

INDUSTRY 4.0, HPC AND BIG DATA

**PUTTING IN PLACE A WORLD-CLASS LUXEMBOURG DIGITAL
INFRASTRUCTURE TO SUPPORT THE DIGITALIZATION OF INDUSTRY**

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LE GOUVERNEMENT
DU GRAND-DUCHÉ DE LUXEMBOURG
Ministère de l'Économie

History of the Luxembourg Economy

1839

1870

1980

2000

2020



Agriculture
Emigration

Industrialization
Steel Industry

Banks
Services

ICT Technology
& Knowledge



Yesterday

Today

Tomorrow

Source: http://www.cc.lu/fileadmin/user_upload/cc.lu/Luxembourg_une_economie_dynamique/ECOLUX_septembre_2014.pdf

Key sectors of the Luxembourg Economy

A dynamic economy:

- INDUSTRY
- MEDIA & E-COMMERCE
- LOGISTICS
- EUROPEAN INSTITUTIONS
- SERVICES



The 3rd Industrial Revolution: Everything is becoming digital !



ENERGY

Renewable energies, Production, recovery, Distribution, Storage, Smart metering

MOBILITY

Transports and Logistics (transportation modes, infrastructures materials, innovative lean logistics, driverless solutions

BUILDINGS

Housing & Environment, Materials, Inclusive eco-neighborhood

FOOD

Production, distribution and consumption patterns (agriculture, manufacturers, retailers, horeca, end consumer, etc)

INDUSTRY

Transformation of traditional business models in the industrial sector

FINANCE

Innovative finance approaches / vehicles (Fin-Tech, impact investment, participative finance, e.g. crowdfunding...)

SMART ECONOMY

Digital for sustainability: smart solutions for a post-carbon economy
Digital & Ethics: Open-source & governance, **data** protection, privacy, **digital** preservation

CIRCULAR ECONOMY

Optimization of resource and material flows system
Resource efficiency - Sharing Economy

