Solving Industry problems with AI & IOT

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Global Head – IOT Solutions Engineering

17th October 2018

x

A successful global business
$8 billion in revenue with 160K employees in 62 countries

- 2017 Launched new Brand Identity and rearticulated the "Sprit of Wipro"
- 2014 Launched "Wipro Digital"
- 2000 Listed in the NYSE and enters the BPO business
- 1990 Wipro enters the IT Software business
- 1986 Entry to outsourced R&D business
- 1982 Entry to IT hardware business
- 1945 Incorporation of Western India Vegetable Products Ltd

business units & service lines

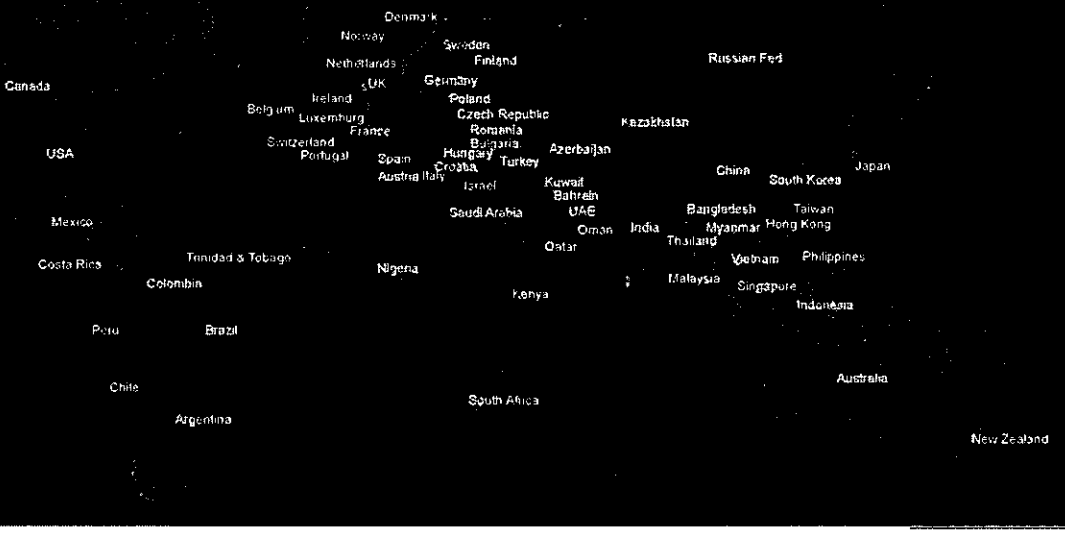
- Banking, Financial Services & Insurance
- Manufacturing & Technology
- Consumer
- Healthcare, Life Science & Services
- Energy, Natural Resources & Utilities
- Communications

- Modern Application Services
- Cloud Infrastructure Services
- Business Process Services
- Cyber Security & Risk Services
- Industrial & Engineering Services
- Data, Analytics and Artificial Intelligence
- Digital & Consulting *

*Digital & Consulting Revenues are part of the Service line ecosystem

Our global presence

Global team

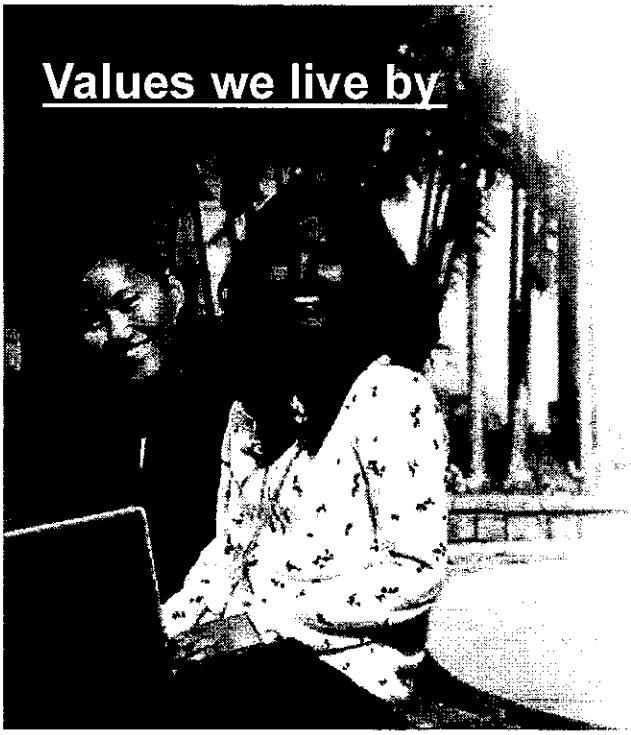


Digital Pods

Aarhus, Barcelona, Berlin, Copenhagen, Lima, London, Madrid, Medellin, Munich, New York, Oslo, San Francisco, Stockholm, Riyadh, Tokyo, Melbourne, Gdansk, Sydney, Bangalore, Mountain View, Dublin, Edinburgh

*As of FY Q1 2018-19

Values we live by

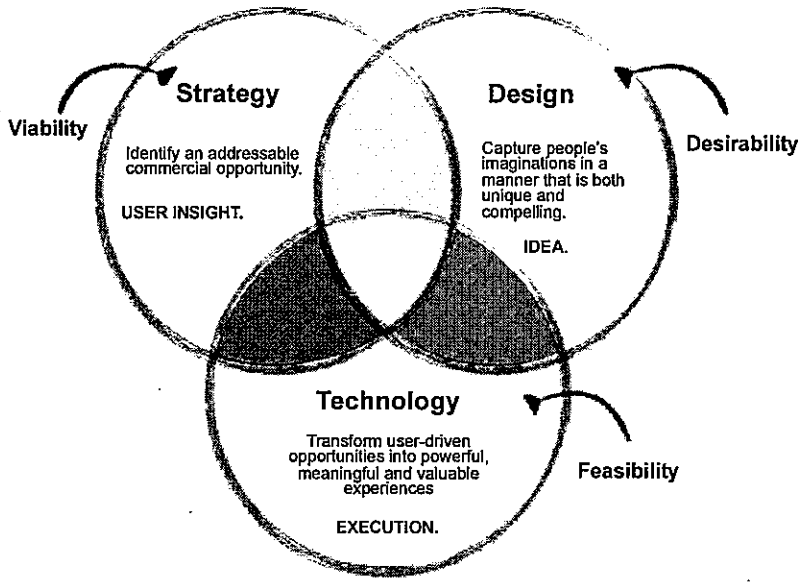


- Be passionate about clients' success
- Treat each person with respect
- Be global and responsible
- Unyielding integrity in everything we do

Digital transformation & internet of things

Curating value at the intersection of Strategy, Design and Technology to deliver outcomes.

Focus on business outcomes, experiences



Wipro in IoT

Internet of Things

6500+
digital and IOT experts

100+
engagements across the industries and geographies

1500+
edge expertise

3000+
platform (incl. Analytics)

2000 +
enterprise

2000+
domain experts

Driving Innovation

C4IR: Founding Member, global, multi-stakeholder cooperation to develop policy frameworks and advance collaborations

WEF: Contributing member

IIC: Contributing member to the premier industrial IoT forum

IEEE : Contributing Member. Defining IoT standards

LoRA Alliance: Contributing Member

Recognition

Zinnov rates Wipro as a leader in their IoT Technology Services mapping

Gartner qualifies Wipro as the only Indian Provider with capabilities in consulting (Bus. & Tech.), Implementation, MS and Prod Design

NelsonHall rates Wipro as a leader under all categories in the NelsonHall vendor Evaluation & Assessment Tool (NEAT) for IoT

IDC highlights Wipro's IoT engagement with JCB India as a case study for best practices

Memberships
Industry Exposure

Accolades
Our Proof Points

Offerings: sensor to cloud, strategy to operations

Edge

- Hardware design & selection
- Firmware design & programming
- Connectivity & device agents
- Protocol integration - OPC, PLC, serial, Profibus, Ethernet, Modbus, OBDII, CAN etc.
- Edge intelligence & analytics

Connectivity

- Long range and short range communication enablement
- Integration with CSP's

Hosting

- Infrastructure/cloud management
- On premise
- Wipro cloud
- Public cloud providers
- Private clouds

Platform

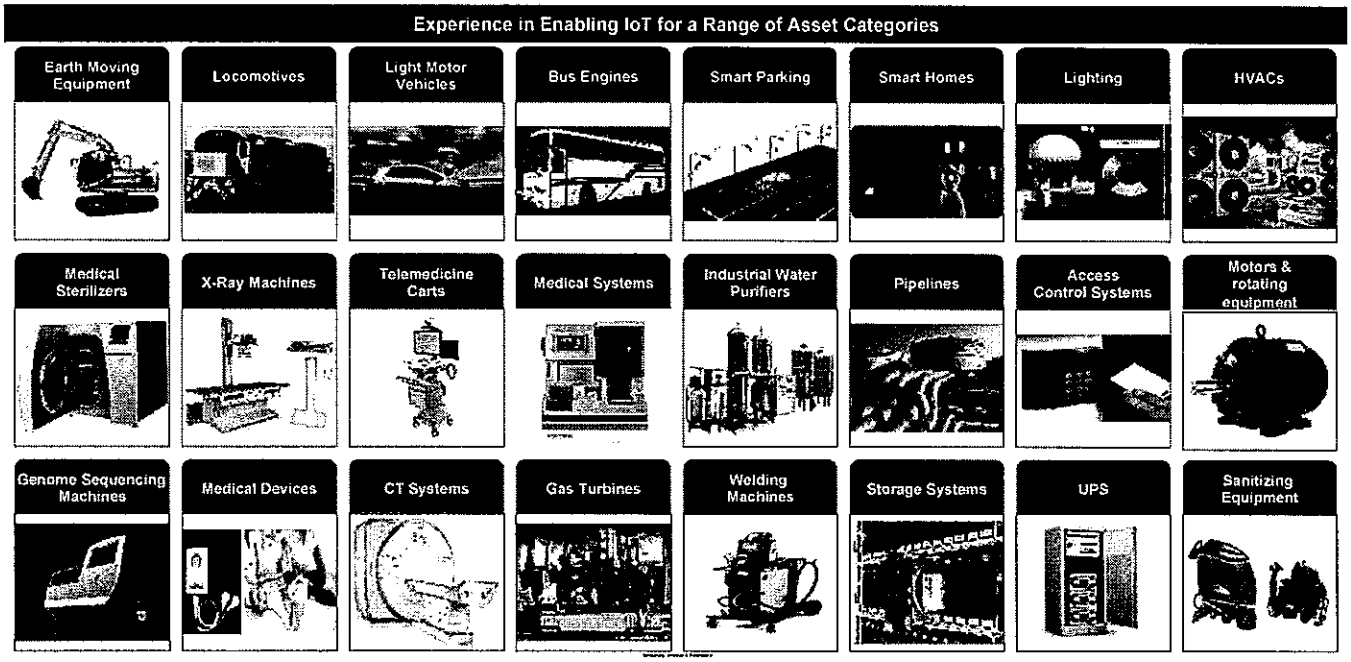
- Asset management
- CoE's on major IoT platforms
- Customized implementations
- Technology integrations

Enterprise

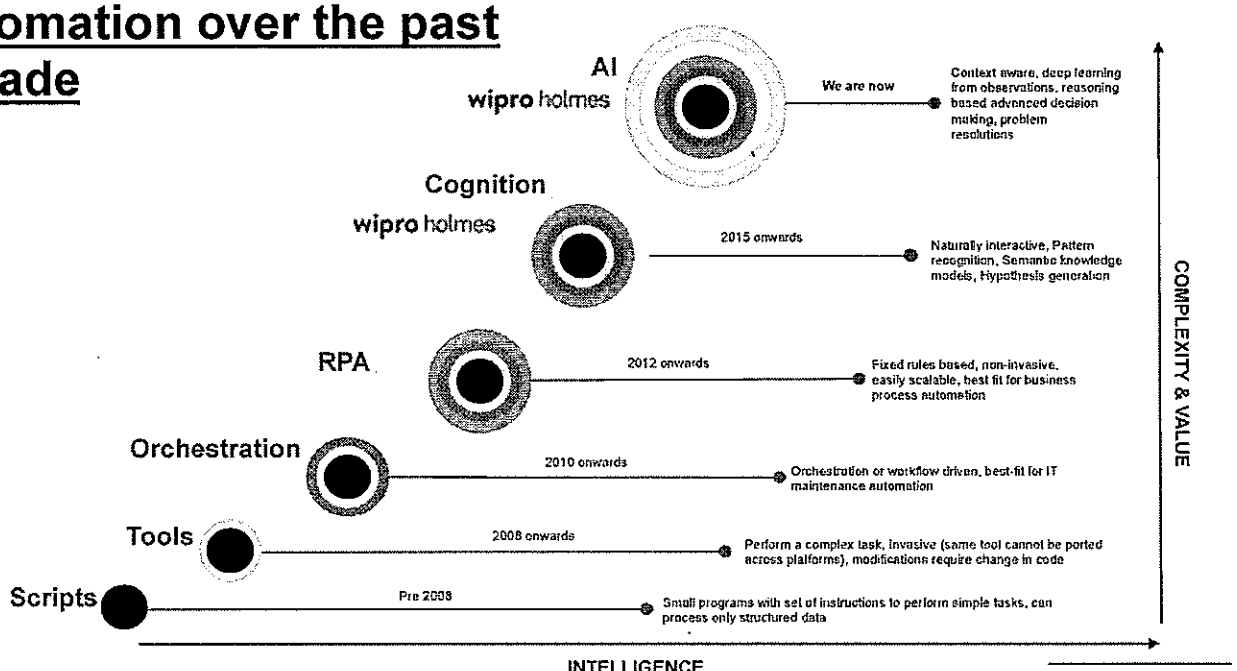
- Industry Applications
- Integration to enterprise systems, traditional industrial systems
- Data insights
- Cognitive & AI
- Augmented Reality

Strategy: Partnering with the customer to jointly define the connected strategy as part of their Digital journey
Design: Product, Process, Experience, Service and UX Design
Consulting: Business, Process and Technology
Strategic Integration: IT, OT, Business, Process, Services and Products
Security Services: End to end security services: device to cloud
Operations and Managed Services: 24/7 forever processes delivering business KPI's through IoT Command Centre

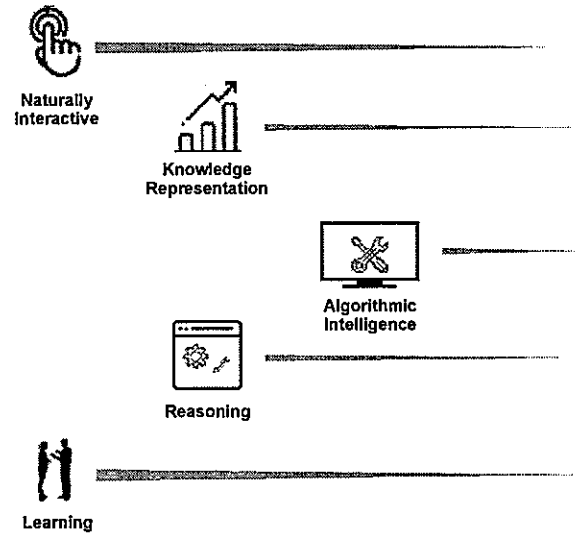
Wipro IoT experience snapshot



Automation over the past decade



Heuristics & Ontology-based Learning Machines and Experiential Systems



Domain
Industry Expertise

+

Data
Insights & Knowledge

+

IP
Technology Capability

Services
Managed Operations & Governance –

"Single Source of Truth"

AI in IoT: use cases by Vertical

Oil & Gas

Cognitive Drilling Assistant

Predicting rate of penetration of oil well drilling using Recurrent Neural Networks

Manufacturing

Prognostic Asset Maintenance

Predicting Remaining Useful Life (RUL) and Asset Failure

Energy

Home Energy Management

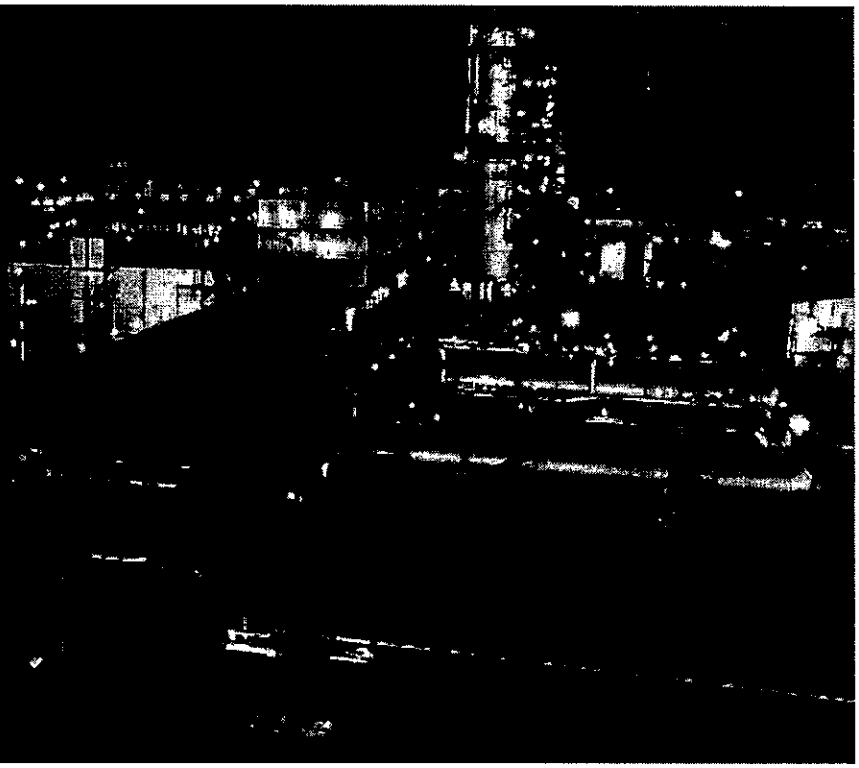
Predicting energy consumption using Neural Network based Deep learning model

Oil and Gas

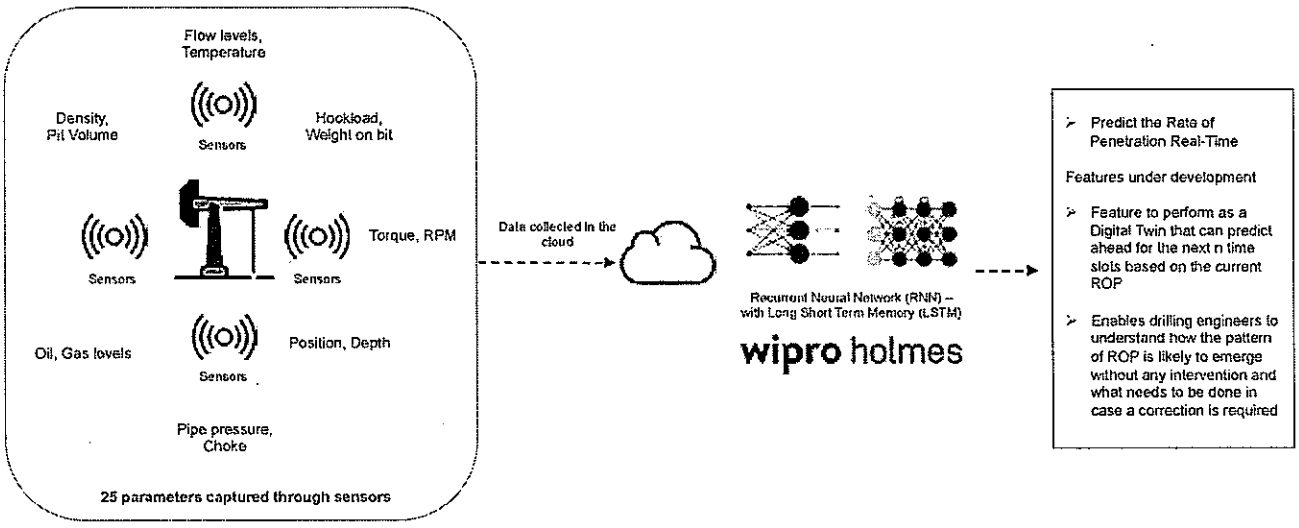
Predicting the Rate of Penetration (ROP) of Oil Well Drilling

Business Context

- Optimization the Rate of Penetration (ROP) in Drilling of Oil Wells is critical to optimize the overall cost of drilling process.
- ROP depends on multiple drilling parameters such as the "Hole Depth", "Flow Rate", RPM, Torque, "Weight on Bit" (WOB), "Stand Pipe Pressure", Fluid Properties (mud density and plastic viscosity) etc.
- Given the dynamics of multiple parameters that need to be factored to understand the ROP, it is important to implement a highly accurate prediction mechanism that can provide near real-time status of the productivity to ensure that drilling engineers can bring in any interventions in case of fall in the rate of penetration.

