Industrie 4.0 und Real-Time Location Analytics

IoT & GIS

Michael Kuczynski
01.02.2017

Atos
Worldwide IT Partner

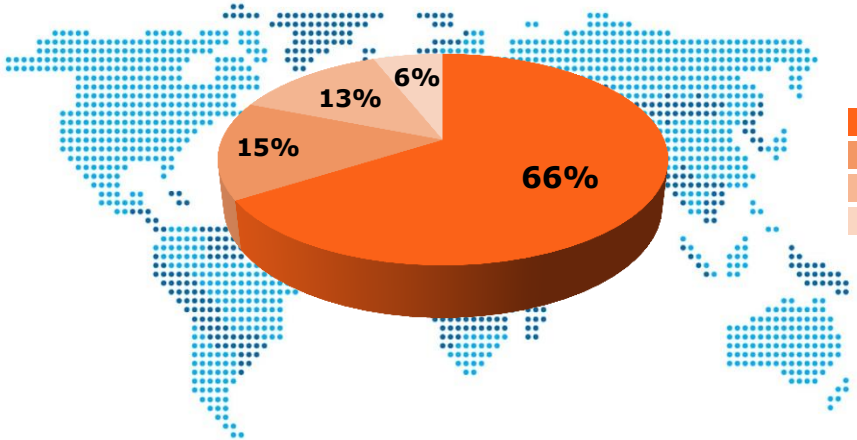
Globales Unternehmen mit europäischen Wurzeln
Hauptsitz in Frankreich und Deutschland

Bezons/Paris HQ

Ca. 100.000 Mitarbeiter
in **72** Ländern

In Deutschland
ca.12.000 Mitarbeiter

München HQ



Die Atos Geschäftsfelder

Managed Services

Consulting

Communication Soware & Platforms

Systems Integration

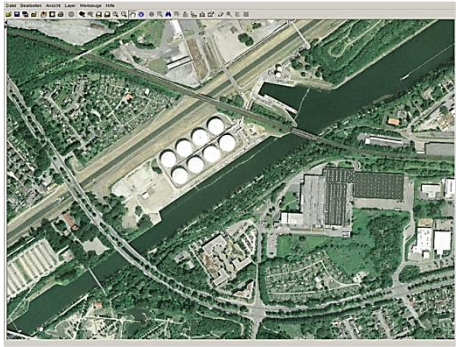
GIS

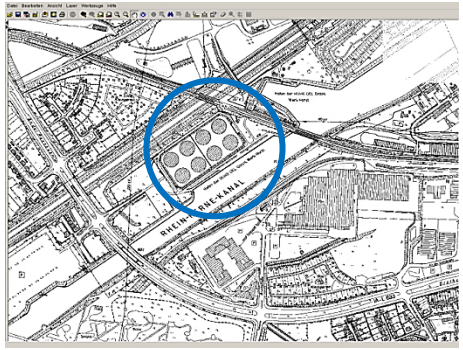
Transactional & Payment Services

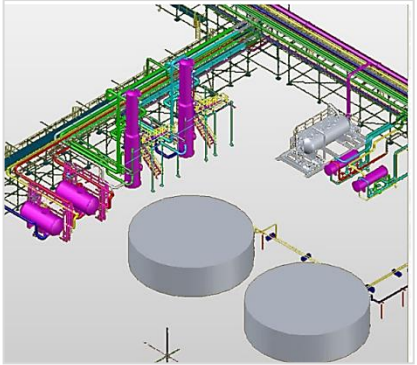
Cloud & Enterprise Software

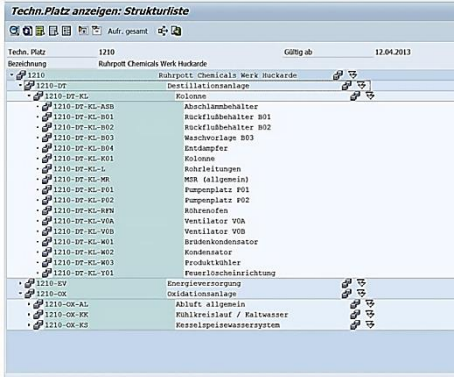
Big Data & Security

Portfolio
GIS - CAD – BIM - SAP

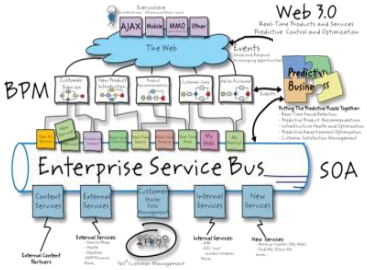








System Integration



GIS

Analytics

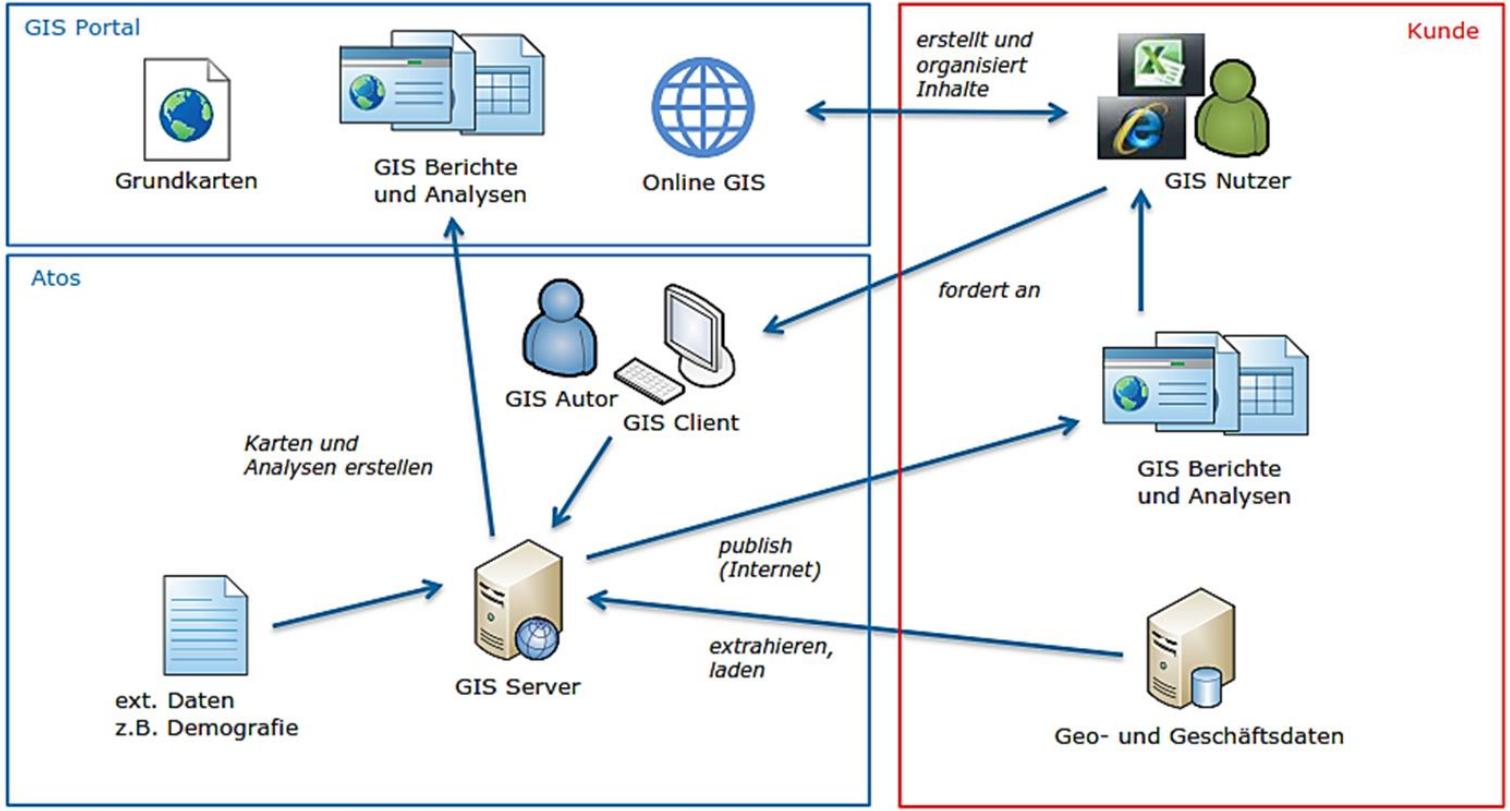
Cloud & Web
Infrastructure

Database Technology

Key Offering - „Big GDI“

- Design und Sizing komplexer Geodateninfrastrukturen
  - auch im sicherheitsrelevanten Umfeld
- Aufbau und Betrieb
- Integration in die IT-Infrastruktur
- Daten-Migration und –Konsolidierung
- Support
  - aktuell für mehr als 1000 Anwender

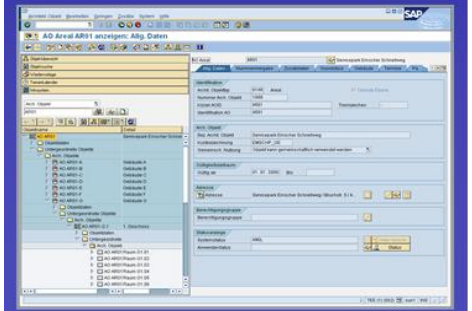
Key Offering – „GIS as a Service“



Key Offerings- Integration

SAP

Customer
Contracts
Business Data
…



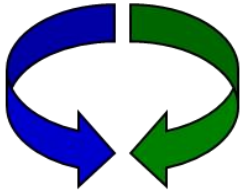
Land Use Management

Real Estate

Facility Management

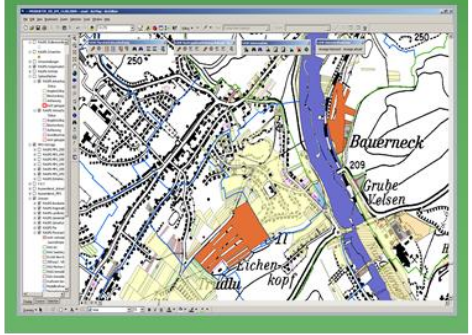
Plant Maintenance

Construction



GIS / CAD

Network
Topology
Technical Data
…



Industries

Public & Health			Manuf., Retail, Transport			Telco, Media, Utilities			Financial Services
Defense / HLS	Smart Cities & Research	Connected healthcare	Industry 4.0	Connected Retail	Connected Vehicles	Smart Telco	Medias	Utilities	Bank & insurance
C4I Missiles Urgencies ...	Meteo Air quality Research ...	Medical devices & machines ...	Connected plants & machines, ...	Connected stores & devices ...	Cars, trucks, machines, ...	Devices, infra-structures, ...	devices, advertising walls, ...	Smart Grid, smart water, ...	Payment & smart devices

