A simpler and faster way to automate business processes

Artificial Intelligence
SAP AI Business Services

Manuel Namyslo, SAP

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THE BEST RUN **SAP**

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The potential of intelligent technologies
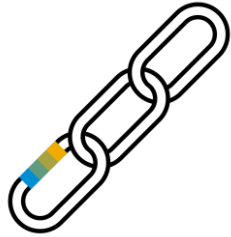
Supply Chain

At least 50%

of large global companies will be using **AI, advanced analytics and IoT in supply chain operations** by 2023*

Procurement

Almost 60%

of individual tasks involved in the source-to-pay process have the potential to be **fully or largely automated** using currently available technologies**

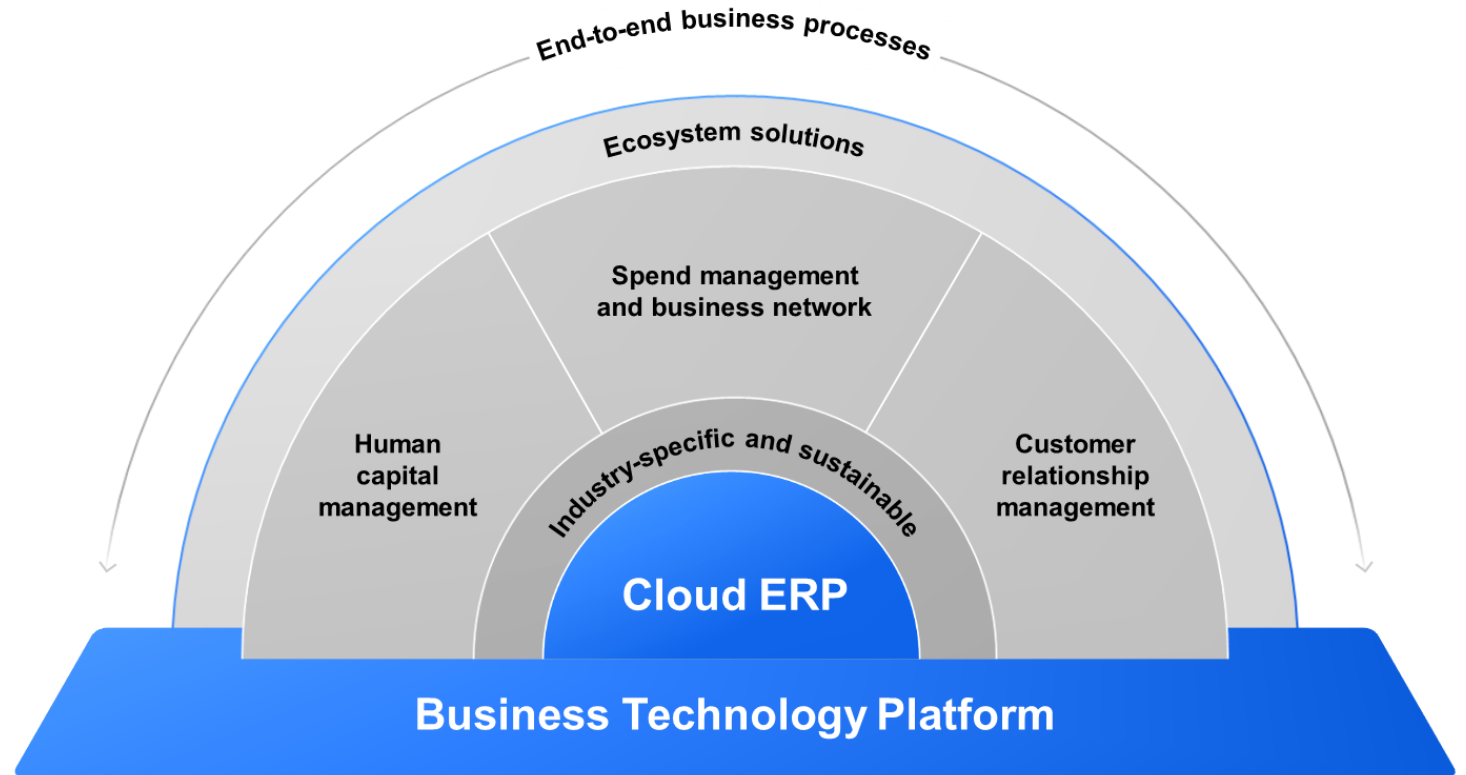### Finance

Yet about 50%

of the overall time of the workforce in finance and insurance is devoted to collecting and processing data, where **the potential for automation is high***

Enable every enterprise to become an **intelligent, sustainable enterprise**

End-to-end business processes

Ecosystem solutions

Spend management and business network

Human capital management

Industry-specific and sustainable

Cloud ERP

Customer relationship management

Business Technology Platform

Value of the Business Technology Platform

1. Accelerate integration
2. Keep the Core Clean
3. Optimize and Automate Business Processes
4. Drive Decisions Based on Data