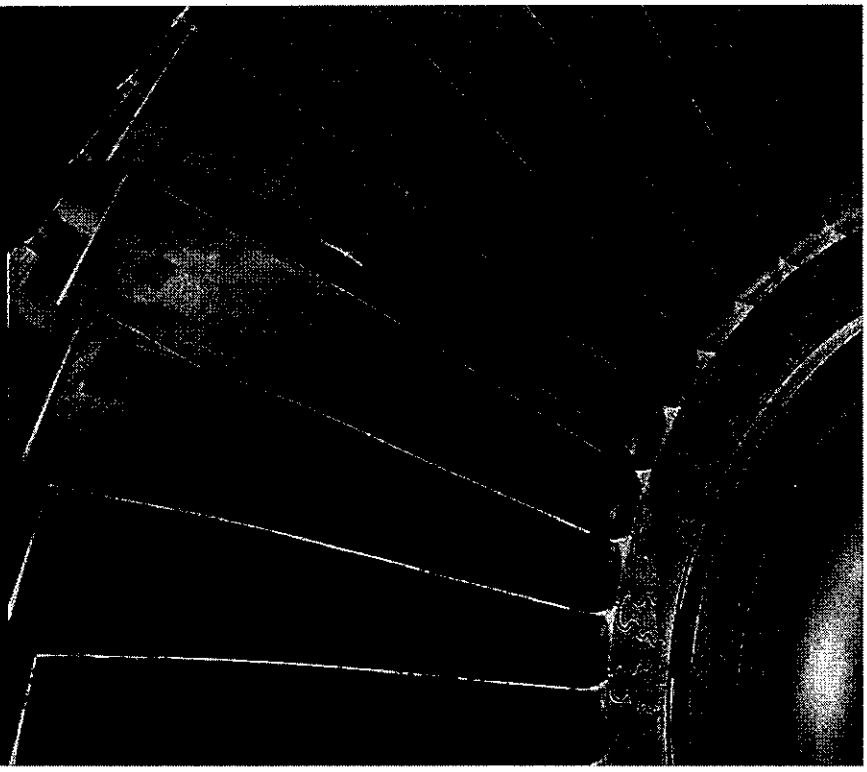


Cognitive Drilling Assistant



Manufacturing

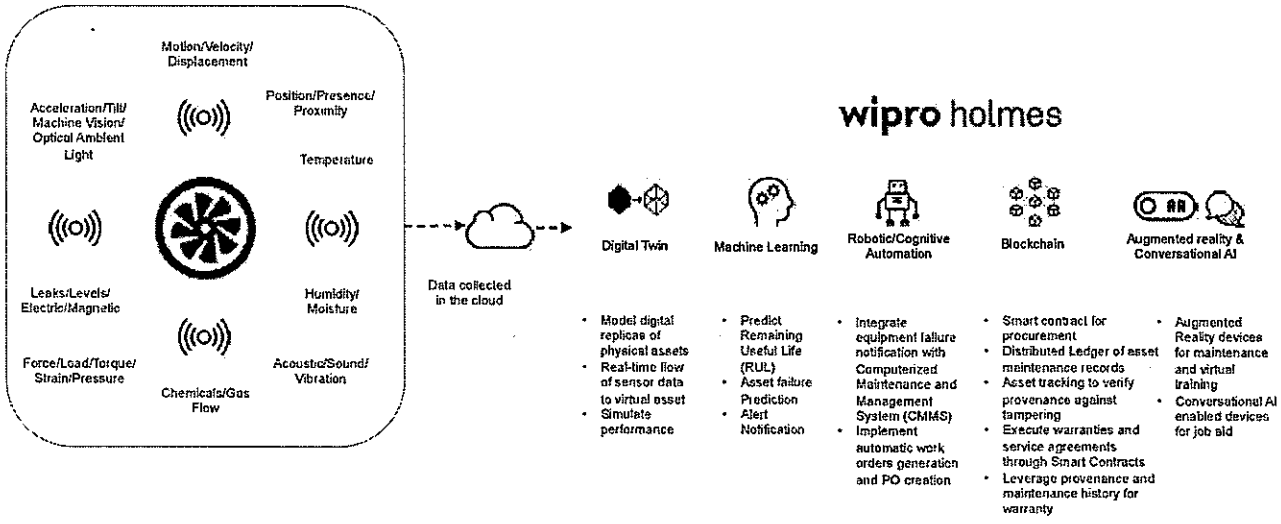
Prognostic Asset Maintenance for Rotary Moving Equipment



Business Context

- Unplanned downtime will decrease the production capacity and increase the operating costs, Predictive maintenance program will minimize loss and increase flexibility
- Wear and tear depends on a list of parameters including Velocity, Temperature, Humidity, Flow, Torque, Strain, Pressure etc.
- Solution will model digital replicas of physical assets, receive real-time flow of sensor data to virtual asset, simulate performance to predict Remaining Useful Life (RUL) and notify alerts on Asset Failure: Future capabilities will include prescriptive maintenance using cognitive automation, and contract management using Blockchain and customer support using AR/VR and conversational AI

Prognostic Asset Maintenance



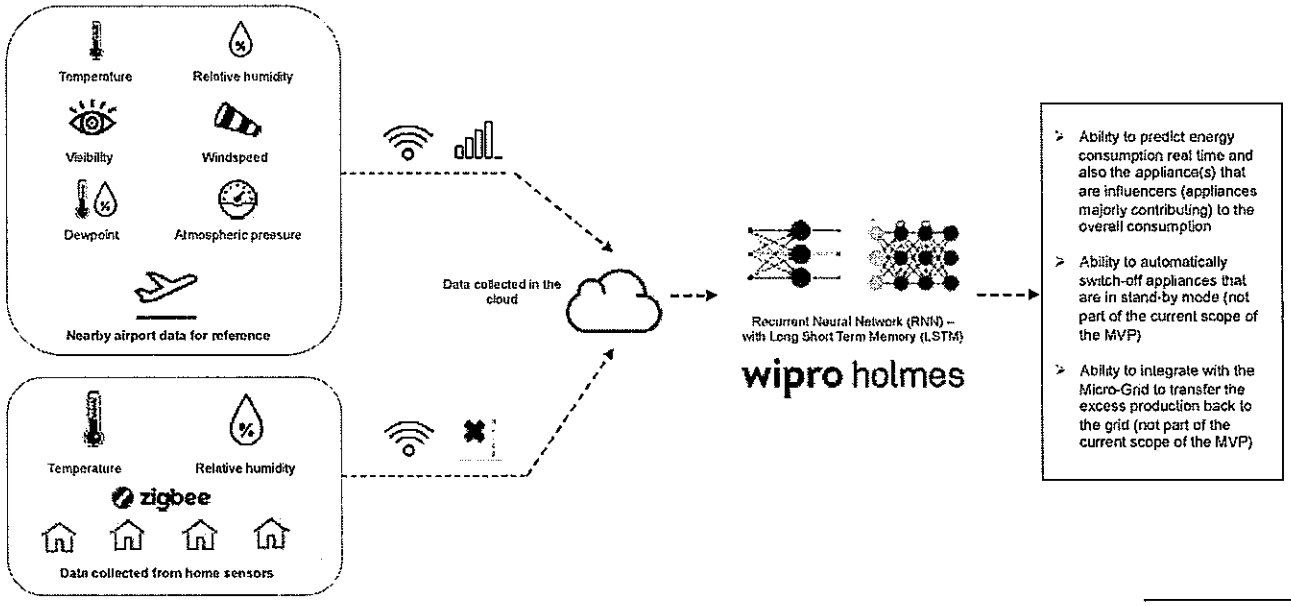
Energy and Utilities

Predict Energy Consumption by Home Appliances for Home Energy Management

Business Context

- Appliances represent a significant portion of the electrical energy demand; prediction of energy consumption in buildings will be a major input to grid and energy management solutions
- Energy consumption was dependent on internal parameters – "temperature and humidity"; data on external parameters, "temperature, humidity, atmospheric pressure, dewpoint" were collected for cross-reference
- Ability to predict energy consumption real-time and appliances that (majorly)t contribute to overall consumption. Future use cases: switch off appliances in standby mode, and transfer excess energy back to the grid

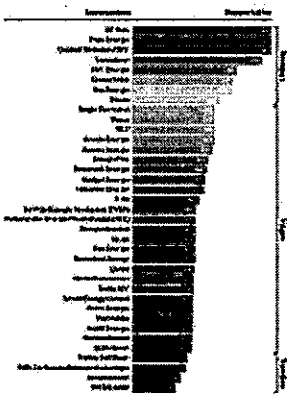
Home Energy Management



Lyv...
Background information

(one of) the largest projects in NL
- Home storage

- 2015: Book local energy companies
-
2013-2016. De Unie
- 2015
  - 2007-2014 TexelEnergie energy supplier
- TexelEnergie (Award winning Dutch Energy Company)
  - 2011 Duurzame topper (Energy Efficiency) 'Shared first place with Unilever'
  - 2012
  - 2014 [illegible]
  -
2000-2010: Plumber
- 2000-2010: Plumber

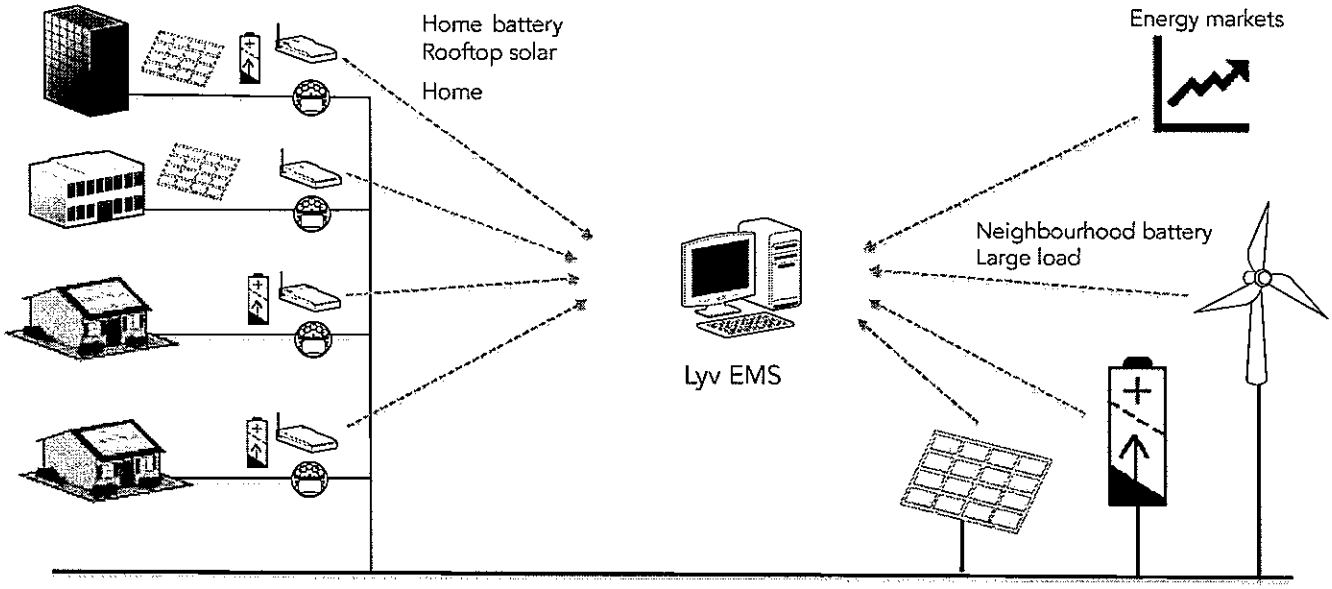


Business Context

- Energy Efficiency initiatives
- Lower Energy bill & Energy consumption
- Protection & freedom of choice – Consumer decides
- Challenge: Consumer participating in Smart Grid projects

Scalability is crucial for a healthy business case.

One system many applications



Wipro Cognitive Intelligence Platform

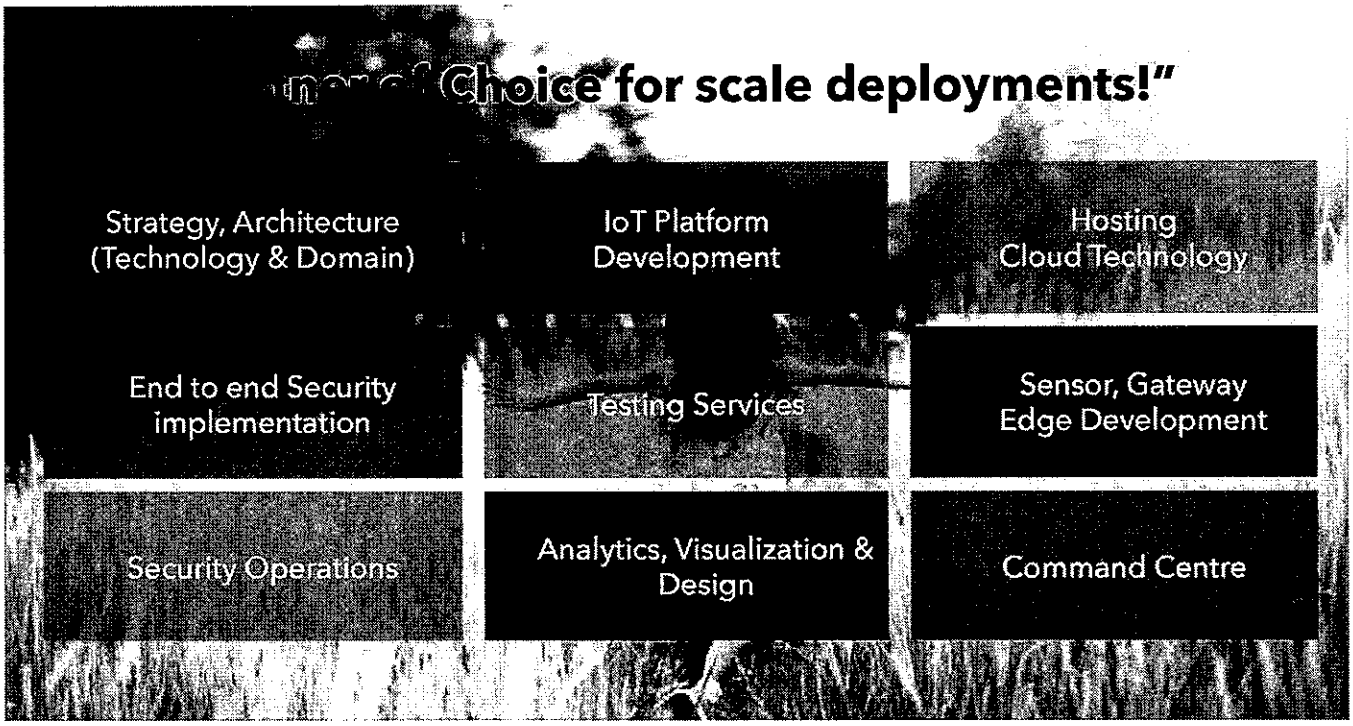
Monitoring & Conttol
- Consumption visibility
- Appliance status visibility
- Rate and cost visibility
- Usage advisory
- Battery and appliance control

In-home Optimisation
- Battery optimization to minimize customer bill
- Personalized advise and control of appliances
- Demand reduction by intelligent operation of appliances and battery

Virtual Power Plant
- Manage customer batteries in aggregate to run Virtual Power Plant (VPP) functions
- Reduce spot market exposure during supply demand gap using VPP
- Earn revenue by taking advantage of high spot price by using VPP
- Reduce localized demand by using VPP

Bundled Services
- Data analytics showing insight on behavior, appliance and market
- Customer advisory providing actionable insights
- Premiumized services where unique customer specific services are provided for a charge
- Non-energy services like insurance on appliances, advisory on appliances, advertisement from service providers

Energy Exchange
- Platform for inter-customer and community energy exchange
- Ability for customers to buy from anywhere and sell to anyone
- Ability to form smaller groups to drive efficiency and cost benefits
- Platform for utilities to provide services like meter reading services, asset usage services, reconciliation services
- A federated multi-layered market is envisaged



Wipro sessions at IoTSWC 2018

Panel: Why Edge First in Oil & Gas?
• • •
Time: 10:25 – 11:10, Oct 16
Gopakumar Nair
GM & Global Sales Head of IoT, Wipro

Customers for Newer Revenue Models through Smart Connectedness and Improved Operations
• • •
Time: 13:20 – 14:05, Oct 16
Sharmila Paranjpe
VP, Manufacturing, Wipro

Generating Business Value and Insights for IoT
• • •
Time: 16:25 – 17:10, Oct 16
Geetha Gopalakrishnan
GM & Global Delivery Head of IoT, Wipro

Monetizing Digital & Process Twins: From the Component to the Operational to the Process Level
• • •
Time: 17:20 – 18:05, Oct 16
Anita Ganti
SVP & Global Head, Product Engineering Services, Wipro

Keynote: Realizing Business Outcomes With IoT
• • •
Time:10:25 – 11:10, Oct 17
Jayraj Nair
VP & Global Head, IoT, Wipro

Command Control and Managed Shared Services for Smart Cities, Smart Campuses and IoT Systems
• • •
Time: 11:30 - 12:15, Oct 17
Ashish Khare
GM, Cloud Infrastructure Services, Wipro

Solving industry problems with AI & IoT
• • •
Time: 12:25 - 13:10, Oct 17

Santhosh Madathil
GM, IoT Solutions Engineering, Wipro

Using Digital Thread/Digital Twin to Connect the Factory and the Field
• • •
Time: 13:20 – 14:05, Oct 17

Calvin Smith
Director & Head of Partner Engineering, Wipro

Product to Service Transformation through Human-Centric Design: Next Gen Services for Smart Pumps
• • •
Time: 18:15 – 19:00, Oct 17
Adam Hassan
Managing Director, Designit

Panel: IoT in Finance
• • •
Time: 13:20 – 14:05, Oct 18
Gopakumar Nair
GM & Global Sales Head of IoT, Wipro

Thank You
ಧನ್ಯವಾದ
Obrigado
Gracias
Gràcies
Danke
Grazie
Merci
شكر
Tack
谢谢

Energy Intelligence Platform – Customer Solution

Advisory	Market Integration	Add-On Services	Autonomous Operation
Thermostat integration	Smart Plug integration	EV Integration	District Heating Integration
Demand Forecast	PV Generation Forecast	Cost Optimization	Analytics
Asset Control	Real time Profile	Remote Operation	Weather Forecast Interface
User Registration	Asset Registration	Service Registration Int/Ext	Asset Model

In Place | Under Development

Energy Intelligence Platform – Utility/Reseller Solution

Dynamic Tariff Support	Demand Management	Imbalance Market	P2P Trading Platform
Aggregate Virtual Power Visibility	Flex Assessment and Control	Flex Program Management	DSO Integration
Utility Master Data Management	Aggregate Asset Control	Reporting	Operations Dashboard
Ticketing	Field Monitoring	Customer Account Management	CRM Integration
User Onboarding	Asset Registration	Service Registration Int/Ext	Asset Model

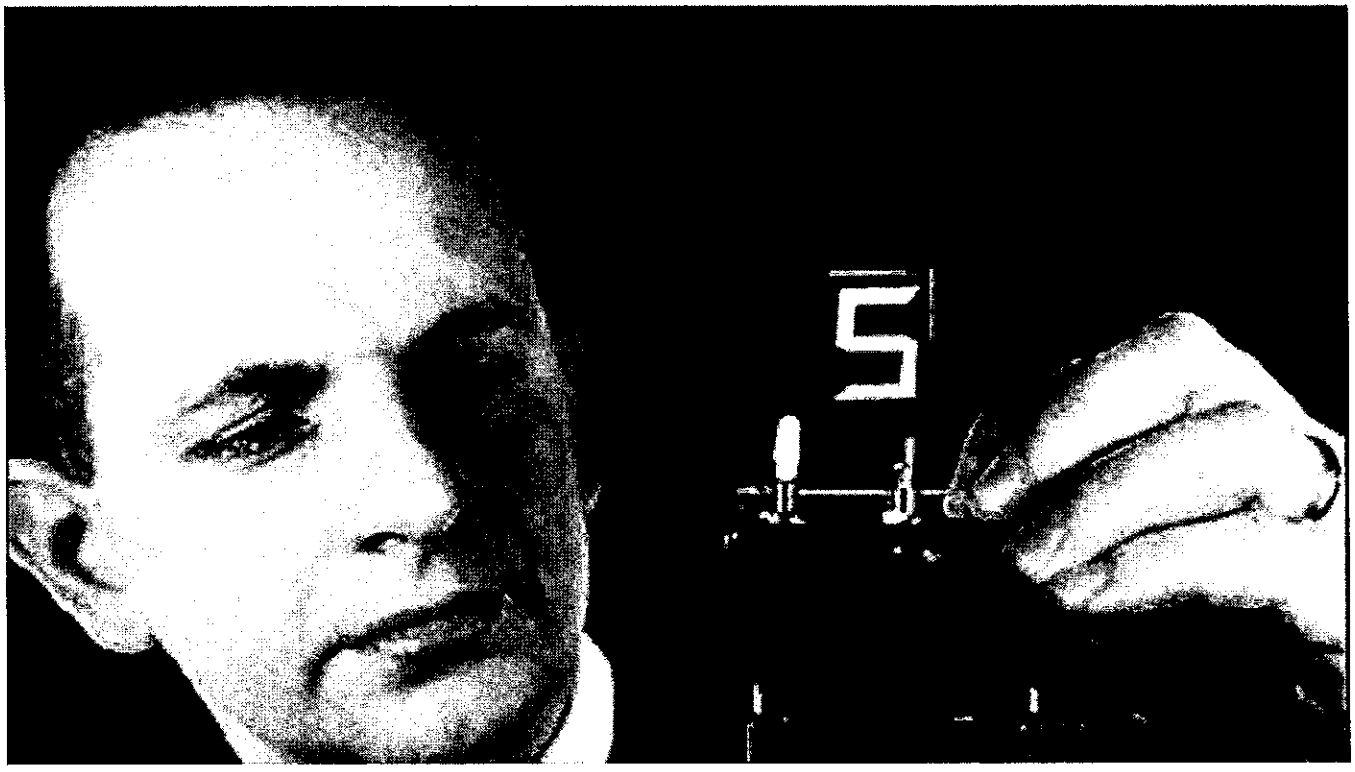
In Place | Under Development

oT, at… s key levers f the… nsformation …

IoT Solutions-Barcelona
October 2018

Patrice SLUPOWSKI
SVP Digital Innovation
@slupowski

orange

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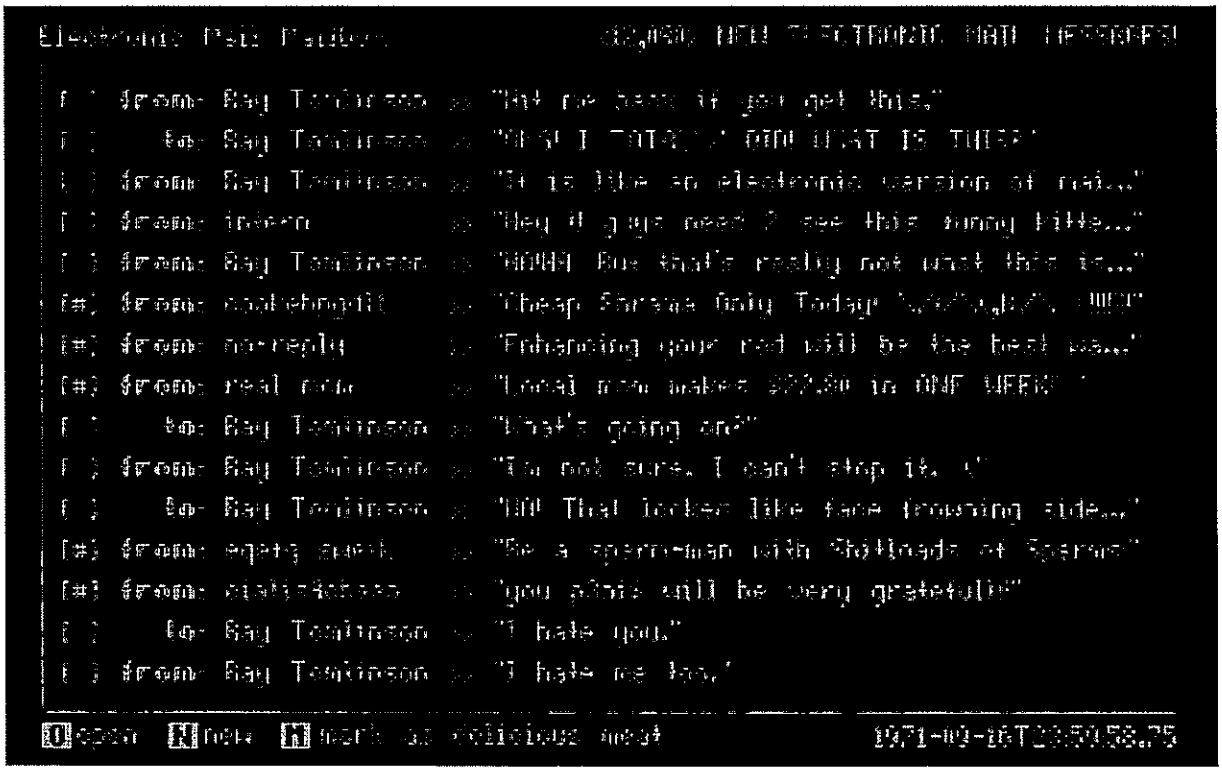
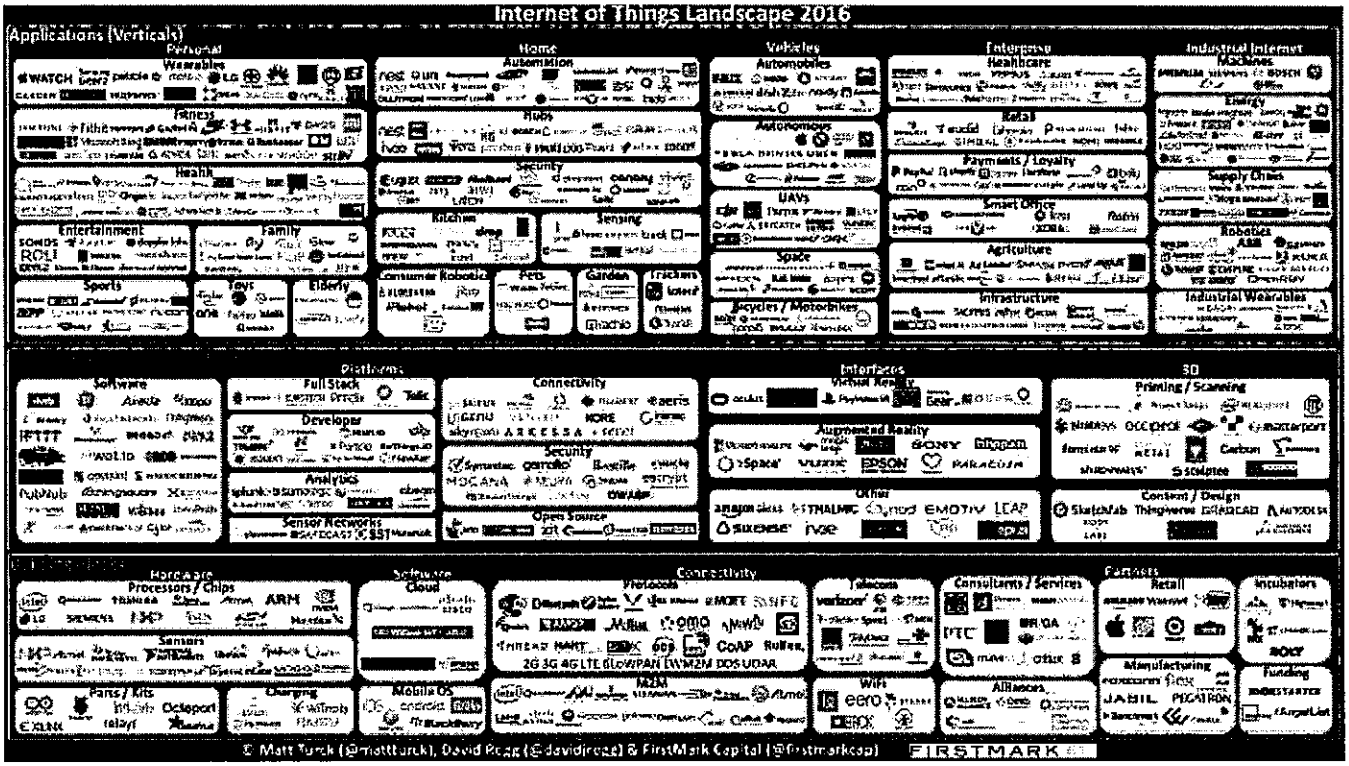
15832


