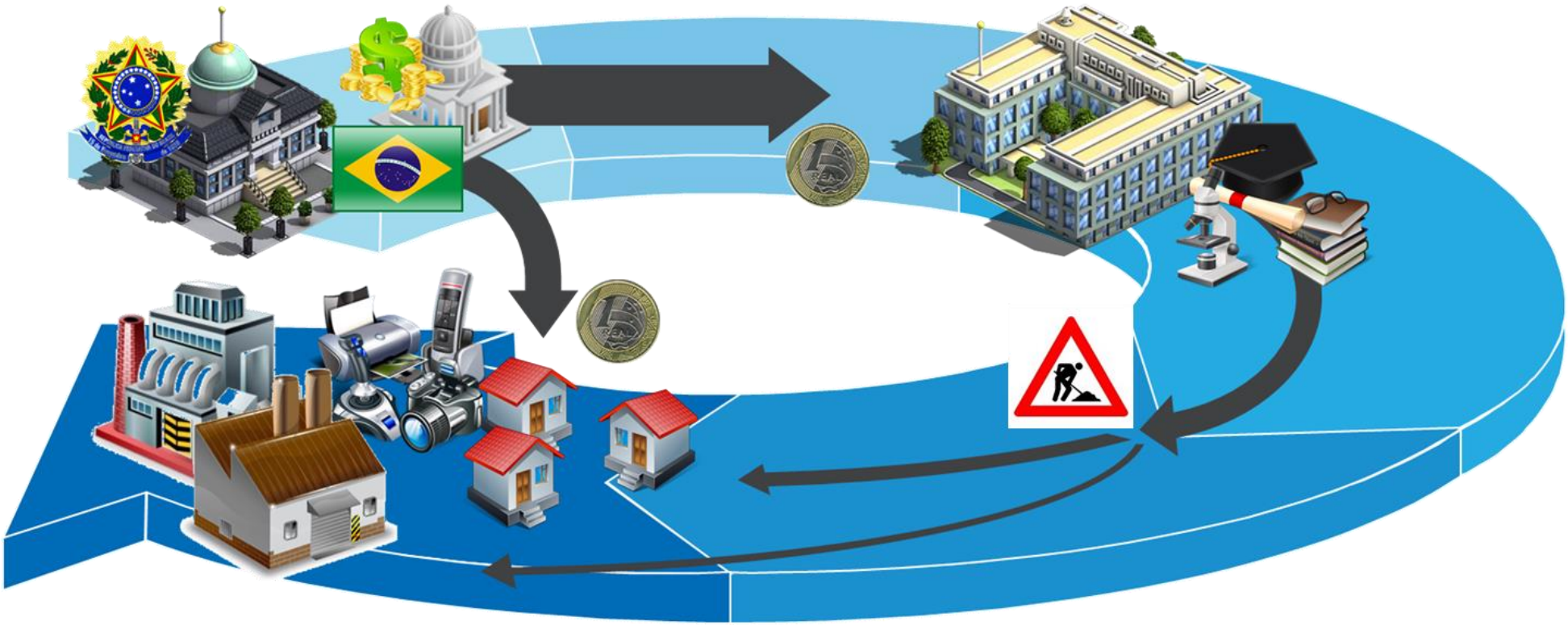
SENAI Innovation Institute for Integrated Solutions in Metalmechanics

Dr. Ronald Josef Zvonimir Dangel
Operations Manager

The actual scenario of the brazilian innovation system



R&D&I Institute

Universities, STIs

Government

Funding Agencies

Industry (BMSMEs)

Startup Communities

The actual scenario of the german innovation system

R&D&I Institute

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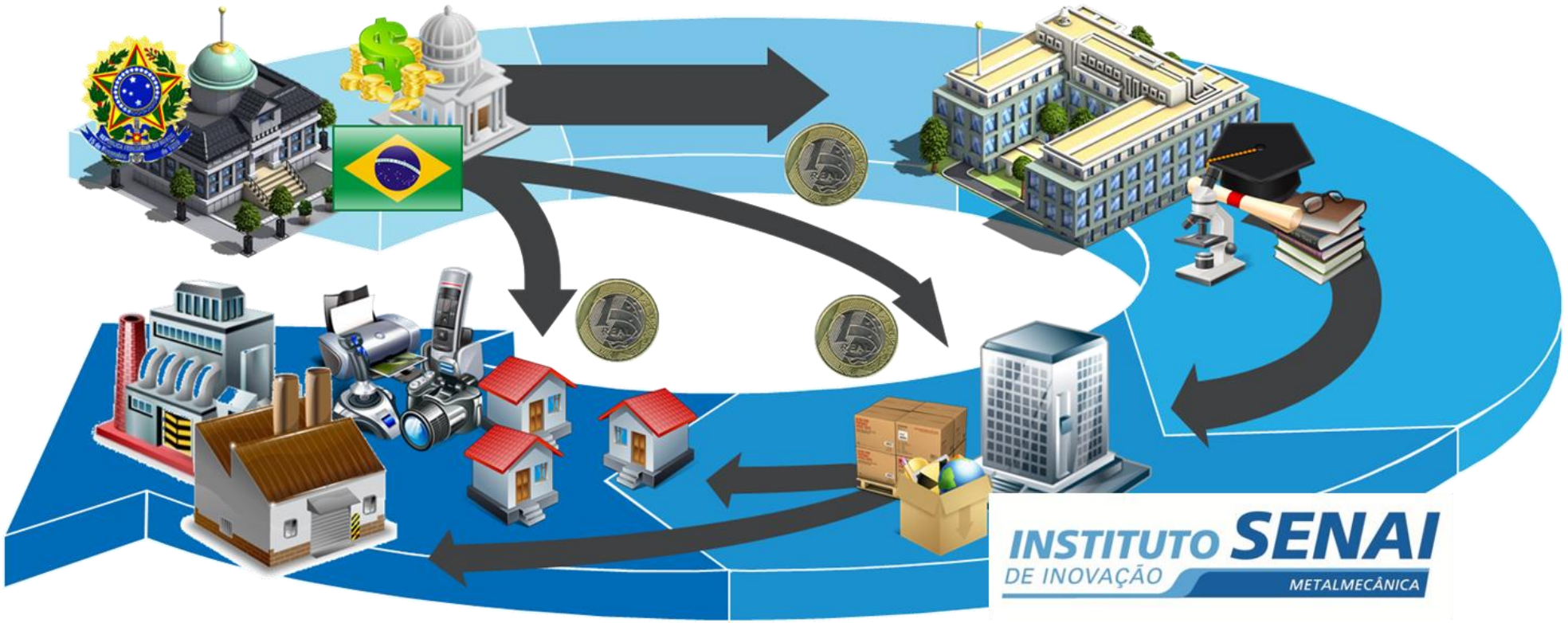
The new scenario of the brazilian innovation system



