



Co-funded by the
Erasmus+ Programme
of the European Union

FROM AUTOMATION AND CONTROL TRAINING TO THE OVERALL ROLL-OUT OF INDUSTRY 4.0 ACROSS SOUTHEAST ASIAN NATIONS (ASEAN FACTORI 4.0)



25 of February 2021 9 AM (Paris hour)

Region AUVERGNE-RHONE-ALPES

1. Region Auvergne Rhône Alpes (RA) : First industrial region in France
2. Industry & Innovation : Main Players of the RA
3. Industry 4.0 : State and Impact for the RA society (Cloud, Big data, IA, IoT & IIoT, Vision & Robotic)
4. RA entreprise office : A commitment to professional development
5. The Industry 4.0 Regional RA programme

26 of February 2021 9 AM (Paris hour)

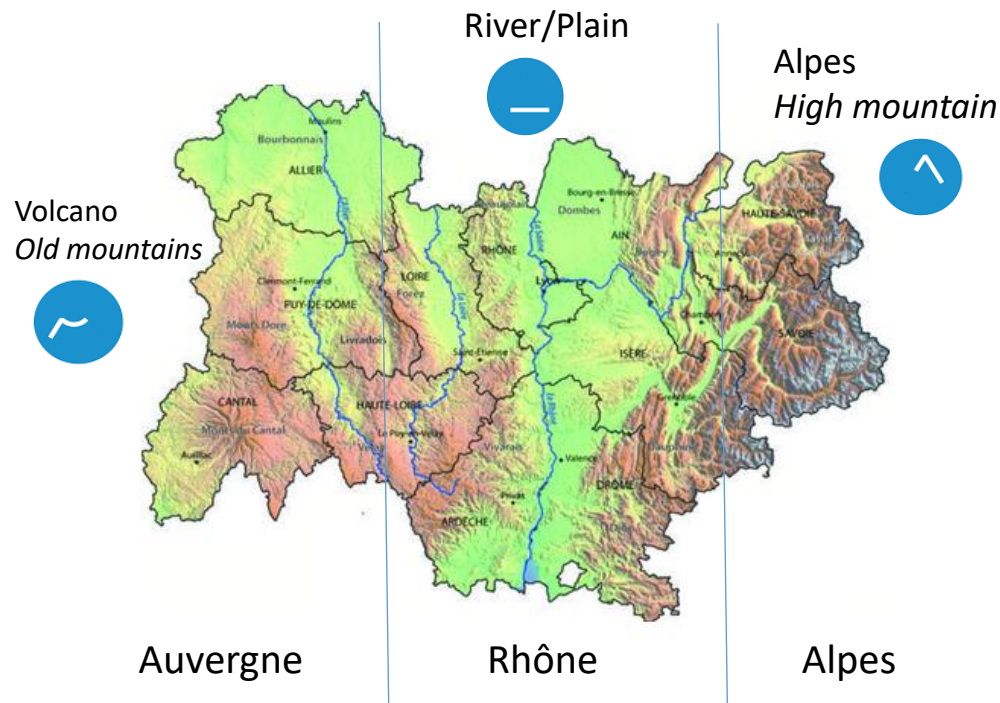
Region AUVERGNE-RHONE-ALPES

1. The RA vision of Industry 4.0
2. Case study of RA : To enhance Factory development,
3. RA Innovative Platforms and Cluster Network to support Degree Programme & vocational training & SME development
4. Discussion

Region Auvergne Rhône Alpes (RA) :
**The second most dynamic and
innovative regions in France**

The first industrial region in France

About the logo





SOME FIGURES

Territory



70,000 KM²

I.E. 13 % OF METROPOLITAN
FRANCE



67% OF THE REGIONAL TERRITORY

IS LOCATED IN MOUNTAIN AREAS



3rd LARGEST

REGION IN FRANCE



3 MOUNTAIN RANGES

MASSIF CENTRAL, ALPS
AND JURA



2 RIVERS

THE LOIRE RIVER AND
THE RHÔNE RIVER



1ST MOUNTAIN REGION

IN EUROPE



10 GOOD REASONS TO CHOOSE AUVERGNE-RHÔNE-ALPES

1. A DYNAMIC REGION
2. AN INNOVATIVE TERRITORY
3. A STRATEGIC LOCATION
4. A MAJOR PLACE FOR EDUCATION
5. A GREAT POTENTIAL OF RESEARCH
6. AN INTERNATIONAL REGION
7. A POWERFUL AND INDUSTRIAL AREA
8. 32 INNOVATIVE CLUSTERS
9. 8 SECTORS OF EXCELLENCE
10. AN AGENCY AT YOUR SERVICE



La Région
Auvergne-Rhône-Alpes

A DYNAMIC REGION



2nd MOST

POPULOUS REGION IN FRANCE



7.8 MILLION

INHABITANTS, I.E. 12 %
OF FRENCH POPULATION

(EQUIVALENT TO THE POPULATION OF CATALUNYA)



300 000

STUDENTS



58,000 MORE INHABITANTS

EACH YEAR

Biggest Cities:

Lyon (capital of the region): 1, 35 million inhab.

Grenoble: 444 000 inhab

Saint-Etienne: 402 000 inhab

Clermont-Ferrand: 290 000 inhab.

AN INNOVATIVE REGION

Economy - Employment

 **2nd REGION IN FRANCE**

AND 8th IN EUROPE IN TERMS
OF GDP. THE REGION'S GDP
(EUR 240 BILLION)
REPRESENTS 11.4 %
OF THE NATIONAL WEALTH

*GDP : GROSS DOMESTIC PRODUCT



**1st INDUSTRIAL REGION
IN FRANCE**

500,000 EMPLOYEES
IN THE INDUSTRIAL SECTOR



Research and Innovation

 **40,000 RESEARCHERS**
2nd RANK IN FRANCE



**14 COMPETITIVENESS
CLUSTERS**



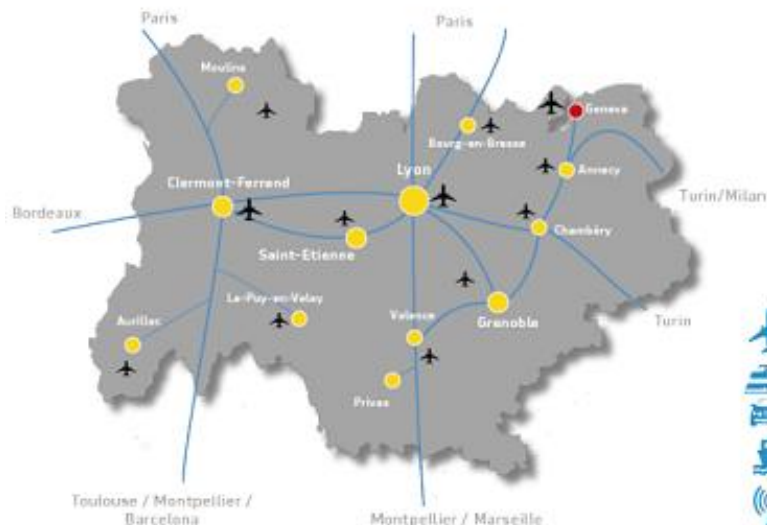
**18 REGIONAL LABELED
CLUSTERS**



**2nd RANK IN FRANCE
FOR THE NUMBER OF
PATENT APPLICATIONS**

A STRATEGIC LOCATION

Bordering **Swiss** and **Italy** at east, the Auvergne-Rhône-Alpes region lies at the crossroads of the main European and national communication ways: east to **Geneva** and **Turin**, south to **Montpellier**, **Marseille** and **Barcelona**, west to **Bordeaux** and **San Sebastian**, north to **Paris**, **Lille** and **Brussels**



INFRASTRUCTURES



- **2 international airports** (Lyon Saint Exupéry and Clermont-Auvergne)
- 9 regional airports
- **Geneva international airport very close by**
- **High speed train lines**
- 1,700 km of motorways
- **Less than 4 hours from 80% of the French territory**
- 550 km of navigable waterways on the Rhône and Saône
- The 1st area to have a complete fully fiber network

A MAJOR PLACE FOR HIGHER EDUCATION



- **300 000 students** / 30 000 foreign students
- **11 universities**
- **36 “Grandes Ecoles”** (institutions of higher education specialized in engineering, business, architecture, arts...)
- **3 communities of universities:** Lyon-Saint-Etienne, Grenoble-Savoie and Clermont-Auvergne
- **15% of the French engineers** trained in Auvergne-Rhône-Alpes

**INTERNATIONAL SCHOOLS FROM
NURSERY SCHOOL TO HIGHER
EDUCATION**



Clermont-Ferrand
International Bilingual School



Cité Scolaire Internationale
LYON

A TRAINING OFFER IN COOPERATION WITH CENTERS OF EXCELLENCE

The higher education offer in Auvergne-Rhône-Alpes covers all disciplines.
Auvergne-Rhône-Alpes is particularly well known for its centers of excellence working with research and economy in several fields:



- Life sciences and biotechnologies
- Micro- and nano-technologies
- Green chemistry and environment
- Engineering and renewable energies
- Human and social sciences
- Agro-food industries

A GREAT POTENTIAL OF RESEARCH



- **2nd french region and 5th european region** for research
- More than **600** laboratories
- **40 000** researchers and engineers
- **20%** of patents in France

Major international laboratories:

- the European center for Nuclear Research,
- the European Synchrotron Radiation Facility,
- the International Agency for Research on Cancer,
- the French National Institute for Agricultural Research
- ...





La Région
Auvergne-Rhône-Alpes

AN INTERNATIONAL REGION



- **2nd** rank in terms of exportation and importation:
53 billion € exported | 52,5 billion € imported in 2014
- **2nd most attractive** french region for foreign investment
- Auvergne Rhône-Alpes counts **2 800 foreign companies**
- Auvergne-Rhône-Alpes companies established around **3000 subsidiary companies**, JV, representative offices, commercial agencies and shops abroad
- **Member of the "4 motors"**, major economic regions in Europe, with Baden-Württemberg (Germany), Catalonia (Spain) and Lombardy (Italy)

Top 3 of customer countries



Top 3 in foreign investments





La Région
Auvergne-Rhône-Alpes

A POWERFUL AND INDUSTRIAL REGION



2nd french region and 7th european region for wealth creation

Auvergne-Rhône-Alpes is the **1st industrial region in France**:

- **500 000** employees
- Many international companies



ARKEMA

BASF
We create chemistry



SANOFI PASTEUR



Gerflor
the flooring group

The **tertiary sector** accounts for more than half of the regional added value.

- Lyon, **2nd** french tertiary sector
- **1 500** headquarters in the region
- Tourism: **140 000** employees and **9%** of the regional added value

COMPETITIVENESS CLUSTERS



REGIONAL LABELED CLUSTERS



OUR MAIN SECTORS



Advanced Manufacturing



Agriculture, Agrifood,
Forest



Construction & Public Works



Energy



Digital



Mobility



Health



Sport, Mountain, Tourism

AN AGENCY AT YOUR SERVICE

An agency to support the development of regional businesses

The **Auvergne-Rhône-Alpes Entreprises Regional Economic Agency** was born out of the Region's desire to bring together the economic structures throughout its territory to support businesses. **Financed mainly by the Region**, *Auvergne-Rhône-Alpes Entreprises* is a non-profit association, present in all the territories thanks to 11 local branches and **130 employees**.

The missions of **Auvergne-Rhône-Alpes Entreprises** :

The Regional Economic Agency provides guidance and support for **industrial companies** and **services to industry** at all stages of their development : investment, training and employment, innovation, export, access to finance and European projects...



