

# LIFERAY IOT EXPERIENCE

The platform that makes Liferay ready for Industry 4.0

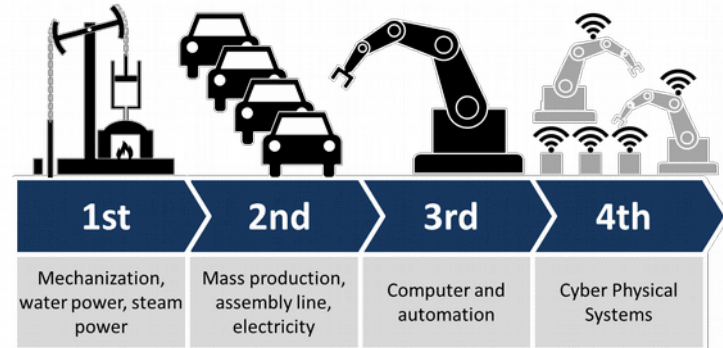
Mauro Mariuzzo  
Chief Software Architect, SMC Treviso



#redhatosd

# INDUSTRY 4.0

We are in the forth industrial revolution



For a factory or system to be considered Industry 4.0, it must include:

- Interoperability
- Information transparency
- Technical assistance
- Decentralized decision-making

(Bernard Marr, Forbes, Jun 20 2016)

# Internet of Things - Perception

For most people it is only Home Automation (as end-user)



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(as end-user)



For some other is a new way to do  
DDoS attack or build a botnet

# Internet of Things - Perception

Perception of IoT and what it means  
is bind to user experience.

Go beyond your (first) impression



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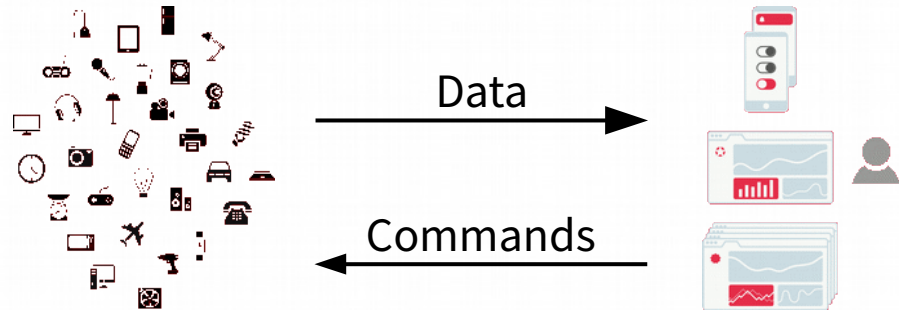
Previously on

# Liferay IoT Experience at DevCon 2016



# Internet of Things

- Thing  
Every physical or virtual element able to produce data or execute command

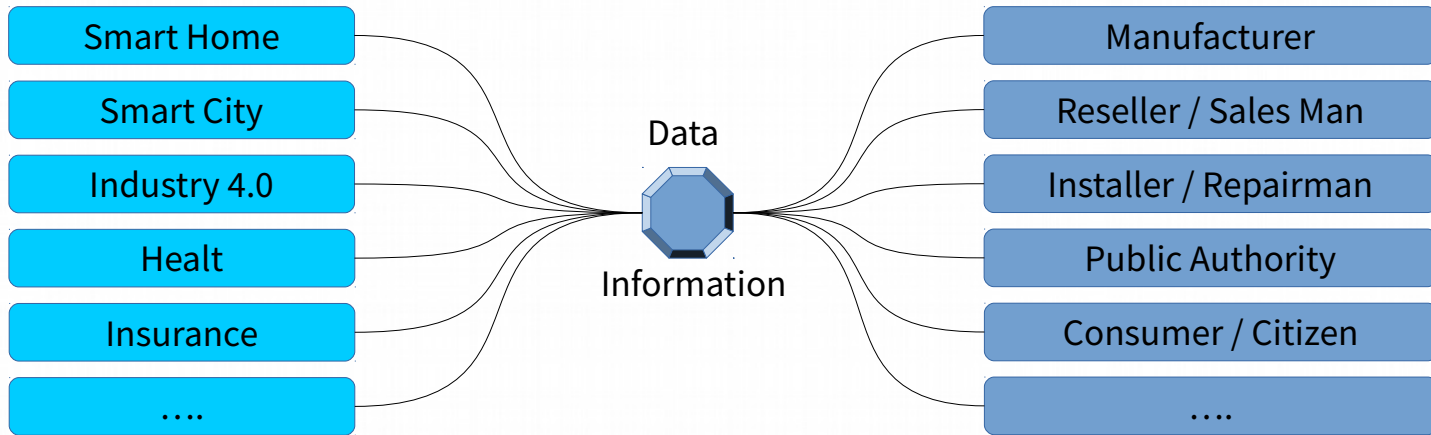


- Data vs Information  
A “data” is a simple observation of a phenomenon. An “information” provide the contextualization