Electronic Mail Reader
[ ] From: Ray Tomlinson ... "Put me down if you get this."
[ ] To: Ray Tomlinson ... "WHAT I TYPED! AND WHAT IS THIS?"
[ ] From: Ray Tomlinson ... "It is like an electronic version of mail..."
[ ] From: intern ... "Hey I guys need to see this funny bitte..."
[ ] From: Ray Tomlinson ... "HMMM But that's really not what this is..."
[#] From: cookethegrill ... "Cheap Sarsaw Only Today"
[#] From: noreply ... "Enhancing your rod will be the best we..."
[#] From: real rate ... "Local area makes $$2.5M in ONE WEEK!"
[ ] To: Ray Tomlinson ... "What's going on?"
[ ] From: Ray Tomlinson ... "I'm not sure. I can't stop it. :("
[ ] To: Ray Tomlinson ... "OH! That looked like face trousing vide..."
[#] From: eqety quest ... "Be a sperm-man with 7Gbloads of Sperm!"
[#] From: distribution ... "you pbbie will be very grateful!"
[ ] To: Ray Tomlinson ... "I hate you."
[ ] From: Ray Tomlinson ... "I hate me too."
Open New Mark as religious meat
1971-02-16T23:59:58.75



8.38

billion connected devices

for

7.5

billion people on Earth

in 2017

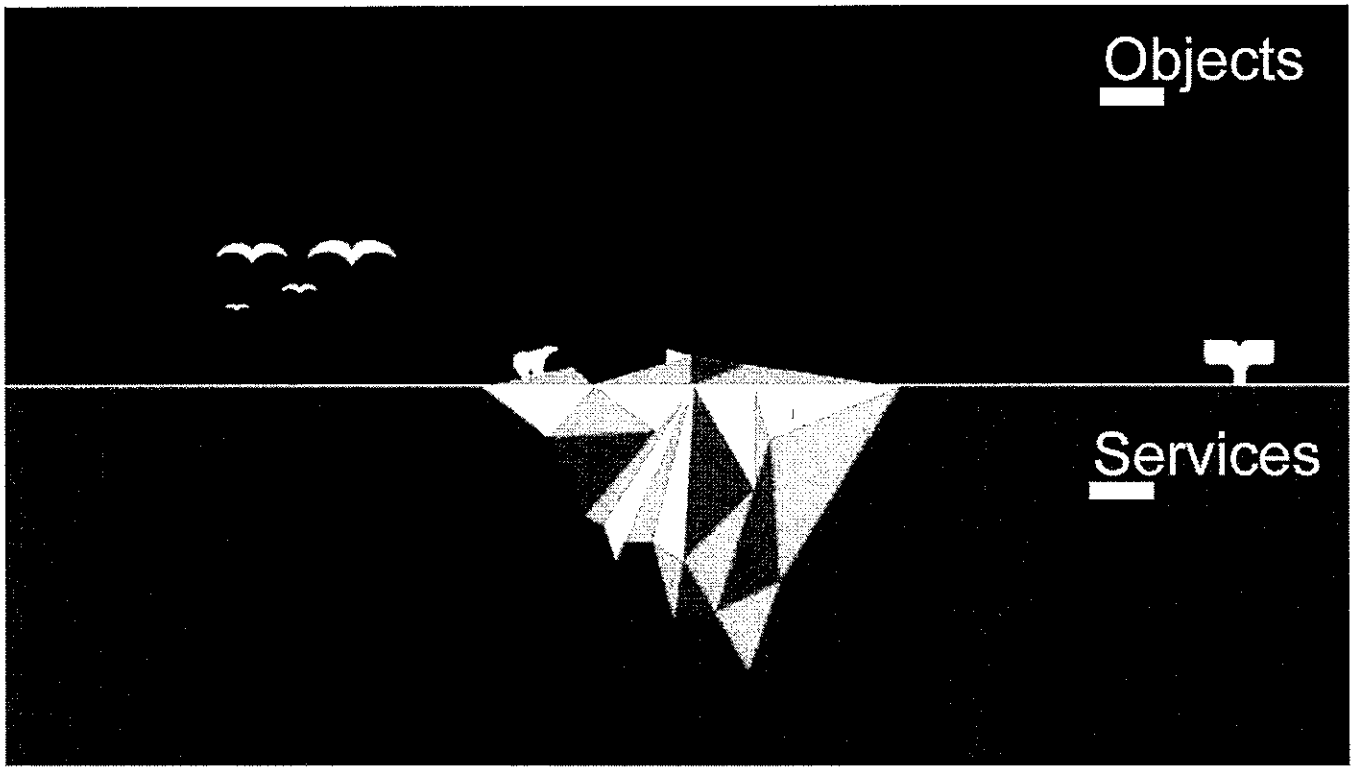
(source: Gartner)

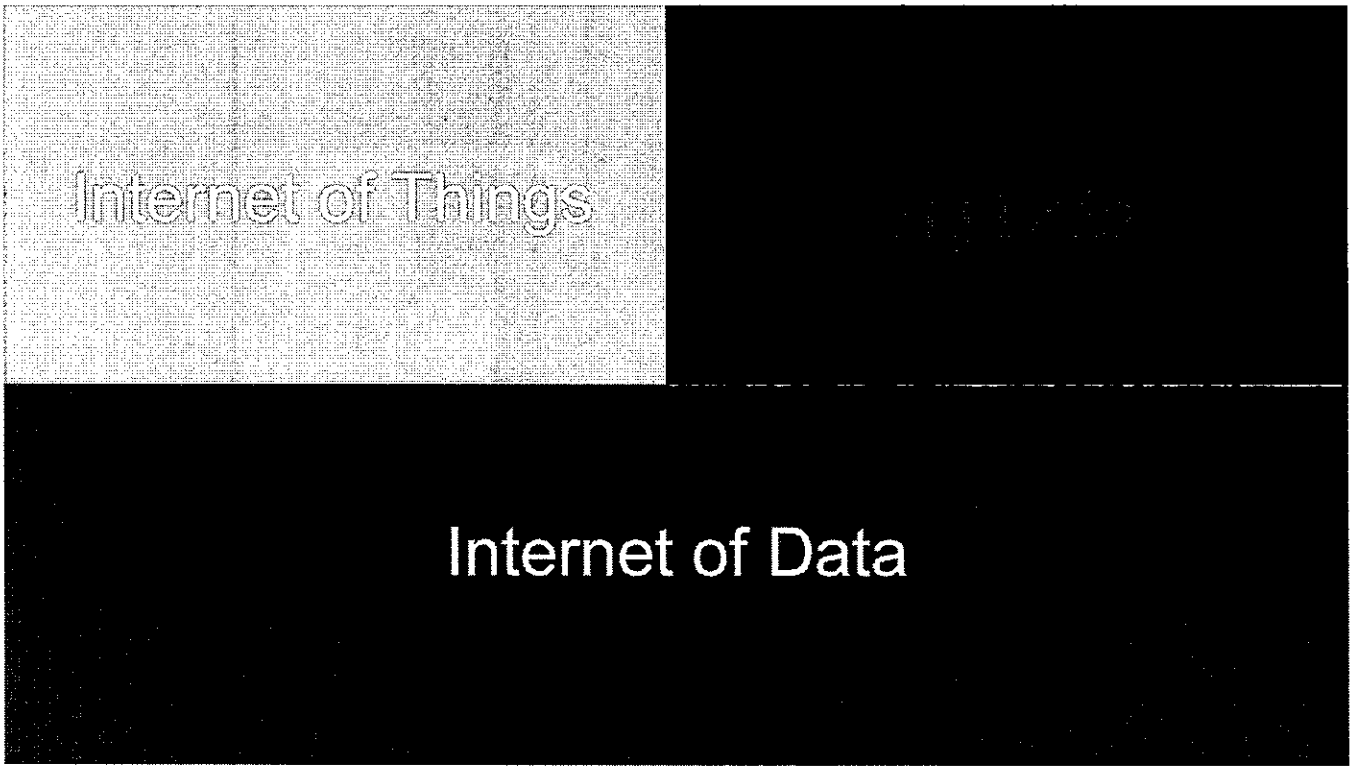
21

billion connected devices

worldwide in 2020

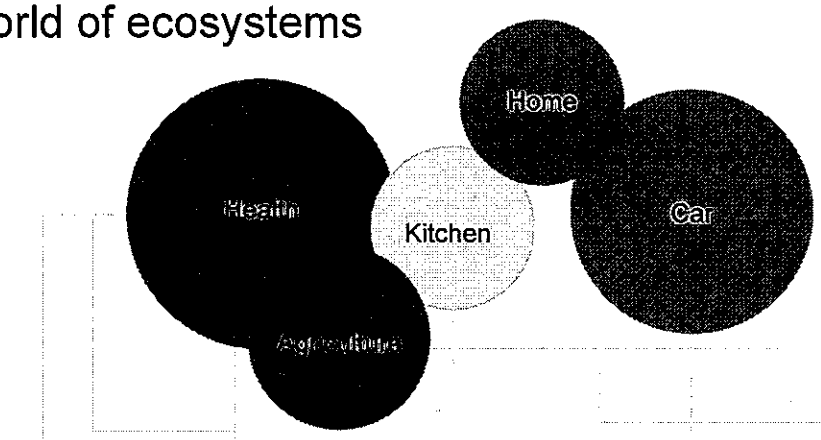
(source: Gartner)


Objects
Services


Internet of Things
Internet of Data

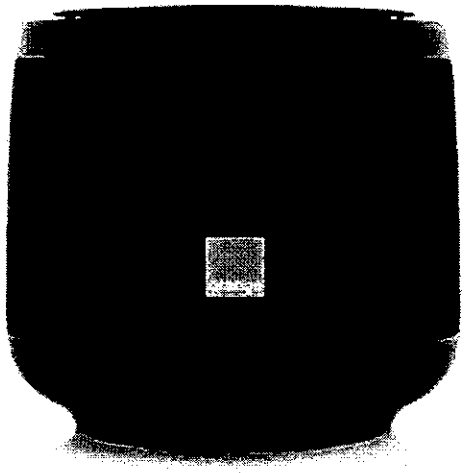
Internet of Data

A world of ecosystems



Bank Insurance Retail Energy Transport Industry

Customer interactions of tomorrow

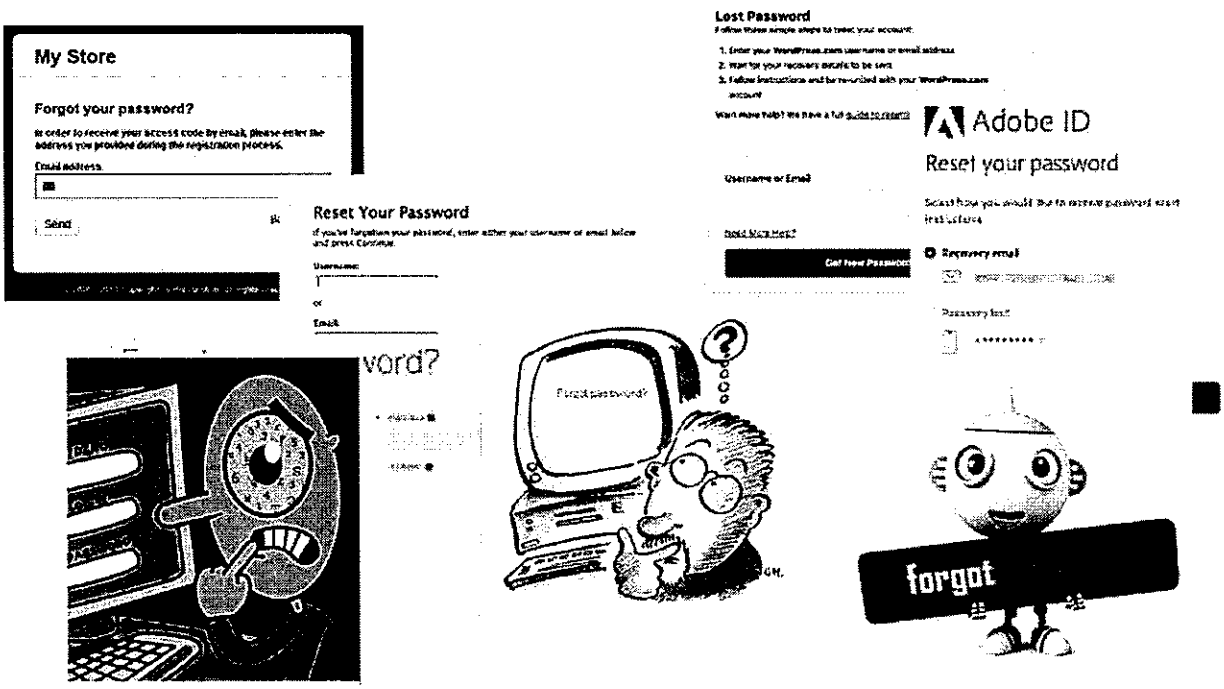


AI is the new UI

orange

What is the most used feature on any website or app?

11



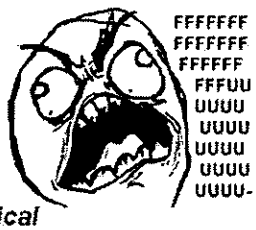
12

Password is dead

Friction is everywhere

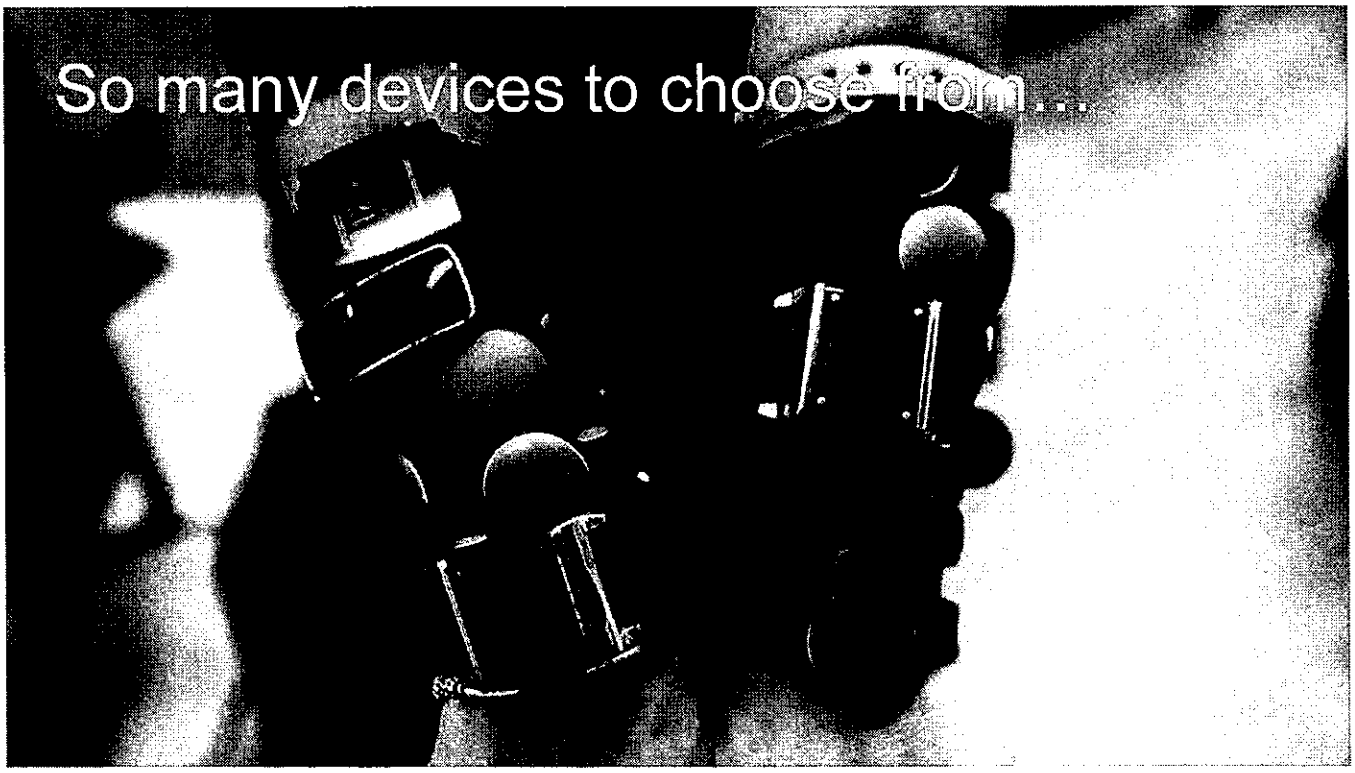
So many passwords…

Creating a password

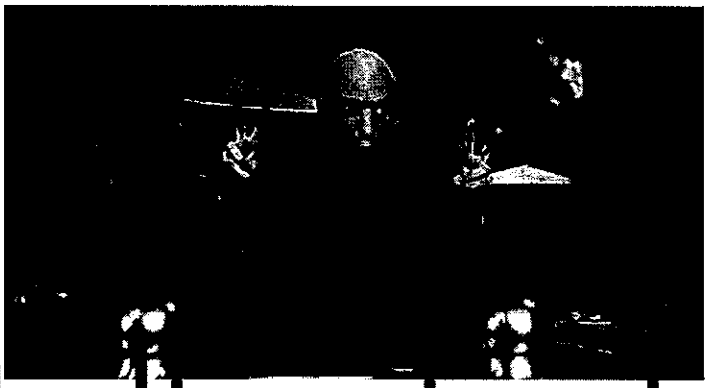


cabbage
Sorry, the password must be more than 8 characters.
boiled cabbage
Sorry, the password must contain 1 numerical character.
1 boiled cabbage
Sorry, the password cannot have blank spaces.
50fuckingboiledcabbages
Sorry, the password must contain at least one upper

The IoT will densify the internet by a factor of 15



But hang on, where is my data?!

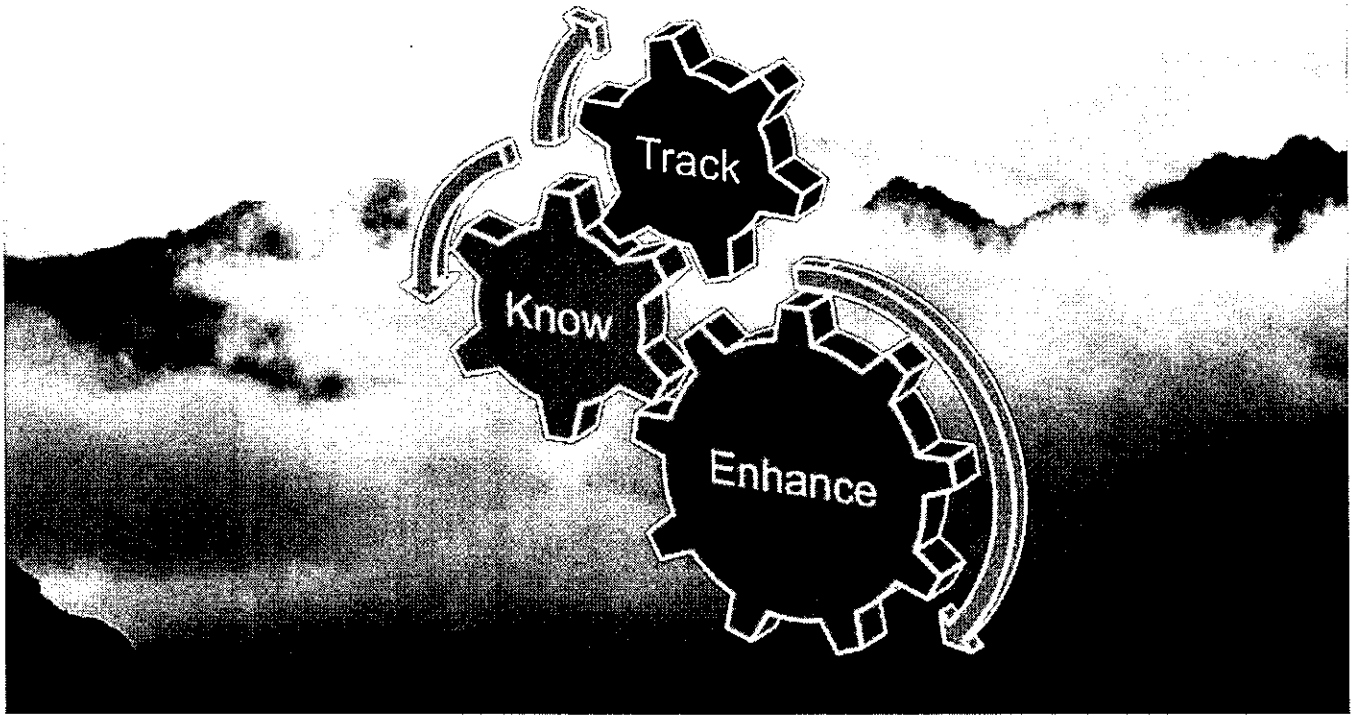


In the cloud

But hang on, where is my data???

In the cloudS


Data


Track
Know
Enhance

fitbit

Weekly Stats

Hi Pats, here are your weekly stats.

