



AEROSPACE TECHNOLOGY CONGRESS 2019

SUSTAINABLE AEROSPACE INNOVATION IN A GLOBALISED WORLD

STOCKHOLM WATERFRONT CONGRESS CENTRE, 8-9 OCTOBER 2019

Swedish-Brazilian Cooperation in Aeronautics in Santa Catarina State

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SANTA CATARINA

GOVERNO DE
SANTA CATARINA
SECRETARIA DE ESTADO
DO DESENVOLVIMENTO
ECONÔMICO SUSTENTÁVEL



SANTA CATARINA

AREA: 95.737,90 km²
1,13% OF THE NATIONAL TERRITORY
295 MUNICIPALITIES

POPULATION: 7.001.161 (2017)
10th LARGEST IN NUMBER OF INHABITANTS

GDP: R\$ 249,1 BILLION (2015)
6th LARGEST ECONOMY IN BRAZIL (GDP)



QUALITY OF LIFE

- 193 CAMPI, UNIVERSITY CENTERS, COLLEGES AND TECHNICAL INSTITUTES
- LOWER ILLITERACY RATE
- 3rd HIGHEST HDI IN THE COUNTRY (0,774)
- HIGH LIFE EXPECTANCY (79 YEARS)
- LOWER RATE OF INFANT MORTALITY IN THE COUNTRY



QUALITY OF LIFE

- BEST INDICATOR OF ECONOMICALLY ACTIVE YOUNG PEOPLE (86%)
- LOWER UNEMPLOYMENT RATE IN THE COUNTRY
- LOWER LEVEL OF SOCIAL INEQUALITY AND INCOME DISTRIBUTION

ECONOMY AND BUSINESS

3rd MOST INDUSTRIALIZED
STATE IN BRAZIL

5th MOST OPEN ECONOMY IN
BRAZIL (EXP + IMP / GDP)

STRONG AND
DIVERSIFIED ECONOMY

2nd LARGEST PRODUCER OF
CHICKEN MEAT AND RICE

LARGEST PRODUCER OF PORK, APPLE,
ONIONS, OYSTERS AND MUSSELS

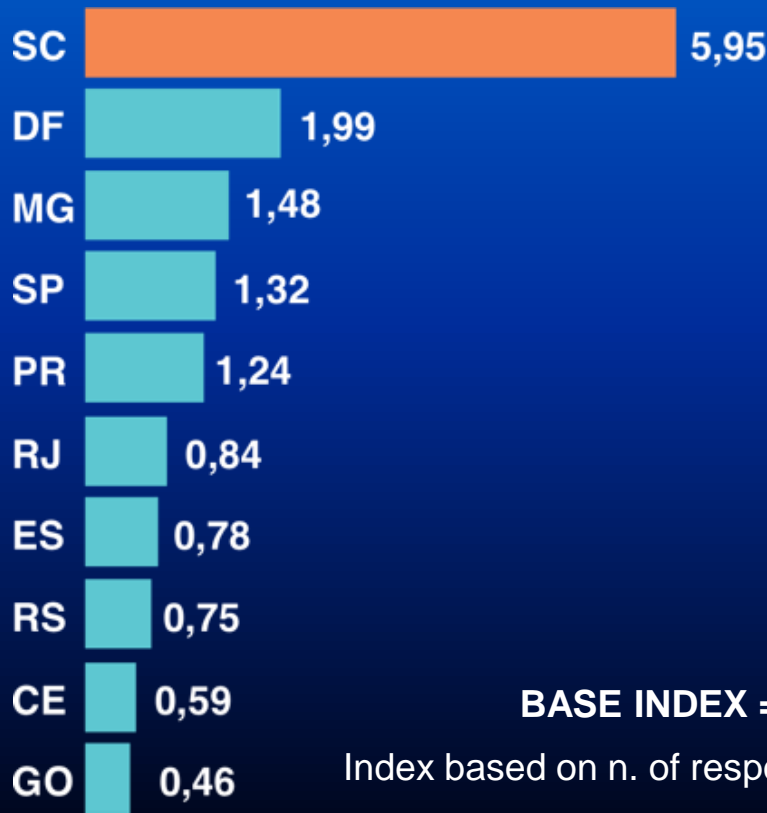
ONE OF THE BEST INDICES OF INDUSTRIAL
CONFIDENCE (66.6 Santa Catarina / 63.2
Brazil)

2nd STATE WITH THE HIGHEST
COMPETITIVENESS INDEX IN BRAZIL

GOVERNO DE
**SANTA
CATARINA**
SECRETARIA DE ESTADO
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ECONÔMICO SUSTENTÁVEL

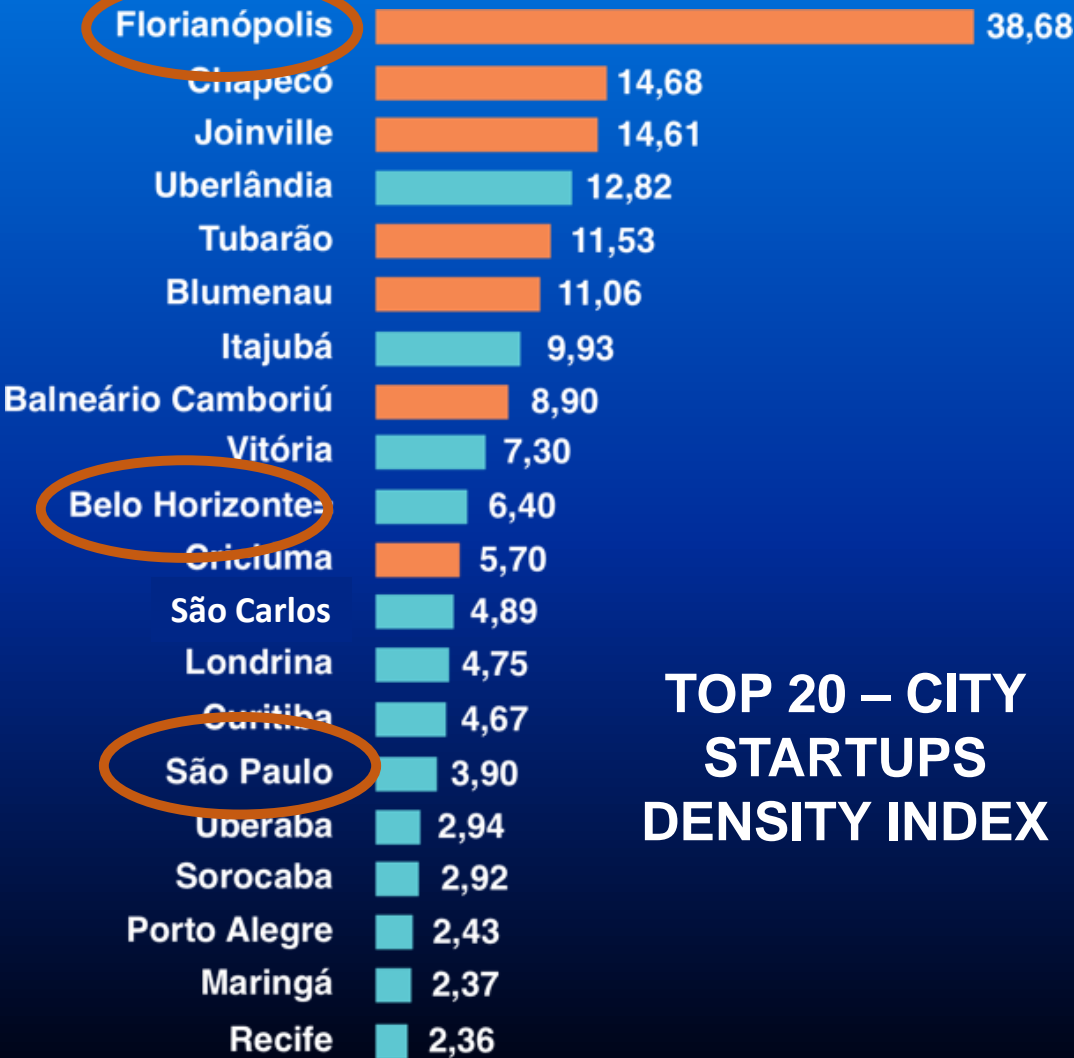
Innovation Ecosystem

TOP 10 – STARTUPS DENSITY INDEX BY STATE



BASE INDEX = 100 (Brazil average)

Index based on n. of responding startups / n. inhabitants



TOP 20 – CITY STARTUPS DENSITY INDEX

Source: Radiograph of the Brazilian Startup Ecosystem 2017. Panorama IBGE, Abstartups and Accenture analysis.