R&D&I Institute

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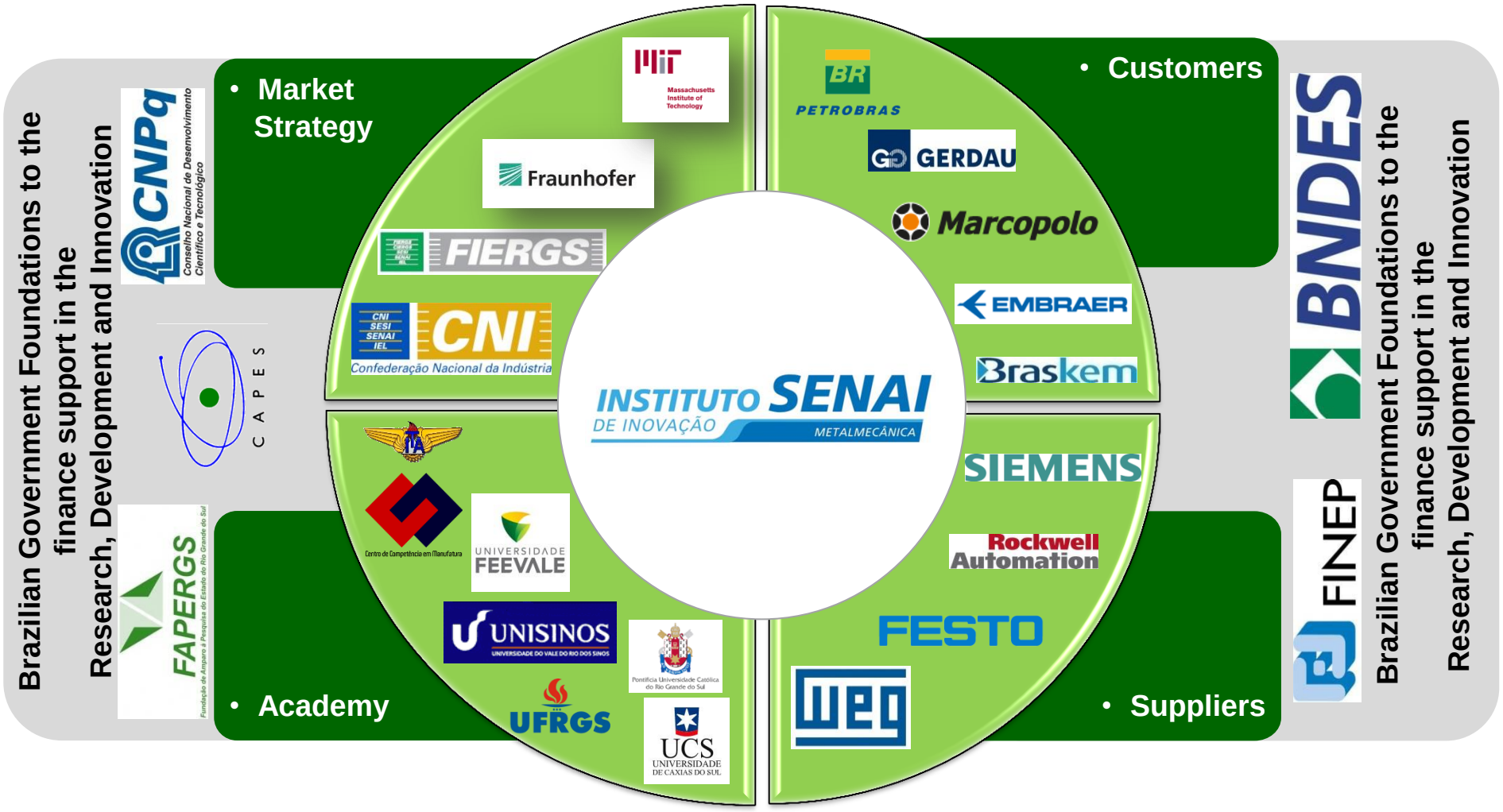
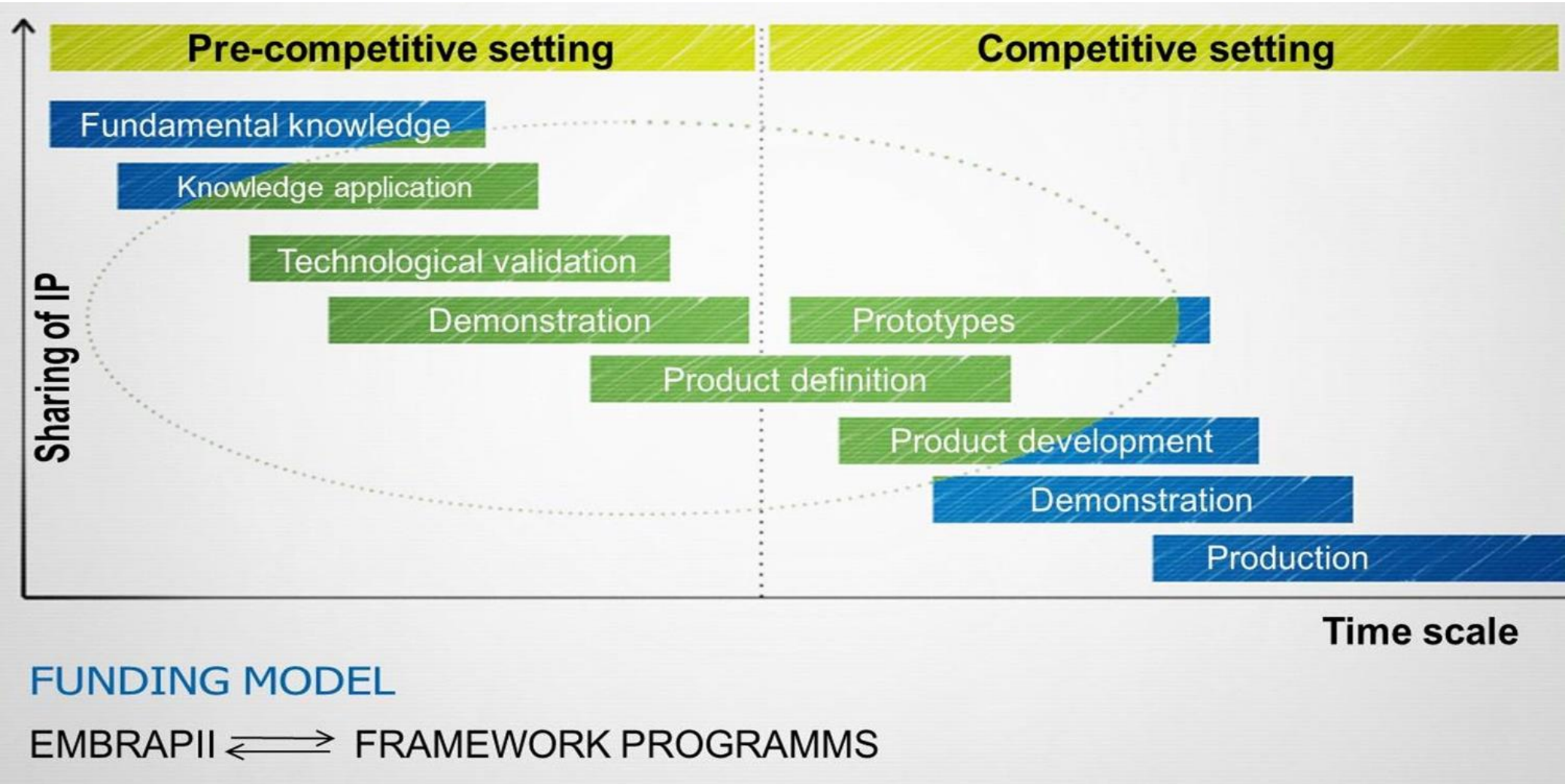
INSTITUTO SENAI
DE INOVAÇÃO
METALMECÂNICA

