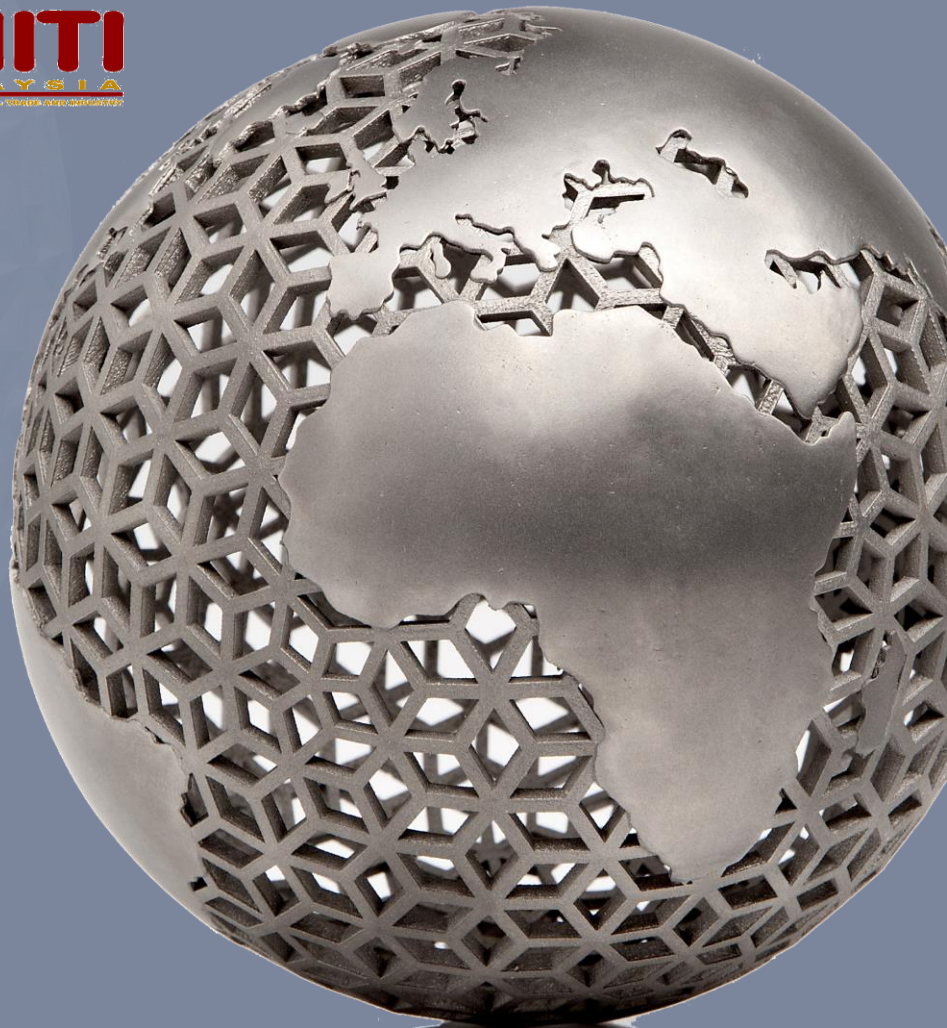
Regional and Global Perspective on Government's role and Policy Approaches for Smart Manufacturing :

Capitalizing from European and French developpment stages

Milko Papazoff
CETIM, Technical Centre for Mechanical industries
Penang, 25 September 2018



CETIM's experience in assisting French industries to adopt Industry 4.0

CETIM, the Technical Centre for Mechanical Industry

established in France in 1965 to improve companies' competitiveness

1st French research institute in mechanical engineering (non profit)

- 1,000 employees
- 127 M€ turn over

Main technology partner for Industry 4.0 roll out

5 main customer markets :

