

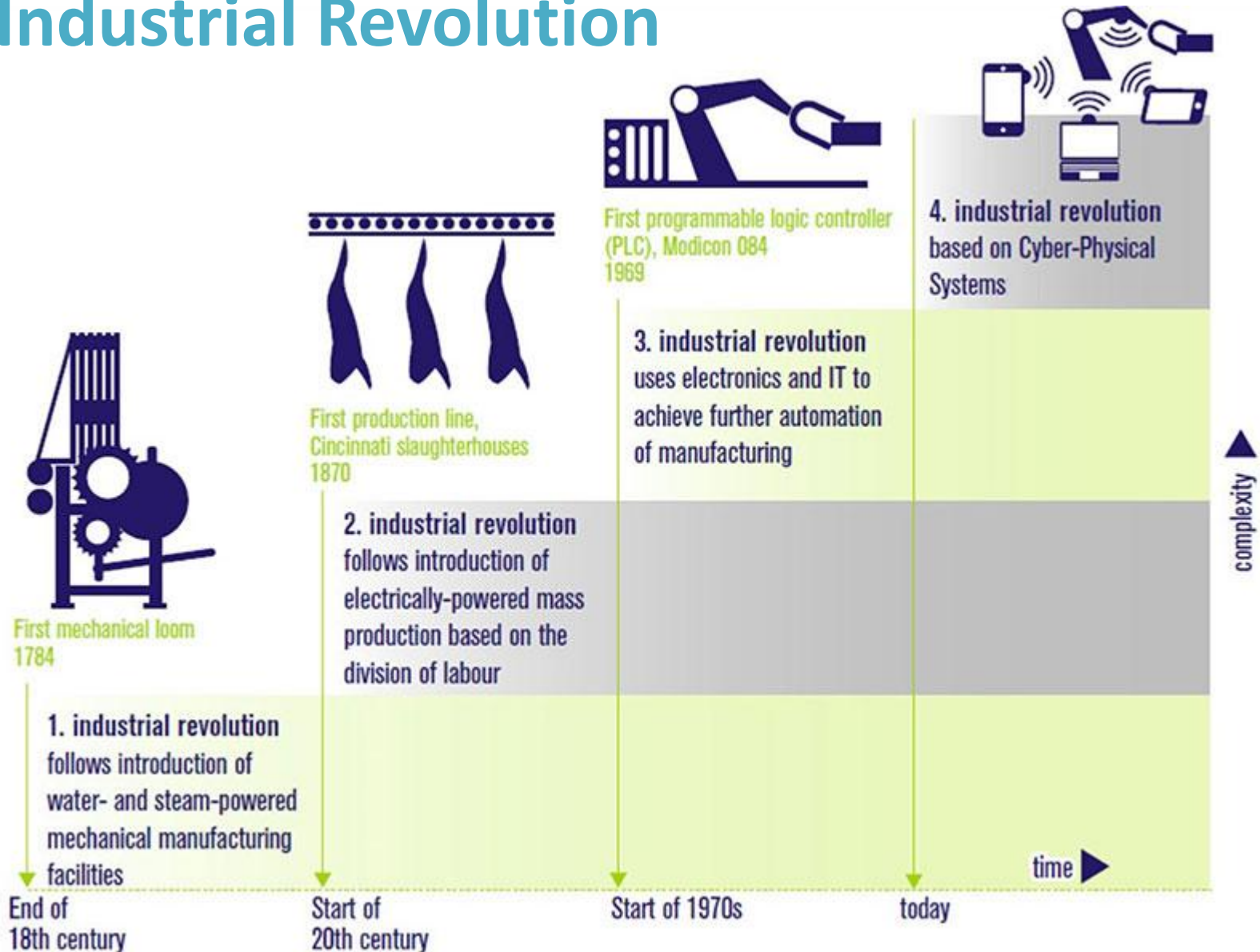


NETAS

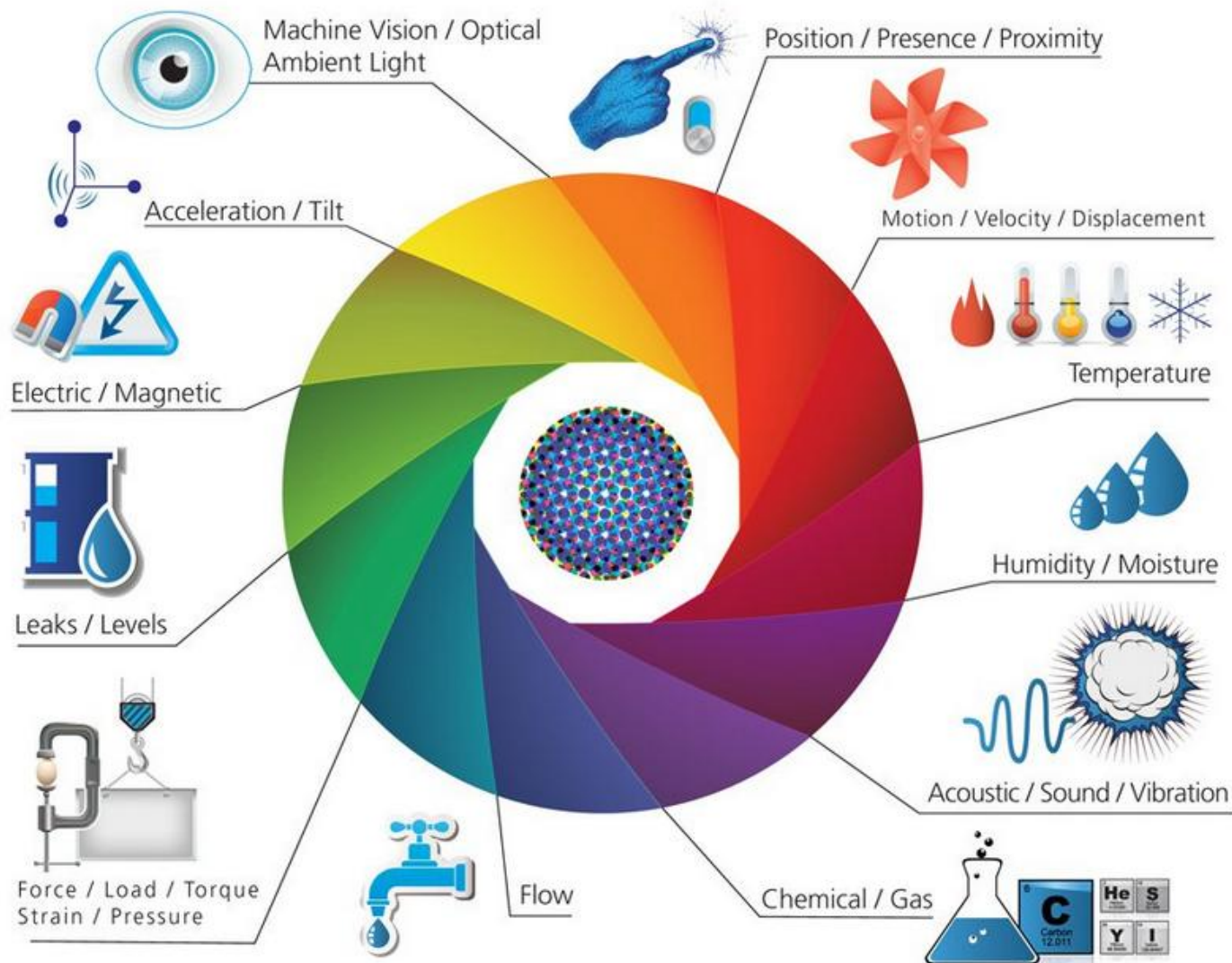
