



THE FRAMEWORK PROGRAMME FOR RESEARCH AND INNOVATION

# HORIZON 2020

## *Robotics in the EU programme*

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**European Commission**

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**SESSION INFORMATION PARIS - 7 JUILLET 2016**

# Outline

- Robotics activities in the EU programme: background
- SPARC - The Partnership for Robotics in Europe
- H2020 programme & projects
- H2020 – next steps
- DEI (Digitising European Industry) strategy:  
Digital Innovation Hubs in Robotics



# Outline

- Robotics activities in the EU programme: background
- SPARC - The Partnership for Robotics in Europe
- H2020 programme & projects
- H2020 – next steps
- DEI (Digitising European Industry) strategy



# Why Robotics?



- Millions of robots in the world today – many more tomorrow
- Not just on the factory floor, but also in hospitals, transports, fairs, shops, farms...
- Robots becoming much more intelligent, cooperative, versatile, flexible...
  - **R&D&I challenges**
- Huge untapped potential
  - **Economic and societal impact**



**EUROPE AT THE HEART OF THE ROBOTICS REVOLUTION**

# Robotics in EU programme

## Dedicated unit created 12 years ago

- More than 100 ongoing projects
  - > 700 partners
  - > €550m funding 2007-2013 (FP7)
- €70m–€80m funding for new projects per year

# EU activities in Robotics – context

*However*

- **Research results do not translate sufficiently into innovative solutions and applications**
- **Industry could benefit from a better understanding of what research has to offer**
- **Application needs could inspire research**
- **Involvement of users of robotic technology**
- **Commitment from the constituency needed**  
→ **Public-Private Partnership in Robotics**

# Outline

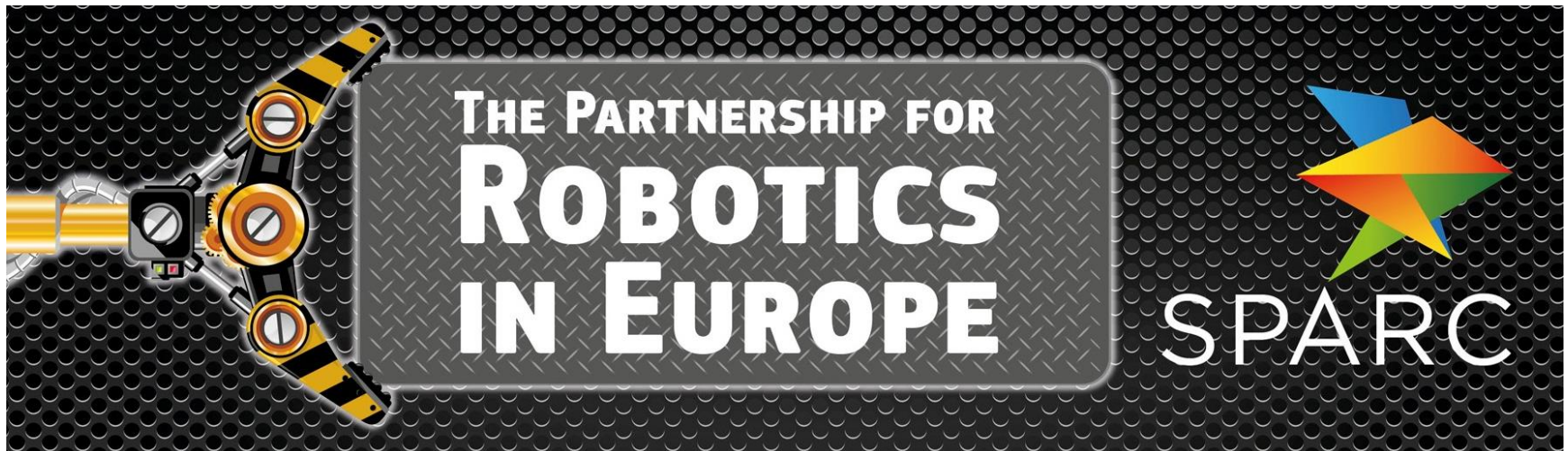
- Robotics activities in the EU programme: background
- **SPARC - The Partnership for Robotics in Europe**
- H2020 programme & projects
- H2020 – next steps
- DEI (Digitising European Industry) strategy



# SPARC

## The Public–Private Partnership for Robotics in Europe

To realize the robotics revolution in Europe  
→ Maximize benefits for Europe,  
its Economy, its Society, its Citizens