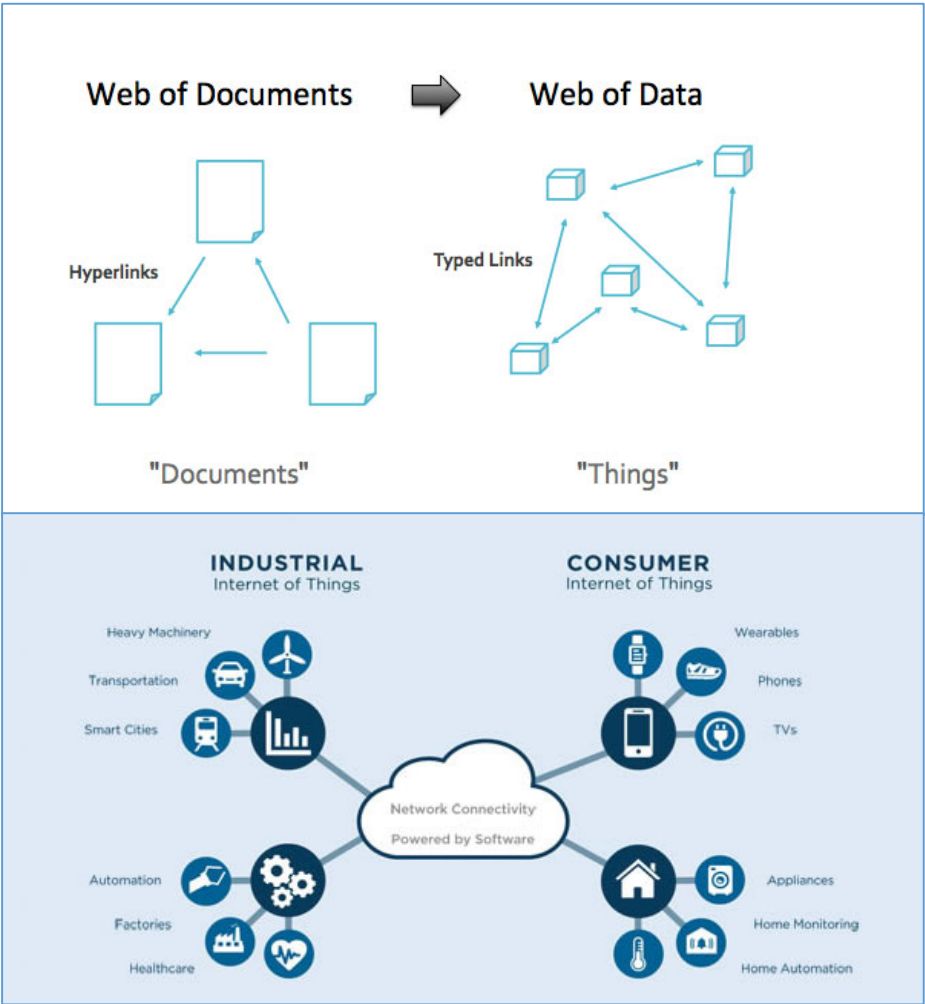
PROSUMERS AND SOCIAL MODEL

Labor, tax and legal aspects
Impact of the rise of new economic models (lateral power: sharing economy, crowd economy...)
Work organization, prevalence of the human dimension, social solidarity/cohesion

Data will become also a strategic asset for the manufacturing sector

- Europe's industry has lost ground in the past two decades.
- With Industry 4.0, there is a chance that Europe can increase its dwindling industry share.
- Digitizing the traditional industry to keep – to create new - jobs in Europe.
- Industry is critical to ensure a balanced labor market and skills pyramid.

Impact & Evolution of the Internet



The strategy of the Ministry of Economy is focused on the opportunities offered by the digital transformation

The MECO strategy contains four major policy and action levers:

1. Investments in **computing infrastructures** - High Performance Computing capacities and capabilities.
2. Development of a “**trusted**” world class **cloud and data infrastructure** that will provide Luxembourg companies with wide computing and data handling capacities.
3. Supporting **cross-border collaboration** on innovative digital experimentation activities e.g.: “HPC and Big Data enabled Testbeds”.
4. Addressing new **regulatory challenges** arising from digitization of the industrial fabric e.g.: subjects related to data generated by the multitude of new smart products, liability of autonomous systems

Lever 1: Computing Power & Digital Infrastructures

Key MECO actions in progress:

Initiation of European IPCEI for HPC and Big Data

- Lead on the Important Project of Common European Interest to acquire pre-exascale and exascale computing with France, Italy and Spain

Building-out the Luxembourg HPC Ecosystem

- Attraction of the European Commission HPC and Quantum Technology Unit (C.2) to Luxembourg

Early access to HPC Capabilities

- Partner in European HPC Network and ecosystems including FR, DE, IT, and ES (others joining)

Delivering national HPC capabilities

- During 2018-19, a Petaflop/s supercomputer will be installed

Enabling the 3rd Industrial Revolution

- Creation of an HPC Competence Center to enable applications of HPC and Big Data capacities in areas such as AI, IoT, Robotics, BioTech, 3D-Printing and Autonomous Vehicles

Lever 2: Trusted Cloud Enabled HPC-Services for Industry

Key MECO actions in progress:

- Definition of key characteristics for a European “**Trusted**” HPC enabled data infrastructure in partnership with Italy and Spain.
- Submission of a “**scoping document**” to the European Commission DG-CONNECT for consideration (July 2017).
- Ongoing preparation to submit a project for the development of a prototype for a “**trusted cloud enabled data hub**” together with partners from Italy : *Connecting European Facility* call for proposals (2018).
- Integration of services within LUX-HPC Competence Center (2018-19).

Level 3: Supporting digital experimentation “Testbeds” on HPC & Big Data Enabled Applications

Key MECO actions achieved or in progress:

- Agreement between Italy, France, Spain and Luxembourg on **four** HPC & Big Data enabled **testbeds**.
- HPC & Big Data **testbeds** will be **supported by the European Commission** - DG CONNECT H2020 Program (2018-2020).
- Luxembourg will **lead** the testbed on Big Data enabled **Smart Space & e-mobility**.
- Luxembourg is **participating** in a planned testbed on **Advanced Manufacturing** led by Italy.

Level 4: Addressing new regulatory challenges arising from digitization of the industrial fabric – promoting a digital friendly landscape

Key MECO actions in progress:

- **Participation** in European Commission “Digitizing European Industry” initiative; with specific focus on *European Industrial Data Space*.
- Participation in a 28 MS **“Action plan on automated and connected driving”**.
A public-private Data Task Force was set up in May 2017 focused on data exchange and data flow concerning Safety Related Traffic Information (SRTI).

