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The Digital Revolution

Digitalization has brought disruptive changes in the way we interact and do business.

Communication
- Live chats, e-mails, SMS, video calls, social media as opposed to buzzers, telex, fax, typewriters, mail parcels

Collaboration
- Cloud allowing for task sharing, project management among departments with real time editing without physical presence

Content creation and publicity
- Less television and newspapers, more websites, blogs, video streaming to target customers

Technologies and Enablers: the new Cornerstones

The foundation of digital transformation lies on the evolution of technology, speed of data transmission and overall innovation.

- Sensors and Microchips
- Big Data and Analytics
- Augmented and Virtual Reality
- Blockchain
- Artificial Intelligence

Technologies and Enablers: Microchips and Sensors

Transistor
- The basic element in modern microelectronic technology obeying Moore's Law.

Integrated Circuit
- Pillars of electronic equipment through Op Amps, Drivers, Audio Amplifiers, etc.

Memory
- DRAM, SRAM, Flash, EPROM, EEPROM,

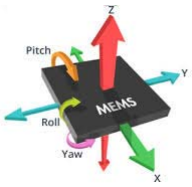
MEMS
- Accelerometers, Gyroscopes, etc.

Transistor

Integrated Circuit

Memory

MEMS



Technologies and Enablers: Big Data and Analytics

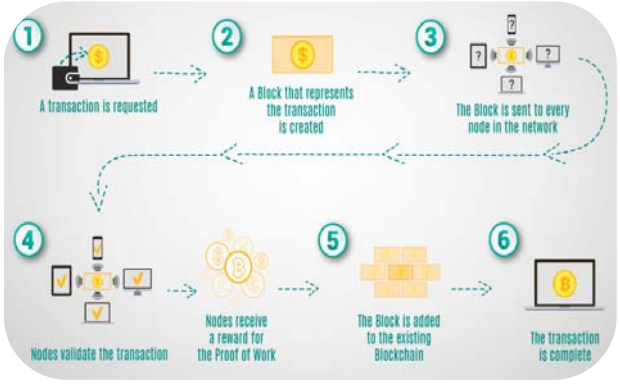
- Big data analytics is the process of examining large and varied data sets.
- It allows to uncover information, including:
  - hidden patterns
  - unknown correlations
  - market trends
  - customer preferences

Technologies and Enablers: Augmented and Virtual reality

- Augmented Reality thanks to computers, sensors, lenses, eye glasses, for advertising, marketing, reporting
- Virtual reality as a tool for professionals to enhance customer experience and awareness on new environments such as 3D simulations. Some examples:
  - Shopping centers and housing viewing through virtual tour
  - Stock market real time simulations with dynamic graphs

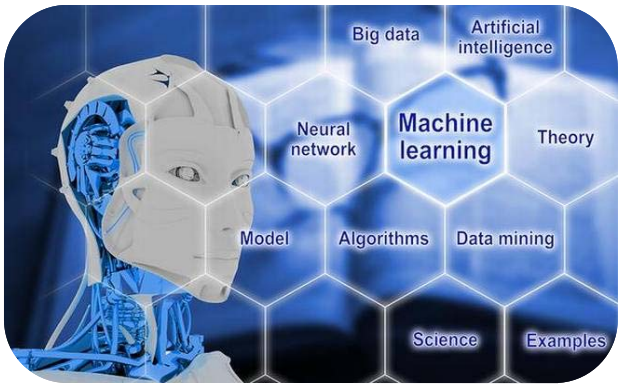
Technologies and Enablers: Blockchain

- Optimization of cross borders currency transfers with real time validation
  - No time wasted
  - No centralized servers
  - Cost reduction
  - Full traceability
- An open question: will cash disappear?



