



Selex ES

A Finmeccanica Company

Industry Relations

Contribution to AESS strategic planning meeting

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AESS BoG Spring 2013 Meeting

Ottawa, Canada,

May 3-4, 2013



 An introduction to

- ASD



- AIAD



- Finmeccanica



- Selex ES





Profile

ASD is the Association that represents the interests of four European industries



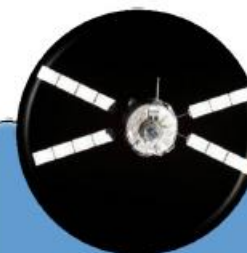
Aeronautics



Defence



Security



Space

€171 billion 730,000 employees 2,000 companies 80,000 suppliers



- ⌚ AIAD is the Italian Industry organization, member of Confindustria. It is a private non-profit organization, financed by its Member Companies.

- ⌚ It represents High Technology Italian Industry almost in its entirety, for the design, construction, research and service of products destined to institutional or similar customer in the following sectors:
 - Civil and Military aerospace,
 - Military Land and Naval,
 - Electronic Systems and Equipment.

- ⌚ Since February 2009, in order to fulfil the requests of Confindustria and to improve its level of representation, AIAD changed its name, while maintaining the same acronym and logo (AIAD), to become "Federation of Italian Companies for Aerospace, Defense and Security".

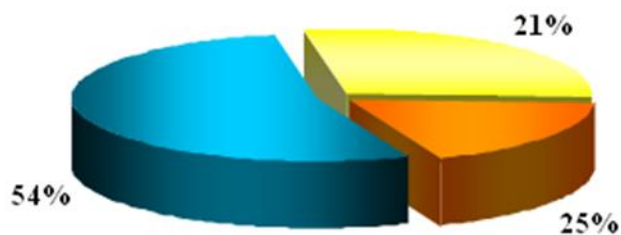
AIAD is member, of the European Association (ASD). It represents the proper interface with all national and international institutions aiming to coordinate any action requiring a collective expression of the relevant national interests.



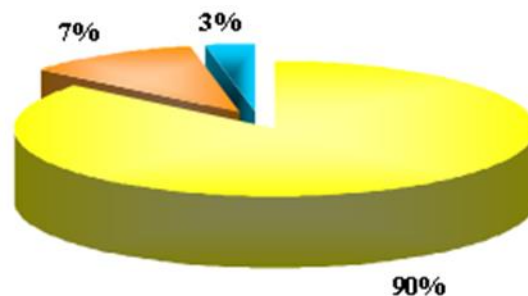
Member Companies : ~ 120



Breakdown by company dimension



Breakdown by company employees



-  **Big Companies > 250 Employees**
-  **Medium Companies < 51 - 250 Employees**
-  **Small Companies < 50 Employees**



Italian Defence Industry Key Figures for 2011



- **Workforce:** **50.400** employees
- **Turnover:** **>13,5 Bil. €**
- **Export:** **about 60%** of the turnover

The performance of the Aerospace, Defence and Security industry, has remained over the years a strong driven for the Italian economy, well beyond its dimension (about 1% of GDP).

It generates technology spillovers in many related field with a multiplier effect of more than twice on the induced employment.

Moreover it has had for many years a positive trade balance which for 2011 is around € 4.5 billion (the national trade deficit was € 25,8 billion).

Its dimension ranks 4th in Europe and 7th in the World.

Finmeccanica is a leader in the high technology sector and ranks among the top ten global players in **Aerospace, Defence and Security**.

With about **70,000 employees worldwide**, Finmeccanica generated in 2011 revenues of approximately **EUR 17.3 billion**.

We operate in:

HELICOPTERS

SPACE

ENERGY








DEFENCE AND SECURITY
ELECTRONICS

DEFENCE SYSTEMS

TRANSPORTATION

AERONAUTICS



| | | | |
|---|---|--|--|
| <p>HELICOPTERS</p> <p>AgustaWestland AgustaWestland Tilt-Rotor Company NHIndustries</p> <p>Revenues EUR 3,915 mil.</p> <p>Workforce 13,303</p>  | <p>DEFENCE AND SECURITY ELECTRONICS</p> <p>DRS Technologies Selex ES</p> <p>Revenues EUR 6,035 mil.</p> <p>Workforce 27,314</p>  | <p>AERONAUTICS</p> <p>Alenia Aermacchi SuperJet International ATR Eurofighter GmbH</p> <p>Revenues EUR 2,670 mil.</p> <p>Workforce 11,993</p>  | <p>SPACE</p> <p>Telespazio Thales Alenia Space</p> <p>Revenues EUR 1,001 mil.</p> <p>Workforce 4,139</p>  |
| <p>DEFENCE SYSTEMS</p> <p>Oto Melara WASS MBDA</p> <p>Revenues EUR 1,223 mil.</p> <p>Workforce 4,066</p>  | <p>ENERGY</p> <p>Ansaldo Energia*</p> <p>Revenues EUR 981 mil.</p> <p>Workforce 1,872</p>  | <p>TRANSPORTATION</p> <p>AnsaldoBreda Ansaldo STS BredaMenarinibus</p> <p>Revenues EUR 1,877 mil.</p> <p>Workforce 6,876</p>  | <p>Revenues and Workforce for business sector at 31 March 2012</p> <p>(*) In 2011 Finmeccanica sold 45% of the share capital of the Ansaldo Energia. As a result of this sale, Ansaldo Energia Holding and its subsidiaries have been consolidated on a proportional basis as of the transaction date.</p> <p>Owned company Joint venture</p> |

From: www.finmeccanica.it/Corporate/EN/Corporate/II_Gruppo/Profilo/

Finmeccanica delivers innovation in technology and services that improve the quality of people's lives. Through research and development with our strategic partners, we are committed to bringing to the world a portfolio of customer-focused products that anticipate and satisfy its current and future needs.

VISION

To consolidate and build on our position as a global high-tech leader deeply rooted in the defence sector and able to succeed in the civil sector through the development of dual-use technologies and platforms.

