

GENERAL OVERVIEW

The industry digitizing is underway



80% of the production lines will be **digitized** in 2020.



In 2020, the whole of humanity will store **44 zettabytes** (44,000 billion gigabytes) of data.



Tomorrow, all **data** will be **distributed on clouds**. Users will access their data **from anywhere**.



Advances in **sensors** and digital processing capabilities make **vehicles increasingly autonomous and intelligent**.



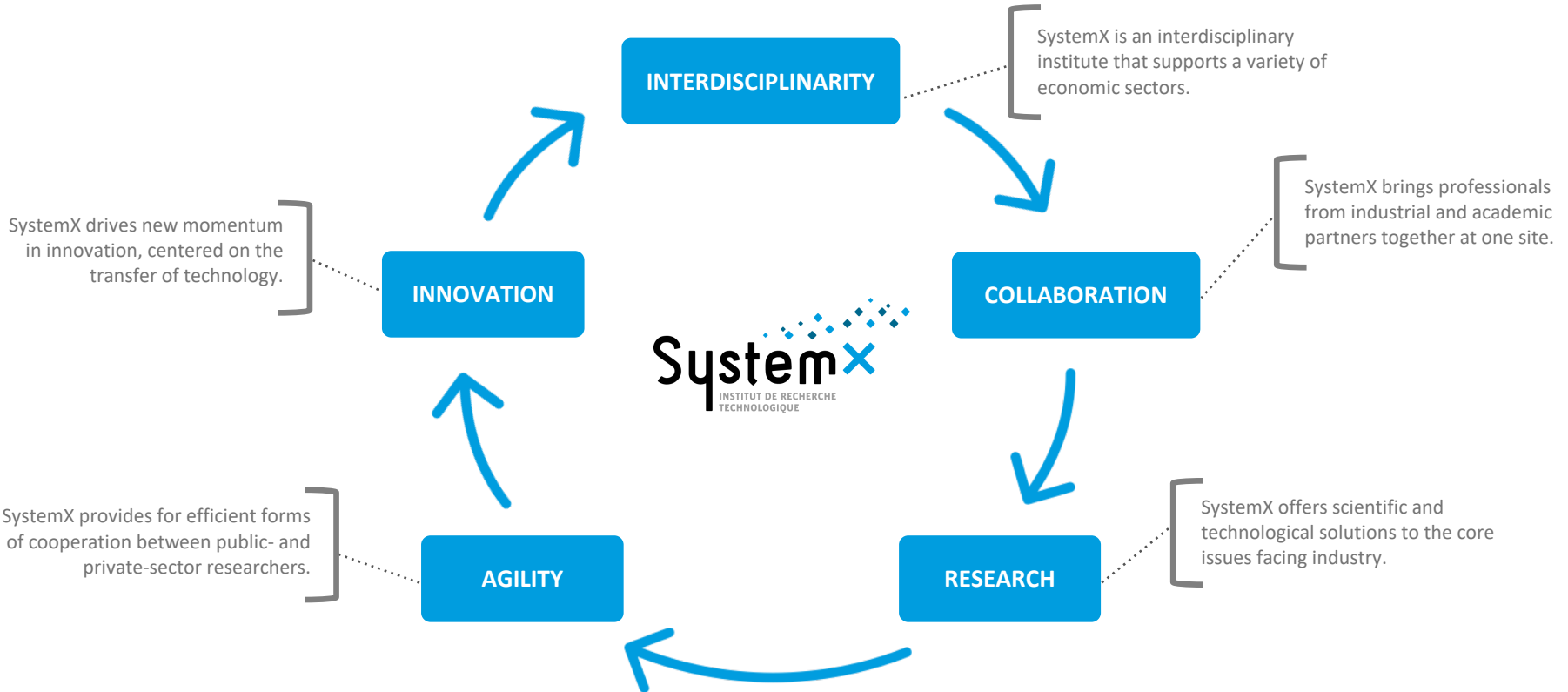
In the field of energy distribution, we will have to collect, store and **analyze 25 petabytes of heterogeneous data** until 2020.