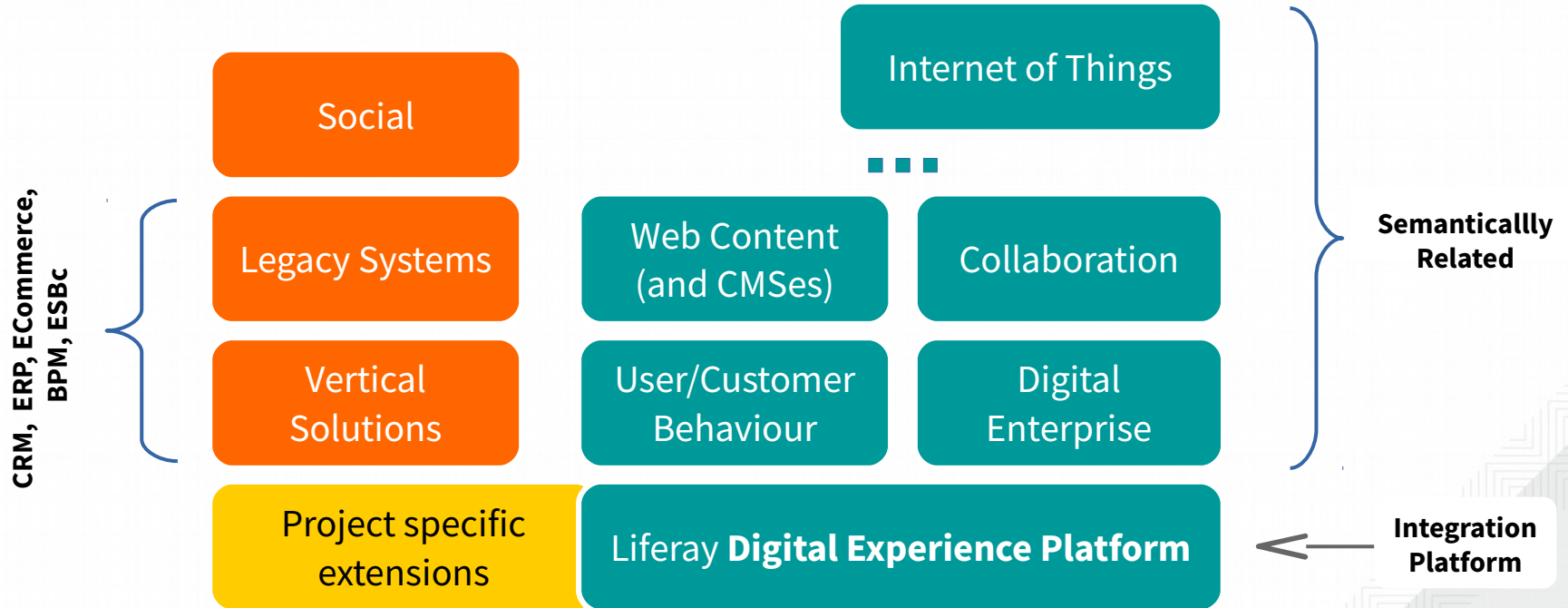


# Internet of Things - Point of View

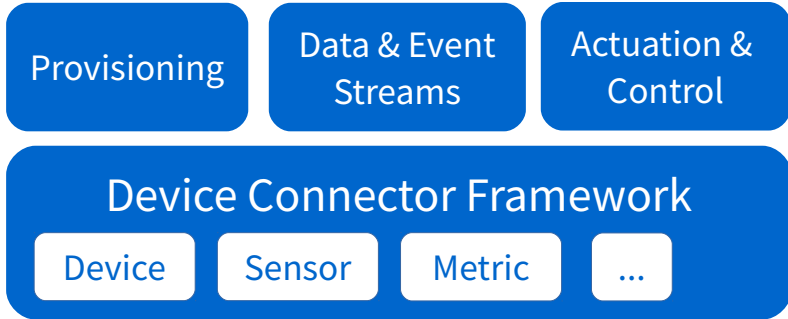
The same data generate multiple informations. The same information has different values or meaning depending on user



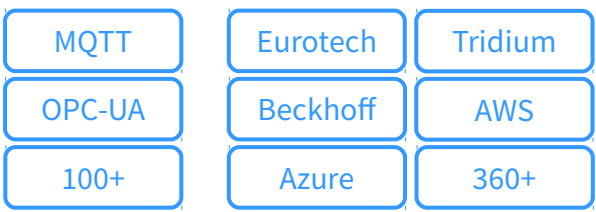
# Internet of Things - Why Liferay



# Liferay



# Provider



# Proof of Concept: Winery

IoT elements becomes Asset. I can use it into CMS

The screenshot displays a CMS interface with a blue header and a navigation sidebar on the left. The main content area features an article titled "Tuscany Wine Production" with a timestamp of 11:9:16 6:57 AM. The article text describes the region's wine production, mentioning grape varieties like Sangiovese and Vernaccia, and historical classifications like DOC and DOCG. Below the article, there are sections for "Related Assets" and "Related Assets:" with links to "Humidity (%)" and "Temperature (C°)".

**ASSET PUBLISHER**

### < Tuscany Wine Production

11:9:16 6:57 AM

Tuscan wine (Italian Toscana) is Italian wine from the Tuscany region. Located in central Italy along the Tyrrhenian coast, Tuscany is home to some of the world's most notable wine regions. Chianti, Brunello di Montalcino and Vino Nobile di Montepulciano are primarily made with Sangiovese grape whereas the Vernaccia grape is the basis of the white Vernaccia di San Gimignano. Tuscany is also known for the dessert wine Vin Santo, made from a variety of the region's grapes. Tuscany has thirty-three Denominazioni di origine controllata (DOC) and nine Denominazioni di Origine Controllata e Garantita (DOCG). In the 1970s a new class of wines known in the trade as "Super Tuscans" emerged. These wines were made outside DOC/DOCG regulations but were considered of high quality and commanded high prices. Many of these wines became cult wines. In the reformation of the Italian classification system many of the original Super Tuscans now qualify as DOC or DOCG wines (such as the new Bolgheri label) but some producers still prefer the declassified rankings or to use the Indicazione Geografica Tipica (IGT) classification of Toscana. Tuscany has five sub-categories of IGT wines today.

Related Assets:

- Humidity (%)
- Temperature (C°)

**RELATED ASSETS**

MQTT Organic Site Production > Tuscan Wine Cellar Monitoring > Temperature (C°)

- Temperature (C°)
- Measures temperature
- Apiculture

Related Assets:

- Tuscany Wine Production

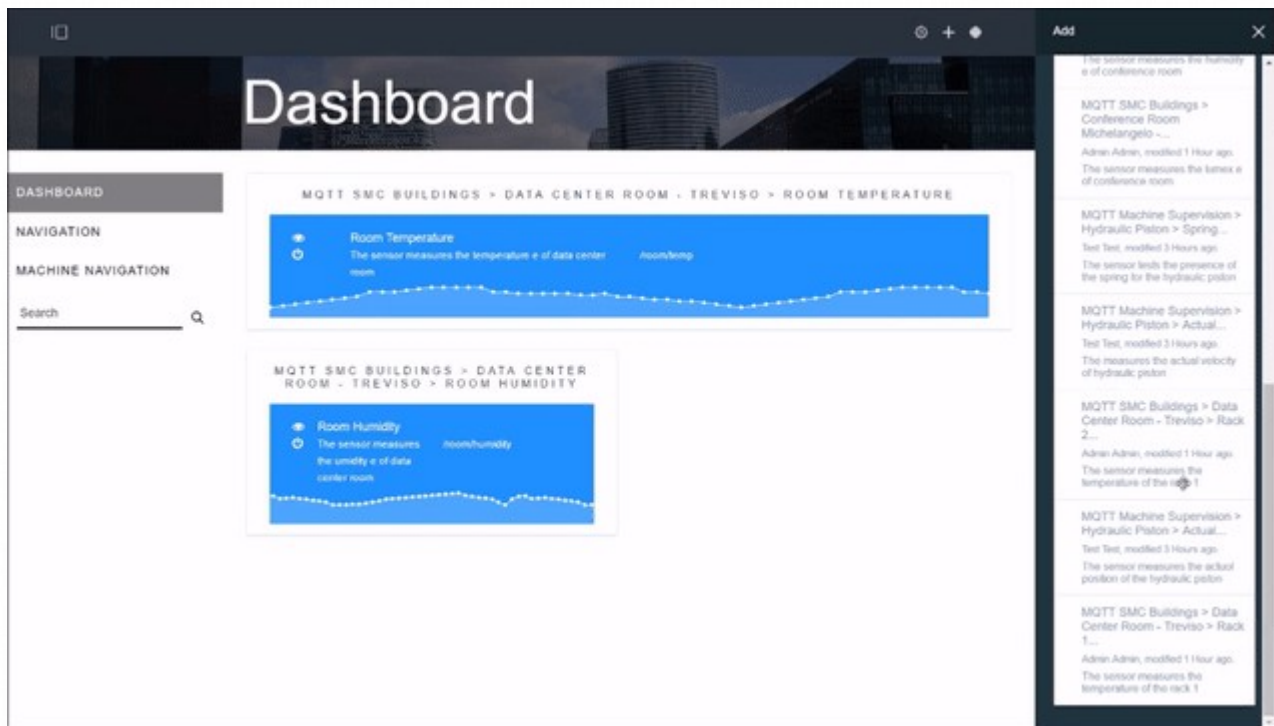
MQTT Organic Site Production > Apulian Olive Grove Monitoring > Humidity (%)

- Humidity (%)
- Measures humidity
- Apulian Olive Grove

Related Assets:

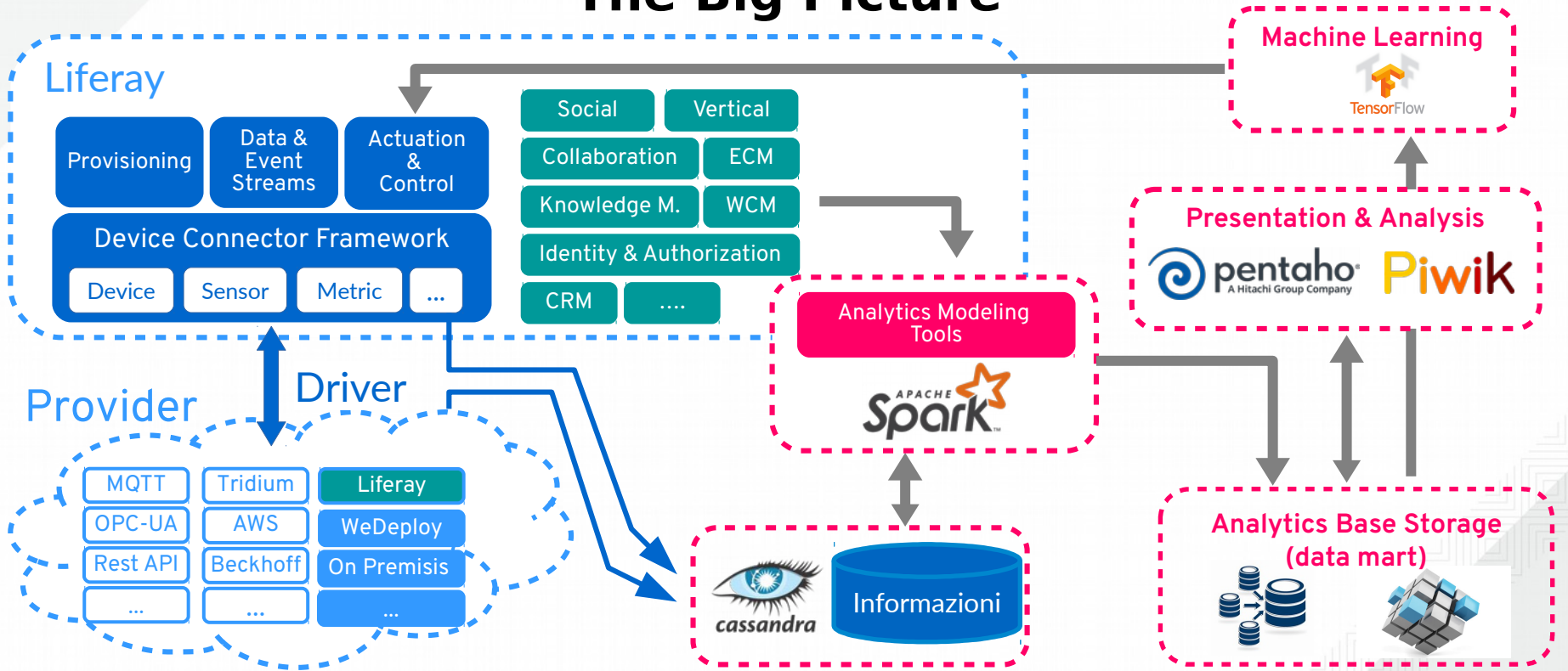
- Olive oil production
- Tuscany Wine Production

# Proof of Concept: Dashboard and Navigation



# Liferay IoT Experience

## The Big Picture



# Liferay IoT Experience

Part 2



# Industry Point of View

Three big pillar:

- Product Experience
- Manufacturing
- Support and Feedback (give value on)



# Smart Product Experience

- Unique Identifier

# Smart Product Experience

- Unique Identifier
- Provisioning
  - Customer
  - Product for Customer
  - Multiple Owner

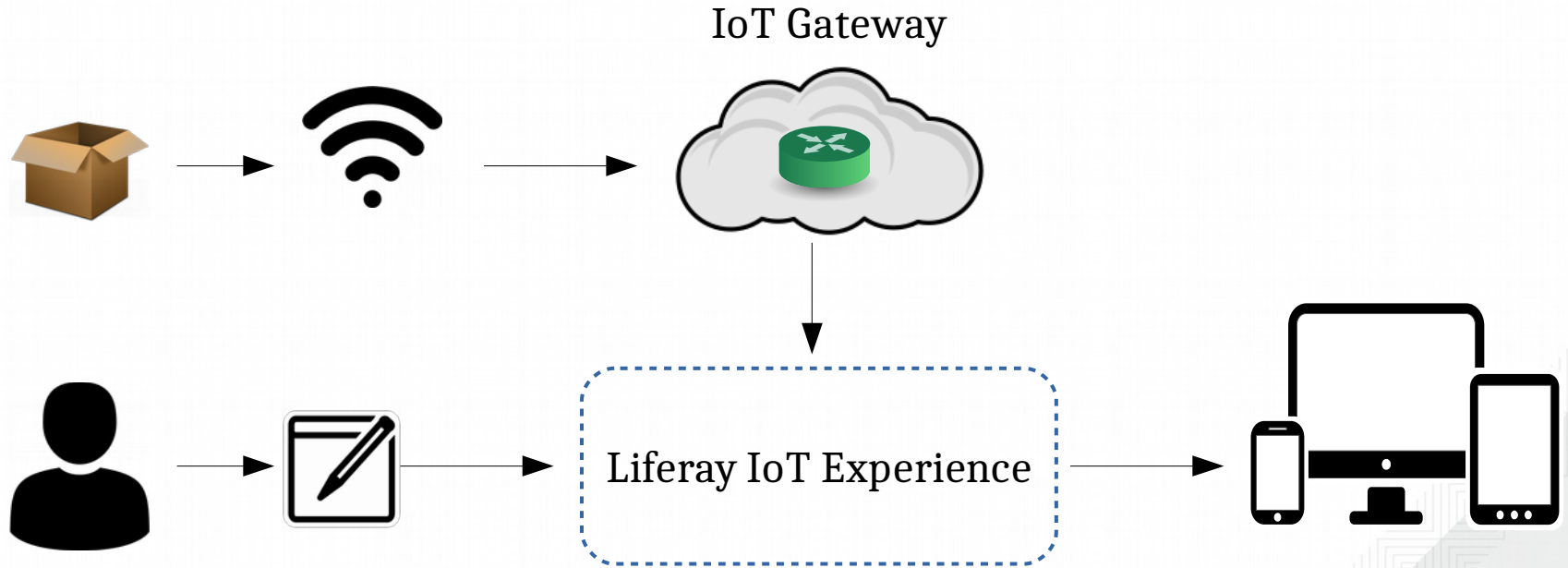
# Smart Product Experience

- Unique Identifier
- Provisioning
  - Customer
  - Product for Customer
  - Multiple Owner
- Device Management
  - Connectivity
  - Configuration
  - Monitoring
  - Firmware Upgrade

# Smart Product Experience

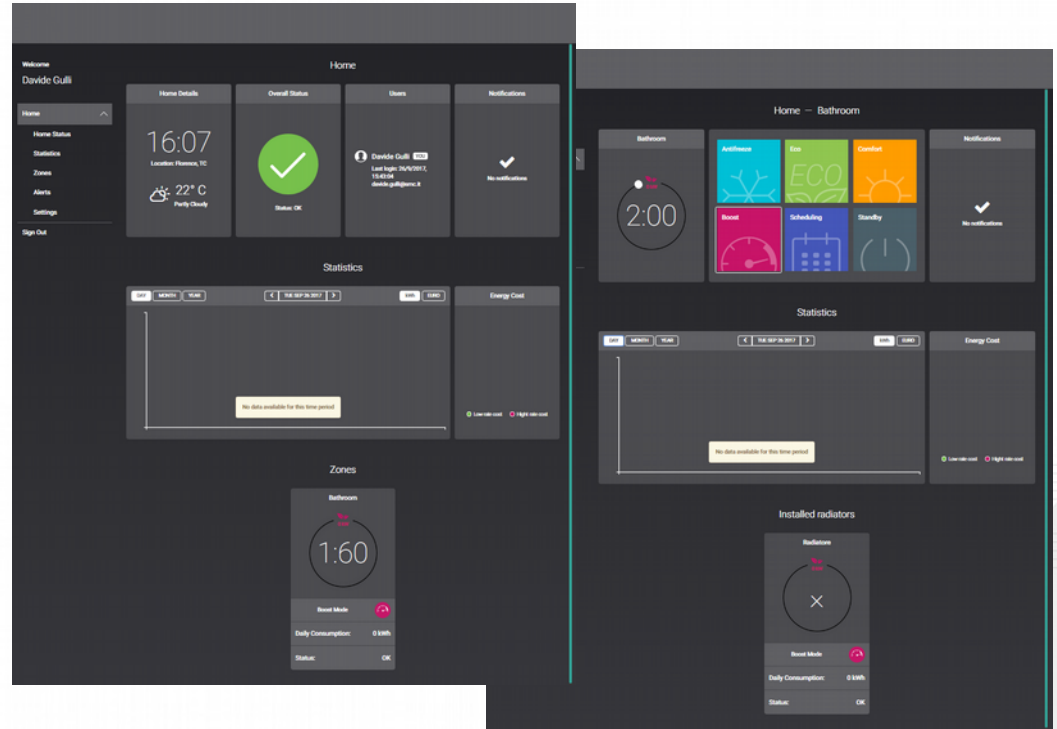
- Unique Identifier
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- Device Management
  - Connectivity
  - Configuration
  - Monitoring
  - Firmware Upgrade
- Channel
  - Web Portal
  - Mobile App
  - Device Panel