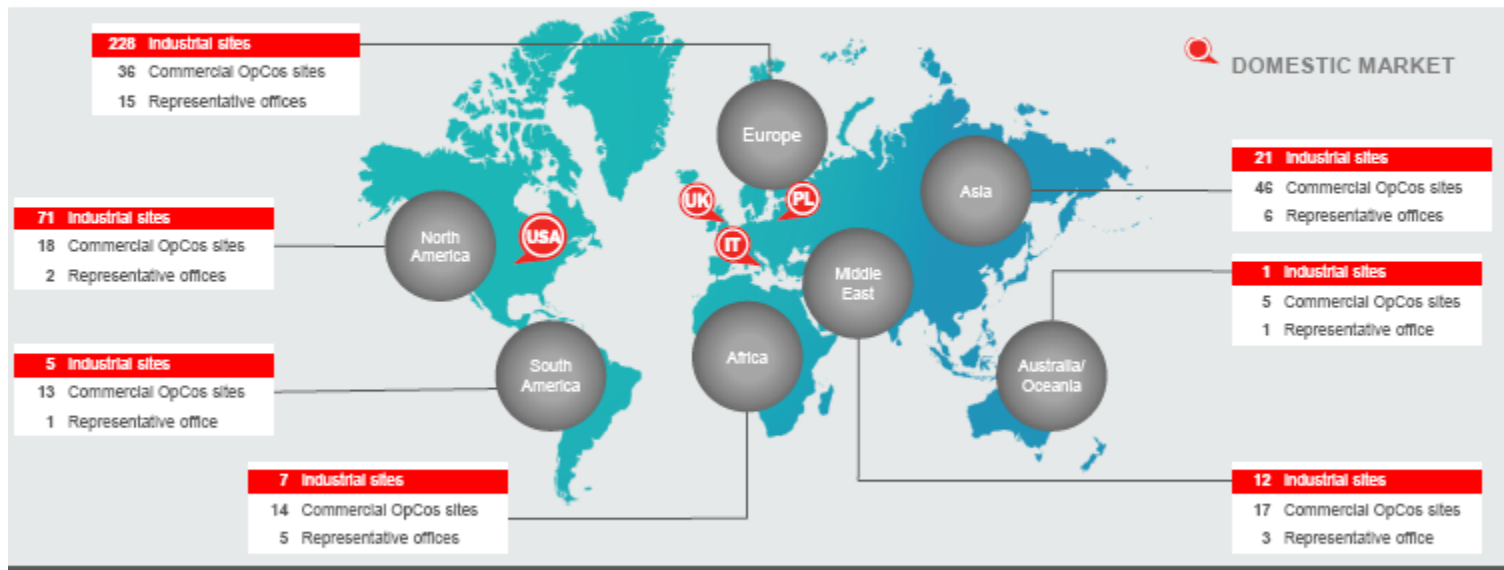
MISSION

To deliver innovation through cutting-edge and competitive products and services generating value for our Customers and Shareholders.



WORKFORCE AND INDUSTRIAL PRESENCE AROUND THE WORLD

We operate globally and respect the culture of every country.



Finmeccanica employs about 70,000 people in over 50 countries around the world; nearly 150 nations use our products.



✦ Mission Critical Systems and Defensive Aids Systems



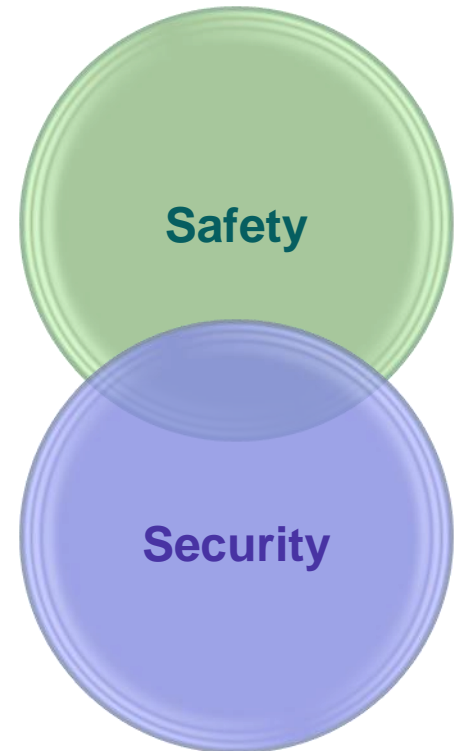
✦ Integrated Networking Solutions for Netcentric Capabilities



✦ Sensors & Systems for Homeland Protection, Homeland Defence, ATC/ATM, VTMS



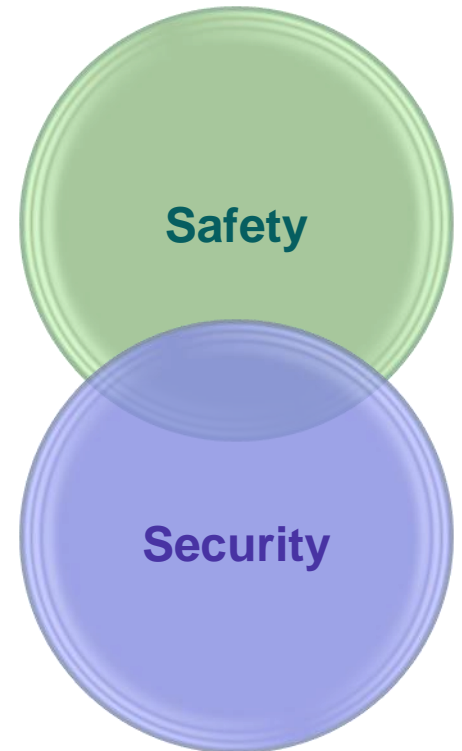
The focus
is shifting
from conventional
to
asymmetric
and
cybernetic threats





Conventional threats
+
Asymmetric threats:

- Unconventional battlefield
- Unconventional weapons (WMD)
- Cybernetic warfare
- Rogue actors



A complex world needs a smarter protection

To establish a customer-focused international business that can:

- ⇒ approach complex challenges with an expanded knowledge base
- ⇒ synergise existing competencies in the air, land, sea, military and civil domain to enhance security & safety
- ⇒ offer the customer a single point of access to address requirements across defence, safety & security, smart solutions (cities, grid, infrastructures)
- ⇒ increase the value of our existing products and systems
- ⇒ develop focused solutions for a broad range of civil and military requirements by leveraging the breadth of our dual application technologies
- ⇒ achieve a deeper level of customer intimacy
- ⇒ develop through-life customer support strategies tailored to customer needs
- ⇒ harness innovation and R&D to ensure timely delivery of critical technologies to our customers



Key facts

- ✦ 17,900 people
- ✦ Revenues in excess of 3.5 billion Euros
- ✦ Italy and UK as domestic markets
- ✦ Strong footprint in
 - US
 - Germany
 - Romania
 - Brazil
 - Saudia Arabia
 - India
 - Turkey

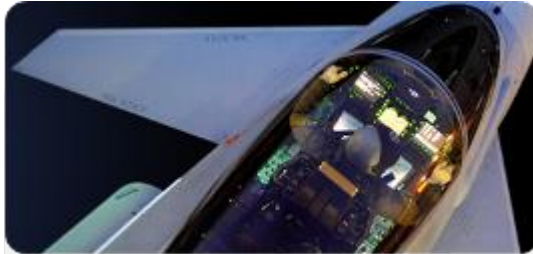


The Divisions

- ✦ Airborne & Space Systems
- ✦ Land & Naval Systems
- ✦ Security & Smart Systems



Entrusted to deliver technology-enabled systems and solutions for a safer, smarter and more secure society



Airborne and Space Systems Division

- Airborne radar
- Sensors
- Electronic warfare systems
- Avionics
- Integrated mission systems
- Airborne surveillance systems
- Tactical UAS
- Target drones
- Simulation systems
- Space sensors and equipment



Land and Naval Systems Division

- Integrated command land and naval command and control systems
- Land and naval radar
- Electro-optical sensors
- Tactical communication systems and equipment
- Battlefield protection systems and equipment



Security and Smart Systems Division

- Homeland and critical infrastructures' protection and security architectures
- Secure communications systems
- Information technology
- Information management and automation systems
- Airport systems
- Air traffic and vessel management and control systems

The **Chief Operating Officer** function brings together the Engineering and Production activities to serve the three divisions by creating and exploiting technology, product and systems' synergies.