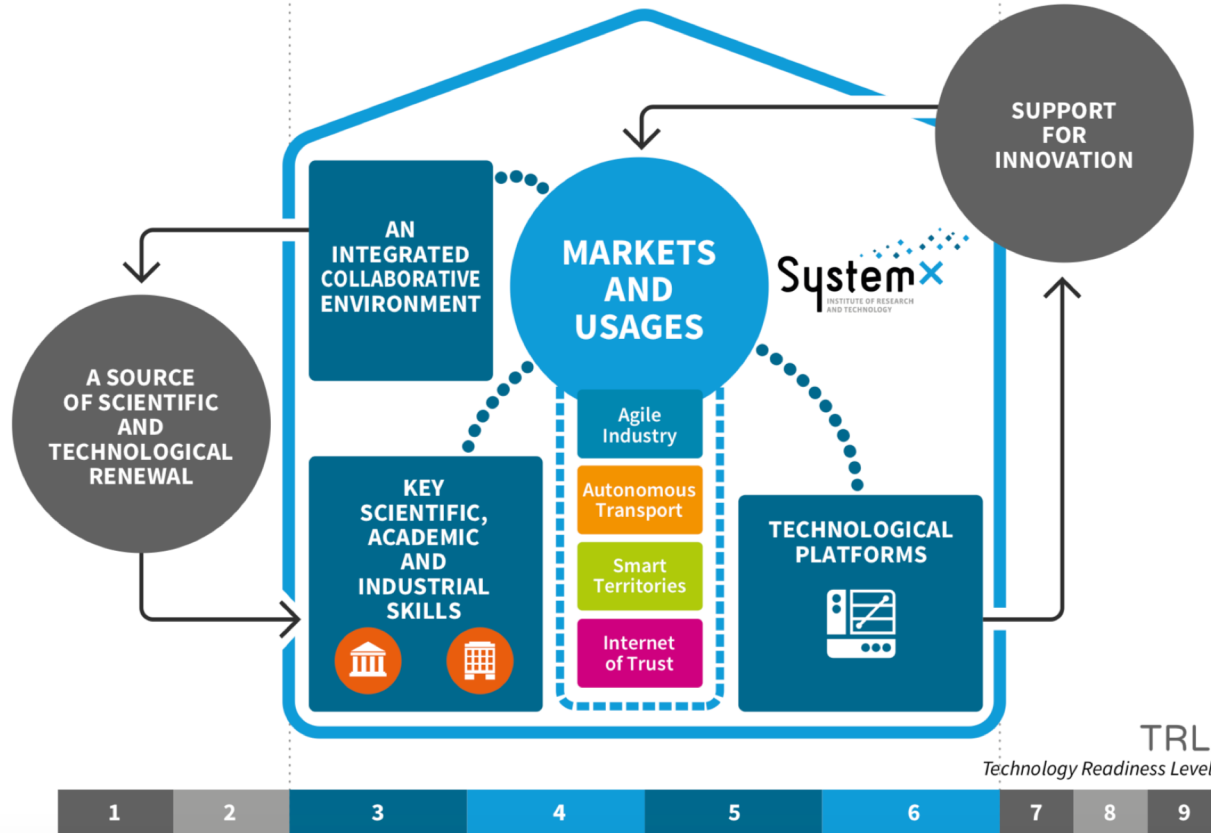
80% of smart objects have potential security vulnerabilities. And the world will have 50 billion smart objects by 2020.

1

NEW MOMENTUM
IN INNOVATION



An integrated collaborative environment



4 SCIENTIFIC DOMAINS

Data Science and Interaction
Using data to understand reality.

Computational Science and Optimization
Using physical models
to understand reality.

Systems and Software Engineering
Creating a formal design
for complex systems.

Infrastructure and Networks
Enabling information system
components to communicate
with each other.

4 RESEARCH PROGRAMS



Agile Industry

Supporting the digital transformation
of industrial processes.



Autonomous Transport

Designing and monitoring the automated,
intelligent and intuitive transport systems.



Smart Territories

Building the intelligent territories
of tomorrow.



Internet of Trust

Developing digital trust
in the Internet of Everything

3 AREAS OF EXPERTISE

Resources and Infrastructure
Defining SystemX's
information system strategy.