- Aerospace
- Automotive
- Energy
- Oil & Gas
- Mechanical industry

Mechanical engineering

Test laboratory, consulting and support

Advanced manufacturing solutions and services

Transfer and industrialization of innovations

CETIM as a pillar of Industry 4.0

- Created in 2015 under association status
- **11 founding members**

Alliance INDUSTRIE DU FUTUR
FÉDÉRER, ACCÉLÉRER, TRANSFORMER

Collège
Academic partners
ARTS ET MÉTIERS ParisTech
INSTITUT Mines-Télécom

Collège
Techno partners
cea
cetim

Collège
Professional federations
AFDEL Les éditeurs de logiciels et solutions internet
FIEEC
FÉDÉRATION DES INDUSTRIES MÉCANIQUES
Gimélec
SYMOP Membre de la FIM — SYNDICAT DES MACHINES ET TECHNOLOGIES DE PRODUCTION
Syntec NUMÉRIQUE
Union des Industries et Métiers de la Métallurgie

Industry of the Future : The French MODEL of Industry 4.0

The new industrial France

1 transversal plan

Industrie du Futur

Updating of production tools and transformation of business models

×

9 thematic solutions

Transports of tomorrow

Smart objects

New resources

Medecine of the future

Digital confidence

Sustainable city

Data saving

Intelligent nutrition

Green transport

A new partnership

State
Quarterly management board chaired by the Minister of Industry

Alliance Industrie du Futur

French non-profit organization, open to new members

Regional Level

Technological Offer

Led by
Bruno Grandjean
President of G.F.I. – Grouping of French Industrial Federations

Co-Presidents

Frédéric Sanchez
President, Fives

Pascal Daloz
D.G., Dassault Systèmes

Research and Education

Priorities

Define the models of support

- Tailor made individual support
- Financial support

Design the future technologies

- Virtuallity / Connectivity / Digitality / Supply chain
- Advances manufacturing processes (ALM, …)
- Composites, new materials and assembly technologies
- Monitoring & Control
- Automatization and process robots
- Special & hybrid process
- Environmental footprint and energy efficiency
- Place of the human in the factory : Cobotics & augmented reality

Manage human factors

- Propose factory models developed around the men and training programs in line with the new and future technologies. Always prioritise on human develppment and capacity