Definition of an appropriate regulatory framework for the data economy!



Digitising European Industry

Strengthening competitiveness in digital technologies value chains and platforms



European Commission
DG RTD and DG CONNECT



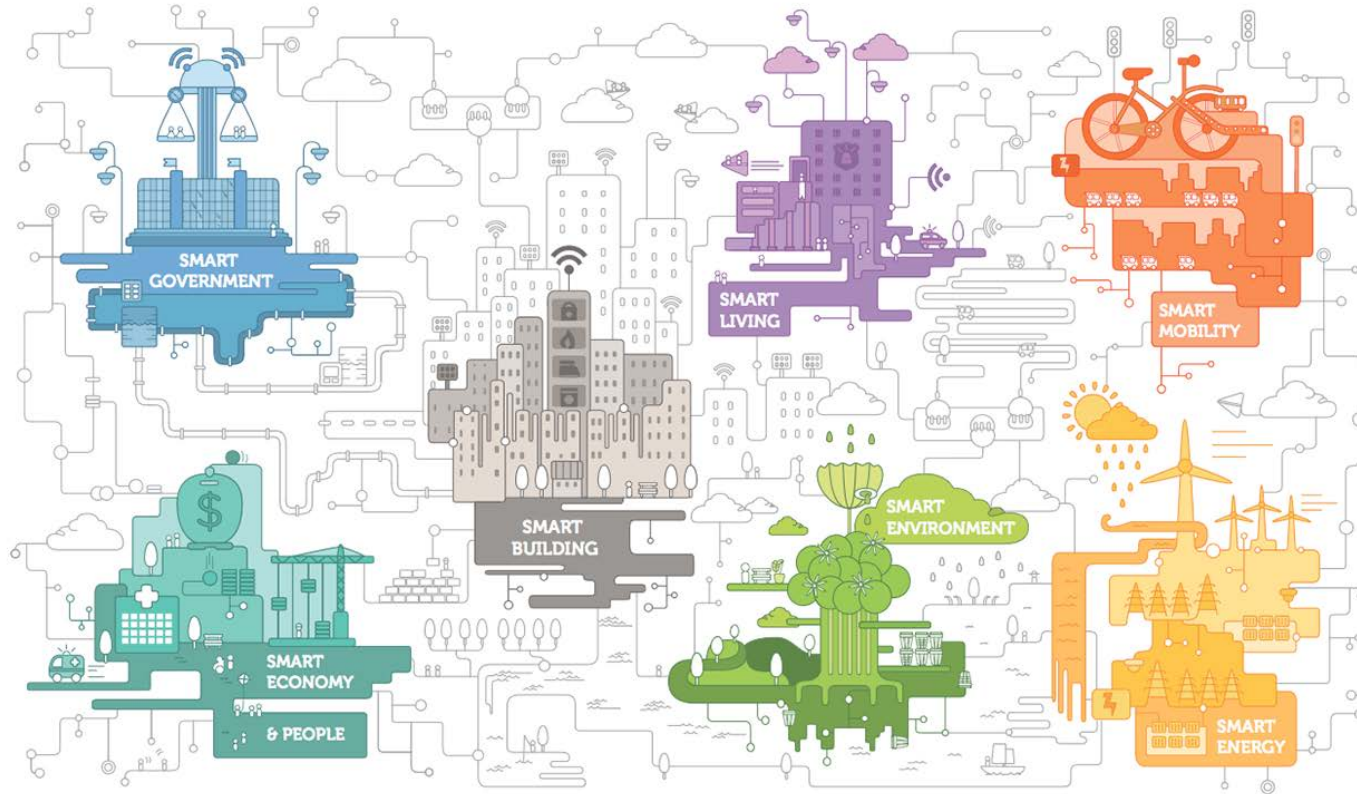
Looking forward:

Luxembourg should be a “digital pioneer” in Europe

- World Class HPC & Big Data enabled Hub and Ecosystem
- Digital – data - friendly regulatory environment
- Competitive digital advantages in key strategic sectors



Thank you for your attention



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