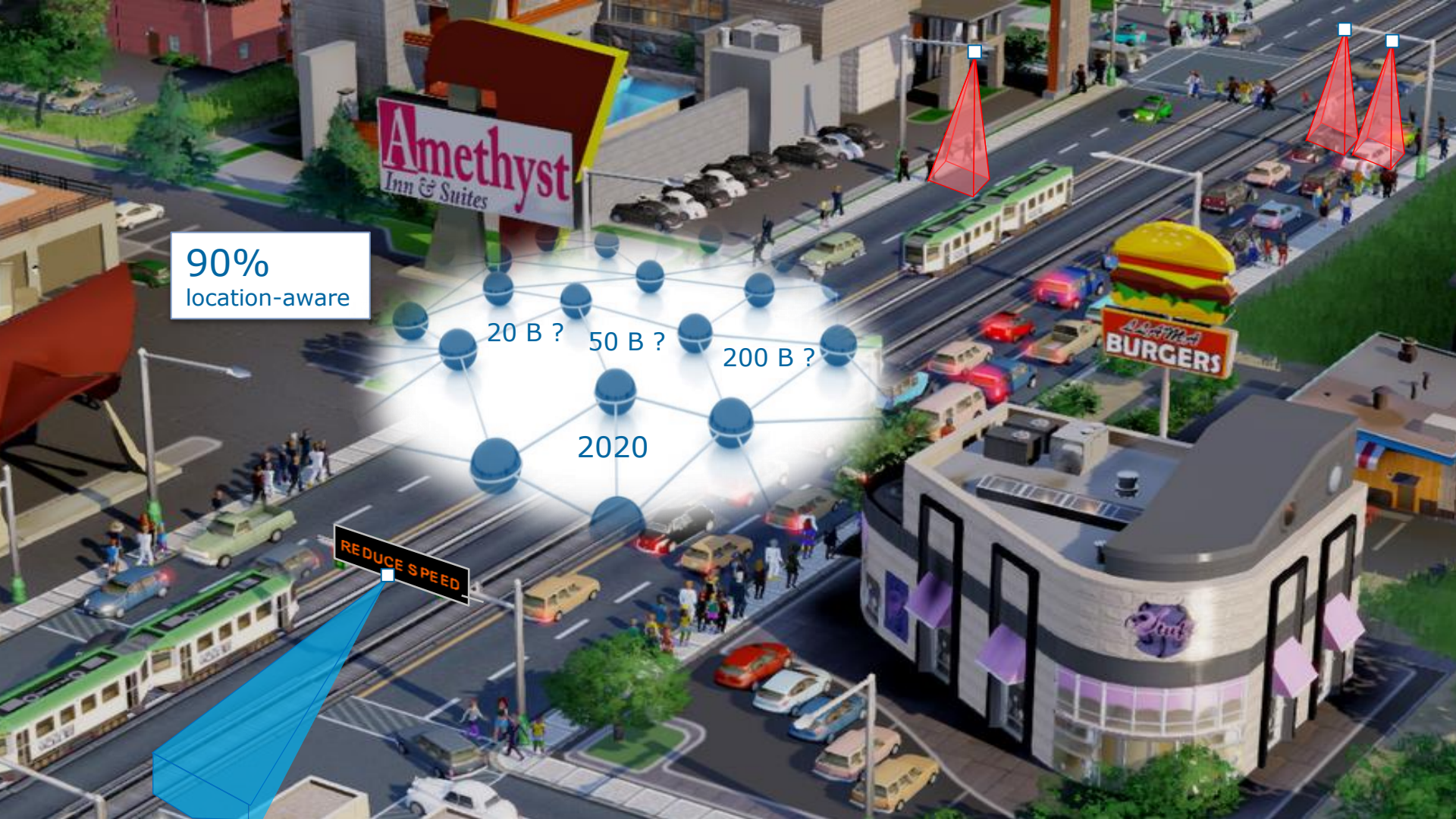
7,700,000,000,000,000,000,000

$7{,}7 \times 10^{21}$ Gigabytes an Daten werden jeden Tag auf der Welt generiert

10%

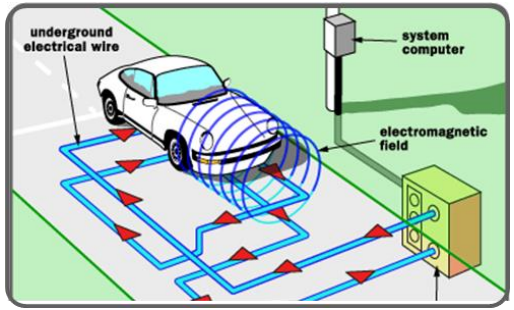
weniger als 10% der gesammelten Daten werden analysiert

Lucidworks, 2016

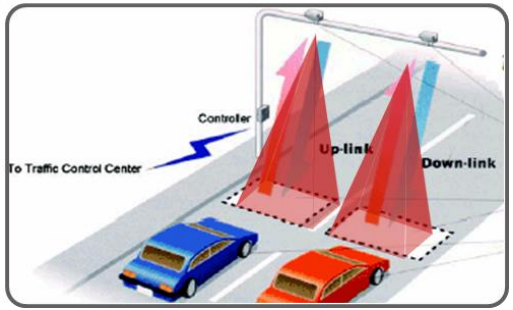

90%
location-aware
20 B ?
50 B ?
200 B ?
2020
Amethyst
Inn & Suites
BURGERS
REDUCE SPEED

Stationary field sensors (*discrete geo-locations*)

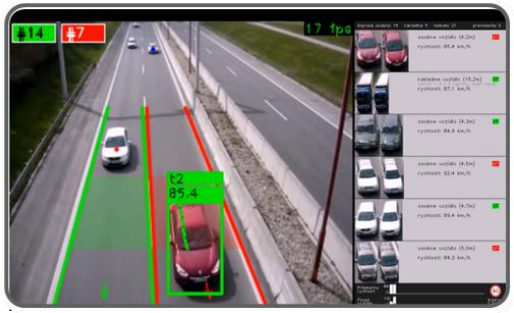
Induction loop sensor



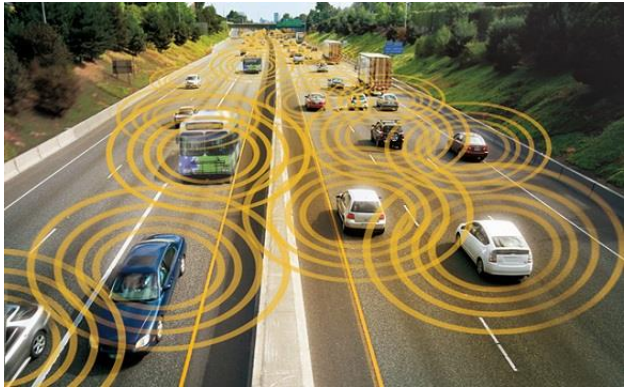
Active infrared sensor



CCTV Camera

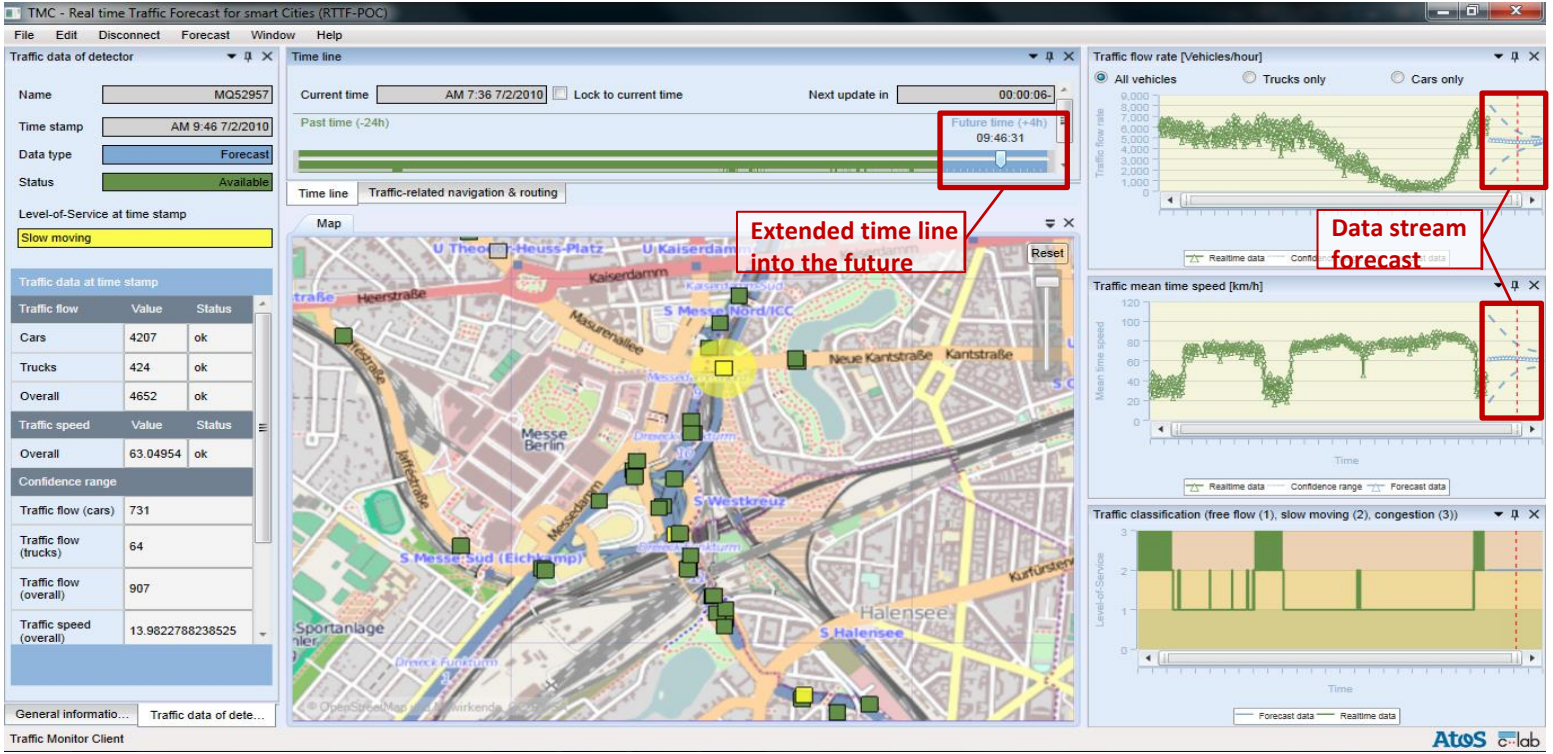


Floating sensors (*moving geo-locations*)