- ✦ AESS vision with regards to Industry.
- ✦ A large percentage of AESS members is from Industry.
- ✦ An example of top 20 Aerospace & Defence Companies.
- ✦ Contact top aerospace companies and put their HR links on our website.
- ✦ Role of CTO as PoC for AESS.
- ✦ *Relevance of the members from SMEs (Small and Medium Enterprises).*
- ✦ *Relevance of the members from academia: professors, PhD, students and researchers in R&D centres (Government, Defence, etc.).*
- ✦ *Contact potential members and suitable organizations from BRICS and Arab Countries.*
- ✦ Professional development and technical challenges.
- ✦ *Relevance of innovation.*
- ✦ *IEEE AESS industrial award proposal.*
- ✦ Desired deliveries:
 - • Industry Relations web page.
 - Contribution to IEEE AESS strategic plan.

IEEE Aerospace and Electronic Systems Society Strategic Plan – April 2013



IEEE Aerospace and Electronic Systems Society Strategic Plan, September 2011 Update April 2013

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VI. Industry Relations

1. Review of current status and issues

- AESS has an unusually high proportion of members from Industry, so it makes sense for us to treat their interests as a high priority.
- The Industry Survey has given us a great deal of information from several perspectives – a snapshot of what we are doing currently and what members think of it.
- From the point of view of Industry, it is suggested that the things of greatest interest are recruitment, training and career development of the workforce, and perhaps promotion of

Candestic Top 20 Aerospace & Defence Companies 2012

Sales-based



**THE WORLD'S TOP 100
AEROSPACE & DEFENCE
COMPANIES**



2012

September 2012

| Rank | Company | Home Country | A & D Sales 2011 (or latest available) (mil USD) | A & D Sales in % of Total Sales | A & D Defense/ Government Sales (%) | Ownership Type | Main Shareholders (>5%) | Selecte d Shareholdings and Subsidiaries |
|------|-------------------------|------------------------|--|---------------------------------|-------------------------------------|----------------|--|--|
| 1 | Boeing | USA | 68,735 | 100% | 45% | Public | State Street (13.9%), Evercore Trust (9.6%), Capital World (5.9%), BlackRock (5.6%) | Alferon, Anair, Jeppesen, United Launch Alliance (50%), Argon ST |
| 2 | EADS | France, Germany, Spain | 68,310 | 100% | 25% | Public | Sogefo (22.4%), Daimler (22.4%), SEPI (5.5%) | Airbus, Eurocopter, Eurofighter (67%), ATR (50%), Dassault Aviation (46%), MBDA (37.5%) |
| 3 | Lockheed Martin | USA | 46,489 | 100% | 99% | Public | State Street (19.8%), Capital World (12.9%), Mass FSC (5.7%), BlackRock (5.3%) | Sandia, United Launch Alliance (50%), AWI ML (33%) |
| 4 | General Dynamics | USA | 32,677 | 100% | 80% | Public | Northern Trust (9%), Longview (9.3%), Capital Research (5.5%), BlackRock (5.4%) | Bath Iron Works, Gulfstream Aerospace, Electric Boat, NASCO, Force Protection |
| 5 | BAE Systems | UK | 28,488 | 100% | 96% | Public | Invesco (12%), BlackRock (5.1%), AXA (5%) | MBDA (37.5%), Eurofighter (33%), Delica, Atlantic Marine, L-1 ISG, Strasec, ETI, Norcom, OASYS |
| 6 | Northrop Grumman | USA | 26,412 | 100% | 96% | Public | State Street (11.8%), Capital World (5.9%), BlackRock (5.7%), Capital World Investors (9%) | EuroHawk GmbH (50%), Remotec, Scaled Composites, Sperry Marin |
| 7 | Raytheon | USA | 24,857 | 100% | 95% | Public | BlackRock (7.1%), Barrow, Hanley, Mewhinney & Strauss (5.2%) | Thales Raytheon Systems (50%) |
| 8 | United Technologies | USA | 24,440 | 42% | 50% | Public | State Street (12.2%), BlackRock (5.8%) | Pratt & Whitney, Hamilton Sundstrand, Sikorsky, Rockwell, Engine Alliance (50%), IAE (61%) |
| 9 | Finmeccanica | Italy | 20,640 | 82% | 80% | Public | Italian Government (30.2%) | DRS, Alenia Aeronautica, AgustaWestland, Selex Galileo, Selex SI, Telespazio (67%), MBDA (25%) |
| 10 | General Electric | USA | 18,900 | 13% | 25% | Public | BlackRock (5%) | CFMI (50%), Engine Alliance (50%) |
| 11 | Safran | France | 16,510 | 100% | 20% | Public | French Government (30.2%), Employees (16%) | Snecma, Hispano-Suiza, Labinal, Turbomeca, Sagem, CFMI (50%) |
| 12 | Thales | France | 16,304 | 90% | 60% | Public | French Government (27%), Dassault Aviation (26%) | Alcatel Alenia Space (67%), Thales Raytheon Syst. (50%), Diehl Aerospace (49%), DCNS (35%) |
| 13 | L-3 Communications | USA | 15,189 | 100% | 90% | Public | Vanguard Group (5.5%), Harris Associates (5.3%), Clearbridge Advisors (5.1%) | Narda, MPRI, Wescam, Funa Int'l, Verlex Aerospace, Insight Technology Titan |
| 14 | Rolls Royce | UK | 12,516 | 89% | 30% | Public | Invesco (6.9%), BlackRock (5%) | ITP (47%), Europrop (28%), MTR (33%), Eurojet (33%), AirTanker (20%) |
| 15 | Honeywell International | USA | 11,475 | 31% | 45% | Public | State Street (10%), BlackRock (5.4%) | IGS (50%) |
| 16 | Bombardier | Canada | 8,594 | 47% | 0% | Public | Bombardier/Beaudoin family (QC) (54.3%) | |
| 17 | Textron | USA | 8,387 | 74% | 50% | Public | FMR (9.9%), T Rowe Price (9.2%), BlackRock (5.1%), The Vanguard Group (5%) | Bell, Cessna, AAI |
| 18 | Goodrich | USA | 8,075 | 100% | 30% | Public | None (over 5%) | Rohr, TEAC Aerospace, Goodrich-Messier (50%), RR Goodrich Engine Control Systems (50%) |
| 19 | SAIC | USA | 7,729 | 73% | 100% | Public | Vanguard Fiduciary Trust Company (16.9%), BlackRock (5%) | |
| 20 | Huntington Ingalls | USA | 6,575 | 100% | 100% | Public | State Street (9.5%), Pennant Capital Management (5.9%), Hotchkiss and Wiley (5%) | Newport News Shipbuilding, AMSEC |