Florianópolis: Innovation Ecosystem

More than 600 technology companies

2 high quality public universities

15 graduate educational institutions

4 Venture Capital funds



1st Brazilian capital in digital inclusion

One of the best 10 cities to work and live in the world (*Newsweek*)

The best Brazilian capital in life quality

The friendliest city in world (*Condé Nast Traveler*)

Model Benchmarking



References:

- TDP – Technology Demonstration Platforms
- Technology Demonstrators
- Multi-user laboratory

topology

connection types

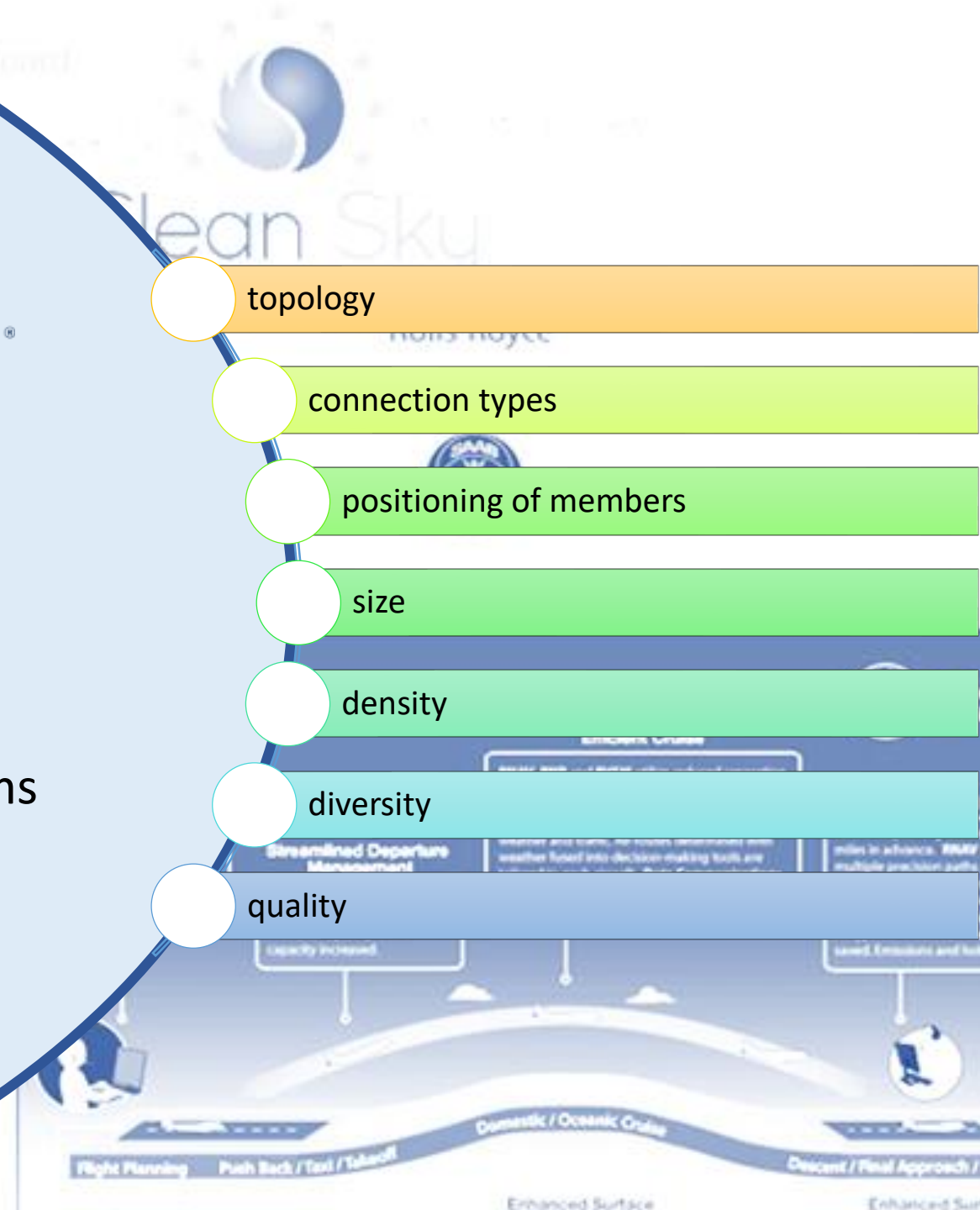
positioning of members

size

density

diversity

quality



The creation of SC2C.Aero

Cooperation on Aeronautics at UFSC and Certi and the Brazil-Sweden cooperation