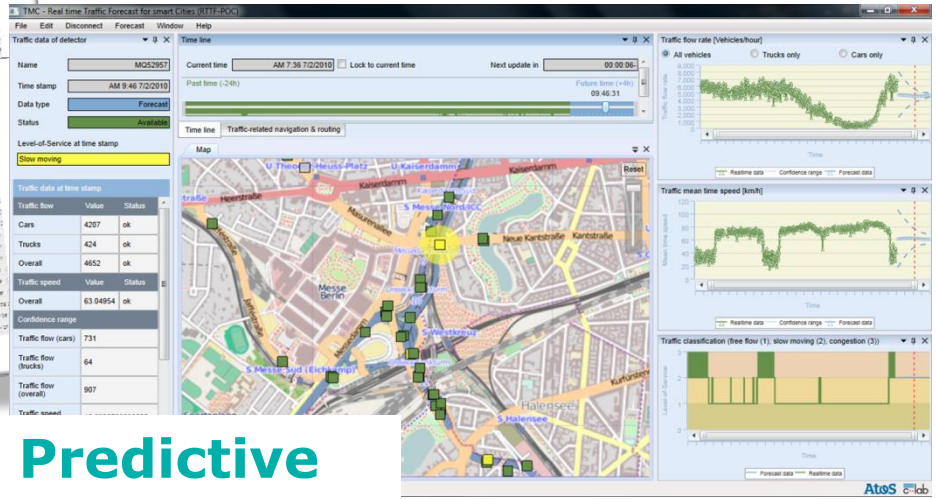


Real Time Traffic Forecast

Reconfigurable Dashboard (command & control center client)



Paradigm change – From reactive to proactive



Descriptive
Diagnostic

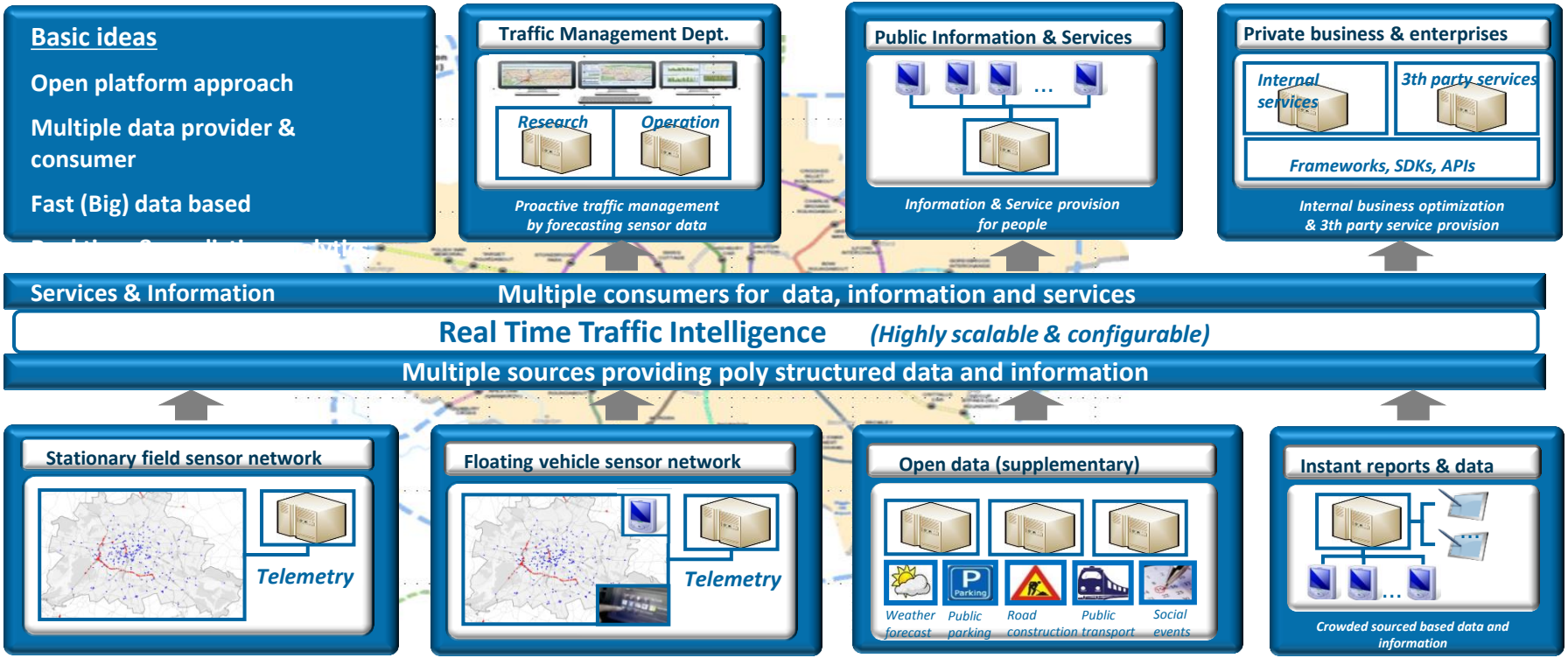
What happened?
Why did it happen?

Predictive
Prescriptive

What will happen?
What can we do?

Our vision – Real Time Traffic Intelligence

Open platform supporting proactive traffic management



From Data to Information
Siemens Power - Maintenance

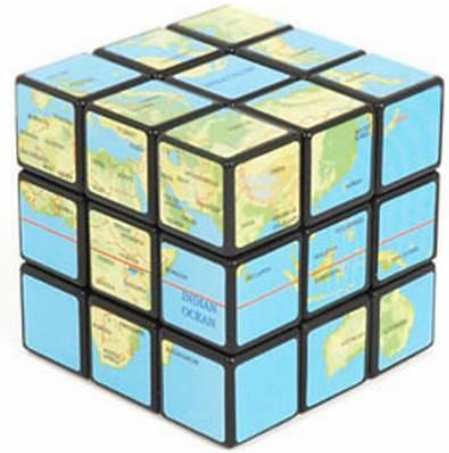
Power Generation Services

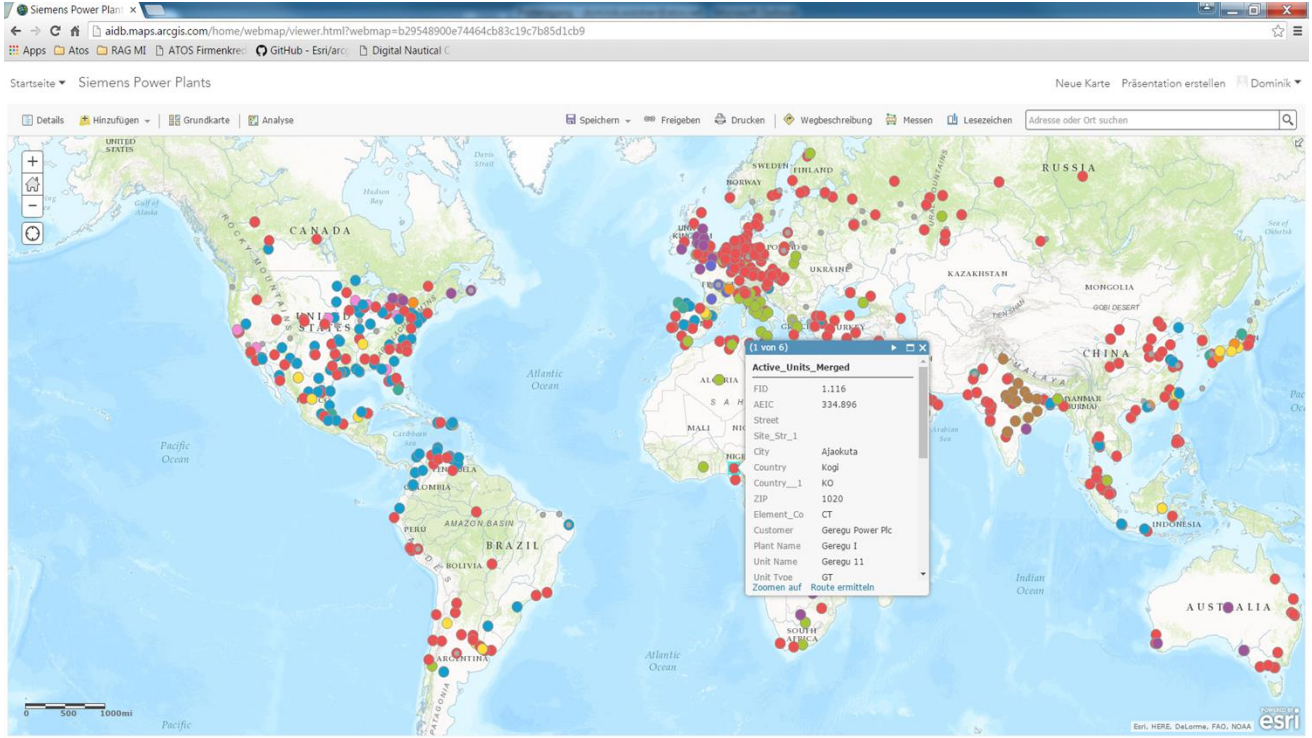
Mit unserem breiten Spektrum an innovativen Produkten und Serviceleistungen sind wir weltweit einer der führenden Partner, wenn es darum geht, hohe Zuverlässigkeit und optimale Leistungsfähigkeit von Turbomaschinen für die Energiebranche, die Öl- und Gasindustrie sowie verschiedene Prozessindustrien sicherzustellen.