# Smart Product Flow



# Smart Product End User

- “Static” Dashboard
- “Static” Navigation
- Limited customization

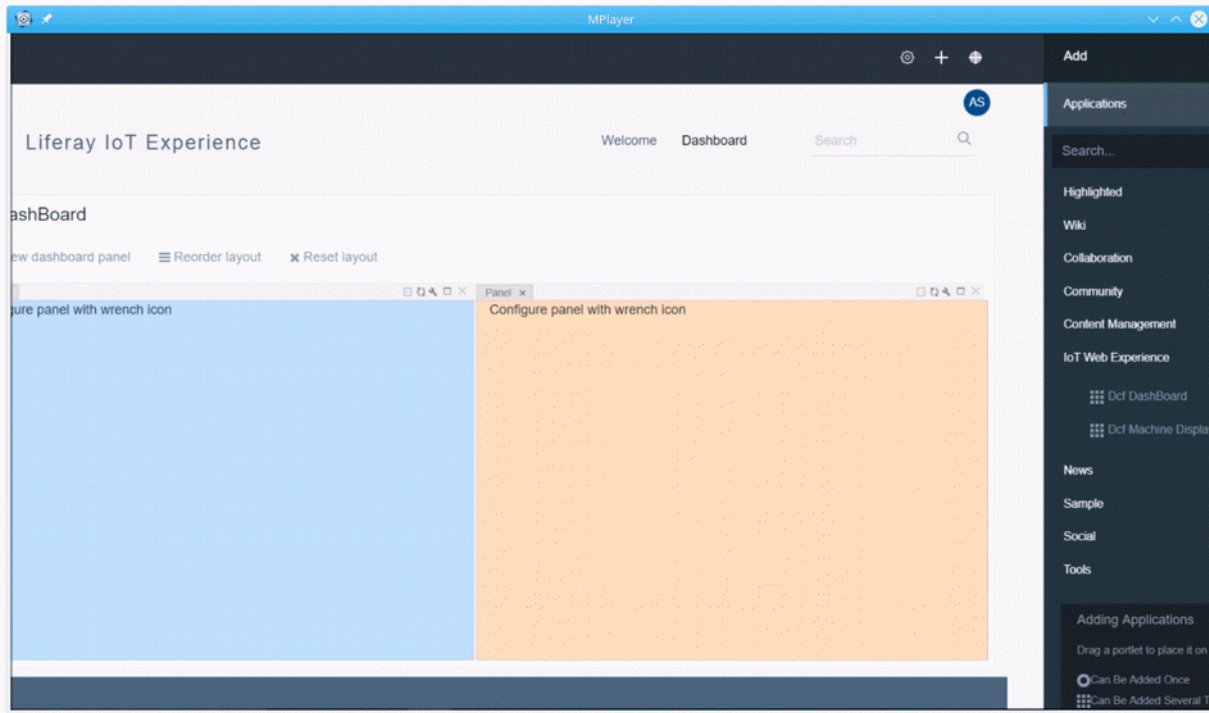


# Smart Product Industry User

- Static and dynamic Dashboard
- More customization options



# Smart Product Dynamic Dashboard





# Manufacturing

Boss needs answers

- How much time, and resources, I spent to realize a single product?
- Am I using my machinery efficiently?
- How much can I increase my production without new investments?
- Am I able to prevent delay or failure?