Promote & coordinate

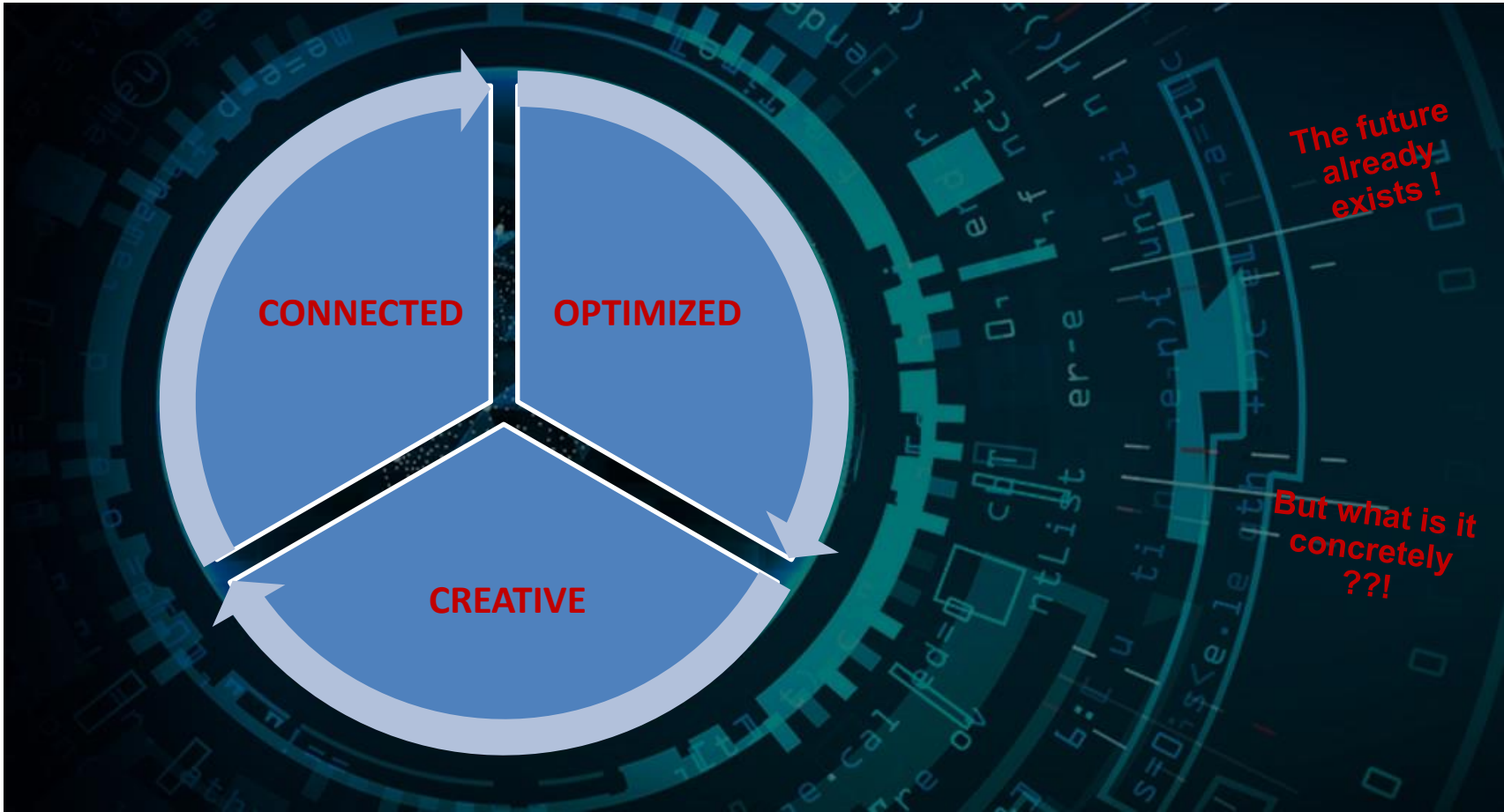
- To launch at least 15 projects for display with national and international recognition thanks to advanced industrial partners
- Online tools
- One single umbrella « alliance industrie du Futur » as a recognized label
- International promotion

Push the standards boundaries

Working the int groups:

- International norms ISO / IEC / UIT
- European norms CEN / CENELEC / ETSI
- Digital norms

Vision : the future is …



Tools:

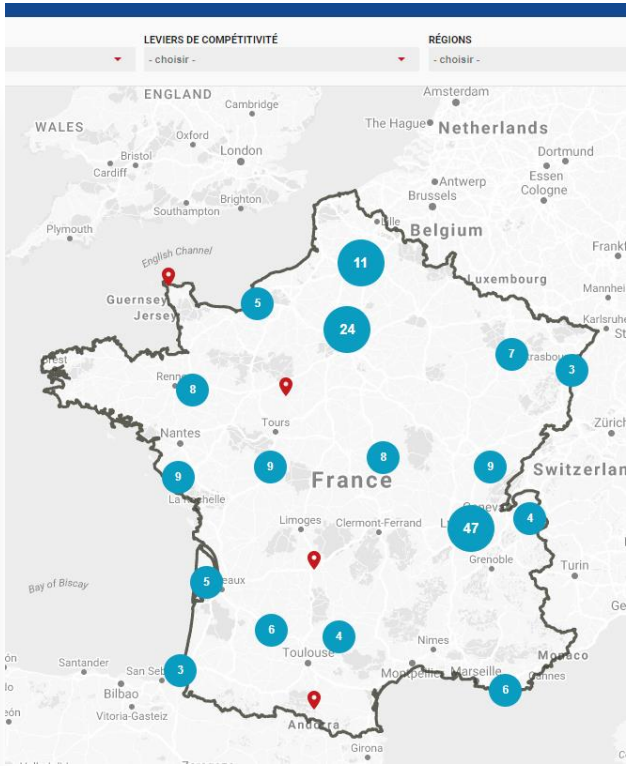
Identified « levers » & « bricks »