# Public-Private Partnership in Robotics



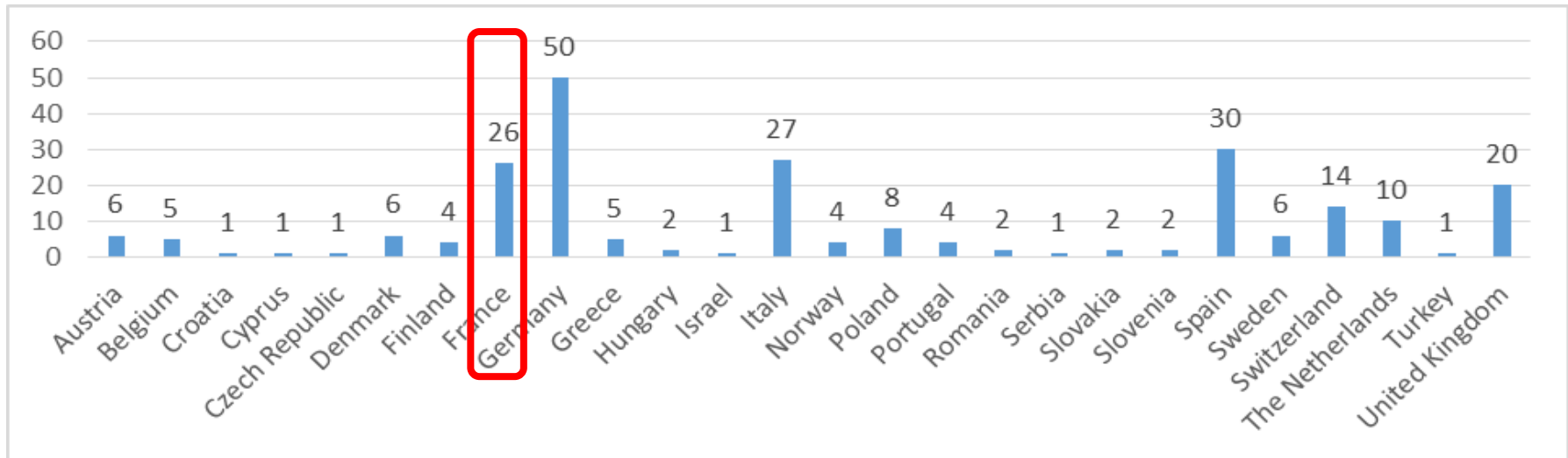
**STRATEGIC RESEARCH AGENDA**



- Industry
- Academia
- End-Users

- Work Programme
- Call implementation

→ Mutual Commitment: €2.8Bn - 2014-2020



euRobotics Membership: Distribution by country as of 31.12.2015

# SRA = Strategic Research Agenda

# MAR = Multi-Annual Roadmap



VISIONING  
GOALS

GUIDANCE  
HOW TO



Essential reading for proposers, providing detailed definitions of technologies and abilities and illustrative examples of the selected priorities.

# Strengthen Europe's position in Robotics

## Global robotics market



## *PPP and the constituency*

- The call organisation and operations are run by the European Commission
- The evaluation and selection of proposals does not involve the private side of the PPP – done by the Commission with the help of independent experts
- Proposers need not be PPP members
- PPP membership gives **no advantage or preferential treatment** in evaluations
- But PPP membership gives an opportunity to be involved in shaping future funding directions

# Outline

- Robotics activities in the EU programme
- SPARC - The Partnership for Robotics in Europe
- **H2020 programme & projects (latest results)**
- H2020 – next steps
- DEI (Digitising European Industry) strategy



# EU HORIZON 2020

## 3 PILLARS

Excellent Science  
(24.4 B €)

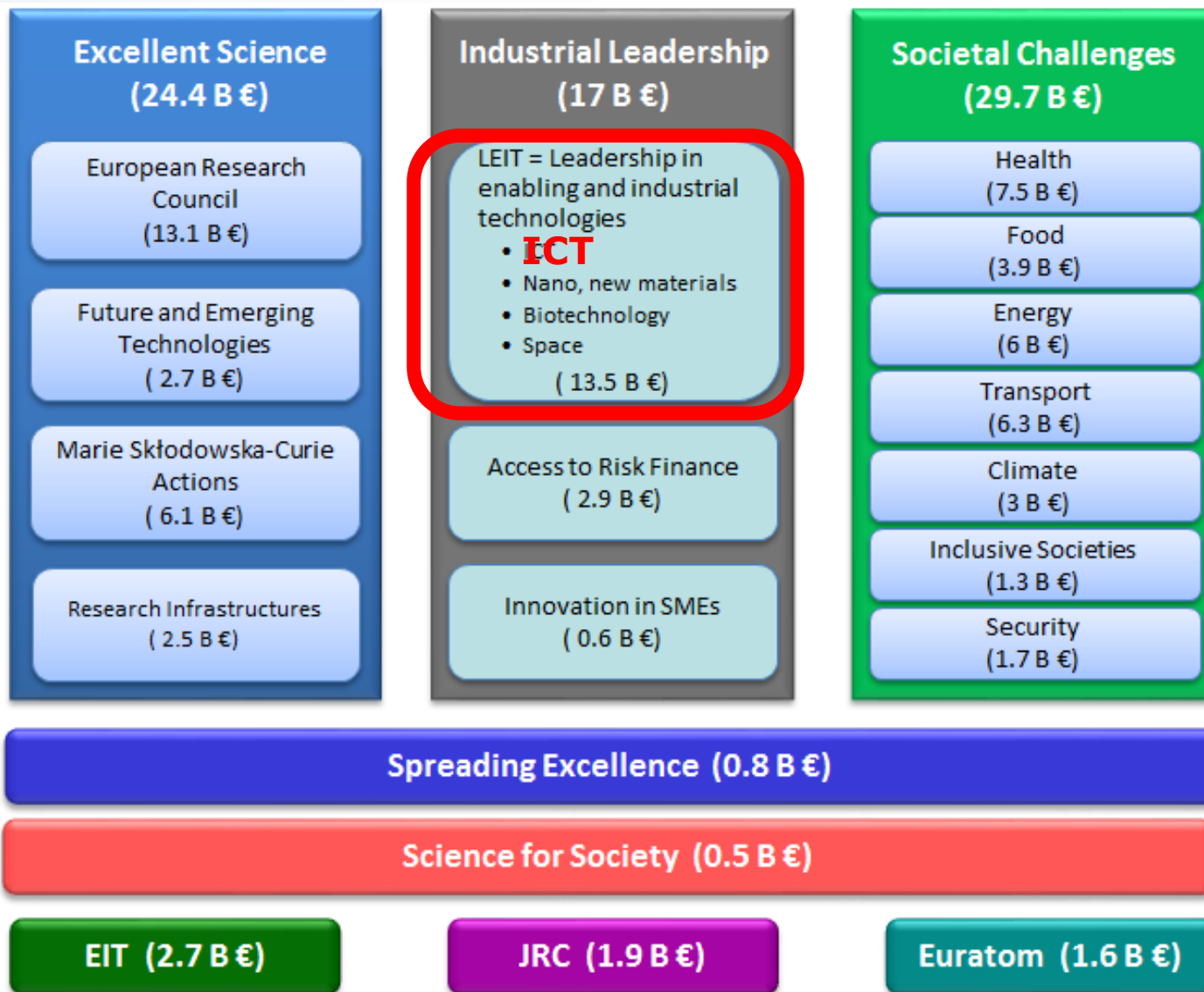
Industrial Leadership  
(17 B €)

Societal Challenges  
(29.7 B €)

