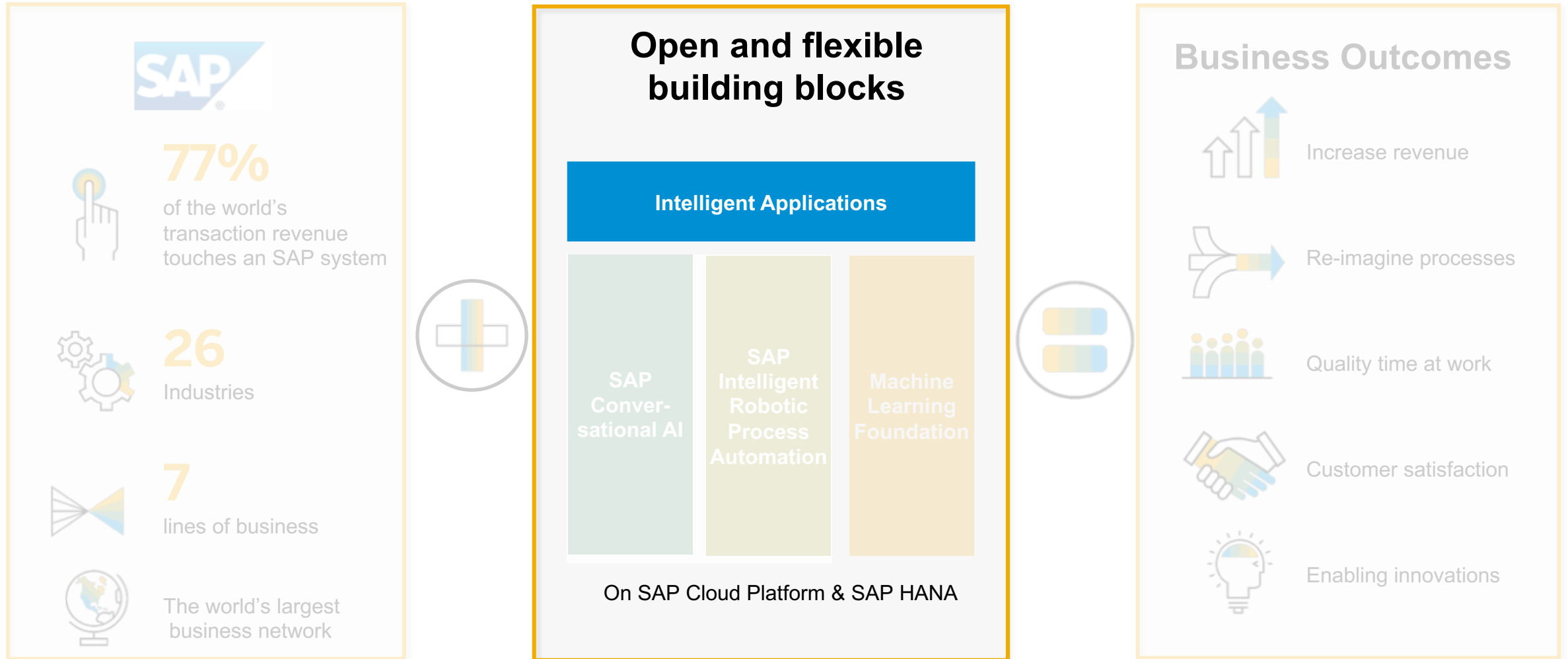


Optimize transport document processing



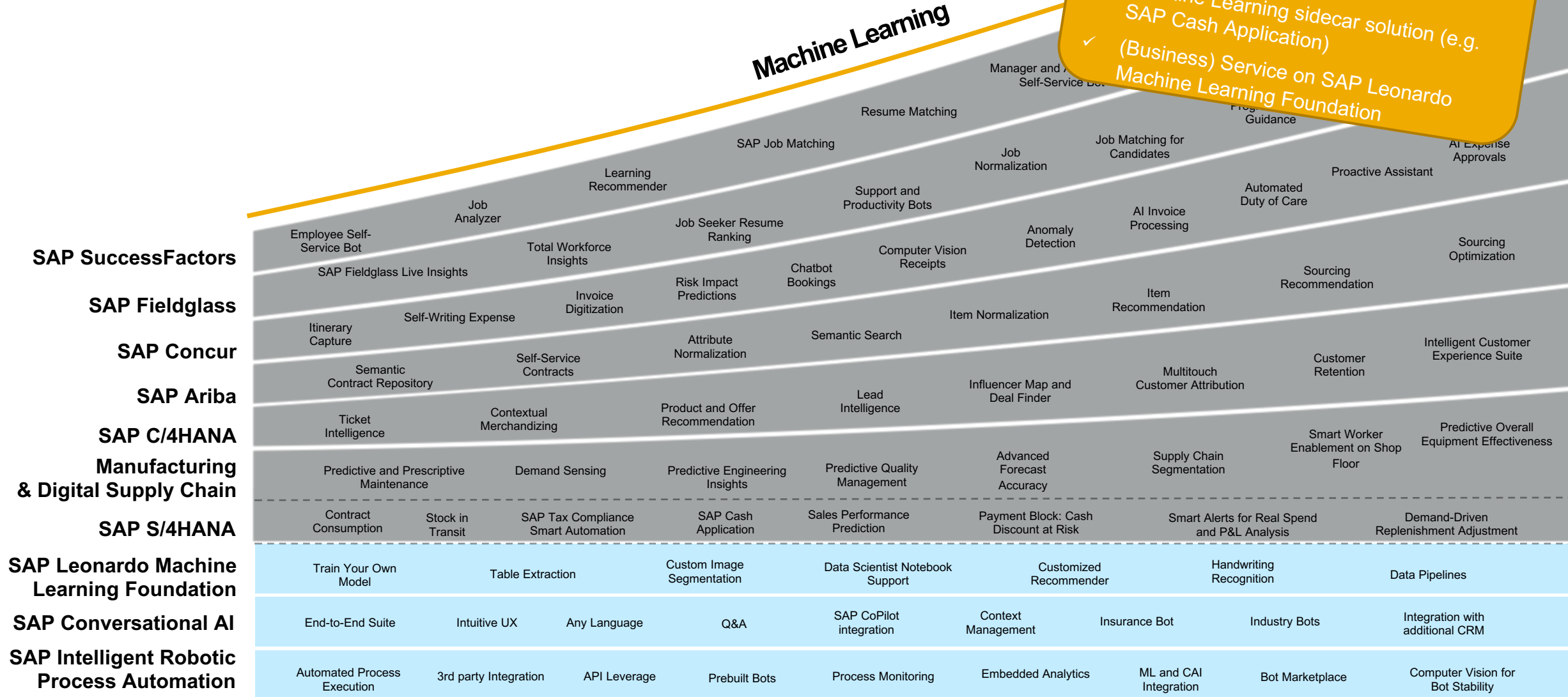
Identification of changes in documents

How SAP Leonardo ML helps to deliver the Intelligent Enterprise



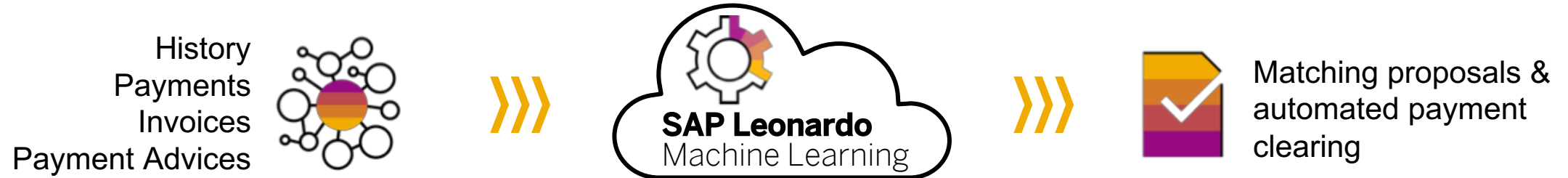
Build the Intelligent Enterprise

Machine Learning Roadmap Excerpt



Example: SAP Cash Application

Intelligent receivables automation powered by SAP Leonardo Machine Learning



SAP Cash Application intelligently learns matching criteria from your history, reads and processes payment advice documents, and automatically clears payments with minimal intervention.

