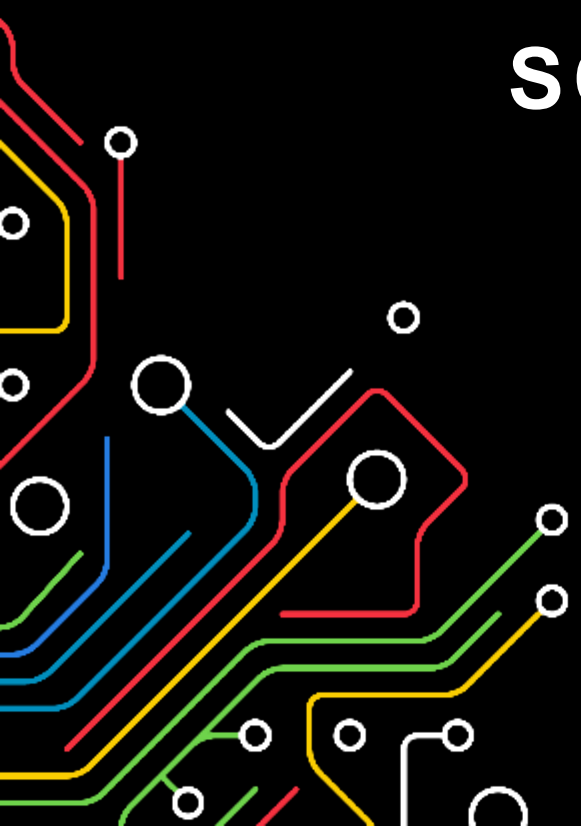
INSTITUTE FOR SYSTEMS
AND COMPUTER ENGINEERING,
TECHNOLOGY AND SCIENCE

INESCTEC

HIGH-ASSURANCE SOFTWARE LABORATORY

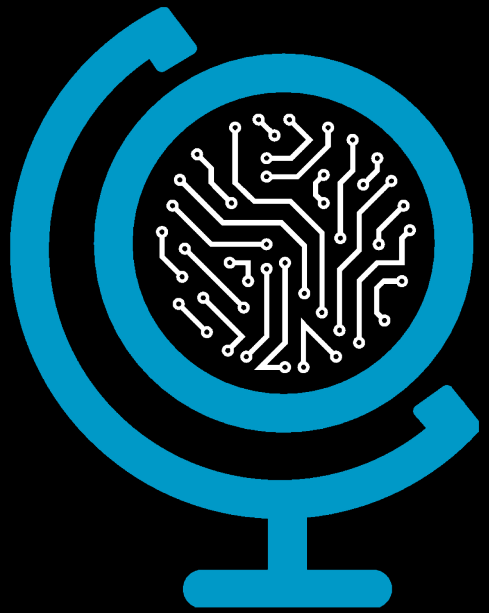
SCOPE AND ACTIVITY FOR 2022

CCI/2022-02-22



from knowledge
generation to
science-based
innovation

HASLAB IN BRIEF



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HASLAB

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We focused on the **design** and **implementation** of **high-assurance software systems**: software that is correct by design and resilient to environment faults and malicious attacks.