3/6/12 ◆:◆◆ ◆ to 3/11/12 ◆:◆◆ ◆

WEEK'S MOST ACTIVE DAY
3/7/12 ◆:◆◆ ◆

WEEK'S LEAST ACTIVE DAY
3/6/12 ◆:◆◆ ◆

TOTAL STEPS
87,876
DAILY AVERAGE 12,554 steps
WEEKLY BEST 23,513 steps

TOTAL DISTANCE
40.21 miles
DAILY AVERAGE 5.74 miles
WEEKLY BEST 10.74 miles

TOTAL FLOORS CLIMBED
184
DAILY AVERAGE 26 floors
WEEKLY BEST 55 floors

TOTAL CALS BURNED
19,684
DAILY AVERAGE 2,812 cals
WEEKLY BEST 3,455 cals

WEIGHT CHANGE
0.0 kg
LIGHTEST --kg
HEAVIEST --kg

AVG SLEEP DURATION
6 hrs **46** min
AVG TIMES AWAKENED 5
AVG TIME TO FALL ASLEEP 0hrs 5min

Last week's step winners

1 Pats ◆◆,◆◆◆ steps

2 laurent ◆◆,◆◆◆ steps

The Benz ◆◆,◆◆◆ steps

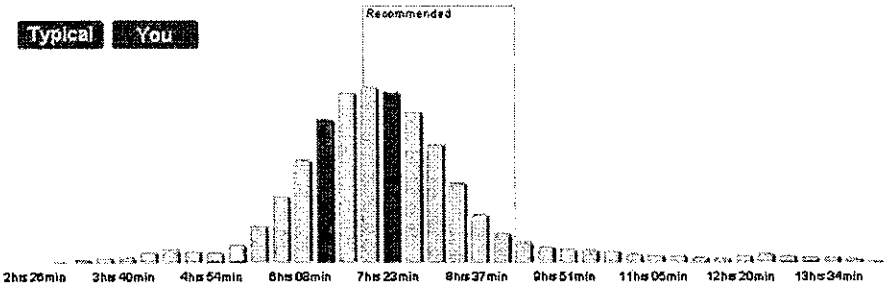
See current leaderboard

Last week's badges

5000 10,000 20,000 15,000 10 25 50

See all of my badges

21



You averaged
6hrs 43min
of sleep per night this week

You get more than
32 percent
of all men 35 to 44 yrs who are overweight

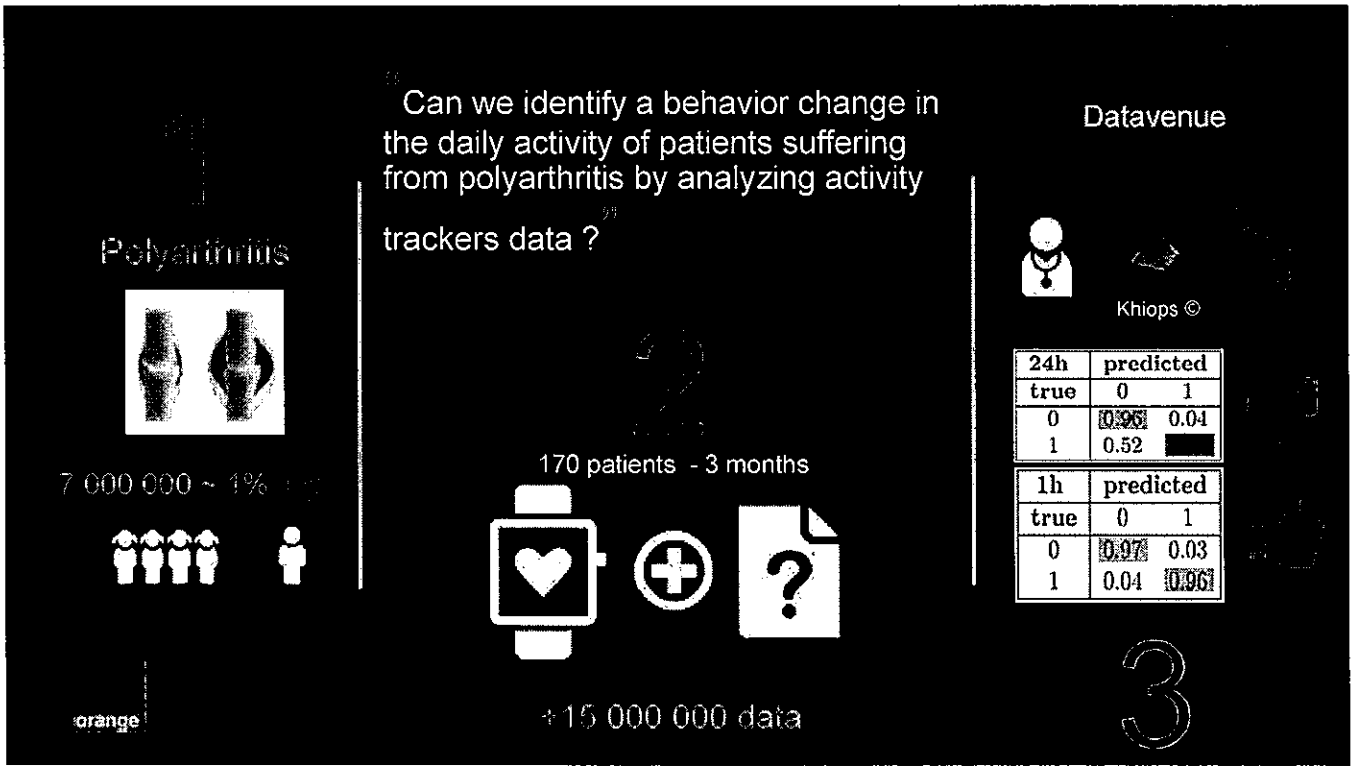
You averaged **6hrs 42min** of sleep per night this week. A good night's rest is important for your alertness during the day and can help prevent chronic disease. It is recommended that you get between **7 and 9 hrs** of sleep a night. You get **18min** less than that. Try to get some more rest – you might feel better for it.

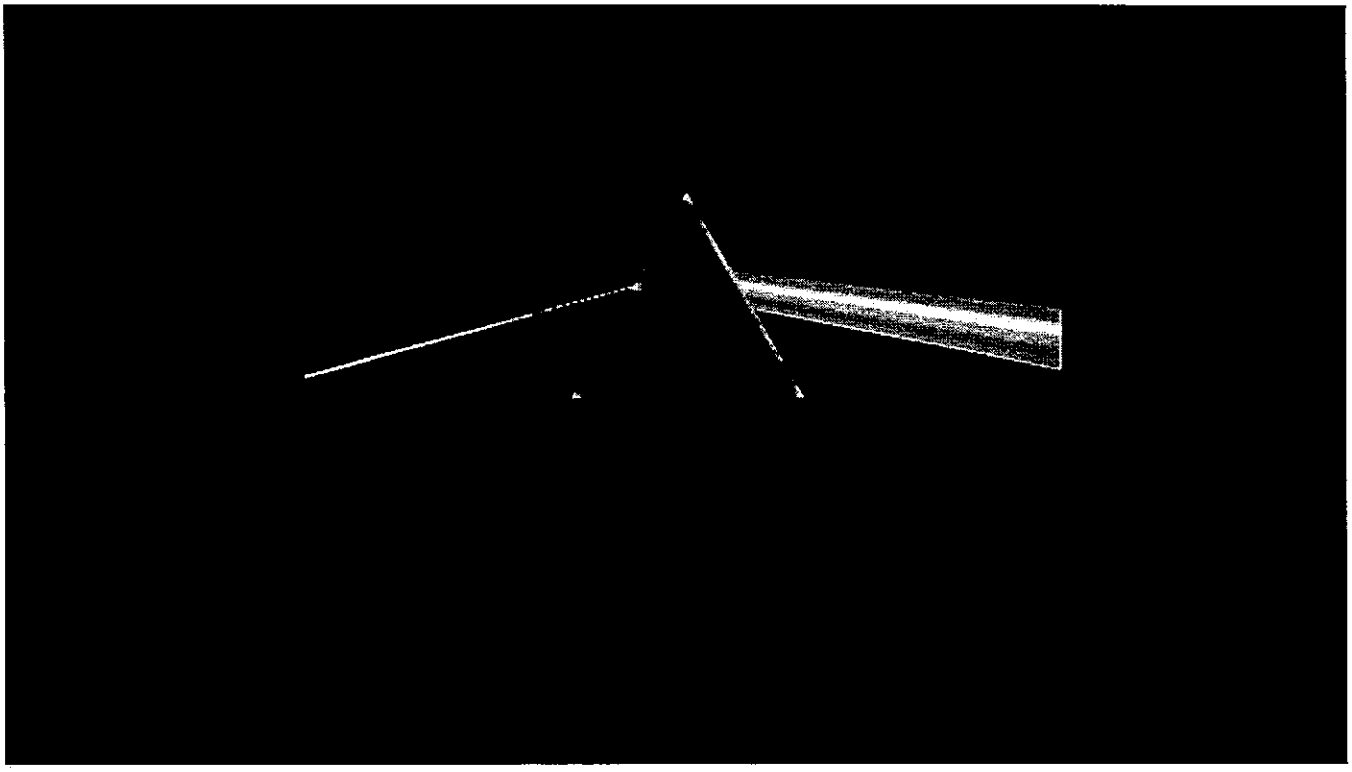
Sleep History

Sleep Time (hr)

1 Week 1 Month 3 Month 6 Month 1 Year

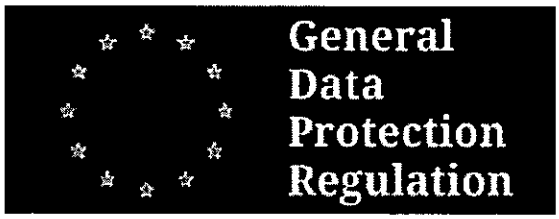
Behavior change will be the killer-app of the IoT






Information
privacy
Shift

GDPR: General Data Protection Regulation



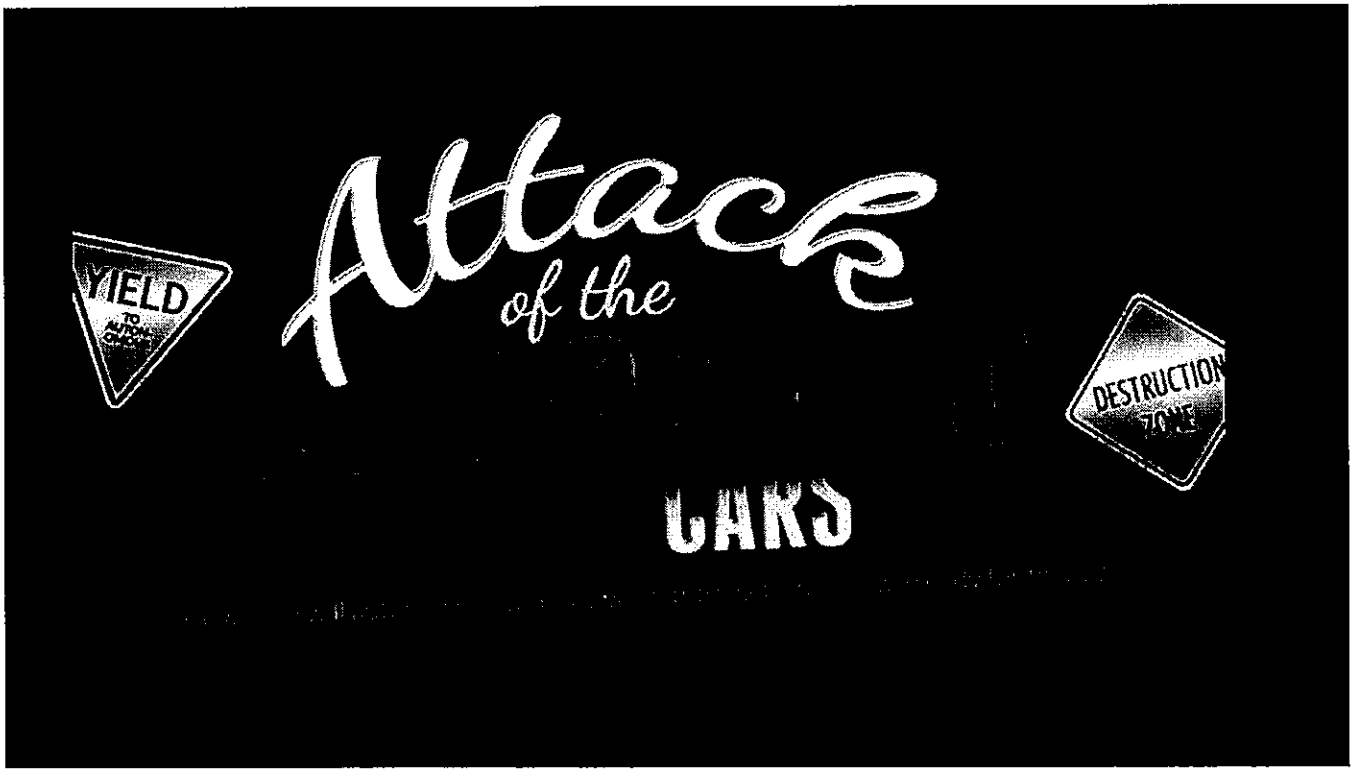
- Harmonized framework
- Extraterritorial application
- Explicit and positive consent
- Right to be forgotten
- Personal Data Portability
- Profiling
- Privacy by design

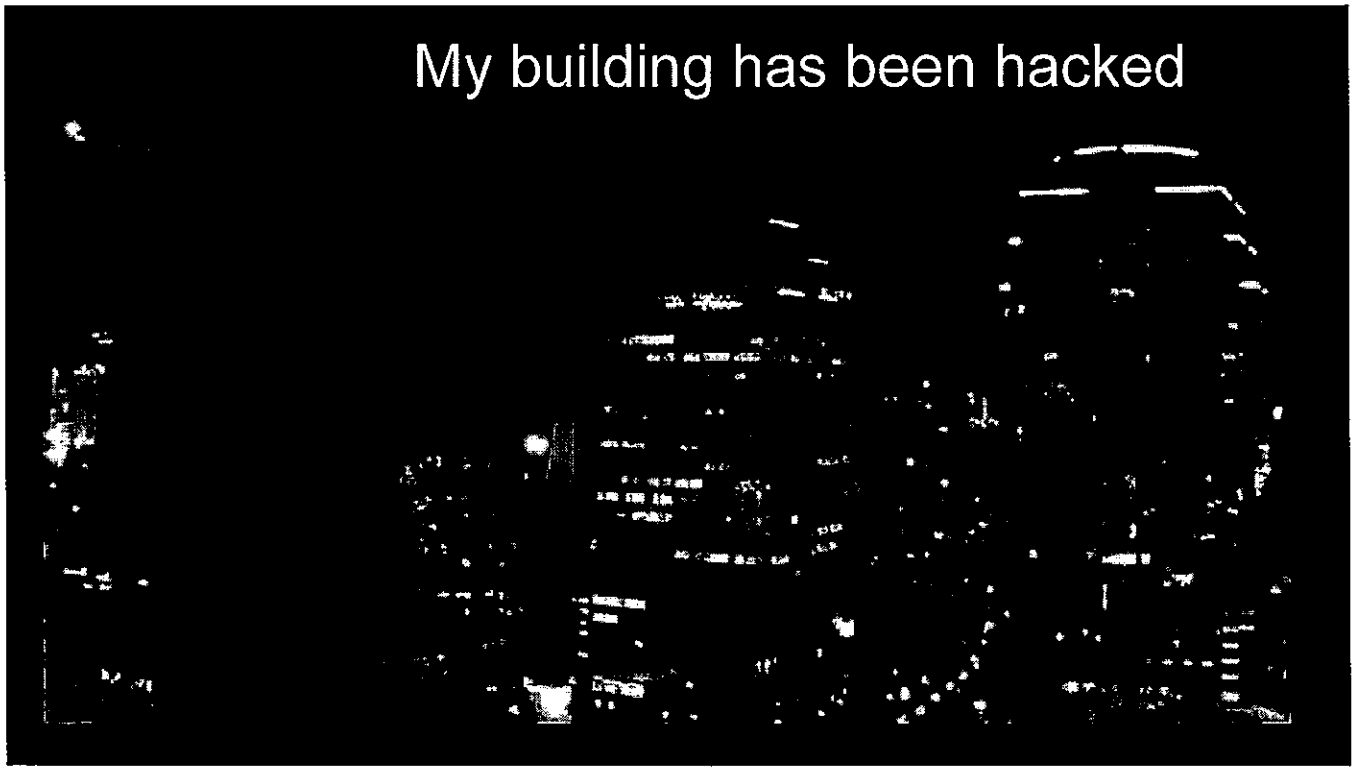
- Data leaks notifications
- Data Protection Officer nomination
- Potential fines for data security breaches (up to 4 % of overall turnover)
- Creation of the European Data Protection Board
- Application from May 25th 2018

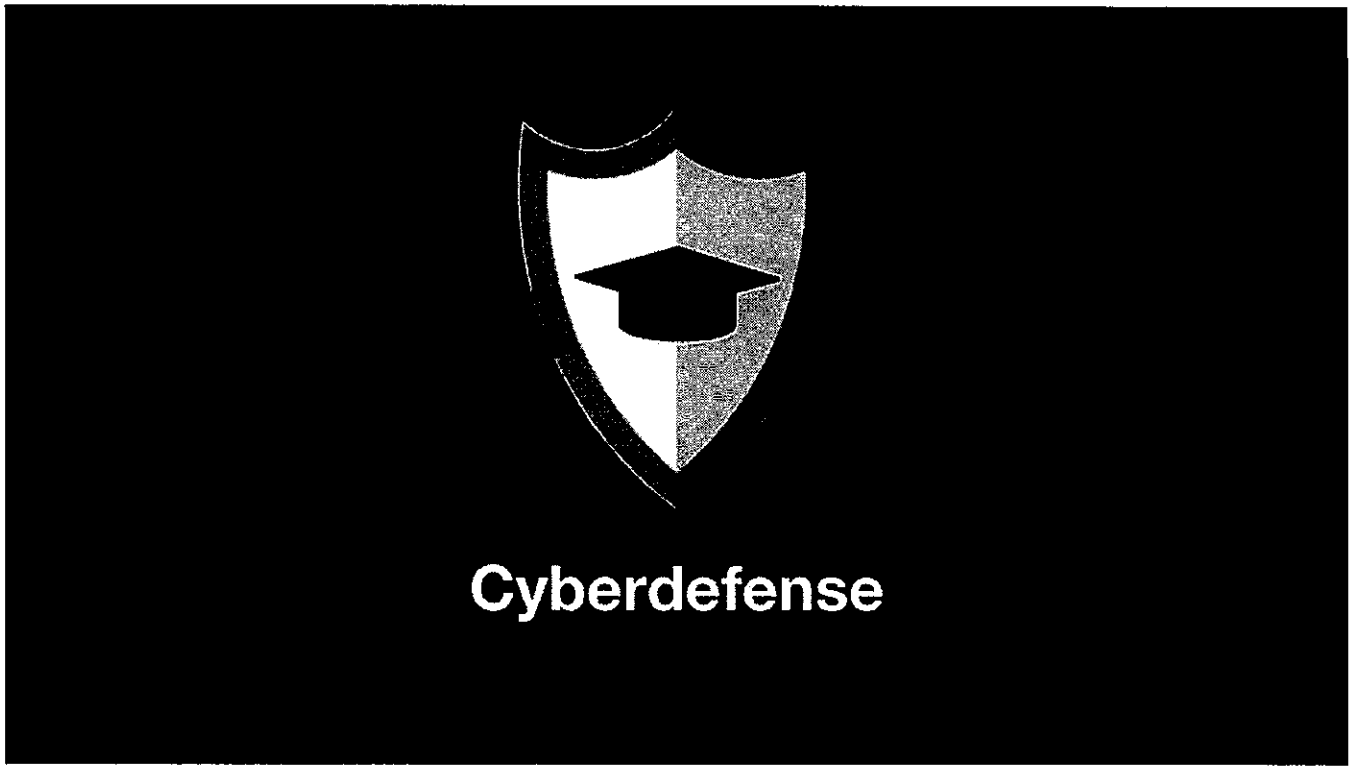
Users Data must belong to Users


STALKING
PROBLEMS
IDENTITY
ACCTS
TERRORISM
RESOURCES
ENTERING
SCAMS
CYBER
NATION
CHILD
ACTIVITIES
TECHNOLOGY
GOVERNMENT
CONTENT
CRIME
USE
TRAFFICKING
PORNOGRAPHY
HACKING
INFORMATION
MAIL
SEVERAL
COMBATTING
USING
SURROUNDING
DEFINED