Improves days sales outstanding

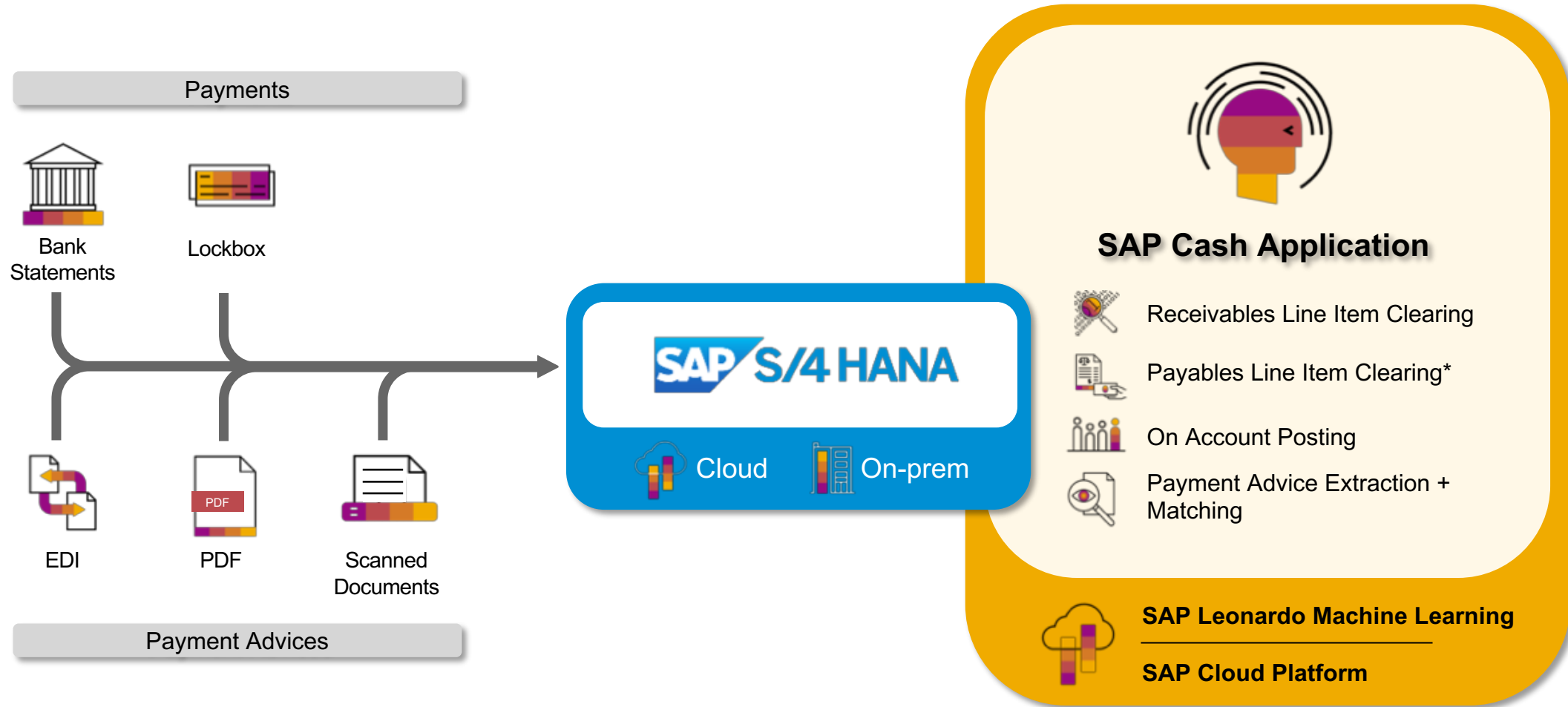
Seamlessly integrated with SAP S/4HANA

Allows shared services to scale as the business grows

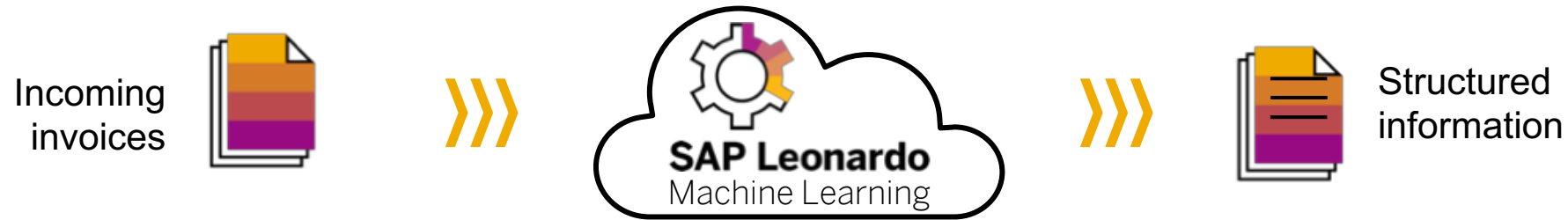
Reduce manual effort, focus on strategic tasks and service quality

Cash Application: Solution Overview

End-to-end process automation with SAP Leonardo Machine Learning



Example: Accounts Payable on SAP Leonardo Machine Learning



Accounts Payable is a bundle of machine learning services to automate your accounts payable process.