Industry 4.0

Riza Durucasugil
Director, Innovation and R&D Strategies
Oct 2016

Industrial Revolution

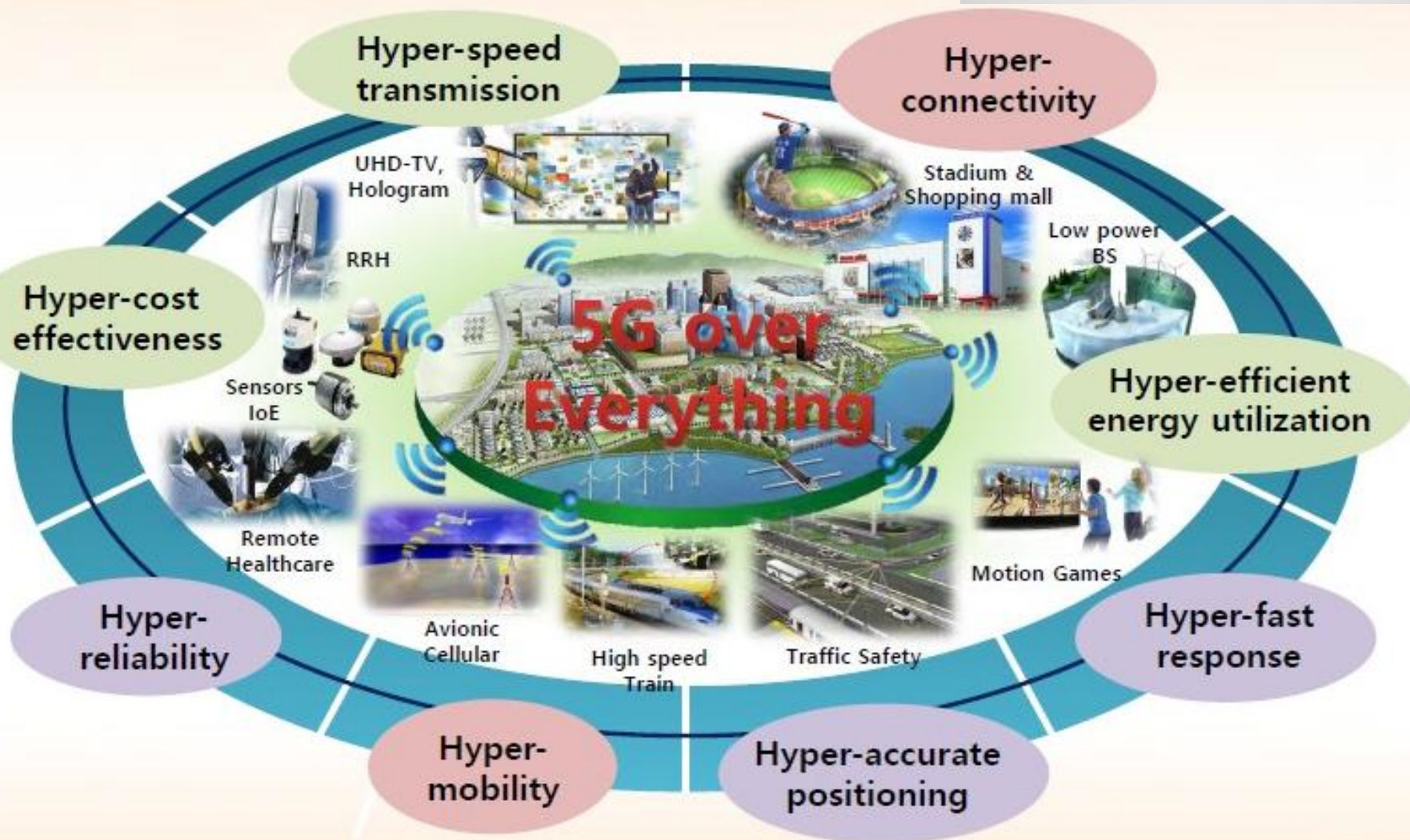


Sensor/Controller Types



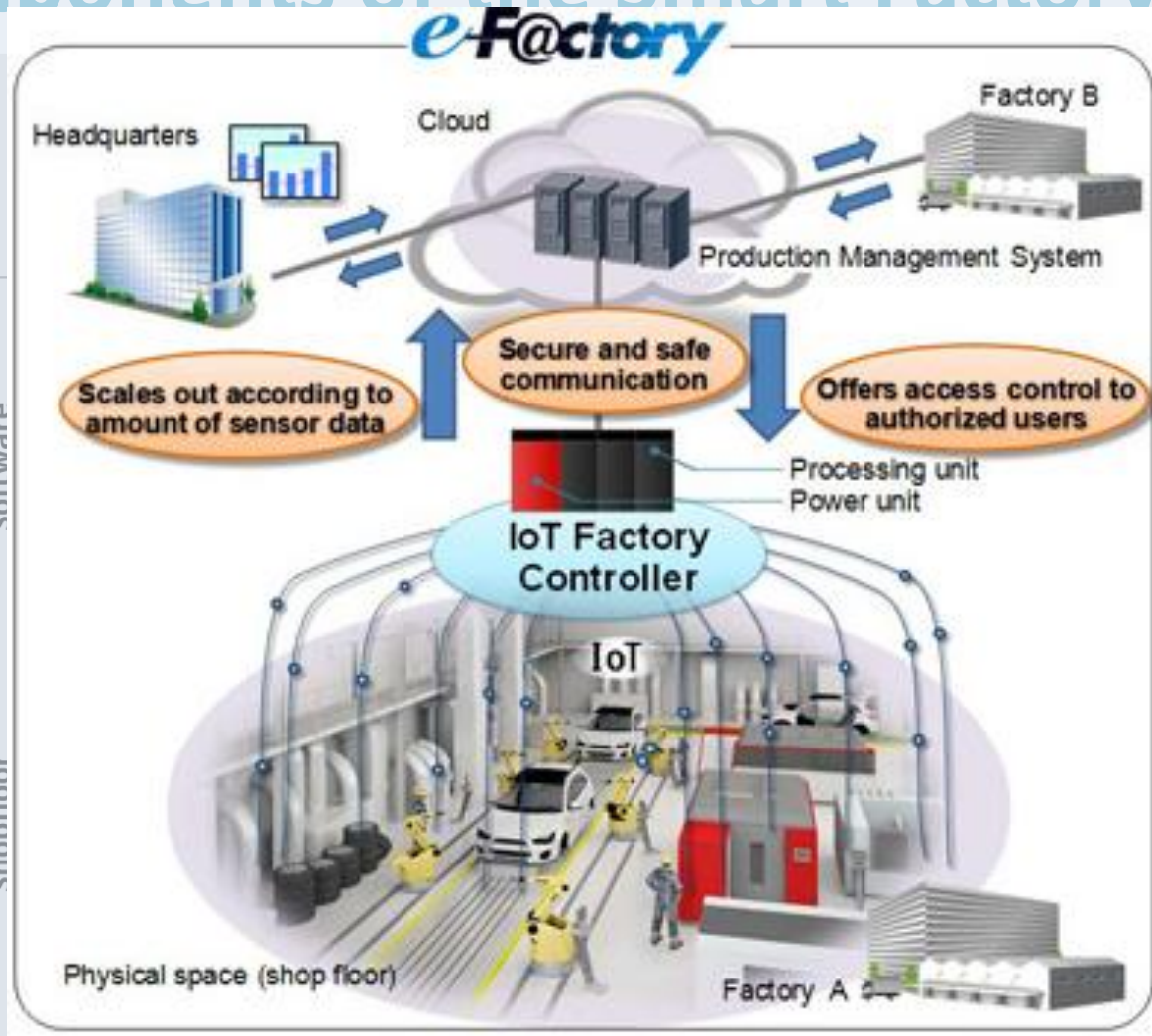
*Everything that can be Sensed,
will be Sensed*

Industry 4.0 Connected...