COMPUTER SCIENCE

RESEARCH LINES

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Distributed Systems

Software Engineering

Information Security

RESEARCH LINES

Distributed Systems

Large-scale Database Systems

Storage Systems

Cloud and HPC

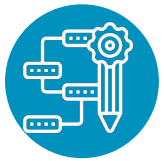
Distributed Algorithms

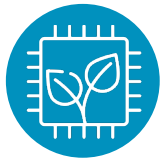
Decentralized Systems

Systems Interoperability

Software Engineering

Logic and Formal Methods

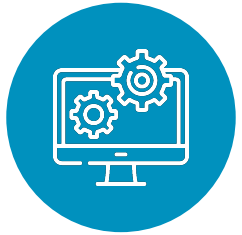


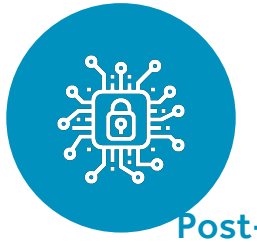


Green Computing

Quantum Computing

User Interfaces and Usability





Information Security

Applied Cryptography

High-assurance Cryptographic Software

Computer Aided Cryptography

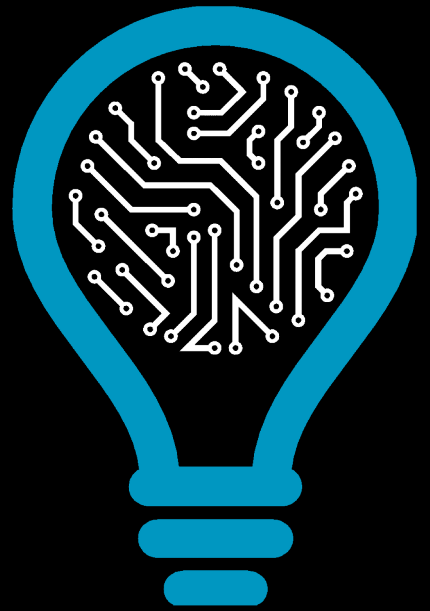
Post-Quantum Cryptography

Digital Identity and Certification

Secure and Verifiable Computation

Secure Outsourcing of Data and Computation

ABOUT 2022



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MAIN OBJECTIVES AND ACTIONS

- **Organisation, human and material resources**
  - Organize **short monthly *staff meeting* with all senior researchers** to improve the communication with the centre's coordination
  - **+ 1 PhD and 2 MSc researchers/developers**
  - Attract foreign researchers
- **Research**
  - Perform a **detailed analysis of the current publication patterns**, identify under- and over-performers, and identify reasons that can explain such low or high productivity
  - Increase the **number of publications in top conferences** (CORE A* and A) and top journals
  - Raise awareness to the value of **releasing the datasets** to the public domain

ACHIEVEMENTS

11

meetings

2

new foreign researchers

2

new public domains

datasets released

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MAIN OBJECTIVES AND ACTIONS

- **Innovation**
  - Identify **competences in the centre's portfolio with potential for valorisation and technology transfer**
  - Define a **communication plan to promote the competences**, including, among others, webinars or short videos in INESC TEC social media platforms
  - Raise the awareness for **knowledge valorisation** in HASLab, and in particular aim to have more invention disclosures
- **Advanced Training**
  - **HASLab internship program**
  - **Mentoring program for PhD students**

ACHIEVEMENTS

2

new invention disclosures

8

Publications co-authored by master students

6

New PhD students

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MAIN OBJECTIVES AND ACTIONS

- **Dissemination**
  - To be involved in **international conferences organisation**
  - To define a **medium-term plan to submit proposals for organising more top-level international conferences**
  - To be involved in the **organisation of summer schools**
  - To publish a **book on formal software design with Alloy 6**, targeting an educational and industrial audiences
  - To organize a **tutorial about this tool at a top-level international** Software Engineering conference

ACHIEVEMENTS

3
Workshops/conferences

1
Proposal for conference organisation

2
Summer schools

1
Book

1
Tutorial

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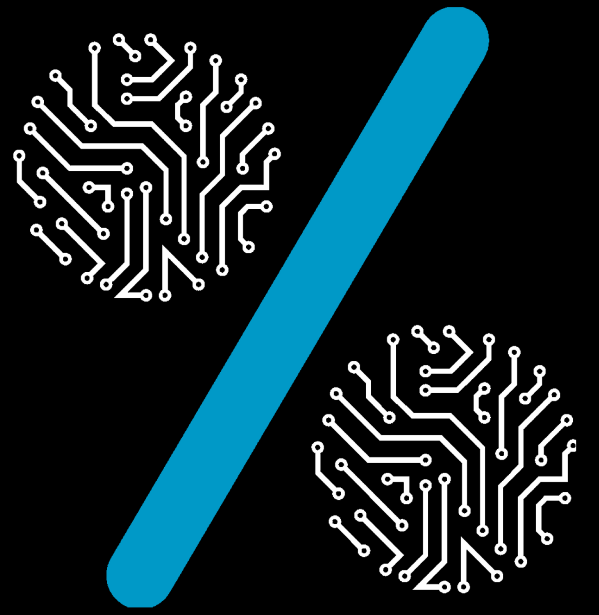
FACTS AND FIGURES