Architecture and Software Integration
Designing and integrating service-oriented
software architectures of the proofs of concept
studied within R&D project.

Data, UX and Interaction
Studying, designing and developing
sector-specific use cases and proof of concept
interactions.

An R&D commitment tailored to industry



R&D PARTNER



Take advantage of the **open innovation** model of SystemX R&D projects to:

- Develop or enhance innovative technology associated with the industrial issues we study.
- Expand your skillset with our scientific and technological expertise.

ASSOCIATE PARTNER



Test potential uses for your technology and assess its technical, economic and legal feasibility.

START-UP PARTNER



Demonstrate your capacity for innovation and technological creativity and contribute to the START@SystemX program for tackling the industrial challenges facing our partners.

An R&D commitment tailored to academic research



**STRATEGIC
INVOLVEMENT**



Take part in the Scientific Department activities and play an active role in SystemX's growth.

**THESIS
SUPERVISION**



Oversee a SystemX doctoral student throughout his or her dissertation and enhance your research activities.

**ACCESS TO
RESEARCHERS**



Integrate SystemX research projects and become a part of the digital transformation.

A new offer of collaboration



**RESEARCH PROJECTS
IMPLEMENTATION**

- Rapid launch
- Intellectual property based on inputs
- Project evolution facility
- Effective transfer of research results to technological platforms



**COLLOCATION OF
RESOURCES**

- Multisectorial projects
- Multidisciplinary expertise
- Scientific and professional commitment



PRIVATE FUNDING



PUBLIC FUNDING

2

A MODEL THAT BRINGS
PARTNERS TOGETHER

Creation



Partners

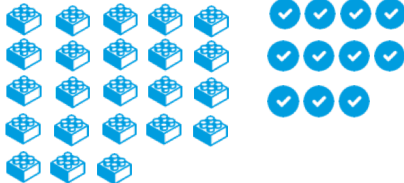


Industrial partners



Academic laboratories

Research projects



23 projects ongoing
and 11 projects completed

European projects

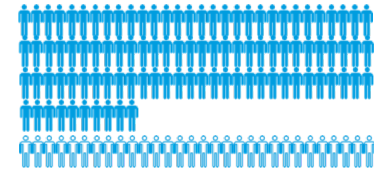


TOICA, IN2RAIL,
Holiship, ICN2020

Finance



Researchers-engineers and doctoral students



100 researchers-engineers,
30 doctoral students

Valorisation



9

Platforms and equipment



49

Patents and software



304

Publications

* Figures at June 2018

INDUSTRIAL PARTNERS



ACADEMIC PARTNERS





START@SystemX enables startups to **take advantage of the institute's innovation dynamic** by joining its research projects.

Access to the large groups and technology suppliers enables them to **build tomorrow's new services** by experimenting and testing their technologies on concrete problems.

3 thematics to date

MOBILITY: 2 SEASONS
or how to transform tomorrow's travel.





Affluences




BLOCKCHAIN

or how to support new services and uses associated to this technological breakout.





CYBERSECURITY

or how enhance cyberattacks resilience for future connected systems.




In collaboration with



3

AN AMBITIOUS STRATEGY

A three-phase ambition

**2013
2015**

PHASE 1

Consolidate a digital engineering systems skills base.

Establish leading-edge technological platforms to accelerate the transfer.

Obtain recognition in Europe and worldwide.

**2016
2019**

PHASE 2

Become a key European actor in digital engineering systems and systems of systems, supporting the European SMEs involvement.

Expand the use of technological platforms alongside European platforms to develop partner SMEs and build sectors.

Become a leading-edge scientific competences (methods, technologies, tools, standardization).

**2020
>>>>**

PHASE 3

Become an international reference center in digital engineering systems.

Maintain the level of industry commitment in the form of financial support for projects, including the allocation of personnel.