From 2000

Research projects
with Embraer

From 2014

Cooperation and
research projects with
Embraer, Saab, KTH, LiU

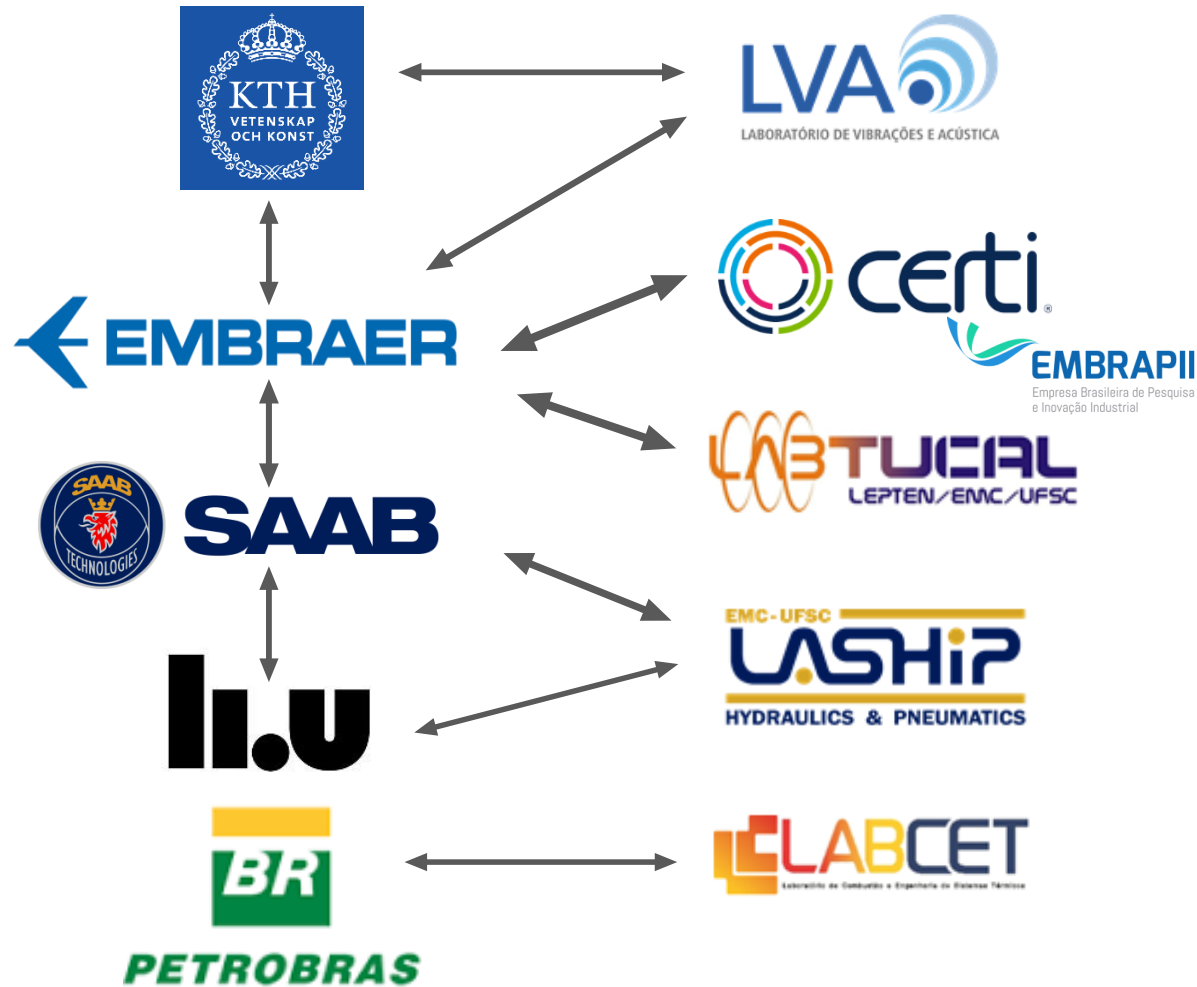
From 2017

SC2C.Aero

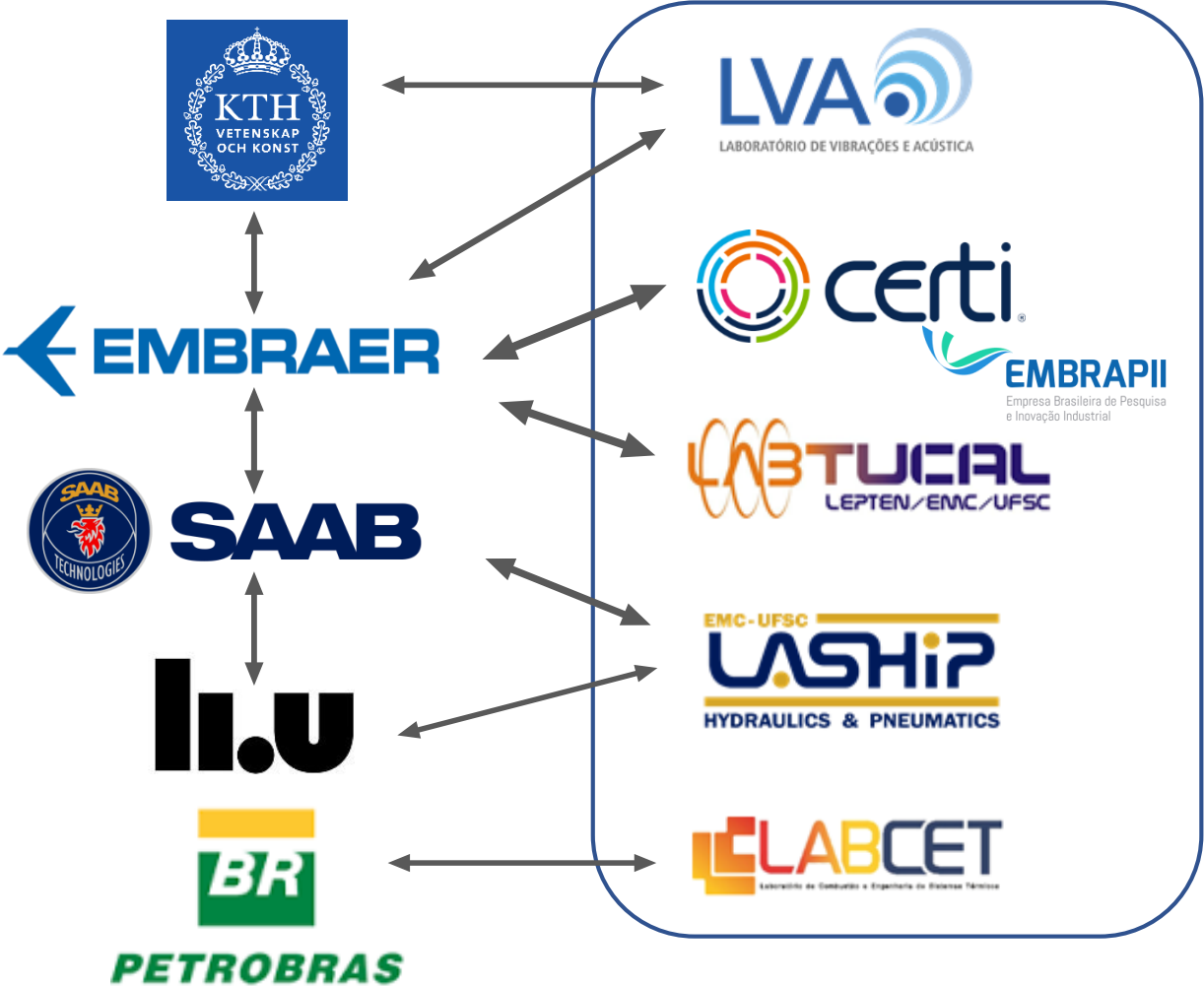
Santa Catarina's Center of Convergence
for Aerospace Technologies

The creation of SC2C.Aero

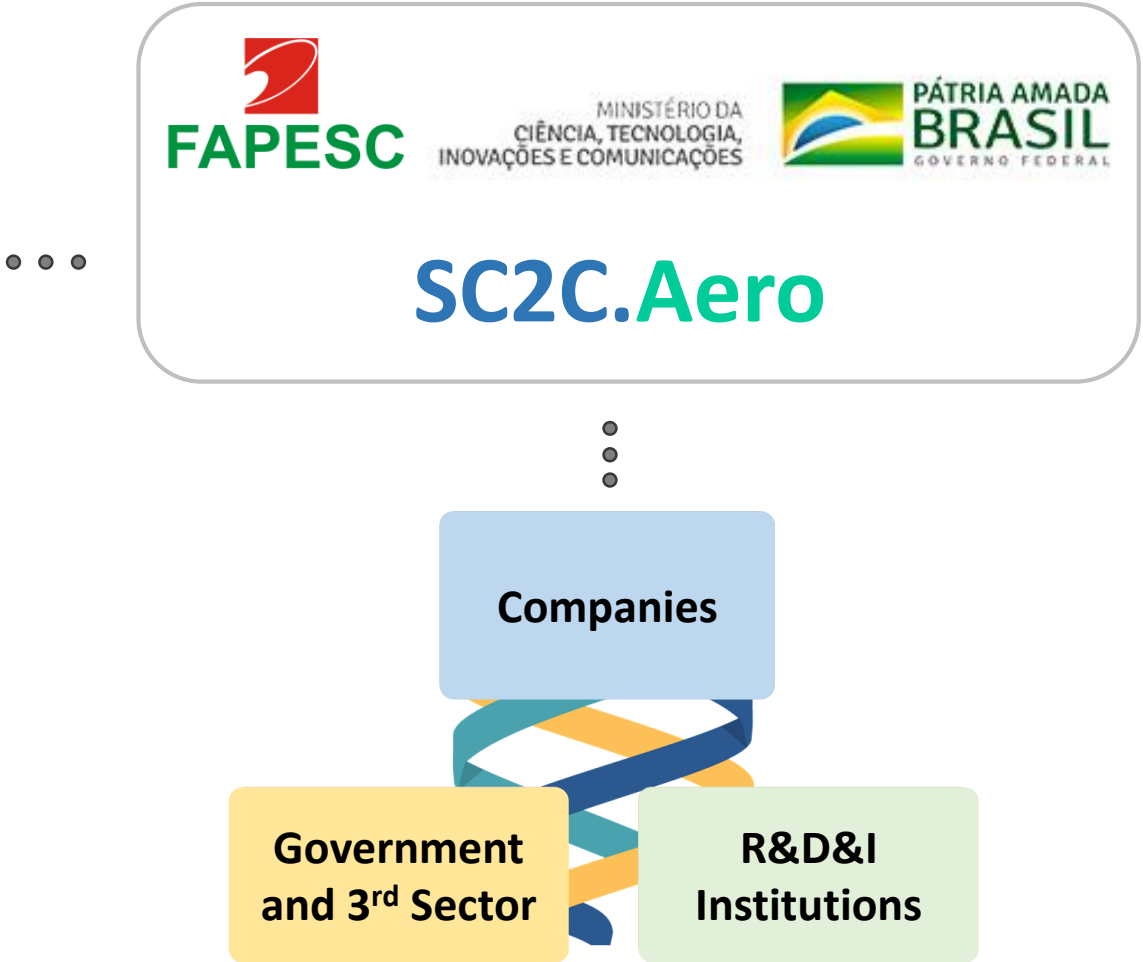
Per.-to-per. Connections: Transactional Partnerships



The creation of SC2C.Aero



Evolving to Transformative Partnerships



The SC2C.Aero

Institutional agreements with Swedish universities...
...a step towards transformative partnerships



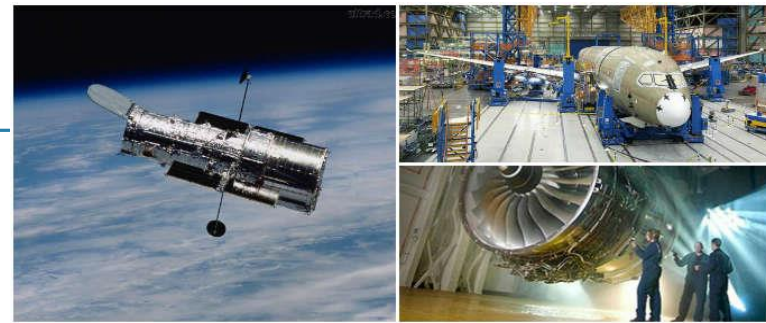
Digital Convergence and Mechatronics
Metrology and Instrumentation
Productive Processes and Advanced
Manufacturing