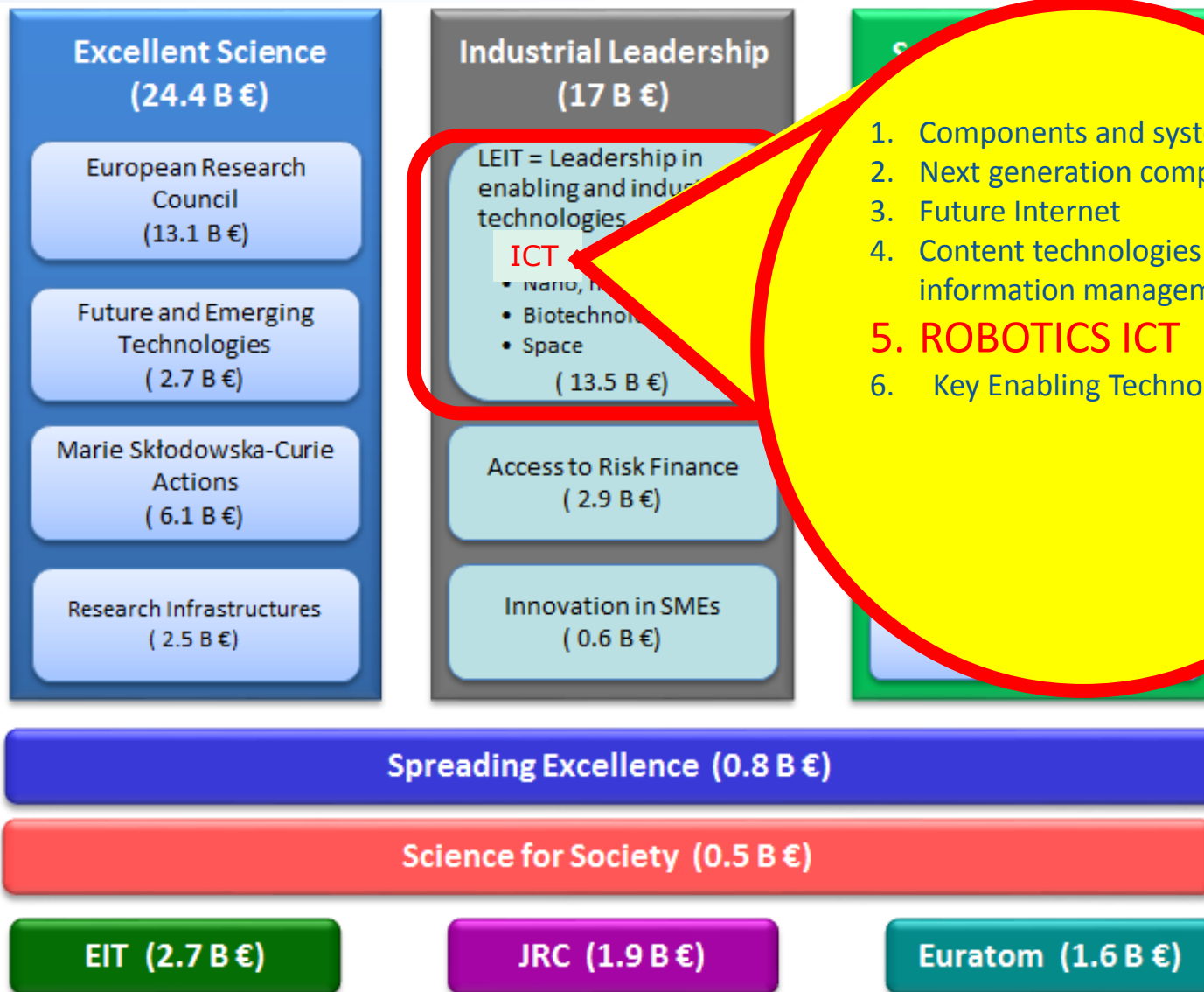
↪ **Robotics in the 3 pillars**

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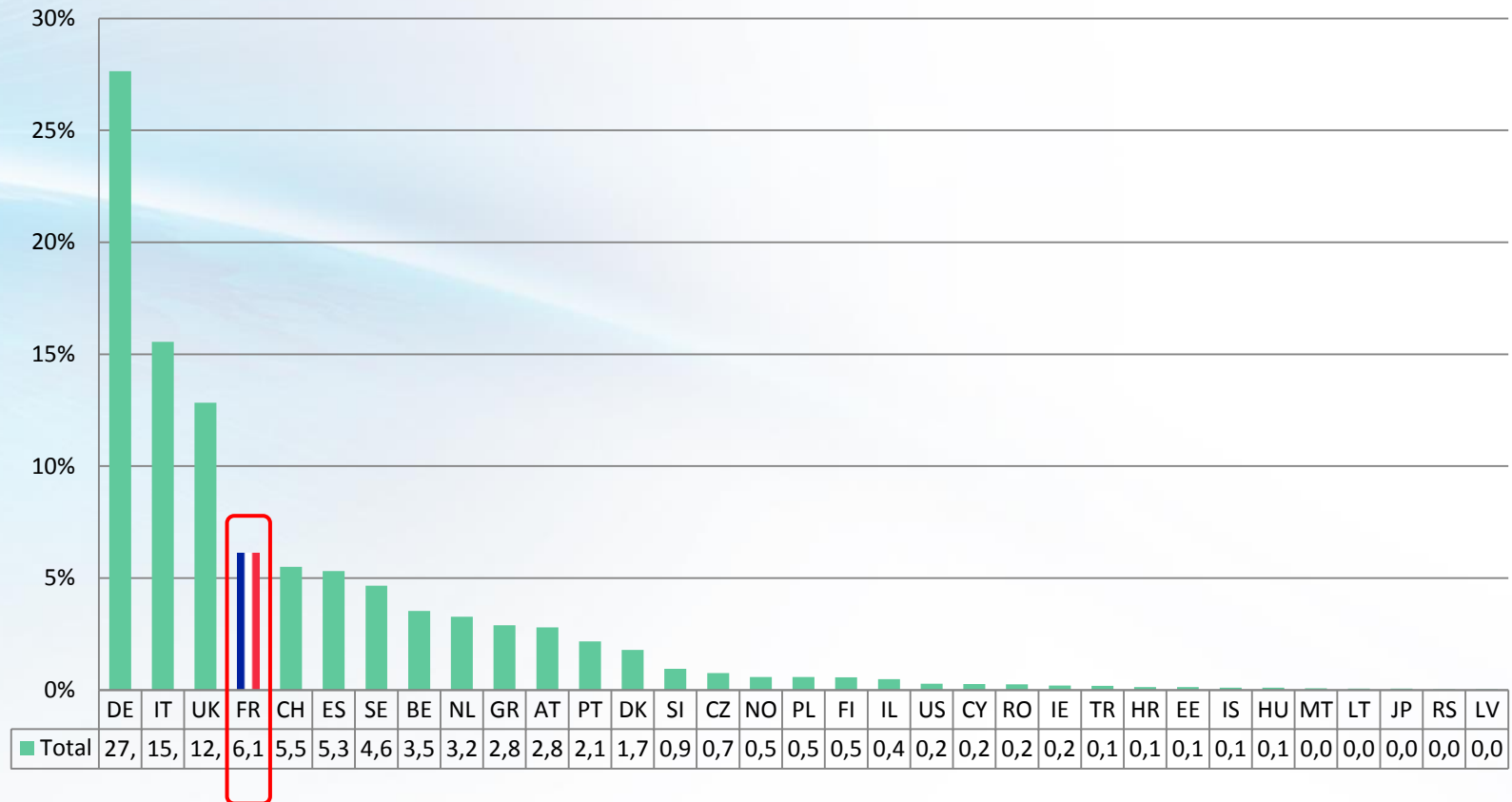