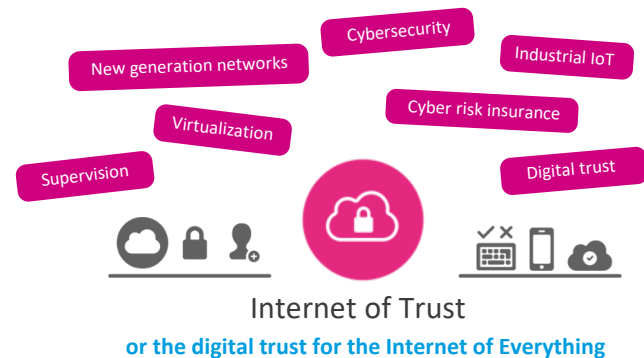
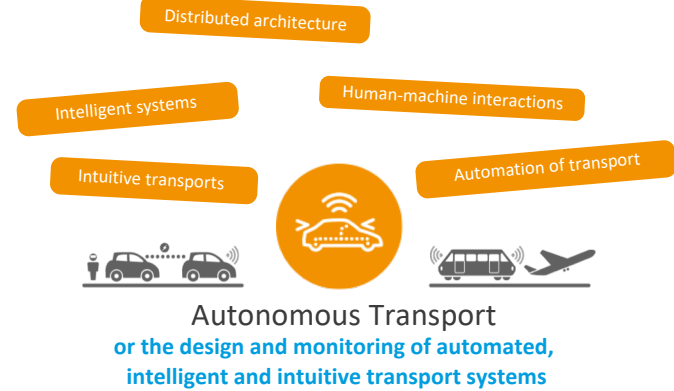
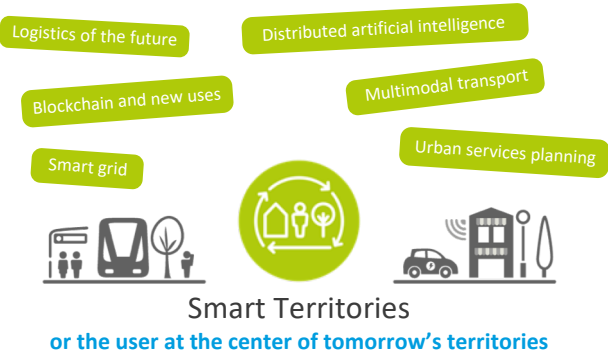
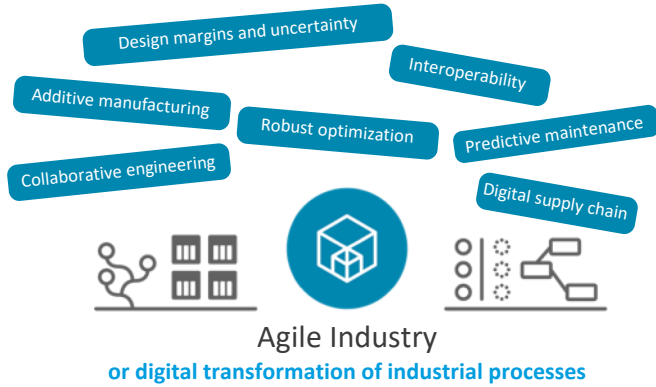
Use the technological platforms as a technological reference to speed up the transfer and consolidate expertise for industries.

Locations in France and internationally

As part of its development strategy, SystemX aspires to become a **recognized player in the field of digital engineering of complex systems** on the national and international stage. To nourish this ambition, the institute has forged partnerships in France and internationally by opening a site in Lyon and a representative office in Singapore. Thus SystemX accesses **new experimental fields** in order to test its innovations.



A strategy for innovation



INDUSTRIAL, ECONOMIC AND SOCIETAL BENEFITS

SYSTEMX'S ADDED VALUES

Agile Industry



**AGILITY
PRODUCTIVITY
COMPETITIVENESS**

Methods, processes and software tools for **optimized, robust design; digital simulation; collaborative engineering** for complex systems; and **digital channel** tools for additive manufacturing.

Autonomous Transport



**AUTOMATION
INTELLIGENCE
INTUITIVENESS**

Studies and simulation of secure and safe new architectures, including artificial intelligence, on behalf of **smart and autonomous transportation**, adapted to the latest forms of use.

Smart Territories



**SUSTAINABLE DEVELOPMENT
SECURITY
APPEAL**

Decision-support tools for **optimization** and **operational planning** of **smart regions**.