INSTITUTO **SENAI**
DE INOVAÇÃO METALMECÂNICA

SC2C.Aero

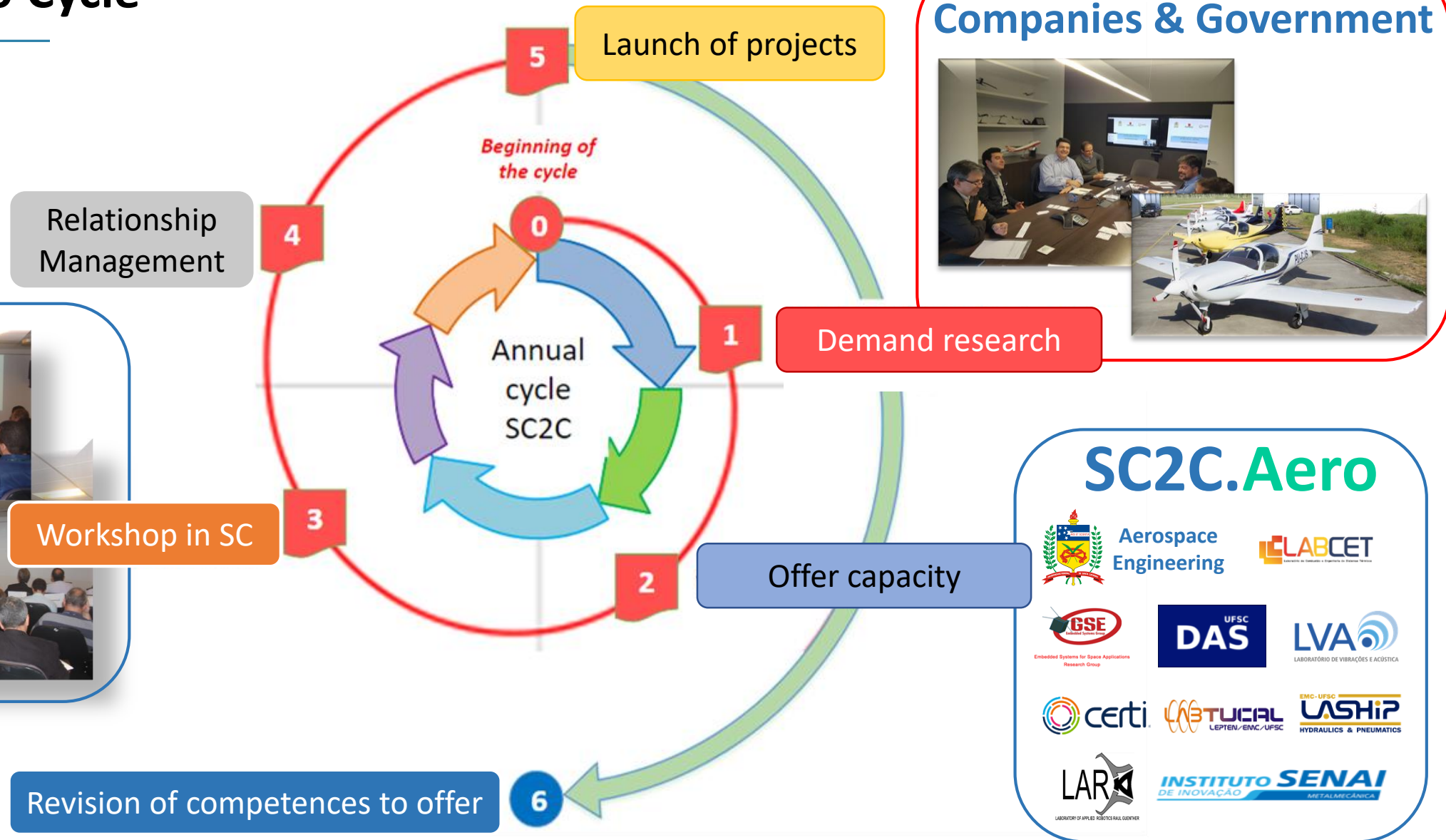




MISSION To attract public and private investments from Aerospace Sector to the State of Santa Catarina through **collaborative work as a technology convergence center**

VISION In 2030, the **State of Santa Catarina** will be on the top three states in Brazil considering the investments in the Aerospace Sector - and the network and its members will be organized as an important driver to keep this position.

The SC2C.Aero Cycle

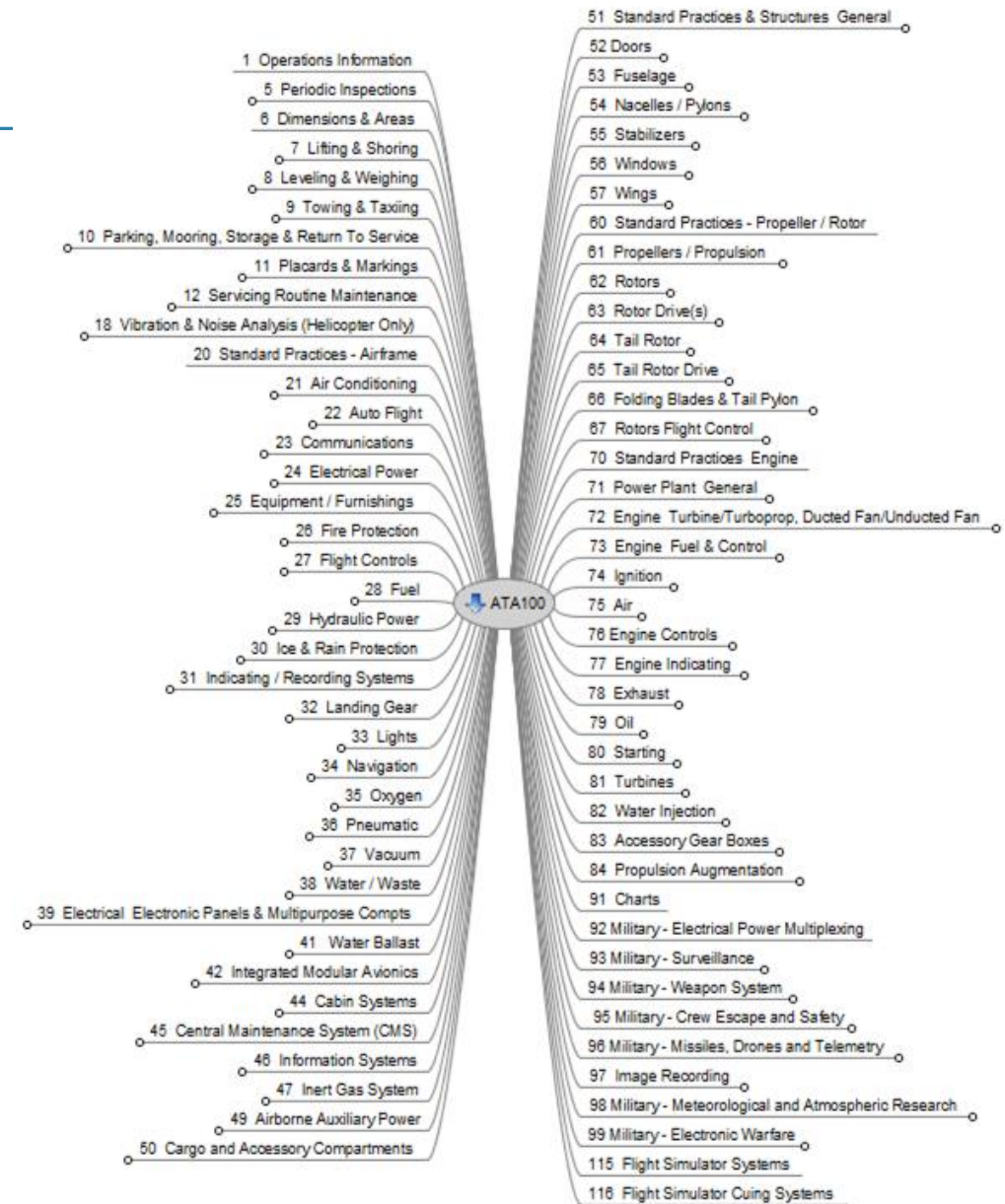
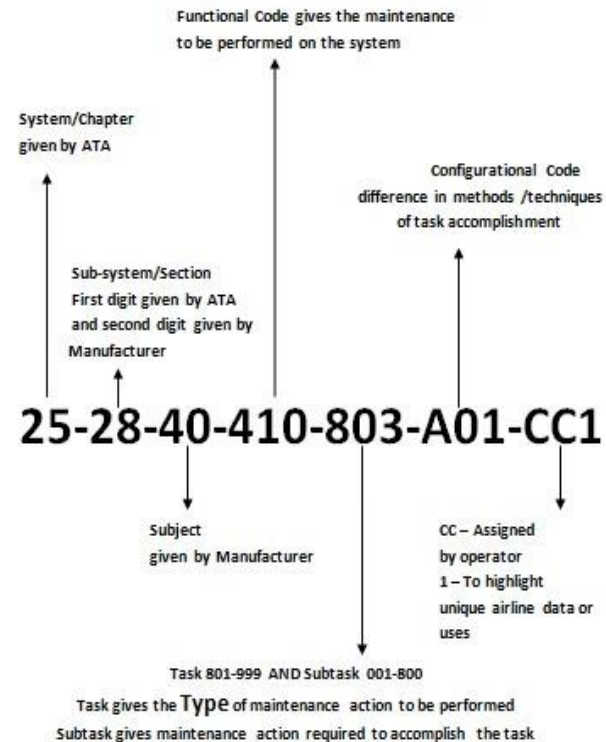