Invoice-to-Record (I2R) is a business service as part of Accounts Payable. The service intelligently reads invoices, extracts and categorizes fields, and reproduces them to post to an ERP – reducing time, effort, and errors associated with manual labor.

Vendor Matching and **Employee Matching** use the extracted information from I2R to match it against master data from a data base providing vendor ID and employee ID.

Example: SAP Service Ticketing

Automate classification and suggested responses of customer/internal support tickets

Categorize tickets

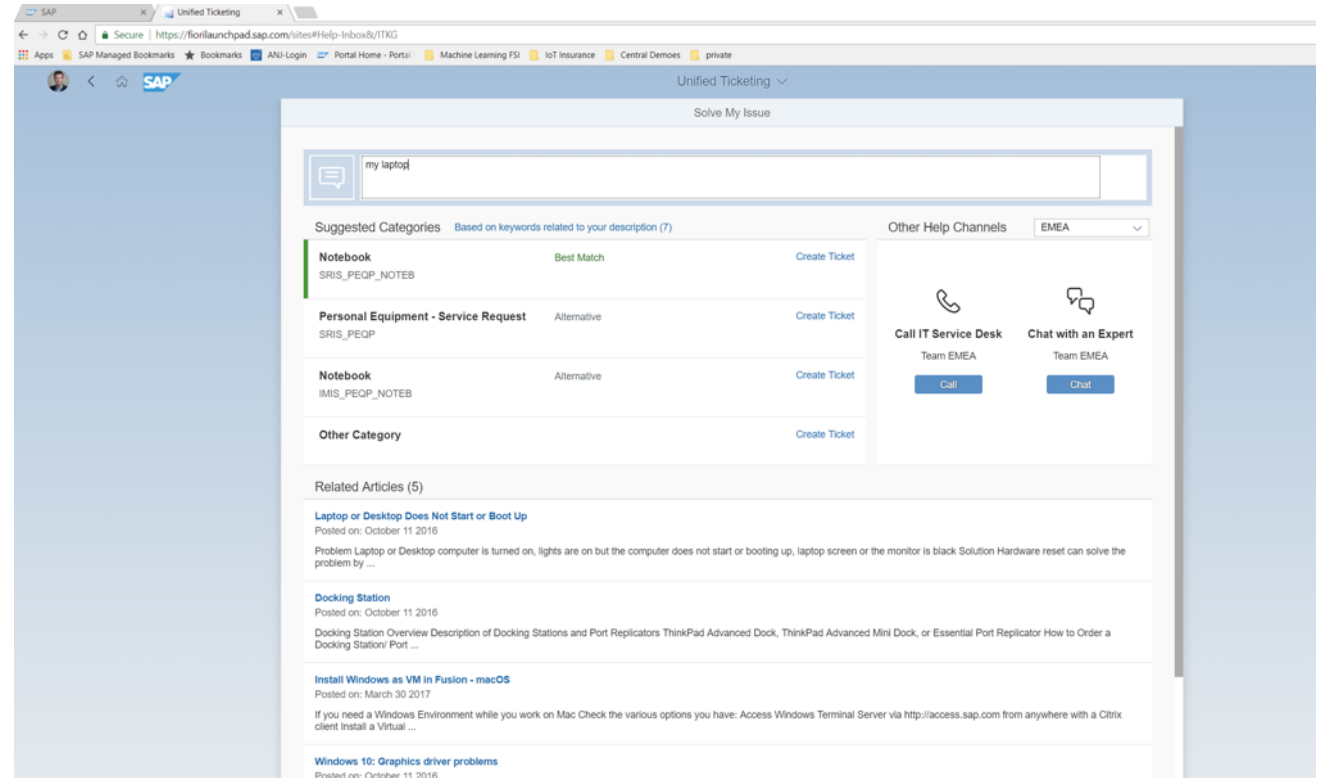
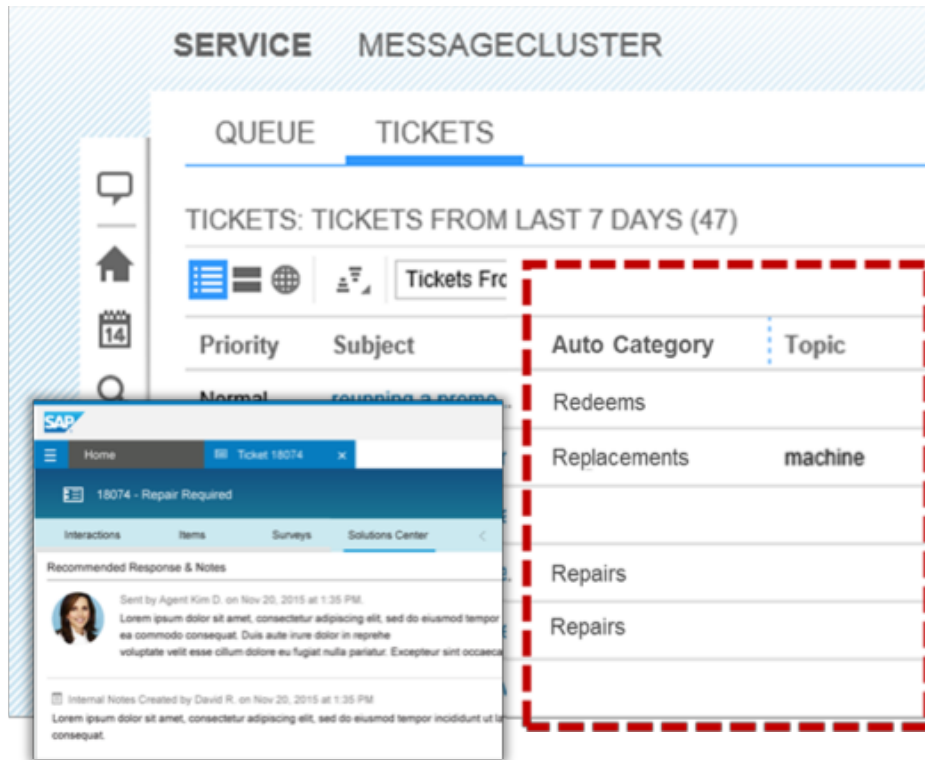
Read ticket content, determine category, and automatically route ticket