From Data to Information
Input

Site Street	Site City	ountry Regic	PS Latitude	PS Longituc	Plant Name	Unit Status	In Service Date	IW Site Rate	Frame	Serial No.	ipment Numty	Type Actixt	Event Tyjt	Event Prioxt	Event Stat	Event Statuel - Primar	lanufacture	BB	Role - DSM	Project Manage	Role - Salesperson
30385 Crow	Fremont	Louisiana	30,482874	-92,401115	Acadia 1	Operating	2002-03-23	177	SGT6-5000F	37A8102-1	37A8102-1	Base	Combustor	Actual Order	2016-04-13	Confirmed	Natural Gas	Westinghous		Steve Tissue (Z0007	Steven Skrentny	Tony Lawdanski (Z00
30385 Crow	Fremont	Louisiana	30,482874	-92,401115	Acadia 1	Operating	2002-07-03	214	SGT6-5000F	37A8104-1	37A8104-1	Base	Combustor	Actual Order	2016-04-13	Confirmed	Natural Gas	Westinghous		Steve Tissue (Z0007	Steven Skrentny	Tony Lawdanski (Z00
30385 Crow	Fremont	Louisiana	30,482874	-92,401115	Acadia 2	Operating	2002-04-26	177	SGT6-5000F	37A8110-1	37A8110-1	Intermediate	Combustor	High Probabi	2016-08-12	Confirmed	Natural Gas	Westinghous		Steve Tissue (Z0007	John O Neill (Z00	Tony Lawdanski (Z00
30385 Crow	Fremont	Louisiana	30,482874	-92,401115	Acadia 2	Operating	2002-05-19	214	SGT6-5000F	37A8114-1	37A8114-1	Intermediate	Combustor	High Probabi	2016-08-12	Confirmed	Natural Gas	Westinghous		Steve Tissue (Z0007	John O Neill (Z00	Tony Lawdanski (Z00
30385 Crow	Fremont	Louisiana	30,482874	-92,401115	Acadia 1	Operating	2002-05-21	264	SST6-5000	10212	10212/1	Base	Component I	High Probabi	2015-11-29	Confirmed	Natural Gas	Siemens	K36-25-TPL,	Steve Tissue (Z0007	Steven Skrentny	Tony Lawdanski (Z00
30385 Crow	Fremont	Louisiana	30,482874	-92,401115	Acadia 2	Operating	2002-06-24	264	SST6-5000	10213	10213/1	Intermediate	Complete Un	Informational	2017-09-25	Forecasted	Natural Gas	Siemens	K36-25-TPL,	Steve Tissue (Z0007	John O Neill (Z00	Tony Lawdanski (Z00
100 Southw	Holden	Missouri	38,791798	-93,984278	Holden	Operating	2002-02-14	105	SGT6-2000E	800444	800444	Standby					Natural Gas	Siemens		James Gonzales (Z0		Mike Bollenbach (Z000
100 Southw	Holden	Missouri	38,791798	-93,984278	Holden	Operating	2002-03-22	105	SGT6-2000E	800445	800445	Standby					Natural Gas	Siemens		James Gonzales (Z0		Mike Bollenbach (Z000
100 Southw	Holden	Missouri	38,791798	-93,984278	Holden	Operating	2002-04-16	105	SGT6-2000E	800446	800446	Standby					Natural Gas	Siemens		James Gonzales (Z0		Mike Bollenbach (Z000
305 Prescott	Lebanon	Pennsylvanis	40,352703	-76,35482	Ironwood	Operating	2001-06-15	235	SGT6-6000G	37A8003-1	37A8003-1	Base	Other	Actual Order	2016-05-07	Confirmed	Natural Gas	Westinghous		Richard Gautille (Z00	James Bocten (Z	Mike Clark (Z0000NWF
305 Prescott	Lebanon	Pennsylvanis	40,352703	-76,35482	Ironwood	Operating	2001-06-22	235	SGT6-6000G	37A8004-1	37A8004-1	Base	Other	Actual Order	2016-05-07	Confirmed	Natural Gas	Westinghous		Richard Gautille (Z00	James Bocten (Z	Mike Clark (Z0000NWF
305 Prescott	Lebanon	Pennsylvanis	40,352703	-76,35482	Ironwood	Operating	2000-05-02	259	2316RT2	24A3031-1	24A3031-1	Base	Volt Reg	Informational	2015-11-02	Confirmed	Natural Gas	Westinghous	245B	Richard Gautille (Z00	James Bocten (Z	Mike Clark (Z0000NWF
21 North We	Londonderry	New Hampsl	42,903264	-71,421867	Granite Ridge	Operating	2002-07-13	250	SGT6-6000G	37A8010-1	37A8010-1	Base	NDE Insp	High Probabi	2015-12-03	Confirmed	Natural Gas	Westinghous		Andy Philbrock (Z00	Matt Robbins (ZC	Michael Glynn (Z002F
21 North We	Londonderry	New Hampsl	42,903264	-71,421867	Granite Ridge	Operating	2002-08-01	250	SGT6-6000G	37A8011-1	37A8011-1	Base	NDE Insp	High Probabi	2015-12-03	Confirmed	Natural Gas	Westinghous		Andy Philbrock (Z00	Matt Robbins (ZC	Michael Glynn (Z002F
21 North We	Londonderry	New Hampsl	42,903264	-71,421867	Granite Ridge	Operating	2002-05-01	264	SST6-5000	10194	10194/1	Base	Other	High Probabi	2016-03-05	Confirmed	Natural Gas	Siemens	N36-2x10.3-	Andy Philbrock (Z00	Matt Robbins (ZC	Michael Glynn (Z002F
832 Red Oak	Sayreville	New Jersey	40,446682	-74,35228	Red Oak Fow	Operating	2002-02-02	185	SGT6-5000F	37A8083-1	37A8083-1	Base	Other	Actual Order	2015-12-01	Confirmed	Natural Gas	Westinghous		Chris Stentiford (Z00	Adam Hymel (Z0	Tom Battinieri (Z00000
832 Red Oak	Sayreville	New Jersey	40,446682	-74,35228	Red Oak Fow	Operating	2002-02-13	185	SGT6-5000F	37A8080-1	37A8080-1	Base	Other	High Probabi	2016-04-01	Forecasted	Natural Gas	Westinghous		Chris Stentiford (Z00	Adam Hymel (Z0	Tom Battinieri (Z00000
832 Red Oak	Sayreville	New Jersey	40,446682	-74,35228	Red Oak Fow	Operating	2002-03-18	185	SGT6-5000F	37A8082-1	37A8082-1	Base	Major Inspec	Informational	2017-04-29	Modeled	Natural Gas	Westinghous		Chris Stentiford (Z00	Adam Hymel (Z0	Tom Battinieri (Z00000
25111 175th	Pleasant Hill	Missouri	38,798665	-94,289187	Dogwood En	Operating	2001-04-17	185	SGT6-5000F	37A8072-1	37A8072-1	Intermediate	NDE Insp	Actual Order	2015-11-02	Confirmed	Natural Gas	Westinghous		James Gonzales (Z0	Mark Sestile (Z0	Mike Bollenbach (Z000
25111 175th	Pleasant Hill	Missouri	38,798665	-94,289187	Dogwood En	Operating	2001-05-03	185	SGT6-5000F	37A8071-1	37A8071-1	Intermediate	Hot Gas Path	Actual Order	2016-02-29	Confirmed	Natural Gas	Westinghous		James Gonzales (Z0	Mark Sestile (Z0	Mike Bollenbach (Z000
9300 US HW	Athens	New York	42,252296	-73,76886	Athens Gene	Operating	2003-06-26	250	SGT6-6000G	37A8007-1	37A8007-1	Intermediate	Controls	Actual Order	2015-11-30	Confirmed	Natural Gas	Westinghous		Dennis Stasio (Z000	Matt Robbins (ZC	Peter Shevchuk (Z000
9300 US HW	Athens	New York	42,252296	-73,76886	Athens Gene	Operating	2003-05-12	250	SGT6-6000G	37A8008-1	37A8008-1	Intermediate	NDE Insp	Actual Order	2015-11-08	Confirmed	Natural Gas	Westinghous		Dennis Stasio (Z000	Matt Robbins (ZC	Peter Shevchuk (Z000
9300 US HW	Athens	New York	42,252296	-73,76886	Athens Gene	Operating	2003-04-04	250	SGT6-6000G	37A8012-1	37A8012-1	Peaker	Generator	Actual Order	2015-11-14	Confirmed	Natural Gas	Westinghous		Dennis Stasio (Z000	Matt Robbins (ZC	Peter Shevchuk (Z000

From Data to Information





Siemens Power Plant

aidb.maps.arcgis.com/home/webmap/viewer.html?webmap=b29548900e74464cb83c19c7b85d1cb9

Apps | Atos | RAG MI | ATOS Firmenkred | GitHub - Esri/arcg | Digital Nautical C

Startseite | Siemens Power Plants | Neue Karte | Präsentation erstellen | Dominik

Details | Hinzufügen | Grundkarte | Analyse | Speichern | Freigeben | Drucken | Wegbeschreibung | Messen | Lesezeichen | Adresse oder Ort suchen

(1 von 6)

Active_Units_Merged

FID	1.116
AEIC	334.896
Street	
Site_Str_1	
City	Ajaokuta
Country	Kogi
Country__1	KO
ZIP	1020
Element_Co	CT
Customer	Geregu Power Plc
Plant Name	Geregu I
Unit Name	Geregu 11
Unit Type	GT

Zoomen auf | Route ermitteln

FILE TOOLS VIEW

Siemens Power Plants Dashboard for Multiple Displays_2

Upcoming Events (1 Week)

- Other Event — Juni 1, 2016
- Combustor — Juni 1, 2016
- Minor Inspection — Juni 1, 2016
- New Install — Juni 1, 2016
- Medium Overhaul

