

# delaware

SAP Leonardo

Internet of Things

by Bruno Mommens

SAP  
Pinnacle  
Awards  
2017  
Winner

**SAP**

Gold  
Partner

TM


# delaware

225 mio \$  
revenue

1600  
Professionals

25 offices in  
13 countries





Customer journey



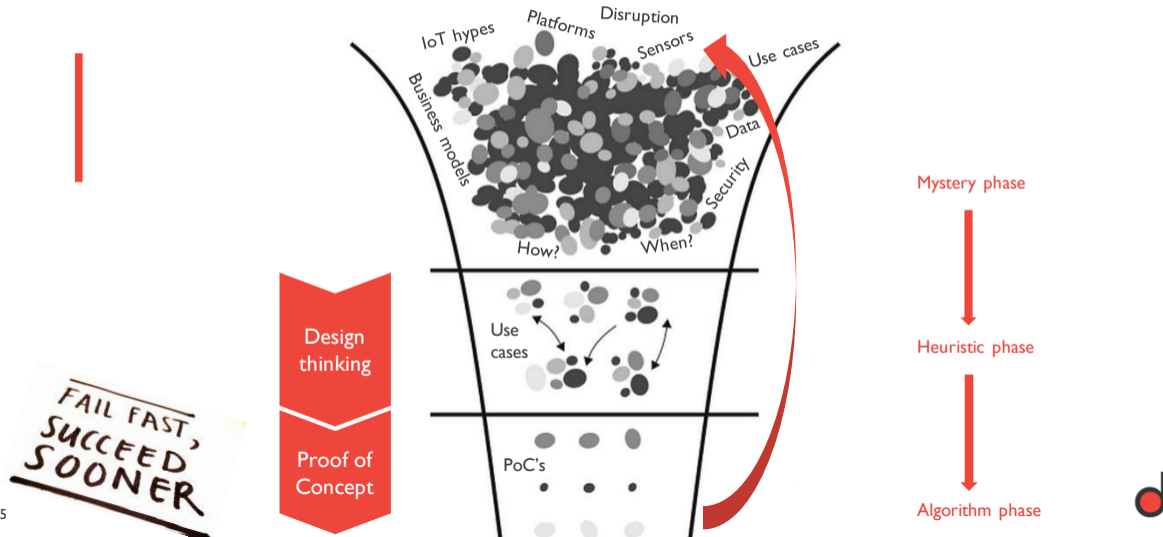
**HOW TO...**



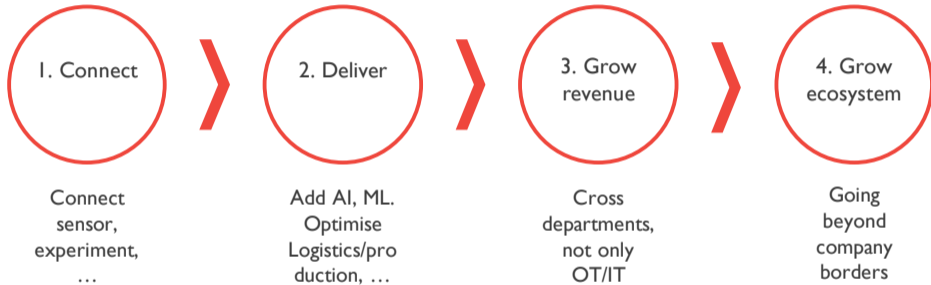


# IoT Knowledge funnel


Cfr. "The Design of Business: Why Design Thinking is the Next Competitive Advantage" by Roger L. Martin