Internet of Trust



**CYBERSECURITY
PERFORMANCE
FLEXIBILITY**

Cognitive and cybersecurity algorithms for **intelligent control** and **optimal management** of the networks of the future.



Collaboration, agility, interoperability

Robust optimization and performance

Comparison and optimization
of system architectures

Management of uncertainties
and design margins

Digital channel in additive manufacturing
and new manufacturing processes



Learning, fusion of sensors
and decision-support

Safe and reliable cooperative and
autonomous vehicles

Intelligent and intuitive
transports

Interaction of uses,
ergonomics of use

Digital system architecture



Design of use-oriented urban systems

Understanding factors that drive mobility, improvements to multimodal transport service offerings

Energy optimization as part of development of eco-neighborhoods

Development of new forms of use based on ethics and trust in data



Cybersecurity and platform
for open experimentation

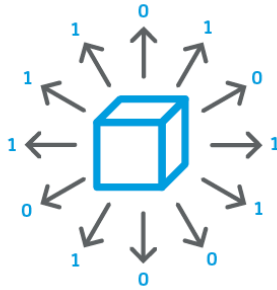
Design of cooperative, programmative
networks of the future

Decision support
for distributed systems

User experience
and digital trust

A science strategy

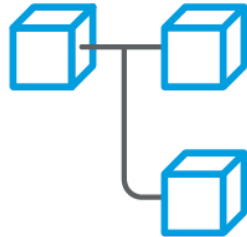
1 Data science and Interaction



2 Scientific Computation and Optimization



3 Systems and Software Engineering



4 Infrastructure and Networks



Typology of SystemX Platforms



INTEGRATION AND FEDERATION OF SOFTWARE COMPONENTS

Software platforms designed for the implementation of prototypes, evaluation and sharing components produced by research.



MODELING AND SIMULATION OF CYBER-PHYSICAL SYSTEMS

Platforms for modeling and simulating cyber-physical systems.