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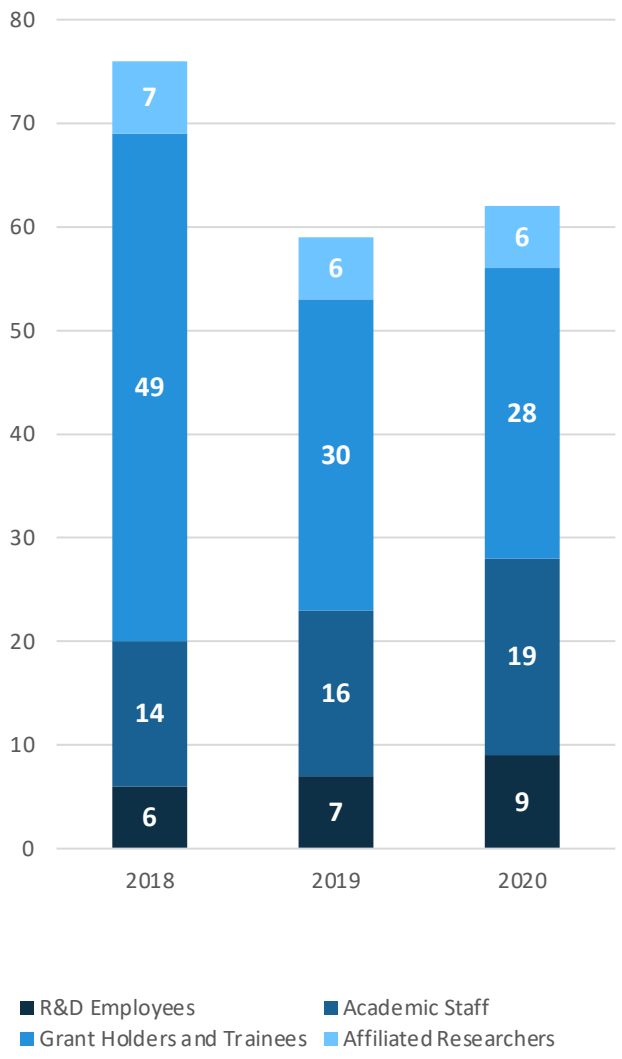
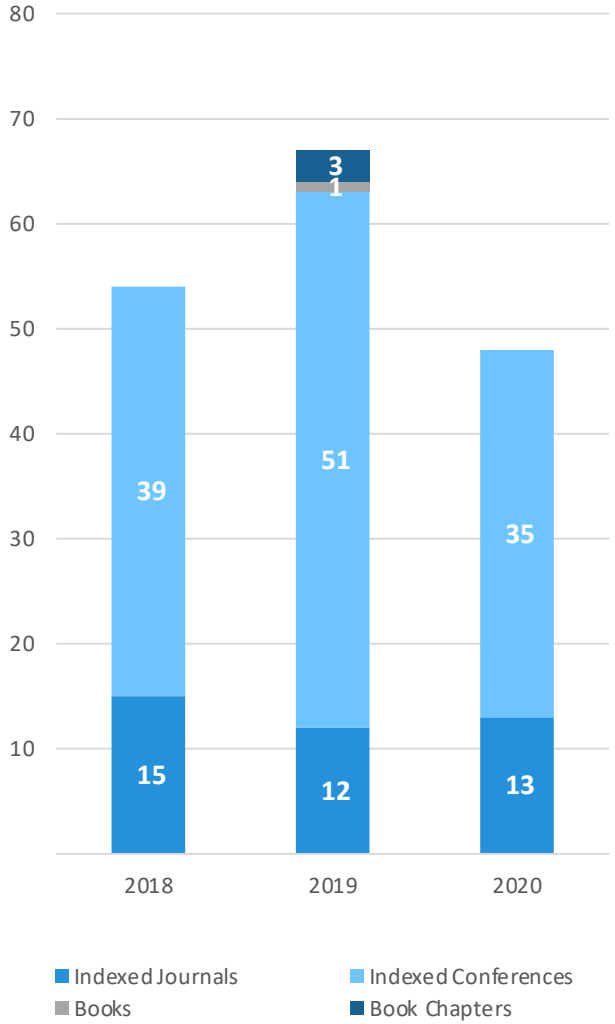
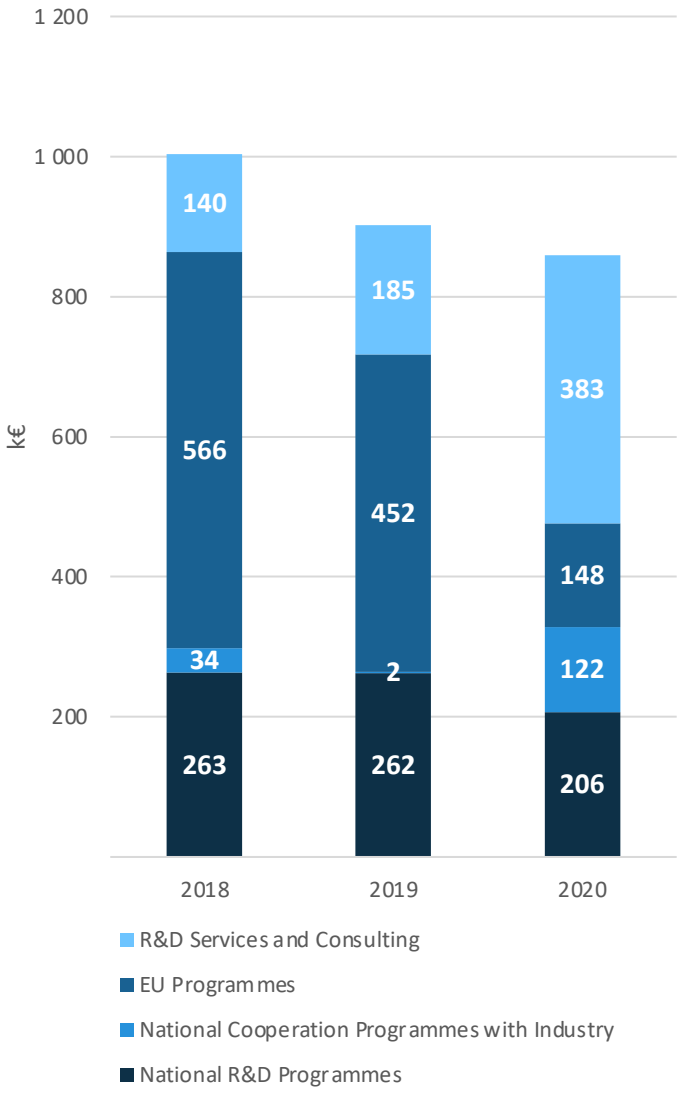
INNOVATION ACTIVITIES