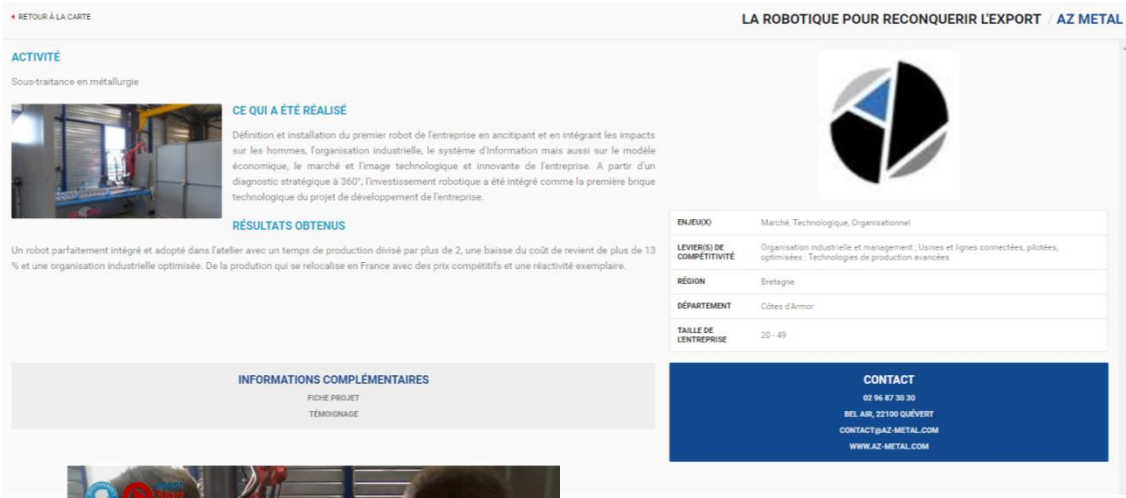
Publications

- Connected objects and industrial internet
- Advanced production technologies
- New approach to men at work
- Connected, controlled and optimized islands/lines and factories
- Integrated Customer/supplier relations
- New economic and societal models, Strategy and alliances

Database :“Used Cases“ Industrie du Futur

Examples of success stories, testimonies & Centres of Excellence





Example : push towards robotization

ROBOT Start PME

The French program was launched 4 years ago to support automation/robotization among SMEs ; 2 years after the launching, here the survey conclusions from the first 80 batch :

- **84%** average productivity increase
- **15.5%** Sales increase and **27.5%** profit margin increase
- **26%** of the companies engaged in the program managed to conquer international markets
- **89%** of the companies consider a big improvement in working conditions
- Thanks to the growth generated, **63%** of the companies hired between 1-5 staff
- Most of the companies are planning new projects following this first experience

From manual welding & business development difficulties to :

- Fully integrated robot to work with operators
- Production time divided by 50%
- Cost reduced by 13%
- Managed to recapture business lost to overseas suppliers

The success factor was to really analyze the need before rushing into a solution and before consulting EQUIPMENT MANUFACTURERS

Robot Start PME business case : AZ Metal (SME)

What did we learn ?