Suggest solution

Provide potential solutions to agent

Boost customer experience

Improve resolution rate, time to resolution, closure rate



Example: Intelligent Services for Master Data

Powered by SAP Leonardo Machine Learning Foundation



New or Inconsistent
Master Data



Data Harmonization



Consistent
Master Data



Automate and
speed up master
data creation and
maintenance



Gain easier and
faster master data
insights



Reduce errors and
manual efforts
when maintaining
master data

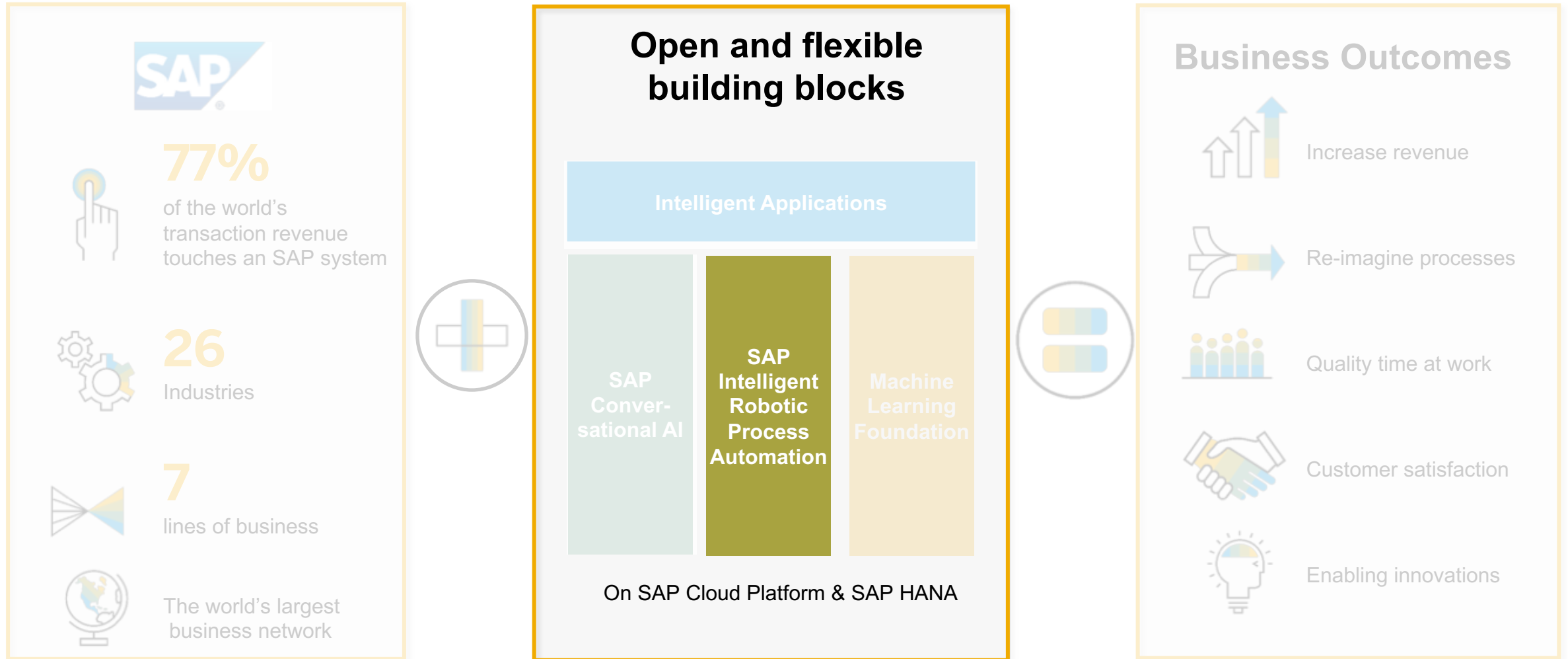
Use Case Examples

Match external information (e.g. Point of sale) to your own product hierarchy

Predict the right value for complex fields

Classify purchase transactions into expense categories

How SAP Leonardo ML helps to deliver the Intelligent Enterprise



SAP Intelligent Robotic Process Automation Solution

Powered by SAP Leonardo for enabling Intelligent Enterprises