Economic
development
Industry



Innovation



Employment
Training



Europe
International

in addition

A GREAT QUALITY OF LIFE

- **2nd French area** for quality of life
- **Lyon: the most attractive** French City for executives
best french city **for business**
- **Clermont-Ferrand, 1st** city in the South East of France
→ the 2nd most attractive region for **executives** & **157 000 newcomers / year**



in addition



La Région
Auvergne-Rhône-Alpes

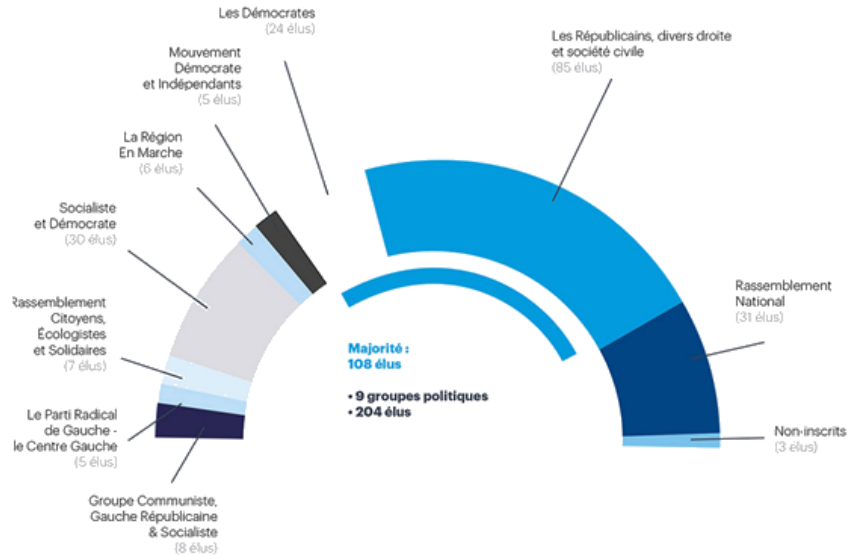
WORLDWIDE EVENTS



Grande Halle d'Auvergne, Eurexpo, Alpexpo, Cité Internationale... Auvergne-Rhône-Alpes has major facilities to host international events:

- **Pollutec:** International exhibition of environmental equipment technologies and services
- **Sommet de l'Élevage:** The leading european show for livestock professionals
- **SldO:** The intelligent internet of things Showroom
- **Solutrans:** International show for road & urban transport solutions
- **Sirha:** The world hospitality and food service event
- **Industrie:** The tradeshow for production technologies
- **Biovision:** The world life sciences forum
- **Leti Innovation Day:** Event dedicated to innovative technological solutions
- **FIP Solution Plastique:** The Plastic industry exhibition in France
- **Digital Summ'r:** The 1st European BtoB event dedicated to the performance and the innovation in the Software & Digital Services sectors
- **And many others...**

Regional Council



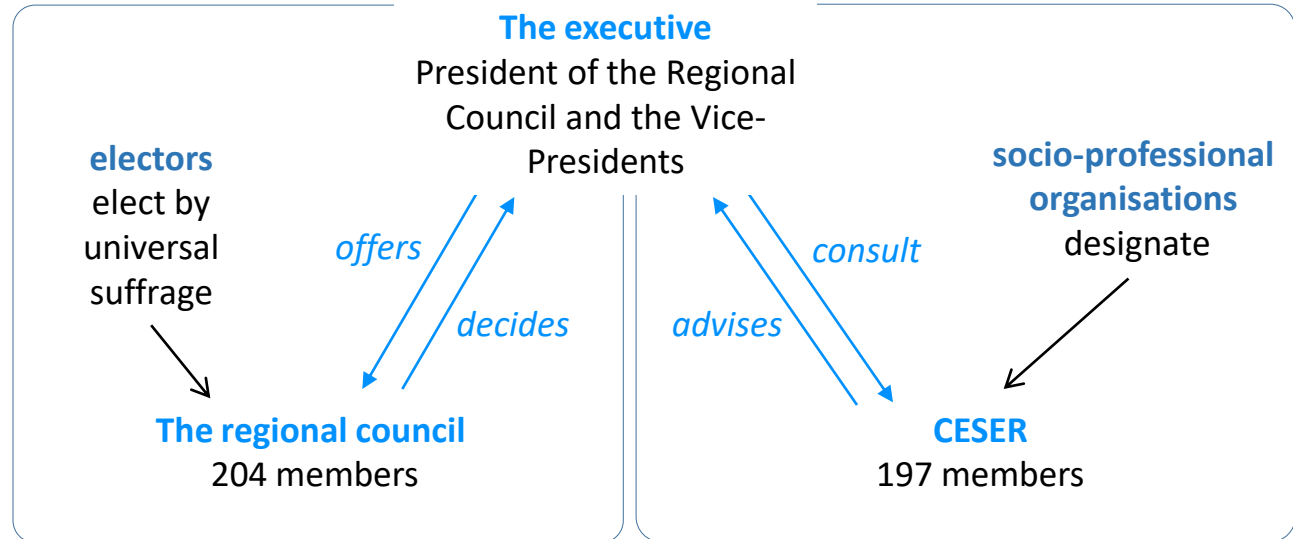
M. Laurent WAUQUIEZ
President of the region

The 204 members of the Regional Council of the new Auvergne-Rhône-Alpes Region were elected in December 2015 for a 6-year term until March 2021*. They form the deliberative assembly of the Regional Council and sit in plenary sessions and in thematic commissions. The purpose of these commissions is to examine the reports presented by the executive and prepared by the administration before each assembly.

() extended in june 2021 due to the pandemic*

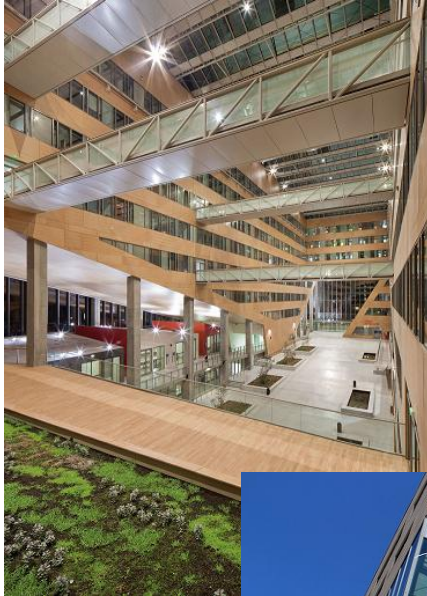
Regional Council

The **Regional Economic, Social and Environmental Council (CESER)** is the 2nd regional institution. It is the **consultative assembly** of the Auvergne-Rhône-Alpes Region. Through its **opinions and contributions**, it contributes to the administration of the Region. Competent in all areas of regional action, these bodies study, investigate, hear, **analyse and draft opinions and contributions for the Regional Council** and all regional decision-makers.



Organisation

Around 2,000 agents work at the head offices in Lyon (1,600) and Clermont-Ferrand (400), and around a hundred agents are spread over the territory between several areas and branches. The Region also employs 6,800 people in high schools spread over the 12 departments of Auvergne-Rhône-Alpes.

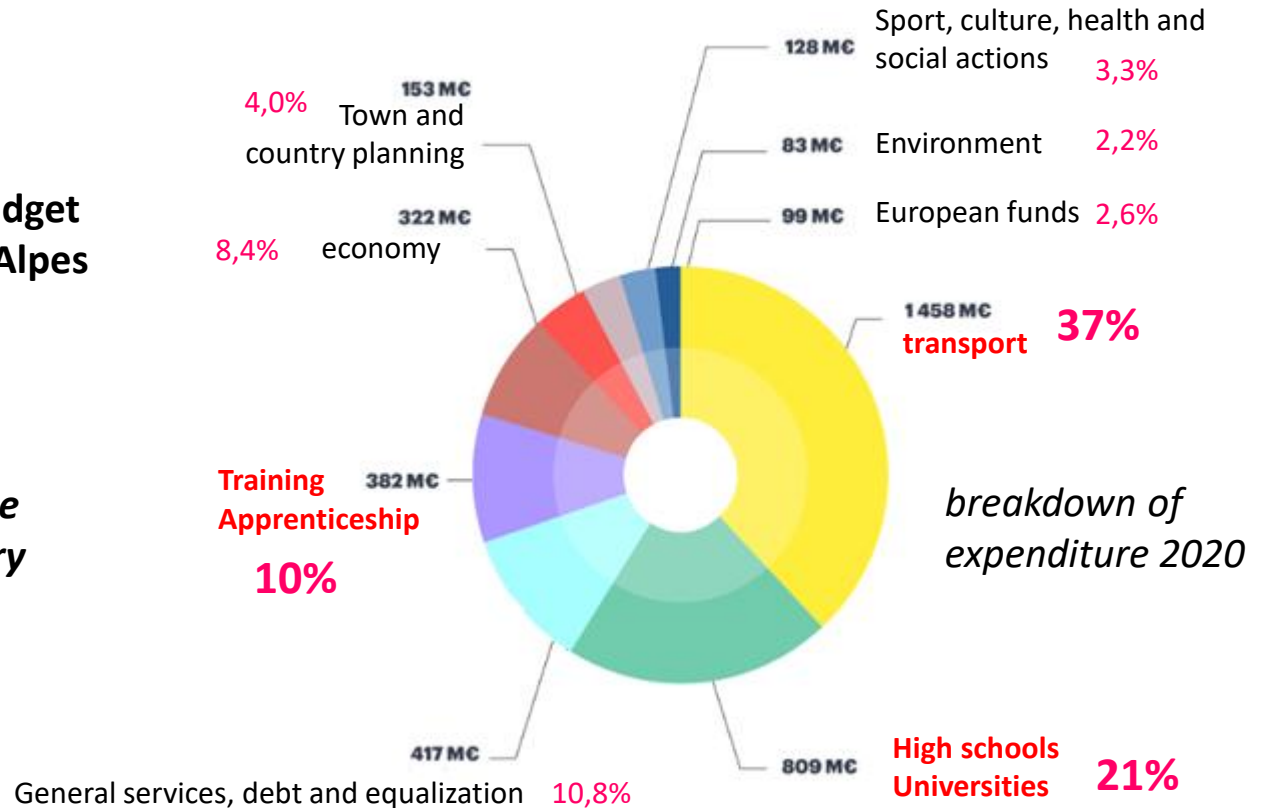


Budget

**3.851 billion euros* of budget
for the Auvergne-Rhône-Alpes
region in 2020**

() = 4,59 billion US Dollars*

***A 2021 budget against the
pandemic and for recovery***





OUR MAIN SECTORS



Advanced Manufacturing



Agriculture, Agrifood,
Forest



Construction & Public Works



Energy



Digital



Mobility



Health



Sport, Mountain, Tourism



La Région
Auvergne-Rhône-Alpes



ADVANCED MANUFACTURING

2750 companies | 100 000 jobs



APPLICATION FIELDS

Aeronautics

Mechanics

Plastics

Turning

Industrial
Equipment

MAIN COMPANIES



CLUSTERS



TECHNOLOGIES

Process

Robotics

Chemistry

Additive layer
Manufacturing



La Région
Auvergne-Rhône-Alpes



AGRICULTURE AGRIFOOD FOREST

2500 companies
62700 farms | 176 000 jobs



APPLICATION FIELDS

Water

Sanitary issues

Territorial food
systems

MAIN COMPANIES



Bayer CropScience

SODIAL



DANONE



CLUSTERS



TECHNOLOGIES

Ecological and
economical uses

Agritech



La Région
Auvergne-Rhône-Alpes



CONSTRUCTION & PUBLIC WORKS

73 000 companies | 135 000 jobs



APPLICATION FIELDS

Eco-construction

Civil engineering

Climatic
engineering

Construction
systems

MAIN COMPANIES

EIFFAGE

LAFARGE

Matière

somfy.