*anything that can be **connected**,
will be **connected***

15 Components of the Smart Factory



Suppliers

1 Smart Supply network

Transparency over supplier inventories and vehicle logistics allows for automatic and optimized supply decisions



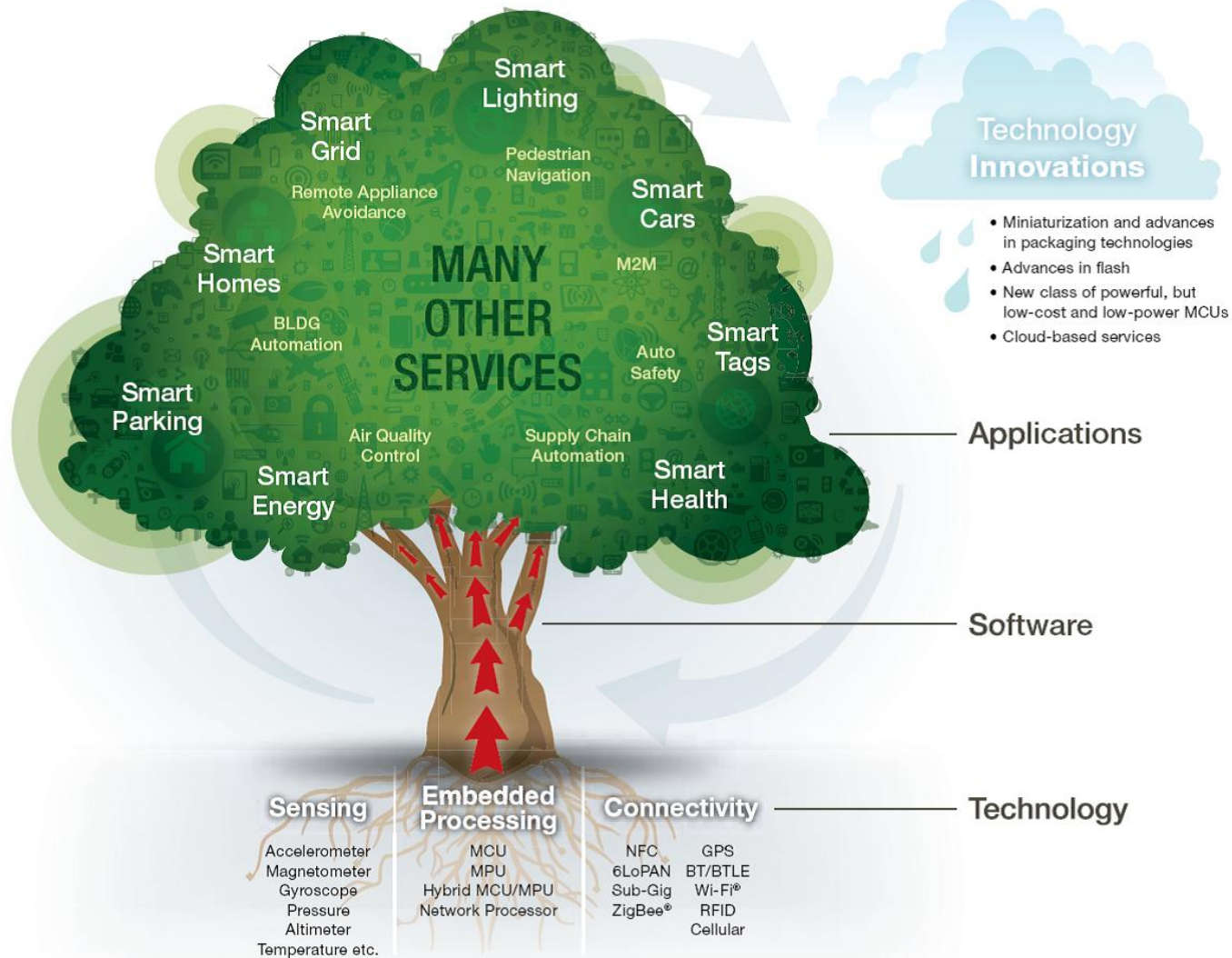
Customers

Responsive manufacturing
Individual manufacturing steps are designed for customer interaction so that products can be tailor-made for customers

IoT-related

Not IoT-related

Industry 4.0 Opportunities



Industry 4.0 Cyber Security Risks



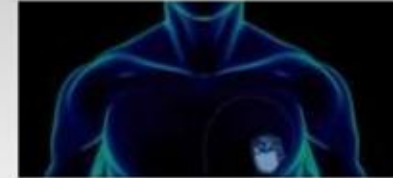
Vehicle Hacking

Wireless hacks can alter a car's electronic control units (ECUs) and sensors to affect brake systems, send false tire pressure signals, or start and stop the engine remotely