1950s – 1960s → Research Laboratories

Many large corporations established **research laboratories** locations remote from their headquarters and manufacturing facilities. The goal was to collect **brilliant scientists** and allow them to **study relevant topics, explore new ideas, and publish respected research papers**, in an environment unhindered by day-to-day business concerns. The **director** of the laboratory was often a corporate vice president who **did not participate in decisions** regarding corporate **strategy and direction.**

Late 1980s → Chief Technology Officer

Companies began to anoint R&D laboratory directors as **Chief Technology Officers**. **Technology was becoming such a prevalent part of company products and services** that senior management needed an operational executive who could understand it and provide reliable advice on its application. However, the **CTO positions were filled by the same people that had led the R&D laboratories.**

Beginning 1990s

Several experiences made it clear that **the responsibilities of the CTO were significantly different from those of the R&D laboratories.**

The CTO position requires a technologist or scientist who could translate technological capabilities into strategic business decisions.

Ref.: R. D. Smith, "The Chief Technology Officer: Strategic Responsibilities and Relationships", *Research Technology Management*, July-August 2003.

Role of CTO

General strategic responsibilities (1/2)

The CTO position is far from being standardized. Each company has unique requirements for its CTO and provides a unique organizational structure into which the person will fit. However his strategic responsibilities can be schematized as follows.

Monitoring and assessing new technologies

The rate of change of technology guarantees that knowledge and expertise gained several years ago will no longer be completely valid. CTOs collaborates to monitor, evaluate, and select technologies that can be applied to future products and services.



Establish the strategic innovation

In some industries, new products based on new technology are the lifeblood of the company. In other industries, core products remain unchanged for decades, but the processes used to create them are continually evolving and becoming more efficient.

The CTO must take into account and put boundaries also to the related risks.

Mergers and acquisitions

Mergers and acquisitions are an important part of the growth strategy of many Companies. The CTO's role in due diligence includes evaluating patents, reviewing technical publications, and studying trade data to determine the value of the target company and to rank it against competitors.



Role of CTO

General strategic responsibilities (2/2)

Marketing and media relations

Constructing the information and images released to the public is primarily the responsibility of the marketing and sales departments. However, technical expertise is required to accurately translate some product details into terms that can be marketed.



Relationships with Government, Academia, professional organization

Governmental committees investigate issues of national importance. Service on these committees is an honor, but it is also an opportunity to influence the decisions in a professionally positive manner, and to gain an early and intimate access to the work.

Product Vision

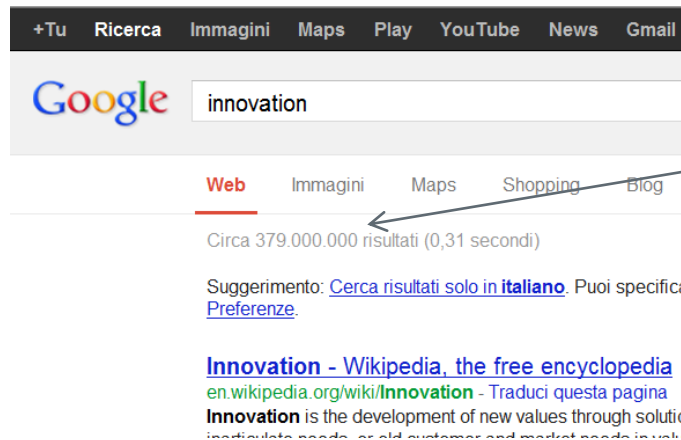
The CTO collaborates to achieve a global technical view to be integrated to the business view in order to define the Technologies Roadmap and Product Roadmaps. A particular attention is focused on the Company Competitive Position and consequently on the competitive impact of such choices.



The CTO can also serve an important role in creating the internal culture. The CTO should initiate activities and policies that create a **technology-friendly culture** aligned with the company's business strategy.

Company culture

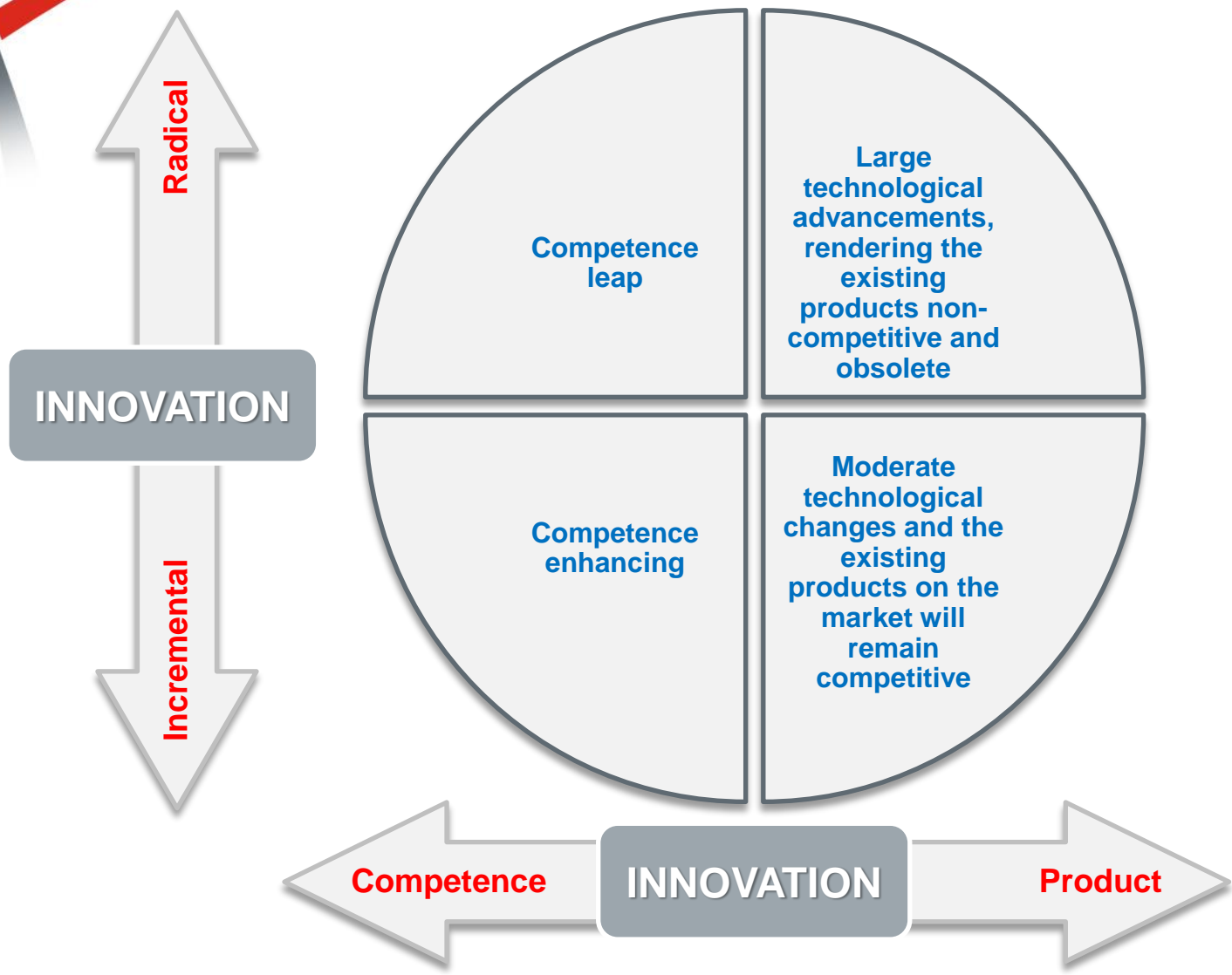
☛ Is 'Innovation' now one of the most overused word?