CORPORATE IMAGE = KICK EFFECT:

“a modern and innovative business, for all stakeholders”

- The company becomes a viable industrial partner to clients = **more clients, more business**
- The company becomes more attractive to job seekers = **less HR costs** (hiring, training, retaining) ; more qualified, less labor intensive (less MCs)
- The company becomes a **Centre of Excellence** to display
- First project gets the buy in & the ball rolling

- Conclusion : **More business / Less costs**
- Note : for robots, thinking **only** about replacing labor is a mistake in the approach and often a NoGo, due to ROI model

Challenges and benefits on automation / robotics cases

Social considerations:

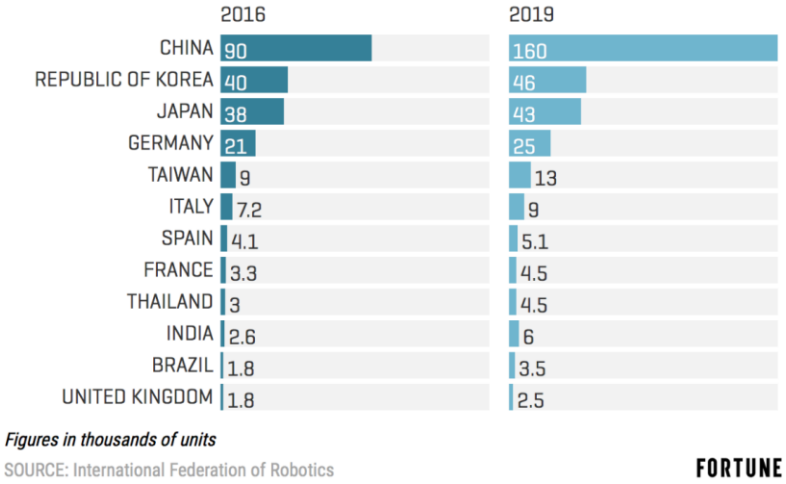
- Workforce health vs long and repetitive tasks (in particular occupational health)
- Attractivity towards industries (more/less value added),
- Diversity integration (reduction of heavy work, gender, OKU),
- Skill shortage: less dependency ; autonomous night shifts…
- Against delocalisation even …RE-localisation,

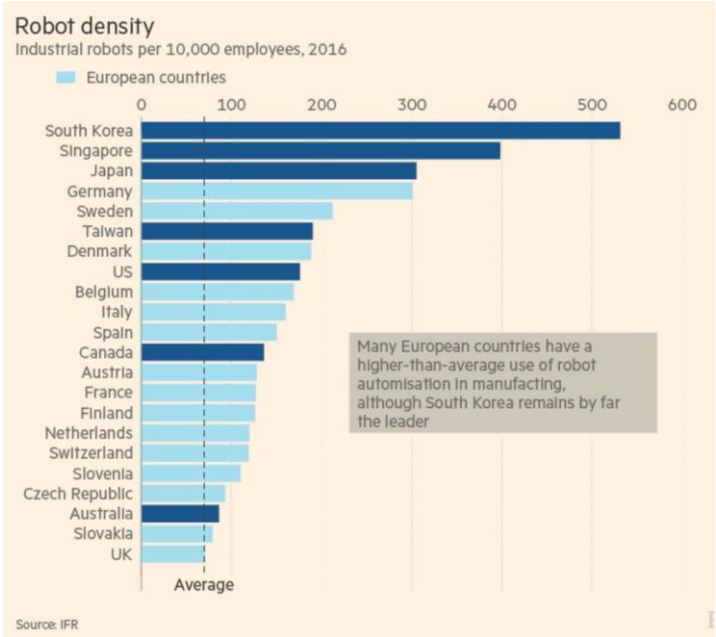
Technological considerations:

- Better process mastering, traceability, flexibility, repeatability
- Integrate innovative and performing processes
- Keep up to date with technologies (!)

OVERALL industry situation and progress of French Ind 4.0

- As of 2018, **4,100** companies have been supported on their journey
- **22** companies have been rewarded as Centre of Excellence
- The **SMEs** require more attention & support as we can consider a “do or die” situation especially in automation/robotics





- The **MNCs** are moving fast and have developed internal capacities to keep going
(see example next slide)

OVERALL industry situation and progress of French Ind 4.0

The cultural change is slow compare to the rush of new digital technologies.