1. Components and systems
2. Next generation computing
3. Future Internet
4. Content technologies and information management
- 5. ROBOTICS ICT**
6. Key Enabling Technologies

# FP7 Robotics – French participation

Percentage of Funding per country - FP7 - Robotics (ICT & FoF)



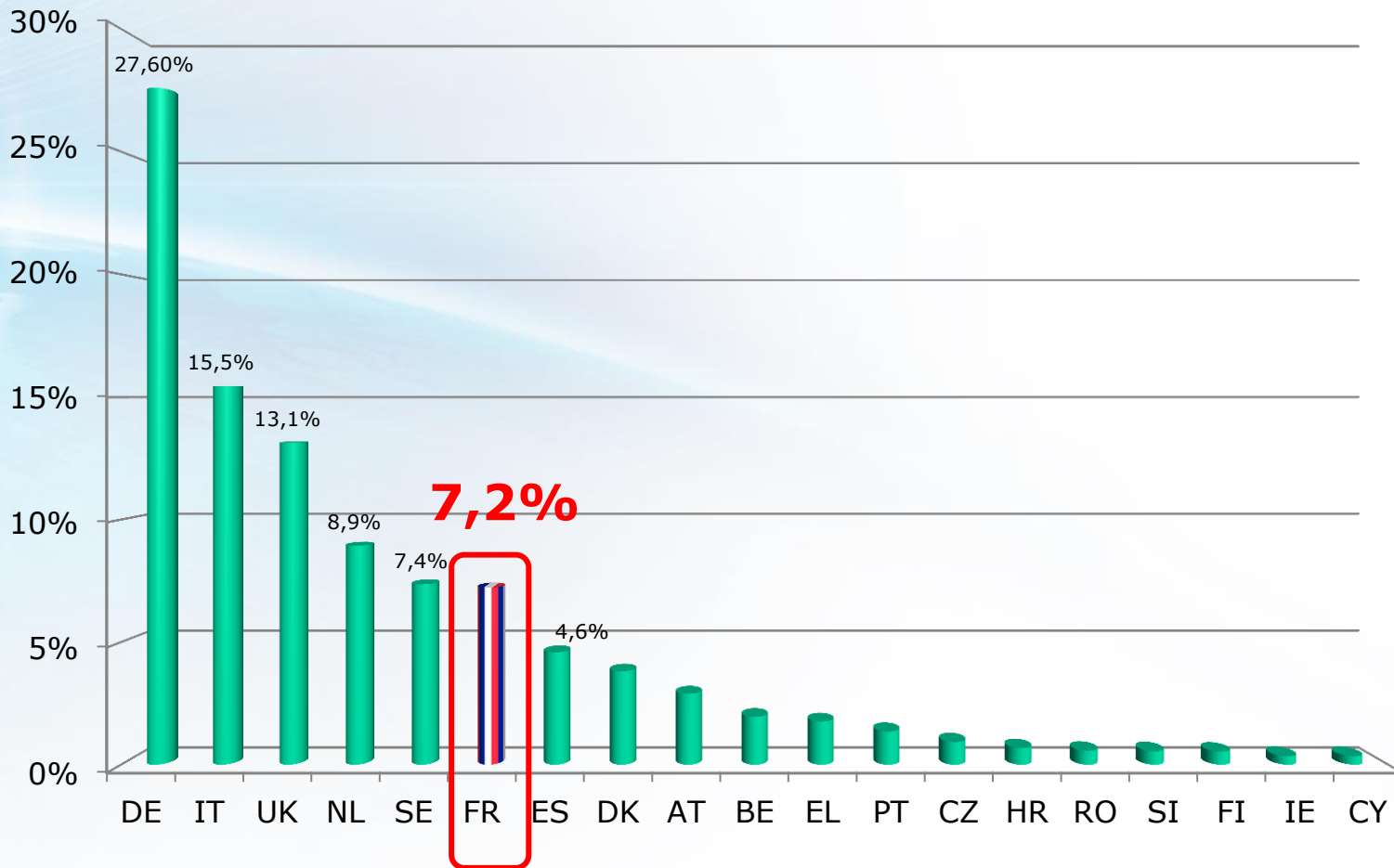
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# H2020: CALL1 & 2 Robotics