	TEC4AGRO	TEC4ENERGY	TEC4HEALTH	TEC4 INDUSTRY	TEC4SEA
Requirement specification and validation	x	x	x		x
Algorithm design and implementation		x	x		x
Evaluation of critical software component		x	x	x	
Polyglot data management		x			
Cloudification services		x	x		

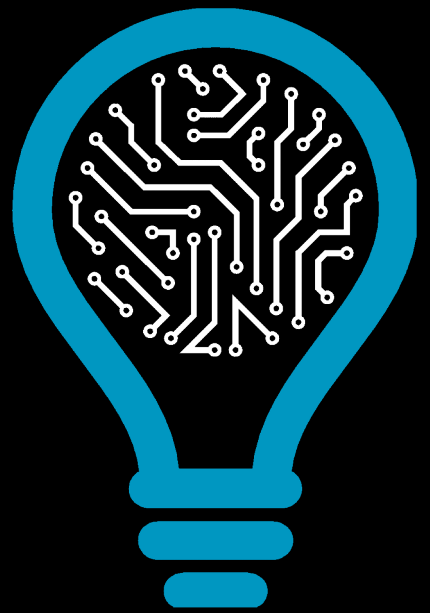
TEAM AND ACTIVITY







FLAGSHIP PROJECTS



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IBEX PROJECT

Ibex will develop mathematical methods to model and analyse imprecisions in cyber-physical software. The project's innovation lies in the development of quantitative methods, **namely methods that can deal with uncertainty, stability, and noise in cyber-physical software.**