- Large companies have competencies and resources to integrate new technologies, but SMEs usually no...
- SMEs represent more than 50% of French industrial activity.
- French offer could take advantage of Ind 4.0 to improve their non-price factors: Quality, Design, Product branding, Service and Innovation.

Actions were announced last week by the French Prime Minister:

- To support investment with advantageous rules on depreciation.
- Key initiatives and funds to help digital transformation within the companies.
- And creation Ind4.0 Accelerating Centres.

International competition on Ind 4.0 has started. French large companies are well placed, but SMEs…

OVERALL industry situation and progress of French Ind 4.0

The French Prime Minister announced the creation of Ind 4.0 Accelerating Centres, based on CETIM model everywhere in the country:

- Local access for SMEs.
- To focus local stakeholders on Ind 4.0.
- All new technologies will be available at the same place with service to help integration in your factory. Integration of Ind 4.0 technologies is not so complicated, but it needs a strategic plan which addresses the overall company.
- Key transformer actions are **Innovation**, **Coaching** and **Training**:
- Human change, energy saving and environment issues must be addressed and will help on the adoption of new technologies.

Focusing energy in Ind 4.0 Acceleration Center's will help the French Industry to recover its position.

Our neighbours ?

Foreword : German-French complementarities

Topic	German focus	French focus
Industry	Offer	Demand
Platforms	Supply	Innovation
Standards	Machines	Digital
Training	Technical	Initial
Automation	Robots	Man-Machine Interface
Ontologies	Devices	Organizations
Flows	Smart Devices interconnection	Supply Chain Systems of Systems

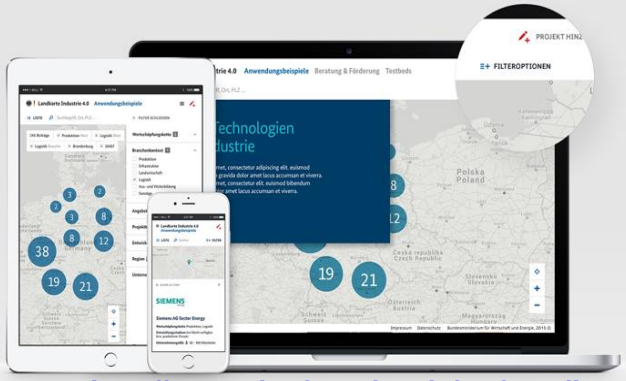
German-French comparison

PLATTFORM INDUSTRIE 4.0

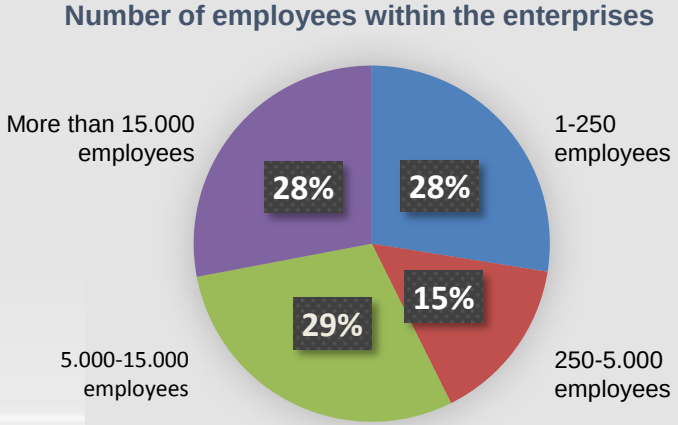
Virtual Map Industrie 4.0
German exercise

207 examples of application of Industrie 4.0…

…within **small, medium and large sized** enterprises from **various branches.**



http://www.plattform-i40.de/I40/Landkarte



[multiple answers possible]