## Start small...



Recipe for success: Design Thinking



Customer testimonial







Design thinking workshops

# 1. Overall Equipment Effectiveness (OEE)



**Visualisation:** dash-  
boarding, mobile app

**Validation:** Proof of capability

**Enabler:** business model  
evolution: pay per usage.



## 2. Predictive maintenance

**Aim:** Higher operational excellence

**Evolution** of maintenance model: corrective => prescriptive

**Enabler:** business model evolution

# 3. Smart data/insights sharing



**Visualisation:** smart integration via API (mngt)

Low-maintenance management


Secure

**Enabler:** business model evolution to e.g. 3<sup>rd</sup> parties.

# 4. Visual inspection of produced goods

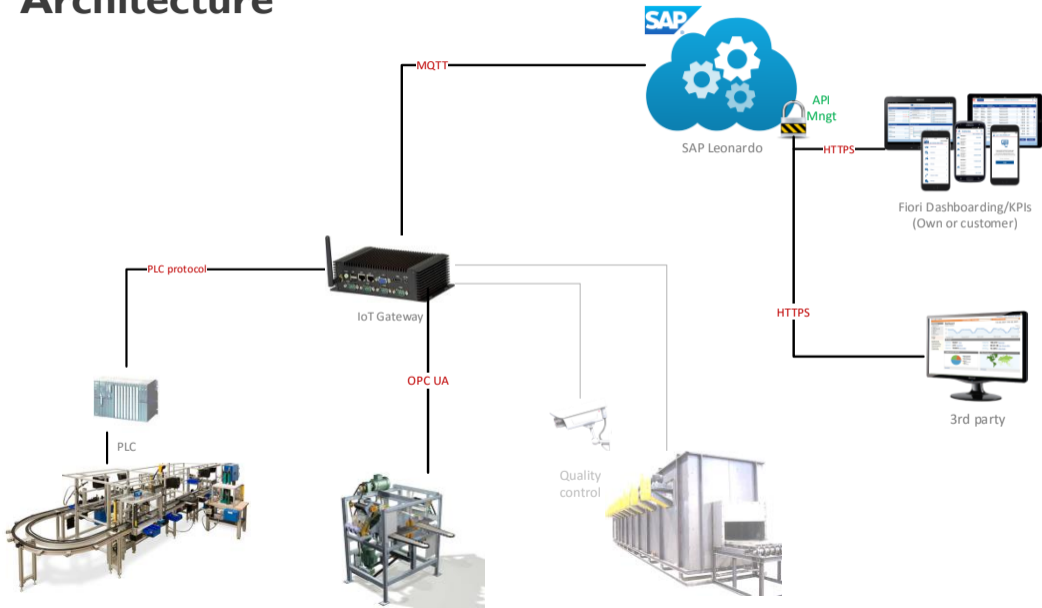


Machine Learning  
**Edge computing** options by SAP Leonardo  
**Enabler**: business model evolution

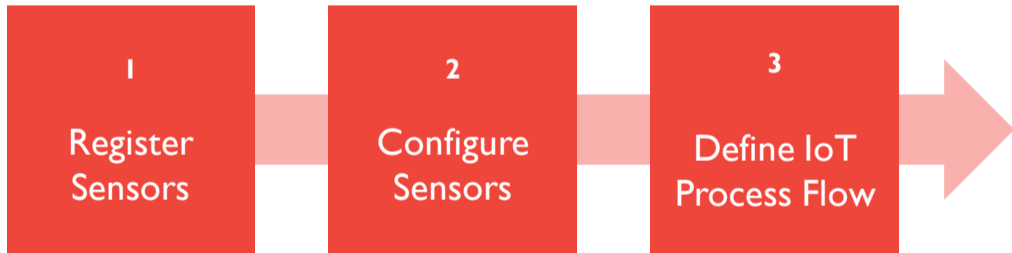
A graphic featuring the text "Leonardo solution" centered on a black background. The text is surrounded by a radial burst of numerous thin, multi-colored lines (including shades of blue, purple, red, and yellow) that emanate from the text, creating a starburst or fireworks effect.

Leonardo solution

# Architecture



# SAP Leonardo – ease of configuration





# SAP Leonardo – ease of configuration

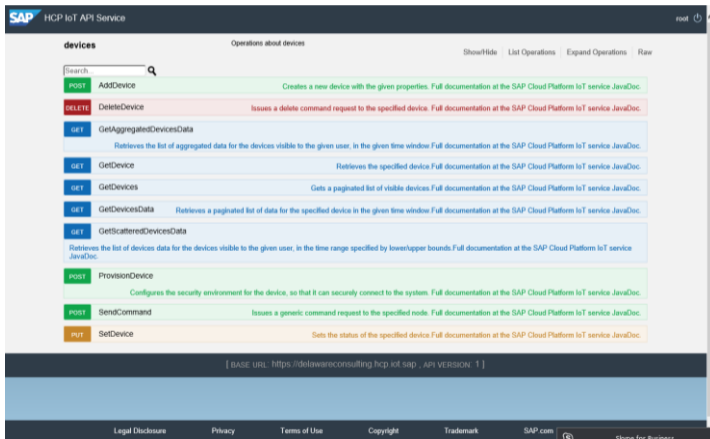
1  
Register  
Sensors

2  
Configure  
Sensors

3  
Define IoT  
Process Flow

## I. Register Sensors (SCP API Service)

Manual or **Fully  
automated** for high  
volumes



The screenshot displays the SAP HCP IoT API Service interface. At the top, it shows the SAP logo and the title "HCP IoT API Service". Below this, there's a navigation bar with "devices" and "Operations about devices". A search bar is present. The main content area lists various API operations, each with a colored button (POST, DELETE, GET) and a brief description. The operations listed are:

- POST AddDevice**: Creates a new device with the given properties. Full documentation at the SAP Cloud Platform IoT service JavaDoc.
- DELETE DeleteDevice**: Issues a delete command request to the specified device. Full documentation at the SAP Cloud Platform IoT service JavaDoc.
- GET GetAggregatedDevicesData**: Retrieves the list of aggregated data for the devices visible to the given user, in the given time window. Full documentation at the SAP Cloud Platform IoT service JavaDoc.
- GET GetDevice**: Retrieves the specified device. Full documentation at the SAP Cloud Platform IoT service JavaDoc.
- GET GetDevices**: Gets a paginated list of visible devices. Full documentation at the SAP Cloud Platform IoT service JavaDoc.
- GET GetDevicesData**: Retrieves a paginated list of data for the specified device in the given time window. Full documentation at the SAP Cloud Platform IoT service JavaDoc.
- GET GetScatteredDevicesData**: Retrieves the list of devices data for the devices visible to the given user, in the time range specified by lower/upper bounds. Full documentation at the SAP Cloud Platform IoT service JavaDoc.
- POST ProvisionDevice**: Configures the security environment for the device, so that it can securely connect to the system. Full documentation at the SAP Cloud Platform IoT service JavaDoc.
- POST SendCommand**: Issues a generic command request to the specified node. Full documentation at the SAP Cloud Platform IoT service JavaDoc.
- PUT SetDevice**: Sets the status of the specified device. Full documentation at the SAP Cloud Platform IoT service JavaDoc.

At the bottom of the interface, there's a footer with the base URL: [ BASE URL: https://delawareconsulting.hcp.iot.sap , API VERSION: 1 ] and a navigation bar with links for Legal Disclosure, Privacy, Terms of Use, Copyright, Trademark, SAP.com, and a logo for SAP Leonardo.