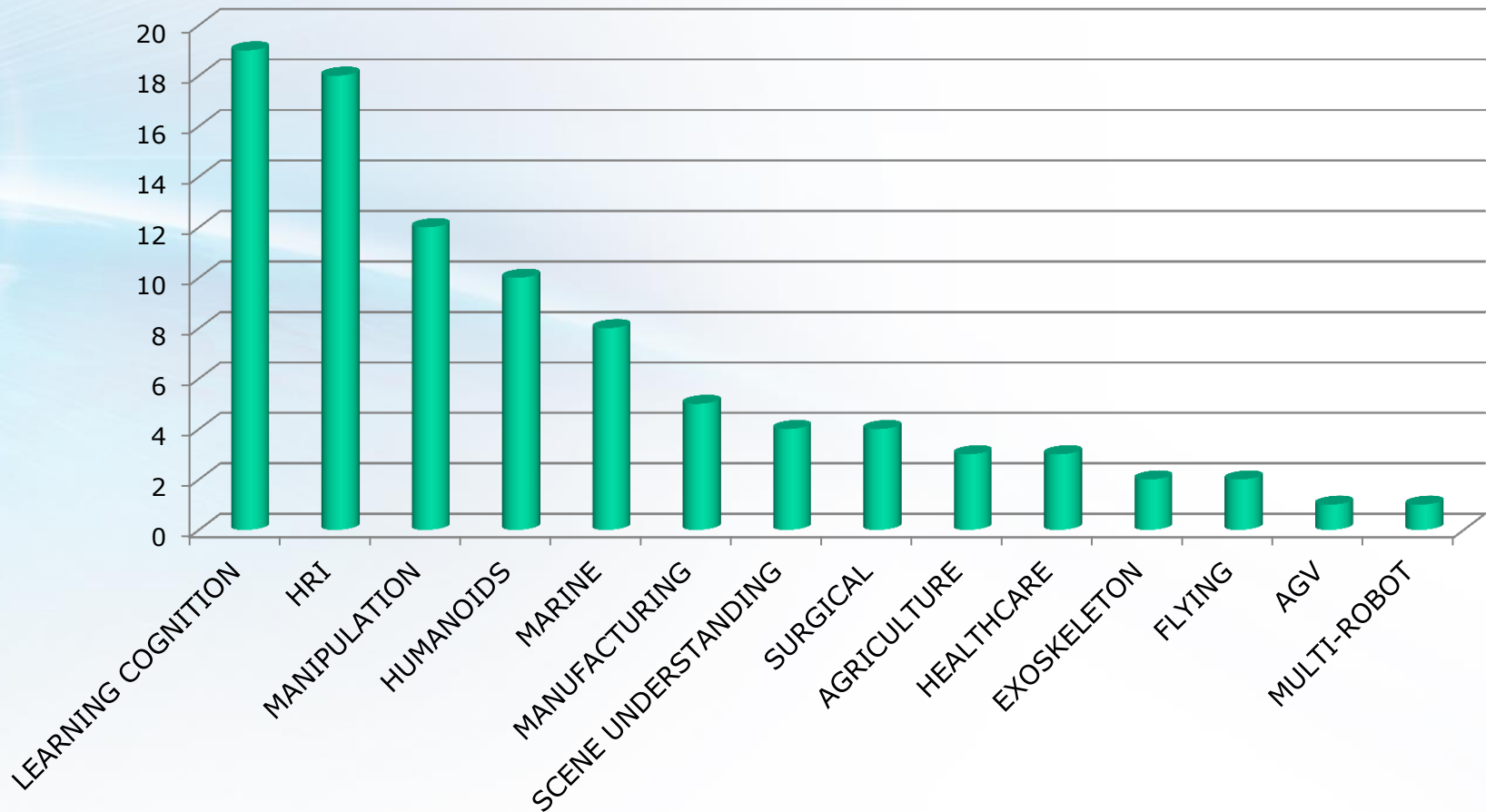
## FR participation

Percentage of funding per country



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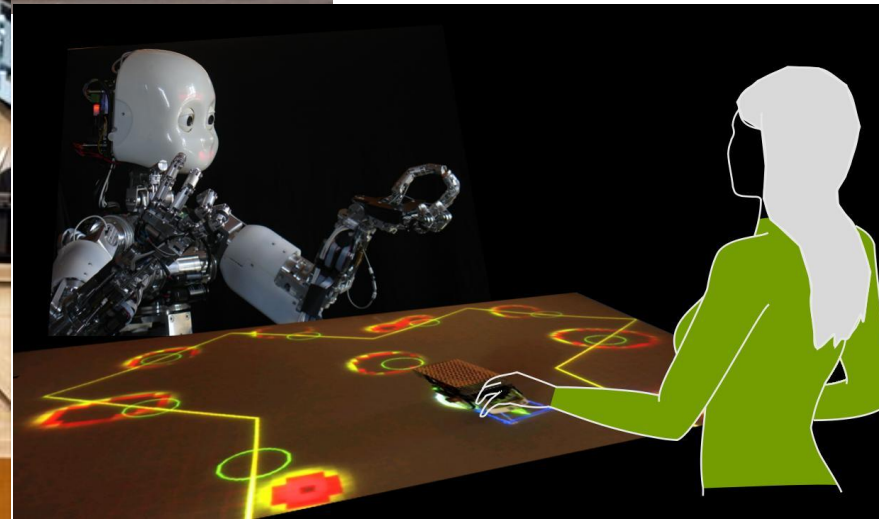
# FP7 Robotics – French participation: domains of expertise