End-to-end business processes

Ecosystem solutions

Spend management and business network

Human capital management

Industry-specific and sustainable

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Business Technology Platform
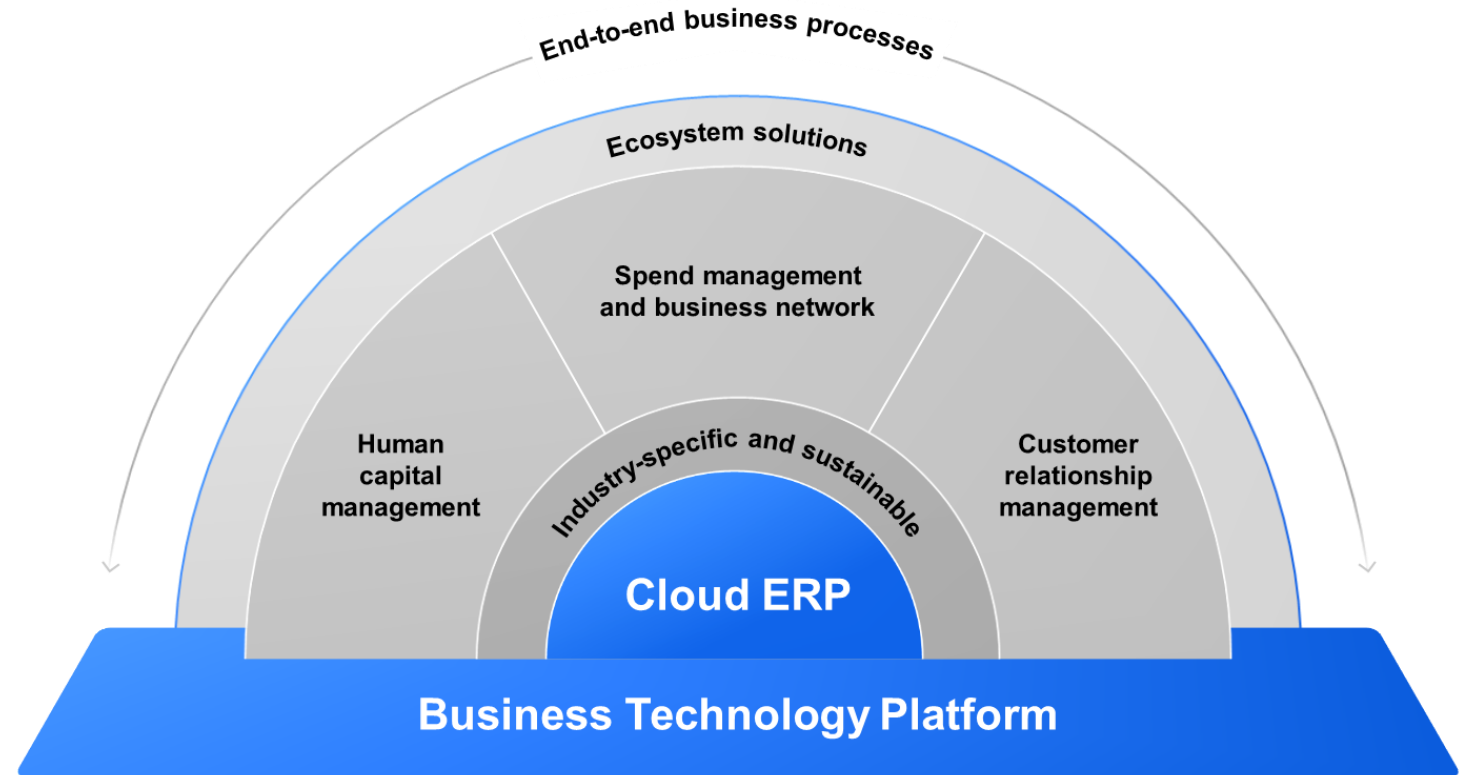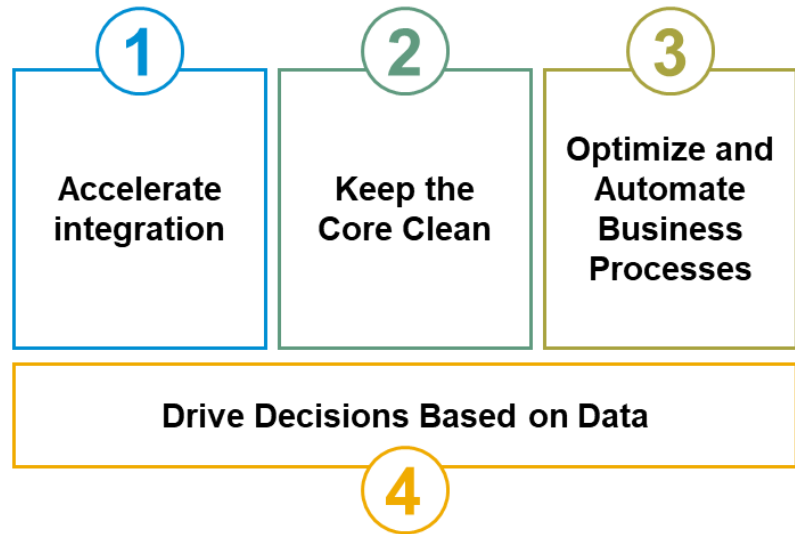
Extend and scale applications with business-centric AI capabilities in SAP BTP

Business Users

AI integrated into business processes and solutions

Intercompany reconciliation | Sales order automation | SAP Cash Application | Workflow intelligence | Personalized learning recommendations | Returnable packaging management | Product and pricing recommendations | Intelligent expense scanning | Automatic invoice processing | Digital assistant

Developers

SAP AI Business Services

Data Attribute Recommendation | Document Information Extraction | Business Entity Recognition | Personalized Recommendation

SAP Build Process Automation

Workflow | Robotic process automation | Business rules | Process visibility

AI Engineers & AI Ops

SAP AI Core
SAP AI Launchpad

SAP HANA Cloud

Automate & Optimize Business Processes with SAP AI Business Services
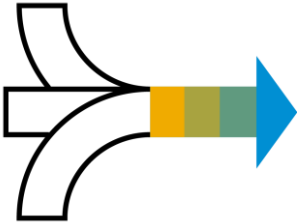
Add intelligence to your applications using AI models pretrained on business-relevant data, available on SAP BTP.

Business Document Processing

Business Entity Recognition
Detects and highlights named entities in unstructured text

Document Information Extraction
Automatically extracts information from unstructured documents and classifies them

Personalized Recommendation
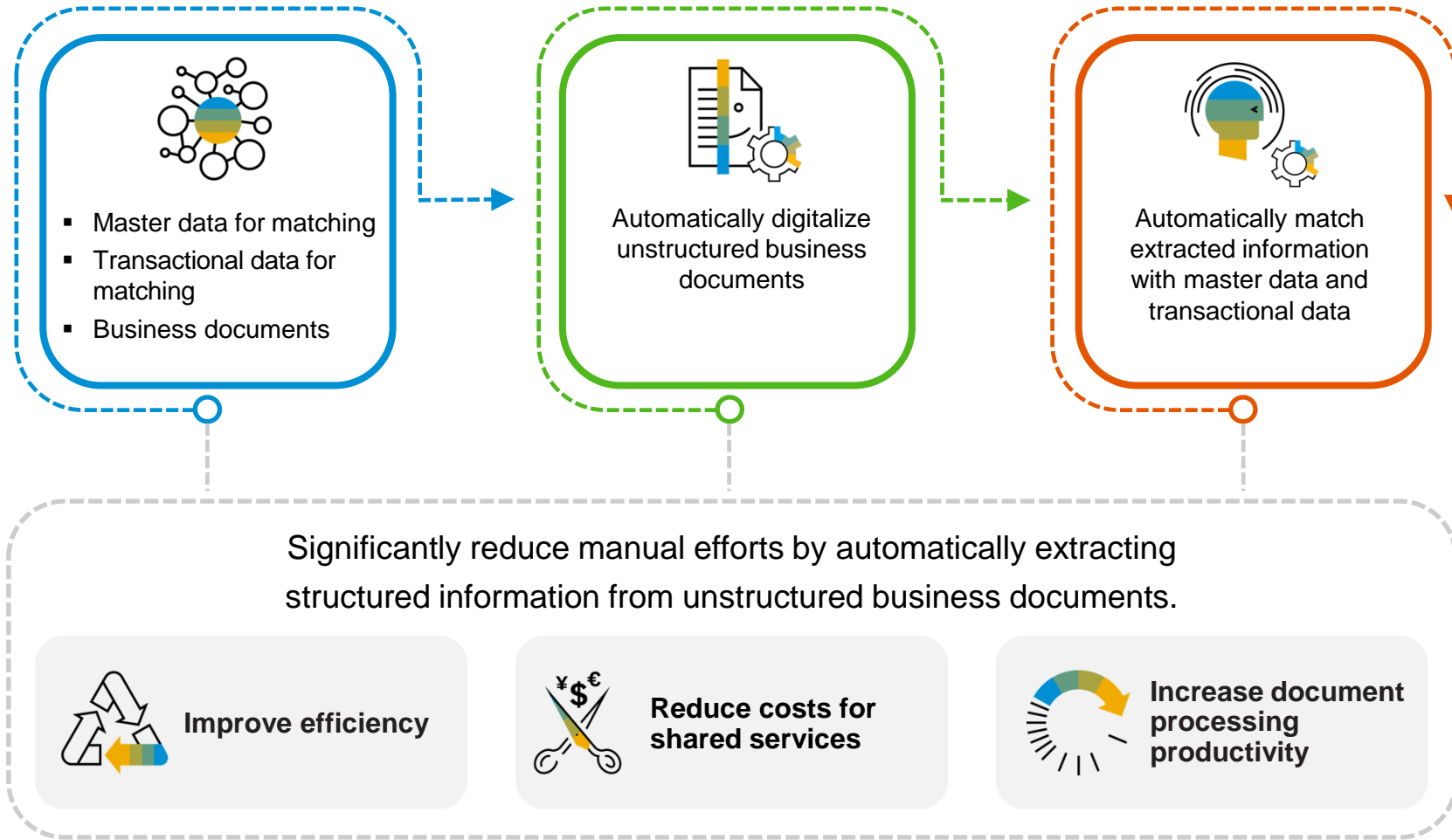Get accurate recommendations based on users' browsing history and/or item description

Data Attribute Recommendation
Perform classification and regression tasks

Document Information Extraction

Extract structured information from unstructured documents and classify them

- Master data for matching
- Transactional data for matching
- Business documents

Automatically digitalize unstructured business documents

Automatically match extracted information with master data and transactional data

Significantly reduce manual efforts by automatically extracting structured information from unstructured business documents.