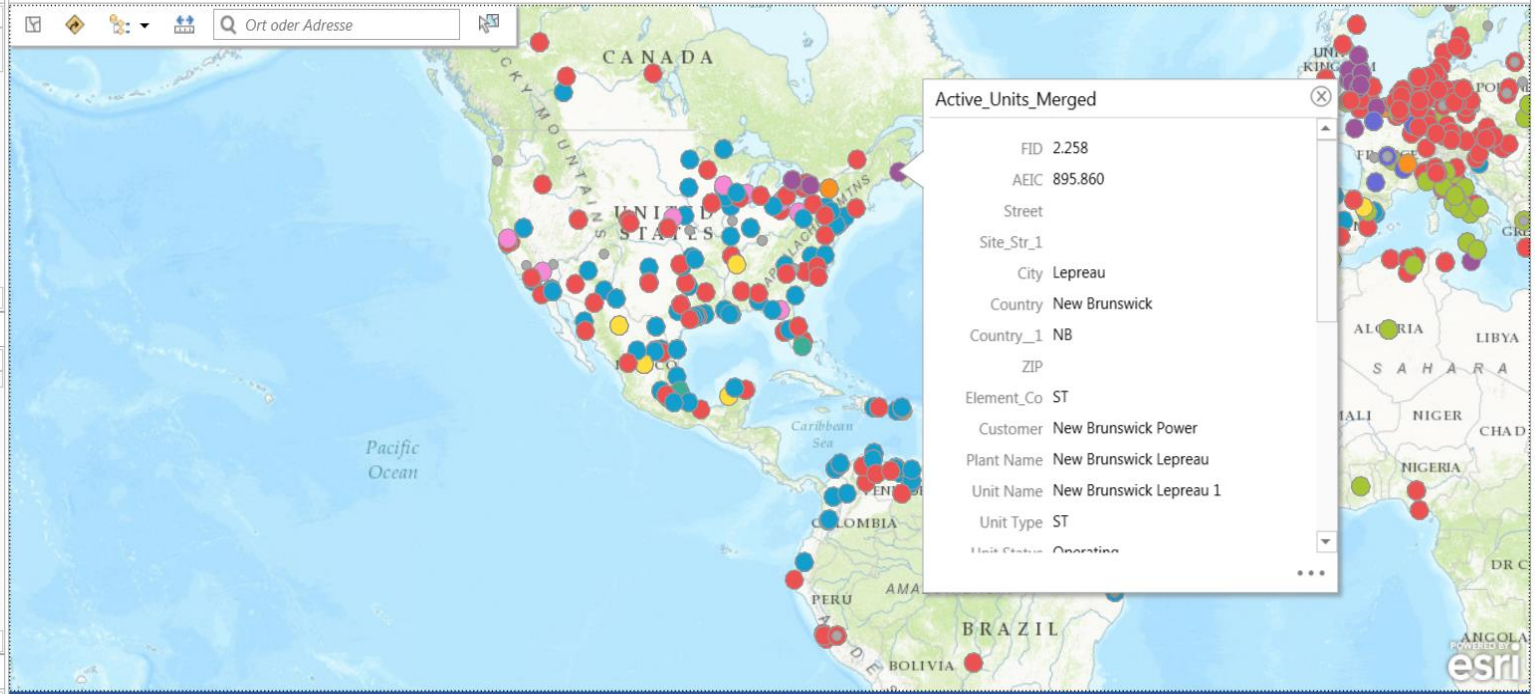
Upcoming Events (1 Month)

- Other Event — Juni 1, 2016
- Combustor — Juni 1, 2016
- Minor Inspection — Juni 1, 2016
- New Install — Juni 1, 2016
- Medium Overhaul

Upcoming Events (3 Months)

- Other Event — Juni 1, 2016
- Combustor — Juni 1, 2016
- Minor Inspection — Juni 1, 2016
- New Install — Juni 1, 2016
- Medium Overhaul

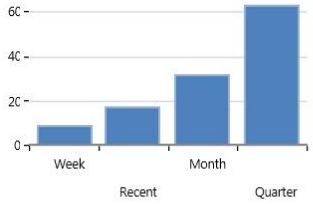
Siemens Power Plants



Active_Units_Merged

FID	2.258
AEIC	895.860
Street	
Site_Str_1	
City	Lepreau
Country	New Brunswick
Country_1	NB
ZIP	
Element_Co	ST
Customer	New Brunswick Power
Plant Name	New Brunswick Lepreau
Unit Name	New Brunswick Lepreau 1
Unit Type	ST
Unit Status	Operating

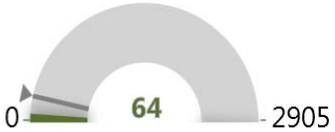
Overall Distribution



Current Outages

- Major Inspection at Louisiana
- Valves + Gen at Havana
- Valves at Riverside Energy
- Major Inspection

Unit Outage Count



Threshold: 7%

Critical Plants

Critical Plants: 32

FILE TOOLS VIEW

Siemens Power Plants Dashboard for Multiple Displays_2

Upcoming Events (1 Week)

- Other Event
  Juni 1, 2016
- Medium Overhaul
  Juni 1, 2016
- Minor Inspection
  Juni 7, 2016

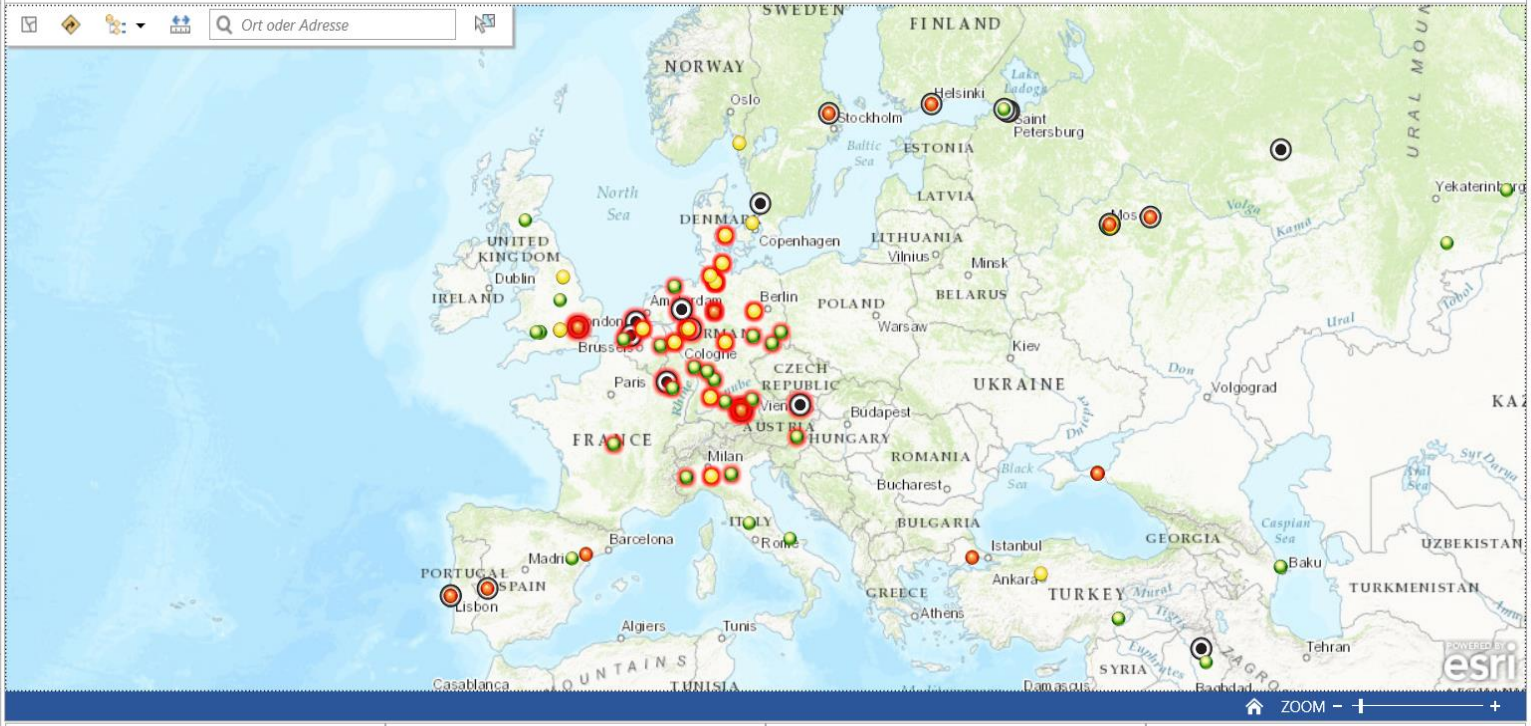
Upcoming Events (1 Month)

- Other Event
  Juni 1, 2016
- Medium Overhaul
  Juni 1, 2016
- Minor Inspection
  Juni 7, 2016
- Other Event
  Juni 10, 2016
- Minor Inspection

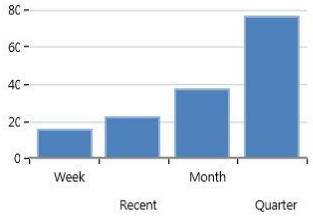
Upcoming Events (3 Months)

- Other Event
  Juni 1, 2016
- Other Event
  Juni 1, 2016
- Medium Overhaul
  Juni 1, 2016
- Minor Inspection
  Juni 7, 2016
- Other Event

Siemens Power Plants



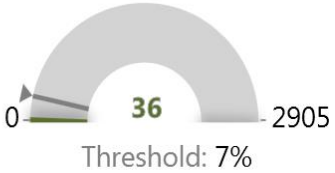
Overall Distribution



Current Outages

- Other Event
  at Kirchmoeser
- Other Event
  at LUBLIN WROTKOW 1
- Other Event
  at Turbigo
- Module Overhaul

Unit Outage Count



Critical Plants

Critical Plants: 0

FILE TOOLS VIEW

Siemens Power Plants Dashboard for Multiple Displays_2

Upcoming Events (1 Week)

- Other Event — Juni 1, 2016
- Combustor — Juni 1, 2016
- Minor Inspection — Juni 1, 2016
- New Install — Juni 1, 2016
- Medium Overhaul