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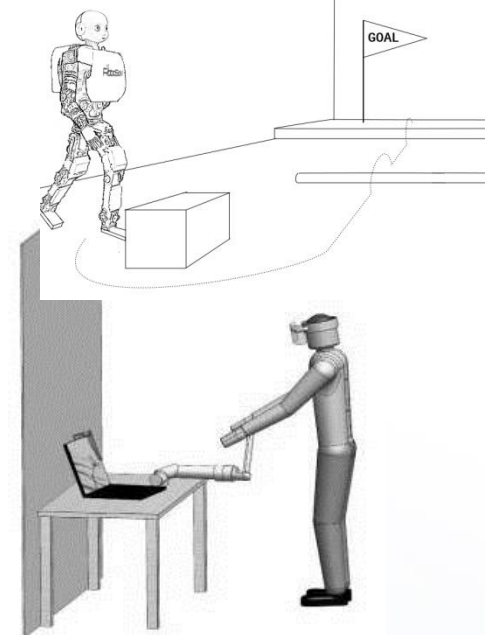
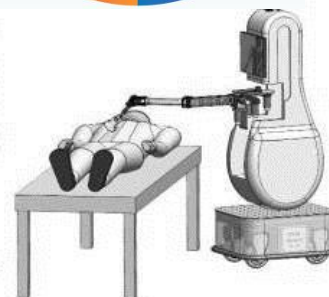
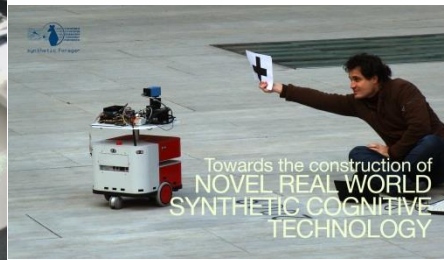
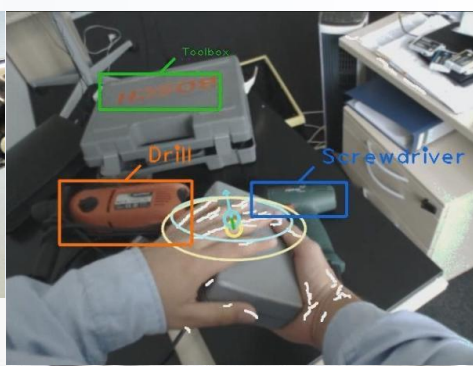
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# Some illustrations of the French landscape in FP7



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# HORIZON 2020



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# H2020 –ROBOTICS

## Projects portfolio

### 1<sup>st</sup> and 2<sup>nd</sup> call

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# CIVIL

# COMMERCIAL



**AEROWORKS**  
aerial collaborative robots  
Infrastructure inspection & maintenance

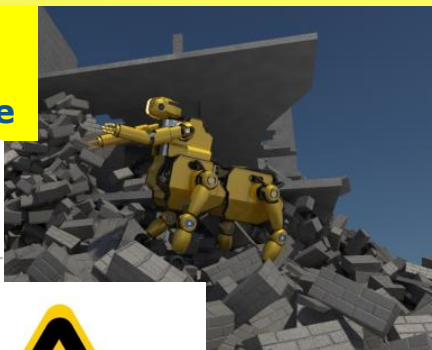
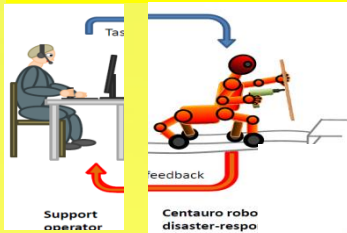


**AEROARMS:**  
Oil/gas industry



**FLOBOT:** Professional Floor Washing

**Centauro:**  
Urban  
search and Rescue

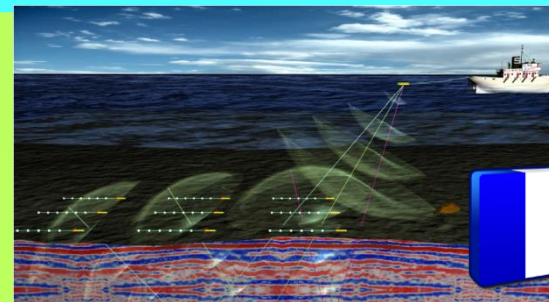


**RoMaNS:** Nuclear handling  
waste material



**SoMa: On-Line Store:**  
Packing of  
Fruits and  
Vegetables

**Smokebot**  
support to  
fire brigades  
and Search  
and Rescue

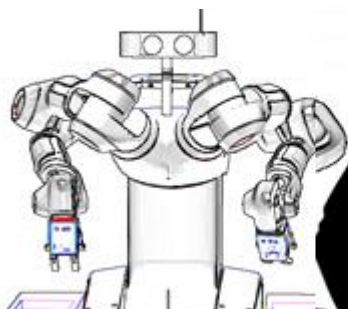


**WiMUST:** Marine Geosciences –  
distributed sensors

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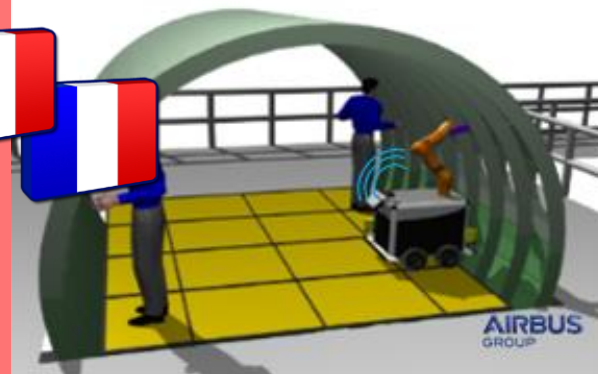
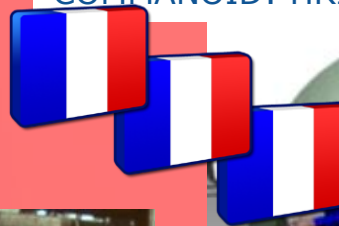


SARAFUN: robot for small parts assembly



# MANUFACTURING

COMMANDOID: HRI – aircraft manufacturing



secondHands: maintenance of production machinery



ROBDREAM: autonomous and assistive tasks in manufacturing. Machine tending and assembly tasks