Schneider
Electric

CLUSTERS

INDURA



MINALOGIC

Eco
Snergies
L'ECO-SYSTEME

Cluster
Lumière

tenerdû
ENERGY CLUSTER

TECHNOLOGIES

Innovative materials

BIM

Regulation and
instrumentation

Smart lighting

Renewable energy



La Région
Auvergne-Rhône-Alpes



ENERGY

450 companies | 50 000 jobs

APPLICATION FIELDS

Energy producers
and distributors

Sustainable mobility

Building sector

MAIN COMPANIES



Schneider
Electric

ENGIE



SIEMENS

Nexans

Atos

Air Liquide

CLUSTERS



éco
Energies
L'ÉCO-BÂTIMENT



AXELERA
driver for sustainable growth

tenerdus
ENERGY CLUSTER

TECHNOLOGIES

Smart grids

Storage

Renewable energy



La Région
Auvergne-Rhône-Alpes



DIGITAL

15 000 companies | 60 000 jobs



APPLICATION FIELDS

Software

Microelectronics

Mobility

Cybersecurity

Health

Cultural
Industries

MAIN COMPANIES

Atos

sopra

almerys
Innovate your life

CGI

Capgemini
CONSULTING TECHNOLOGY SOLUTIONS

ST
life.augmented

Cegid
Group

visiativ

soitec

CLUSTERS

MINALOGIC

DIGITAL
LEAGUE

imaginove
INNOVATION IN DIGITAL TECHNOLOGIES

e-cluster
Knowledge efficient solutions

COBOTEAM

TECHNOLOGIES

Photonic

Sensors

Embedded software

Nanotech

Augmented reality



La Région
Auvergne-Rhône-Alpes



MOBILITY

800 companies | 130 000 jobs



APPLICATION FIELDS

Public transport

Good transport

Smart cities

Personal and
goods mobility

Supply chain

MAIN COMPANIES



navya

ALSTOM

IVECO



CLUSTERS

INDURA



ViaMéca
Pôle de compétitivité mécanique

Elastopôle
Pôle de compétitivité matériaux

TECHNOLOGIES

Self-contained vehicle

Connected infrastructure

Materials

Software

Modeling



La Région
Auvergne-Rhône-Alpes



HEALTH

1 200 companies | 80 000 jobs



APPLICATION FIELD

**Personalised
Medicine**

MAIN COMPANIES

SANOFI PASTEUR



3i nature



Alizé Pharma



TECHNOLOGIES

Clinical tests

Nanomedicine

Biotech

CLUSTERS

LYONBIOPOLE



RESEARCH & INNOVATION





La Région
Auvergne-Rhône-Alpes



SPORTS, MOUNTAIN AND TOURISM

800 companies | 50 000 jobs



APPLICATION FIELDS

Mountain
development

Outdoor sports

Thermalism

MAIN COMPANIES



TECHNOLOGIES

Materials

Digital

CLUSTERS



Industry & Innovation : Main Players of the RA*

* Region Auvergne Rhône Alpes

8 Major Research Infrastructures are located in Auvergne-Rhône-Alpes. The region boasts strengths in many fields of research such as health and biotechnologies, environment, chemistry and technical textiles, digital technology, engineering, nanotechnology, energy and physical science.

One of France's four national interdisciplinary Artificial Intelligence Institutes (3IA) is located in Grenoble. 13.6% of researchers in France work in the region's public and private laboratories.

One of the most important research centres in the region



*Atomic
Energy
Commission
in Grenoble*



Gross domestic expenditure on R&D stands at €7.0 billion in Auvergne-Rhône-Alpes, i.e. 14% of the national total and 2.6% of the regional GDP (2.2% in France).

The region is in second place nationally. 69.4% of Auvergne-Rhône-Alpes' internal expenditure on R&D is accounted for by businesses (i.e. 3.5 points above the national average). Private-sector R&D centres employ 41,200 researchers, engineers and support staff, i.e. 15% of the national total (2018). The region is behind 19% of protected inventions in France (2,542 patents in 2019).



66% of semi-conductor patent applications come from the region, and also 27% in the field of **chemistry**, 25% in **electrotechnology**, 24% in **optics**, 22% in **furniture/games** and 20% in **medical technologies** and in civil engineering too.



The four regional metropolises (Lyon, Grenoble, Clermont-Ferrand and Saint-Etienne) are ranked the top four in France for invention intensity (number of inventors per 1,000 managers in metropolitan functions).

At the heart of a dense business fabric, some thirty competitiveness centres and clusters innovate in the region's areas of excellence: **14 of the 56 competitiveness centres** (*pôles de compétitivité*) with national accreditation have a base in Auvergne-Rhône-Alpes, 8 of them having their head offices there



Electronics and Information Technology Laboratory in Grenoble

Created in 1967, it is one of the divisions of the “Commissariat à l'énergie atomique et aux énergies alternatives” (CEA - Atomic Energy and Alternative Energies Commission), employing 1,900 researchers, to which must be added 250 doctoral students (38% of whom are foreigners) and 55 post-doctoral students. In 2017, CEA-Leti will have a portfolio of more than 3,100 patents, 40% of which are licensed. Its clean rooms will cover an area of 10,000 m² in 2020.

CEA's Electronics and Information Technology Laboratory, or **CEA-Leti**, is one of the world's leading centers for applied research in **microelectronics** and **nanotechnology**.

CEA-Leti, a **technology research institute at CEA Tech**, pioneers micro and nanotechnologies, tailoring differentiating applicative solutions that ensure competitiveness in **a wide range of markets**. The institute tackles critical challenges such as healthcare, energy, transport and ICTs.

Its multidisciplinary teams deliver solid expertise for applications ranging from sensors to data processing and computing solutions, leveraging world-class pre-industrialization facilities.

CEA-Leti builds **long-term relationships with its industrial partners** - global companies, SMEs and startups – and actively supports the launch of technology startups. CEA-Leti is a member of the **Carnot Institutes network**

Minalogic is the world competitiveness cluster for digital technologies, combining **micro-nanoelectronics**, **optics-photonics** and **software**. The cluster covers the entire Auvergne-Rhône-Alpes region and is located in Grenoble and Saint-Etienne.

It was labelled in 2005. In 2012, it received the European Gold Label "*Cluster Organisation Management Excellence*" awarded by the European Cluster Excellence Initiative (ECEI).

The technologies developed as part of the cluster's collaborative R&D projects find applications in the ICT, health, energy, the factory of the future, building, mobility, sport & mountains, and all industries integrating electronics, looking for technological breakthroughs or innovations.

The **Minalogic cluster** supports its members in their innovation and growth projects, in order to strengthen their development and influence objectives at the global level.

As such, Minalogic coordinates and federates, in the Auvergne-Rhône-Alpes region, the skills of players specialising in the **development, production** and **integration** of products and services based on **digital technologies**.

This world-class ecosystem is based both on leadership in **research** and **innovation**, and on the driving role of large groups to benefit the growth of **start-ups** and **SMEs**.

In 2019, the cluster is made up of more than 400 members, including :

- 350 companies, 73% of which are SMEs & ETIs
- 10 research and training organisations
- 10 local authorities
- 23 economic development and other organizations
- 7 private investors
- 575 collaborative R&D projects labelled and financed
- 3 by the State and local authorities to the tune of €850 million, for a total budget of more than €2.1 billion.
- 72 collaborative R&D projects finalised, having generated 86 products marketed or in the process of being marketed

The EasyTech programme, *an example of cooperation between industry, education and research*



Easytech is a programme aimed at **SMEs** from all sectors of activity who wish to integrate **intelligence** into their products. This agile system makes it possible to support and **co-finance innovative projects** (50%) integrating **digital technologies** from the **region's research organisations**. *Advice meetings are organised on the 1st and 3rd Wednesday of each month for companies.*

Easytech is a programme of the IRT Nanoelec, supported by the Auvergne-Rhône-Alpes Region, the ANR and the local authorities of the Auvergne-Rhône-Alpes region and piloted by Minalogic.

In 2015, I was south-east director of Cap'Tronic



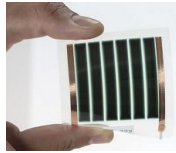
CAP'TRONIC supports the digital transformation of products and production processes thanks to connected electronic systems.



ESISAR - National Graduate School of Advanced Systems and Networks.

The school trains more than 500 engineering students per year, in the field of embedded systems, computer science and cybersecurity

Examples of EASYTECH support



Dracula Technologies has created LAYER®, a printed technology that generates energy from ambient light. LAYER® is the world's 1st shaped Organic Photovoltaic Cells.



EnerBee is a startup that develops a motion-based micro power generator that replaces batteries in connected consumer and industrial objects.



The Delta Drone group is a major player in the sector of civil UAVs for professional use.

IRTs are thematic and interdisciplinary technological research institutes set up by the French Government for industrial competitiveness.

Their mission is to generate innovations in economic sectors of the future through balanced public-private strategic partnerships

They operate research programmes by relying on the co-location of researchers and on state-of-the-art technological platforms.

The **eight French IRTs** have come together within the French Institutes of Technology (FIT) association



Nanoelec is one of the Technological Research (IRT) set up by the French government and financed by the PIA to federate academic and industrial R&D and innovation laboratories.

Nanoelec contributes to the competitiveness of the **microelectronics sector**, particularly in France. It is **based in Grenoble**, France, a world-leading centre for research, innovation and production in microelectronics.



COMPETITIVENESS CLUSTERS





REGIONAL LABELED CLUSTERS





AUVERGNE-RHÔNE-ALPES BUSINESS INFORMATION PLATFORM

<https://phareco.auvergnerhonealpes-entreprises.fr>

PHAR'ÉCO is a partnership platform of economic information on the Auvergne-Rhône-Alpes region administered by *Auvergne-Rhône-Alpes Entreprises* and driven by the Auvergne-Rhône-Alpes Regional Council. The aim of this territorial diagnostic tool is to provide strategic information useful for action, for businesses and territories in the region.

Phar'éco strives to **focus knowledge** on the **regional economy** and provide access to the wealth of work carried out in the region in the field of **socio-economic analysis**.

MARKET'PLACE is the market place platform of the Auvergne-Rhône-Alpes Region

APEC : employment
agency for professional
and managerial staff

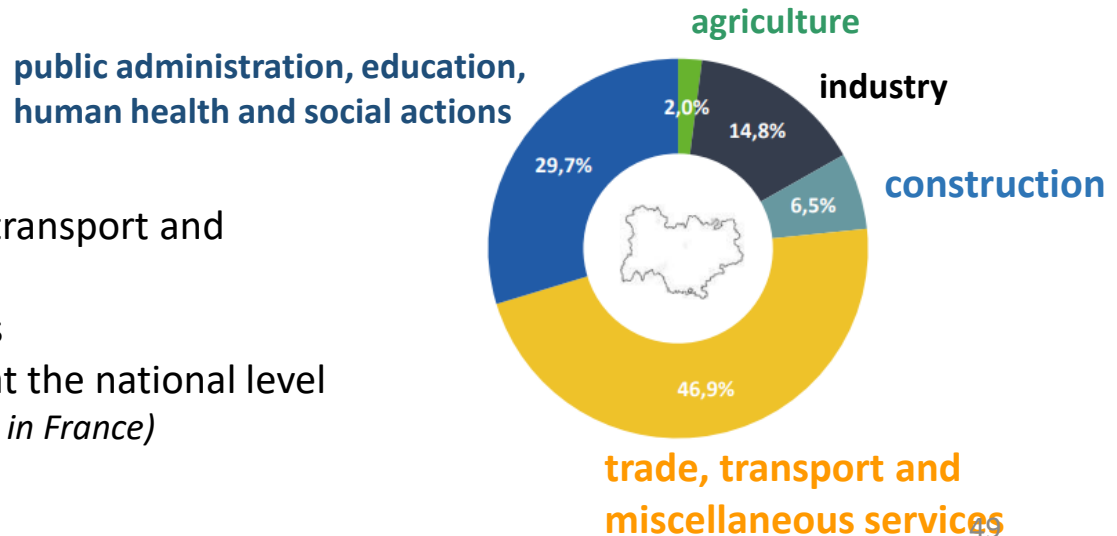


Employment 2021 : Recruitment intentions for executives are still limited, reflecting the difficulty for companies to anticipate in a health context fraught with uncertainty.