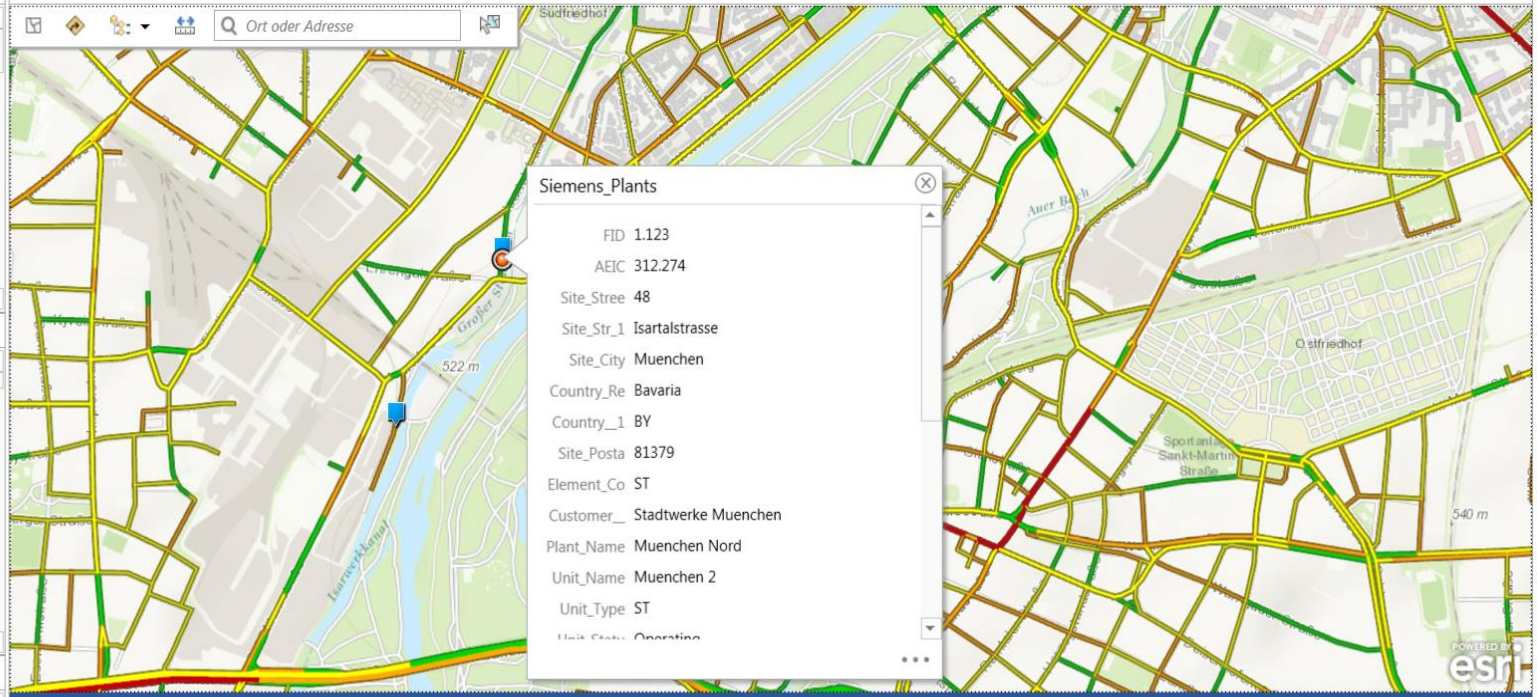
Upcoming Events (1 Month)

- Other Event — Juni 1, 2016
- Combustor — Juni 1, 2016
- Minor Inspection — Juni 1, 2016
- New Install — Juni 1, 2016
- Medium Overhaul

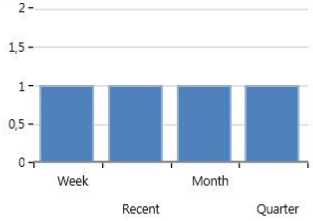
Upcoming Events (3 Months)

- Other Event — Juni 1, 2016
- Combustor — Juni 1, 2016
- Minor Inspection — Juni 1, 2016
- New Install — Juni 1, 2016
- Medium Overhaul

Siemens Power Plants



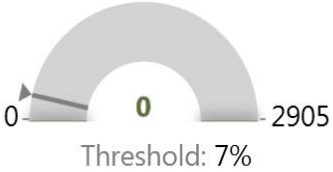
Overall Distribution



Current Outages

No Features

Unit Outage Count



Threshold: 7%

Critical Plants

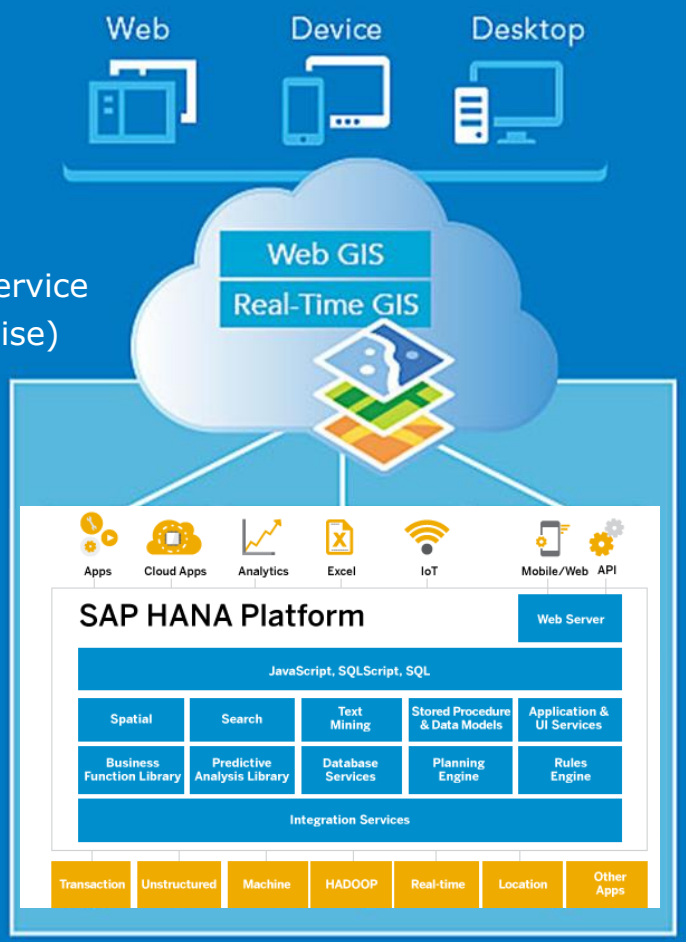
Critical Plants: 0

Real-Time GIS

- ❑ Dashboard
- ❑ Web GIS
- ❑ Map Service
- ❑ Analytics
- ❑ Data

ArcGIS Online
Atos GIS as a Service
Portal (On-Premise)

GeoEvent Extension

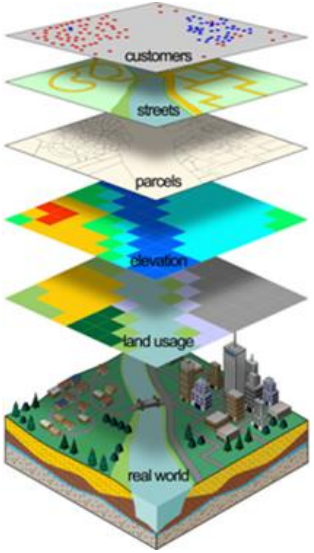


Esri, 2016

The Challenge

Combine Enterprise Data and Spatial Analytics

- Without replication
- In a single location
- In Real-time



Spatially enabled applications to operate a company

Atos end-to-end SAP offering

12.000+ skilled SAP professionals

Local SAP teams in 40+ countries

6.200+ SAP projects implemented in 90+ countries

Built one of the world's largest Hybrid Cloud

2.9 million+ SAP End-Users supported

SAP **Partner for 32 years** & SAP VAR Partner

Global SAP-certified in Hosting, HANA Operations, cloud and AM services

Industry leading SAP-certified Bullion Hardware for Hana

Public & Health			Manuf., Retail, Transport			Telco, Media, Utilities			Financial Services
Defense / HLS	Smart Cities & Research	Connected healthcare	Industry 4.0	Connected Retail	Connected Vehicles	Smart Telco	Medias	Utilities	Bank & insurance
C4I Missiles Urgencies ...	Meteo Air quality Research ...	Medical devices & machines ...	Connected plants & machines, ...	Connected stores & devices ...	Cars, trucks, machines, ...	Devices, infra-structures, ...	devices, advertising walls, ...	Smart Grid, smart water, ...	Payment & smart devices

Building Information Management

Facility Management

Maintenance optimization

Connected Healthcare

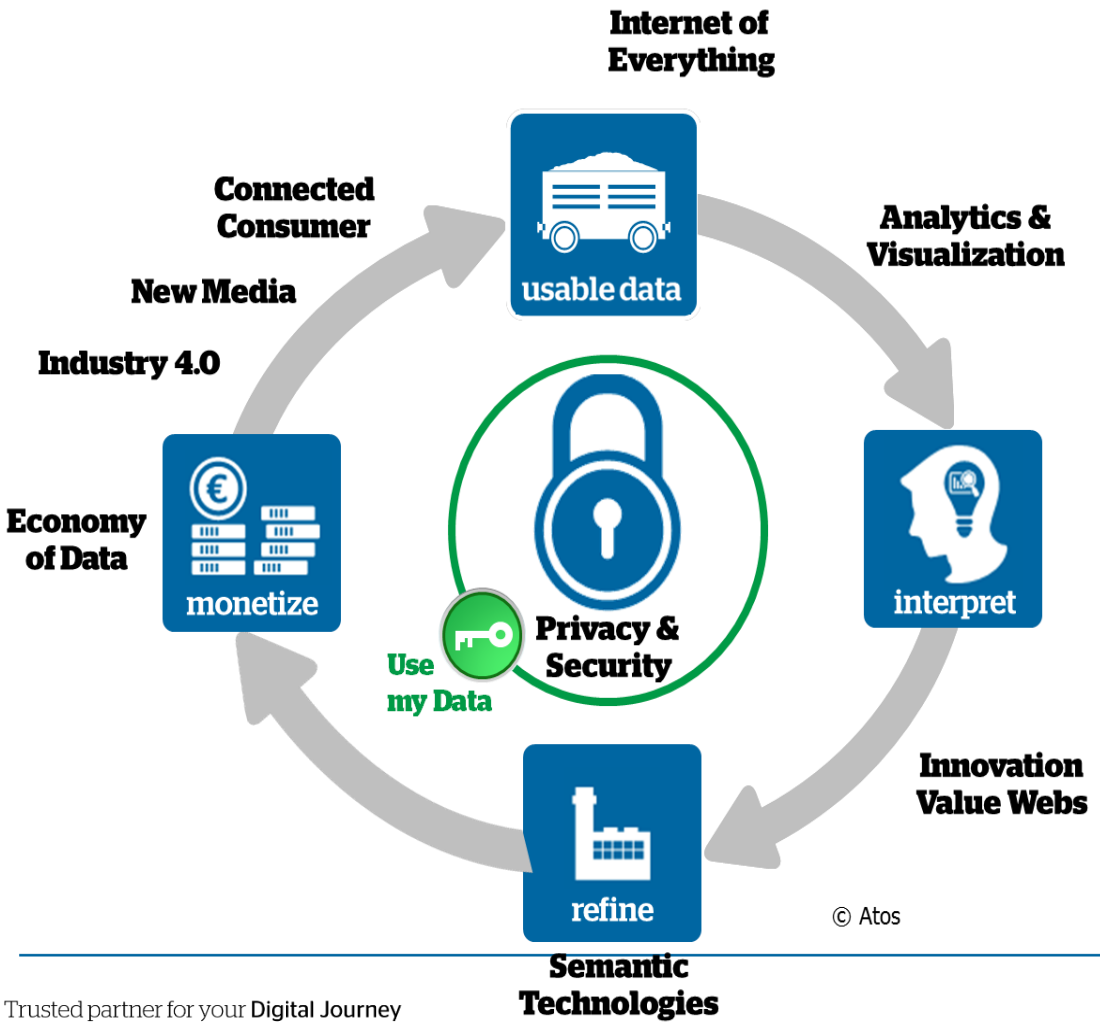
Grid infrastructure analytics

Predictive maintenance

Demand response management

Virtual power plants

Leakage and fraud management



Integrated systems for **collaborative ecosystem** - customers, employees and partners