Improve efficiency

Reduce costs for shared services

Increase document processing productivity

Problem: Large Amounts of Incoming business documents

John,
AP-Clerk

Company	Time2Go Company
Supplier ID	009753
Invoice N°	123456
Amount	3684.00
Currency	USD
Date	2013-11-01
Position 1	Amount: 1400 Unit: PC Amount: 1684.00 Description: Apples
Position 2	Amount: 120 Unit: KG Amount: 2000.00 Description: Nuts

Enrichment happens manually
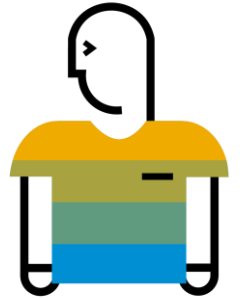
John,
spends much time on searching and matching the right information

Solution: Document Information Extraction

Company	Time2Go Company
Supplier ID	009753
Invoice N°	123456
Amount	3684.00
Currency	USD
Date	2013-11-01
Position 1	Amount: 1400 Unit: PC Amount: 1684.00 Description: Apples
Position 2	Amount: 120 Unit: KG Amount: 2000.00 Description: Nuts

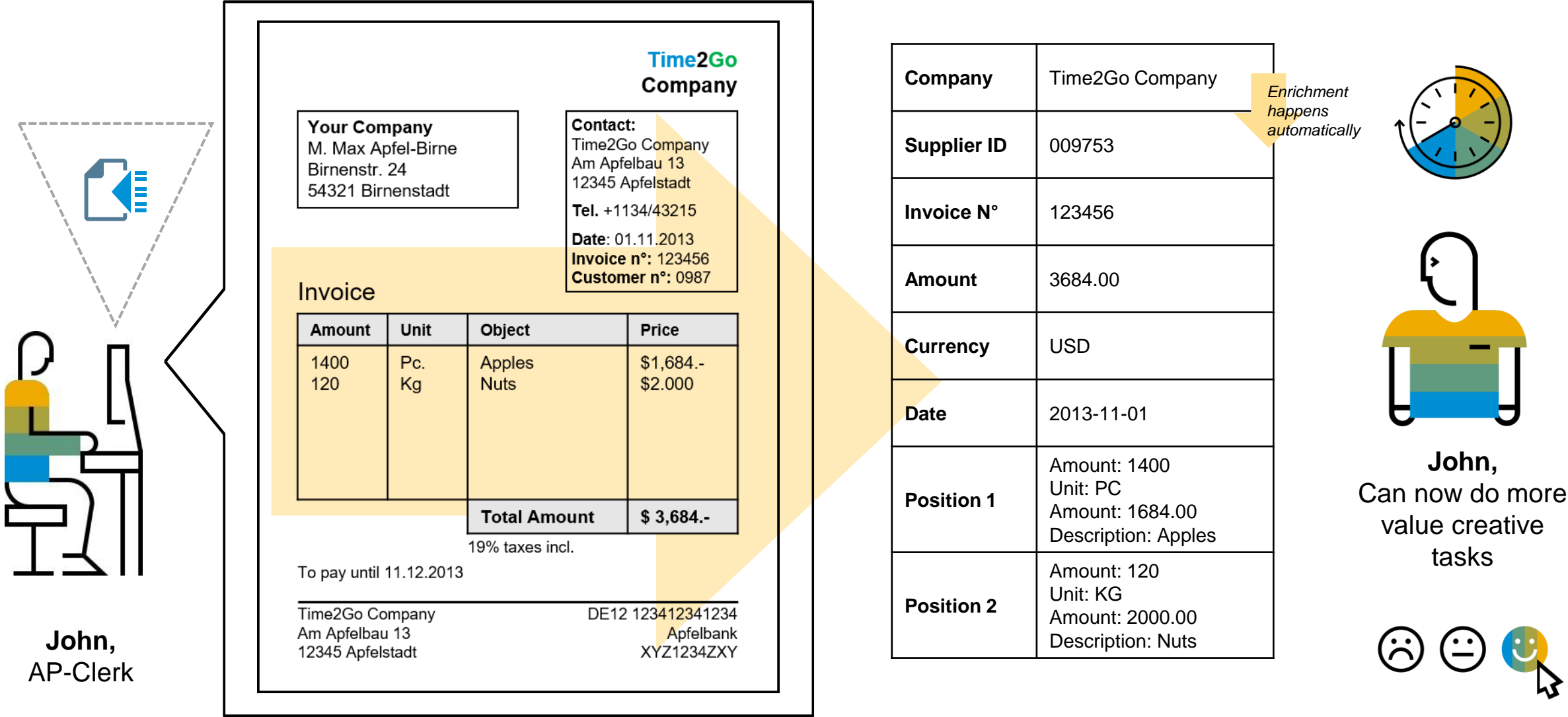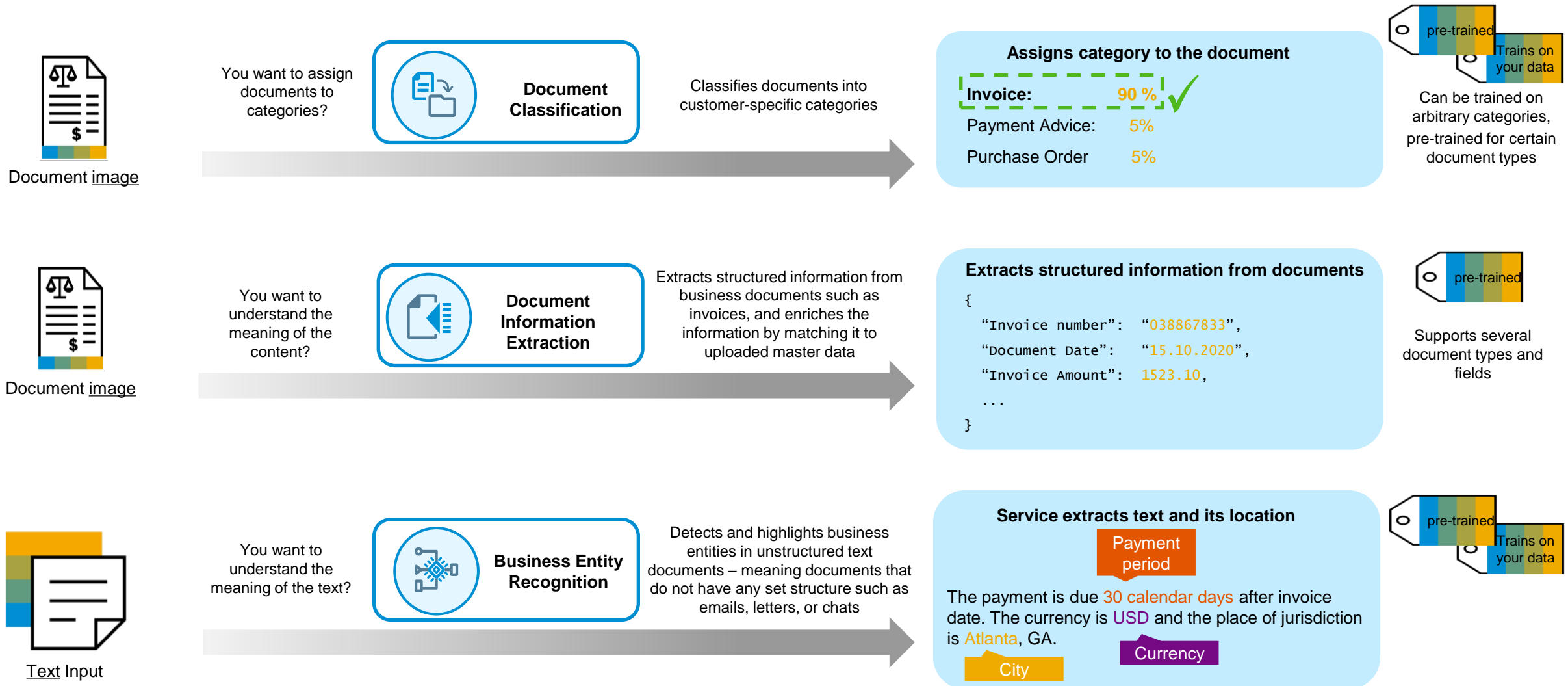*Enrichment happens automatically*