TOTAL EMPLOYMENT: AN INDUSTRY MORE DEVELOPED IN THE REGIONS THAN IN FRANCE

2nd economic region in France (11% of national GDP and 12% of the number of establishments and jobs) - **1st industrial region in number of jobs** (nearly 505,300) and industrial establishments with at least 1 employee (21,400), which represents 15% of the national level. 14.8%, the share of industry in total employment (12% in France) Its industrial fabric is one of the most diversified,

- Nearly 1 in 2 jobs (47%) in trade, transport and miscellaneous services
- 30% of jobs in the public" services
- A more developed industry than at the national level (14.8% in region compared with 11.7% in France)



Training - metalworking industries and trades

The Union des **industries et métiers de la métallurgie** (UIMM - *metalworking industries and trades*) is the French employers' federation grouping together the main French companies in the field of metallurgy. A member of the Medef, the UIMM is considered one of its most influential branches.

The first private network in the field of technical and industrial training, steered by the UIMM, the UIMM Training Poles network trains nearly 130,000 employees every year, 32,000 of whom are on work-study programmes. More than 15,000 companies already rely on the Training Centres to support their strategy and strengthen their industrial performance. There are 16 training centres in the auvergne rhone alpes region



IRI : Institute of Industrial Resources

Attached to UIMM LYON for more than 60 years, **IRI** is defined by its desire to train operational and competent staff, with profiles **in line with the constant changes in the industry**.

The centre, located in Lyon, comprises 30,000 m2 of industrial resources and equipment and is supported by 180 specialists (trainers, engineers, consultants, employees) dedicated to vocational training. It contributes its know-how to develop the skills of human resources in 11 areas of expertise.





The **French Fab** has deep ambitions for the French industrial fabric :

- Accelerate the transformation of industry in France through the diffusion of the concepts and technologies of the Industry of the Future.
- To network the energies of French industrial players.
- To give visibility and pride to the actors who make French industry on a daily basis, to French industrial excellence, both in France and abroad.
- To embody the prosperous future of French industry and the attractiveness of the professions that make it up, from training (initial, professional or continuing education) to employment.
- To provide information on the public support available for industrial activities in France.

The **French Tech** is an official label awarded by the French authorities to metropolitan centres recognised for their startup ecosystem, as well as a common brand that can be used by innovative French companies.

French Tech aims in particular to give a strong common visual identity to French startups, as well as to encourage exchange between them.



Alliance Industry of the Future

On 20 July 2015, the “**Alliance Industrie du Futur**” is officially created. Its role is to support French companies, particularly small and medium-sized businesses, in the **modernisation of their industrial tools** and the **transformation of their economic models** through new digital and non-digital technologies.

Its aim: **to integrate employees** with their know-how, skills and interpersonal skills as a major element in the success of this modernisation and transformation. The aim is to reposition French industry at the **centre of the country's economic development**, which involves improving the competitiveness of these companies.

The “**Vitrine Industrie du Futur**” (**Industry Showcase of the Future**) label, synonymous with the successful transformation of the industry, is awarded to companies that have concretely developed an innovative project for the organisation of their production, usually via digital technology, and by placing people at the heart of the transformation undertaken.

Three strategic axes to transform the industry :

- Transformation of SMEs, ETIs and sectors in the territories
- Development and integration of future technologies and their standardisation
- Developing tomorrow's skills

Man, placed at the heart of the industry of the future, constitutes an important key to success in the transition of companies towards the industry of the future.

" Osons l'industrie" (*Daring the Industry*) is a collaborative project coordinated by the Industry of the Future Alliance. The objective is to provide information on the **evolution of trades, qualifications and skills to young people** in a guidance situation and to employees in active employment or undergoing vocational retraining. The "Osons l'industrie" portal is also a source of content for those involved in initial and continuing training.



The **French Federation of Robotics Clusters** aims to support the development of regional robotics clusters in France. A robotics cluster is a legal entity whose mission is to **develop the robotics economic sector in line with the regional economic development strategy.**

Public cluster



Labelled by the Auvergne-Rhône-Alpes Region in 2015, the main objectives of the **Coboteam cluster** are to animate and help structure its robotics sector in partnership with all **the players in economic and technological development.**

The regional robotics sector is made up of nearly 500 players involved in robotics projects: manufacturers of robots and robotics solutions, integrators, manufacturers of components and sub-assemblies, expert users, teaching and research establishments and technical centres. This sector generates a cumulative turnover of more than **3 billion euros** and involves **nearly 19,000 people.**



Private cluster

The Regional Robotics Network, portal for Industrial Robotics. The **3R Network** is at the service of VSEs and SMEs specialised in **Industrial Robotics**, based on the principle that there is strength in numbers.

The vocation of this network is to **help its member-members**, and in particular service companies in industrial robotics, **to develop thanks to a pooling of skills** : each member of the network covers only part of the field of possible skills.



Industry 4.0 : State and Impact for the RA* society

(Cloud, Big data, IA, IoT & IIoT, Vision & Robotic)

* Region Auvergne Rhône Alpes

The concept of the industry 4.0 - industry of the future

The Factory of the Future is a generic concept that is part of a general awareness of the importance of the manufacturing industry in the national wealth. This reflection is intended to preserve and develop in France, and therefore in Europe, a strong, innovative, exporting, wealth-generating and job-creating industrial activity.

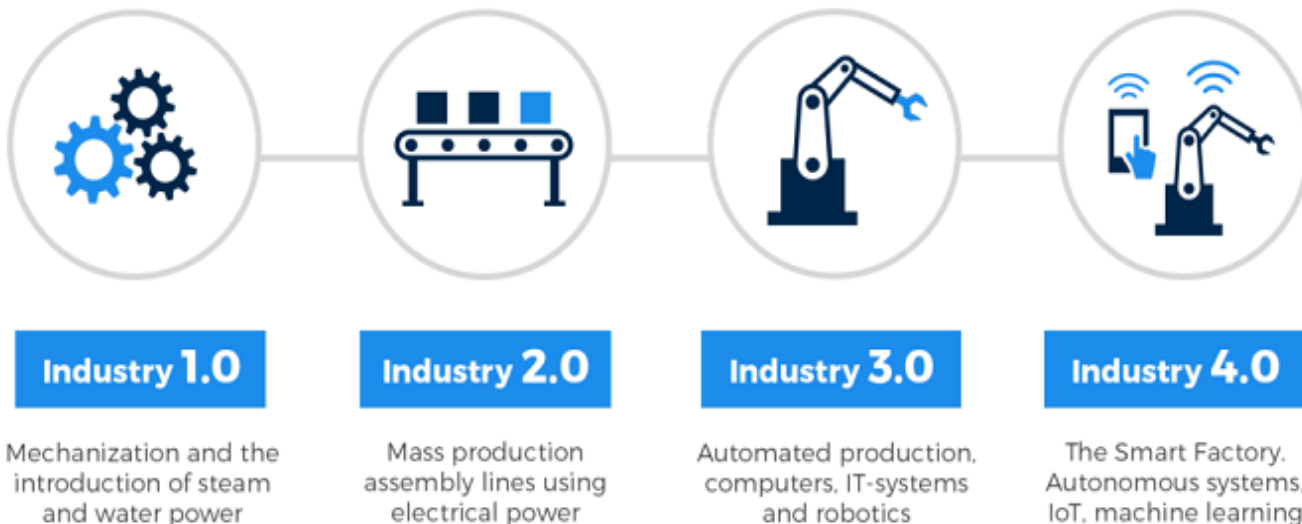
-  "Manufacturing renaissance"
-  Smart Everything Everywhere
-  Precision Manufacturing
-  Intelligent Manufacturing
-  "Innovation 25" program



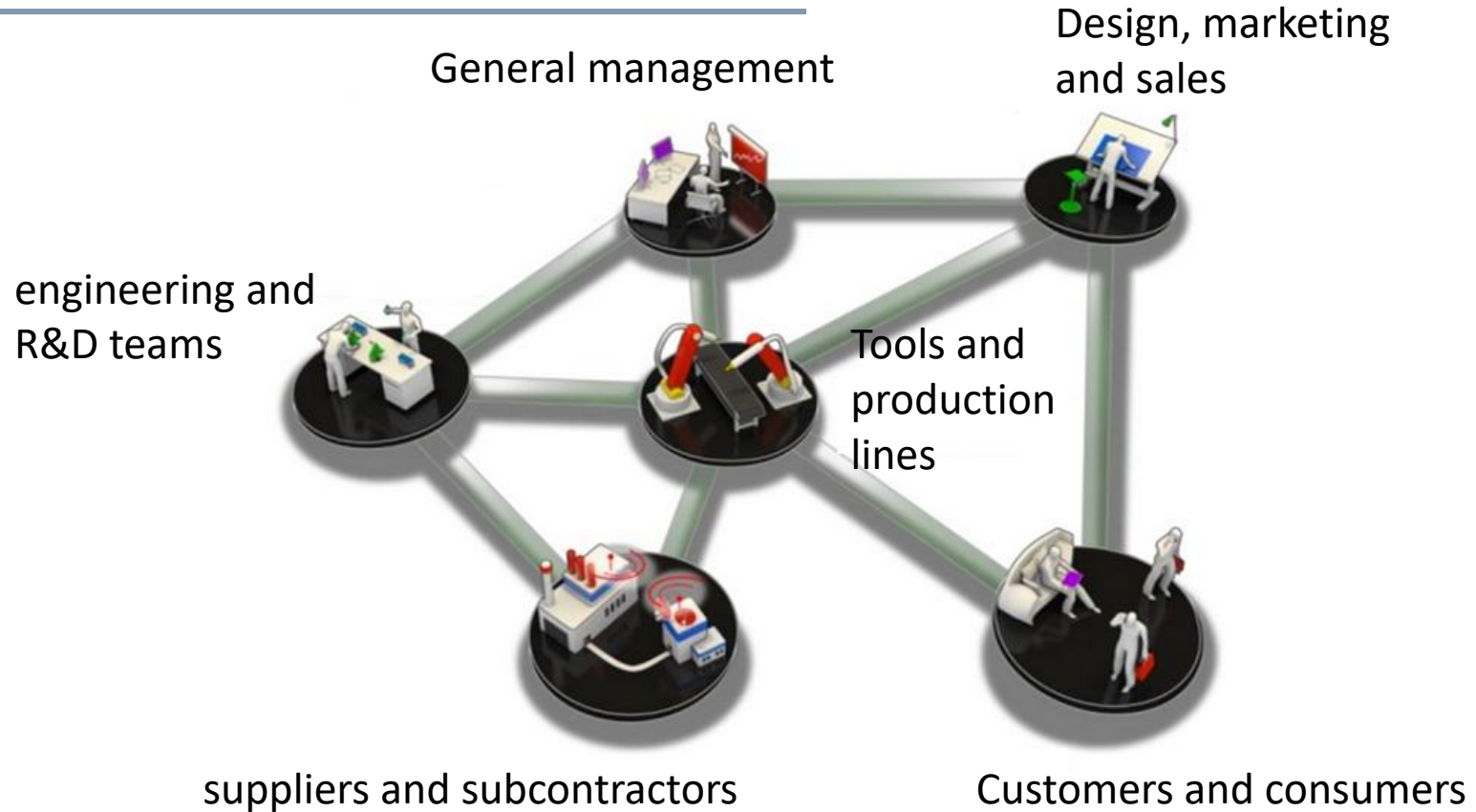
-  Industry of the Future
-  High Value Manufacturing
-  Smart Industry
-  Production 2030
-  Manufacturing 4.0
-  Produktion der Zukunft
-  Operational Programme
-  Fabbrica Intelligente