GPS Spoofing

Counterfeit GPS signals can facilitate hijacking or cause collision and damage to ships, aircrafts, drones



Healthcare Device Hacking

Implantable Medical Devices (IMDs) that control heartbeats, deliver painkillers or insulin, or measure vital signs to report to doctors and nurses can be jammed and made to fail



Industrial Hacking

Foreign hacking groups have been caught infiltrating water control systems for a U.S. municipality



Smart Home Hacking

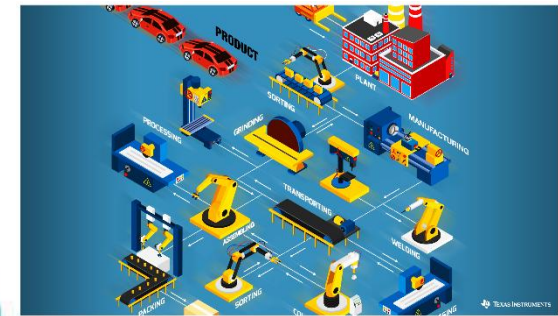
Smart door locks can be opened and lock codes changed remotely to break into a home without any sign of forced entry



Connected-Car Mandate

National Transportation Safety Board (NTSB) wants the government to require that all new vehicles be able to wirelessly communicate with other cars to help prevent crashes and increase overall safety

Industry 4.0 Summary



Research & Innovation Priorities

Domain 1: Advanced Manufacturing Processes

Innovative processing for both new & current materials or products

Domain 2: Adaptive and Smart Manufacturing Systems

Innovative manufacturing equipment at component & system level, including mechatronics, control & monitoring systems

Domain 3: Digital Virtual & Resource Efficient Factories

Factory design, data collection & management, operation & planning, from real-time to long term optimisation approaches

Domain 4: Collaborative & Mobile Enterprises

Networked factories & dynamic supply chains

Domain 5: Human-Centred Manufacturing

Enhancing the role of people in factories

Domain 6: Customer-Focused Manufacturing

Involving customers in manufacturing value chain, from product process design to manufacturing associated innovative services

Challenges & Opportunities

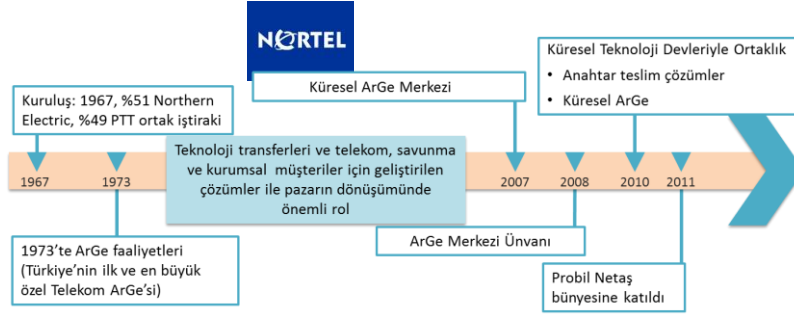
- Manufacturing Future Products
- Economic
- Social
- Environmental

Sustainability

Technologies & Enablers

- Advanced Manufacturing Processes
- Mechatronics for Advanced Manufacturing Systems
- Information & Communication Technologies
- Manufacturing Strategies
- Knowledge Workers
- Modelling, Simulation & Forecasting

Biz Kimiz?



- 5 kez Türkiye'nin yazılım ihracat şampiyonu (yıllık 30 M\$ yazılım ihracatı)



- 25 büyük üniversite ile yakın ilişkiler
 - 8 ortak proje: METU, Boğaziçi, İTÜ ve Özyeğin
 - 10 üniversite ile 20 tez projesi
- Bilimsel yayınlar
 - 13 @ 2013, 3 Makale & 10 Bildiri
 - 17 @ 2014, 2 Makale & 15 Bildiri
 - 33 @ 2015, 8 Makale & 25 Bildiri