ENERSHARE PROJECT

CPES
CENTRE
Power and Energy Systems

ener share

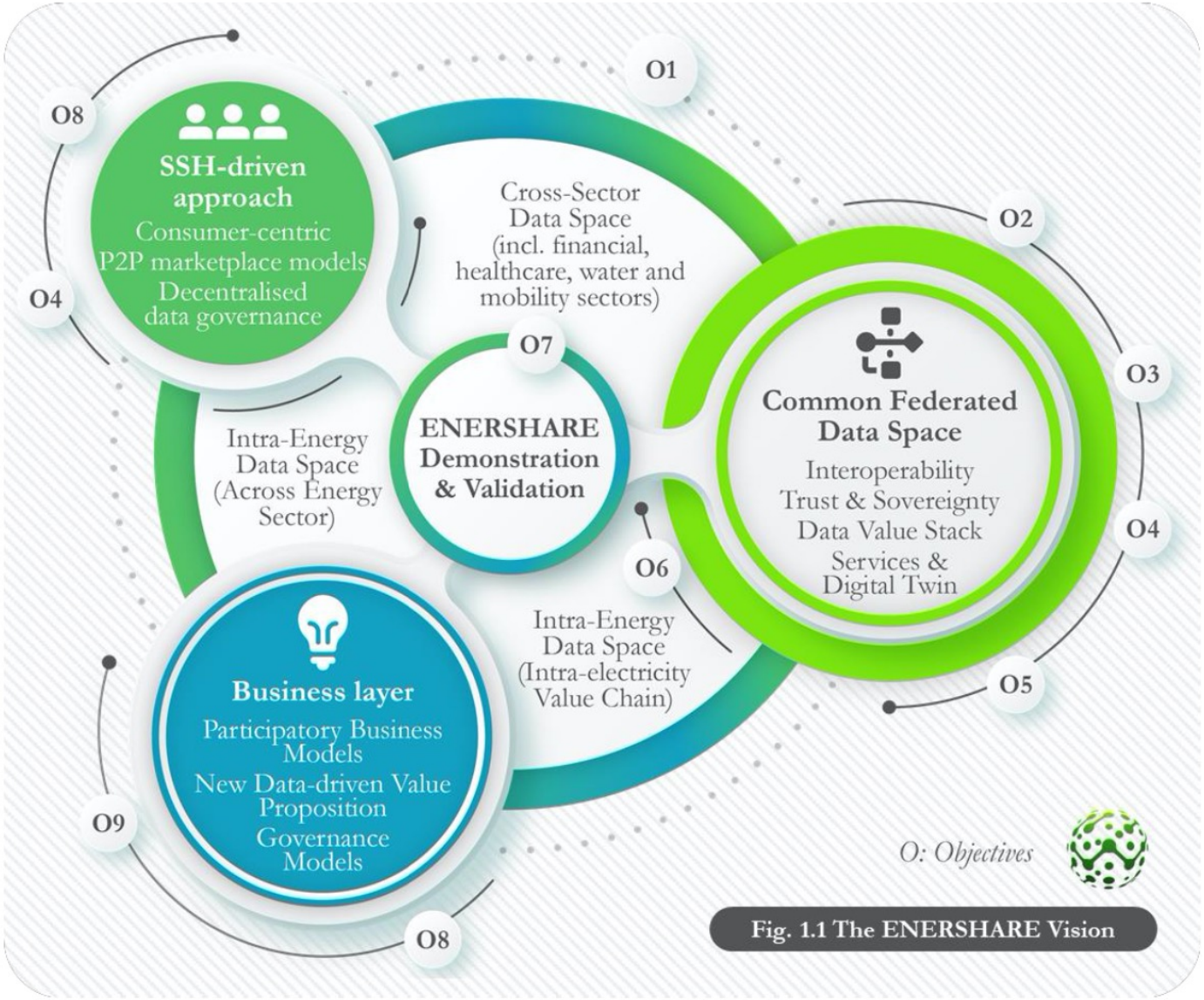