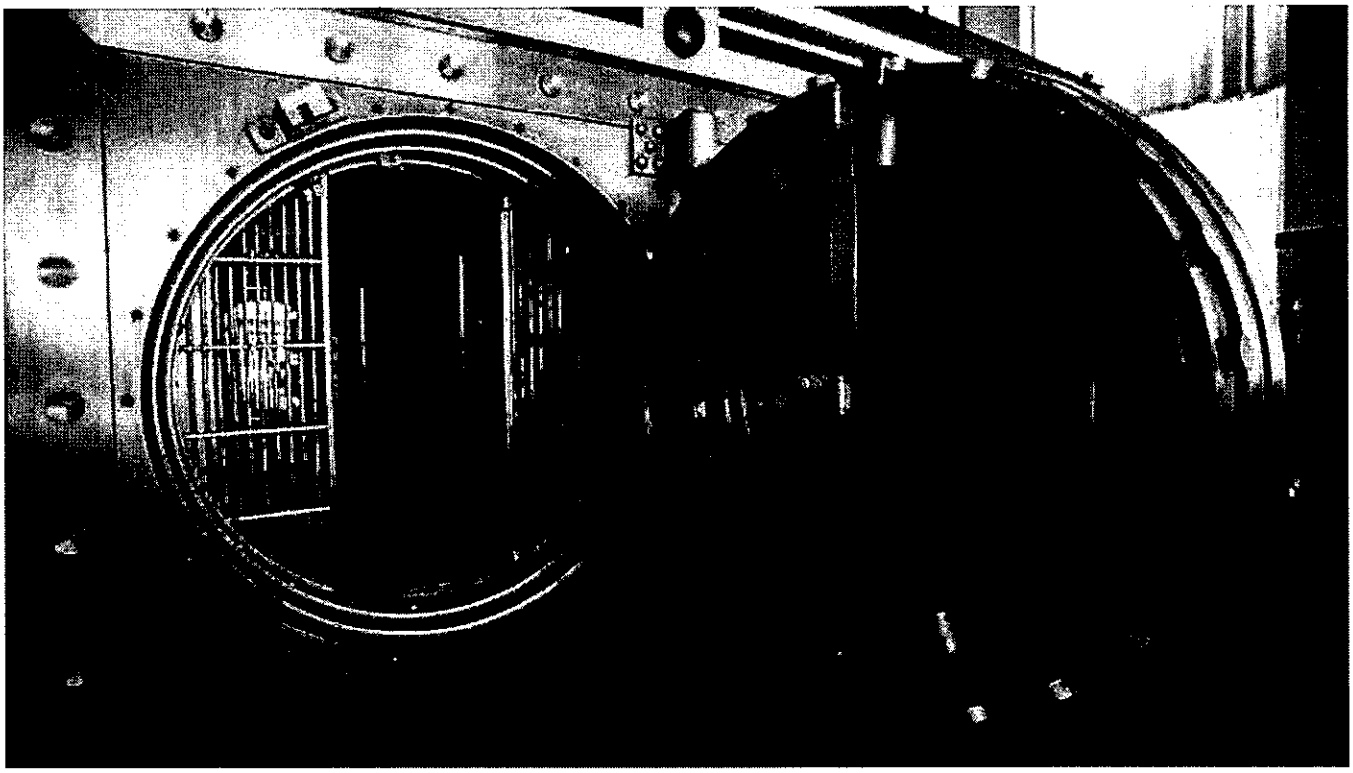

ATTACK
OF THE
DRONES

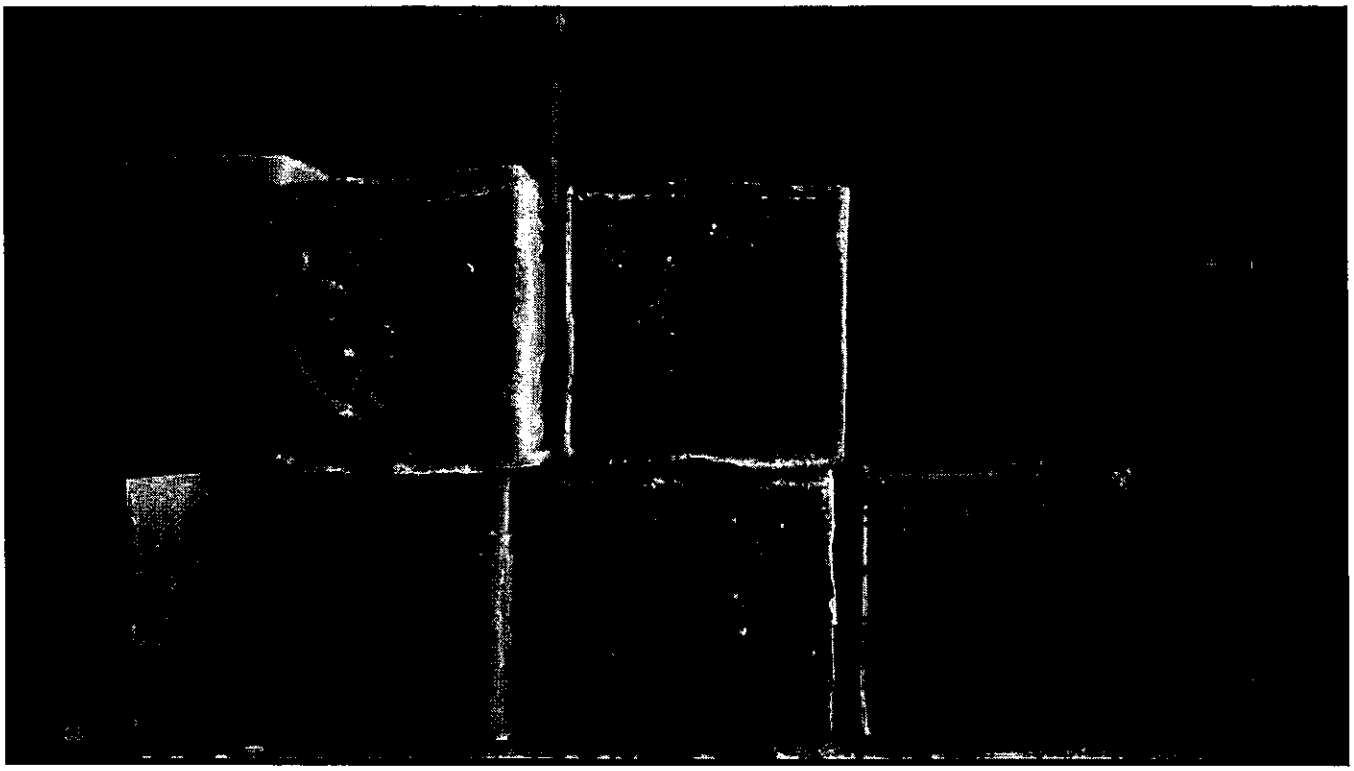

YIELD
Attack
of the
DESTRUCTION
ZONE
CARS

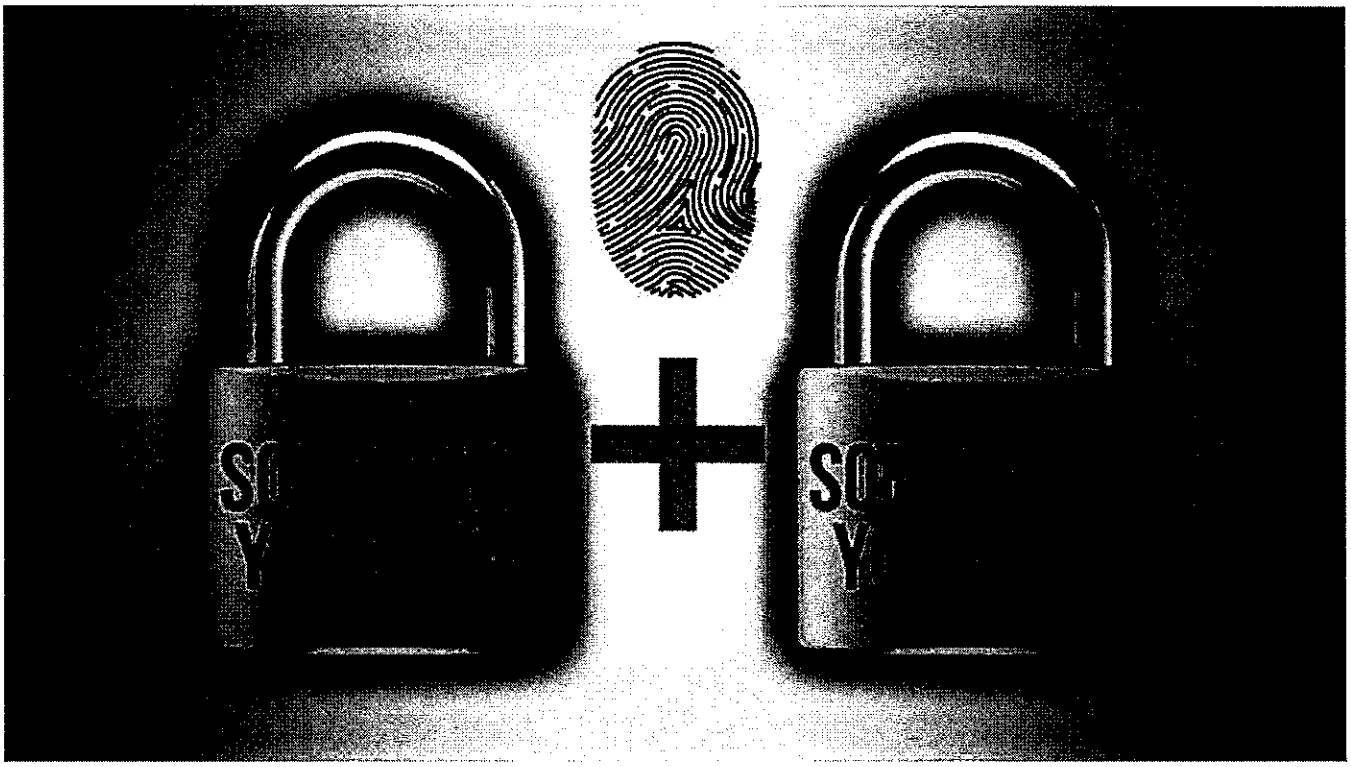

My building has been hacked



Future of Digital Identity will be strong, frictionless and multi-factor







mobile connect

Authenticate/Plus Proposition Overview

A simple, safe end user authentication solution on a global scale

Simplify and secure the customer identification journey

Orange ID

access account creation process by limiting fraud on identity,
with the guarantee to obtain reliable data
directly connected to the customer Orange account

on mobile and PC websites and apps

GLOMO AWARDS 2017
THE GLOBAL MOBILE AWARDS
WINNER

1 Form filling

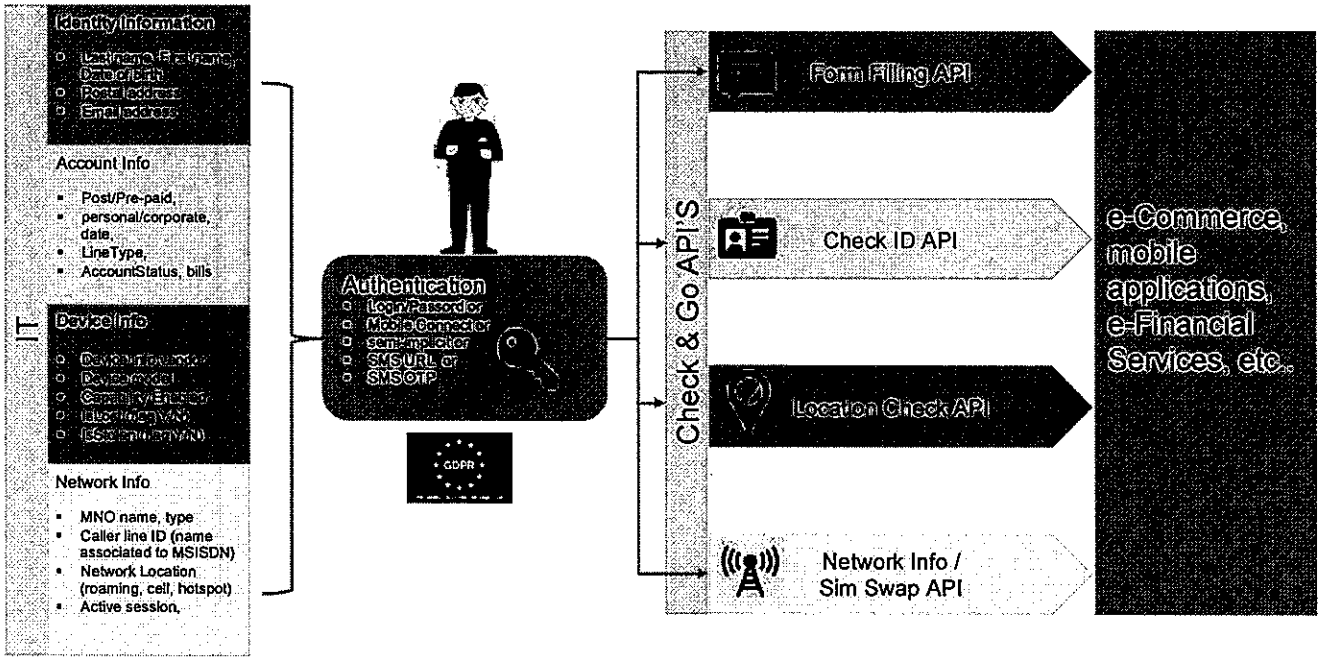
automatic form-filling and account creation

2 use cases

2 Check ID

consistence check with personal identification data

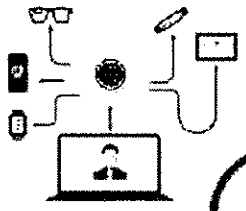
Orange ID (Check & Go) General Overview



The Internet of Things

Orange covers the whole of the IoT value chain

Networks suitable
for the exchange between objects.



Distribution of connected objects
particularly in Smart Stores.

IoT

Value-added services
in health, wellbeing, connected home, smart city, industry, automobile or business.

Datavenue:
A modular offer regarding Data & IOT in order to help companies to select, connect, handle and control them Connected Objects and Data, with security.

IoT must be inclusive, smart and trusted

As it continues to grow wider and more dense, the Internet of Things will offer new opportunities to make progress for people, society and the planet.

From the design phase to final uses, we build an inclusive, smart and trusted technology. We have chosen to prepare for the IoT revolution because it is useful to us and it must respect our freedom of choice and our wishes.

Our key figures

500

Smart Stores[1] in Europe, Africa and the Middle East sell connected devices.

200,000

connected devices sold in France in 2017.

2,000

IoT and data experts at Orange Business Services.

375

million data bits[2] processed every minute.

15

million devices[2] managed on our networks.

[1] Figures as of late June 2018
[2] Figures as of early July 2018

Connectivity: a full portfolio of complementary technologies

Because we believe in open, interoperable, global and sustainable technology, we are combining our historic cellular networks with LoRa® and LTE-M technology, an upgrade of our 4G network, and are preparing for 5G, so that every use case can benefit from optimal connectivity.

1. Our historic and 4G cellular networks

2. LoRaWAN™ technology

3. LTE-M technology

1. Our 2G, 3G and 4G cellular networks

They enable a vast geographic coverage as well as roaming.
They are suited to high-speed and real-time connection needs: fleet management, cameras, payment terminals, etc.

2. LoRaWAN™ technology

Orange has been an active member of the LoRa Alliance™ since May 2016, contributing to the worldwide success of the LoRaWAN™ protocol.

This network is dedicated to devices requiring low-bandwidth and low-energy connectivity. It is perfect for sensors located inside buildings and basements: smart water meters, geolocation of industrial assets, as well as connected agriculture.

Our partnership with Nexxtep Technologies, which plans to connect 4,000 sensors to Orange's LoRa® network over three years, illustrates our intention to participate in the development of digital, high-performance and competitive agriculture.

2. LoRaWAN™ technology

- In France, nationwide coverage with more than 30,000 towns and 95% of the French population covered, via 4,900 gateways spread across the mainland.
- In Slovakia, a LoRa® network and a line of associated services (data management devices and platform) are already available in five cities, including Bratislava, and soon in two other cities.
- Targeted LoRaWAN™ coverage in other countries, cities, ports and industrial sites is in development and will be available soon.
- Initial technical roaming tests carried out successfully with KPN and Actility.

3. LTE-M technology

This technology is complementary to LoRa® technology for use cases requiring additional functionalities, such as output, real-time connectivity, voice support, mobility and roaming available worldwide.

It connects a vast range of devices in a fully secure and scalable way. For consumers, these devices include GPS trackers and activity monitoring wristbands. For businesses, LTE-M offers the ideal solution for connecting devices like smart meters, telemetry trackers and sensors for vehicle fleets and industrial equipment, as well as alarm systems.

Ultimately, it is likely that LTE-M will replace 2G for M2M applications. But during the transition phase, Multi Mode 2G-LTE-M solutions will step in to ensure service continuity and international consistency.

LTE-M technology

After the announcement in late December 2017 of this technology's roll-out in Belgium, LTE-M pilot tests are now underway in Spain, Romania, Poland, France and soon in Slovakia.

Tomorrow,

5G will develop and build on the LoRa® and LTE-M networks for devices requiring low energy consumption.

5G will integrate existing Mobile IoT technologies and their upgrades. Aside from increased performance in terms of coverage, battery life and geolocation, 5G will lend a crucial new dimension to the most demanding uses of the Internet of Things: ultra-reliability and very low latency.

The first commercial roll-out of 5G networks will begin in 2020 (consumers, smartphones, services dedicated to certain business sectors), set to be expanded by advanced functionalities starting in 2022.

Orange is preparing today for the arrival of this new network, for example through 4G/5G connectivity for self-driving vehicles, in partnership with UTAC-CERAM and Ericsson, and in the context of the European 5G PPP initiative and the 5GCAR project.

Design and develop innovative services and offers for consumers

Orange designs secure and useful products and services that are accessible for everyone, covering all the needs of each individual.

Smart Security

In Spain, in collaboration with Tyco, and in Luxembourg. Manage your house from your mobile phone and protect all your assets, while getting alerts in case a problem occurs.

Djingo

The voice or text-controlled multiservice virtual assistant created by Orange is already included in the Orange TV and Orange Bank apps. Other deployments will follow for this virtual assistant across the range of Orange services.

Datavenue: four modules to accelerate your digital transformation

Datavenue is Orange Business Services's Internet of Things and data analytics offer . This range of solutions and services is aimed at all businesses, from start-ups and SMEs to multinationals, and covers the entire value chain for connected devices with its four modules: select, connect, manage and control.

Datavenue:
four modules to accelerate your digital transformation

Select

Choose your connected devices or transform your equipment into smart devices, using our catalog of connected devices and our marketplace Datavenue Market.

Connect

Facilitate data transmission by choosing the kind of connectivity adapted to your customers' uses (LPWA, 2G/3G/4G, RFID, ethernet, Wi-Fi and soon 5G).

Manage

Collect, analyze and store your devices related data in total security using our Live Objects platform and enable their virtualization.

Connect

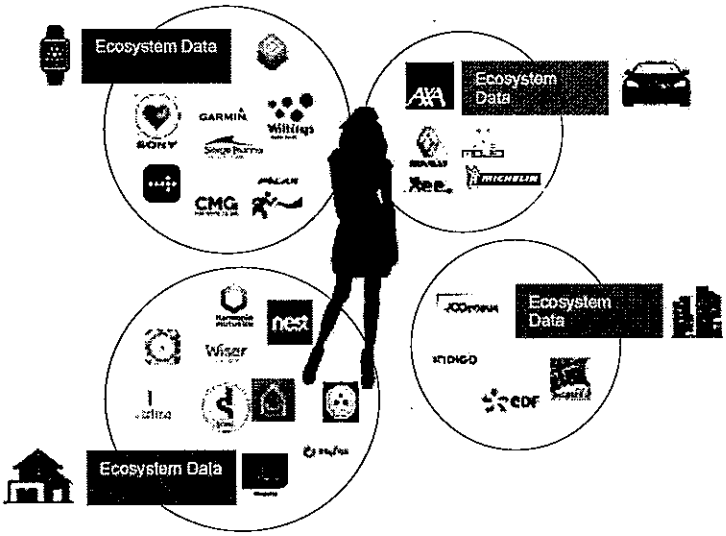
Manage your IoT projects from start to finish using a full catalog of support services (consulting, build, run, security, etc.).

Reinvent customer relationship and generate value

Facts

Connected objects management is also complex for the end user:

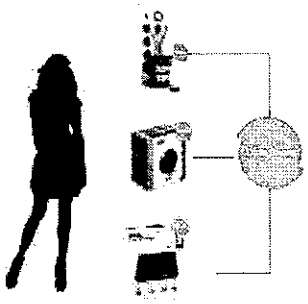
- every object brings an app
- usage universes are various
- basic services value added is limited
- data is scattered



Data share an open set of resources (APIs, interfaces ...)

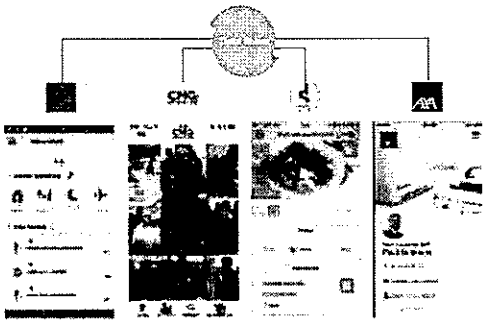
Increase trust by solving fragmentation and boost customer satisfaction

1 Understand the compatibility between objects and services thanks to a « label »



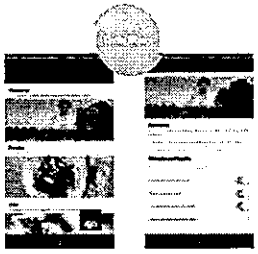
- label for UX
- compatibility warranty
- data harmonization
- **service continuity**

2 Crystal Clearness for personal data sharing between objects and services.



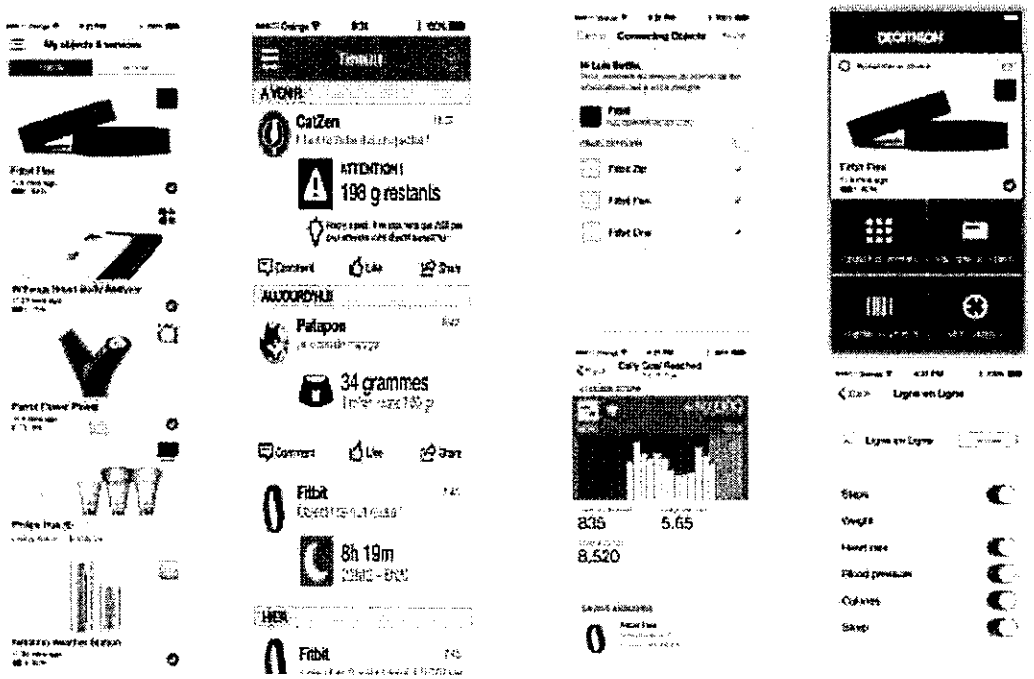
- user identity
- data history
- data sharing
- distributed scenarios engine

3 Simplify the complexity of the connected objects ecosystem



- shared data centralised management
- services distribution

Data Share, from aggregation to interactions



API's from Orange

Log in

Orange Developer Products Support Blog My apps

Build your service and co-innovate with Orange

Access our APIs

57

The secret of our innovations?

Collaboration with the IoT ecosystem

1.

[illegible] innovation approach

Every day, Orange develops its collaborations with businesses of every size:

- [illegible] co-construction of a new culinary experience with Foodle
- [illegible] the connected moisture meter K-mIoT
- [illegible] the SMATI software solution for building operation.

2.

Datavenue Market

Orange created [illegible] to facilitate interactions between connected device manufacturers and companies or developers seeking to test and validate their IoT project autonomously and at low cost.

The secret of our innovations?

Collaboration with the IoT ecosystem

3.

Orange Developer

Orange provides developers with a wide range of solutions, such as APIs and prototyping kits, and organizes challenges to inspire and support developers.

4.

A program dedicated to software vendors and integrators

Who benefit from simplified access to Orange and can find commercial and technical support to take the best out of Orange's IoT networks, platforms and devices.

The program is composed of tailored offers built for the different customer's use cases. It includes network connectivity (LoRa®, cellular) and access to the Live Objects platform, but also training and invitations to Orange and partners industry events. Selected participants also benefit from improved visibility on Datavenue Market and can be integrated into Orange's portfolio

IoT Open Campus, our eco-campus for innovation

The connected greenhouse

Humidity and temperature control using the 2G and LoRa® network.
In collaboration with the start-up MyFood.

The connected beehive

Beehive activity monitoring (temperature, humidity, weight, etc.) using the LoRa® network, in collaboration with the start-up Hostabee.

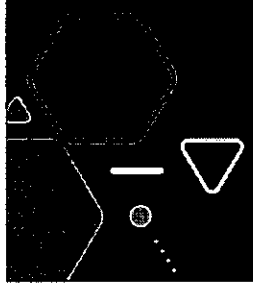
The Open IoT Lab

A dedicated space for device manufacturers seeking to test their product or service in a network environment based on LTE-M technology.

The connected streetlamp

An LTE-M antenna used by device manufacturers to test their outdoor solutions on this network.

Thank you.



pavlice.slupovski@orange.com

orange

Open APIs for Open Minds

PREDICTIVE MAINTENANCE ACROSS DIFFERENT IOT PLATFORMS USING OPEN SOURCE

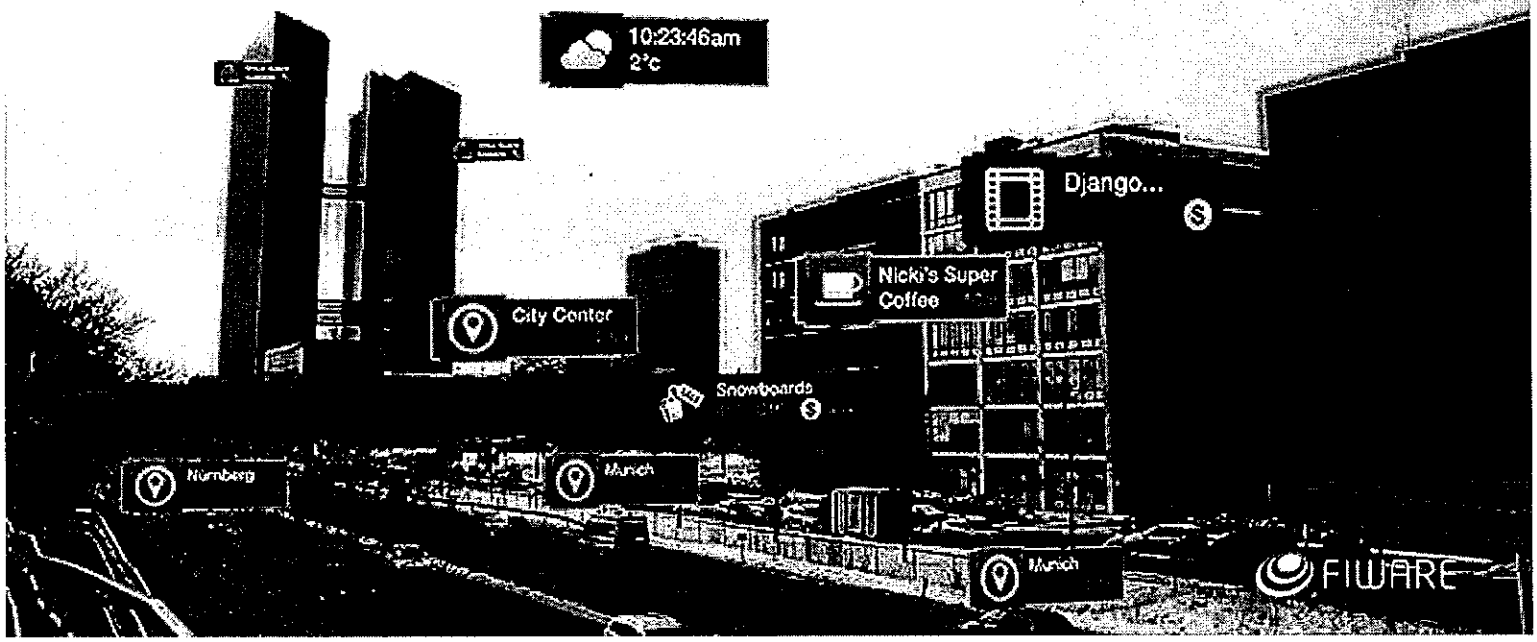
17.10.2018, IoT Solutions World Congress, Barcelona

Ulrich Ahle
CEO FIWARE Foundation
Founding Member and Member of the Board of the International Data Spaces Association

ulrich.ahle@fiware.org

FIWARE

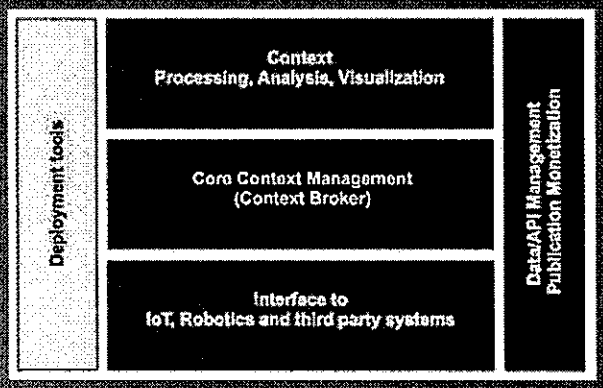
The new Digital Life will gravitate around context information. Context information which describe <u>what</u> is going on, <u>where</u>, <u>when</u>, <u>why</u> ...