Interact

Conversational AI (CAI)

- Chatbots to interface
- Handover to execution bot



Interfacing

Execute

Intelligent Bot (RPA)

- Multiple bot workflows for execution (attended +unattended)



Performing Tasks

Optimize

Machine Learning (ML)

- Self-learning bots with dynamic adaptability, learn from exceptions



Robust Bots and Improve

SAP Intelligent Robotic Process Automation

Make Automation intelligent to **Scale**

Standard RPA

- Bots use UIs just like humans
 - Remove manual steps to drive efficiency
- Opens further complexity
- What happens when a UI changes?
 - ... or a system is upgraded?

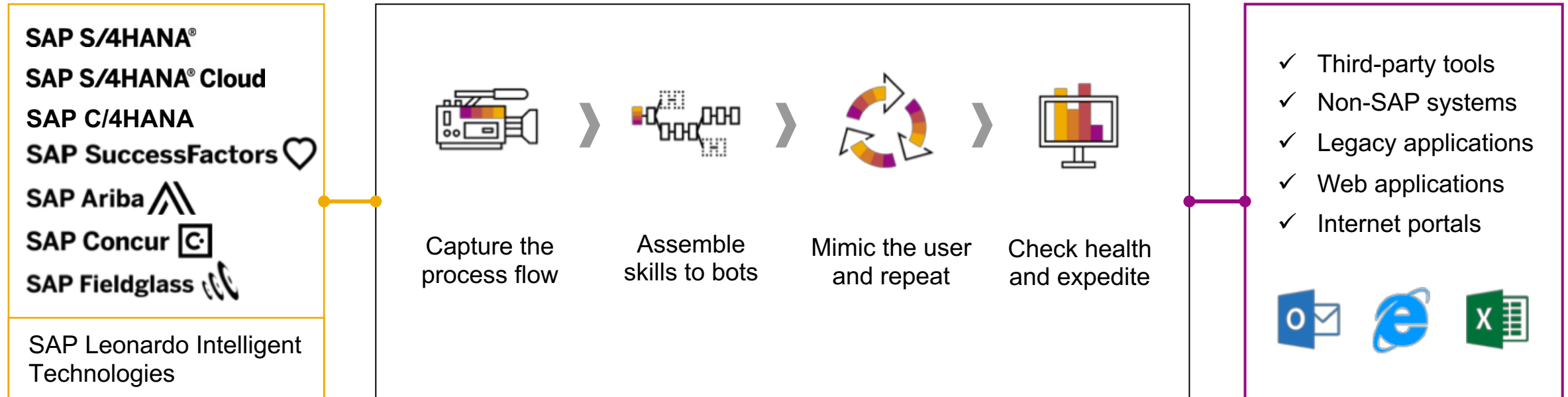


Add Intelligence

- SAP simplifies implementation by using **native APIs** that are **robust** and **stable**
- Interactions are natural with **Conversational AI**
- Automations become intelligent with **Machine Learning** capabilities