Impact in the value Chain



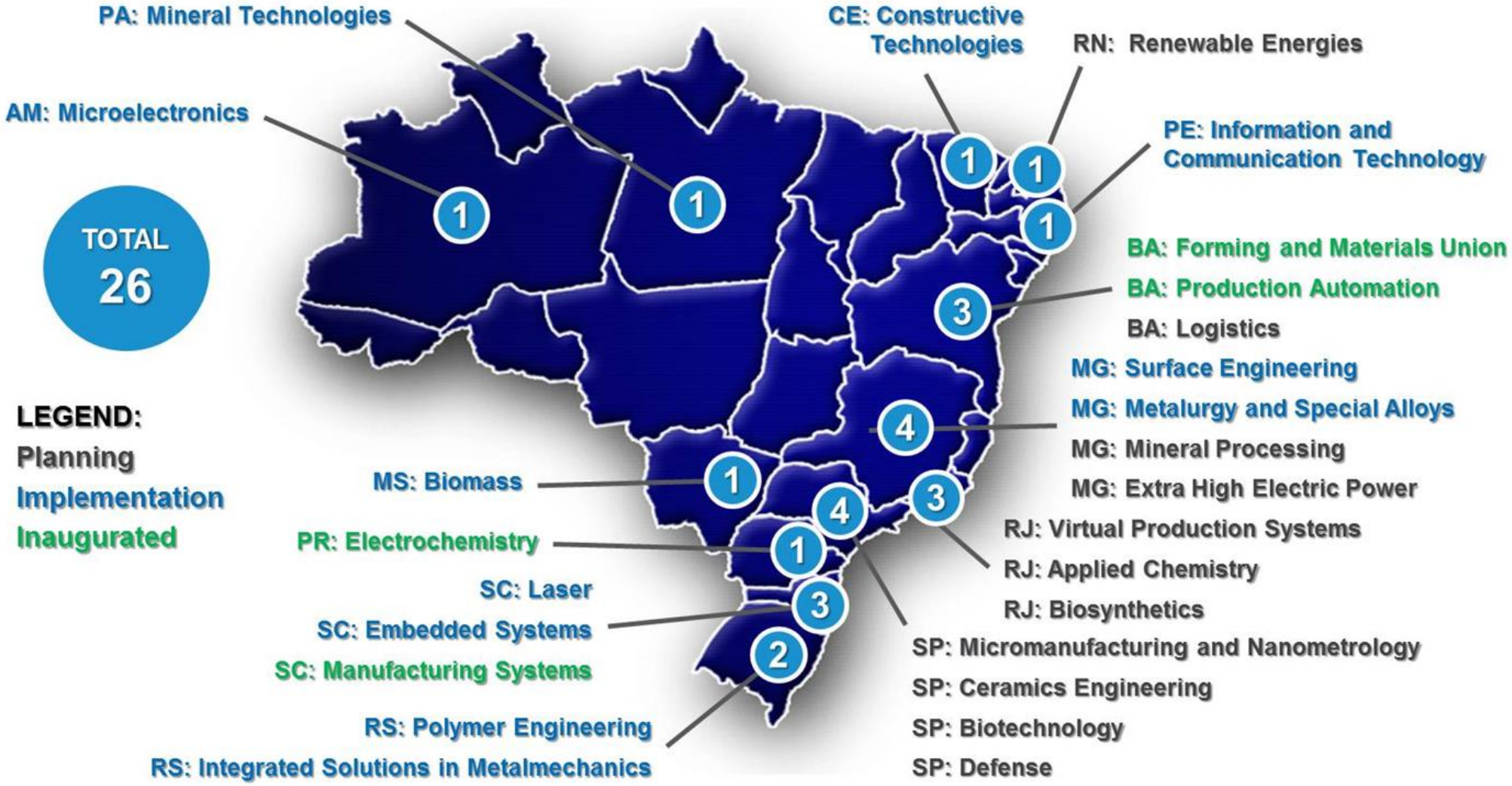
Impact in the value Chain



FUNDING MODEL

EMBRAPII ⟷ FRAMEWORK PROGRAMMS

ISI Network for Innovation



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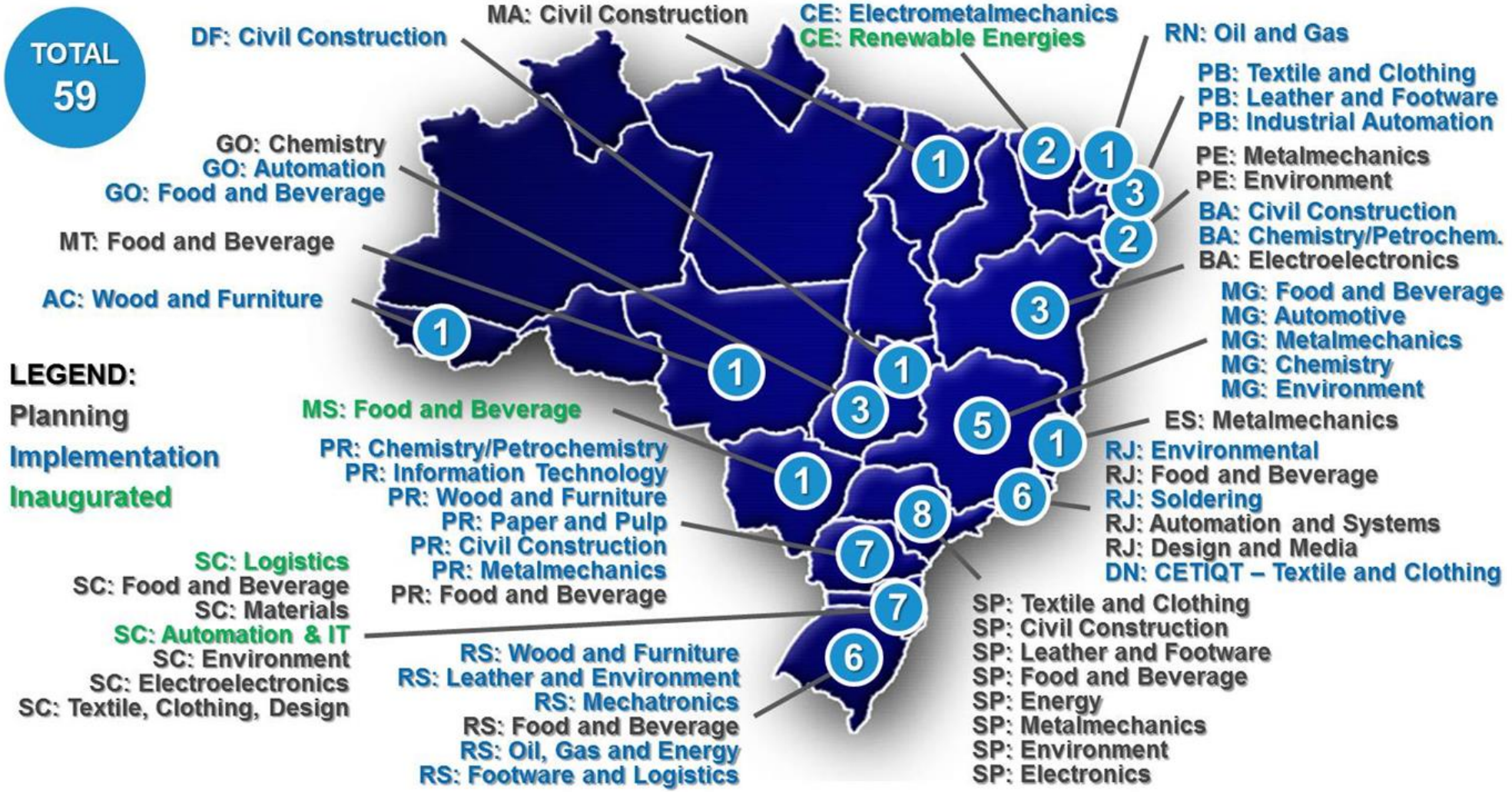
IST Network for Services



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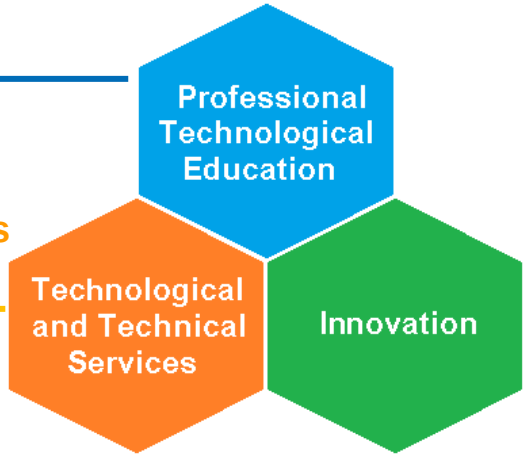
Main areas of the ISI Intregated Solutions in Metalmechanics

- Technical course in Automation
- Technical course in Eletronics
- Technical course in Safety and Health
- Technical course in Mechanics
- Technical course in Mechatronics (July/14)

- Test and Calibration Lab (LEC)
- Technological Development Nucleus (NDT)



- Quality programs
  - OSHAS 18001:2007 (ISI SIM)
  - 8S
  - PGQP
  - GSA Group
  - Local supervision
  - ABNT NBR ISO 9001:2008

- SENAI Unit located in São Leopoldo 30 km from Porto Alegre;
- More than 30 years of experience with metal mechanic industries

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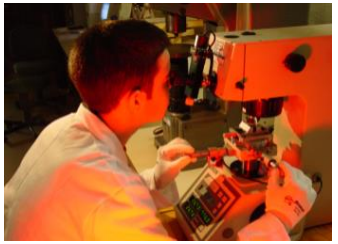
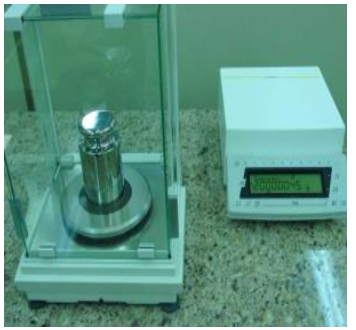
Who we are today...

