delaware

SAP Leonardo

Internet of Things

by Bruno Mommens
delaware

1600 Professionals
225 mio $ revenue
25 offices in 13 countries

USA Brazil

Belgium The Netherlands UK France Luxembourg Hungary

Dubai

China Singapore Hong Kong Malaysia Philippines
Customer journey
IoT Knowledge funnel

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

Mystery phase
Heuristic phase
Algorithm phase
Start small…

1. Connect
   Connect sensor, experiment, …

2. Deliver
   Add AI, ML. Optimise Logistics/production, …

3. Grow revenue
   Cross departments, not only OT/IT

4. Grow ecosystem
   Going beyond company borders

Recipe for success: Design Thinking
Customer testimonial
Design thinking workshops
Overall Equipment Effectiveness (OEE)

Visualisation: dashboarding, 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. 3rd parties.
4. **Visual inspection of produced goods**

**Machine Learning**

**Edge computing** options by SAP Leonardo

**Enabler**: business model evolution
Leonardo solution
Architecture

MQTT

SAP Leonardo

API Mngt

HTTPS

Fiori Dashboarding/KPIs (Own or customer)

HTTPS

3rd party

PLC protocol

OPC UA

Quality control

HTTPS

3rd party

Fiori Dashboarding/KPIs (Own or customer)
SAP Leonardo – ease of configuration

1. Register Sensors
2. Configure Sensors
3. Define IoT Process Flow
SAP Leonardo – ease of configuration

1. Register Sensors (SCP API Service)

Manual or **Fully automated** for high volumes
SAP Leonardo – ease of configuration

2. **Mngt Sensors** (SCP IoT Service)

Full bi-directional **management** of sensors
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

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
**SAP Leonardo – ease of presentation**

![Image of SAP Leonardo dashboard](image)

<table>
<thead>
<tr>
<th>Measure</th>
<th>ItemGrossWeight</th>
<th>ItemNetWeight</th>
<th>ItemVolume</th>
<th>Number of Outbound Delivery Orders</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warehouse 2300</td>
<td>1,560.00</td>
<td>1,360.00</td>
<td>1,000.00</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Status</td>
<td>Completed</td>
<td>In Progress</td>
<td>To Pick</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PO40</td>
<td>870.00</td>
<td>770.00</td>
<td>800.00</td>
<td>26</td>
<td>3</td>
</tr>
<tr>
<td>Status</td>
<td>Completed</td>
<td>In Progress</td>
<td>To Pick</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warehouse PO40</td>
<td>1,292.00</td>
<td>1,410.00</td>
<td>92.00</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Status</td>
<td>In Progress</td>
<td>To Pick</td>
<td></td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Warehouse PO40</td>
<td>3,600.00</td>
<td>3,000.00</td>
<td>200.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Status</td>
<td>In Progress</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warehouse PO40</td>
<td>101,538.00</td>
<td>84,615.00</td>
<td>5,640.00</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Status</td>
<td>To Pick</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SAP Leonardo – ease of presentation
Business Benefit
Easily manage millions of IoT devices and gateways.

Secure integration services.

Real-time data ingestion and live streaming analytics.

Data processing at the device ‘edge’.

Scalability and flexibility.

Integrate with core business processes.
Lessons learned
Getting data outside customer walls

Facilitate: what’s your customers added value?
Start small today with Leonardo
Think big by defining the strategy for the long term, from the start