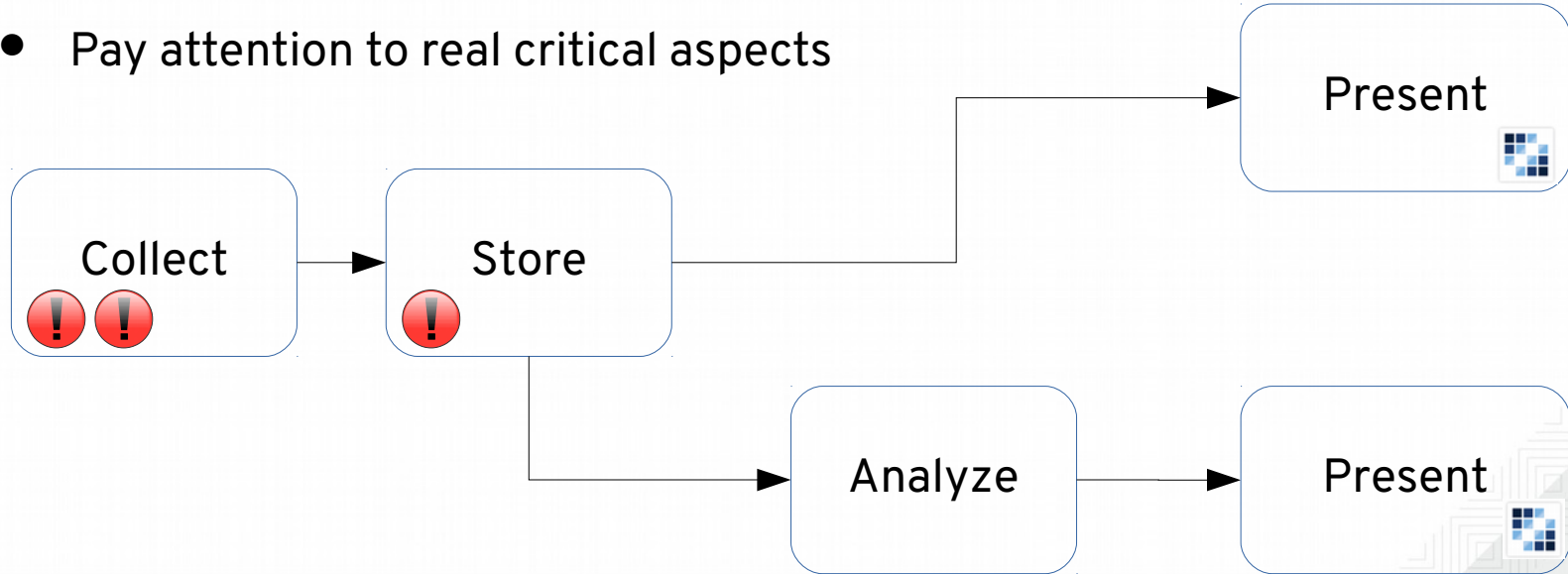


# Industrial Internet of Things

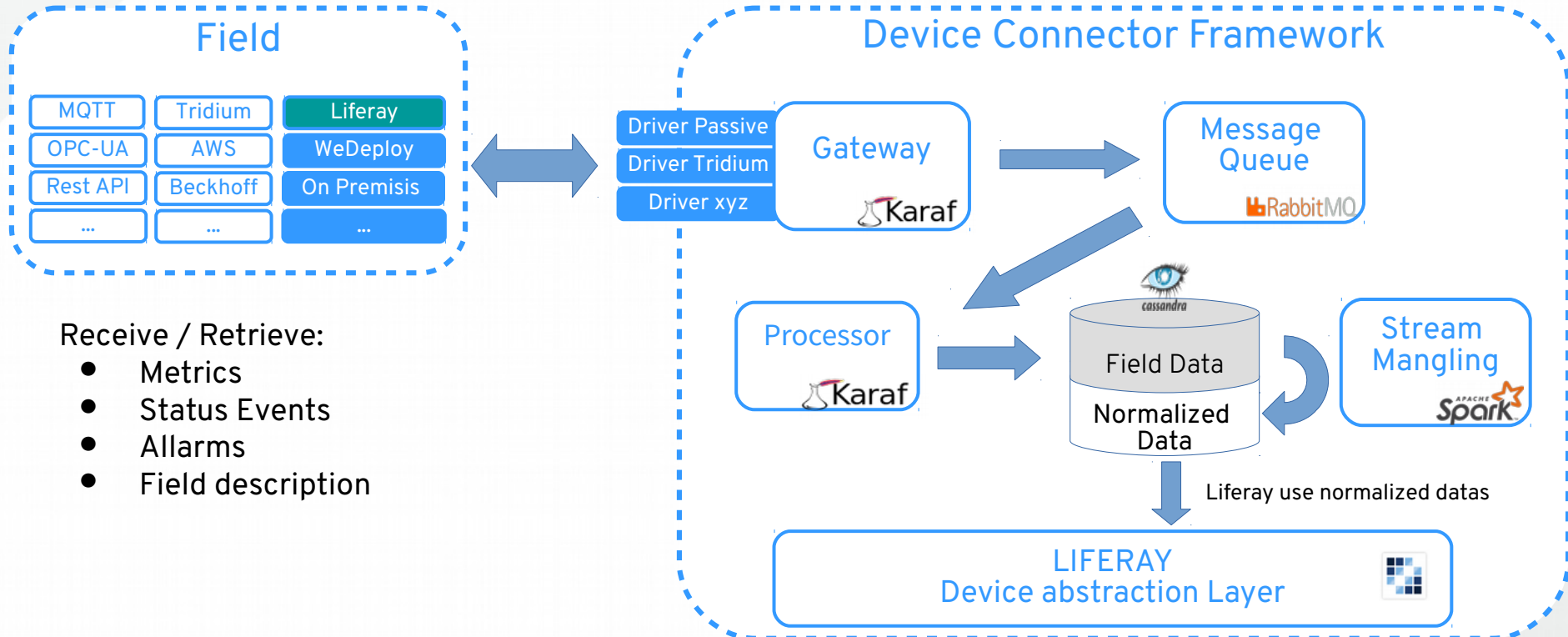
- Is a project requiring planning

# Industrial Internet of Things

- Is a project requiring planning
- Pay attention to real critical aspects



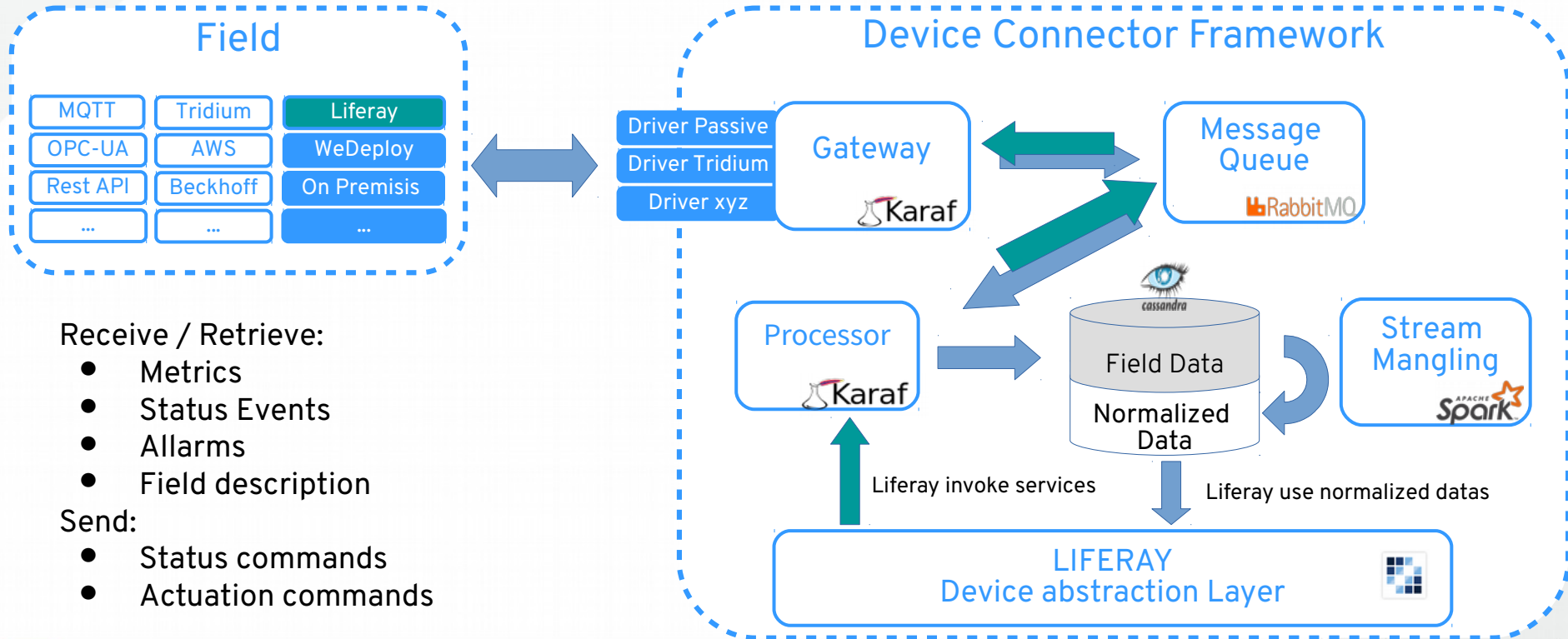
# Data Ingestion and Commands



Receive / Retrieve:

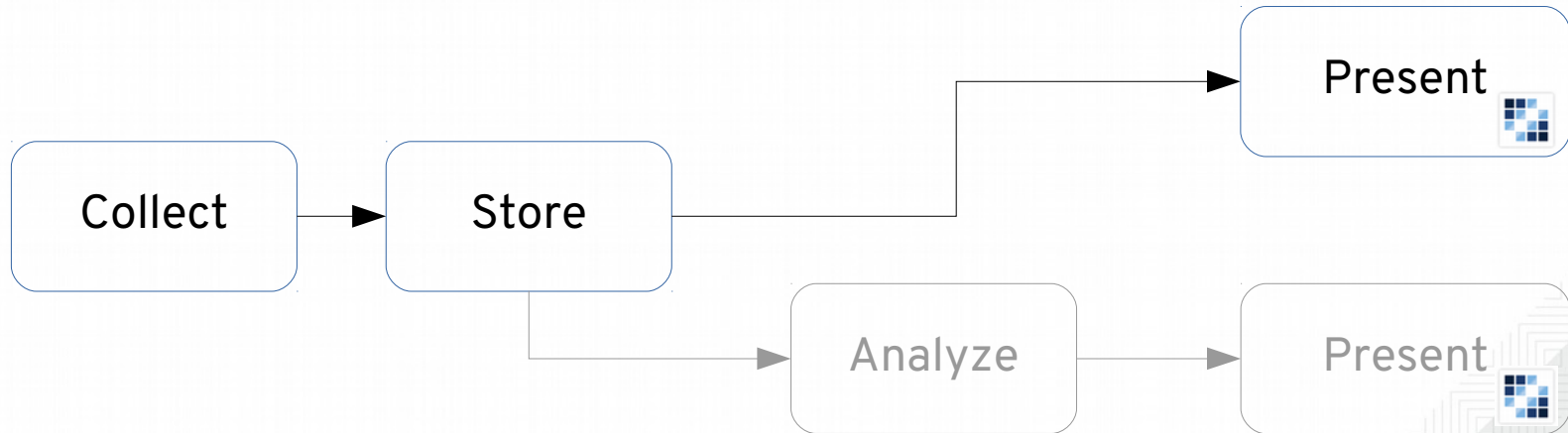
- Metrics