Test and Calibration Lab (LEC)

17 Employees

- ✓ **Industrial Radiography**
- ✓ **Mechanical**
- ✓ **Chemical**
- ✓ **Forces and Torques**
- ✓ **Mass**
- ✓ **Pressure**
- ✓ **Volume**
- ✓ **Dimensional metrology**



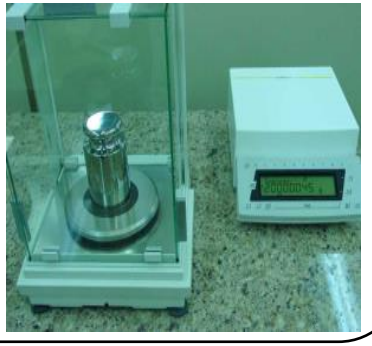


Who we are today...

Test and Calibration Lab (LEC)

Quality Control and Certifications

- ✓ **CNEN Authorization Ref.: 2013SCRA1314**
- ✓ **INMETRO Accredited**
- ✓ **Brazilian Network of Calibration RBC**
- ✓ **ABNT NBR ISO 9001:2008**
- ✓ **ABNT NBR ISO/IEC 17025:2005**
- ✓ **Recognized by RS Metrology Network**



Who we are today...

Technological Development Nucleus (NDT)

5 Employees

- ✓ **Reverse Engineering**
- ✓ **Tridimensional Prototyping**
- ✓ **Tridimensional Digitalization**
- ✓ **High speed cutting**

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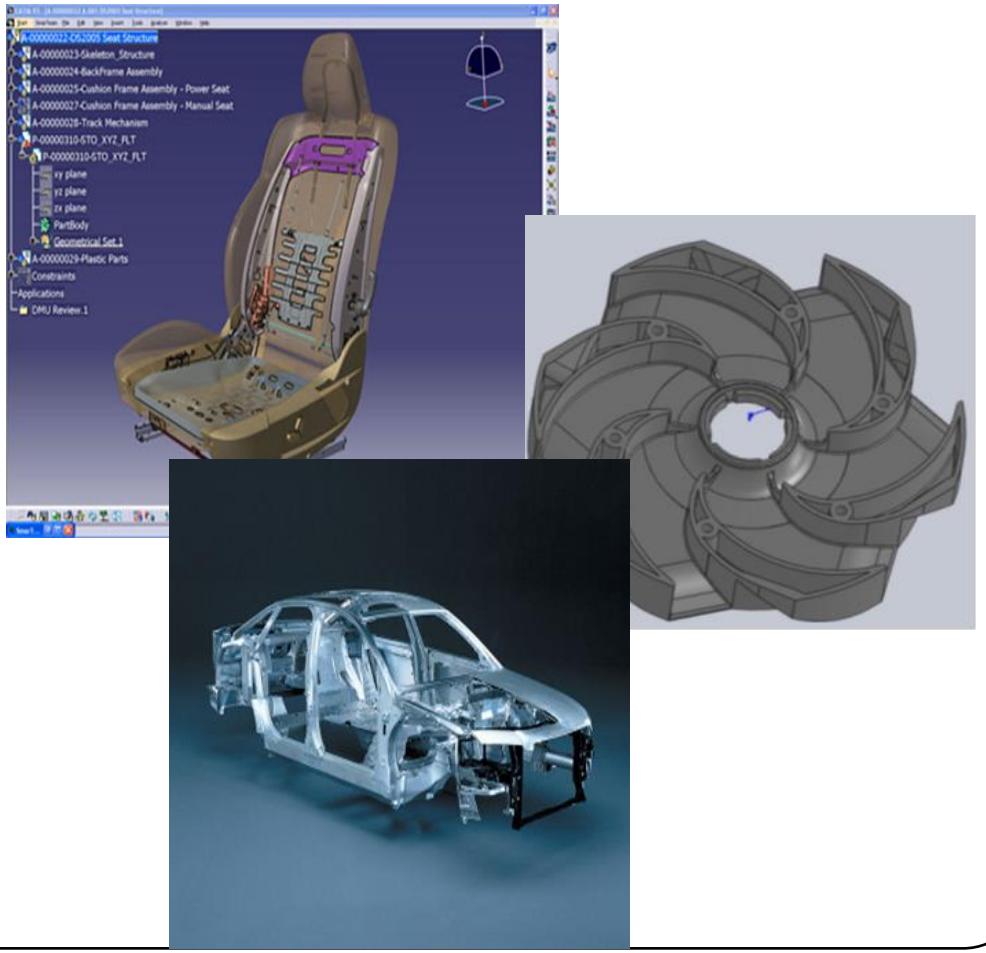
Who we are today...

Technological Development Nucleus (NDT)

Reverse Engineering

- ✓ **CAD/CAM/CAE high performance softwares to reconstruct complex surfaces;**
- ✓ **Development of projects;**
- ✓ **Dimensional analyse to compare models.**



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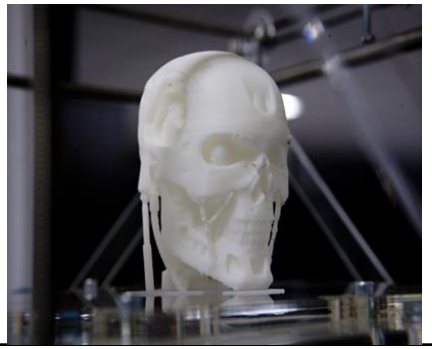
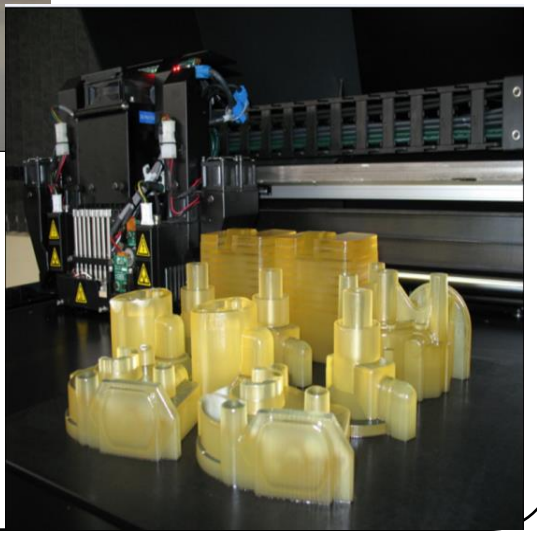
Who we are today...