Fig. 1.1 The ENERSHARE Vision

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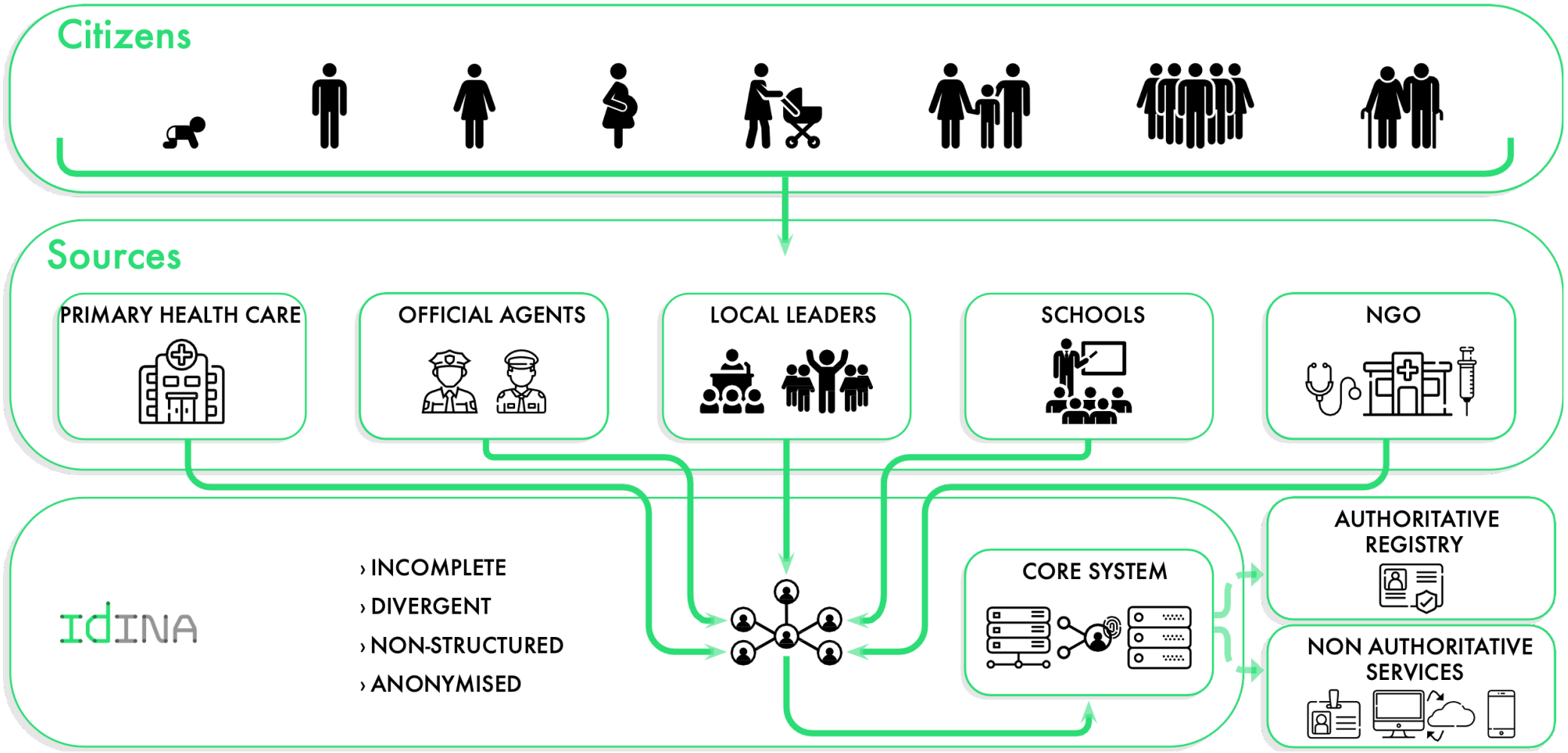
AURORA PROJECT