- Status Events
- Allarms
- Field description

# Data Ingestion and Commands



# Industrial IoT Hot Path

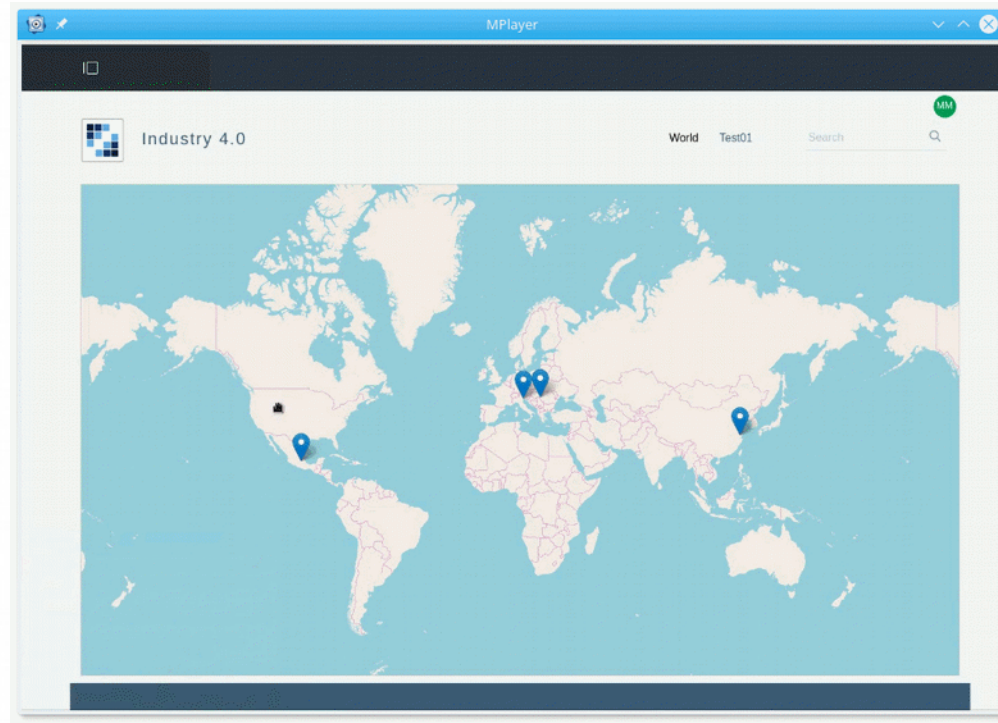
- (near) real-time feedback to different actors
  - Boss
  - Maintainer
  - Manager



# Machine Plant Navigation

- Drill up, Drill down navigation
- Geo Localization and Micro Localization
- Derived metrics or attributes
- Dynamic dashboard
- ... more to come