# SAP Leonardo – ease of configuration

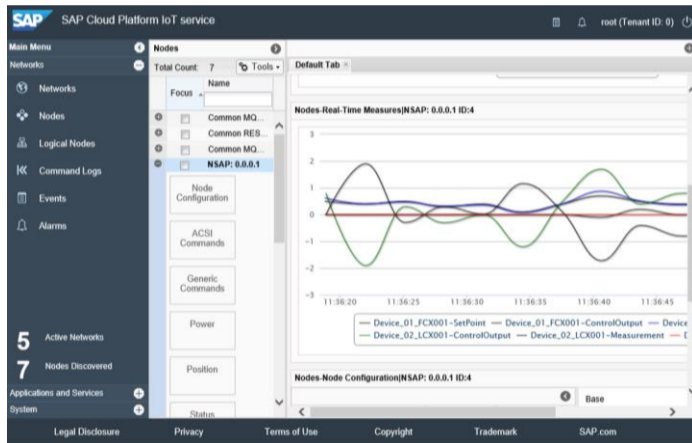
1  
Register  
Sensors

2  
Configure  
Sensors

3  
Define IoT  
Process Flow

## 2. Mngt Sensors (SCP IoT Service)

Full bi-directional  
management of sensors



# SAP Leonardo – ease of configuration

1

Register  
Sensors

2

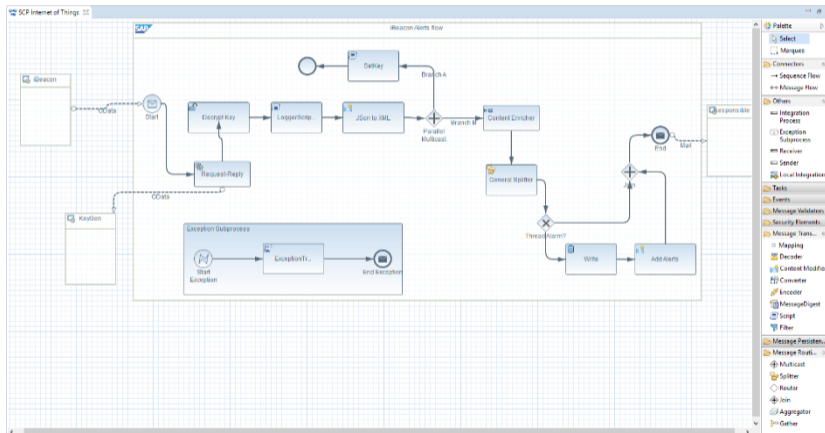
Configure  
Sensors

3

Define IoT  
Process Flow

## 3. Define IoT Process Flow (BPM Flow)

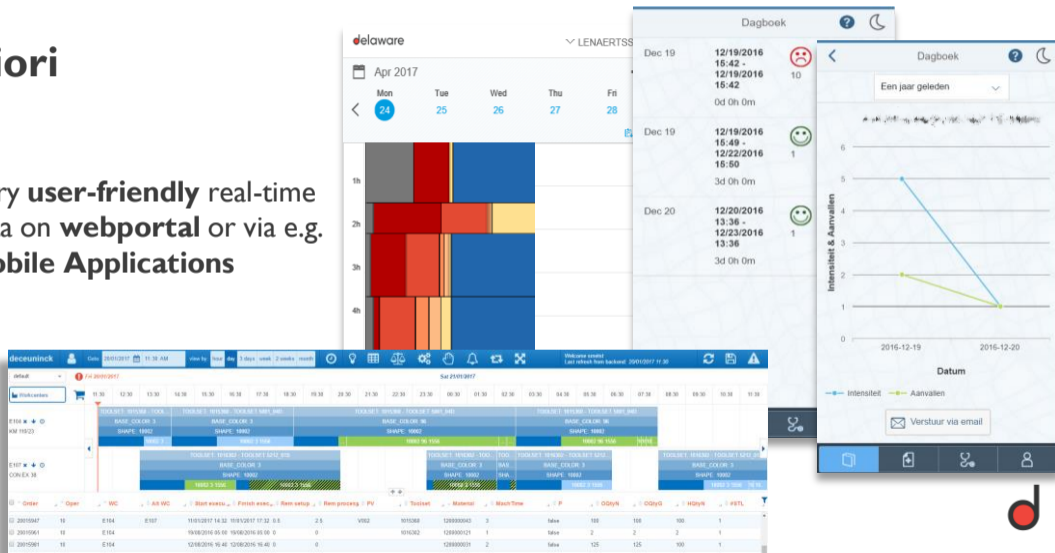
Insert **intelligence**  
in received data  
packages



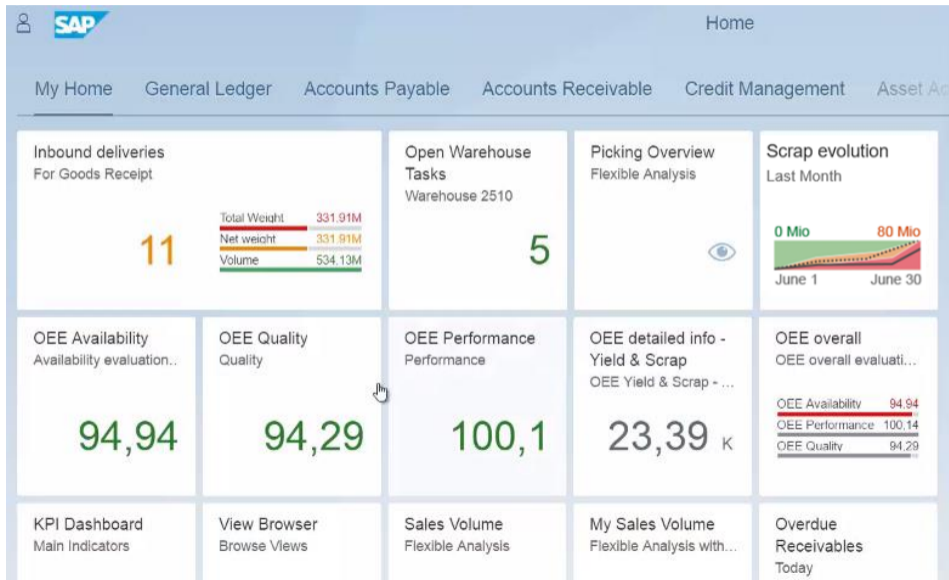
# SAP Leonardo – ease of presentation

## I. Fiori

Very user-friendly real-time data on **webportal** or via e.g. **Mobile Applications**