AURORA aims to improve the data cycle and the development and processing of models to characterize the activity and emotions of passengers in vehicles

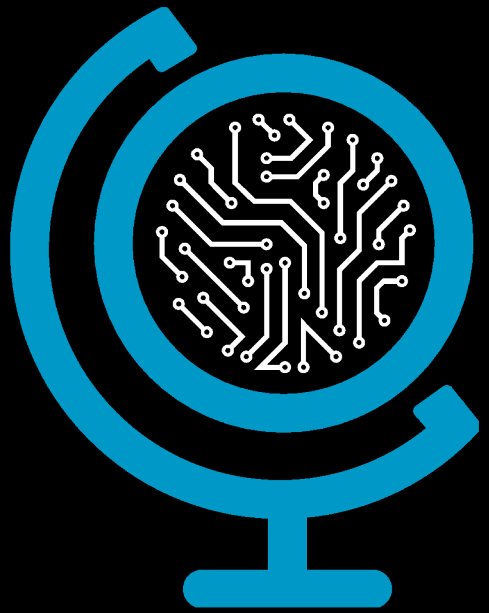
BOSCH

CTM
CENTRE
Telecommunications and Multimedia

IDINA PROJECT



PARTNERS AND COLLABORATIONS



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EXTERNAL PARTNERS