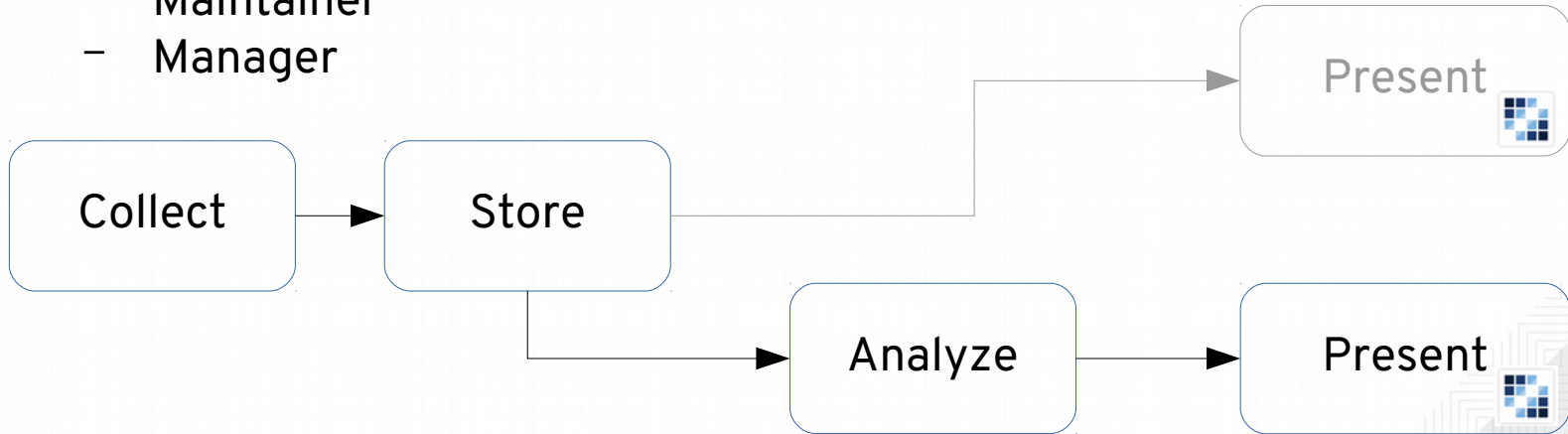
# Machine Plant Navigation





# Industrial IoT Cold Path

- Data aggregation, enrichment, transformation
- Feedback for different actors
  - Boss
  - Maintainer
  - Manager



# Data Analysis, Prediction, Machine Learning

- Things to consider
  - Big Data
  - Quality Data
  - Goals
- Is a never ending process

# Analytics Experience

- Data Knowledge
  - Data sources definition
  - Metadata definition
  - Relations

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  - We have more, with specific datas

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- Action
  - Use the most suitable tool for the purpose

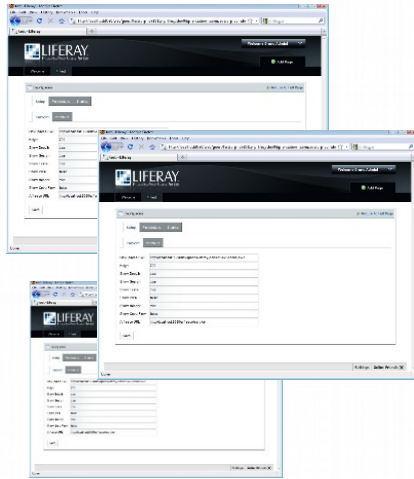
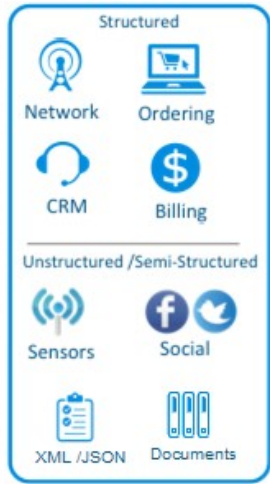
# Analytics Experience

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- Data Mart
  - We have more, with specific datas
- Action
  - Use the most suitable tool for the purpose
- Goal!
  - Take the decision
  - Results could be a quality data?

# Analytics Experience

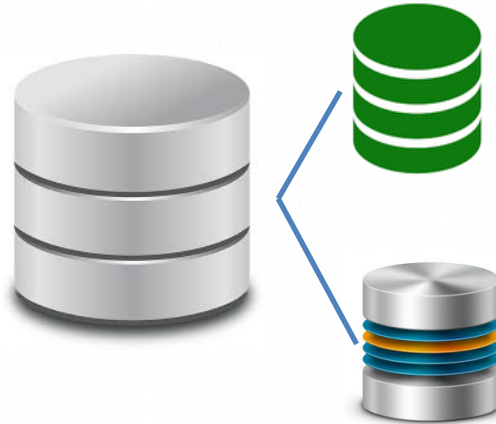
## DATA KNOWLEDGE (LIFERAY)

SOURCES + CONFIGURATION



## DATA ANALYSIS AND PRESENTATION

STORAGE + ANALYTIC MODELS + PRESENTATION





# Liferay IoT Experience

The platform that makes Liferay ready for Industry 4.0

Thank you!

# Liferay IoT Experience

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## Contacts



**Mauro Mariuzzo**  
M2M Team – SMC Treviso  
mauro.mariuzzo@smc.it  
@MariuzzoMauro



**Davide Gulli**  
M2M Team – Smc Roma  
davide.gulli@smc.it  
@davide\_gulli



**Rocco Germinario**  
Analytics Team – SMC Treviso  
rocco.germinario@smc.it



**Paolo Bianchi**  
Analytics Team – Smc Treviso  
Paolo.bianchi@smc.it  
@PaoloBianchi\_TV



**Federico Cosentino**  
M2M Team – SMC Roma  
federico.cosentino@smc.it



**Mauro Celani**  
M2M Team – Smc Roma  
mauro.celanu@smc.it

## Credits

- <https://www.forbes.com/sites/bernardmarr/2016/06/20/what-everyone-must-know-about-industry-4-0/#6eac238e795f>

## Images and pictures

- Christoph Roser at “AllAboutLean.com”
- <http://www.freepik.com>
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# RED HAT OPEN SOURCE DAY

Europe, Middle East & Africa



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