Technological Development Nucleus (NDT)

Tridimensional Prototyping

- ✓ **Tridimensional printing of objects to analyse prototypes;**
- ✓ **Tridimensional printing of objects to model molds and tools;**
- ✓ **Tridimensional printing of objects to events and fairs.**





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Who we are today...

Technological Development Nucleus (NDT)

Tridimensional Digitalization

- ✓ **Extraction of tridimensional digital formats of physical objects;**
- ✓ **Tridimensional digital reproduction of objects;**
- ✓ **Development of products;**
- ✓ **Quality control of products;**
- ✓ **Inspection of products.**

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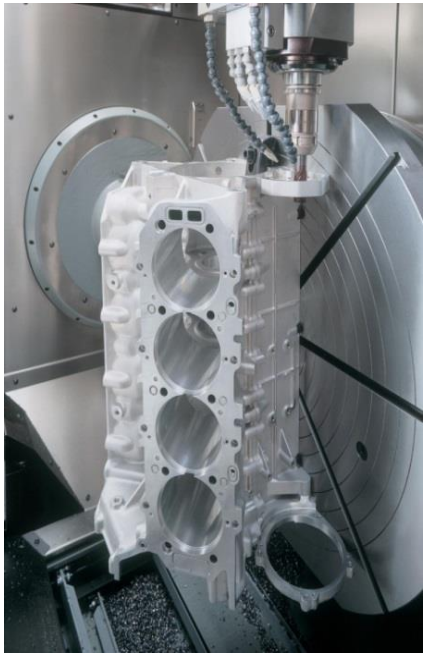
Who we are today...

Technological Development Nucleus (NDT)

High Speed Cutting Machine

- ✓ **Special Cutting;**
- ✓ **Cutting of hard materials from 60 to 70 HRC;**
- ✓ **High precision and complexity cutting;**
- ✓ **Cutting of special materials.**



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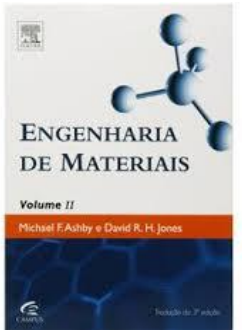
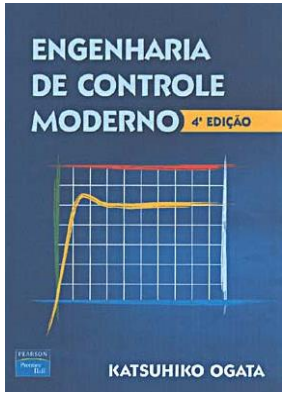
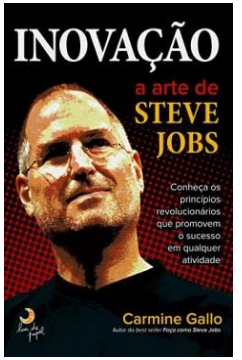
Who we are today...

Technological Information Nucleus (NIT)

2 Employees







- ✓ **Technical and scientific literature ;**
- ✓ **Brazilian service to technical replies;**
- ✓ **Selective dissemination of information Verification of conditions of technical standards to the companies;**
- ✓ **Normatization of documents;**
- ✓ **Clipping**
- ✓ **Evaluation report of anteriority and similarity;**
- ✓ **Standarization of documents.**

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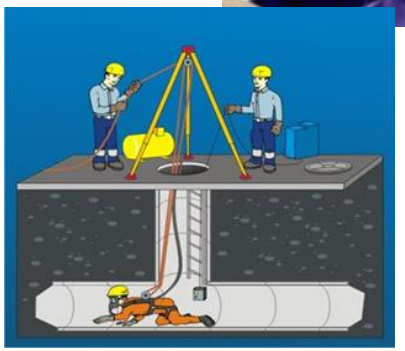
Who we are today...

Safety and Health Nucleus (NST)

9 Employees

- ✓ **Development of didactic safety and health material to SENAI RS;**
- ✓ **Technical support in the Market relationship to SENAI RS;**
- ✓ **Prospection of new oportunities to safety and health area together with industries;**
- ✓ **Consultancy to safety and health area in the companies;**
- ✓ **Technical support to the ISI in safety and health;**
- ✓ **OHSAS 18001 Management in the Institute;**
- ✓ **CIPA and Fire Brigade coordination.**



Who we are today...

Research and Innovation Nucleus (NPI)

6 Employees

5 Trainees

4 Scholarship holders

- ✓ **Aplications of new materials;**
- ✓ **Development and projects of products, machines and components;**
- ✓ **Medical area;**
- ✓ **Processes and optimization of products and manufacturing systems;**
- ✓ **Metrology and quality control.**

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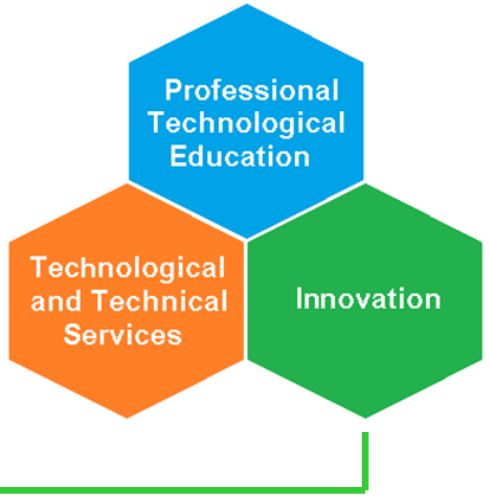
Who we will be tomorrow...

New Building to NPI



- **Applications of new materials**
- **Development and projects of products, machines and components**
- **Processes and optimization of products and manufacturing systems**
- **Medical area**
- **Metrology and quality control**

Who we will be tomorrow...