About 379.000.000 results

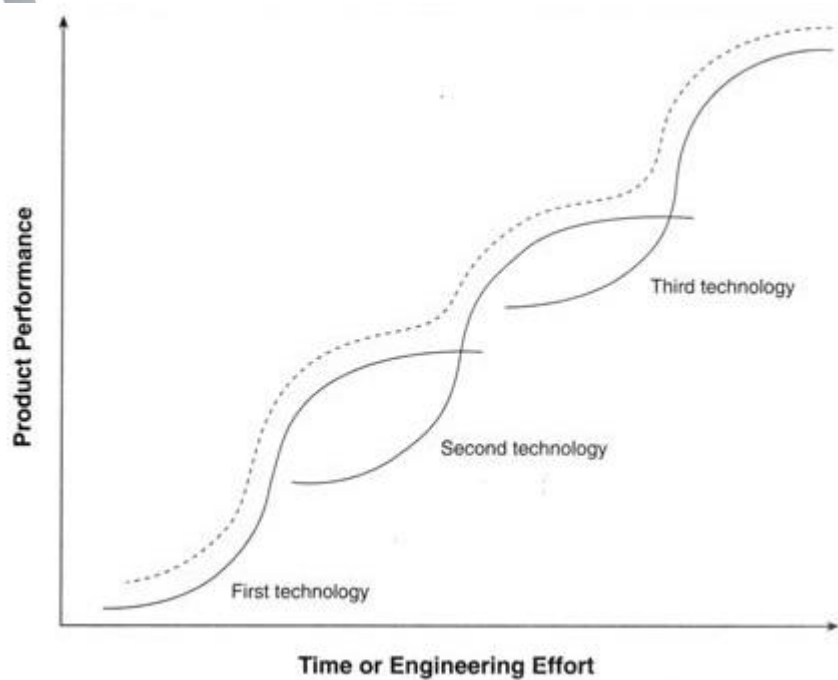
☛ True Innovation radically changes the way we interact with the world. Innovation is **something essential** without which the world would come to a stop.

Discontinuous (radical) vs continuous (incremental)

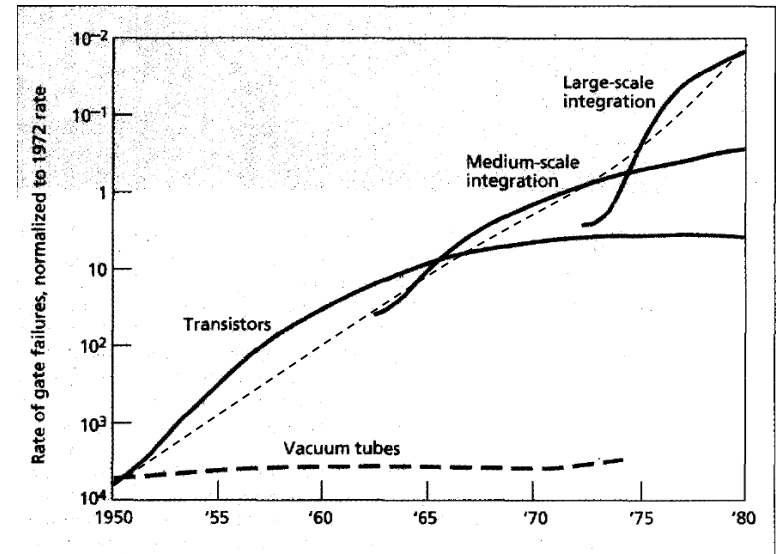


Technology evolves: from S-Curve to Exponential growth

Innovation is unavoidable; it is a must !

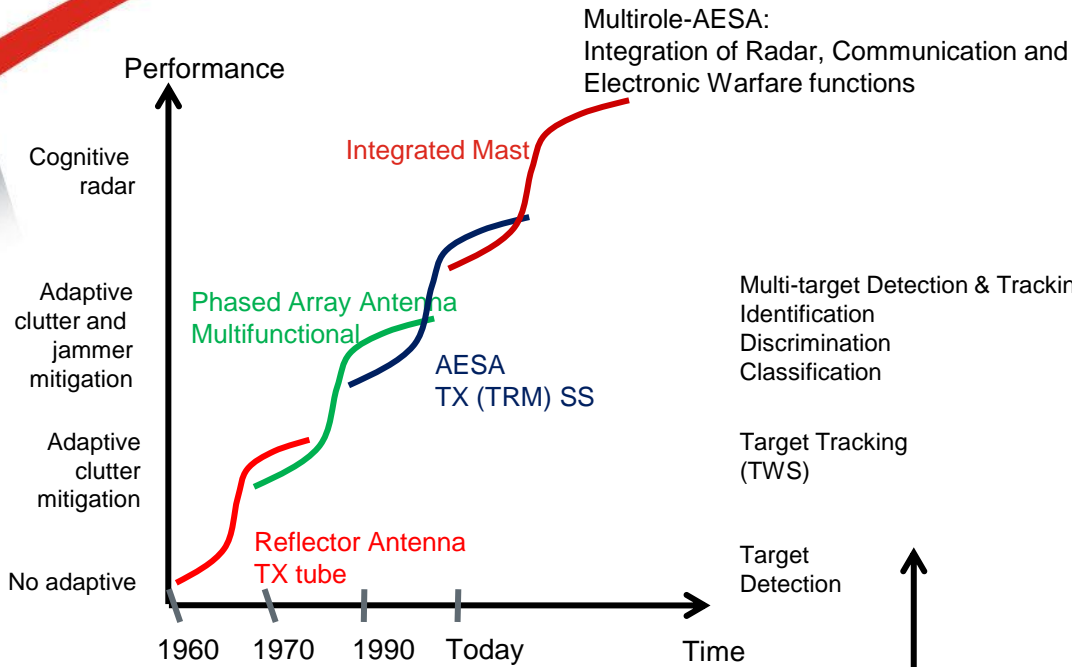


Was **Moore's Law** Inevitable?
http://www.kk.org/thetechnium/archives/2009/07/was_moores_law.php