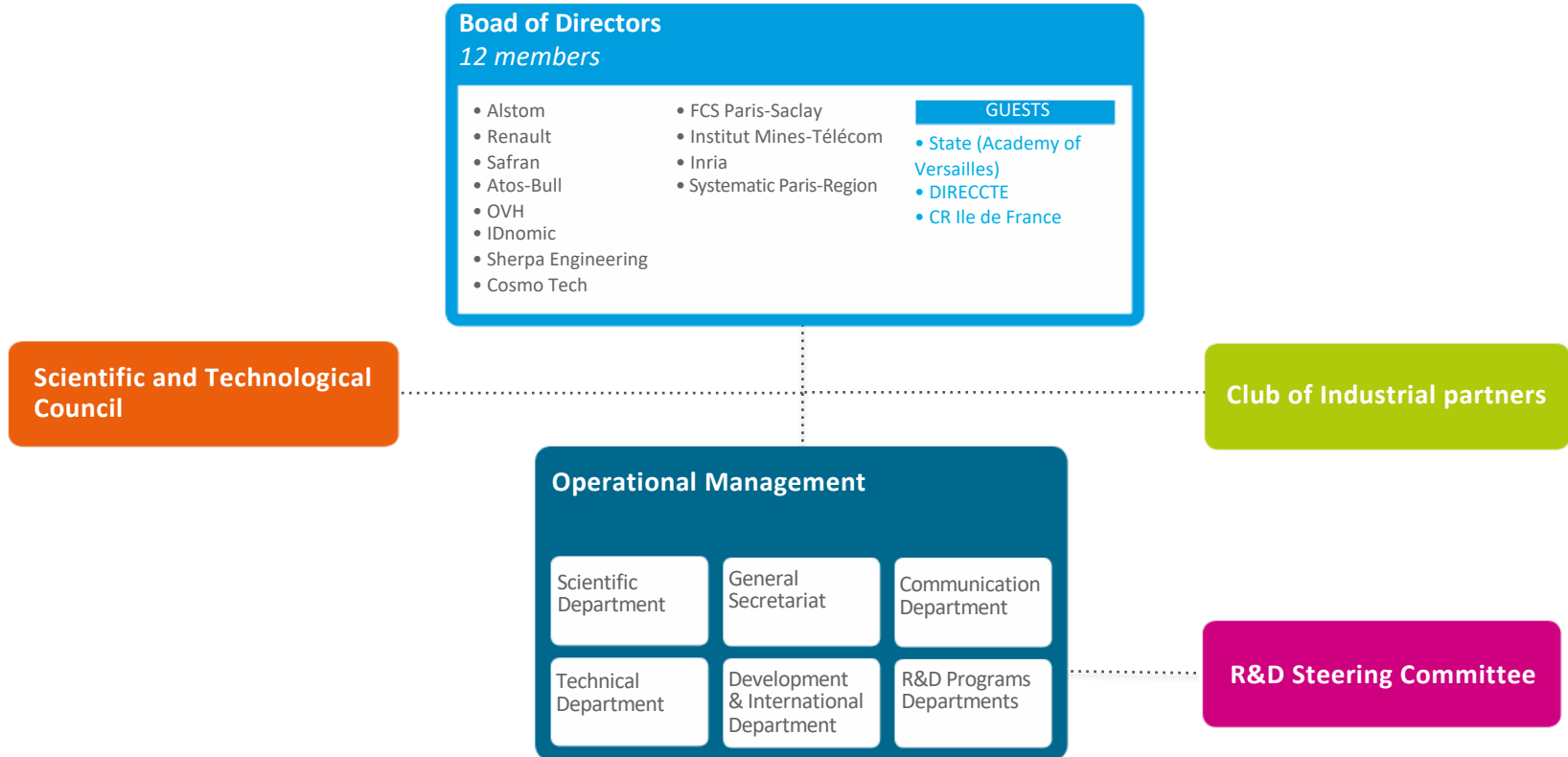


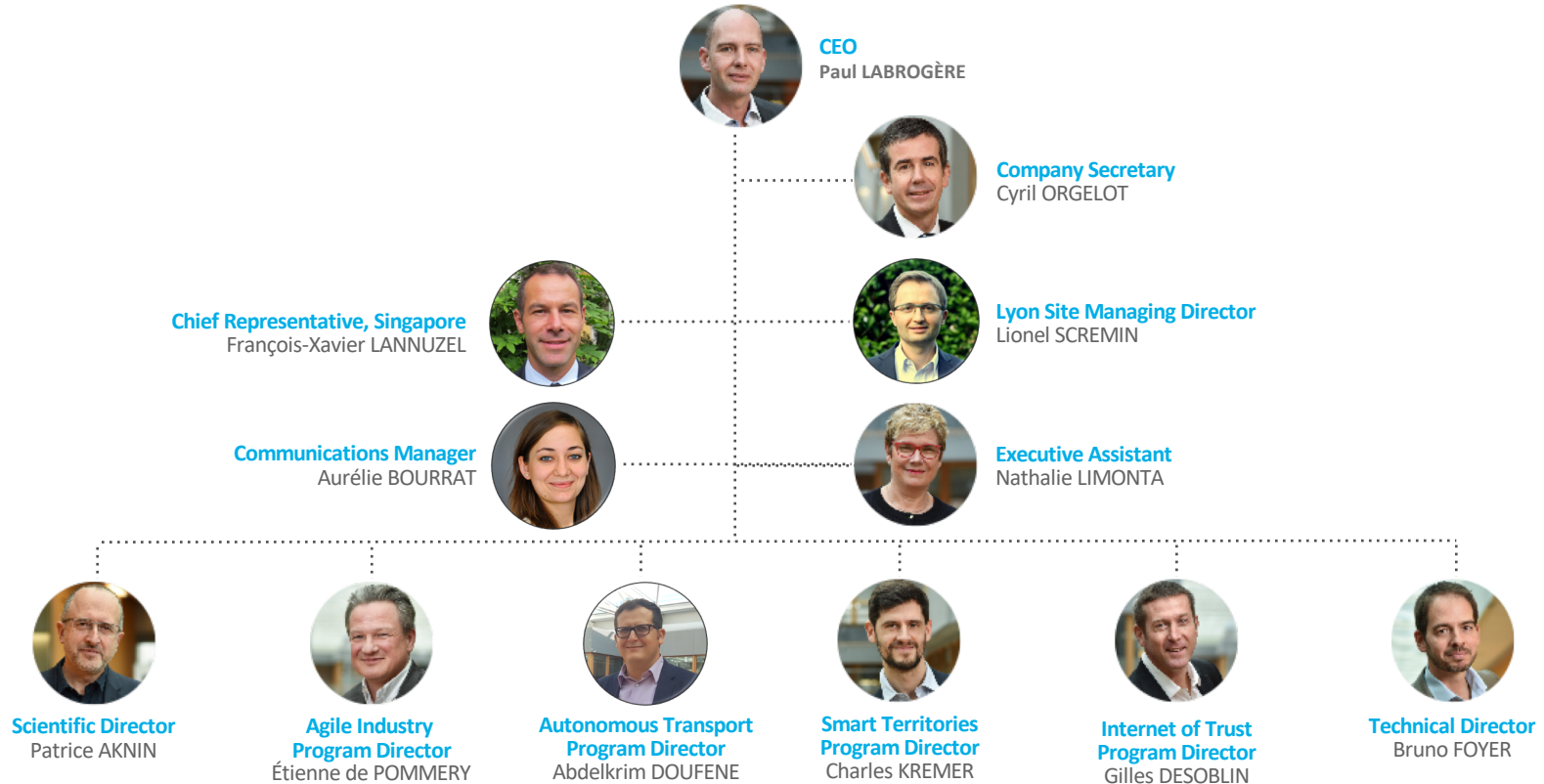
TOOLED-AIDED METHODS AND PROCESSES

Platforms for implementing processes, methods and tools for systems and software engineering.

4

APPROPRIATELY DESIGNED
GOVERNANCE







Yves BAMBERGER
Académie des
Technologies
Founding member



Patrick BASTARD
Renault
Responsible for an
operational department
covering ADAS and chair of
3EA activities



Jean-Claude BOCQUET
CentraleSupélec
University professor



Olivier CAPPÉ
CNRS
Research Director,
Director of the
Université Paris-Saclay
STIC department



Yves CASEAU
AXA
Digital Agency
Director



Gilles DOWEK
Inria et ENS Paris-Saclay
Research director



Serge FDIDA
Université Pierre
et Marie Curie
Professor



Nozha BOJEMAA
*Scientific and
Technological
Council Director*
Inria Saclay research
center director



Denis GARDIN
MBDA Systems
Director of Innovation in
Forward-Looking Technology



Bertrand MAURY
Université Paris-Sud
University profession



Michèle SEBAG
CNRS
Research Director,
Deputy Director of LRI



Bruno SUDRET
ETH Zürich
Professor and Director of
research and strategy at
Phimeca Engineering