John,
AP-Clerk

John,
Can now do more value creative tasks

Services for Business Document Processing

Document image

You want to assign documents to categories?

Document Classification

Classifies documents into customer-specific categories

Assigns category to the document

Invoice:	90 %	✓
Payment Advice:	5%	
Purchase Order:	5%	

pre-trained | Trains on your data

Can be trained on arbitrary categories, pre-trained for certain document types

---

Document image

You want to understand the meaning of the content?

Document Information Extraction

Extracts structured information from business documents such as invoices, and enriches the information by matching it to uploaded master data

Extracts structured information from documents

```
{
    "Invoice number":   "038867833",
    "Document Date":    "15.10.2020",
    "Invoice Amount":   1523.10,
    ...
}
```

pre-trained

Supports several document types and fields

Text Input

You want to understand the meaning of the text?

Business Entity Recognition

Detects and highlights business entities in unstructured text documents – meaning documents that do not have any set structure such as emails, letters, or chats

Service extracts text and its location

Payment period

The payment is due 30 calendar days after invoice date. The currency is USD and the place of jurisdiction is Atlanta, GA.

City

Currency

pre-trained | Trains on your data

Document Information Extraction
Start today

Ready to Use

- Available under **Free Tier** option on SAP BTP
- Commercially available via **Cloud Platform Enterprise Agreement**, on **SAP Store** or as **Pay-as-you-go** model
- Available as **Test Demo & Development** for Partners
- Available on following Data Centers: EU10, EU11, JP10, US10, AP10

Natively Available

The service is integrated into variety of SAP standard products that you use already today:

- SAP Concur Invoice Capture
- SAP Central Invoice Management for SAP S/4HANA Cloud
- SAP CashApplication
- SAP Business ByDesign
- SAP S/4HANA Cloud
- SAP Build Process Automation
- …and many more (see consumption options).

| SAP HELP PORTAL | SAP DISOVERY CENTER | SAP COMMUNITY | CONSUMPTION OPTIONS |

Manage Payment Advises with Cash App

HYPERCOM AG

Lindenstraße
2 74214 Schöntal
DE

Payment Advice

Document / Date
4 / 15/01/2018

Your account with us
10100001

Dear Sir/Madam,

We have cleared the items listed below with document 4.
We will credit the following bank account in 2 business days:
Bank Account:1133698
For inquiries please contact: treasury@domus1.com

Document Number	Invoice Number	Invoice Date	Discount	Amount
1800000120	1800000120	10/10/2017	0.00	4,211.00
1800000101	1800000101	10/10/2017	0.00	692.00
1800000094	1800000094	10/10/2017	0.00	223.00
Total				5,126.00

SAP S/4HANA

+
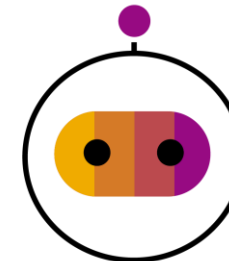
SAP Process Automation

Manage Payment Advice

End User   **Multiple Systems**   **SAP Process Automation**   **Cash-App**
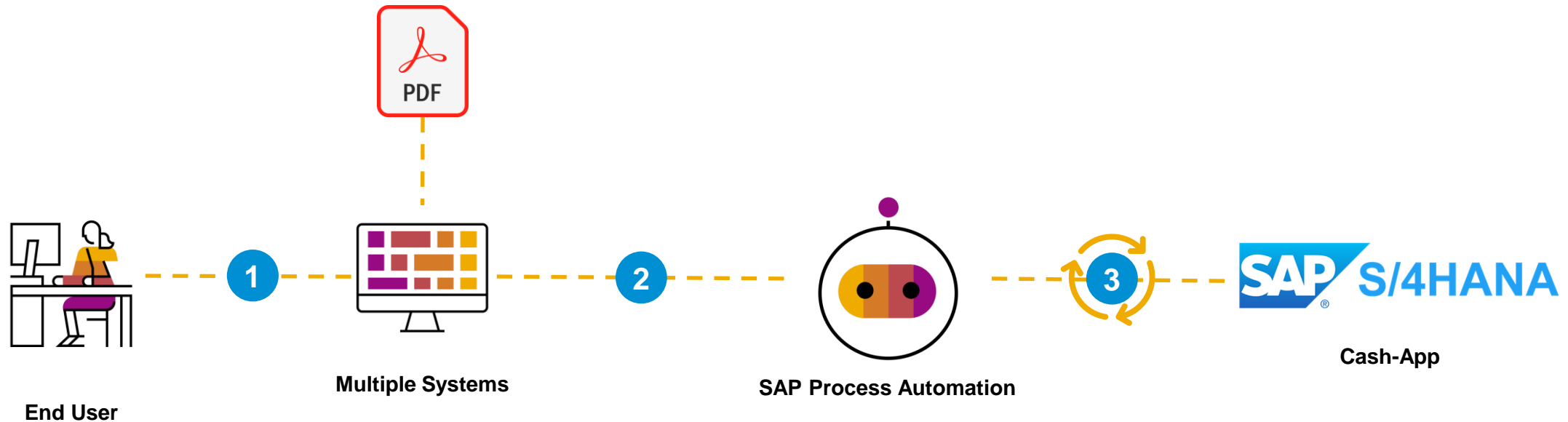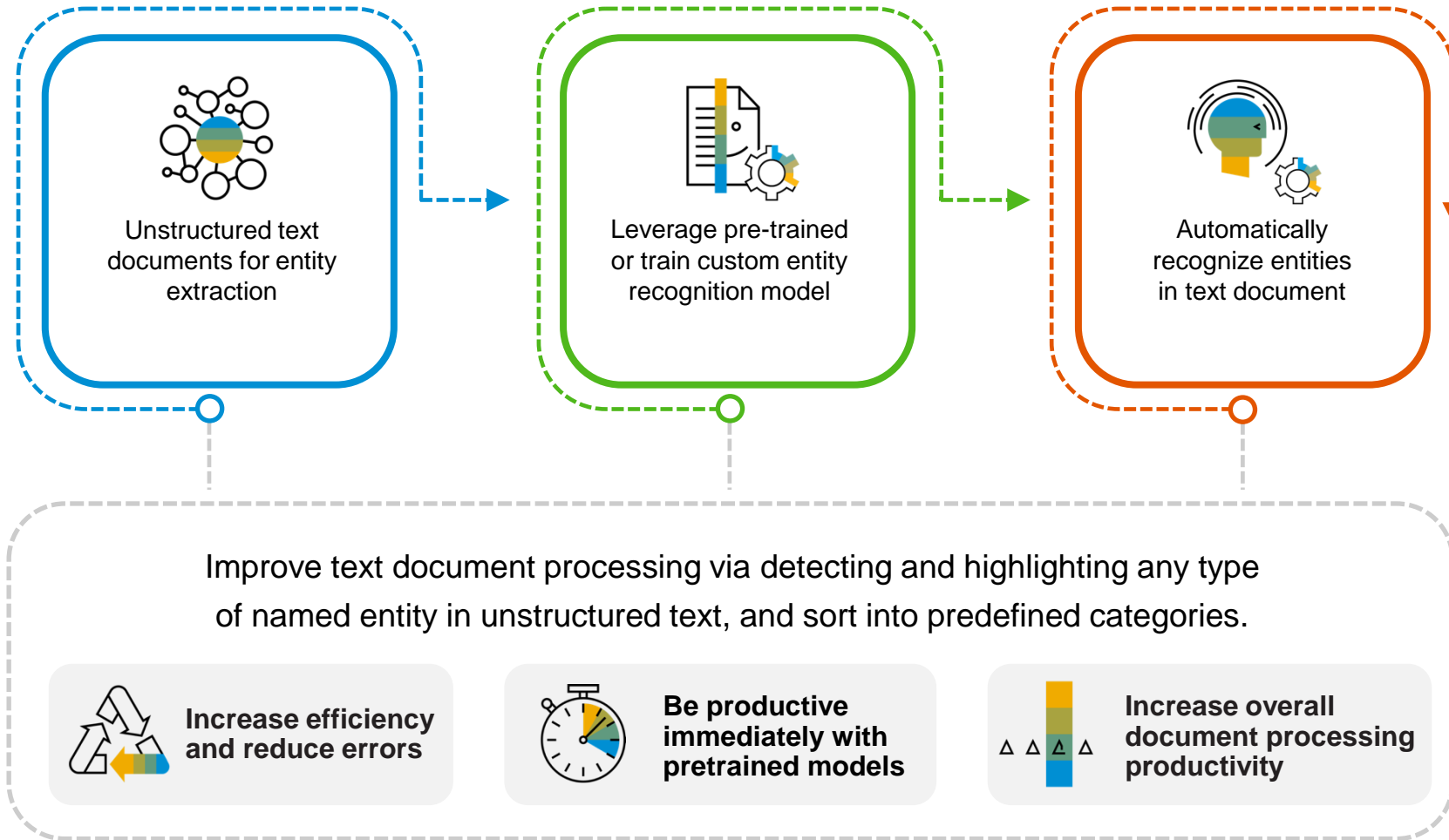
User has multiple PDF Documents from different sources