# SAP Leonardo – ease of presentation



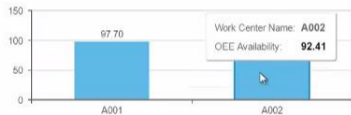
# SAP Leonardo – ease of presentation



OEE Picking Today Sales Issues Purchasing Details

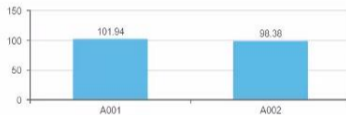
### Availability per Work Center

**94.94**



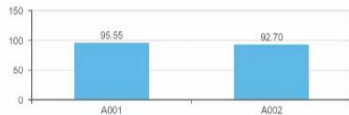
### Performance per Work Center

**100.14**

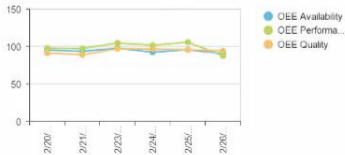


### Quality per Work Center

**94.29**



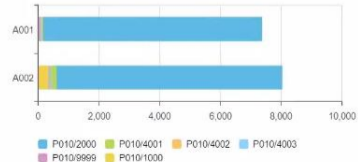
### OEE over Time



### Scrap & Yield per Work Center



### Reasons Downtime by Duration



# SAP Leonardo – ease of presentation



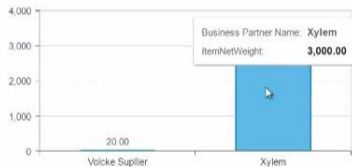
Overdue Orders i

37

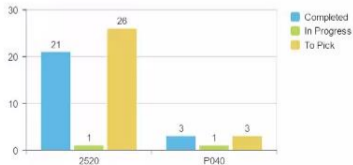
To Pick Overdue i



In Progress Overdue i



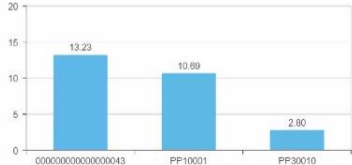
Picking Per Warehouse i



Completed Over Time i



Average Leadtime per Product i



# SAP Leonardo – ease of presentation

OEE Picking Today Sales Issues Purchasing Details



Search 

## MEASURES

- ItemGrossWeight
- ItemNetWeight
- ItemVolume
- Number of Outb...
- Average Picking...
- Average Picking...

## DIMENSIONS

- Warehouse
- Product Name
- ActivityArea
- Product
- StorageSection
- Picking Deadlin...
- Business Partn...
- Warehouse Na...

## COLUMNS

Measures

Filter Members

Select All Members

Suppress Zeros in Columns

Compact Display in Columns

Drilldown by...

Swap With... >

Remove Drilldown

Swap Axes

Undo Previous Step

Back to Start

## ROWS

Wareh...

Status

	A	B	C	D	E	F
1			Measures			
2	Warehouse	Status	ItemGrossWeight	ItemNetWeight	ItemVolume	Number of Outbound Delivery Orders Average
3	2520	Completed	1.560.00	1,360.00	1,000.00	21
4		In Progress	20.00	20.00	0.00	1
5		To Pick	870.00	770.00	500.00	26
6	P040	Completed	1.692.00	1,410.00	92.00	3
7		In Progress	3.600.00	3,000.00	200.00	1
8		To Pick	101,538.00	84,615.00	5,640.00	3
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						



# SAP Leonardo – ease of presentation



Switch Domain

- Sales
- Purchasing
- Inventory

Search

Stock Material

Customer SID

Stock Type

Special Stock

Company Code


Country Key

Base Unit of Measure





**Business Benefit**

A blue computer mouse is the central focus, resting on a desk. In the background, a black keyboard is partially visible. To the right, a white coffee cup with brown horizontal stripes sits on the desk. A black pen lies in the lower right corner. The desk surface is covered with various documents, including one with the heading 'Tax Incentive' and another with 'Investment Report'.

**Real-time data  
ingestion and live  
streaming analytics**


**Easily manage millions  
of IoT devices and  
gateways**

**Secure integration  
services**

**Integrate with core  
business processes**

**Data processing at the  
device 'edge'**

**Scalability and  
flexibility**



Lessons learned

## **Getting data outside customer walls**

**Facilitate:** what's your customers added value?



Security



Shift

# START SMALL **THINK BIG**

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**Start small** today with Leonardo

**Think big** by defining the strategy for the long term, from the start



# delaware

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0032/473/36.15.20