Moore's law and the technology S -curve by M J Bowden, SATM, winter 2004, issue 1, volume 8

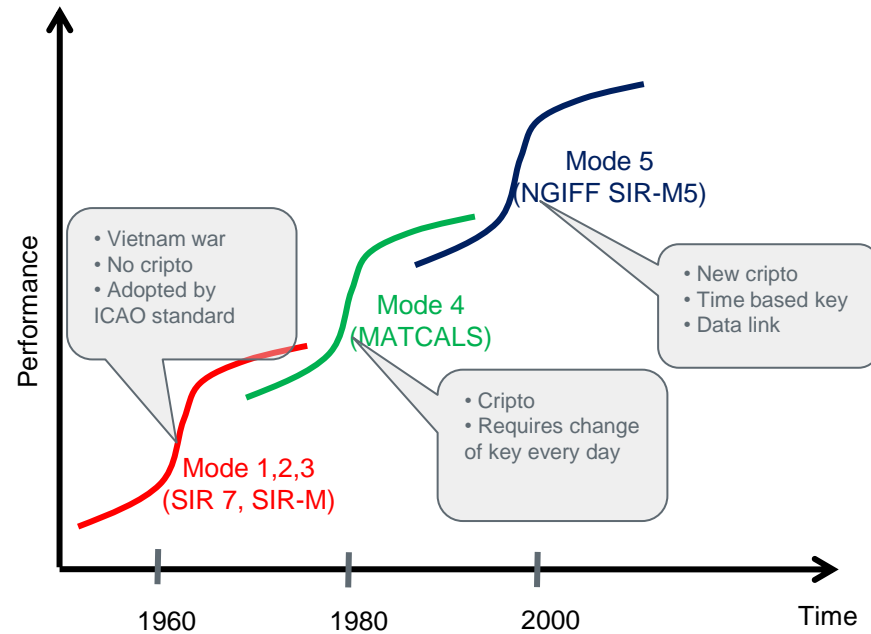
Radar Technology Evolution



- Multi-target Detection & Tracking
- Identification
- Discrimination
- Classification
- Target Tracking (TWS)
- Target Detection

AESA: Active Electronically Steered Array
TRM: Transmit/Receive module
TWS: Track While Scan
TX: Transmitter
SS: Solid State

ICAO International Civil Aviation Organization
NGIFF: Next Generation Identification, Friend or Foe
MATCALs: Marine Air Traffic Control and Landing System
SIR: Secondary Surveillance Radar