Bot is asking for feedback and allocates all relevant PDF's

Bot navigates to Cash App and Uploads all Payment Advices
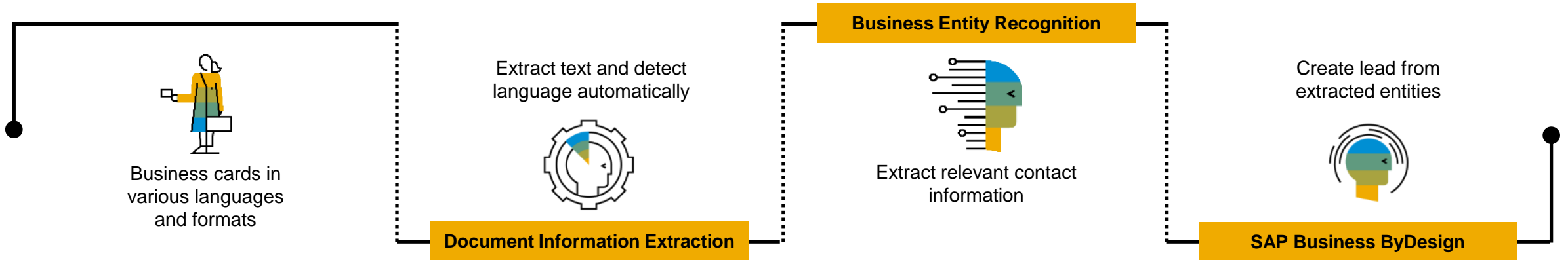
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Company Code	Mail Address														
2	1710	john.doe01@example.com														
3	1010	alicia.hu@sap.com														
4	1110	john.doe@example.com														
5	1010	sap.rpa.fi@sap.com														

Business Entity Recognition

Detect and highlight any type of named entity in unstructured text

Unstructured text documents for entity extraction

Leverage pre-trained or train custom entity recognition model

Automatically recognize entities in text document

Improve text document processing via detecting and highlighting any type of named entity in unstructured text, and sort into predefined categories.

Increase efficiency and reduce errors

Be productive immediately with pretrained models

Increase overall document processing productivity

Intelligent lead capturing from business cards

Business cards in various languages and formats

Extract text and detect language automatically

Document Information Extraction

Business Entity Recognition

Extract relevant contact information

SAP Business ByDesign

Create lead from extracted entities

Business Challenge

- Business cards collected at events or conferences need to be entered manually to capture leads
- Business cards typically come in various languages and formats
- Manual lead capturing might lead to errors and increases the processing time

Solution

Document Information Extraction

- Automatically extracts structured information from unstructured documents such as business cards

Business Entity Recognition

- Extract contact-relevant information via pre-trained business card model

Benefits and Value

- Reducing the manual work
- Speeding up the overall process
- Reducing extraction errors
- Focusing on value-creative tasks
- Immediately productive via pre-trained models

Pre-trained and custom training models

Business Entity recognition offers **pre-trained** models and the possibility to train **custom** training models

Pre-trained models

pre-trained

Use for **specific business problems** (e.g. extracting entities out of invoice headers)

Custom models

Trains on your data

Train custom models for **any given type of entity** in any unstructured text

Overview about pre-trained training models

Email Business Entity

- Entities:
  - Vendor ID
  - Invoice number
- Languages:
  - DE
  - EN

Generic Entities

- Entities:
  - Person
  - Number
  - Date / Time
  - Job
  - Location
  - …
  - Color
  - Distance
  - Duration
  - Language
  - Nationality

- Languages:
  - DE
  - EN
  - ES
  - FR

Address Entities

- Entities:
  - Customer name
  - City
  - Country
  - Street
  - Postal code
  - …
- Languages:
  - DE
  - EN

Invoice Header

- Entities:
  - Sender address
  - Sender name
  - Order date
  - Note number
  - Payment terms
  - PO reference
  - …
  - Total amount
  - Currency
  - Description
  - Tax rate
  - Tax ID
  - Bank account
- Languages:
  - DE
  - EN
  - ES
  - FR