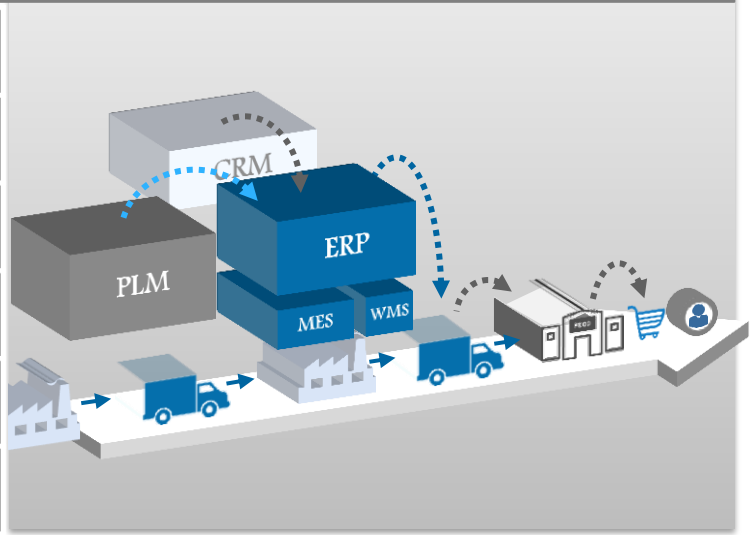
© Atos

Moving from single, siloed systems and organizations to an industrial network of capabilities

PAST

While todays production is linearly organized and optimized within the boundaries of organizational and system siloes…

- Siloed systems
- Centralized
- Layered
- Monolithic
- Interfaces
- Licensed



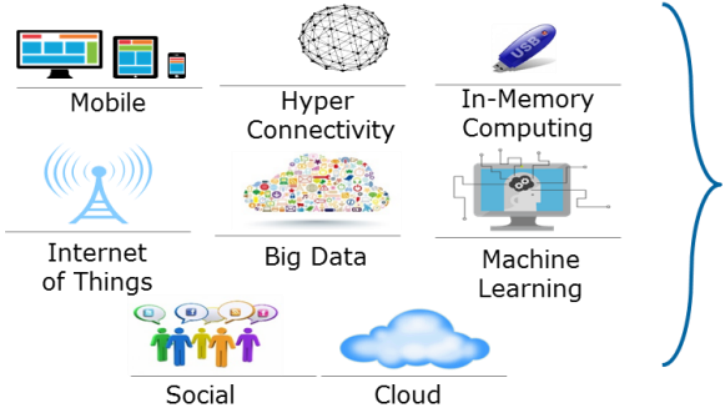
FUTURE

… manufacturing of the future will fulfill individual customer needs by a collaborative and agile network of capabilities

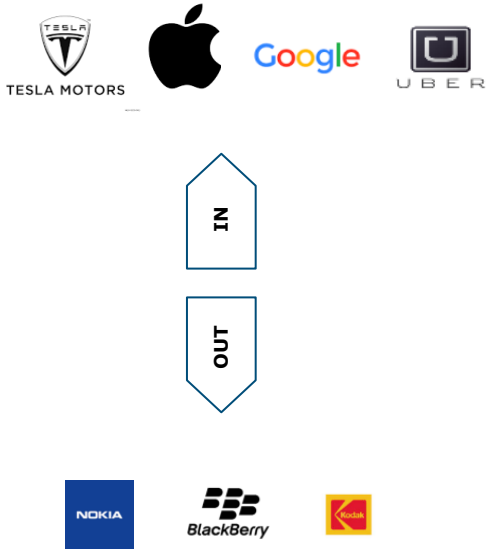
- Interoperability
- Virtualization
- Decentralization
- Real-Time Capability/ Responsiveness
- Service Orientation
- Modularity

The World is Changing

Disruptive business models



Adapt or Fail



Innovation: at the heart of Atos strategy

An ambitious technology roadmap

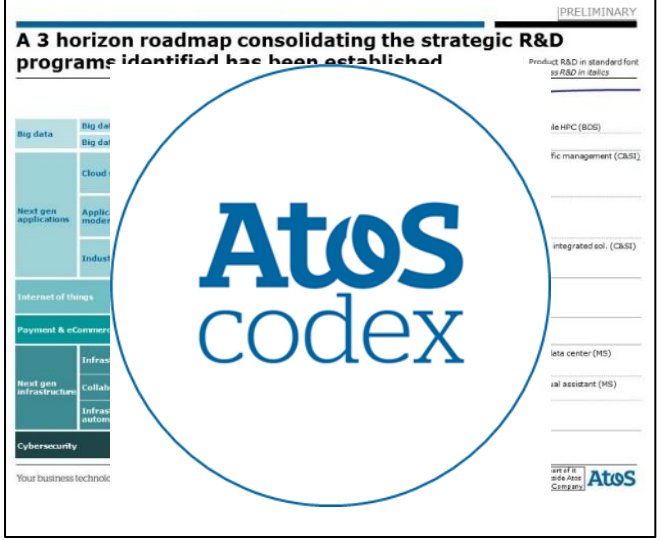
7 Themes

- Payment & e-commerce
- Internet of Things
- Big Data
- Next gen apps
- Next gen infra
- Cyber Security
- Unified Communication

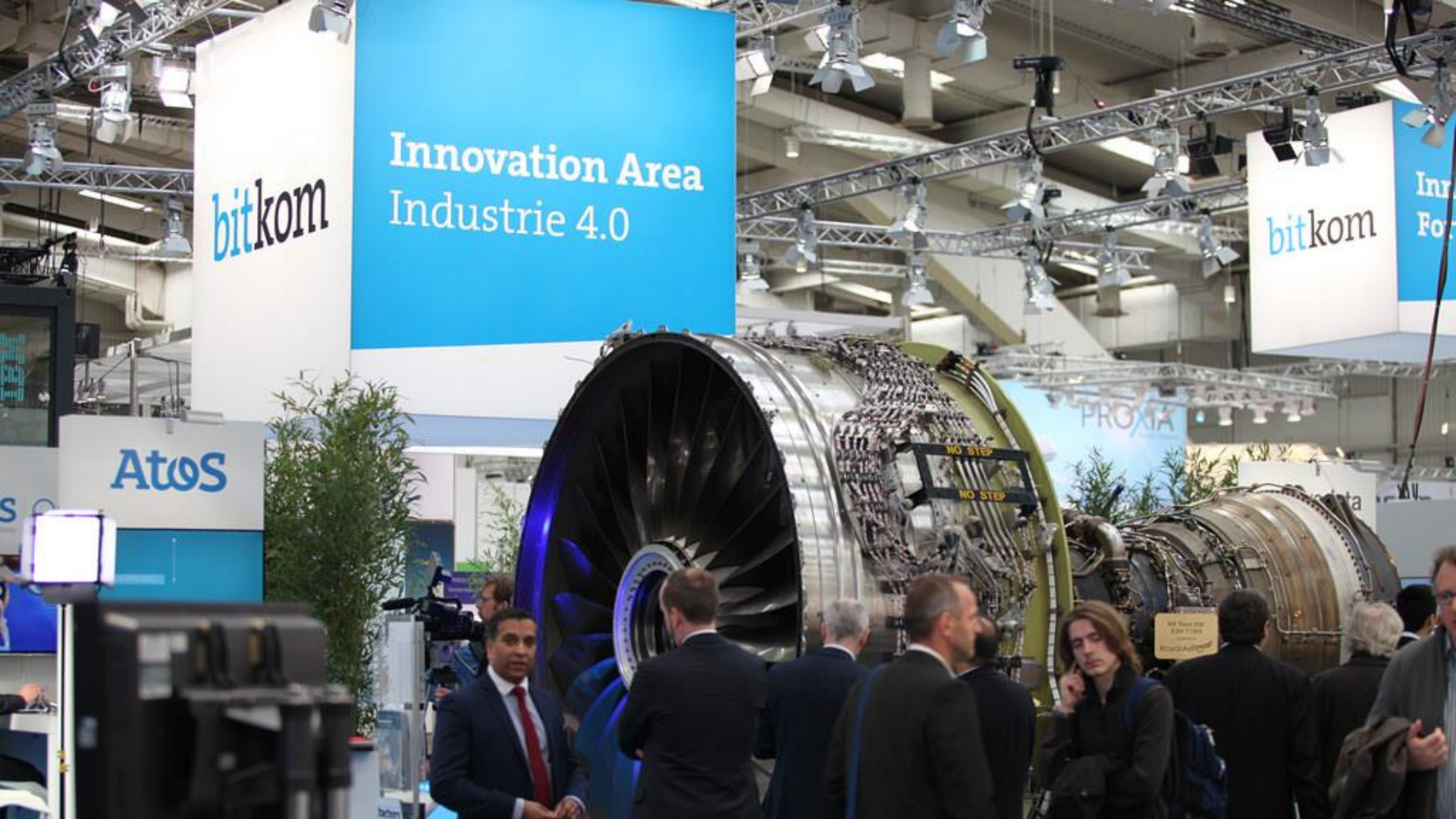
12 Programs

- Payment & e-commerce
- Internet of Things
- Big Data Software
- Big Data Hardware
- NGA: Industry 4.0
- NGA: Cloud solutions
- NGA: Apps modern
- NGI: Infra Services
- NGI: Collaborative Work Pl
- NGI: Infra. Automation
- Cyber Security
- Unified Communication