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# AGRICULTURE



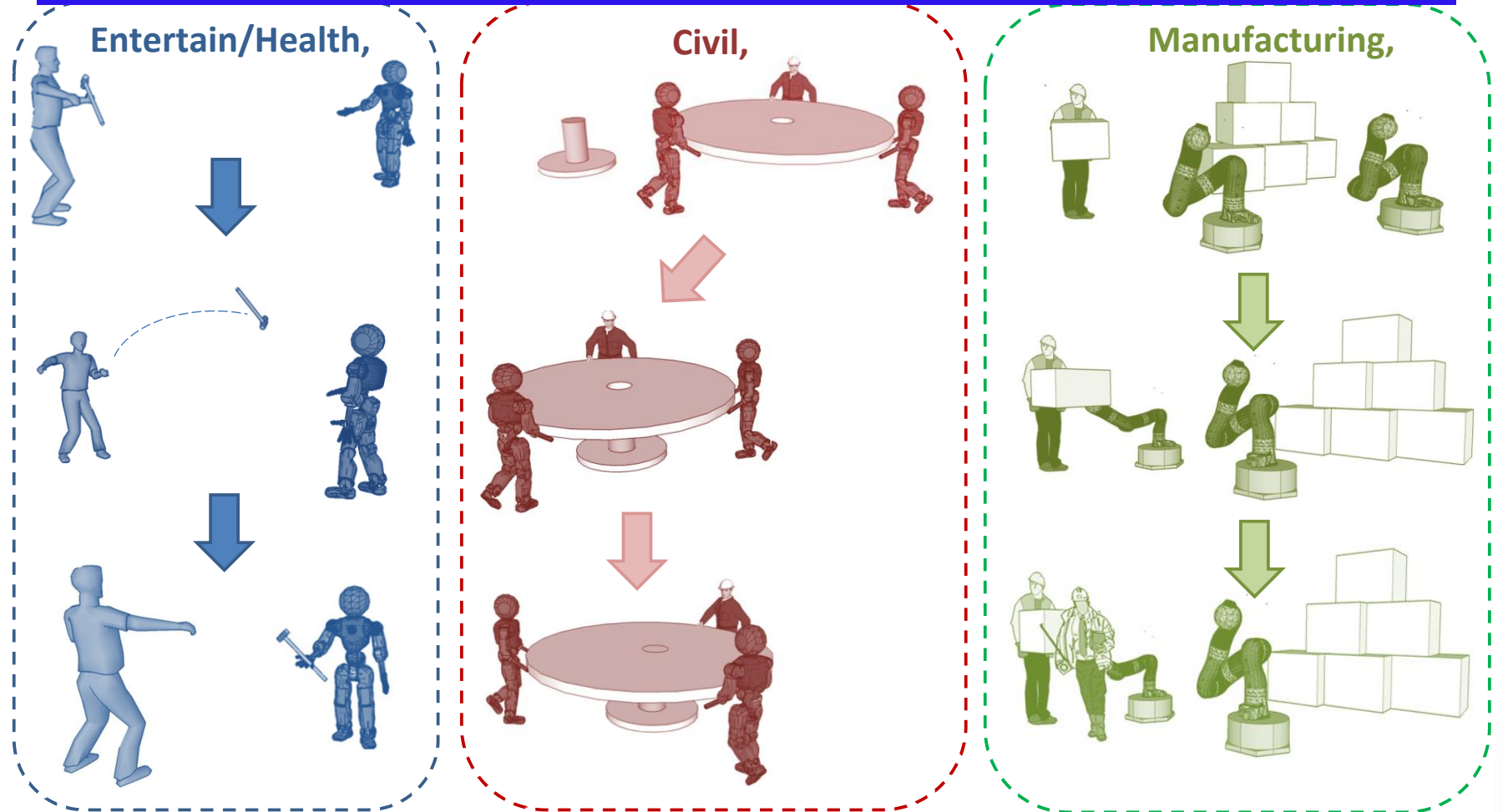
**Flourish:**  
aerial data collection and  
automated ground intervention  
for precision farming



**SWEeper:**  
Harvesting robot  
in Greenhouse Horticulture



# HEALTHCARE/CIVIL/MANUFACTURING

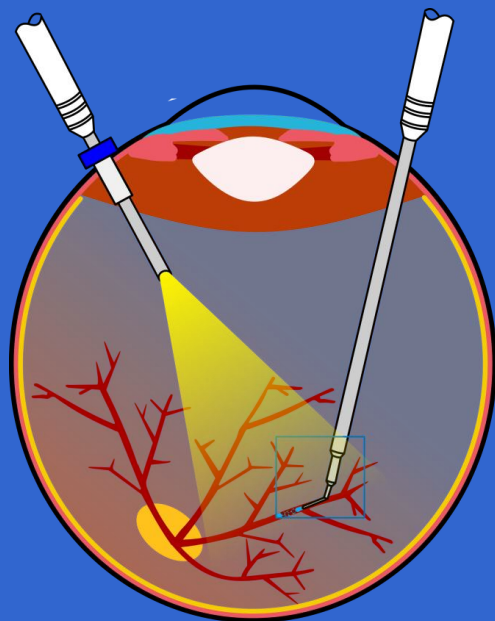


**CogiMon: Cognitive compliant interaction & Team Interaction**

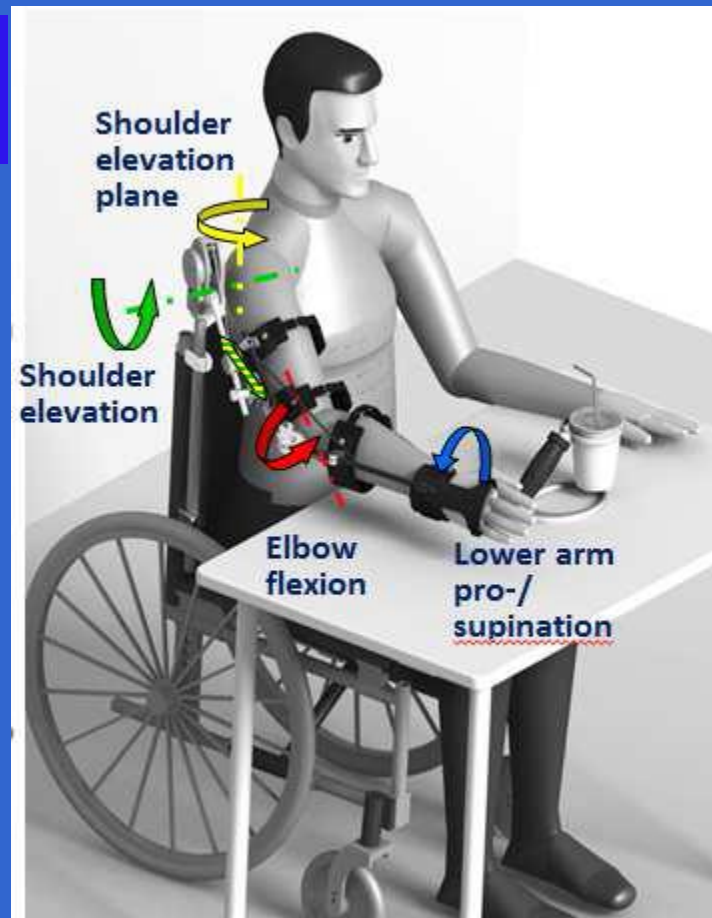
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# HORIZON 2020