Today data are very often organized in silos

This is FIWARE!

FIWARE



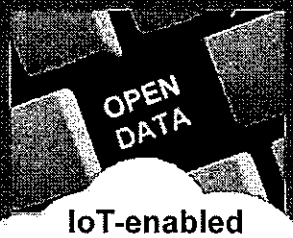
- A framework of open source platform components to access and manage heterogeneous context information through open APIs
- A standard for exchange of context information: FIWARE-NGSI (Next Generation Service Interface)
- Generic Enablers and Solutions to provide Smart Services with the FIWARE Context Broker as main component

FIWARE

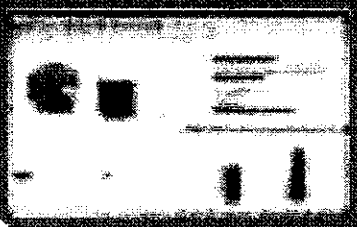
Once context information is gathered, a lot of useful complementary FIWARE enablers can be used

Advanced Web-based UI (AR, 3D)

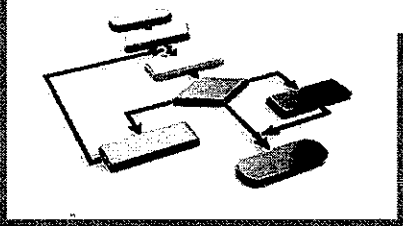
Open data publication



Data/Apps visualization



IoT-enabled Context Information Management



Complex Event Processing

Multimedia processing

Big Data Analysis

FIWARE

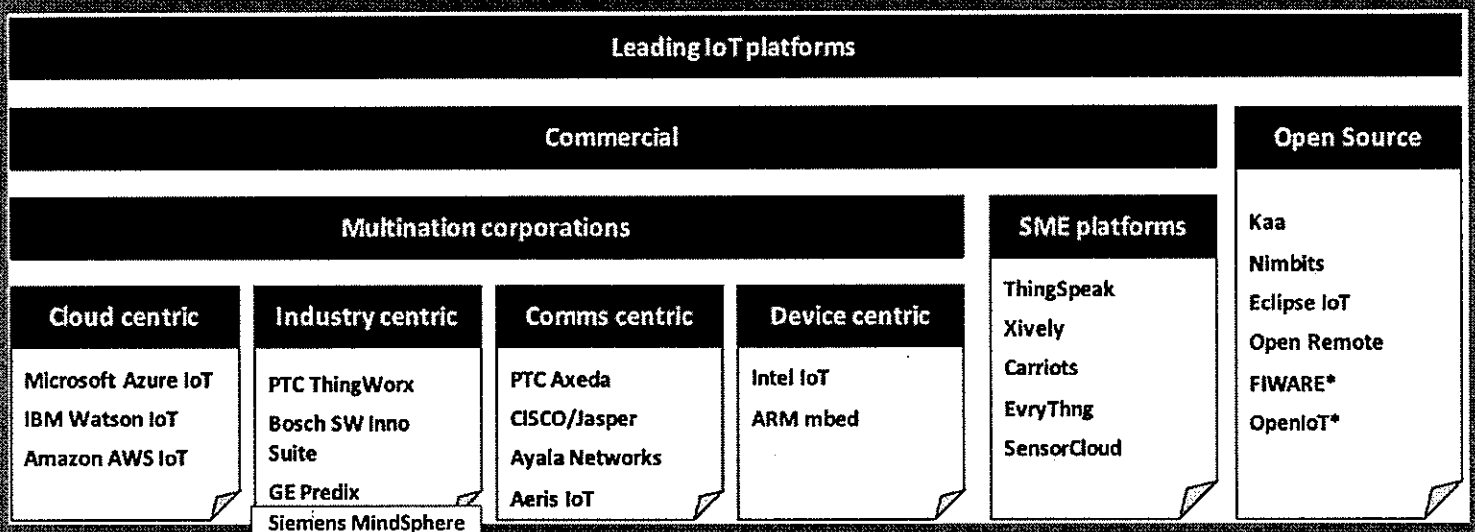
5

FIWARE Lab: A living example of FIWARE can be used free of charge for pilots / testbeds

- 14 Federated Nodes:
  - Europe (10)
  - Mexico (1)
  - Brazil (1)
  - Senegal (1)
  - India (1, since 26.4.18)
- Virtual Hosts: 2592 VMs
- Computing capacity:
  - Cores: 4408
  - Memory: 19.2 Tb
  - Disk: 1014.7 Tb

FIWARE

Leading IoT Platforms out of actually more than 360 world wide



Source: European Commission, published 10/2016

FIWARE

Press echo from PAC Radar
(September 2018)

SUPPLY CHAIN TIMES

News, Comment & Analysis.

...

Today market research and strategic consulting company PAC has published the PAC RADAR IoT Platforms in Europe 2018. It is the biggest market analysis of the vendor landscape around all kinds of IoT platforms. PAC screened more than **120 platforms**, evaluated 43 of them in seven different segments and through this approach identified the best-in-class providers in different areas. **Across all seven segments only 12 players achieved a "Best in Class" ranking**: AWS, Bosch Software Innovations, **FIWARE**, GE Digital, Harman, IBM, Itron, Microsoft, PTC, SAP, Siemens and Software AG.

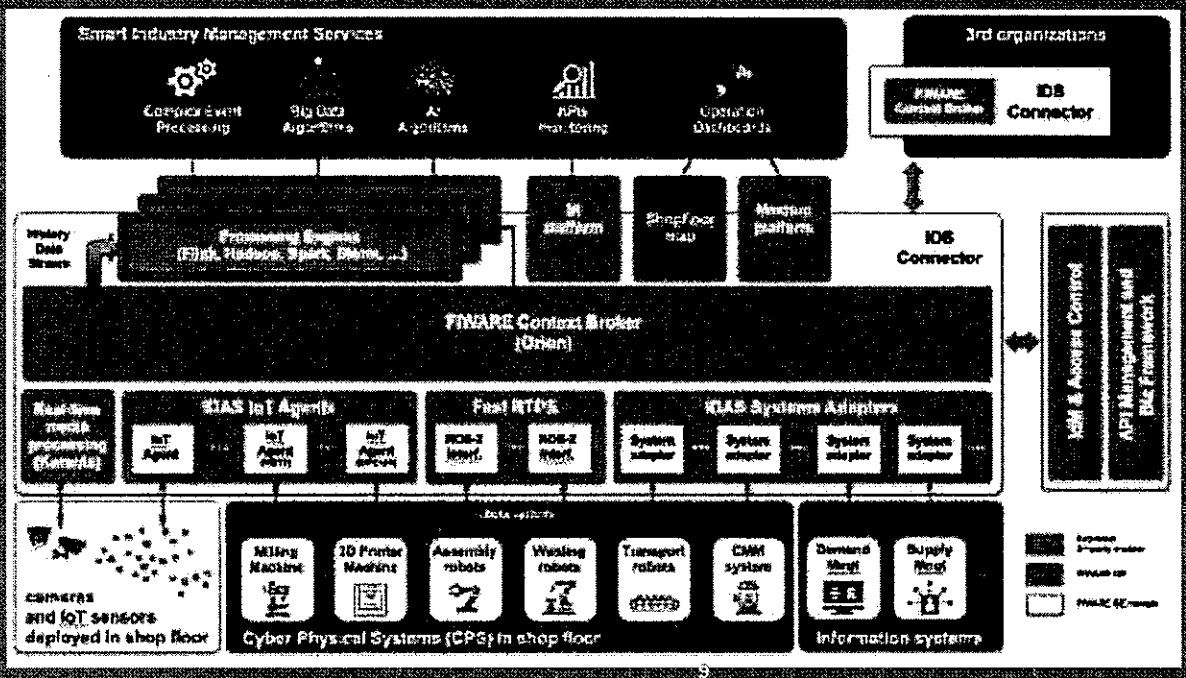
...

IoT platforms for smart cities are designed to cover all kinds of use case around the efficient use of existing city infrastructures and the delivery of the collected data to many different users across the city. **Leading providers in this space are FIWARE and Itron**, but the Urban Software Institute, too, has a very high competence here.

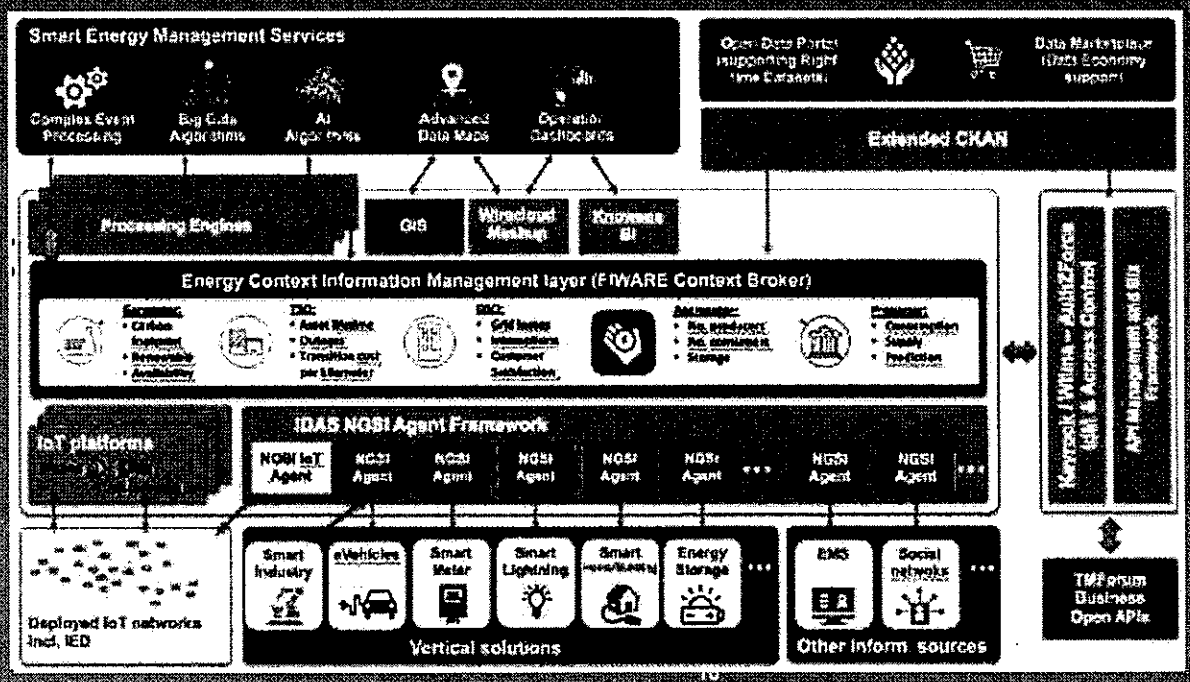
...

FIWARE

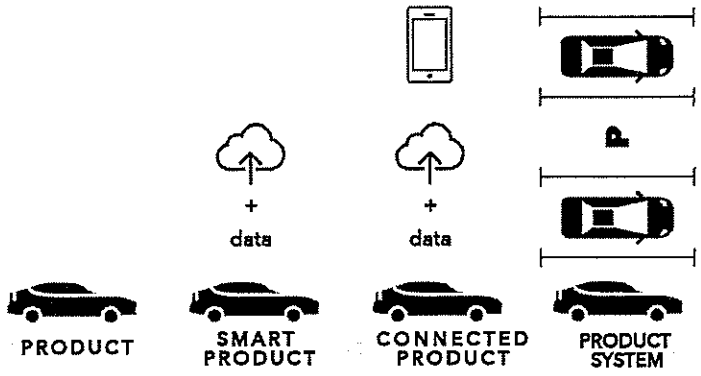
A complete Reference Architecture for Smart Industry

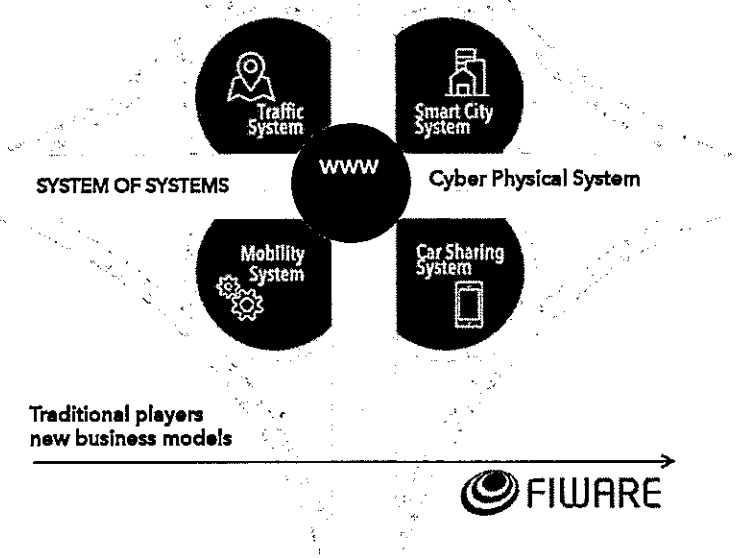


A complete Reference Architecture for Smart Energy



FIWARE for the creation of the System of Systems





Traditional players / products → New (kind of) players new business models → Traditional players new business models

FIWARE

Source: Porter/ Heppelmann, Weiser Design

FIWARE: Digitising the European Industry

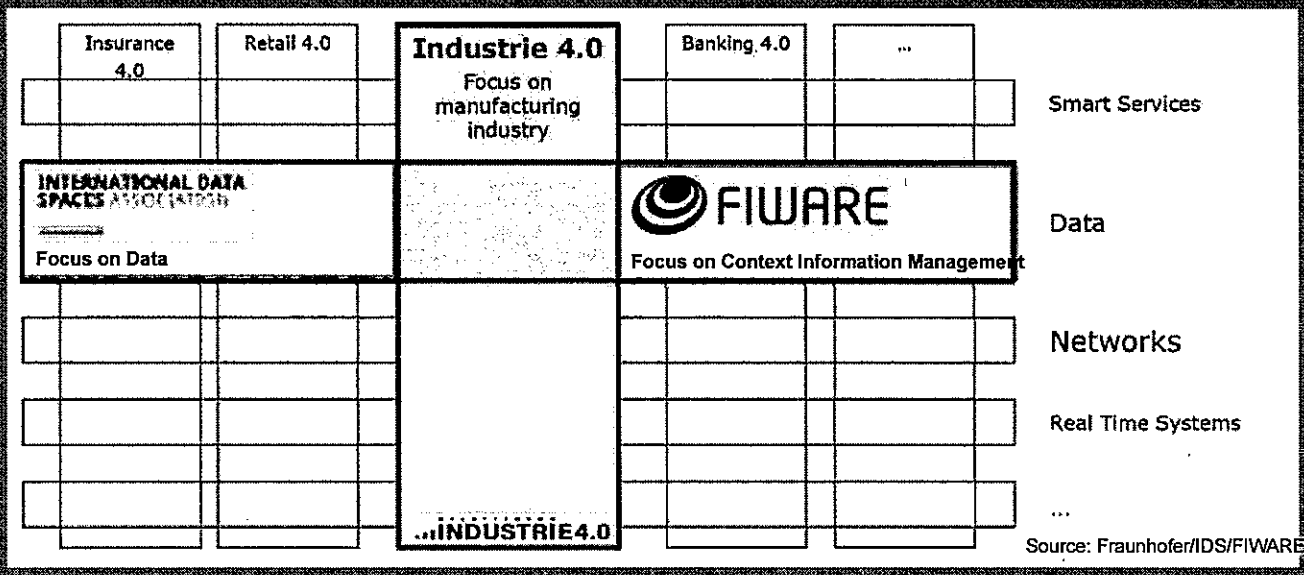
„Promising digital industrial platforms building on European strengths:"

- RAMI 4.0
- Industrial Data Space
- FIWARE

A MoU was signed between the Industrial Data Space and FIWARE in June 2017 to create the first open source based implementation of the IDS concepts based on FIWARE.

FIWARE

Positioning of Industrie 4.0 and IDS - FIWARE shares the same vision as the International Data Spaces

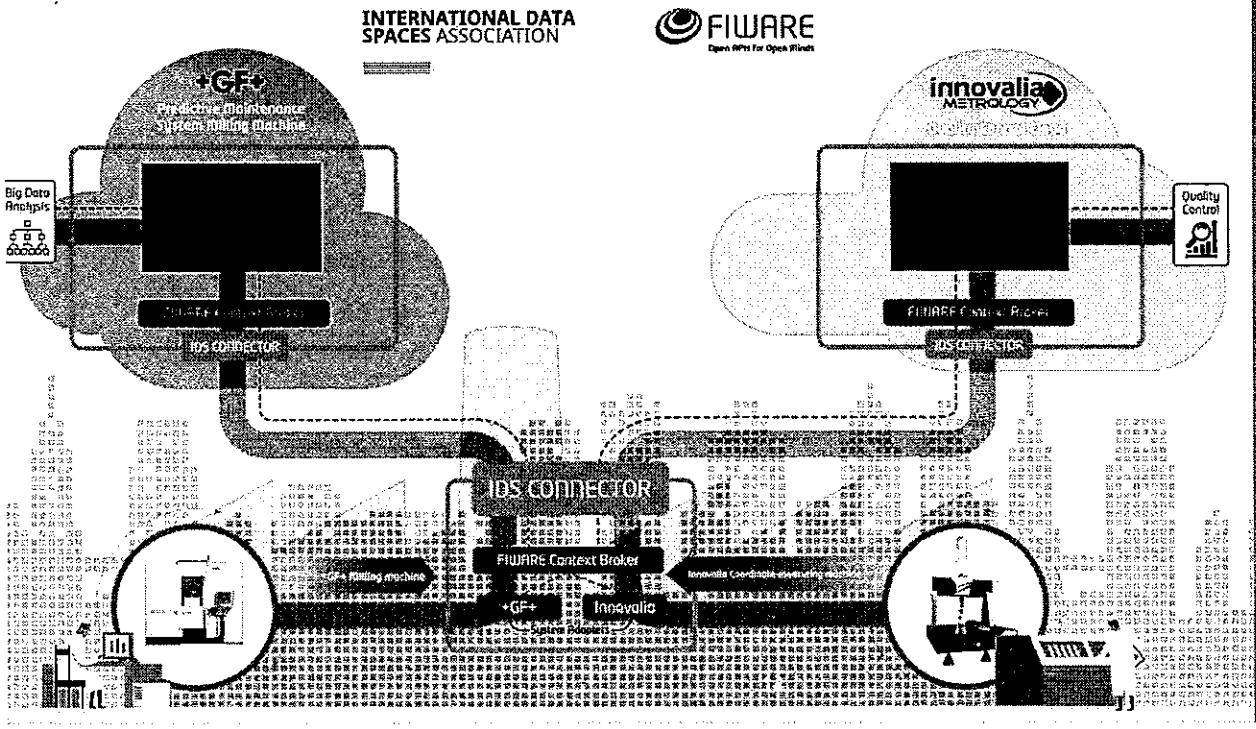


Source: Fraunhofer/IDS/FIWARE

FIWARE

PAVING THE WAY FOR THE FUTURE DATA-DRIVEN INDUSTRIAL DIGITALIZATION

ZERO DEFECT MANUFACTURING

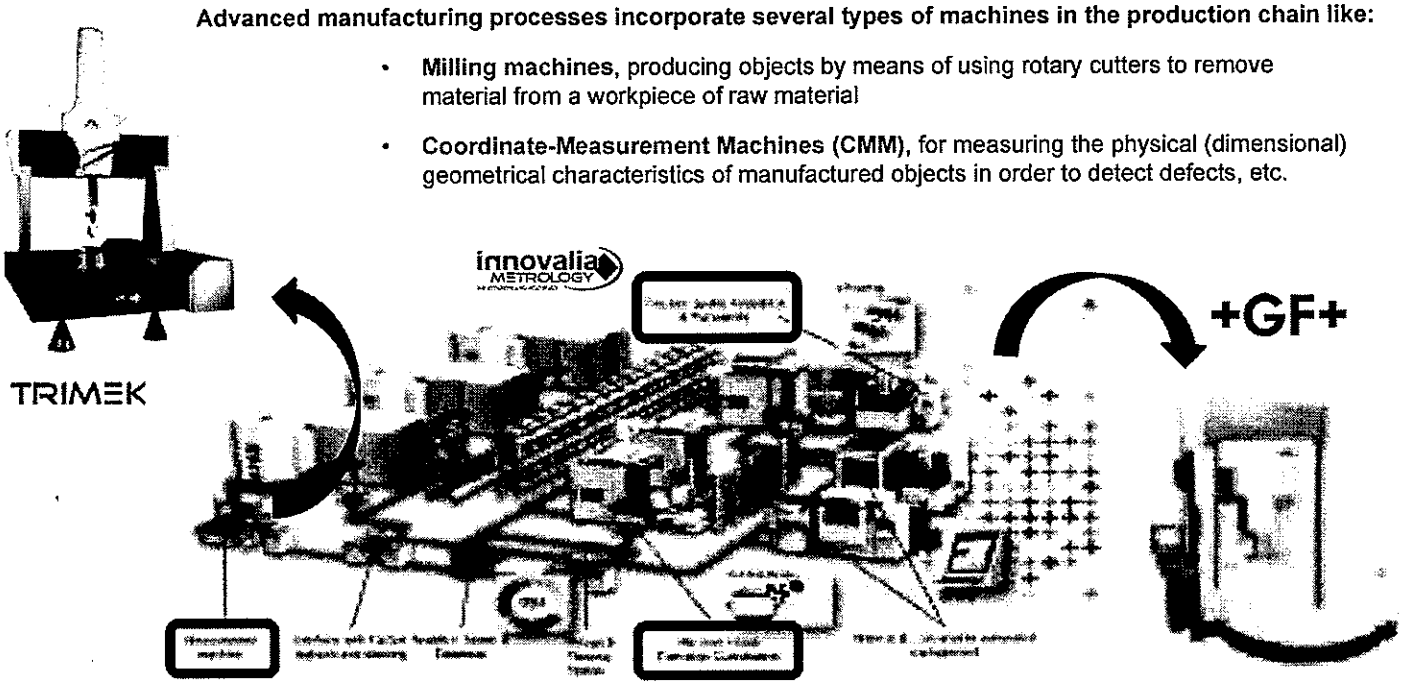


FIWARE

Use Case: Zero defect manufacturing

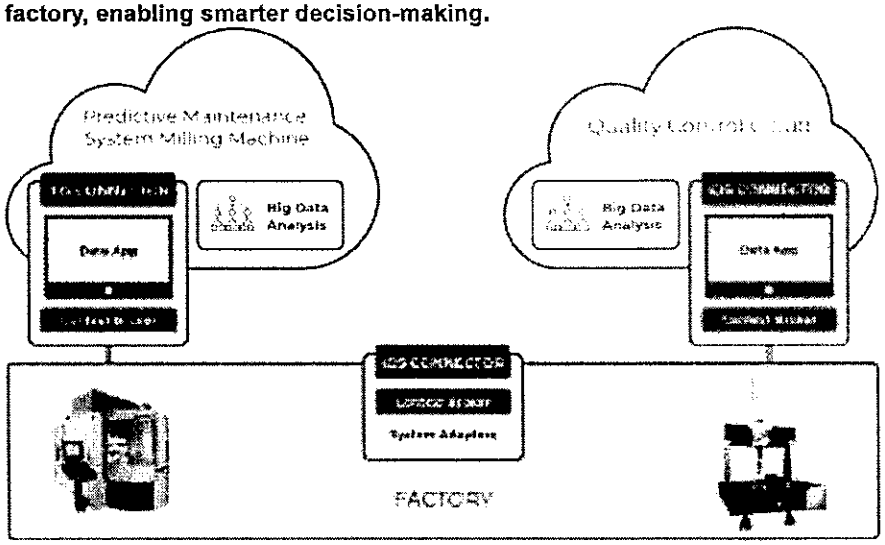
Advanced manufacturing processes incorporate several types of machines in the production chain like:

- **Milling machines**, producing objects by means of using rotary cutters to remove material from a workpiece of raw material
- **Coordinate-Measurement Machines (CMM)**, for measuring the physical (dimensional) geometrical characteristics of manufactured objects in order to detect defects, etc.