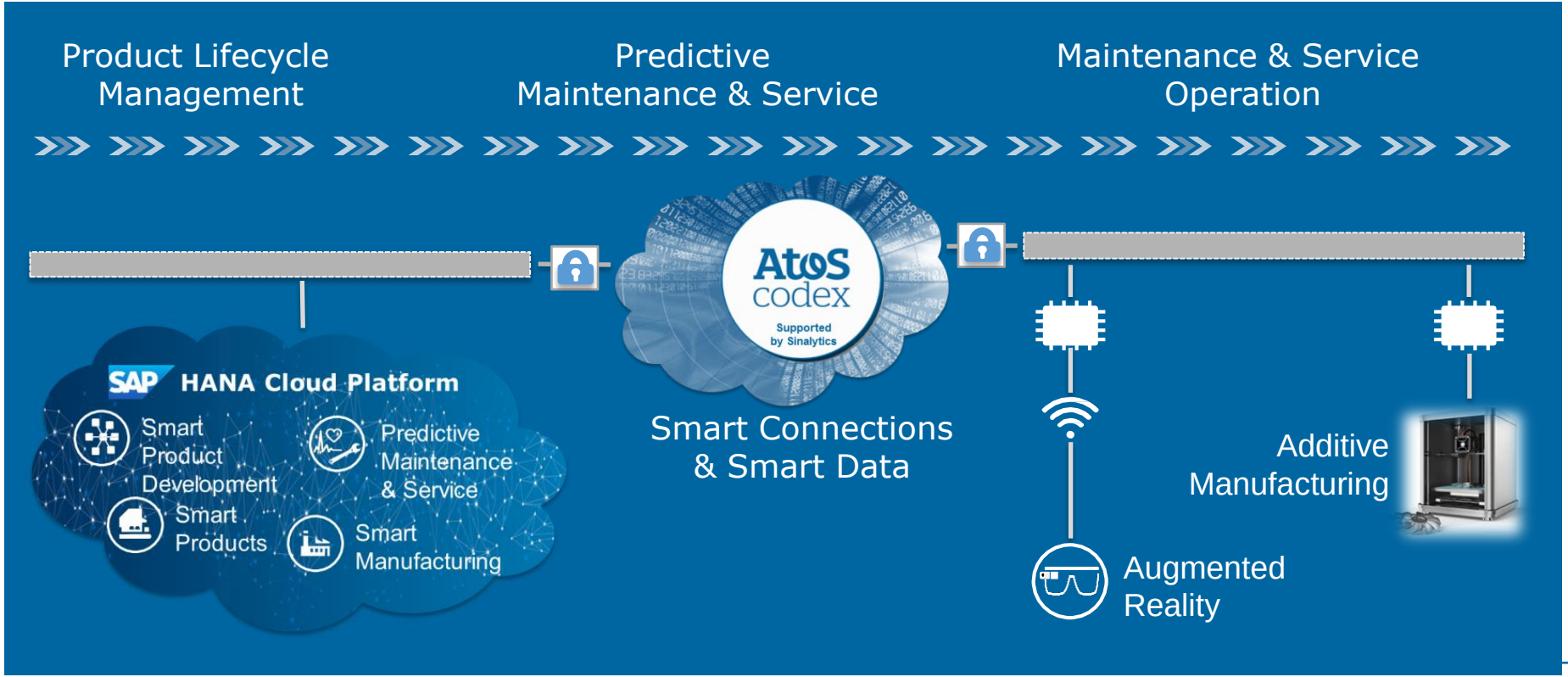
+60 Projects



Atos Codex Analytics partner ecosystem
Success through teamwork


bitkom
Innovation Area
Industrie 4.0
bitkom
Atos
PROXIA
NO STEP
NO STEP

Example: Predictive Maintenance and Service



Examples of customers we work with on Analytics

Manufacturing

Retail

Transport

Public & Health

Finance

Telecom

Media

Energy & Utilities

Advanced Analytics für Industriedaten

Die gemeinsame Plattform von Siemens und Atos

Konnektivität

Mehr als
300.000
angeschlossene Geräte, etwa Windturbinen, Gebäude oder Züge.

Modernste Analyse

Technologische Exzellenz wird um Smart Data ergänzt.

Die technologische Plattform für Siemens Digital Services:
Sinalytics
bietet Datenanalyse, Konnektivität und Cyber-Sicherheit.

Know-how

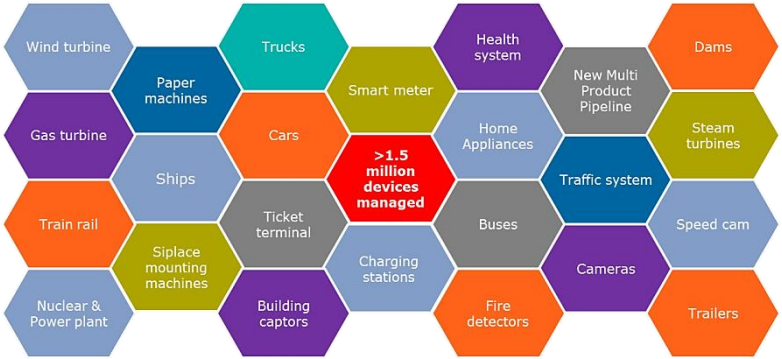
- Umfassendes Produkt-, Branchen- und Data Science-Wissen
- Fundiertes IT-Know-how von rund

17.500
Software-Ingenieuren

Atos Codex

Vorteile für den Kunden

- Höhere Verfügbarkeit
- Niedrigere Kosten
- Verbesserte Leistung
- Mehr Sicherheit



Atos

Today, more than 300,000 systems are serviced with our platform at Siemens

Industry

- Paper machines
- Ships
- Cranes
- SIPLACE mounting machines
- Building technology (e.g. building automation systems, fire detectors, cameras)
- Traffic systems (e.g. traffic computers, traffic light systems, traffic management systems)
- GAS Analysis
- Train Rail Automation

Energy

- Gas turbines
- Steam turbines
- Power plant control systems
- Wind power plants
- NMPP New Multi Product Pipeline in South Africa

Healthcare

- X-ray systems
- Ultrasound systems
- Magnet resonance tomography systems
- Hospital information systems
- Diagnostic systems
- Particle Therapy

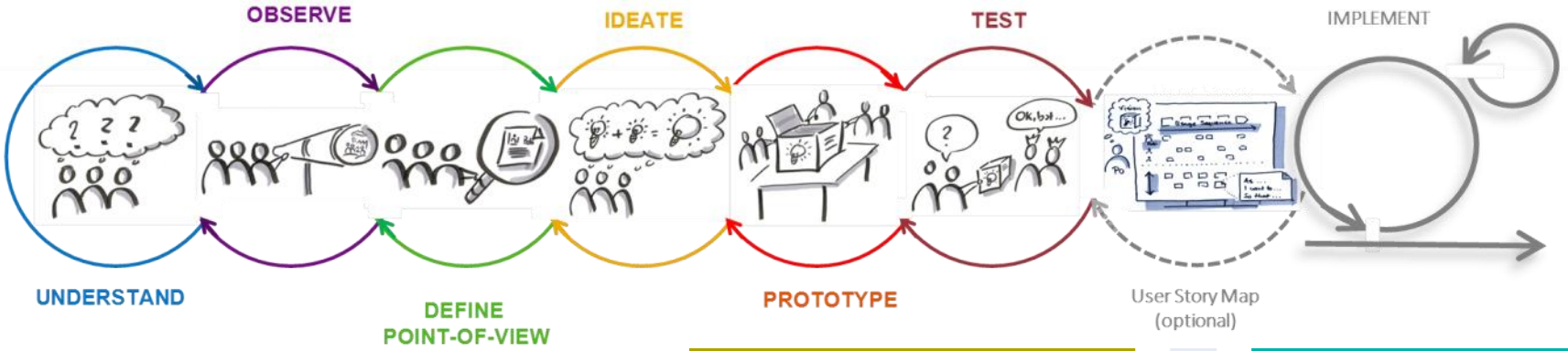
Atos - Partner for the Olympic Games Real-Time Analytics

Atos is the lead technology integrator, delivering the performance of 14,850 athletes (2016) to 4 billion viewers

- Worldwide IT Partner of the **Olympic & Paralympic Games**
- **Cloud enabled IT**
- **Atos Codex** offers real time data available to end user
- **Real-Time Analytics** neutralize 200 IT security events per second with 0 impact

Start Small – Think Big – Move Fast

From first ideas to first roll-outs



Lab Approach

Rapid Prototyping / Hackathons

organize rapid prototyping sessions, together with innovators like universities, research institutes or think tanks

create rough storyboards and user interface sketches to visualize the look & feel of an application

Proof-of-Concepts

produce a „close-to-reality" representation of the envisioned solution by using a s many real interfaces and devices as are available, simulate or mock-up the rest

Pilots and Field Trials

roll-out the first version of the solution to friendly users e.g. in your home market

test your solution in real-life environment but with limited number of devices and users to minimize cost and risk

days

weeks

months

Consulting Approach

Innovation Workshops

brainstorming session with a focus on hands-on experience and demos, creation of ideas in a creative environment

Assessments

proven and structured methodology to identify overall I4.0 readiness, detect low-hanging fruits and mid-term potential

Consulting & Value Engineering

business and technology consulting along the end-to-end value-chain (hardware, connectivity, data, analytics, services)

Business Partnership

joint governance model to define the business plan for the transformation program along its technical, commercial and organizational aspects, risk- and revenue-sharing model

Thank you

Further information:

- Michael Kuczynski
- kuczynski.michael@atos.net
- + 49 211 399 31238

Atos
Worldwide IT Partner

Leveraging multiple capabilities of HCP

Siemens MindSphere – An open cloud platform for Industry Customers

Optimization of plants and machines as well as energy and resources

- **Open standards** for connectivity of Siemens and 3rd party products
- **Plug and play connection** of Siemens products (engineering in the TIA Portal)
- **Cloud for industry** with open application inter- face for individual customer applications
- Transparent **pay-per-use pricing model**
- Opportunities for completely new **business models** (e.g. selling machine hours)

HCP Micro services used:

- Integration service (HCC and HCI) for connecting back-ends
- IoT micro-service for MindSphere middleware
- HCP Mobile Service for mobile apps