> Extraction of **service-related entities** from **emails** or **service requests**
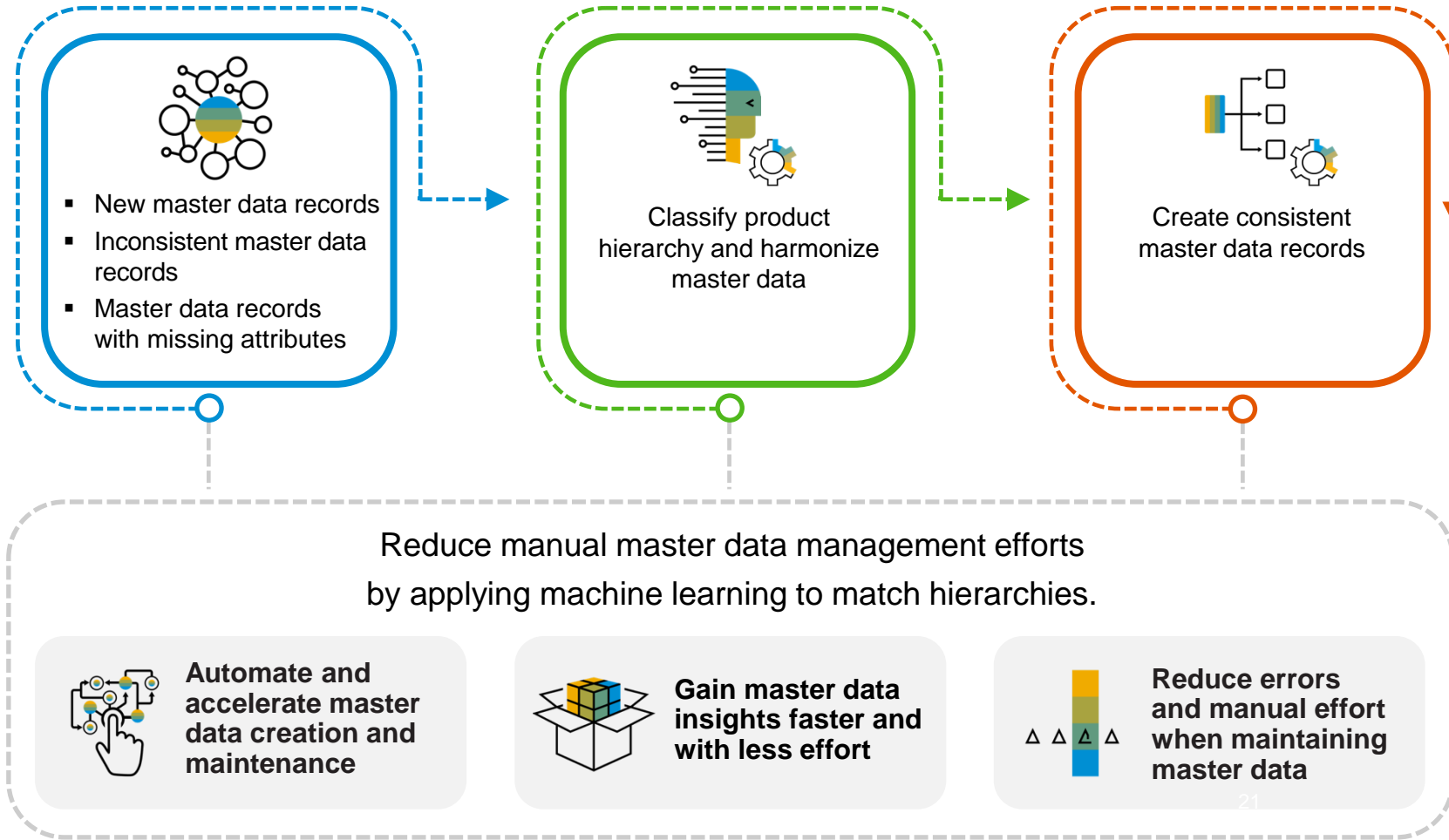
> Extraction of **generic entities** from **any text** (e.g. emails, chats, business documents)

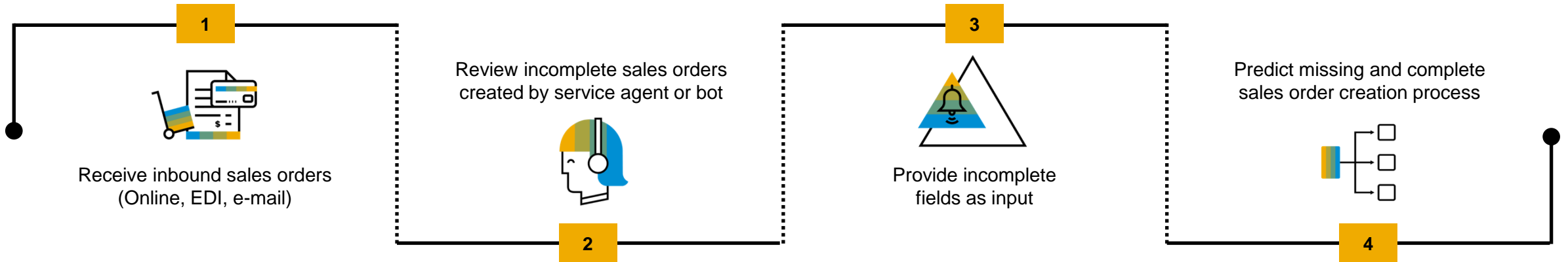> Extraction of **address entities** from any text containing address data

> Extraction of **invoice-related entities** from **text-based invoices**

The full list of extracted entities per pre-trained model is described in the SAP Help Portal

Data Attribute Recommendation

Classifies and predicts structured data fields

- New master data records
- Inconsistent master data records
- Master data records with missing attributes

Classify product hierarchy and harmonize master data

Create consistent master data records

Reduce manual master data management efforts
by applying machine learning to match hierarchies.

Automate and accelerate master data creation and maintenance

Gain master data insights faster and with less effort

Reduce errors and manual effort when maintaining master data

Sales Order Auto Completion

1 Receive inbound sales orders (Online, EDI, e-mail)

2 Review incomplete sales orders created by service agent or bot

3 Provide incomplete fields as input

4 Predict missing and complete sales order creation process

Business Challenge

- Incomplete and overdue sales orders due to missing information
- High manual effort needed to retrieve missing information
- Delay in order fulfillment in the order-to-delivery process

Solution

Data Attribute Recommendation

- Feeds incomplete fields as input to service
- Offers the potential to combine with rule-based procedures
- Classifies sales order exceptions for automated processing

Benefits and Value

- Reduced manual efforts for order completion significantly
- Expedited overall sales order processing
- Leveraged extensive cost-saving potential

Business Challenge - Matching Information done Manually

Material Table

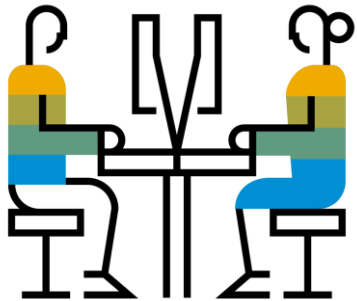| Description	Manufacturer	Price	Category	Subcategory
1875 W Conair Hair Dryer	Conair	19.99	*Health, Fitness & Beauty*	Personal Care & Beauty
40x to 1000x - LED Illumination - Monocular Head	Celestron	369.99	*Cameras & Camcorders*	Binoculars, Telescopes & Optics
Amazons 6" Paperwhite display	Amazon	289.99	*Computers & Tablets*	E-Readers & Accessories
Yellow - Laser - 1500 Page - 1 Each	Brother	50.99	*Connected Home & Housewares*	Office & School Supplies
Take the fight to the next level	Activision	19.99	*Video Games*	Xbox 360
Compatible with select electronic devices	alkaline chemistry	7.99	*Connected Home & Housewares*	Housewares
From our expanded online assortment; compatible with most 1989-2000 Ford, Lincoln and Mercury vehicles	Metra	16.99	*Car Electronics & GPS*	Car Installation Parts & Accessories

Manual matching and insertion of information

Bob,
Master Data Team
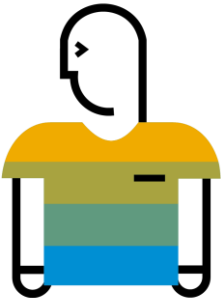
Bob,
spends much time on repetetive tasks