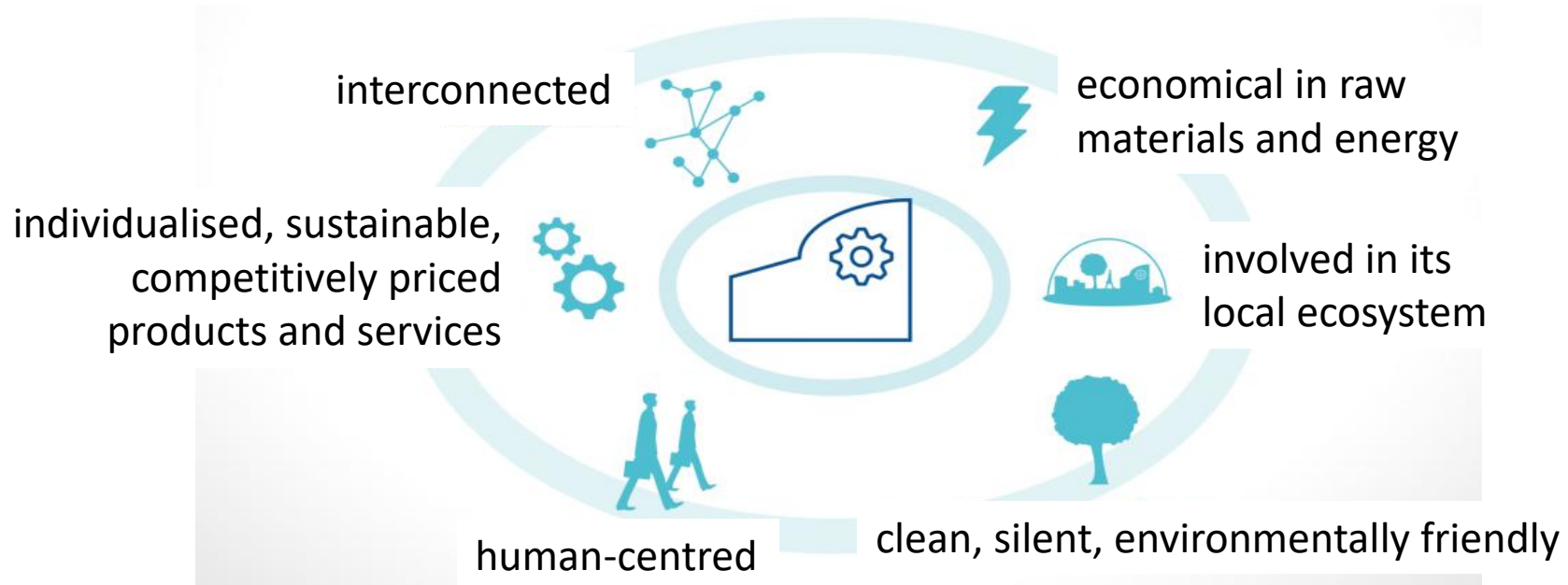


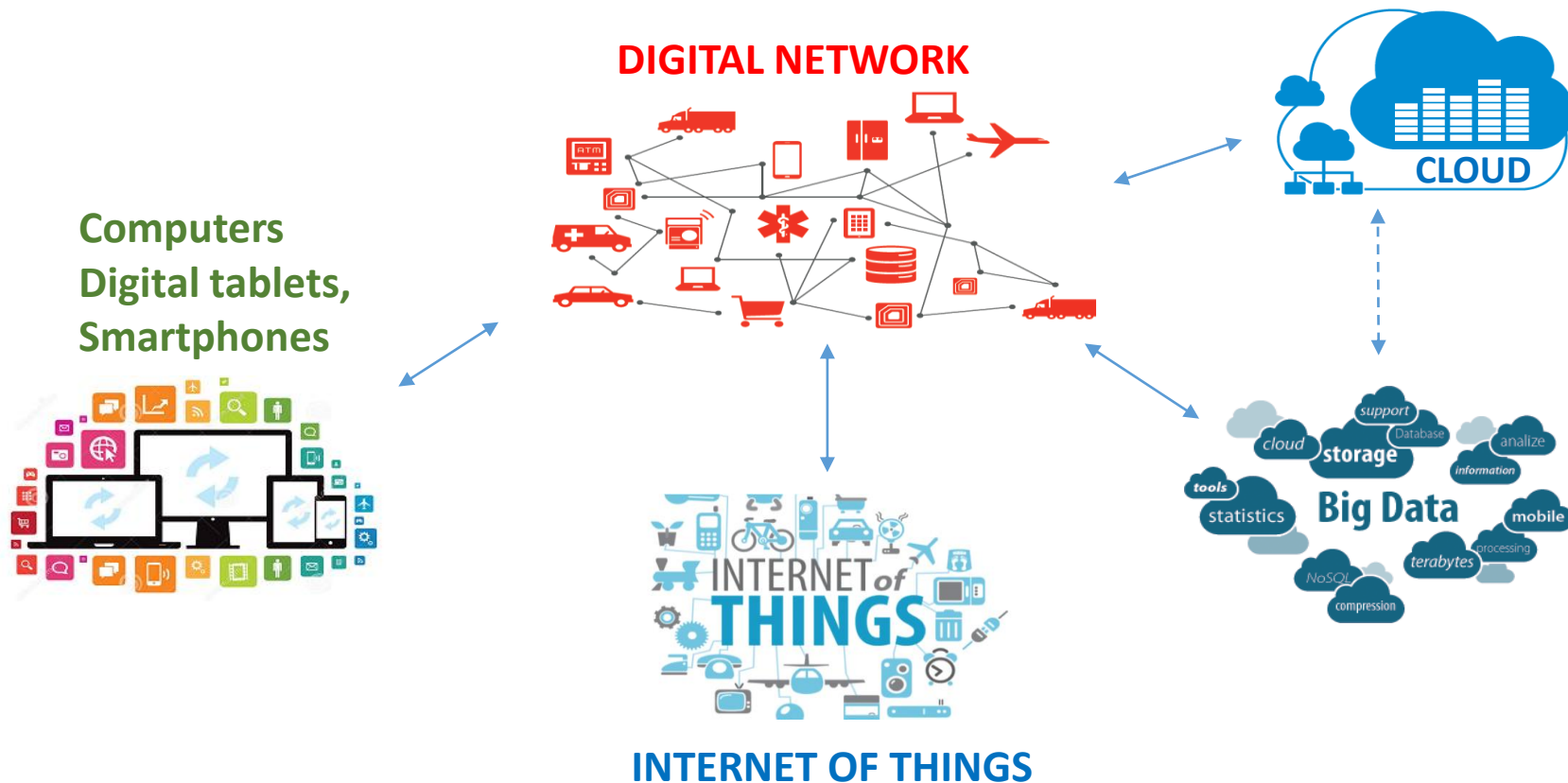
The Four Industrial Revolutions



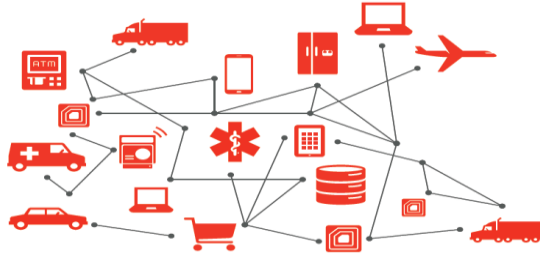
INDUSTRY OF THE FUTURE







DIGITAL NETWORK

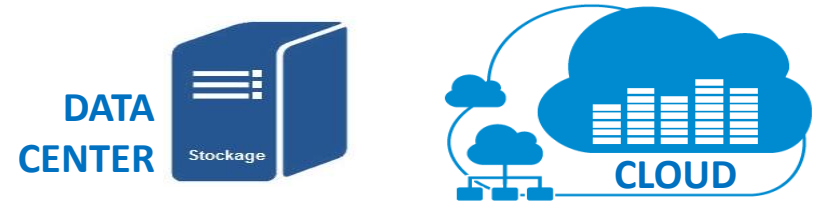


Internet : The network of networks
The information highways



Cloud computing means being able to use IT resources without owning them.

classic Model	Infrastructure (as a Service)	Platform (as a Service)	Software (as a Service)
Applications	Applications	Applications	Applications
Data	Data	Data	Data
Runtime	Runtime	Runtime	Runtime
Middleware	Middleware	Middleware	Middleware
O/S	O/S	O/S	O/S
Virtualization	Virtualization	Virtualization	Virtualization
Servers	Servers	Servers	Servers
Storage	Storage	Storage	Storage
Networking	Networking	Networking	Networking

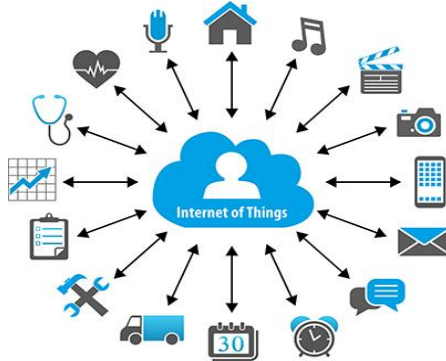


In the company

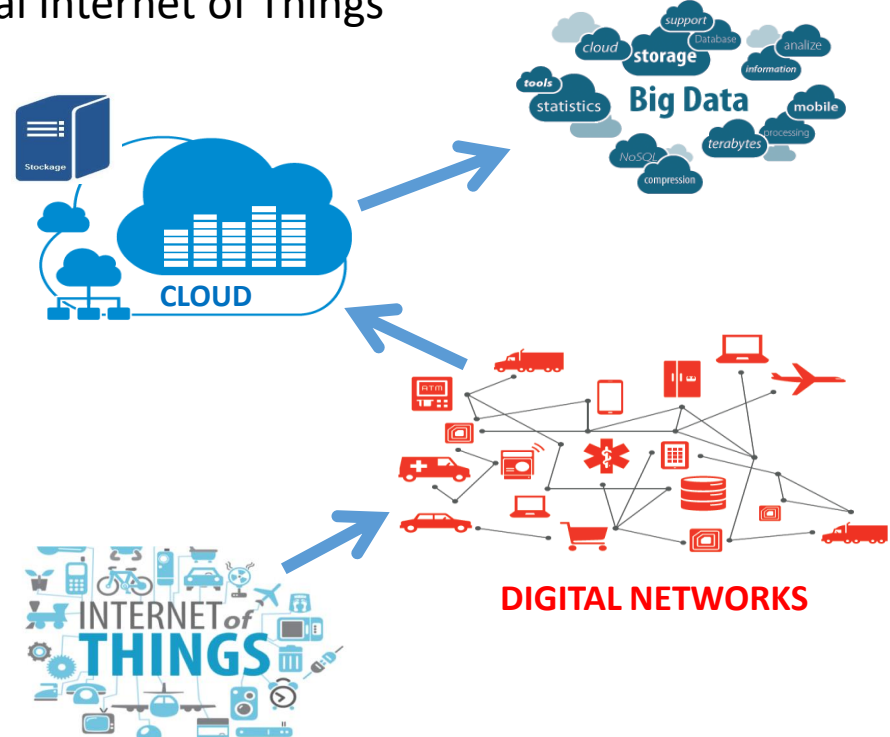
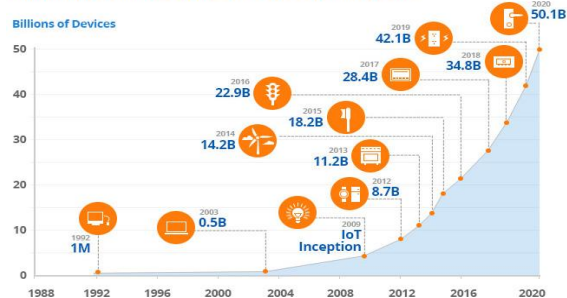
Externalized

IoT : Internet of Things

IIoT : Industrial Internet of Things



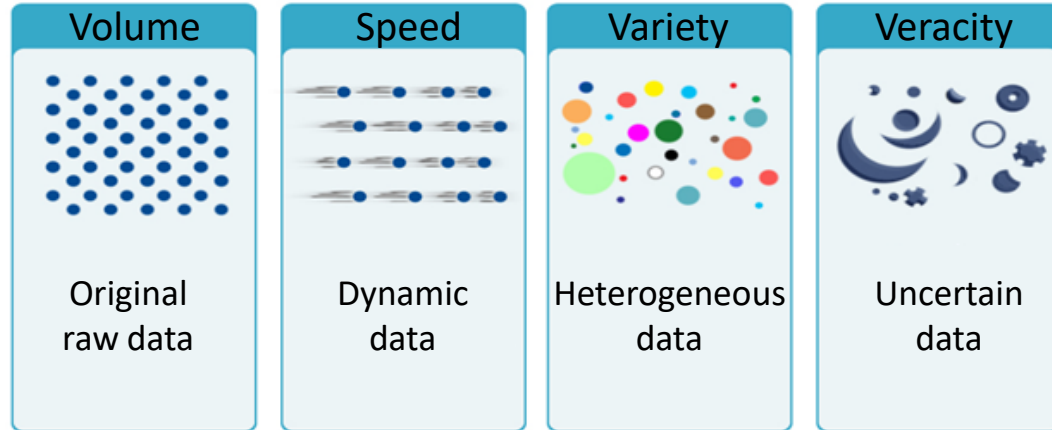
Growth in the internet of things
The number of connected devices will exceed 50 billion by 2020





Big data is accompanied by the development of analytical applications that process the data to make sense of it. These analyses are called Big Analytics. They deal with complex quantitative data using distributed calculation methods and statistics.