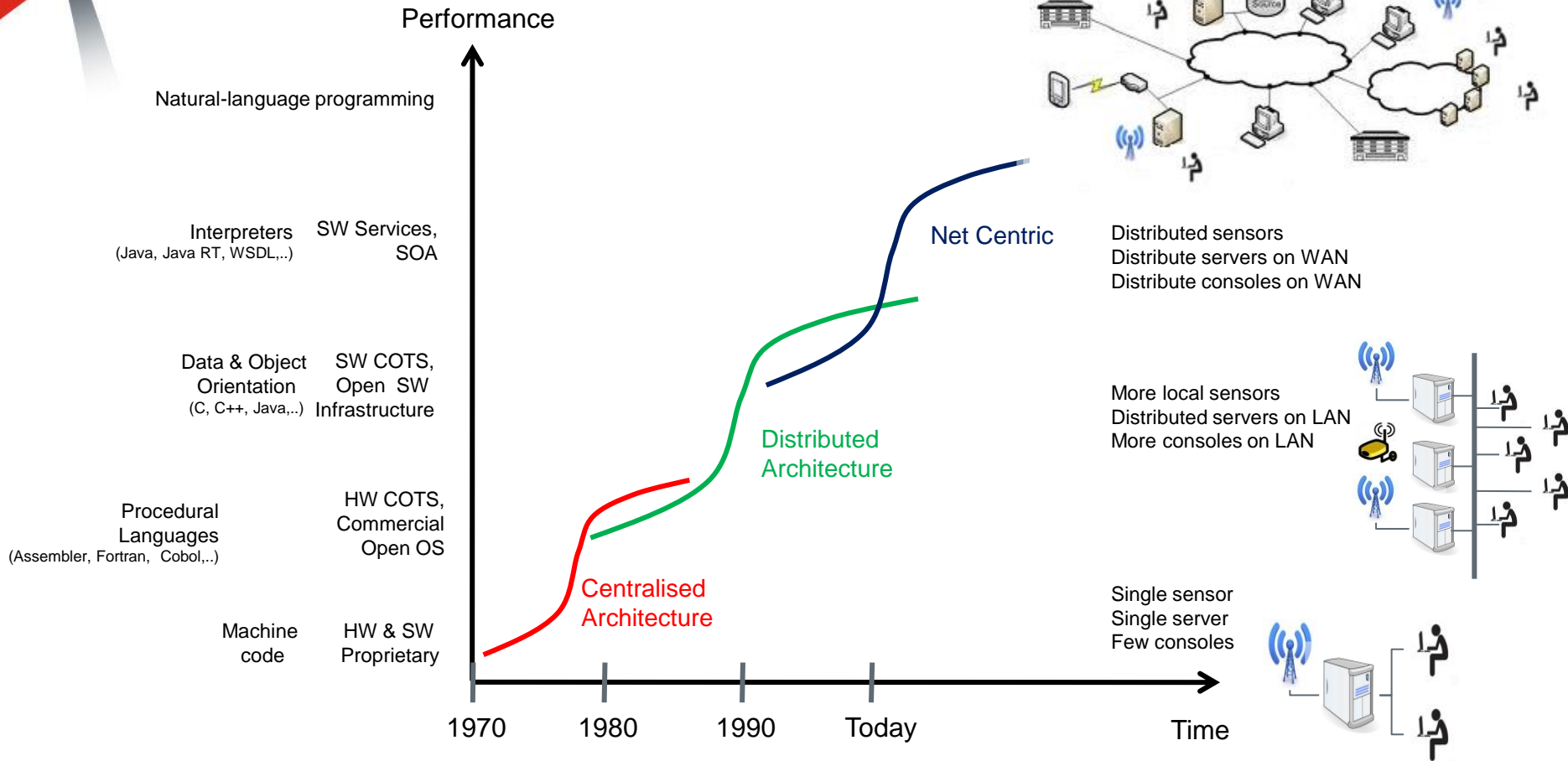


• Vietnam war
• No cripto
• Adopted by ICAO standard

• Cripto
• Requires change of key every day

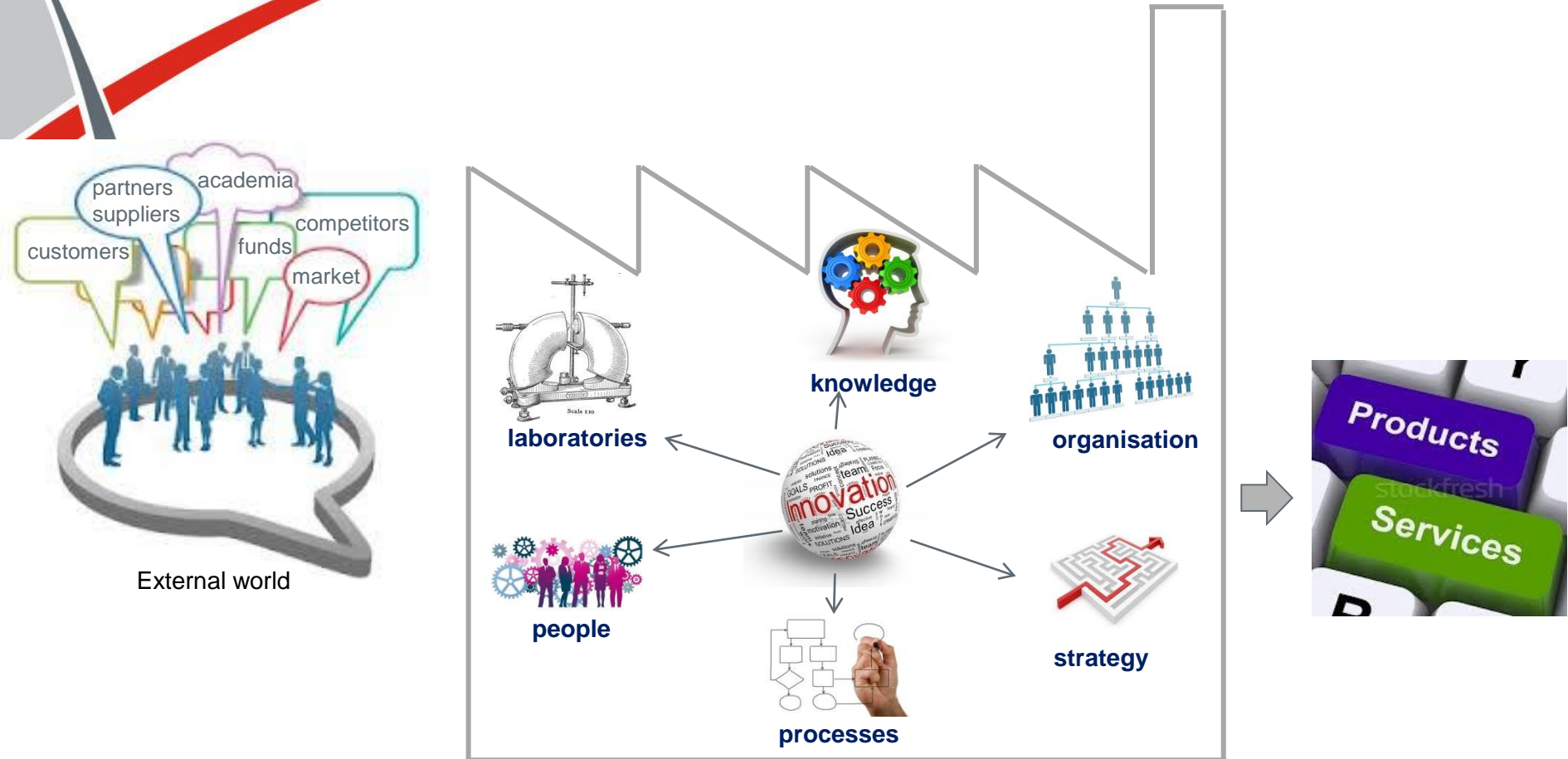
• New cripto
• Time based key
• Data link

Command & Control Systems



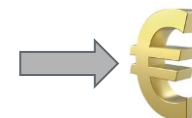
SOA: Service Oriented Architectures
 COTS: Commercial Off The Shelf
 HW/SW: Hardware/Software
 WSDL: Web Service Definition Languages
 LAN / WAN : Local/Wide Area Network

A Company as a Multiple Inputs Multiple Outputs (MIMO) system



MIMO = Multiple Inputs Multiple Outputs

$$f(\text{MIMO, Values, Innovation}) = (\text{Products, Services})$$

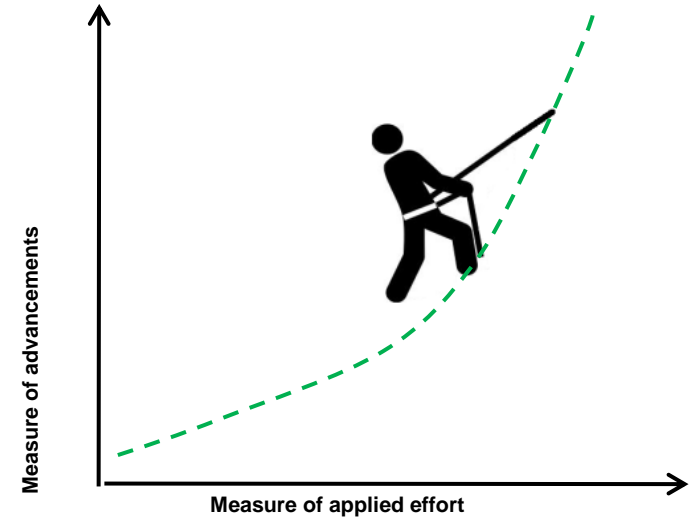


**Revenues,
Orders,
Costs,
EVA**

- ✦ Technical skills
- ✦ Investments, Research & Development
- ✦ Technology watch/scouting
- ✦ Competency/Achievement Rewarding
- ✦ Sharing of know-how
- ✦ Collaborative work
- ✦ Continuous education
- ✦ Technical publications
- ✦ Co-opetition ...