Common language: Taxonomy for companies



Air Transport Association

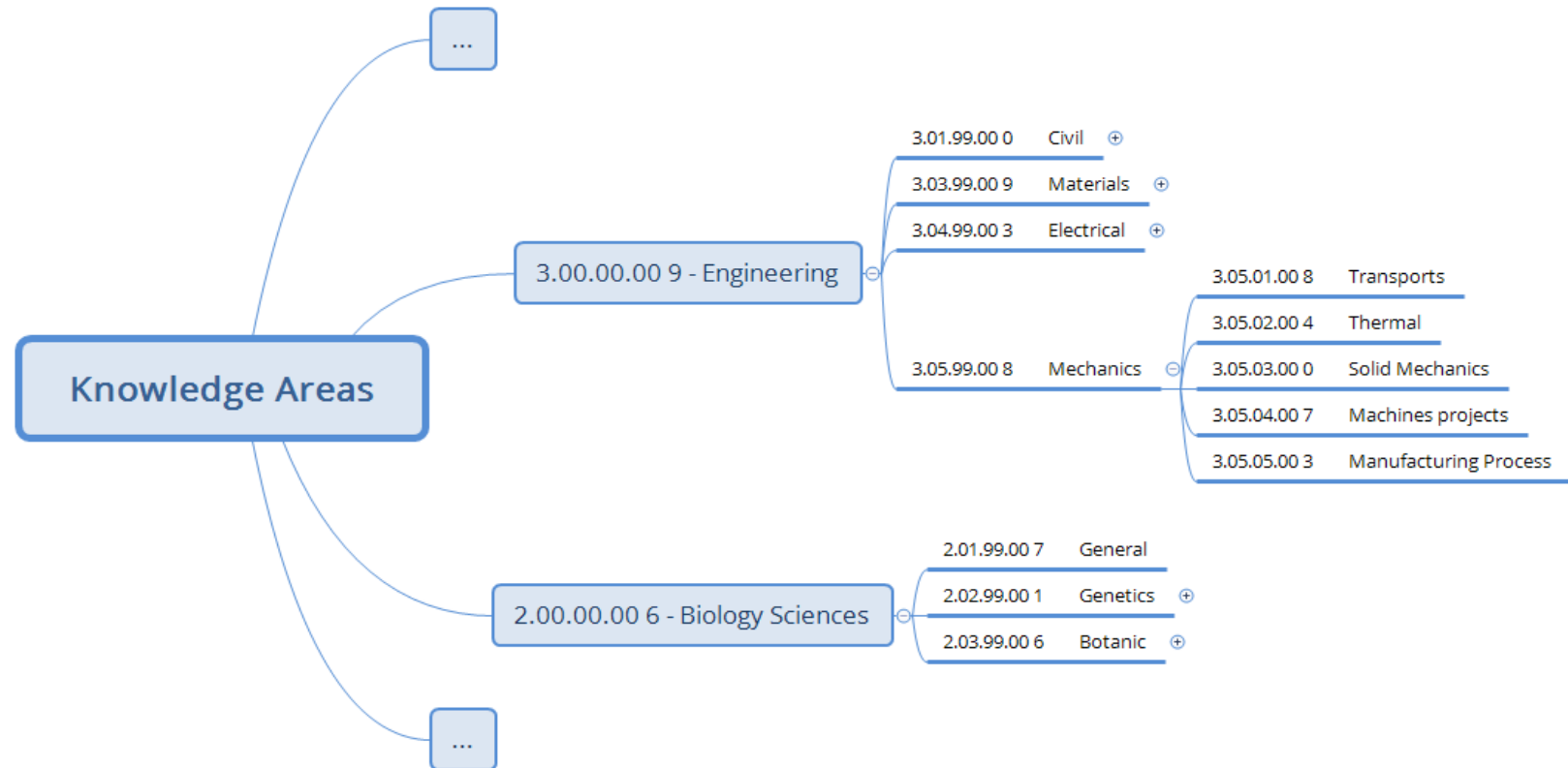
ATA 100
ATA iSpec 2200
S1000D
STD 1808A
...



Common language: Taxonomy for R&D in Brazil



R&D&I institutions usually consider their taxonomy based on knowledge areas.



Common language: ASTERA



European Aeronautics
Science Network

ASTERA taxonomy for aeronautical R&T

<https://easn.net/research-technology-areas/>

ACARE taxonomy: a common european taxonomy for aeronautical research technology

Advisory Council for Aeronautics Research in Europe (ACARE)



Common language: ASTERA

AERONAUTICAL RESEARCH & TECHNOLOGY AREAS

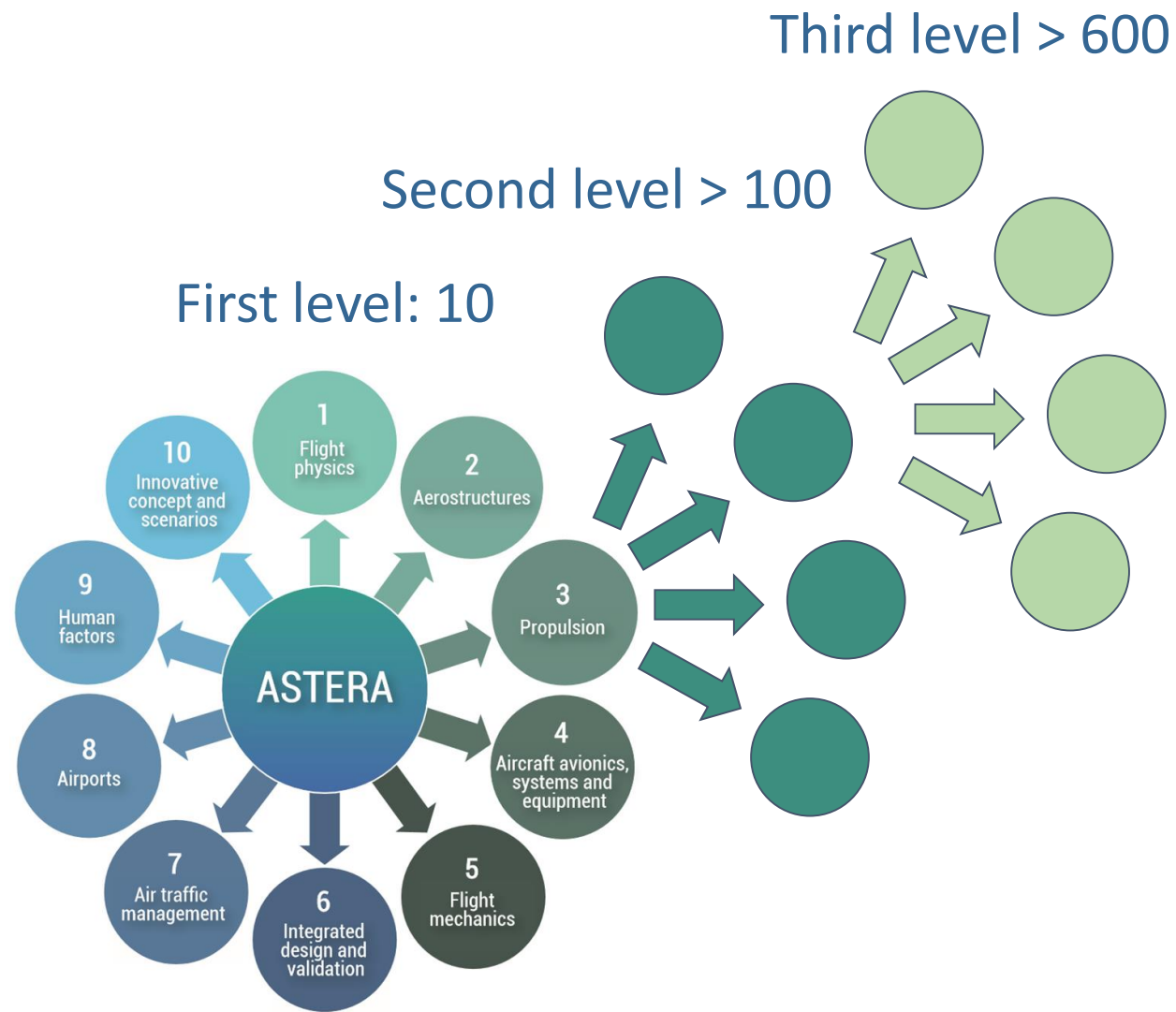
A Working Group consisting of NLR, QinetiQ and ONERA constructed the **ASTERA taxonomy** for aeronautical R&T. This is a hierarchical taxonomy that