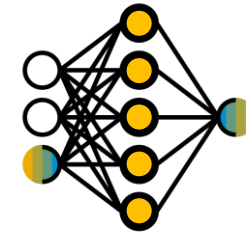# AI Approach - Train a model with historical / labelled data

Material Table

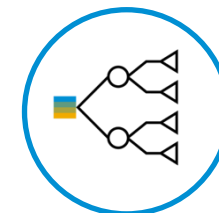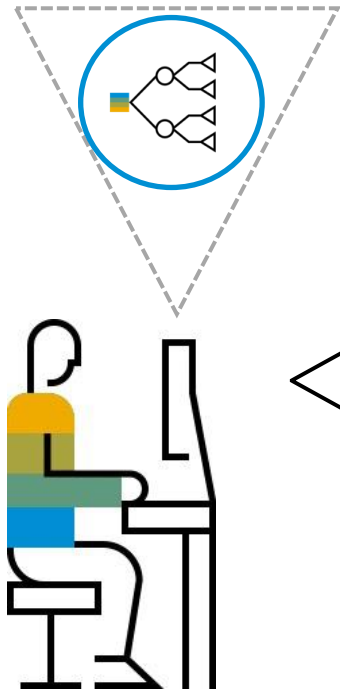| Description	Manufacturer	Price	Category	Subcategory
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Training data

Data Attribute Recommendation

model trained
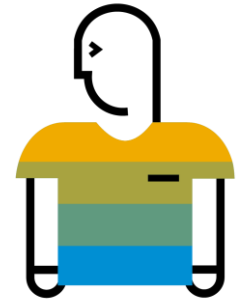
Solution – Automation with Data Attribute Recommendation

Material Table

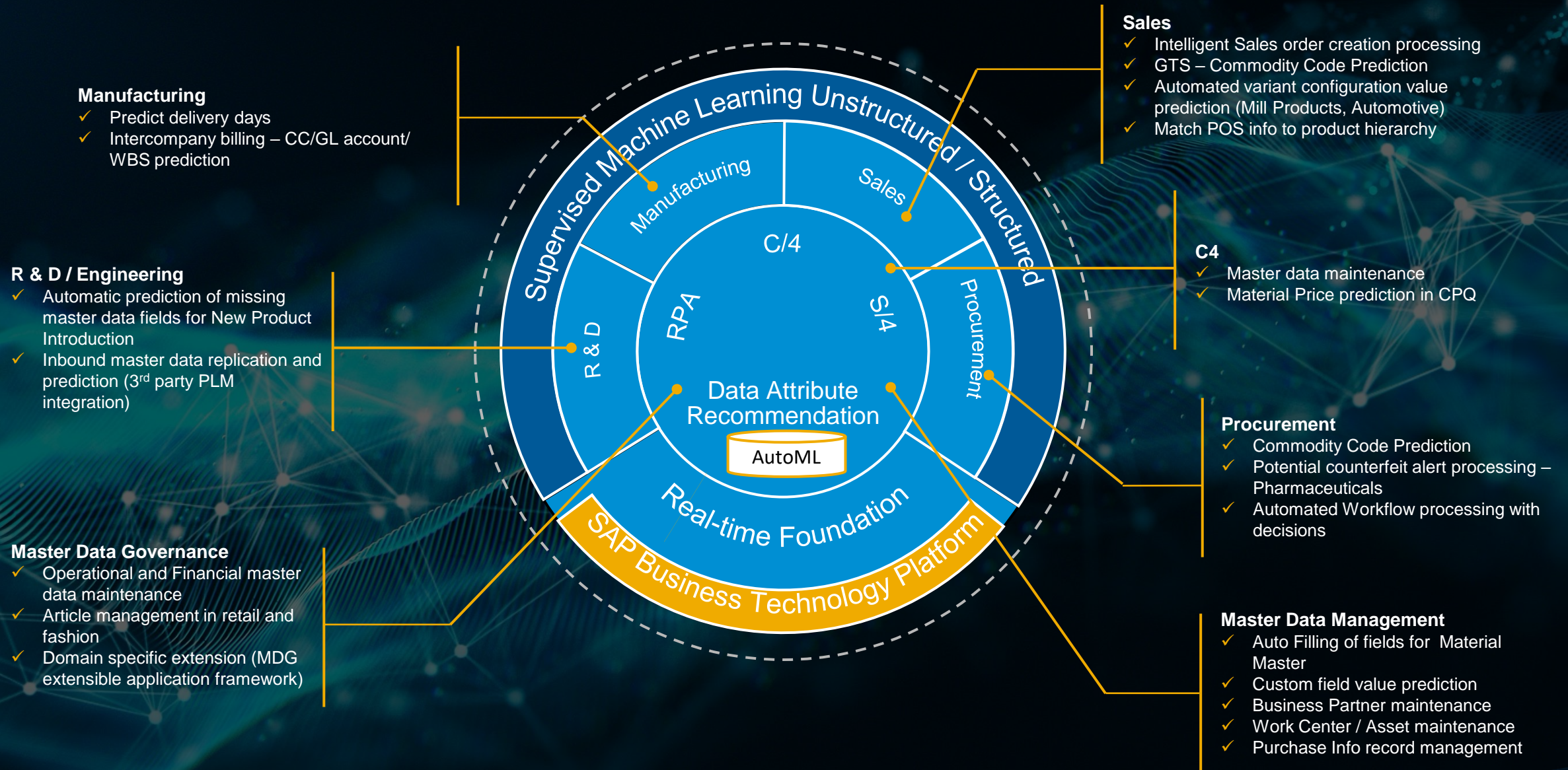| Description	Manufacturer	Price	Category	Subcategory
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Predictions for customer specific fields

Bob,
Master Data Team

Bob,
Can now do more value creative tasks

Intelligent Master Data and Transactional Data Enrichment using Data Attribute Recommendation

Manufacturing
- ✓ Predict delivery days
- ✓ Intercompany billing – CC/GL account/ WBS prediction

R & D / Engineering
- ✓ Automatic prediction of missing master data fields for New Product Introduction
- ✓ Inbound master data replication and prediction (3rd party PLM integration)

Master Data Governance
- ✓ Operational and Financial master data maintenance
- ✓ Article management in retail and fashion
- ✓ Domain specific extension (MDG extensible application framework)

Sales
- ✓ Intelligent Sales order creation processing
- ✓ GTS – Commodity Code Prediction
- ✓ Automated variant configuration value prediction (Mill Products, Automotive)
- ✓ Match POS info to product hierarchy

C4
- ✓ Master data maintenance
- ✓ Material Price prediction in CPQ

Procurement
- ✓ Commodity Code Prediction
- ✓ Potential counterfeit alert processing – Pharmaceuticals
- ✓ Automated Workflow processing with decisions

Master Data Management
- ✓ Auto Filling of fields for Material Master
- ✓ Custom field value prediction
- ✓ Business Partner maintenance
- ✓ Work Center / Asset maintenance
- ✓ Purchase Info record management