- **Applications of new materials**
- **Metrology and quality control**
- **Medical area**
- **Development and projects of products, machines and components**
- **Processes and optimization of products and manufacturing systems**

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Who we will be tomorrow...

Research and Innovation Nucleus (NPI)

Lab 1: Materials and mechanical properties, 112 m²

- Semi - automated polishing
- Digital Microscop
- Diffractometer
- Precision cutting

Lab 2: Welding and thermal processes, 112 m²

- 6-Axes Robot
- Multiprocess welding machine
- Oven

Lab 3: Mechanical Trabsformation and Cutting, 112 m²

- Hydraulic Press
- Plasma cutting

Lab 4: Metallurgy and Additive Manufacturing, 114 m²

- Metal Prototyping
- 3D-Prototyping
- Sintering oven

Lab 5: Computational Simulation, 112 m²

- SolidWorks
- Inventor
- CREO
- Catia
- NX
- Virtual Commissioning PLM and Delmia

Lab 6: Precision metrology, 112 m²

- Industrial Tomography

Lab 7: Automation and control processes, 112 m²

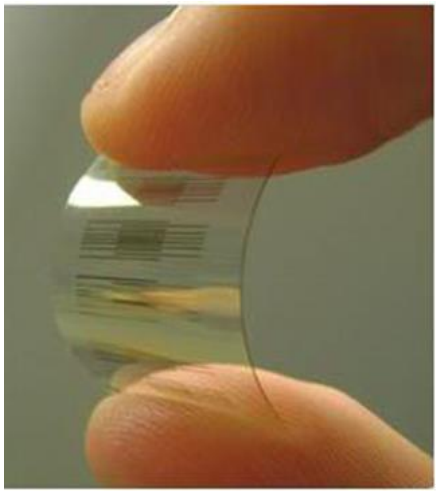
- Artifical vision system
- 6-Axes Robot
- Integrated Manufacturing System
- Programmable logic controller

Lab 8: Tests and Validation, 114 m²

- Machine to dynamic tests
- 3D Scanning
- Tensile strength test machine

First applied research line

Research and Innovation Nucleus (NPI)



material Performance

Wear-resistant materials

Applications of new materials

Metalic lightweight materials

Materials with thermal exchanges

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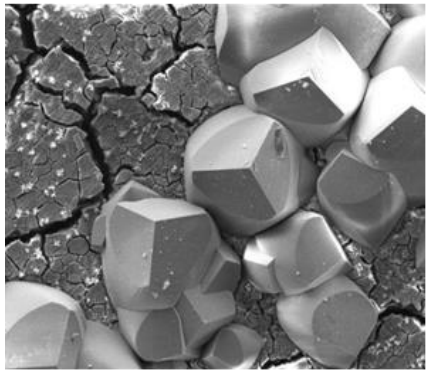
Second applied research line

Research and Innovation Nucleus (NPI)



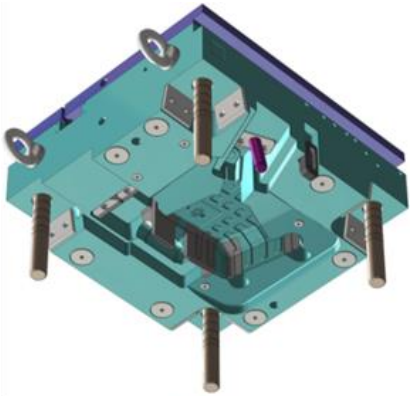
quality Control

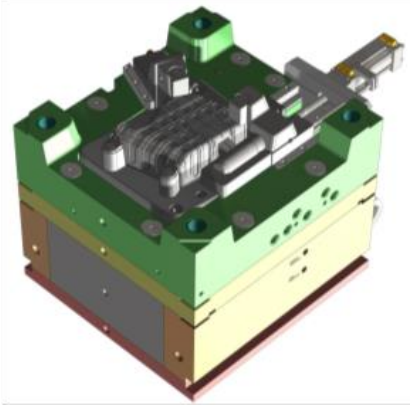
Destructive and non destructive mechanical Tests

Metrology and Quality Control

Capacity in Innovation

Certification





Third applied research line

Research and Innovation Nucleus(NPI)

augmented Reality

smart Prosthesis and orthosis

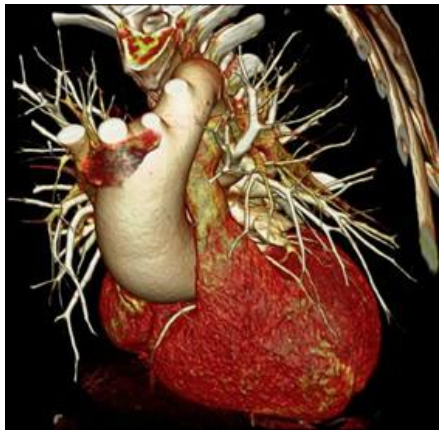
assistive Technology

Medical Area

Medical Equipments

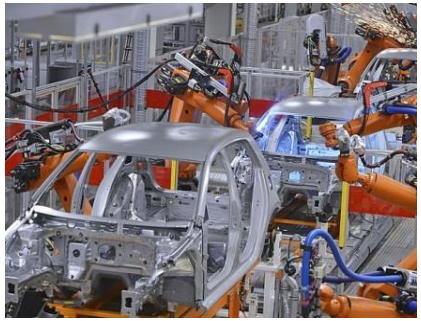
image and signal Processing

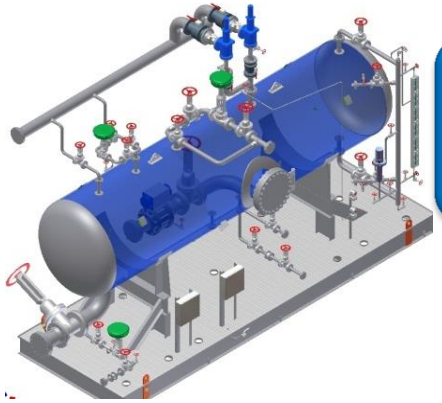
Biomechanics



Fourth applied research line

Research and Innovation Nucleus (NPI)