Alain Bravo
Académie des Technologies
President



Guillaume POUPARD
ANSSI
CEO

2 invités permanents



Jean-Noël PATILLON
CEA LIST



Didier DUMUR
CentraleSupélec



Bernard YANNOU
CentraleSupélec



François ALOUGES
École polytechnique



Bruno MONSUEZ
ENSTA ParisTech



Brigitte DUEME
Inria



Yves SOREL
Inria



Hervé DEBAR
Institut
Mines-Télécom



Laurent PAUTET
Institut
Mines-Télécom



Samir TOHME
Université de Versailles-
Saint-Quentin-en Yvelines



Philippe DAGUE
Université Paris-Sud



Éric DUCEAU
Airbus Group



Louis GRANBOULAN
Airbus Group



**Athanasios
KONTOPOULOS**
Air Liquide



Pascal POISSON
Alstom



Jacques DUYSENS
ANSYS



Élie ZNATY
Bertin Technologies



Gérard POIRIER
Dassault Aviation



Philippe CALVEZ
ENGIE



Catherine DEHAENE
Orange



**Nathalie
MERCIER-PERRIN**
Orange



Jean-Pierre DUMOULIN
PSA Peugeot-Citroën



Cédric VIVIEN
PSA Peugeot-Citroën



Véronique BERTHAULT
RATP



Alain DAURON
Renault



Jean-Marc DAVID
Renault



Frédéric FEYEL
Safran



Pascal FOIX
Thales



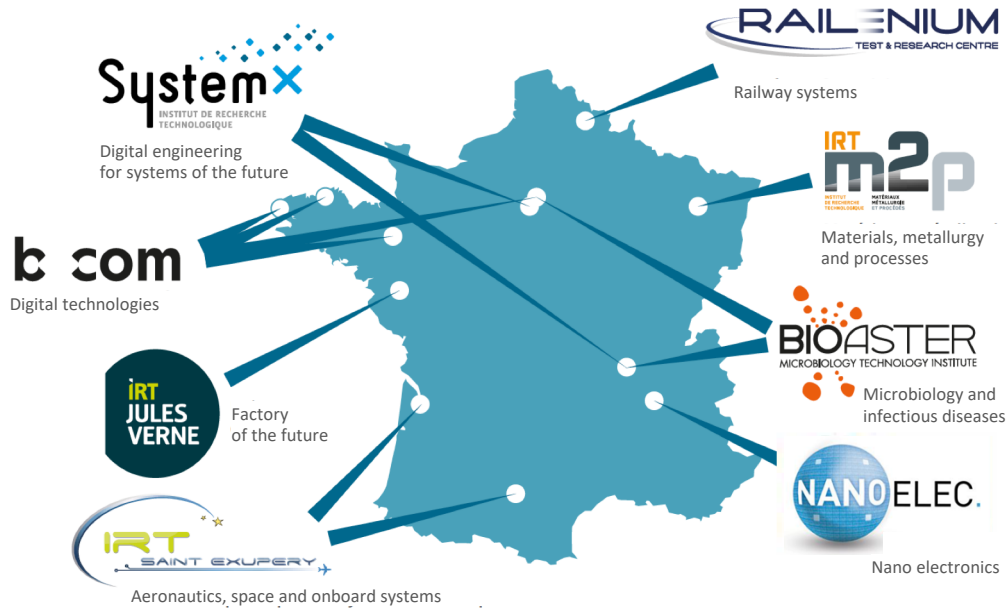
Philippe ROY
Cap Digital



Johan D'HOESE
Systematic Paris-Region

5

A DEVELOPMENTAL ECOSYSTEM



Four objectives:

Attractiveness of the IRT as a model that can be promoted

Relations with the European Commission

Cooperation and sharing of best practices

Consistency among the various objectives in the Future Investment Program

Key figures:

8 IRTs established since 2012

10-year budget of €2.5 billion

500 partners

1200 employees

Characteristics of the model:

Close ties with a research hub

Partner personnel working side by side at one site

Funding (Future Investment Plan) for 50% of costs

Two important pillars at the heart of the Paris-Saclay campus



150
Industrial Groups



480
Startups/SMEs



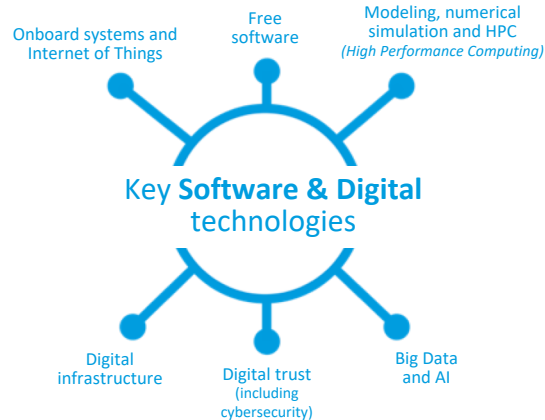
140
Academics



20
VCs &
Business Angels

Industrial markets Software & Digital Technology

- Energy
- Telecommunications
- Information systems
- Factory of the future
- Transportation
- Security
- Health care
- Digital cities



65,000
Students



11,000
Researchers
part of which in:
• Mathematics,
Computing
• Humanities and
Social Sciences



20
Doctoral Schools,
part of these are
STIC and Interfaces



6
Fields Medals



10
Research departments,
of which the STIC
department is part



2
Nobel Prize

Competitive clusters



IRT



ITE



Territorial authorities



And also...



THANKS FOR YOUR ATTENTION



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