How to develop Innovation

Climbing the exponential curve



Co-opetition: an innovative mindset that combines Competition and Cooperation



***“You have to
compete and cooperate
at the same time”,***

Ray Noorda (1924-2006), Novell

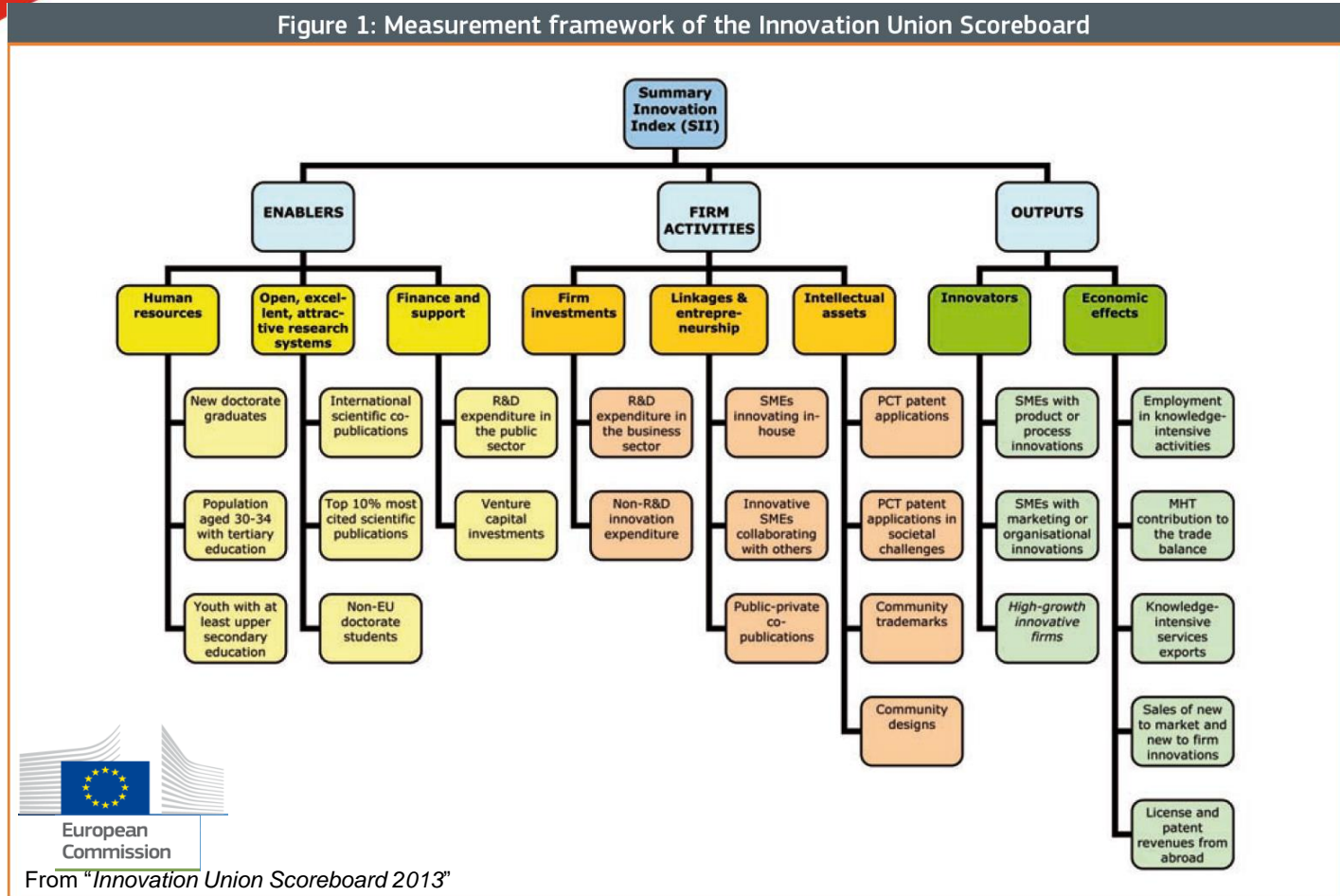


Co-opetition is made of two elements: co-operation and competition.

Co-opetition entails comparing diverging opinions.

Co-opetition is the type of collaboration that is currently performed by the LHC (Large Hadron Collider) experiments at CERN (Conseil Européen pour la Recherche Nucléaire, Geneva, Switzerland) in innovative major activities like the Higgs boson search.

Figure 1: Measurement framework of the Innovation Union Scoreboard



A guideline to measure and monitor Innovation



IEEE AEROSPACE & ELECTRONIC SYSTEMS SOCIETY

WELCOME TO THE AESS



HOME ABOUT THE AESS CONFERENCES EDUCATION MEMBERSHIP PUBLICATIONS TECHNICAL OPERATIONS

INDUSTRY RELATIONS

DRAFT

Why AESS

A large percentage of AESS members is from industry but it is big the relevance of the members from academic: professors, Ph.D. students, and research centres (e.g.: National Council of Research, Istituto Italiano di Tecnologia).

The strong relation existing between AESS and most important Aerospace and Electronic Industries made AESS the best place to take advantage of the cooperative capabilities offered by Academy and Industry.

We are seeking now for new potential members and we encourage your participation from ERIC and Arabic countries.
You are invited to have a better understanding about our vision guidelines, check the content of the following:

AESS Industry vision



V.F. Industry Relations A.Farina

We are willing to face new technical challenges as, for example, the ones related to the future of radar, the role of software resilience in large systems, the role of new materials and we want to be able to tackle the design of complex system via collaborative working. If you are interested in this fields and want to be involved in the loop consider to join AESS today.

Join AESS

Still looking for good reasons to join?
Here you can find a list of good reasons:

Aerospace Best Patents

QE Prize Awards

News on R&D

News on Standards

Strategic Plans from Agencies

European Community - Cordis

Workshops

Radar Museum

Student Corner

Academic corner

We are looking for you: become a member today!

Become a Member of AESS NOW

Being a member of the community is a great opportunity for students: check the sales-based list of the TOP 20 Aerospace Industries. Qualified people are always welcomed in industries environments and can find great job opportunities in connection with the AESS activities. You can find a list of available job opportunities [here](#).

TOP20 Aerospace Industries

Search

Search this site:

Announcements

Meeting Announcement - Ottawa AESS and IEEE Section - FAA Next Generation
Thursday, March 7, 2013 - 14:44

"Call for Nominations" for the McGleis Award
Tuesday, March 5, 2013 - 02:34

Hugh Griffiths is awarded the A F Harvey Engineering Research Prize
Sunday, January 14, 2013 - 02:37

1 of 3 »

Calendar

April

| S | M | T | W | T | F | S |
|----|----|----|----|----|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| 28 | 29 | 30 | | | | |

- ✦ The presentation will be completed in the near future after having received comments from the BoG members.
- ✦ Subsequently, page on the “Relations with Industry” will be compiled for the IEEE AESS Strategic Plan.
- ✦ Web page will be completed too. Please consider the opportunity of setting up a 3rd level domain for the Industry relations web pages (i.e.: <http://industryrelations.ieee-aess.org/>).