Simulation CAE

rapid Prototyping

reverse Engineering

Development and projects of products, machines and components

control Elements

thermal Studies

Normatization

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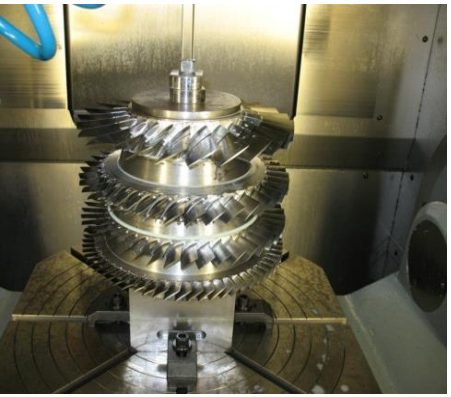
Fifth applied research line

Research and Innovation Nucleus(NPI)



virtual Commissioning

new Technologies of Processes

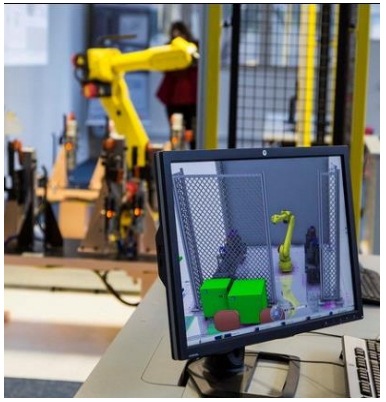
process Optimization

Processes and optimization of products and manufacturing systems

Integrated Manufacturing Systems

Manufacturing and Automation

cost reduction for Processes



Fifth applied research line

Research and Innovation Nucleus (NPI)

Processes

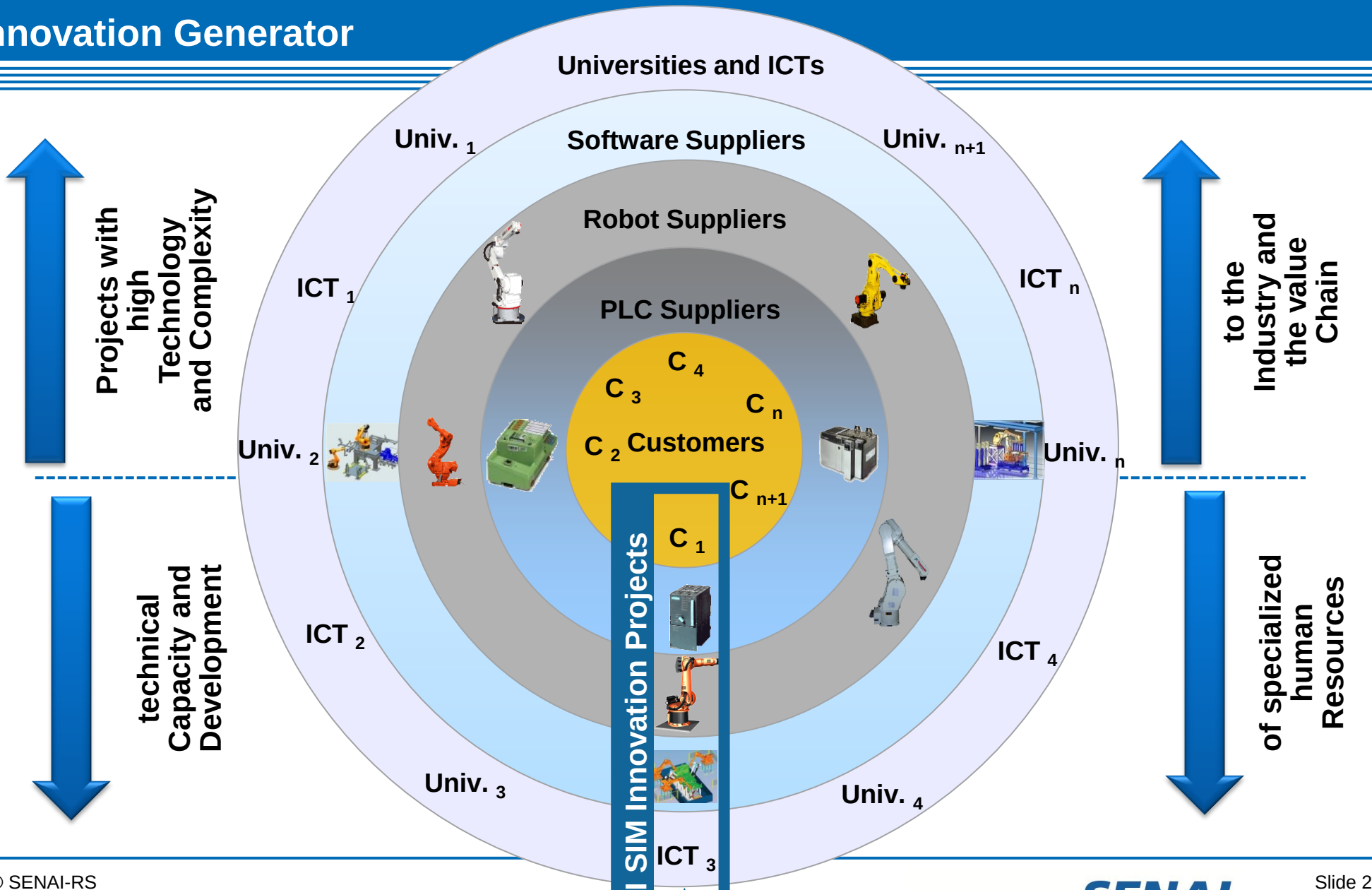
- ✓ Industry Solutions
- ✓ Instruments for applied Research
- ✓ Results for Publications
- ✓ Market Strategy for Research and Innovation

Virtual Commissioning

Distributed Manufacturing in continuous processes
(Standard Parametrization for energy generation using Biogas)

Integrated Manufacturing Systems
(Evolutive Manufacturing)

Innovation Generator



Thank you !

Dr. Ronald Josef Zvonimir Dangel
Operations Manager
Email: ronald.dangel@senairs.org.br

Innovation Senai Institute - ISI
Integrated Solutions in Metal Mechanics - SIM
SENAI - CETEMP

Phone: + 55 (51) 3579.5900, Contact person Mrs. Aidê
Cel.: +55 (51) 9215-2467