Technologies and Enablers: Artificial Intelligence

- Machines will mimic human capabilities and their neural connections
- Leveraging big data and data analytics methodologies
- Becoming predictive from past experience

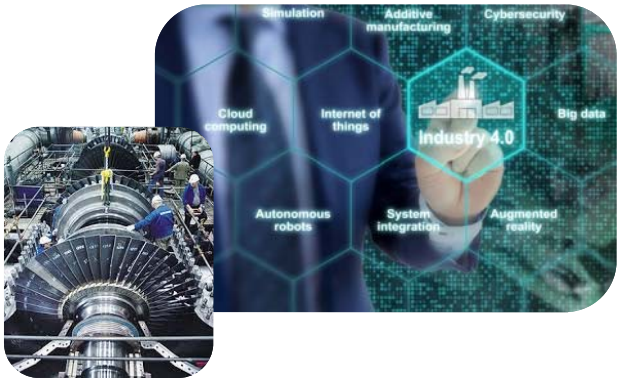


Applications

Industry 4.0

Internet of connected industrial equipment will allow for:

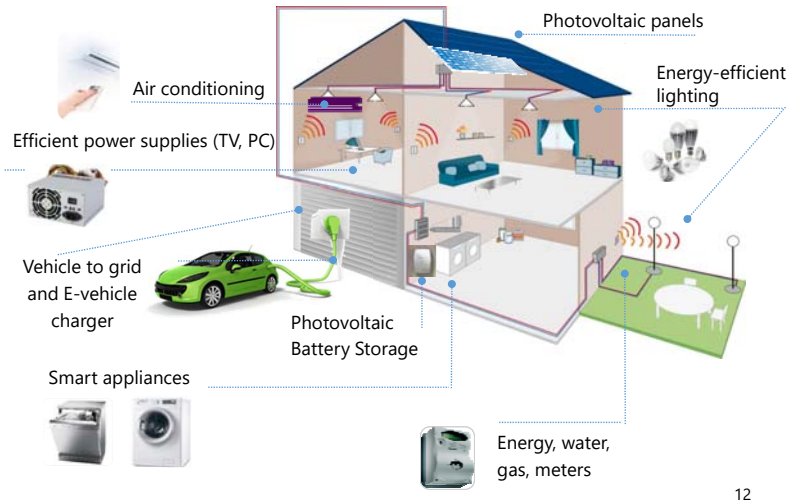
- Preventive Maintenance
- Reduction of machine downtime
- Warehouse Efficient Control
- Cost reduction and increased efficiency
- Shortening of production cycle time
- Cyber Security



Smart Homes

A self-sufficient, environmental friendly, interconnected home

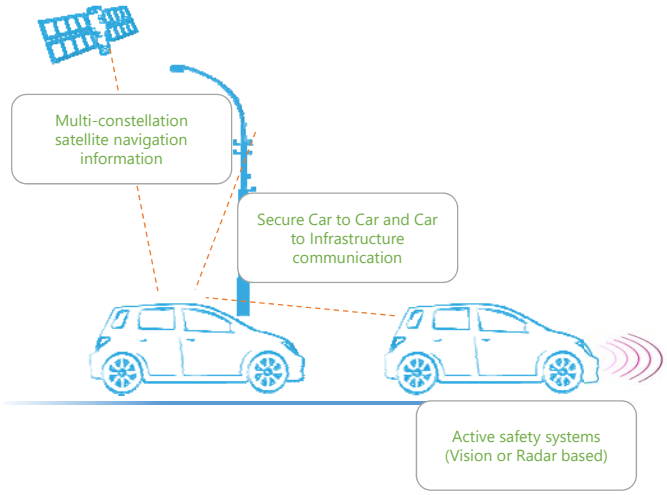
- Generating energy through photovoltaic panels and coated walls
- Increased power efficiency through zero stand-by and battery energy storage
- Anti-theft, smart lock, ambient light control
- Smart appliances: fridge, washing machine, ovens, air conditioning
- Augmented and virtual reality with wireless sensor network, smart systems, walls integrity control



Smart Driving

A safer, more efficient and greener driving

- Anti-collision sensors
- Best routing to avoid traffic and minimize fuel consumption
- Restricted city areas access with tolling and assisted parking
- Active safety measures making driving safer
- Smart traffic lights reducing traffic
- Battery powered, fully electric, assisted and autonomous driving



Smart Garbage Collection

Connected containers allow cities to manage more efficiently garbage collection.