Diagram center: Supervised Machine Learning, Unstructured / Structured, Manufacturing, Sales, C/4, R & D, RPA, S/4, Procurement, Data Attribute Recommendation, AutoML, Real-time Foundation, SAP Business Technology Platform
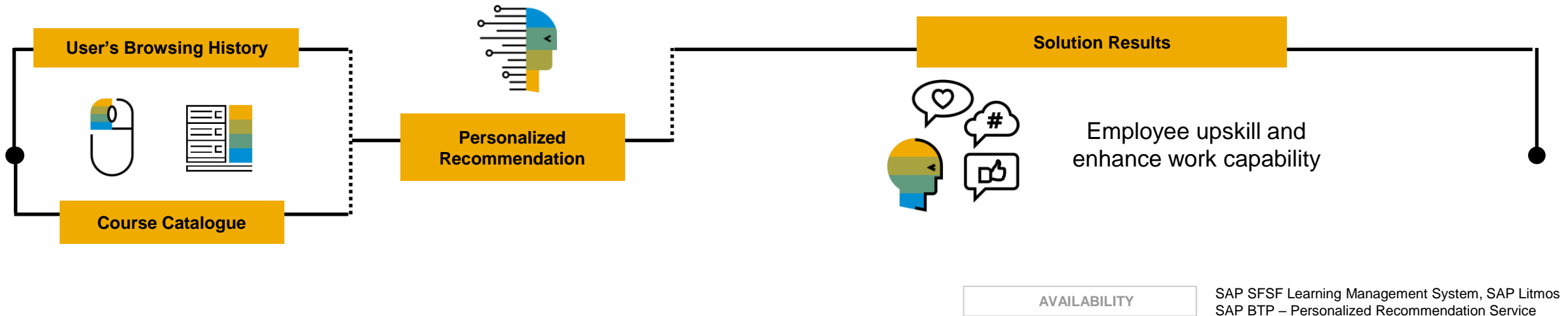
Personalized Recommendation

Draw insights from historical user behavior and item metadata to deliver highly personalized recommendations

Clickstream Data

Item Catalogue

User Profile

Train, evaluate and deploy the model

Personalized Recommendation + Smart Search

Deliver highly personalized recommendations for each user across a wide range of business scenarios such as

Learning Recommendations, Career Path Recommendations, eCommerce Product Recommendations, and so on

Enhance user experience & engagement

Drive conversion by getting customer the right product or contents

Retain business control, curate relevancy and meet KPIs

Learning Recommendations

User's Browsing History

Course Catalogue

Personalized Recommendation

Solution Results

Employee upskill and enhance work capability

AVAILABILITY — SAP SFSF Learning Management System, SAP Litmos
SAP BTP – Personalized Recommendation Service

Business Challenge

Employees struggle with finding relevant courses

- Overwhelming volume of information that makes it difficult to notice and keep track of useful information

- Lack of effect tools that makes it difficult for the employees to find the most useful information

Solution

Personalized Recommendation

- Connects employees with personalized learning beyond traditional course catalogues to fit their learning goals and situation.

Benefits and Value

- Connect employees with personalised learning to fit their learning goals and situation, enabling them to upskill and have personal growth.

- Make better use of vast amounts of relevant and current learning content available

- Talent development to build a better workforce

- Help organizations create a culture of learning

Personalized Recommendation
How does it work

Personalized Recommendation **draws insights from historical user behavior and item metadata** to deliver highly personalized recommendations for each user across a wide range of business scenarios.
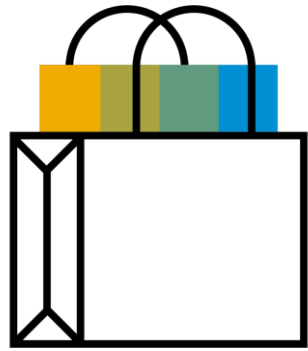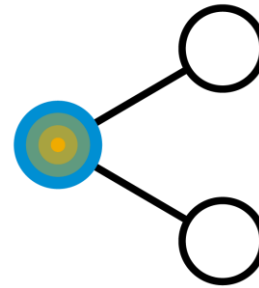

Clickstream Data

Item Catalogue

User Profile

Train, evaluate and deploy the model

Personalized Recommendations
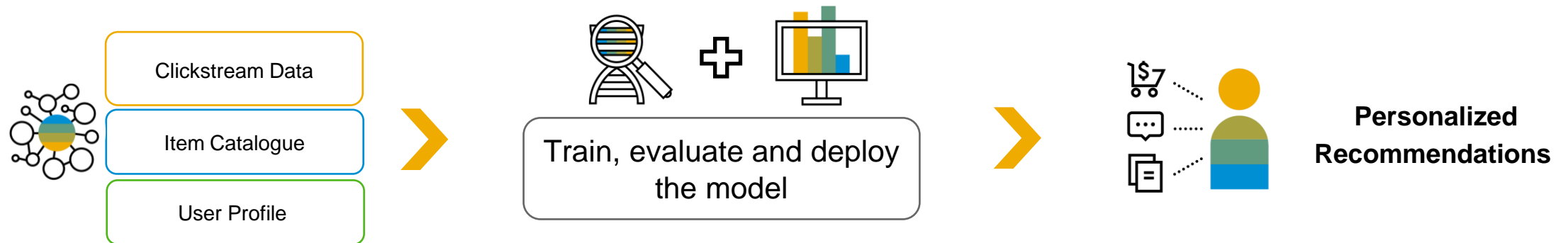
Personalized Recommendation
Recommendation Scenarios

Next-Click

Next-Sell

Content Recommendation

Smart Search

Customers Are Realizing Their Potential with SAP AI Business Services

City of Hamburg
Government

Villeroy & Boch
Consumer Products

Telefónica S.A.
Telecommunications

Aspen Pumps Limited
Industrial machinery

+2.7 million
documents automatically evaluated and classified

91%
of 3,000 incoming emails per year automated

77%
of talent completed profiles, enabling intelligent matching of candidates to positions

350 hours
saved each month by reducing repetitive and manual administrative tasks

SAP AI Business Services Key Takeaways

Rapid time to value
Speed value creation with enterprise-ready services.
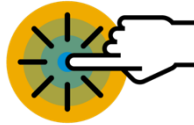
Innovation support
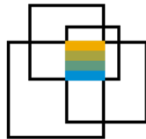Reinvent existing business processes with new technologies.

First step on your ML–based journey
Get started by automating and optimizing business processes.

Generic usability
Solve concrete business problems in various business scenarios across all industries.

Powerful integration
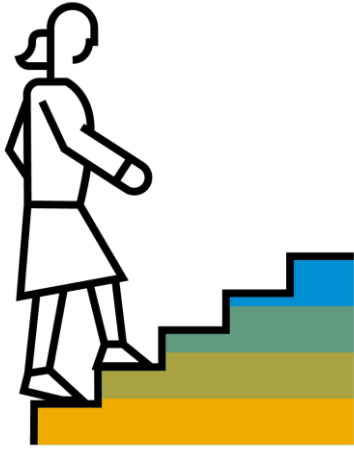Integrate AI capabilities with both SAP and third-party solutions.

Expertise
Take advantage of solutions based on best practices supported by SAP and our customers.

Simple access to and payment for service
Get up and running quickly using CPEA and pay only for what you need.

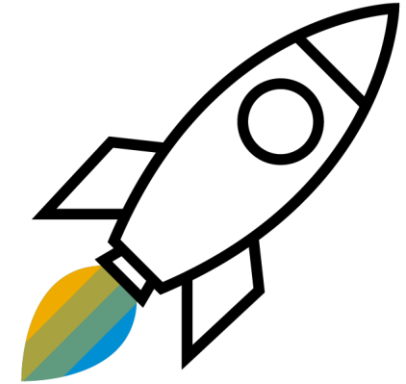# Get Started with SAP AI Business Services Today

First steps
- Visit SAP.com
- Read this blog post
- Read our documentation
- Follow our openSAP course

Stay in touch and learn
- SAP Community (including use cases)
- Q&A
- Roadmap
- Tutorials
- LinkedIn & YouTube

Productive usage
- SAP BTP Free Trial
- SAP Store
- SAP Discovery Center
- Estimator Tool

Thank you.

Contact information:

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T +49 1752957360

E manuel.namyslo@sap.com