SAP Intelligent Robotic Process Automation (RPA)

Unified cloud solution including on-premise automation tools



SAP® Cloud Platform

What does SAP Intelligent RPA consist of?

Design Environment



Central Repository



Runtime Environment



Monitoring Tool



Flexibly design robot workflows

- Automation methods:
 1. API interfaces
 2. OCR/NLP
 3. Screen scraping
 4. Computer Vision
- Connectors for third-party apps, legacy systems, etc.

Store atomic steps for full workflow

- Multi-tenancy
- Bot version control
- Marketplace for third-party bots

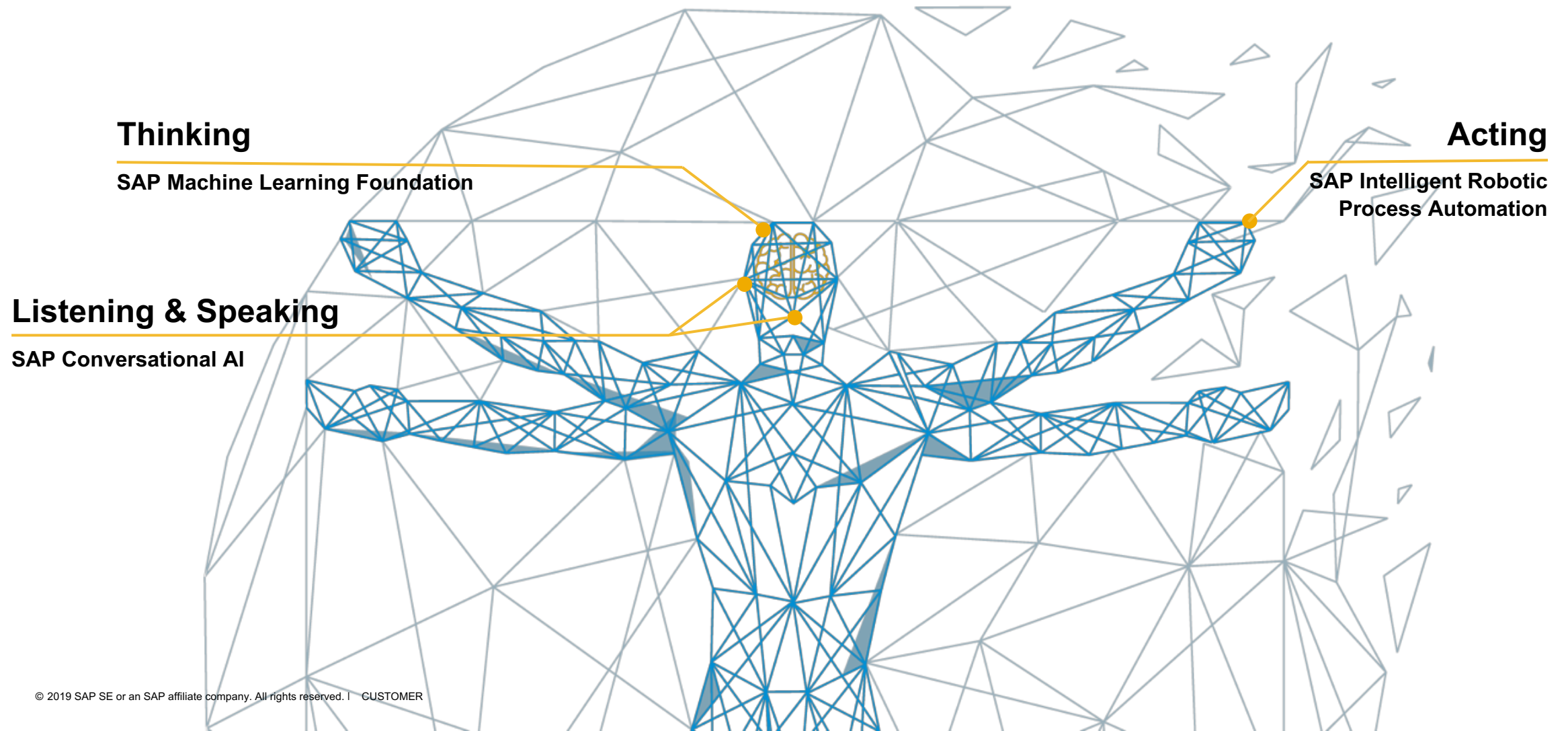
Run bot scripts across deployments

- Scaling/load balancing
- Public cloud deployment-orchestrating desktop and cloud runtime