- Improved garbage fleet management
- Avoid overfilled containers leading to user frustration and dumping
- Only collect when necessary
- Domestic Robots that can differentiate and automatically collect garbage

Smart Museums, Theaters and Shopping Malls

Virtual and augmented reality for a thorough and authentic experience

- Bookings with personalized information and geo-location content
- Museum Interactivity
- Re-living historic live and events
- Musical scores, 3D vision
- Information sent directly to smart glasses and phones

Smart glasses and smart phones to enhance ears and eyes' natural experience

Smart Buildings, Infrastructures and Environment

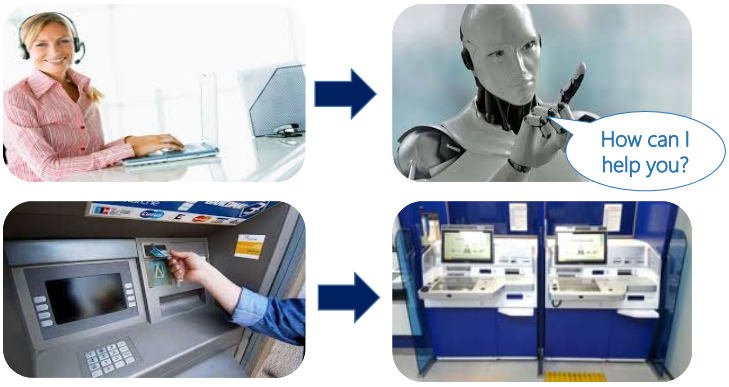
Protecting and monitoring the structure of buildings, bridges and infrastructures

- Motion sensors for pressure and stability real-time monitoring
- Chemical sensors for pH monitoring
- Energy harvesting from structure vibrations for data transfer
- Big data analysis with massive numbers aggregation for better understanding and structure collapse prevention

Smart Bank

Blurred differences between big Banks and Fintech companies. New professionals needed (e.g. Data Scientists)

- From operators to Chatbot virtual assistance
- From card driven ATM to Intelligent Kiosks
- Multi-factor authentication for better security (facial, voice, fingerprints, etc.)
- Robot trading to become the norm thanks to artificial Intelligence
- Real time analysis on big data to enable new services



Smart Office

A new working space with flexibility and fast connection

- Employee multi-factor recognition (voice, facial, fingerprint, password)
- Wireless chargers for laptops, phones, etc.
- Micro projectors on laptops and phones
- Smart Agenda:
  - Analysis of past incomplete actions and follow-up proposals
  - Proposals for the day based on priorities
  - Data Analytics for customer visit preparation

Smart Agriculture

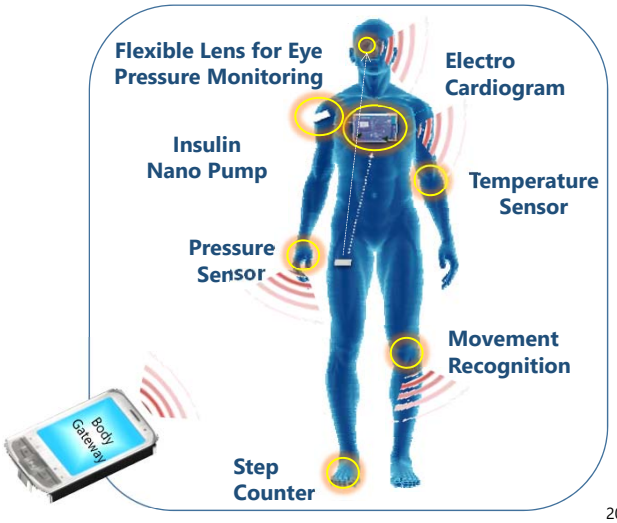
Smart Sensors for remote monitoring of weather conditions, fields and crops