The **ASTERA taxonomy** has been defined, reviewed and agreed upon by a **considerable group of experts** from different fields within the European approach a classification of university activities in the field of aeronautics.

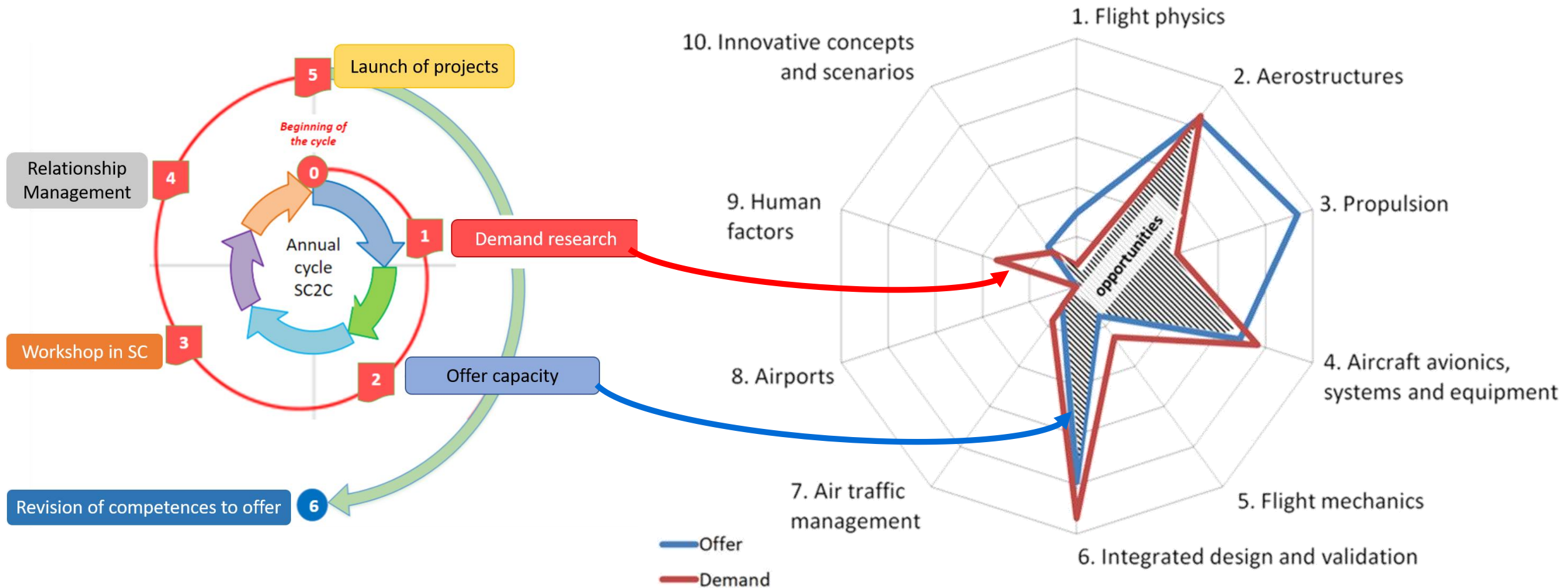
No By clicking on the items you can find the correspondent definitions and the list of EASN members for each area of activity:	
1	Flight Physics
2	Aerostructures
3	Propulsion
4	Aircraft Avionics, Systems and Equipment
5	Flight Mechanics
6	Integrated Design and Validation
7	Air Traffic Management
8	Airports
9	Human Factors
10	Innovative Concepts and Scenarios

Aerostructures	
No	Definition & Sub-domains
2.1	Metallic Materials & basic processes
2.2	Non-Metallic Materials & basic processes
2.3	Composite Materials & basic processes
2.4	Advanced Manufacturing Processes & Technologies
2.5	Structural Analysis and Design
2.6	Aero-elasticity
2.7	Buckling, Vibrations and Acoustics
2.8	Smart Materials and Structures
2.9	Structures behaviour and Material Testing
2.10	Internal Noise prediction
2.11	Helicopter Aero-acoustics
2.12	Noise Reduction
2.13	Acoustic Measurements and Test Technology
2.14	Aircraft Security

Metallic Materials & basic processes	
Definition: High temperature materials for engines and light alloys for airframe development of new materials. Development of new assembling furnaces, powder metallurgy, deposition techniques, oxidation analysis, scanning electron microscopy and microanalyses). Med	
Sub-domains:	1. Superalloys. 2. Aluminium alloys. 3. Titanium aluminides. 4. New weldable alloys. 5. Coatings. 6. Oxidation, corrosion. 7. Assembling processes. 8. Repairing processes. 9. Microchemical analysis