- Workflow management
- Bot scheduler & time zone manager

Monitor robot performance

- UX, mobile access
- Audit trails
- Logging & Monitoring Cockpit

The Human Aspect of Machine Learning



Thank you.

Contact information:

Boris Andree

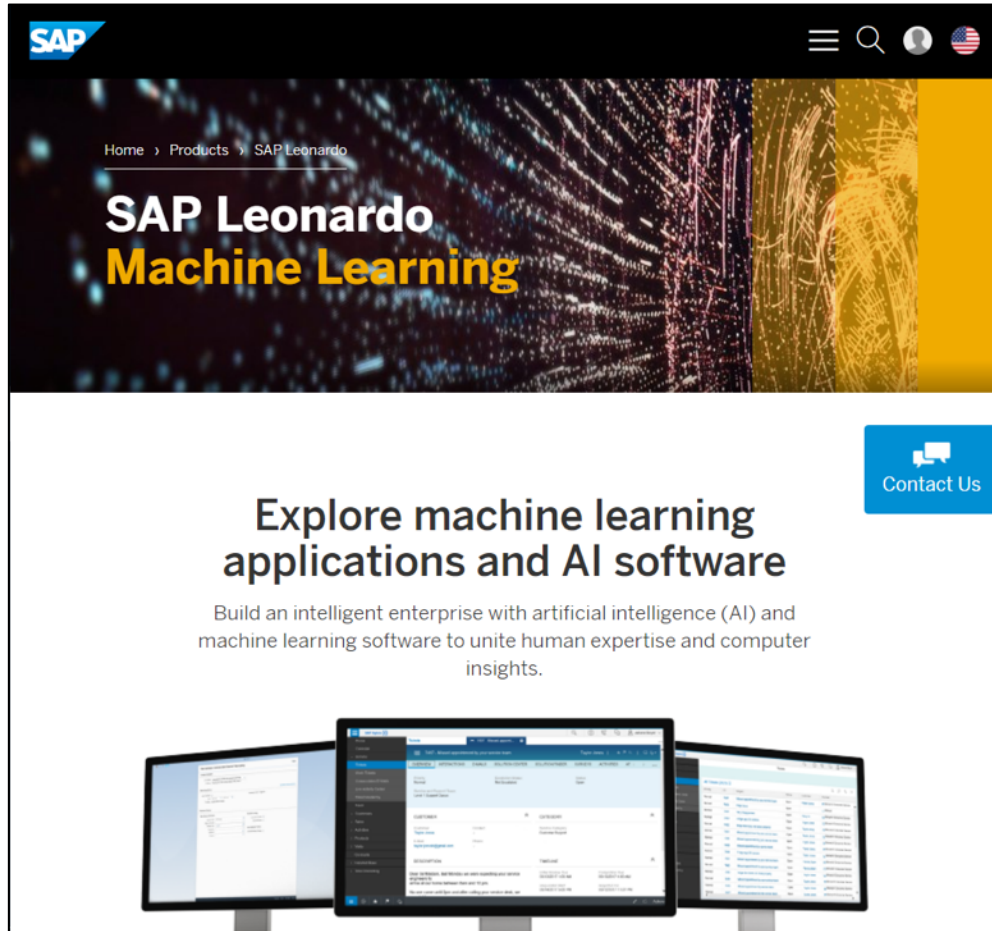
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Solution Management Machine Learning, SAP SE

Links and contacts



Web site

→ sap.com/ML

Online courses

→ Enterprise ML in a Nutshell
open.sap.com/courses/ml1

→ Enterprise Deep Learning with TensorFlow
open.sap.com/courses/ml2/

Social media

→ [@SAPLeonardo](https://twitter.com/SAPLeonardo) on Twitter

Co-innovate

→ ml@sap.com