Dimensions of the big data

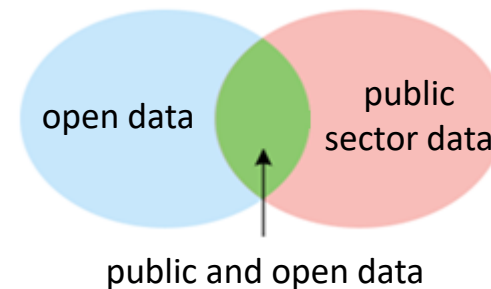


SMART ENERGY



Open data: digital data that can be freely accessed and used by users. It may be of public or private origin, disseminated in a structured manner according to a method and an open licence guaranteeing its free access and reuse by all, without technical, legal or financial restrictions.

Renovation project of « La Part Dieu » station in Lyon



Data open to start-ups to create digital applications and new services

1



physical



physical



physical

2



physical



physical



digital

3



physical



digital

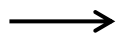


digital

4



digital



digital



digital

Traditional economy



Service economy



Economy of sharing



Economy
solidarity





Artificial
Intelligence



Robotics
Cobotics



Drones



Additive
manufacturing



virtual
reality



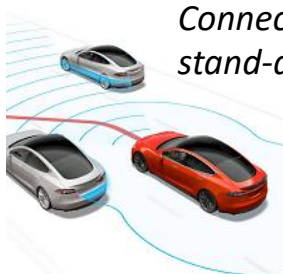
augmented
reality



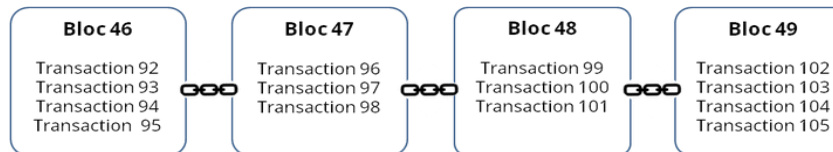
digital

...

The **blockchain** is a technology for storing and transmitting information, which is transparent, secure and operates without a central control body.



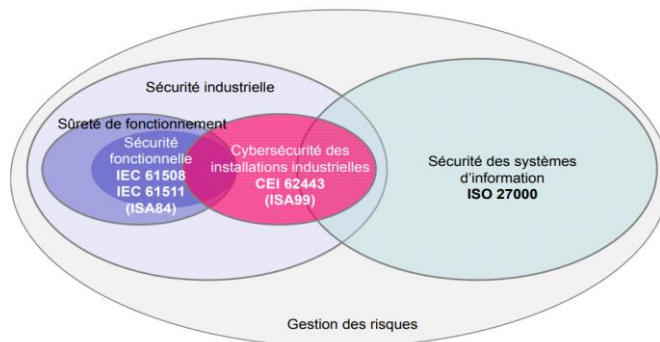
*Connected and
stand-alone objects*



The **decentralised** nature of the blockchain, coupled with its security and transparency, promises much wider applications than the monetary area.

Cybersecurity of industrial installations:

Subset of global security relating to the prevention of risks associated with intrusions into an automation or control system (IACS: Industrial Automation and Control System), linked to possible malicious actions on computer equipment, communication networks, software or data IEC 62443, ISA-99, ISO 27000



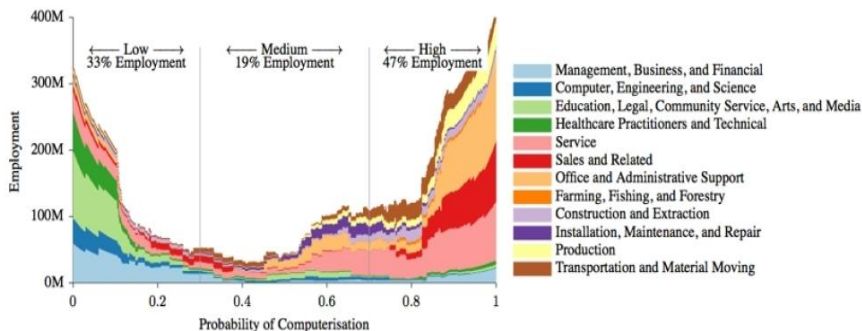
ANSSI

Agence nationale
de la sécurité
des systèmes d'information

new cybersecurity training courses

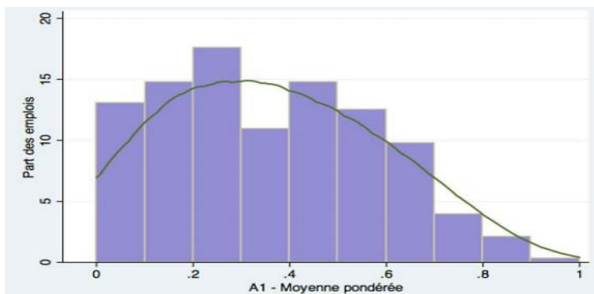


ANSSI : National Agency for the
Security of Information Systems



47% of jobs will be able to be entrusted to intelligent computers in 20 years' time.

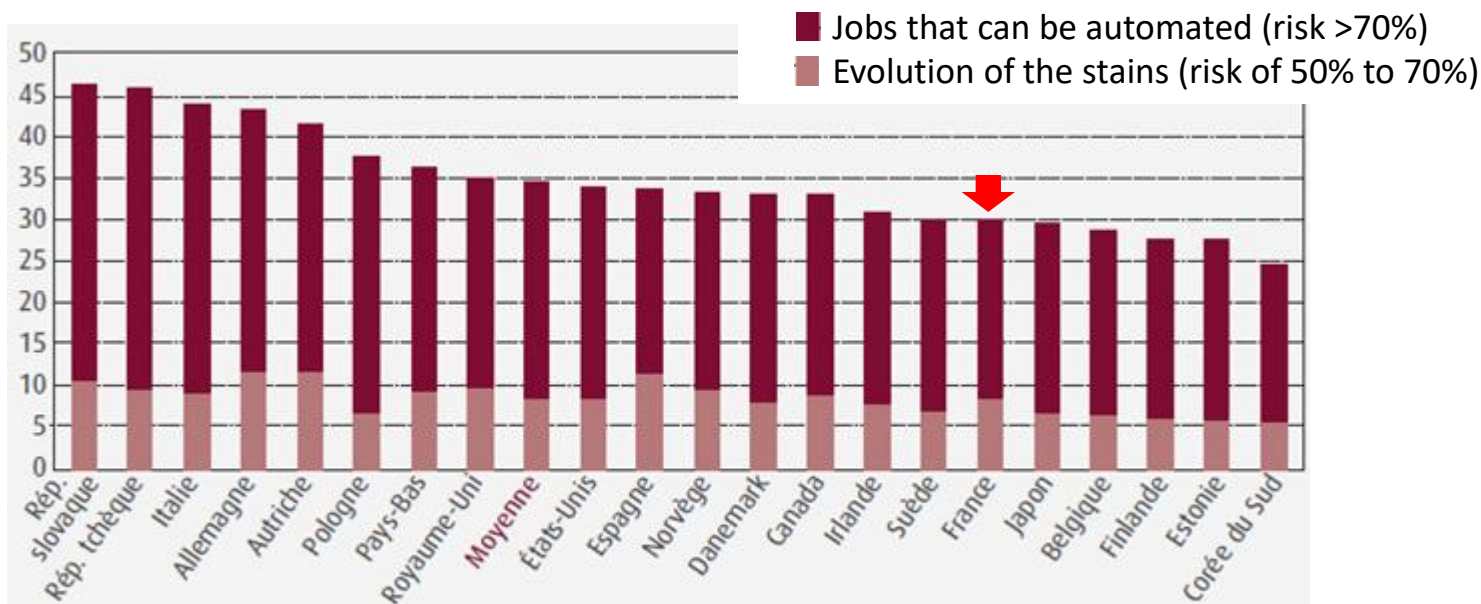
*2013 Oxford University
Frey et Osborne*



Only a small proportion of jobs have a high automation index : in other words, **less than 10%** of jobs significantly combine characteristics that make them **vulnerable** in the light of current technological advances. These are referred to here as "**exposed**" jobs.

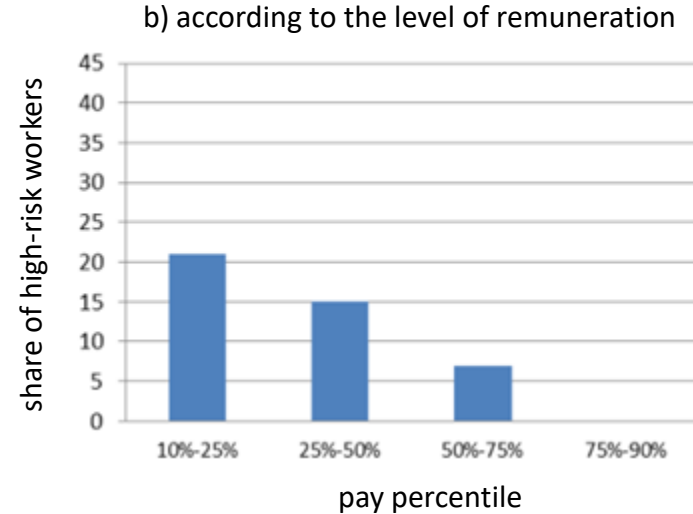
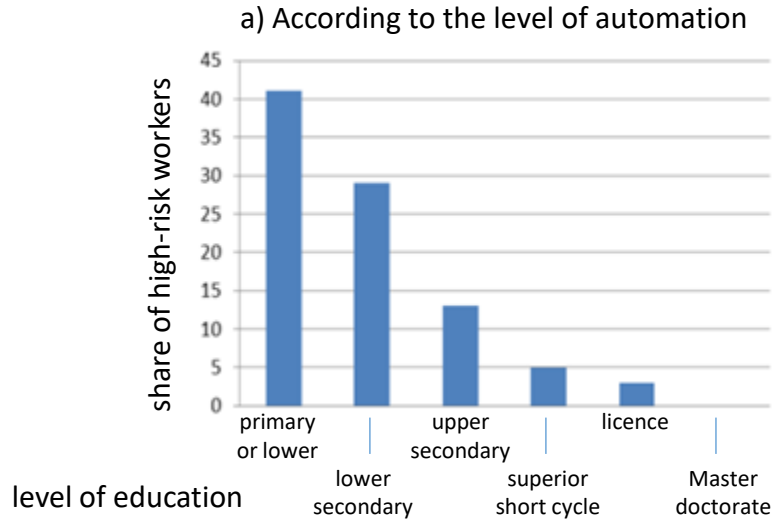
However, a much larger share of jobs are potentially concerned with automation: almost **50% of jobs** could see their **content evolve with the development of digitisation and automation technologies**. These will be referred to here as "**jobs whose content is likely to change**".