Only available in German

German-French comparison

PLATTFORM INDUSTRIE4.0

Virtual Map Industrie du Futur
French exercise

03.03.2016

http://exemples-aif.industrie-dufutur.org/

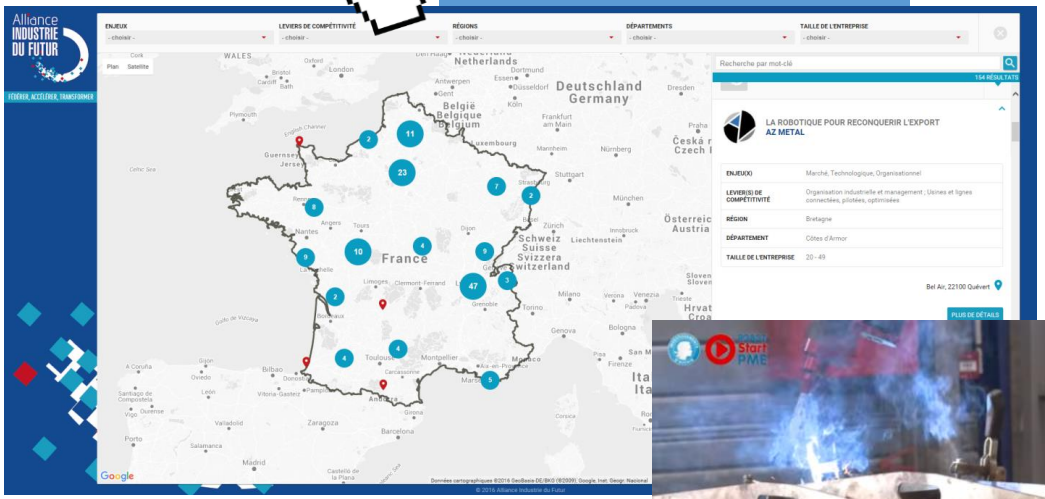
150 examples of application 100% SME's from various branches

- Market
- Technology
- Digital
- Organisation
- Society
- Environnement

CHALLENGES

- New economical models strategical changes
- Sme's alliances
- Industrial organisation and management
- Integrated relations Customers – suppliers
- Connected & optimized processes
- New approach of Man at work
- Advanced production technologies
- Cyber objects WEB in industry

COMPETITIVITY LEVERAGES



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Some European comparisons…

Germany :

- High Tech Strategie 2020
- 10 projects of the future, including Industrie 4.0

Italy :

- Cluster Tecnologici Nazionali : “Fabbrica Intelligente” Plan
- “Fabbrica del Futuro” Plan

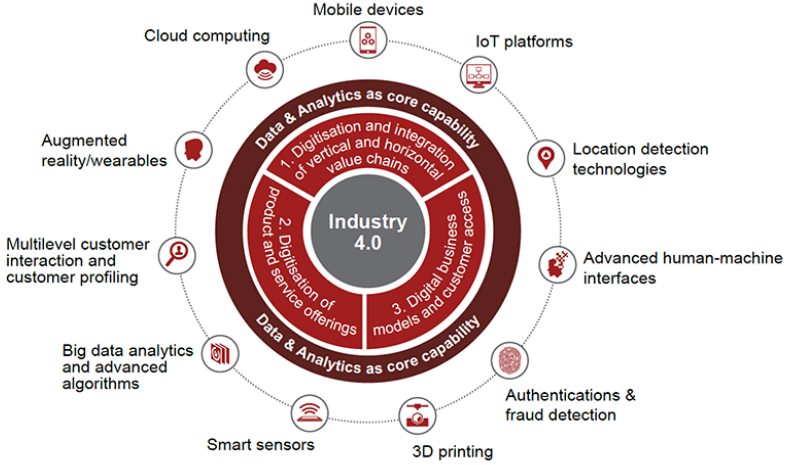
Volume of robotics in Italy : 2.5 times less than in Germany, 2 times more than in France.