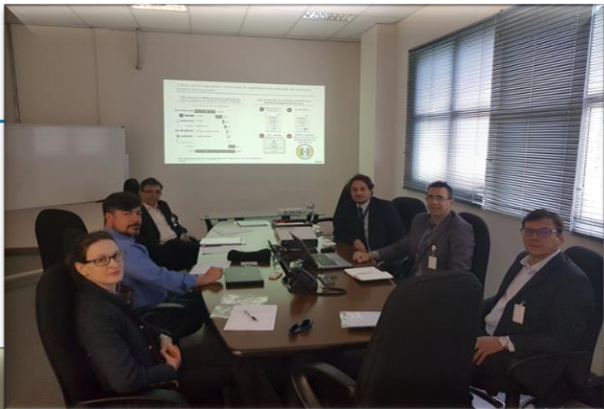


Demands and Offers Indexed on the ASTERA Taxonomy



Cycle 2017-2018

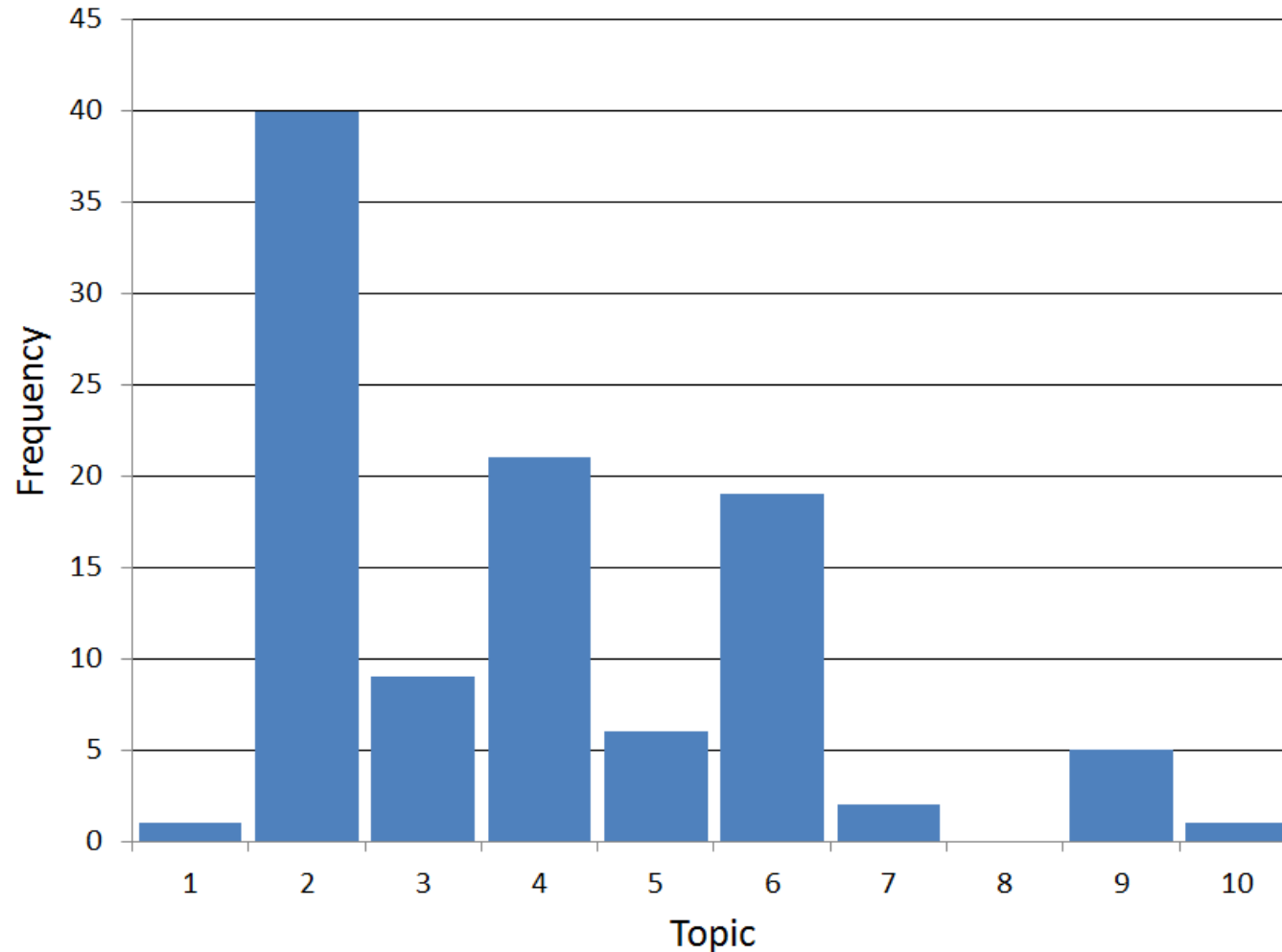
Demand Map & presentation of SC2C.Aero



- by Company
- by Taxonomy
- by Theme:
 - Education
 - Raw Material
 - Process
 - Products and components
 - Technological Services
 - Regulation



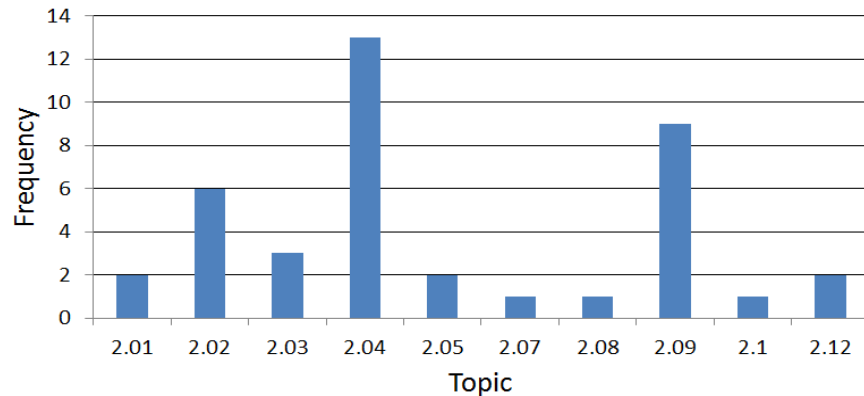
Results of Annual Cycle: Demand Map



- The topics of interest were matched with possible 104 items of the taxonomy;
- The areas of activity most cited:
 - 2 - Aerostructures,
 - 4 - Aircraft avionics, systems and equipment, and
 - 6 - Integrated design and validation.

Results of Annual Cycle: Demand Map

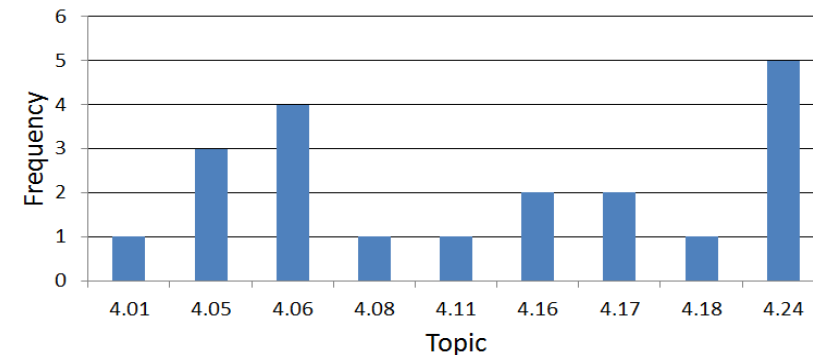
2. Aerostructures



The main **Aerostructures** subitems:
2.04 - Advanced manufacturing processes & technologies;
2.09 - Structures behavior and material testing;
2.03 - Composite Materials & Basic Processes.

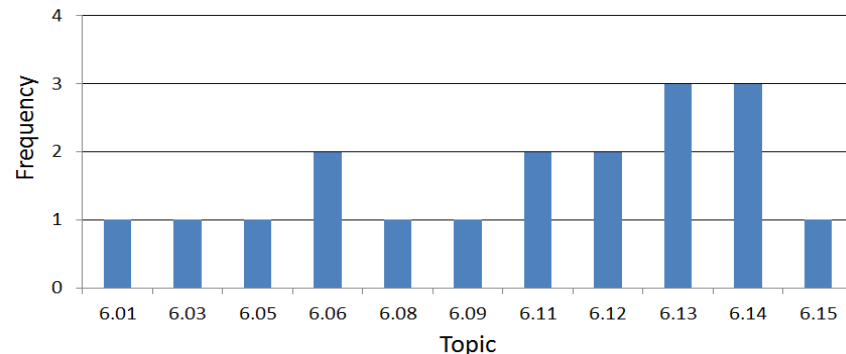
The main **avionics** subitems:
4.24 - Landing gear and braking systems;
4.06 - Sensors integration.