Research

EXTERNAL PARTNERS

Innovation

INCM LAB
PORTUGUESE MINT AND OFFICIAL PRINTING OFFICE

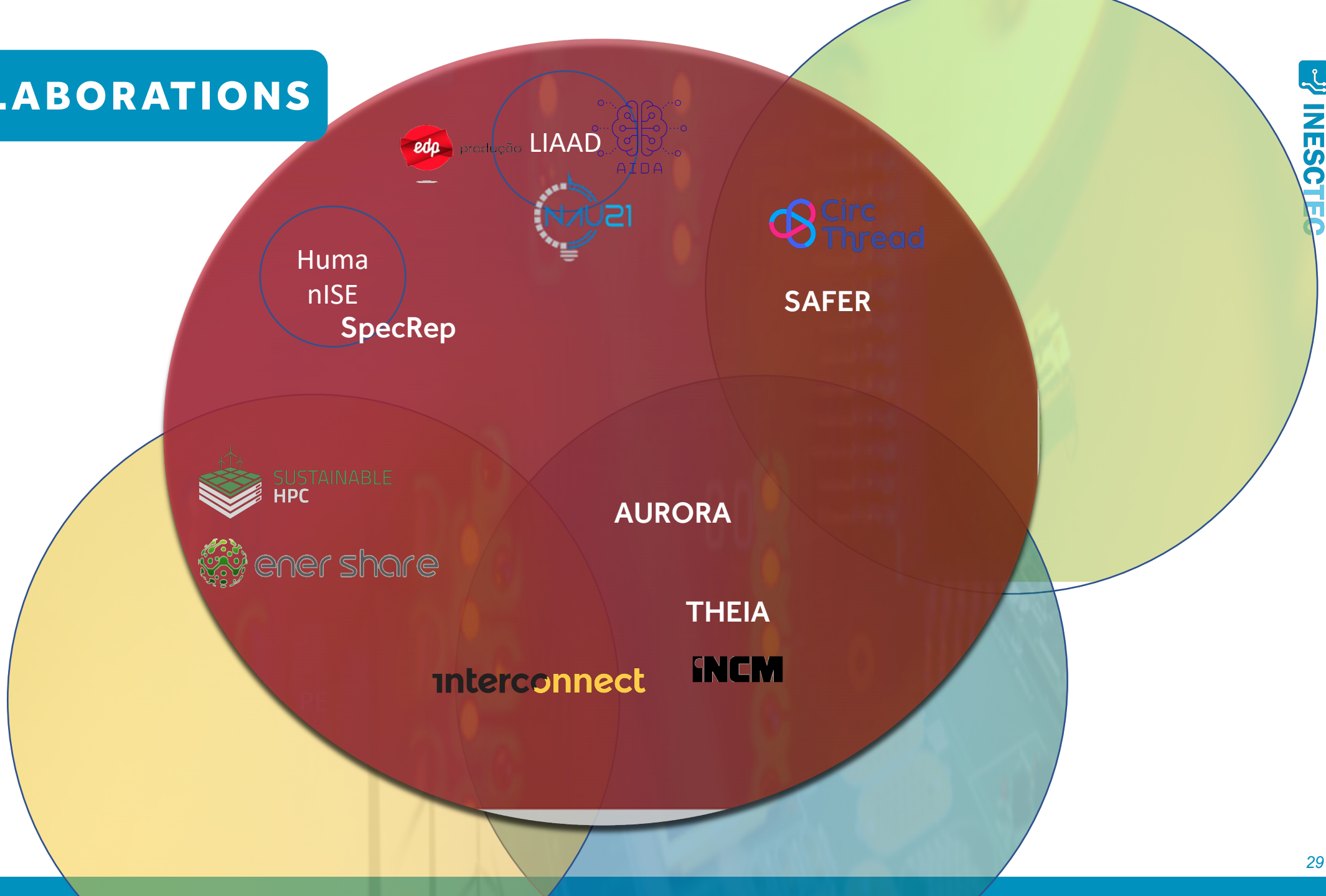
BOSCH

outsystems

efacec

INESCTEC

COLLABORATIONS



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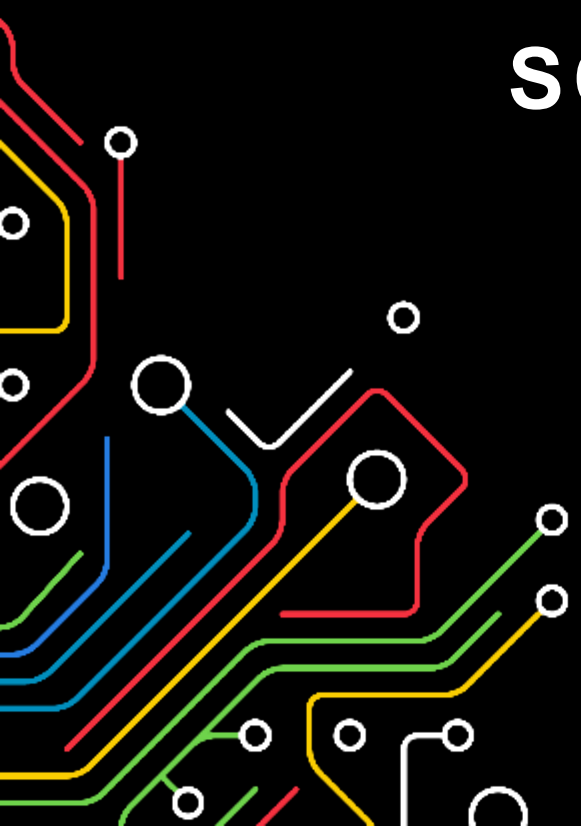

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