- Pressure sensors
- Temperature sensors
- Humidity sensors
- UV and CO_2 sensors
- Luminosity sensors
- Anti- counterfeiting RFID electronic labels
- Drones for environmental monitoring and water saving
- Transparent photovoltaic panels for greenhouses

Healthcare

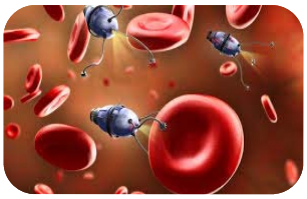
Remote monitoring reducing hospitalization and associated costs

- Remote patient monitoring
  - Blood pressure
  - Heartbeat
  - Electrocardiograph
  - Eye pressure sensor
- Movement reconstruction
  - for Rehabilitation
  - for fitness
- Patient treatment (i.e. insulin nano-pump)



The Next Challenges: Advanced Robotics and Bionics

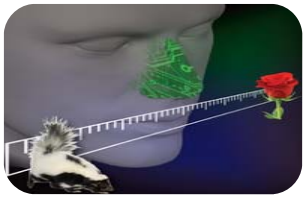
Machines and human beings always different but with many similarities



Nano robots inside the human body for microsurgeries

Bionic hand to mimic human organs

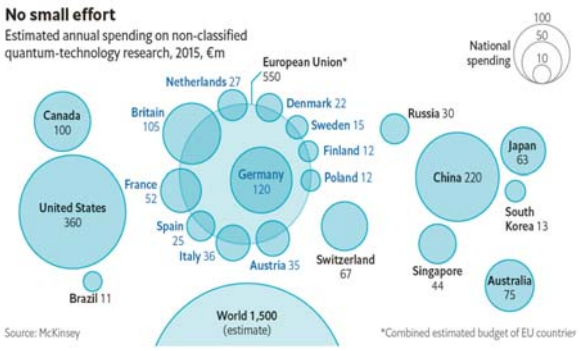
Bio-electronics to increase human brain processing and memory capabilities



Bionic nose able to code and send different smell signals to the brain

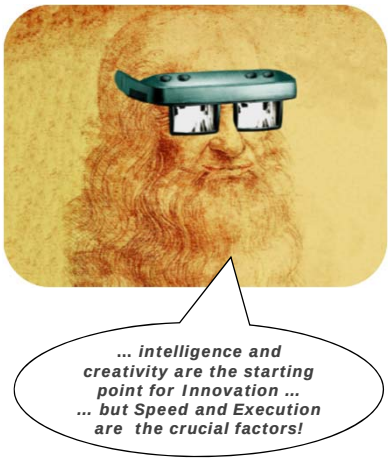
The Next Challenges: Quantum Computing

- This will be the ultimate evolution with a dramatic step forward in terms of speed, processing and performance
- From binary to quantum bit computers based on Physics Superposition Principle
- Artificial Intelligence algorithms based on neural networks will complement quantum computing



Conclusions

- Internet and Social Media drastically changing speed of execution, distances and interactions among humans
- Democracy rules to be updated in a technology-based society?
- New risks with hackers threatening company knowledge and personal privacy and identity
- Continuous training to avoid insurmountable knowledge gaps
- Robots to replace humans in many jobs and tasks, but new jobs and opportunities based on a new set of expertise (Electronics, Data Science, Psychology, Philosophy)
- Innovation spirit, search for excellence and willingness to compete always winning factors making the difference
- Mathematics the basic ingredient for progress



… intelligence and creativity are the starting point for Innovation … … but Speed and Execution are the crucial factors!