4. Aircraft avionics, systems and equipment

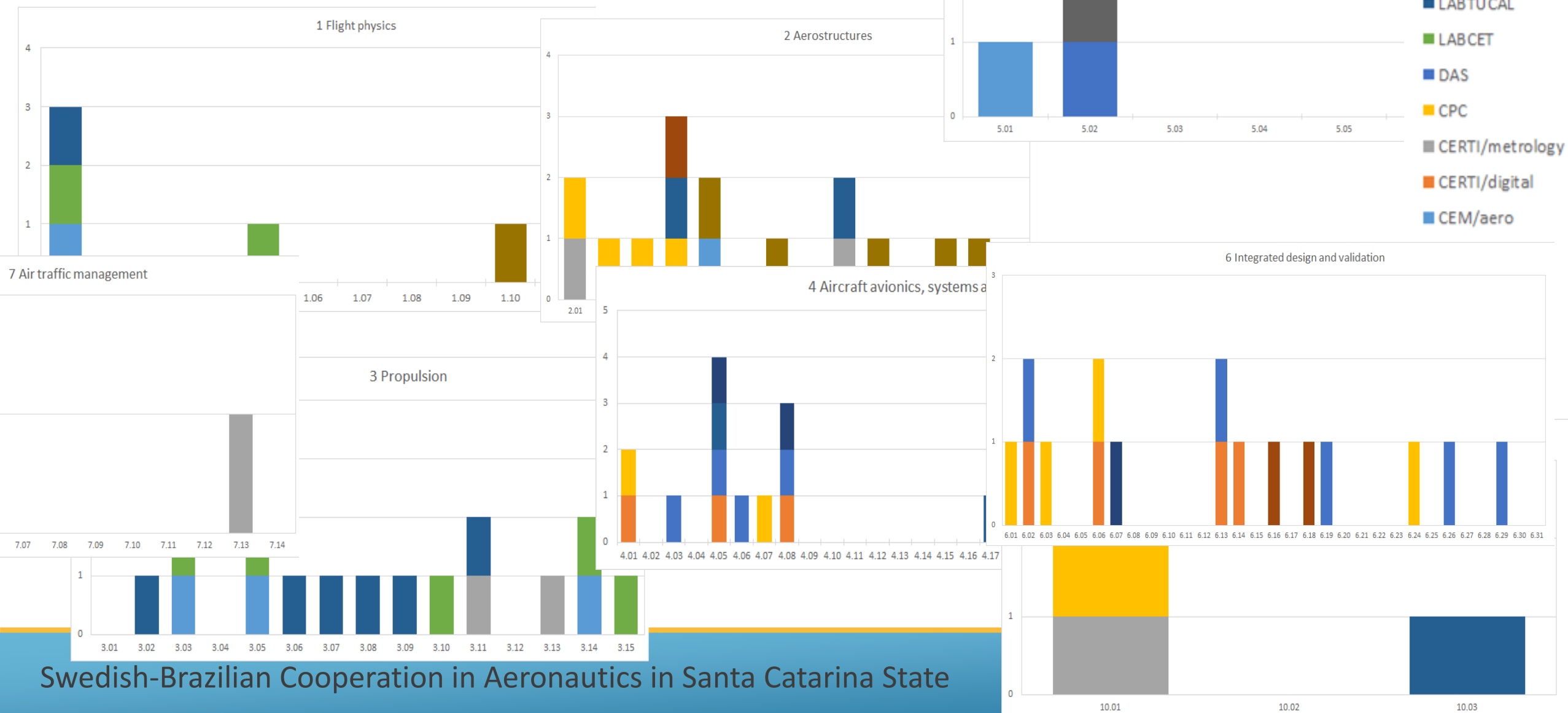


The main **integrated design** subitems:
6.13 - Aeronautical software engineering;
6.14 - Advanced information processing.

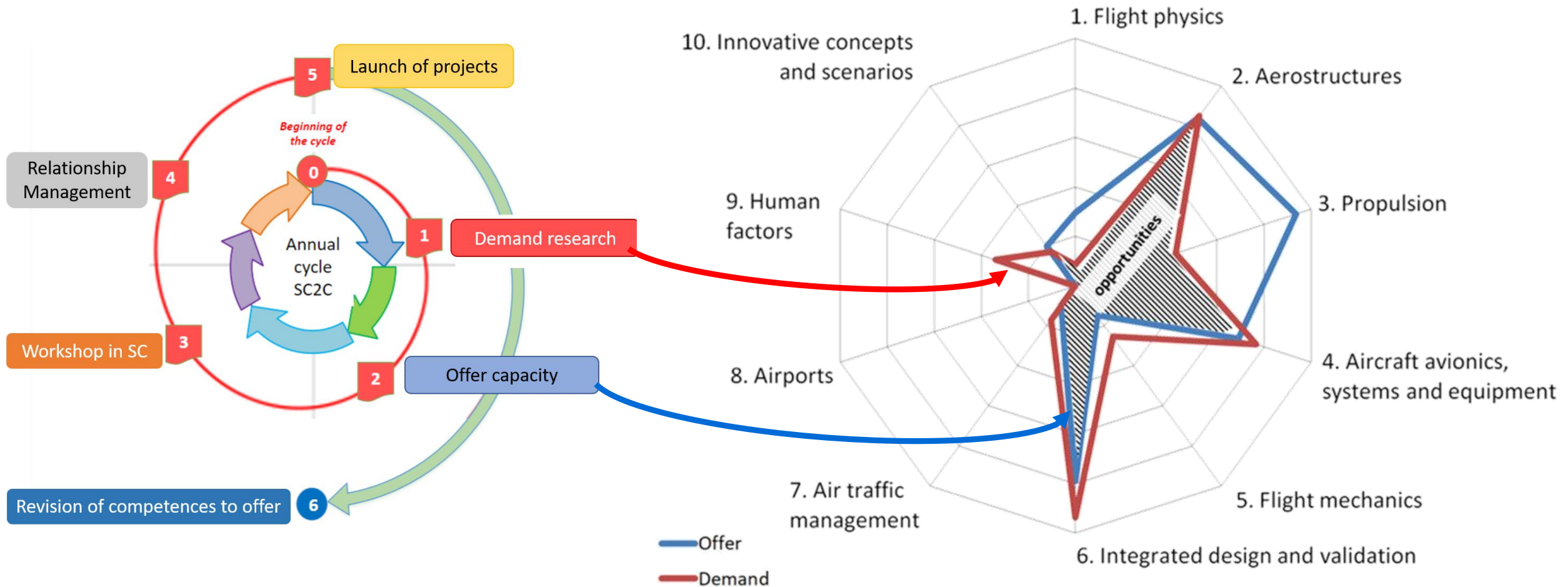
6. Integrated design and validation



Results of Annual Cycle: Offer Map



Demands and Offers Indexed on the ASTERA Taxonomy





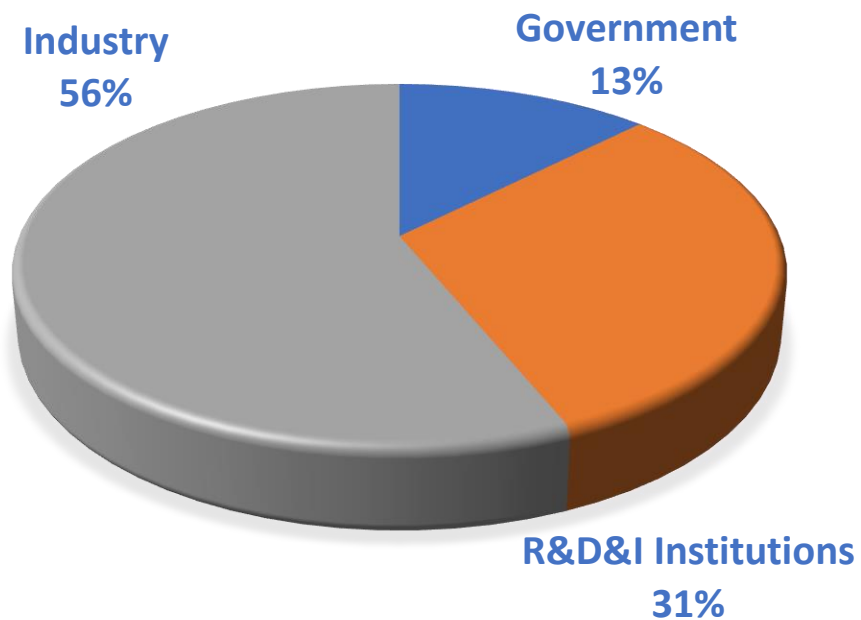
1st Workshop SC2C.Aero

MAY 3 - 4, 2018 • FLORIANÓPOLIS/SC • BRAZIL

Organization



Support



120 Participants
from Brazil and Sweden



Embaixada da Suécia
Brasília



MINISTÉRIO DA
CIÊNCIA, TECNOLOGIA,
INOVAÇÕES E COMUNICAÇÕES



MINISTRY OF
DEFENSE



SAAB

I.I.U



INSTITUTO
FEDERAL
Santa Catarina



Management of **national and international agreements**;
Customer and partner relationship management;
Support for **implementation of development processes** for
the aeronautical sector;



Encourage business with cooperation between *innovative companies*, **demanding technological solutions**, and
RD+I Institutions, **providing qualified offer**.



Database creation and maintenance for demands, offers and
funding sources;

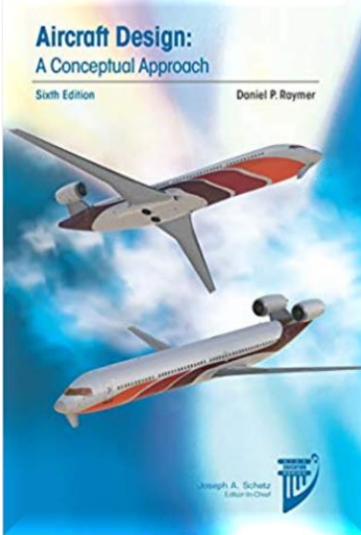


International matchmaking events and educational programs.

Educational Programs

SARC / SC2C.Aero 5-Day Conceptual Aircraft Design Course with Daniel P. Raymer

Florianópolis, March 2019



Swedish Aeronautical
Research Center



From Sweden: 23 PhD st. + 4 prof.

From Brazil: 18 PhD st. + 7 ind. + 3 prof.

More than 50 Brazilian applicants





Swedish-Brazilian Cooperation in Aeronautics in Santa Catarina State

Centers of Reference in Innovative Technologies, Brazil

Federal University of Santa Catarina, Brazil

www.sc2c.ufsc.br

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