Zero defect manufacturing use case: Scope

The Zero Defect Manufacturing use case demonstrates how factories can benefit from IDS reference architecture and FIWARE open-source technology by obtaining enhanced functionalities for monitoring context data exported from the factory, enabling smarter decision-making.



IDS Connector

INTERNATIONAL DATA SPACES ASSOCIATION

FIWARE

Quality Control Dashboard

innovalia METROLOGY

Machine Data

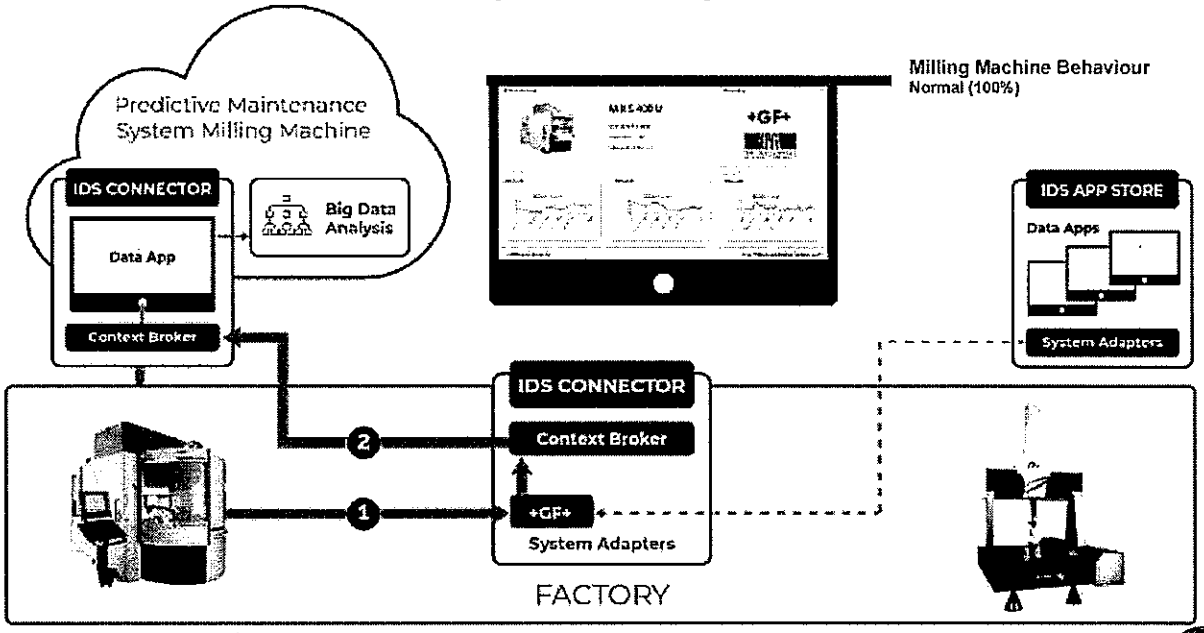
TRIMEK +GF+

Big Data Algorithms

innovalia ASSOCIATION

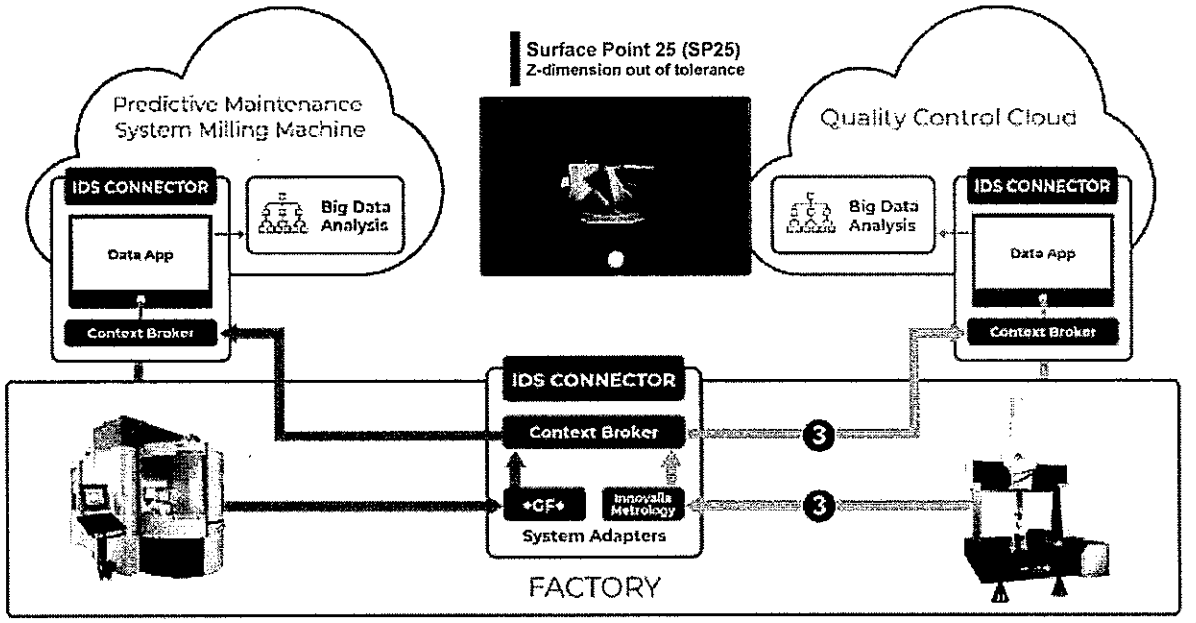
FIWARE

Zero defect manufacturing use case: Smart decision workflow powered by FIWARE-IDS



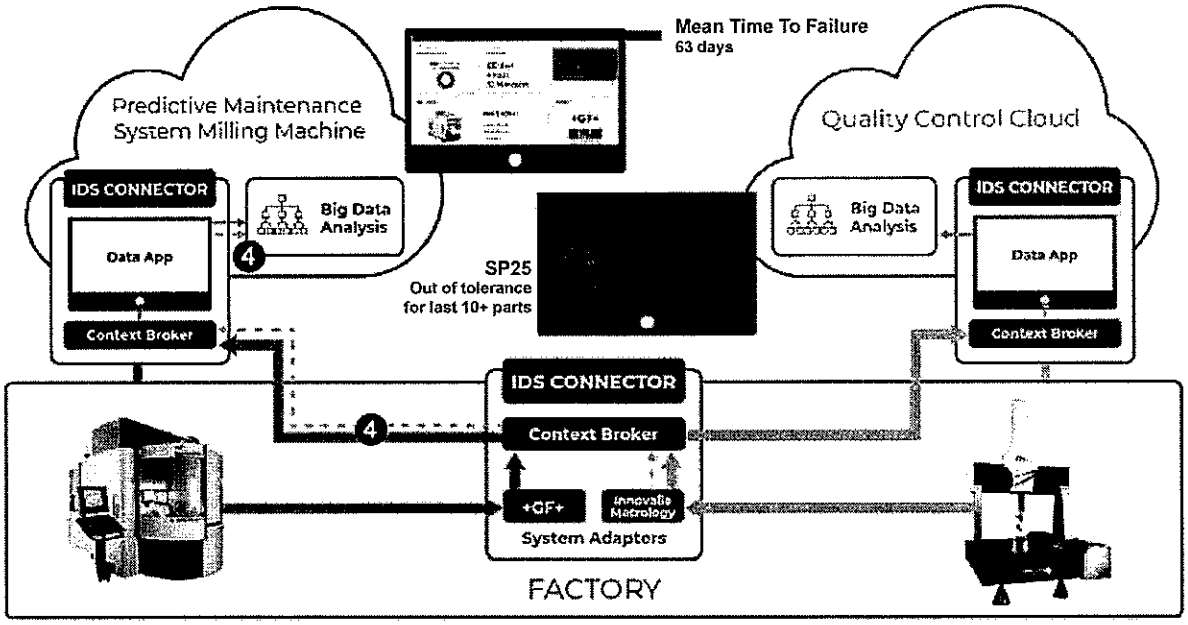
FIWARE

Zero defect manufacturing use case: Smart decision workflow powered by FIWARE-IDS



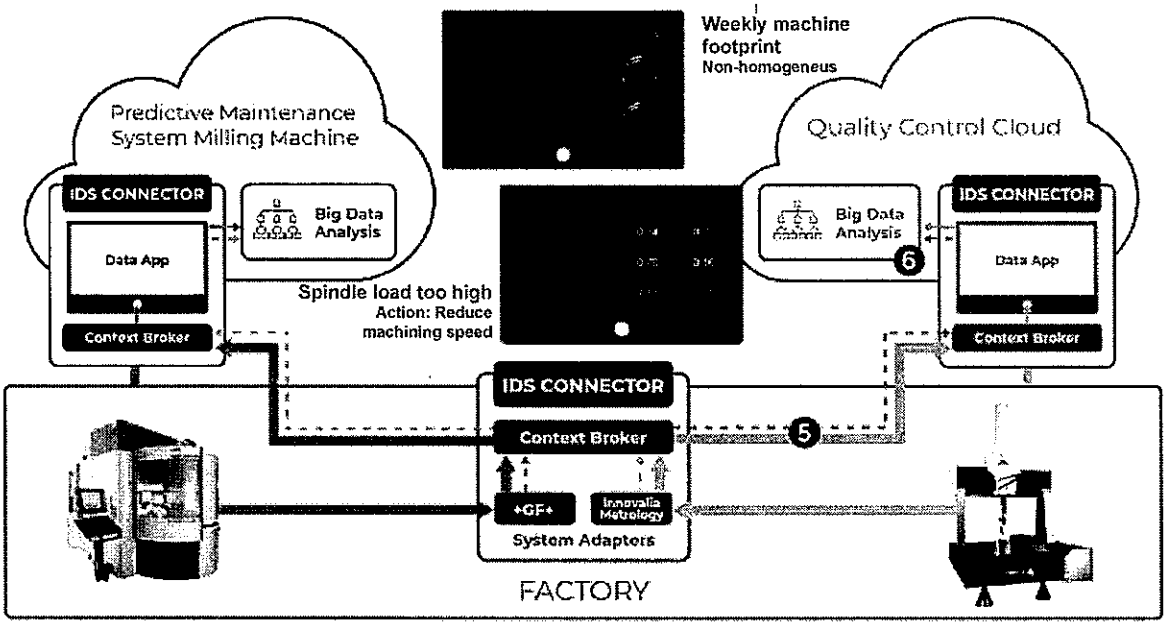
FIWARE

Zero defect manufacturing use case: Smart decision workflow powered by FIWARE-IDS



FIWARE

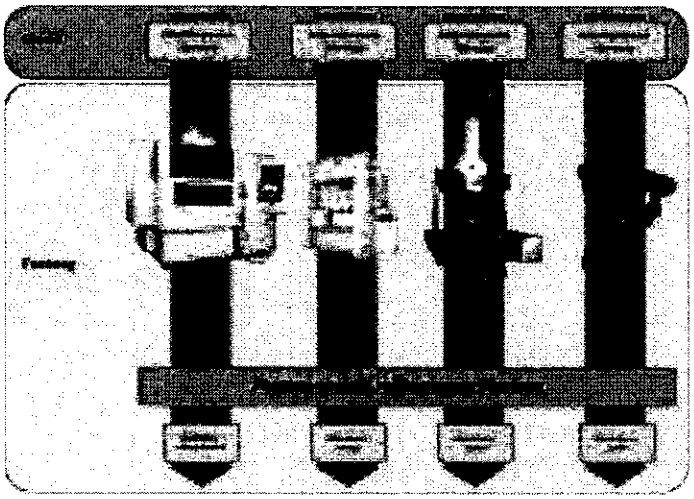
Zero defect manufacturing use case: Smart decision workflow powered by FIWARE-IDS



FIWARE

Breaking the data silos in a controlled manner: Benefits

- Improved performance of the systems connected to the milling machine and CMM. Each machine can enhance its maintenance by means of using data produced by the other machine.
- Data control. Usage of IDS connectors at the factory brings the necessary warranty to Innovalia and Georg Fischer that only the measurements they approve can be delivered to the Milling machine Predictive Maintenance system and CMM system correspondingly.
- Confidentiality of information. Only selected measurements are delivered outside the factory and only for the purpose of improving the predictive maintenance. None of the used data will be shared with a competitive factory.



FIWARE

FIWARE: Digitising the European Industry

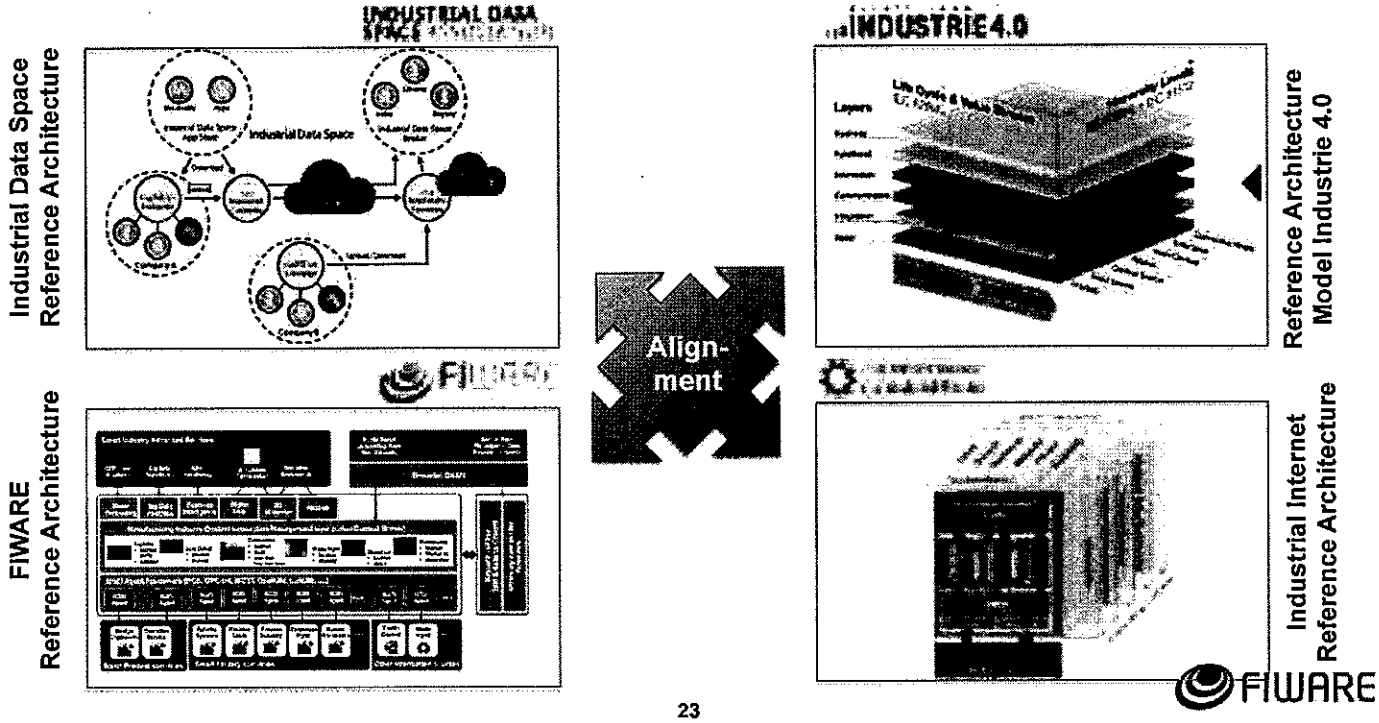
„Promising digital industrial platforms building on European strengths:“

- RAMI 4.0
- Industrial Data Space
- FIWARE

A MoU was signed between the Industrial Data Space and FIWARE in June 2017 to create the first open source based implementation of the IDS concepts based on FIWARE

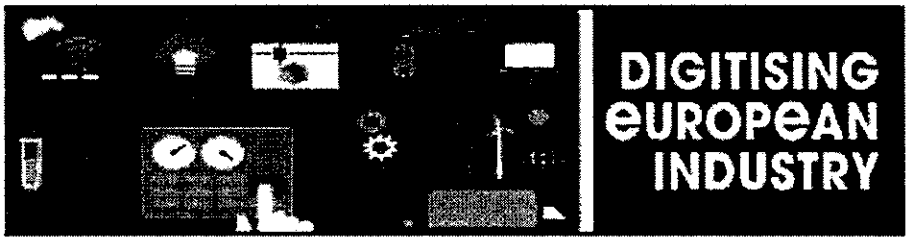
FIWARE

The next Task: Positioning of the four main Drivers of Industrial IoT



Meeting EC, IDS, IIC and FIWARE at Hannover Messe 2018

Preparing the next steps on European Digital Platforms



Advanced & Interoperable Digital B2B Platforms for Smart Factories and Energy

OPENING KEYNOTE SPEECHES

Statements by futurologists on user requirements and the need for Europe to rethink business models in B2B industries

- Dr. Reinhold ACHATZ (Thyssenkrupp)
- Dr. Sanjay PANDE (Accenture)
- Hubert TARDIEU (ADEL)

I PANEL DISCUSSION: EXISTING SOLUTIONS ON THE MARKET

PANEL DISCUSSION

MEMBERS OF THE PANEL

- [illegible] (FIWARE Foundation)
- TBC: Invited panelists/participants include ASD, Bosch, Cumulo, Dassault, FIWARE, IDS, SAP, vDOS

25

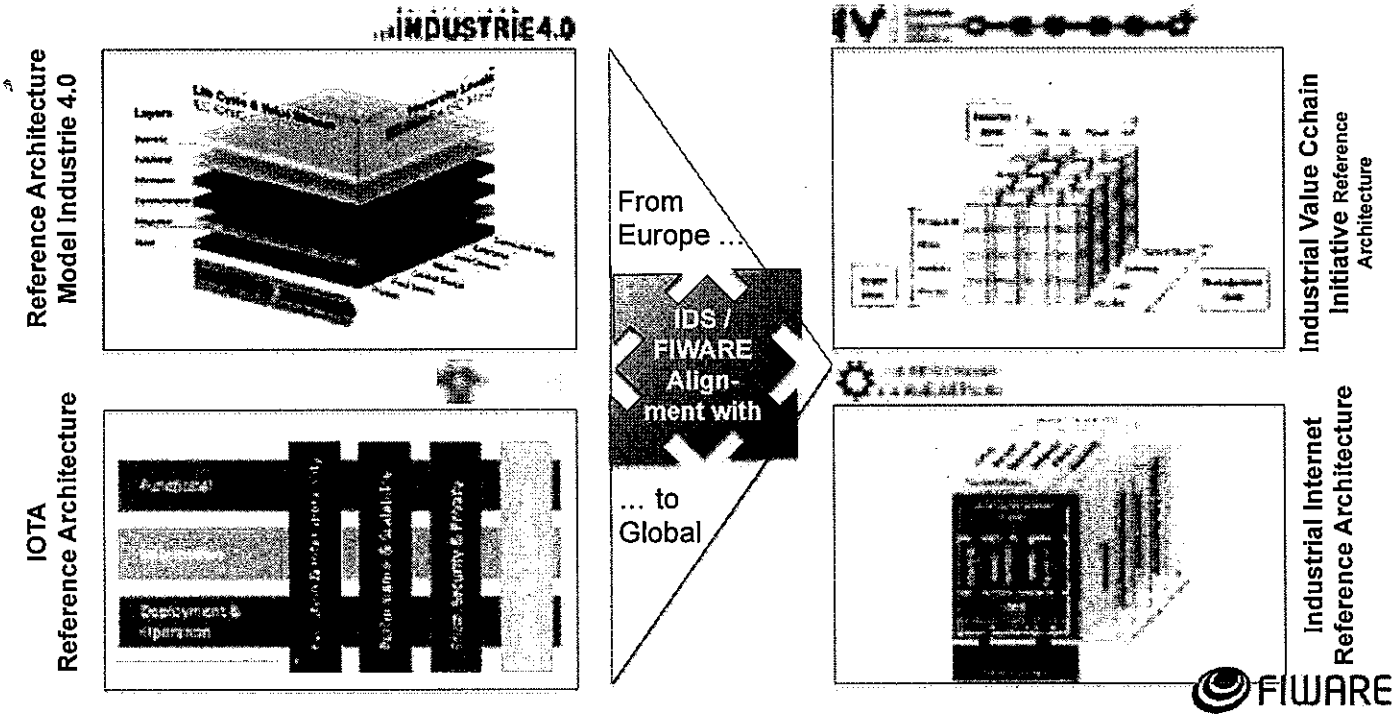
- Workshop in Brussels 15./16.10.2018
- EU Call on Digital Platforms for Manufacturing, Agrifood and Energy will open on 16.10.2018

WHY

In the context of **Digitising European Industry** (DEI), the EU invests around €300 million in next-generation platform building and piloting, during the 2018-20 period. The European Commission invites you to a workshop on **'Advanced & Interoperable Digital B2B Platforms for Smart Factories and Energy'** which aims to foster cooperation of stakeholders across value chains, user-supplier integration, and fast adoption of emerging standards.