Share (%) of workers in jobs with a high risk of automation in several OECD countries



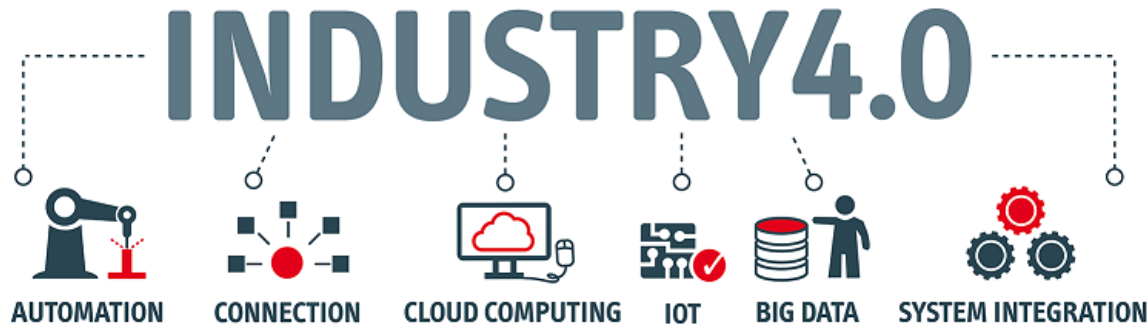
Source : ARNTZ Mélanie, GREGORY Terry et ZIERAHN Ulrich, « The Risk of Automation for Jobs in OECD Countries: A Comparative Analysis », *OECD Social, Employment and Migration Working Papers*, n° 189, 2016.

The proportion of French workers at risk of automation



While more than 40% of workers with the lowest level of education occupy a job with a high risk of automation, less than 5% of workers with higher education are in the same case.

Industrial technologies 4.0



Cloud, Big data, IA, IoT & IIoT, Vision & robotics



Virtual Reality (VR) is a computer technology that simulates the physical presence of a user in an artificially software-generated environment, an environment with which the user can interact.

Virtual reality therefore artificially reproduces a sensory experience, which may include sight, touch, hearing and smell (visual, auditory or auditory).

The purpose of virtual reality is to allow a person (or several) to live an immersion experience, i.e. to carry out a sensory-motor and cognitive activity in a digitally created world, which may be "imaginary, symbolic or a simulation of certain aspects of the real world".

Augmented reality (AR) refers to computer systems that make it possible to superimpose a 2D or 3D virtual model on our natural perception of reality in real time.

It designates the various methods that make it possible to realistically inlay virtual objects in a sequence of images. It applies as much to visual perception (superimposition of virtual images on real images) as to proprioceptive perceptions such as tactile or auditory perceptions.

These applications are multiple and increasingly touch more and more fields, such as video games, education through games, virtual treasure hunts, cinema and television (post-production, virtual studios, sports broadcasts...), industries (conception, design, maintenance, assembly, piloting, robotics and telerobotics, implantation, impact study...etc.) or the medical field.

3 examples of support in the Industry of the Future programme of the Auvergne Rhône Alpes Region

1



RV in industry
For staff training
Nuclear power plants

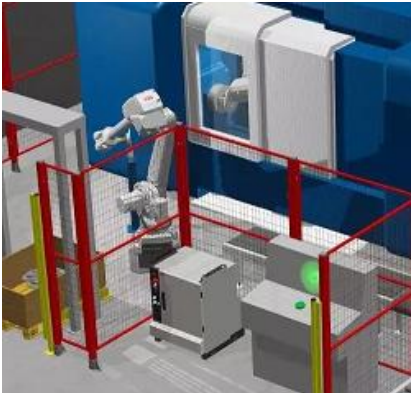


3D scanner



2

Augmented reality for
robotics application



simulation for aircraft
production machine

3





Additive manufacturing, better known as 3D printing, is a manufacturing process that transforms a 3D model into a physical object by assembling successive layers of the same material.

It contrasts, in this sense, with traditional manufacturing techniques, such as machining, which is a subtraction technique involving the removal of material to create a finished element.

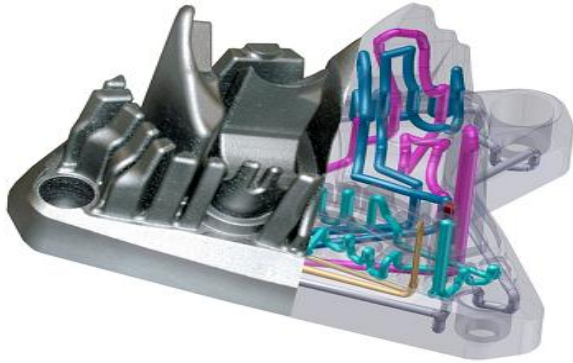
Additive manufacturing is economically suitable for the production of very small components in large quantities or for the contract production of parts with high geometrical complexity.

Industrial technologies 4.0

Startup “**Silex 3D Print**”, located in the Rhône Alpes region, specialises in the production of industrial prototypes and functional parts in series. From 1 to +1000 Parts



Industrial example : Mould for plastic injection



Base material : Liquid, Powder, Ribbon, Fil

Technologies : Laser, Electron beam, Visible light, UV and IR rays, Heat source



Industrial robotics - *Why robotize ?*

Human factors/improvement of working and safety conditions

- ✓ Improving working conditions
- ✓ Fighting MSDs
- ✓ Improving safety
- ✓ Valuing operators
- ✓ Directing staff towards tasks with higher added value

Environmental factors

- ✓ Reducing the company's energy bill, saving on raw materials and environmentally harmful waste.
Example: control of paint and spraying rejects

Induced benefits

- ✓ Structural aspects of robotisation
- ✓ Enhancing the value of the company

Economic factors/Productivity competitiveness

- ✓ Increasing competitiveness
- ✓ Reduce production costs
- ✓ Relocating productions
- ✓ Making production management more flexible
- ✓ Increase production volume
- ✓ Increase the rate of machine engagement
- ✓ Decrease current stocks
- ✓ Improving quality
- ✓ Reducing waste



A very large number of support services provided by the region to SMEs and industrial companies in all fields of application

Arc welding, Machine handling and service,
Packaging/conditioning, Assembly
Painting/Spraying, Cutting and finishing, Machining



Stäubli Robotics, based in Faverges in Haute-Savoie, **1200 employees**, is the only French manufacturer of 4- and 6-axis industrial robots for small, medium and heavy loads. With its range of more than 80 robot models for different markets and its international presence, STÄUBLI supports all its customers in their projects by offering various services (test-feasibility, training, maintenance, assistance, ...).



Industrial technologies 4.0

Collaborative robotics (or **Cobotics**) is an emerging branch of technology that aims to produce robots that assist humans by automating some of their tasks. This field is at the interface between cognition and the human *factor* (*behaviour, decision, robustness and error control*), biomechanics (*modelling of behaviour and movement dynamics*) and robotics.



Machine loading and unloading application



MeanWHOLE

Autonomous mobile robot

COBOTTEAM.fr
Cluster | Auvergne-Rhône-Alpes | Robotique | Cobotique

Mobile robots have the capability to move around in their environment. Mobile robots can be "autonomous" (AMR - **autonomous mobile robot**) which means they are capable of navigating an uncontrolled environment without the need for physical or electro-mechanical guidance devices. Alternatively, mobile robots can rely on guidance devices that allow them to travel a pre-defined navigation route in relatively controlled space (AGV - **autonomous guided vehicle**).

Exoskeleton robot

An exoskeleton or external skeleton, as opposed to an endoskeleton, is an external anatomical feature that supports and protects an animal. Technical-scientific research is currently developing biomechanical or motorised exoskeletons for military, but also medical or industrial needs.



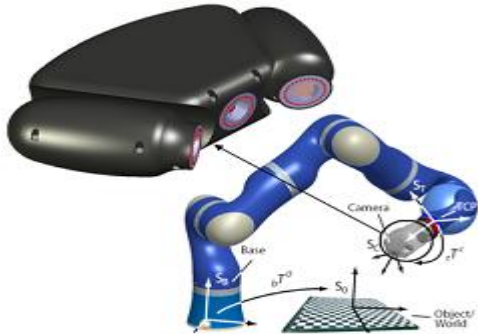
SOFTWARE TREATMENTS



Artificial intelligence is a scientific discipline that seeks methods for solving problems with high logical or algorithmic complexity. By extension, it designates, in everyday language, devices that imitate or replace humans in some of their cognitive functions.

Artificial vision is a branch of artificial intelligence whose main goal is to enable a machine to analyse, process and understand one or more images taken by an acquisition system.

Voice recognition is a computer technique that allows the human voice picked up by a microphone to be analysed and transcribed into a text that can be used by a machine..



Industrial technologies 4.0

More than 175 companies, 80 of which are start-ups, use Artificial Intelligence solutions in Auvergne-Rhône-Alpes

Very high concentration of establishments in the Lyon and Grenoble conurbations (75% of regional establishments)

- ✓ Lyon: mainly focused on algorithmic and machine learning technologies; health application area.
- ✓ Grenoble: very strong specialisation in equipment and infrastructures optimised for AI, many large groups established in the area.

24 robotics companies were identified in this census, with deployments and uses of artificial intelligence technologies.

754 researchers identified in the Auvergne-Rhône-Alpes region in the core field of AI and related Human and Social Sciences. 14% of the national workforce.

Renowned research teams in the fields of :

- Applied mathematics, calculation and simulation
- Algorithms, programming, software and architecture
- Networks, systems and services, distributed computing
- Perception, Cognition, Interaction (including robotics)
- Digital Health, Biology and Planet



Industrial technologies 4.0



Université Grenoble Alpes



Polytech Grenoble



Grenoble INP

Phelma, Ensimag, Ense3



Université de Lyon



EM Lyon



ENS Lyon, Master Humanités numériques



Ecole des Mines de Saint-Etienne

Une école de l'IMT



Université Jean-Monnet Saint-Etienne

21 specific or technical courses related to AI in the Auvergne-Rhône-Alpes region, i.e. 15% of the national training courses listed



The University of Grenoble has been pre-selected by the State to host an interdisciplinary institute in artificial intelligence

The **MIAI Grenoble Alpes** (Multidisciplinary Institute in Artificial Intelligence) aims to conduct research at the highest level in artificial intelligence, to offer attractive courses for students and professionals at all levels, to support innovation in large companies, SMEs and start-ups and finally to inform and interact with citizens on all aspects of AI.

Industrial technologies 4.0

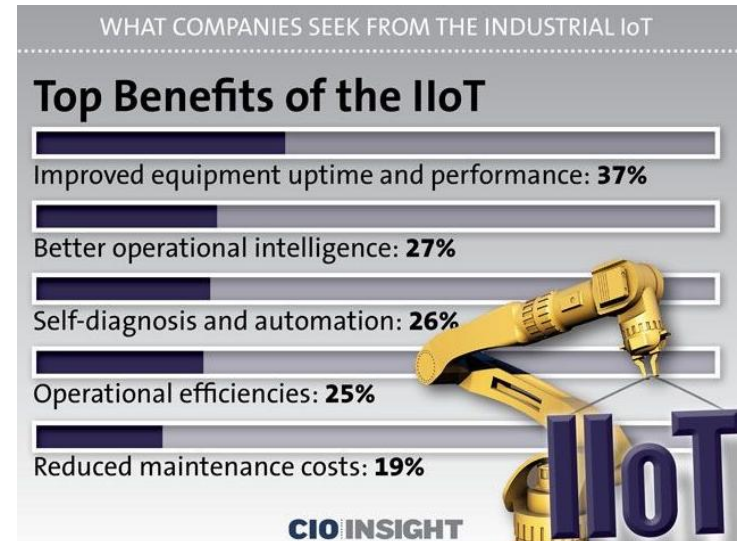
The **Industrial Internet of Things** is the application of Internet and Internet of Things technologies to the industrial domain to interconnect sensors, intelligent industrial equipment and computer systems within geodistributed architectures.