- 2015 Patent ödülü, «En İyi Çıkış Yapan Firma» 3.lük
- 2015 TPE Patent Başvuru Genel sıralamada Türkiye 6.sı,
- Yıllık 70+ patent başvurusu - 2016 hedef 100 yeni başvuru



NETAŞ Solutions towards Smart Urban Life



Government & Public Entities

Governing people in the cities

- Transformation of courts & penitentiaries
- Disaster & Emergency Mgmt Ops. Centers, ..
- Educating crowd for digital age



Energy

'Energy Operators'

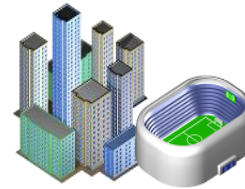
- Transforming Utilities Companies to Operators
- Enable changing distributor company in real time



Finance

'Bank of the Future'

- Mobile Banking
- ATMs & Virtual Teller Machines
- Smart Unified Communications



Smart Life Centers, Buildings, etc.

Managing crowds in buildings & centers

- Solutions from smart homes and offices to large public areas such as stadiums, shopping malls etc.



Telco

Developing & Building Next Generation Smart Networks

- Technology developer for UC systems
- Has own OSS portfolio
- Strong monitoring products



International

Expanding local smart experience to region

- Technology transfer to other countries

Products & Solutions

Smart Justice

Smart Disaster Management

Smart Education

Smart Access Points

E-Registration

Smart Automated Meter Reading

Smart Cabinets

Smart Distribution Management

Unified Communication Virtualization

Cashless ATMs

Smart Stadiums

Smart Malls

Smart Access Networks

OSS solutions for fixed and mobile operators

Real Time VAS Monitoring

Smart Unified Communications

Network Optimization

Netas Portfolio & 4G Value Chain



Project: Smart Stadiums & e-Ticketing



Turkish Football Federation's Project to transform all into smart stadiums

- **31** Stadiums now, more to come every year
- **c.\$60m** business
- Netas to provide :



Per Stadium

- Stadium Backbone Network
- Security Control Room
- Stadium System Room
- Surveillance Systems
- Controllers and Turnstiles
- Portable Card Readers

Central Management System

- Main & Disaster Recovery Datacenters
- (ref customers : hurriyet.com, passo.com.tr) :
- Integrated CRM & Ticketing & Security Systems
 - Card Management
 - Loyalty Management
 - Fan Management
 - E-Ticketing
 - CRM
 - Business Intelligence
 - Content Management
 - Card Personalization
 - Blacklist Management

Highlights

- Built on Microsoft Technologies (Microsoft Dynamics, MS SQL Server, Sharepoint, Power Builder)
- Real time communication with Access Controls for access permissions.
- Real time ticket transfer via Web/SMS
- Priority sales integration with GSM operator
- Details access control reporting integrated with ticketing BI

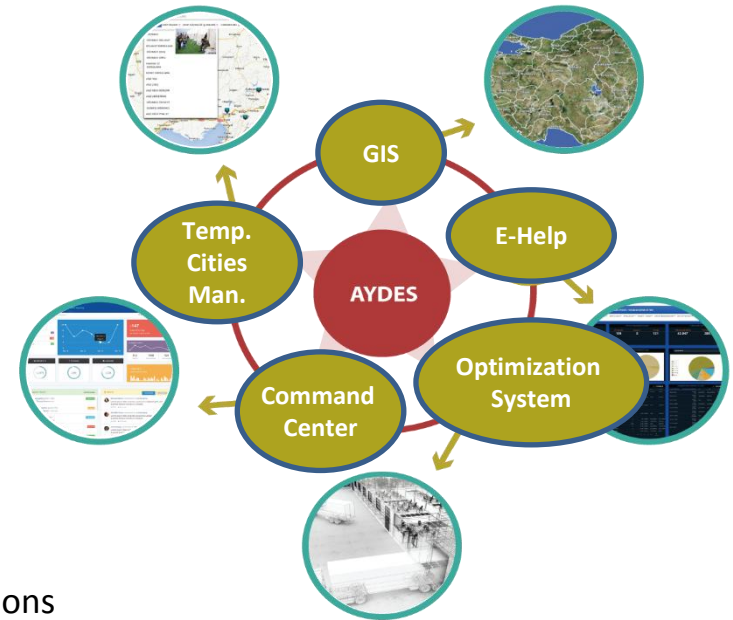
Project : AYDES

Disaster Management & Decision Support System

Turkish Prime Ministry Disaster and Emergency Management Presidency (AFAD) requirement for a GIS based umbrella decision support system to monitor and manage each phase of integrated disaster management.