FIWARE

The next Task: Alignment of the main Drivers of Industrial IoT



The Advantages of an Open Source Platform like FIWARE for Smart Services

- The basic software (Platform and Generic Enablers) is available for everyone, for free, forever
- A large open source developers community is maintaining and further developing the basic software components
- A large group of start ups and global corporate companies are providing smart solutions and smart services based on FIWARE
- Lowest cost of ownership for the end users
- Open data models and open APIs are avoiding a ‚vendor-lock-in' effect

FIWARE

Use Cases

Smart City Platform
Silos Management
Water Management
Quality Farming
Predictive Maintenance
Smart Parking
Sound Analytics
Robotics Platform
Drone-based Delivery

FIWARE

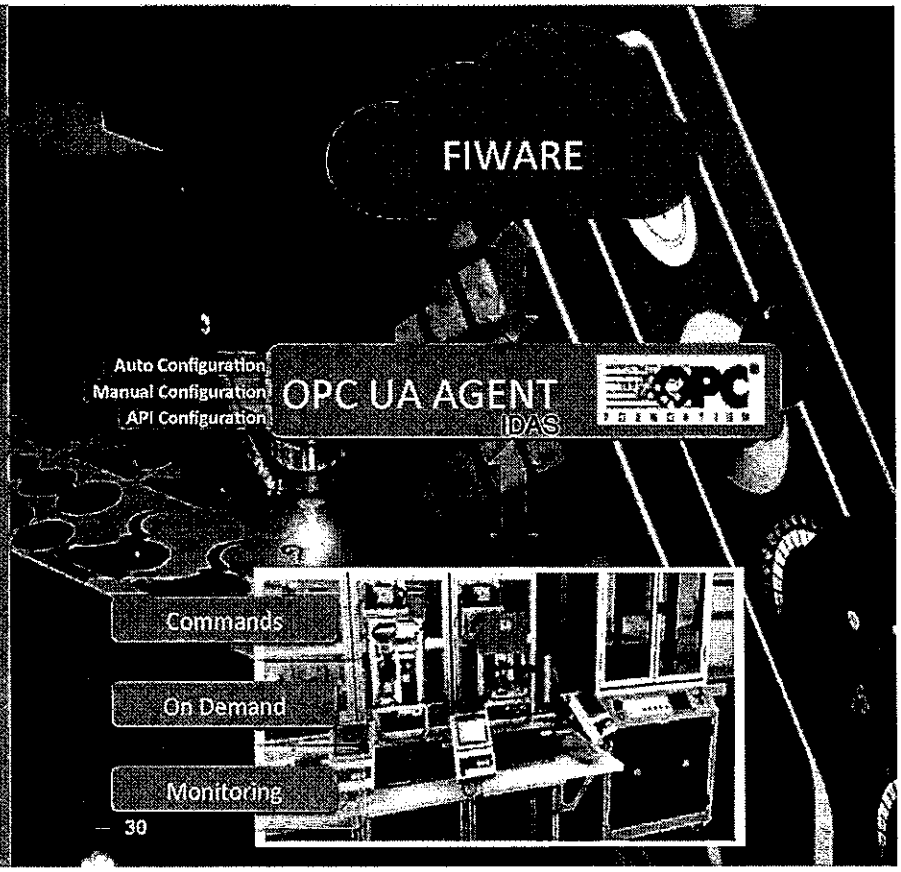
FACILITY ENABLER

- Goal: Enable multi-domain data integration, harmonization and multi-device interoperability.
- Target customers: Smart Industries, Facility Management Companies
- Main features:
  - Register any machines and servers (e.g. OPC UA)
  - Harmonize data in NGSI FIWARE Data models
  - Command machines and monitor their status through user friendly dashboards

ENGINEERING

OPC UA Agent

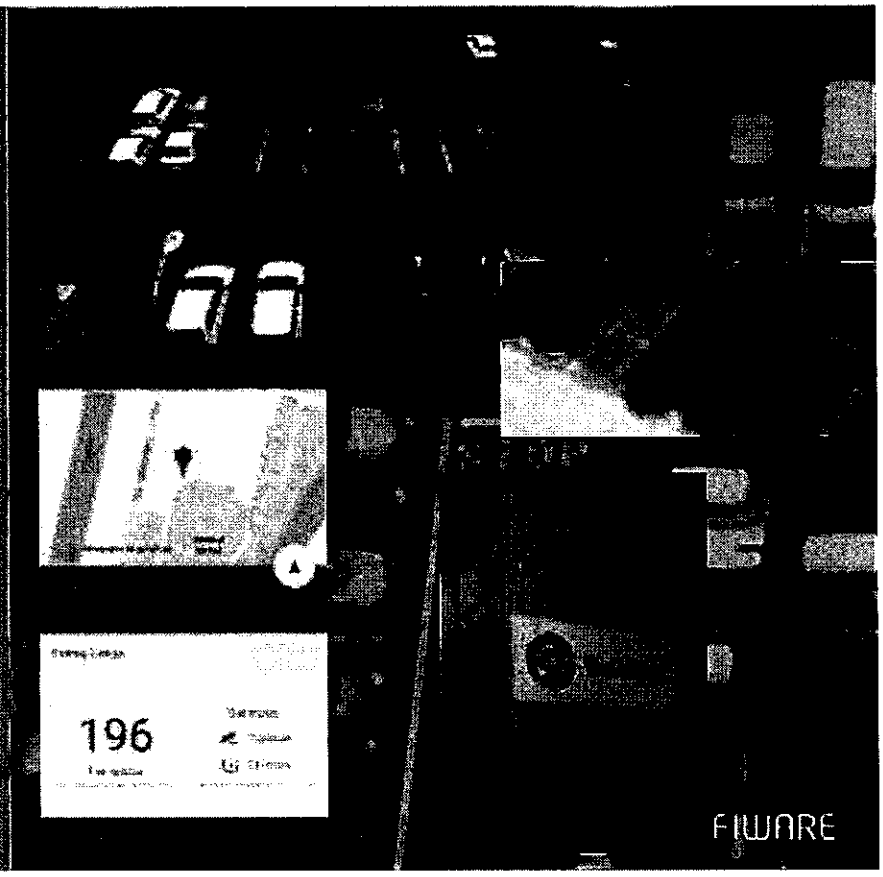
- Goal: To connect FIWARE with Industrial IoT data coming from OPC UA servers
- Target customers: System integrators providing smart industry/energy applications
- Main features:
  - Easy to install and use
  - Automatic configuration
  - Advanced configuration via API
  - Supports bidirectional communication to exchange data and commands



stratio

- Goal: Turning Fleet Maintenance into an exact science
- Target customers: transport sector, field service fleets, ...
- Main features:
  - Simple installation
  - Continuous mechanical analysis in real time
  - Advanced Artificial Intelligence Techniques for predictions
  - Real-time notification to management and workshops

- Goal: Intelligent parking space detection system
- Target customers: Cities and parking space operators
- Main features:
  - Real-time, artificial intelligence image processing algorithm
  - Edge computing of images
  - Web based solution, mobile App and integration into navigation systems
  - Significant savings in infrastructure costs when compared to installing sensors on the pavement



FI-Sonic

- Goal: Noise monitoring and sound event detection and identification
- Target customers: smart cities, smart spaces, security companies
- Main features:
  - advanced and innovative analysis using 3D audio captures
  - monthly and daily readings and statistics

FIWARE

City Pulse

- A mayor's challenge in Eindhoven:
  - Eindhoven is a safe city but ...
  - at **Stratumseind** too many incidents are reported
  - can technology help to reduce the number of incidents?

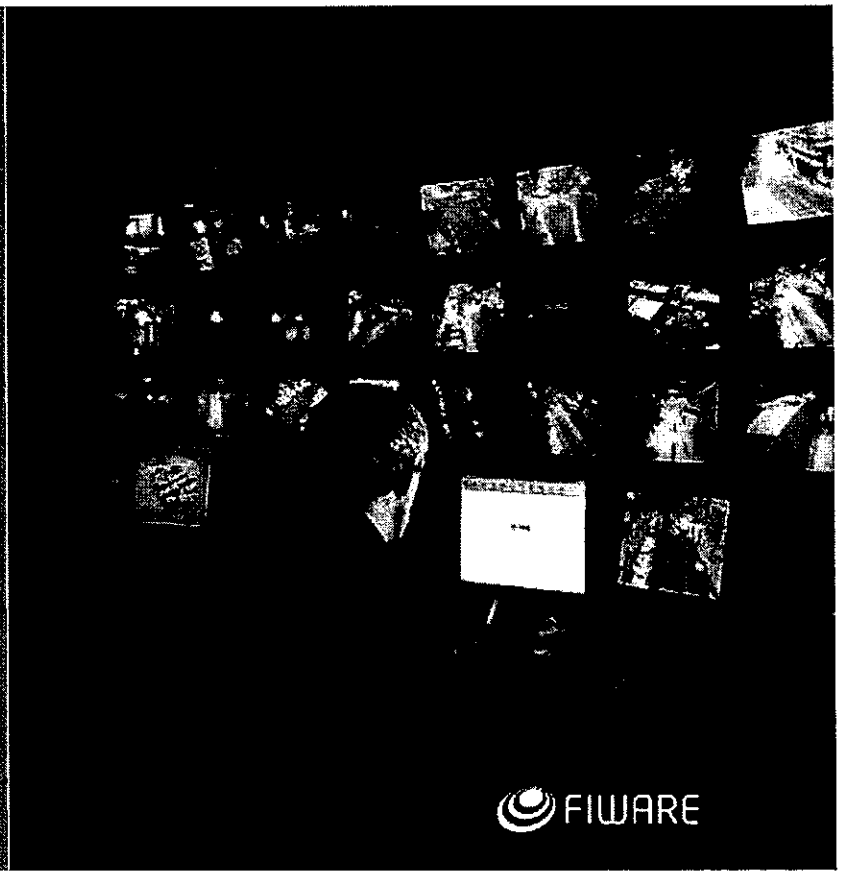
FIWARE

City Pulse

- Stratumseind
- Data analytics on ...
  - Detect walking patterns
  - Social media analytics
  - Sound analytics
- ... results in predictive services for the police

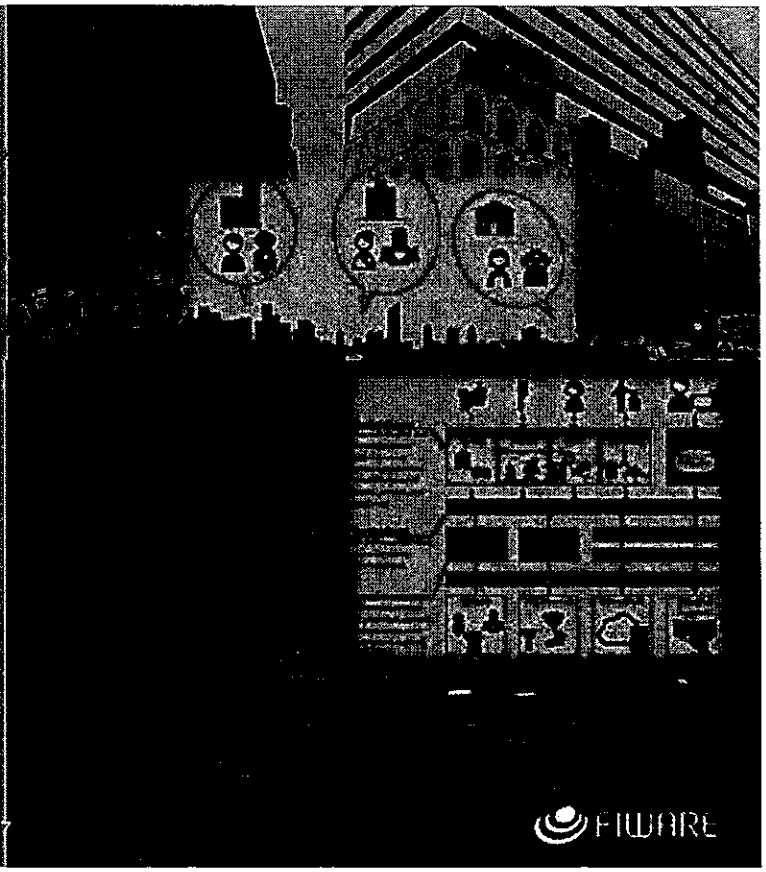
City Pulse

- Safer and more sociable environment for visitors and citizens
- Police resources focussed where they are really required
- Business owners have lower repair and clean-up costs
- Less need for hospital and medical resources due to fewer alcohol related incidents
- More business and tourism attracted to the city due to a fall in negative PR



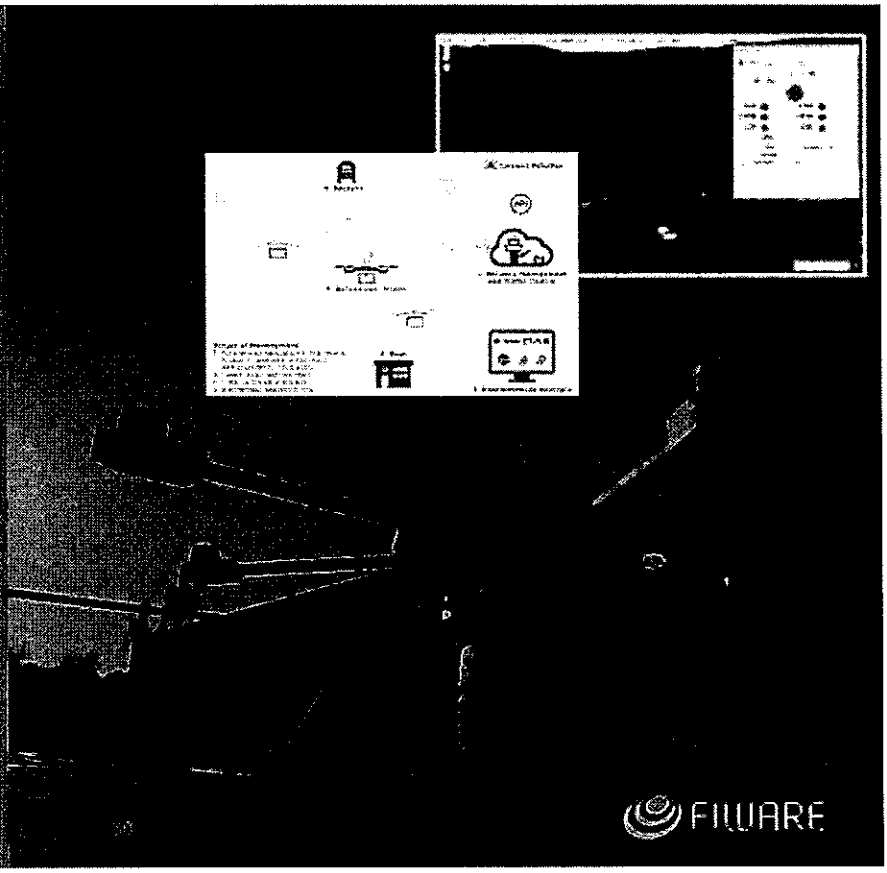
Robotics platform : RoboticBase

- Goal :Orchestrated robot management platform
- Target customers: Smart cities, Robot developers and Building operators
- Main features:
  - State monitoring
  - Remote deployment, management and operation of heterogeneous robots and IoT devices
  - Bridge component between FIWARE and ROS
  - Component orchestration by managed Kubernetes

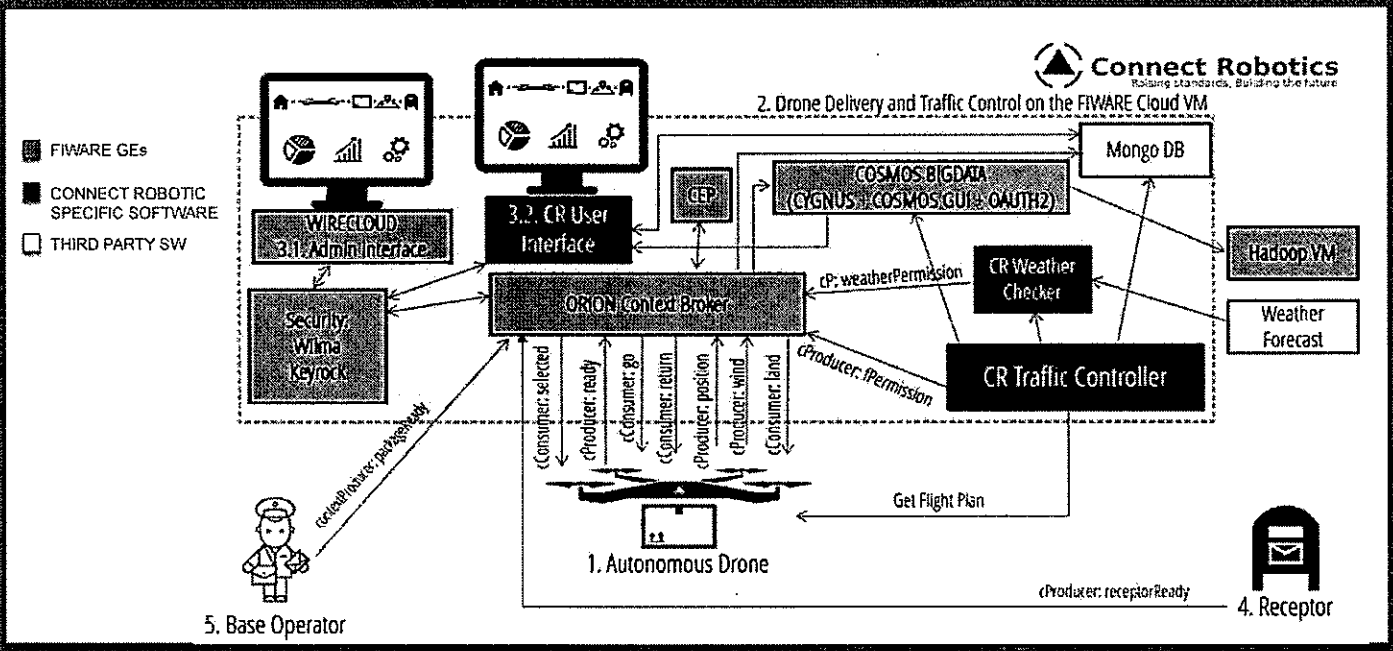


Connect Robotics

- Goal: Automate drones for delivery services
- Target customers: Logistic Operators, Medicine distributors
- Main features:
  - Automated flight planning
  - Context-aware Air Traffic Control
  - Control of aerial corridors
  - Focused to manage deliveries



CONNECT ROBOTICS - System Architecture



FIWARE

FIWARE: Standardization on a global scale

CEF DIGITAL

FIWARE Context Broker Technology have been announced on Feb. 5th, 2018 as new CEF (Connecting Europe Facility) Building Blocks

Existing CEF Building Blocks so far:

- eDelivery
- eInvoicing
- eID
- eSignature
- eTranslation.

FIWARE Standardization:

GSMA

tm

NIST National Institute of Standards and Technology

ETSI World Class Standards

The ETSI ISG CIM has decided to give the name "NGSI-LD" to the Context Information Management API. The rationale is to reinforce the fact that this specification leverages on the ... FIWARE NGSIv2 to incorporate the latest advances from Linked Data.

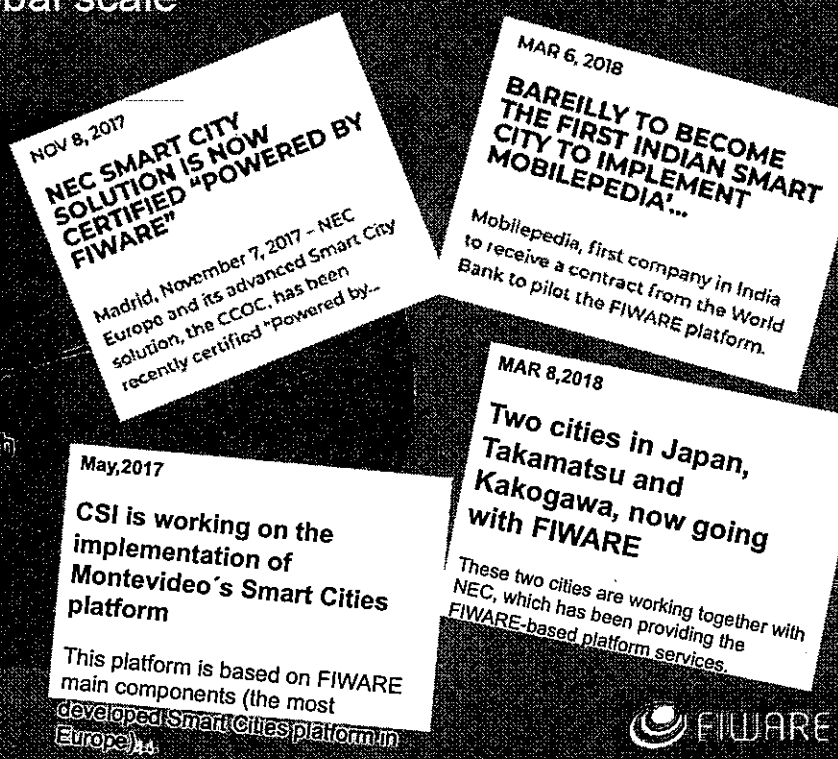
FIWARE

FIWARE: Adoption on a global scale

OPEN & AGILE SMART CITIES

117 cities
24 countries

- Common APIs:
  - ✓ FIWARE NGSI to start with
- Standard Data Models
- Platform for Open Data
- Driven by implementation approach



FIWARE

FIWARE: Public Private Partnership (PPP) Mode – The road to success!

- The history of **FIWARE** started six years ago with the **F**uture **I**nternet Public Private Partnership initiated by the European Commission under Horizon 2020
- 500 million Euro private and public funding have been invested to create an open source IoT platform, data standards and Apps
- A large ecosystems with nearly 1,000 start ups has been created

FIWARE

FIWARE Foundation

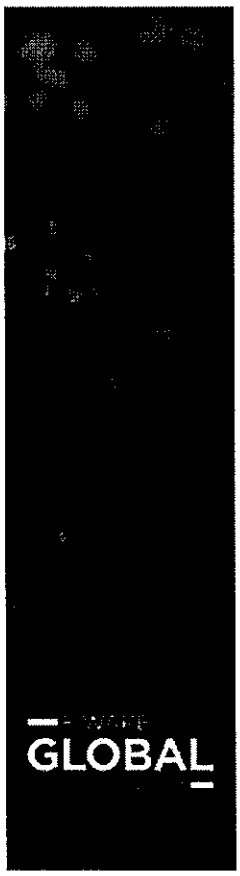
FIWARE Foundation

- Founded end of 2016 by Atos, Engineering, Orange and Telefonica
- Headquartered in Berlin
- Actually more than 190 members from around the world

Main Tasks

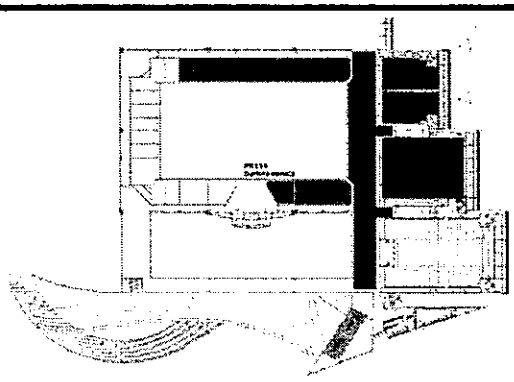
- Support and further development of the FIWARE ecosystem
- Industrialization of the technology
- Enhancement of the former focus vertical **Smart Cities** to **Smart AgriFood** and **Smart Industry** incl. Industrie 4.0 – since May 2018 also **Smart Energy**
- Globalization of FIWARE

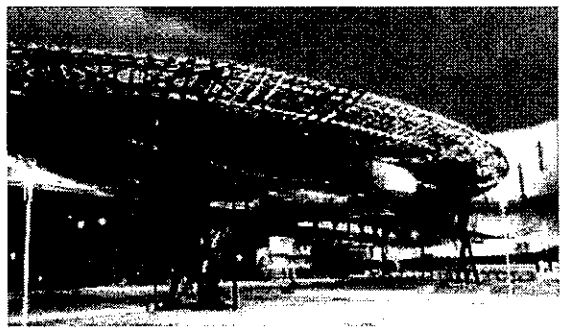
FIWARE



FIWARE Global Summit 2018

- **November 26th - 28th, 2018**
- **Conference Center Malaga, Spain**
- **Conference and Exhibition**
- **Endusers, Solution- and Service-Providers, Developers, Startups, Investors**
- **Smart City, Smart Industry, Smart AgriFood, Smart Energy**





This is FIWARE

The open source platform for our smart digital future!

Thank you!

Ulrich Ahle
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ulrich.ahle@fiware.org

www.fiware.org
Follow @FIWARE on Twitter