The aim of the industrial Internet of Things is, through digital transformation, to develop highly automated production and business processes.

A disruptive approach to maintenance

The exploding phenomenon of the Internet of Things provides many opportunities to Manufacturing industries to manage the maintenance of machines in a new Prescriptive way

Physical objects, mainly machines, are now organised in networks and embody increasingly sophisticated detection (sensors) and communication technologies.





RA* entreprise office : A commitment to professional development

* Region Auvergne Rhône Alpes



Auvergne
Rhône-Alpes
Entreprises

An agency to support the development of regional businesses

The ***Auvergne-Rhône-Alpes Entreprises Regional Economic Agency*** was born out of the Region's desire to bring together the economic structures throughout its territory to support businesses. **Financed mainly by the Region**, Auvergne-Rhône-Alpes Entreprises is a non-profit association, present in all the territories thanks to 11 local branches and **130 employees**.

The missions of *Auvergne-Rhône-Alpes Entreprises*

The Regional Economic Agency provides guidance and support for **industrial companies** and services to industry at all stages of their development : investment, training and employment, innovation, export, access to finance and European projects... *Auvergne-Rhône-Alpes Entreprises* also aims to promote the region internationally and to make the most of its many assets to attract new companies to its territory



economic
development



Employment
Training



Europe
International



Innovation



Strengthen your business
and finance its
development



Setting up a business
and attract talent

The economic agency at the service of your growth

For Industrial Enterprises and Enterprises
providing services to industry



Innovating and
differentiate



Recruiting and training
its teams



Developing
in Europe
and internationally



La Région
Auvergne-Rhône-Alpes

**Auvergne
Rhône-Alpes**
Entreprises

*more than 8000
companies supported
per year*



Enlightenment on the economy of auvergne rhone alpes

<https://phareco.auvergnerhonealpes-entreprises.fr/>

Phar'éco is a partnership platform of economic information on the Auvergne-Rhône-Alpes region administered by Auvergne-Rhône-Alpes Entreprises and driven by the Auvergne-Rhône-Alpes Regional Council. The aim of this territorial diagnostic tool is to provide strategic information useful for action, for businesses and territories in the region.

A veritable knowledge base on the economy of the Auvergne-Rhône-Alpes region and its departments, it offers news, elements of the economic and demographic situation, and economic analyses relating to the economic fabric (establishments, jobs, foreign trade...), the state of the markets (labour, production), investments... and the specific features of the region's sectors, particularly industry.

Hubfi is a free information portal on financing solutions in the Rhône Alpes region. It also acts as a platform for putting companies of all sizes in touch with investors.

Hubfi offers simplified access to the different financing needs of a company : Creation, Takeover/Transfer, Cash Flow Investment, Equity, Innovation, International, Social and Solidarity-based Economy, Company in difficulty, External growth. Nine themes covering all the financing needs of companies



*collaborative portal funded by the
Auvergne-Rhône-Alpes Region and
the French State*

<https://hub-recherche.fr/>

**Welcome to the “research hub”,
free portal to connect researchers and companies**

“Hub Recherche” is a collaborative portal funded by the Auvergne-Rhône-Alpes Region and the French State. It facilitates relations between companies and the world of research. Hub Recherche takes the form of a regional collaborative web platform with a national vocation, organised into 4 complementary functional areas:

- **A public portal** : studies, maps, collaborative blogs, including the publication of challenges by companies to laboratories
- **A database** : scientific skills/technological equipment
- **A private collaborative portal** : support for the animation of thematic communities and B2B exchanges between members in complete confidentiality
- **A My Hub account** that allows members to have a personalised monitoring service according to their areas of interest :automatic feedback of collaboration opportunities, research structures, researcher or company profiles, etc.

Inform: to give companies the opportunity to know the areas of expertise of the laboratories, and thus give laboratories the opportunity to make their skills, equipment, patents and licences available known.

Dialogue: to give companies the opportunity to communicate their needs in terms of innovation and technology, and to be able to get in touch with other companies or laboratories via blogs or within communities. Bringing together and putting companies and laboratories in contact, either directly through the addresses of the contacts made available, or through the intermediation networks whose mission is to help bring companies and laboratories closer together. This tool is initially set up in the Auvergne-Rhône-Alpes region.

Today, **more than 500 structures** (*public research laboratories and their associated teams, technological platforms and industrial technical centres*) are listed in the directory of research centres.

“Hub Recherche” also gives companies and researchers the opportunity to join **collaborative thematic communities** to find solutions to innovation issues, to reflect on future research challenges and to bring out the collaborative projects of tomorrow.

Industry 4.0

6 communities are already led by experts:

- Innovation through uses
- Additive manufacturing
- Bio-sourced materials and buildings
- Instrumentation for the factory of the future
- Cobotics
- Digital and Big Data



<https://www.edig.nu/>

<https://www.smartafabriker.se/>

Technological bricks project

exchange trip to sweden

Chalmers Göteborg Universitet

EDIG - Smarta Fabriker

ASSAR : Industrial Innovation Arena



The Industry 4.0 Regional RA* programme

* Region Auvergne Rhône Alpes

program for industry 4.0



AMBITION Industry 4.0

BE ACCOMPANIED IN MY
"INDUSTRY OF THE FUTURE" PROJECT



INVESTMENT Solution



Research &
Innovation

Evaluate

Transform

Invest

Exchanging, Discovering, Enhancing

TO BE SUPPORTED IN "INDUSTRY OF THE FUTURE" PROJECT

1. Evaluate

2. Designing

3. Produce

4. Driving

5. Mobilising

Rated factory Transformation EVALUATION

Issue : new business models to respond to new issues and uses.
Definition of a 4.0 maturity and an action plan for the digitalisation of the company

Innovative factory Transformation TECHNOLOGICAL

Issue : design of complex products

Agile and automated factory Transformation TECHNOLOGICAL & ORGANISATION

Issue : modernisation of the industry, efficient production and customisation

Digital and connected factory Transformation DIGITAL

Issue : guarantee traceability, create value from data and control risks.

Open factory Transformation MANAGERIAL & PARTNERSHIP

Issue : Collaborative value creation

To be accompanied to integrate solutions or approaches related to the industry of the future. More specifically, help to finance the costs of consultancy services in the following areas

TO BE SUPPORTED IN "INDUSTRY OF THE FUTURE" PROJECT



1. Evaluate

- Eval' Stratégie
- Eval' Digital

2. Designing

- Advanced simulation tools (digital twins)
- Additive manufacturing

3. Produce

- Robotics and Automation
- Operational Excellence
- Creation, Extension, Optimisation of industrial sites
- Flow simulation
- Improvement of processes and control of resource consumption
- Virtual reality, augmented reality, assistance to operators
- Advanced processes (machining, etc.)

4. Driving

- Data Production, Preventive and Predictive Maintenance
- Data storage, cloud
- Internal data management (ERP, PLM, MES,...)
- Intelligent system: IIOT, BIG Data, Data Structuring
- Data traceability, Blockchain
- Data security, cybersecurity
- Mapping its information system and data

5. Mobilising

- Human Capital: Secure project management by taking into account the human capital factor
- Subcontractors: Extended enterprise - supply chain optimisation

ARACT is an association managed by the regional social partners and is a member of the Anact-Aract network. **Aract Auvergne-Rhône-Alpes** (*Regional Association for the Improvement of Working Conditions*) helps SMEs to improve working conditions through participatory approaches.

Improving working conditions, reconciling the quality of life at work and performance, taking better account of women and men at work... These are objectives in themselves! They are also levers for...

- to build employee loyalty,
- develop their commitment, fight against absenteeism,
- facilitate modernisation projects,
- boosting internal innovation capacity,
- and gain in overall performance!

3 offers to take into account the human dimension in **industry 4.0** :

- Human Factor Diagnosis
- Lifting reticence
- Change management

Mission

ENE's mission is to improve the competitiveness and foster innovation of SMEs and VSEs in Auvergne-Rhône-Alpes by developing the use of digital technology. The Region has launched an ambitious € 36 million (\$ 43 million) plan to accelerate and massify the digital transformation of VSEs and SMEs. The aim is to support more than 40,000 companies per year by 2021, from raising their awareness of digital issues to the concrete implementation of their digital project.

Industry 4.0

- **A diagnosis of the company's digital uses.** 7 to 14 hours of individual coaching. 7 to 14 hours of group training. *Cost covered at 100% thanks to the support of the Auvergne-Rhône-Alpes Region and the European Union*
- **Neutral support for digital projects**, combining advice and training on all digital topics : 4 to 8 half-days of advice by digital experts. Up to 10 days of training on all digital topics. *70% of the cost of the programme is subsidised by the Auvergne-Rhône-Alpes Region.*
- **5 to 20 days of advice by digital experts.** 50% of the costs are covered in the form of a grant. For SMEs with 5 to 5000 employees, industrial companies or with a production activity. *Aid capped at € 16,000 (19,000 \$)*



Technical centre for mechanical industries – industry 4.0

151 M€ in turnover (182 M\$) - 1100 employees

13 centres with 700 employees, including 400 engineers

18 patents filed in 2016 and 96 patents filed since 2012

The **Centre technique des industries mécaniques** was created in 1965, at the request of the mechanical engineering industry in order to provide companies with the means and skills to increase their competitiveness, participate in standardisation, act as a link between scientific research and industry, promote the progress of techniques, help improve performance and guarantee quality.

Cetim proposes a global and personalized offer of services to companies and an accompaniment from the functional reflection for SMEs as well as large groups:

- Engineering and design assistance
- Testing and simulation
- Advice, expertise, training



Technical centre for mechanical industries – industry 4.0

3 major locations in the Auvergne Rhone Alpes region



A cluster of laboratories working in the field of machining, **Intercut Network** is intended to federate the laboratories of the Rhône-Alpes region working in the field of machining and to set up regional projects that will bring innovation to SMEs.



The CETIM's **Mechatronics Resource Centre** has been based in Annecy since 2007. CETIM implements numerous applied research projects in the field of "Mechatronics of mechanical equipment". The CETIM has a continuous training offer in mechatronics



Technocentre project



EIMC programme

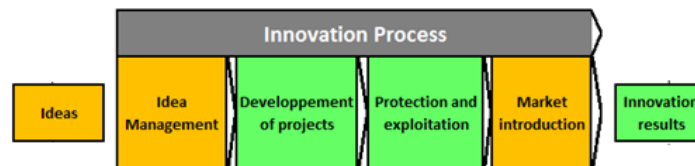
To identify the strengths and weaknesses of the company's innovation process, in accordance with CEN/TS 16555-1 standard



Business Support on Your Doorstep



Check'Innov Entreprise



Enhancing the innovation management capacity of SMEs within the Enterprise Europe Network Auvergne-Rhône-Alpes (EURORAA)

Cost covered at 100% thanks to the support of the Auvergne-Rhône-Alpes Region and the European Union



Co-funded by the
Erasmus+ Programme
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FROM AUTOMATION AND CONTROL TRAINING TO THE OVERALL ROLL-OUT OF INDUSTRY 4.0 ACROSS SOUTHEAST ASIAN NATIONS (ASEAN FACTORI 4.0)