United Kingdom :

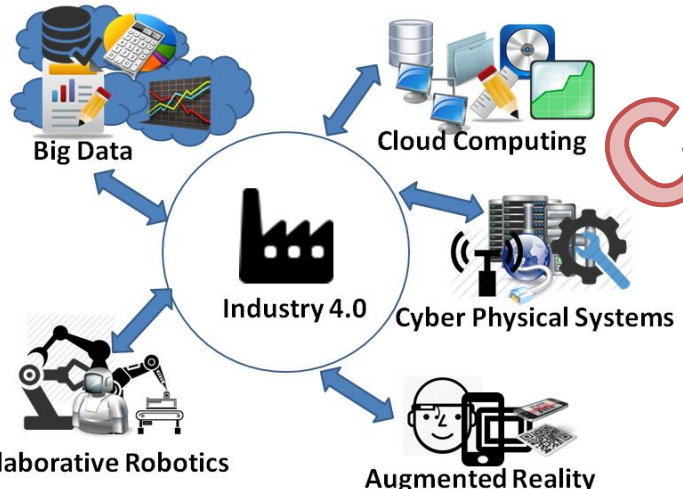
- High Value Manufacturing Catapult Programme
- Digital Catapult Programme
- Various initiatives linked to the Industry of the Future

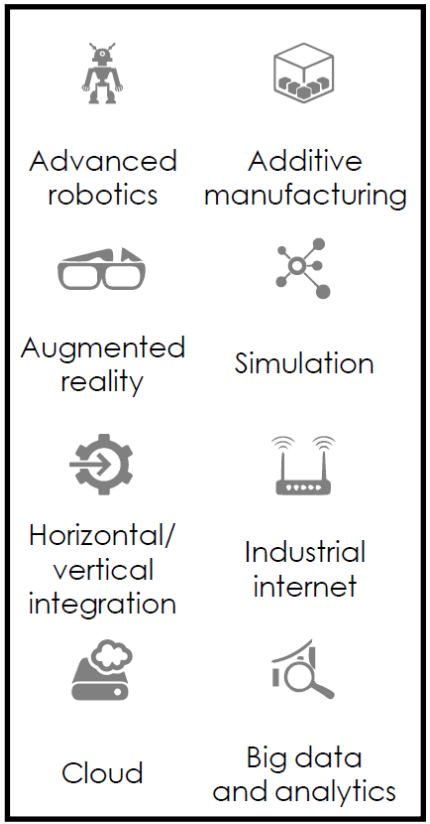
The way forward

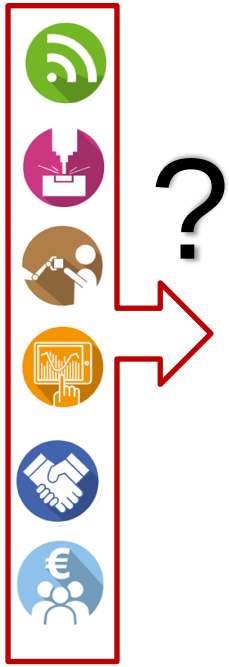
Industry 4.0, WHAT IS IT, ACTUALLY ?



Confusing!







- **Where do you stand ? Take the time to define YOUR own Industry 4.0 (each economy is different like German model not similar to French Ind 4.0)**
- **Need to restrict the scope to key economical sectors (Industries ? Services ? …)**
- **From high level blueprint, it is important to plan on how to go to the ground (support the companies from the concepts to the implementations)**

Terima Kasih
Salamat Po
ขอขอบคุณ
Cảm ơn bạn
ありがとうございました
고맙습니다
谢谢
ຂອບໃຈ
អរគុណ
ကျေးဇူးတင်ပါတယ်
Obrigadu
धन्यवाद
நன்றி
ඔබට ස්තුතියි
آپ کا شکریہ
баярлалаа
धन्यवाद
شکرا
Спасибо
Danke
Gracias
Thank You
Merci

THANK YOU

To the future

Q & A