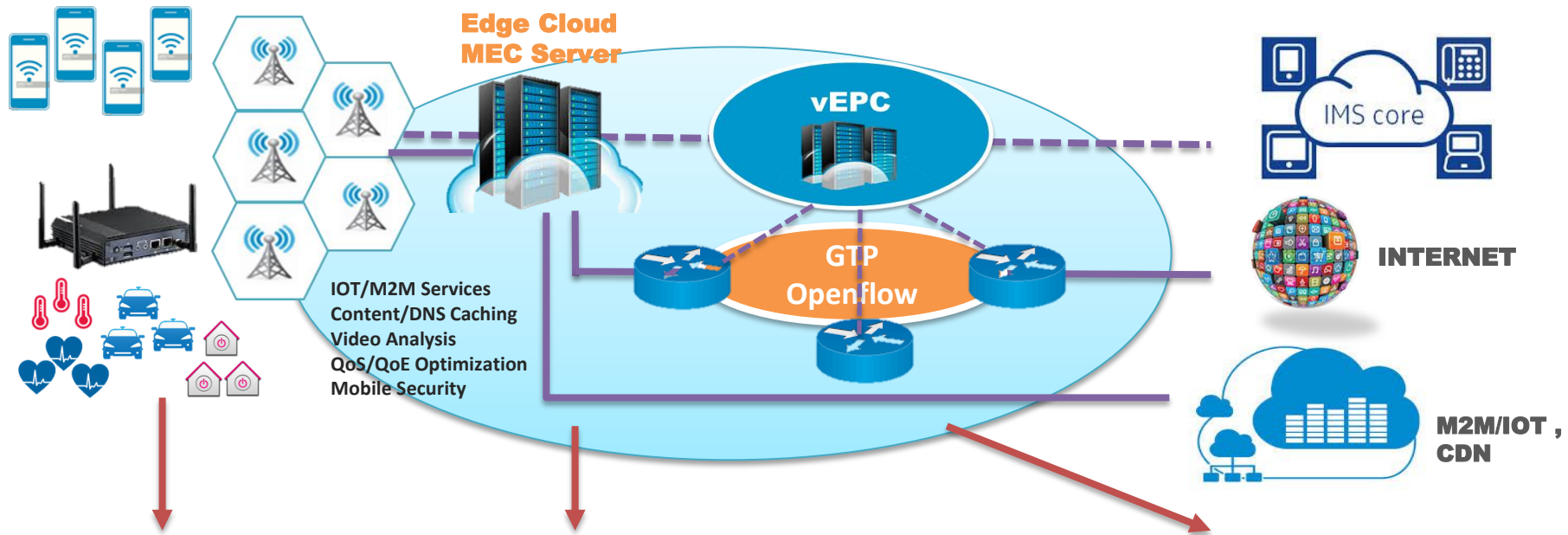
Netas to provide an integrated platform for:

- Early warning and forecasting
- Modeling and simulation
- Situational awareness
- Efficient resource management
- Robust decision support mechanism
- Central command and control structure
- Redundant, secure and seamless system infrastructure
- Integrating with corresponding institutions and organizations



- Developed software integrated with c.30 different e-government services

Netaş 5G Projects



M2M/IOT Gateway

- Hyperconnectivity beyond distinct systems
- Enables common M2M services
- Value added services across ecosystems

Mobile Edge Computing

- Edge platform for mobile data processing
- QoS and QoE optimization
- Network slicing

Virtualized SDMN EPC

- Virtualized EPC functions
- Decomposed control and user planes
- GTP Open Flow for user plane control

Technology center with E2E 4G solutions laboratory

Thank You