# HEALTHCARE



EurEyeCase: Eye Surgery



RETRAINER: Rehabilitation

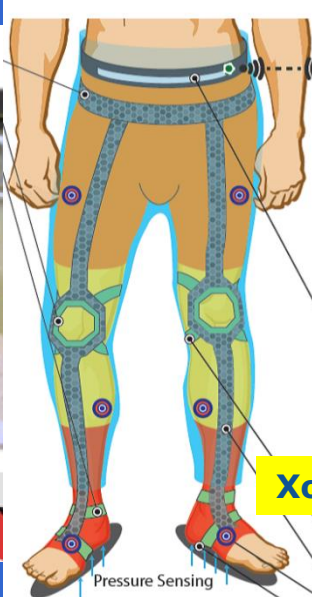
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# HORIZON 2020

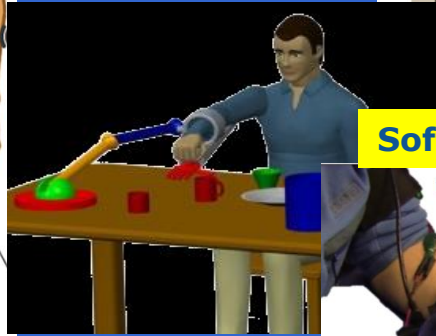
# HEALTHCARE



**SPEXOR**



**XoSoft**



**SoftPro**



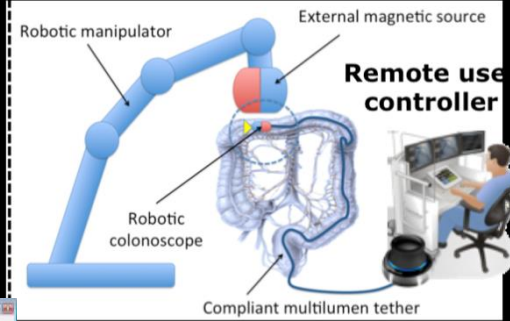
Paretic limb  
Grasped object



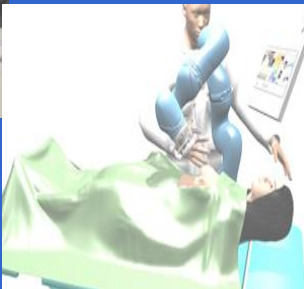
Extrathesis

**EndoVESPA**

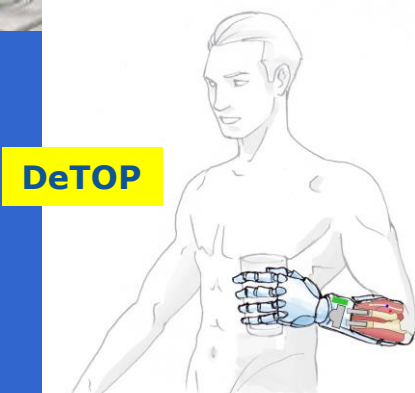
*Robotic capsule colonoscopy*



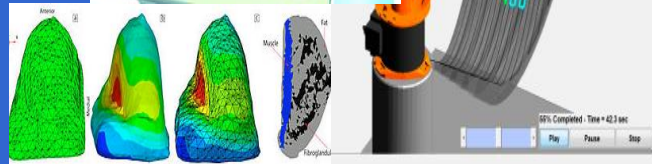
**INPUT**



**MURAB**



**DeTOP**



**Eden 2020**



# CONSUMER



Mummer



Babyrobot



TrimBot2020

# CONSUMER



# CONSUMER



**Babyrobot**



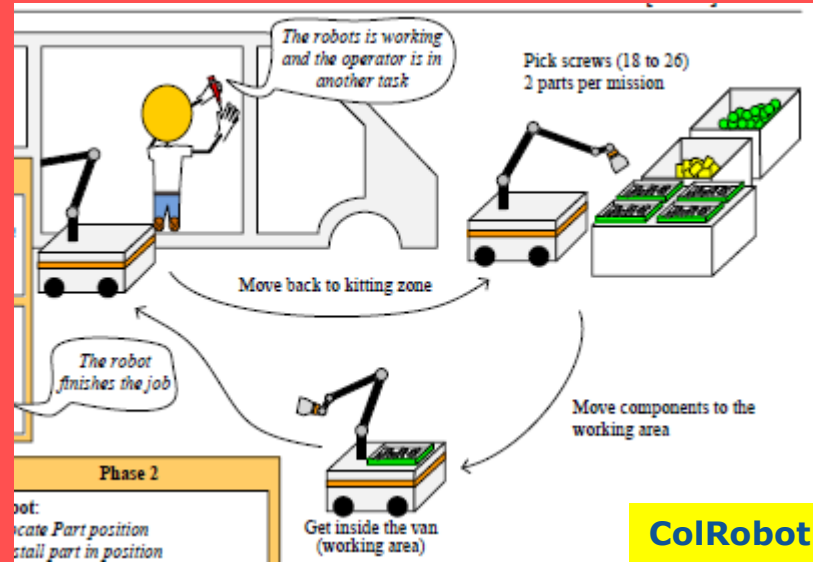


# CONSUMER



# LOGISTICS & TRANSPORT

## UP-DRIVE



ColRobot



Safelog

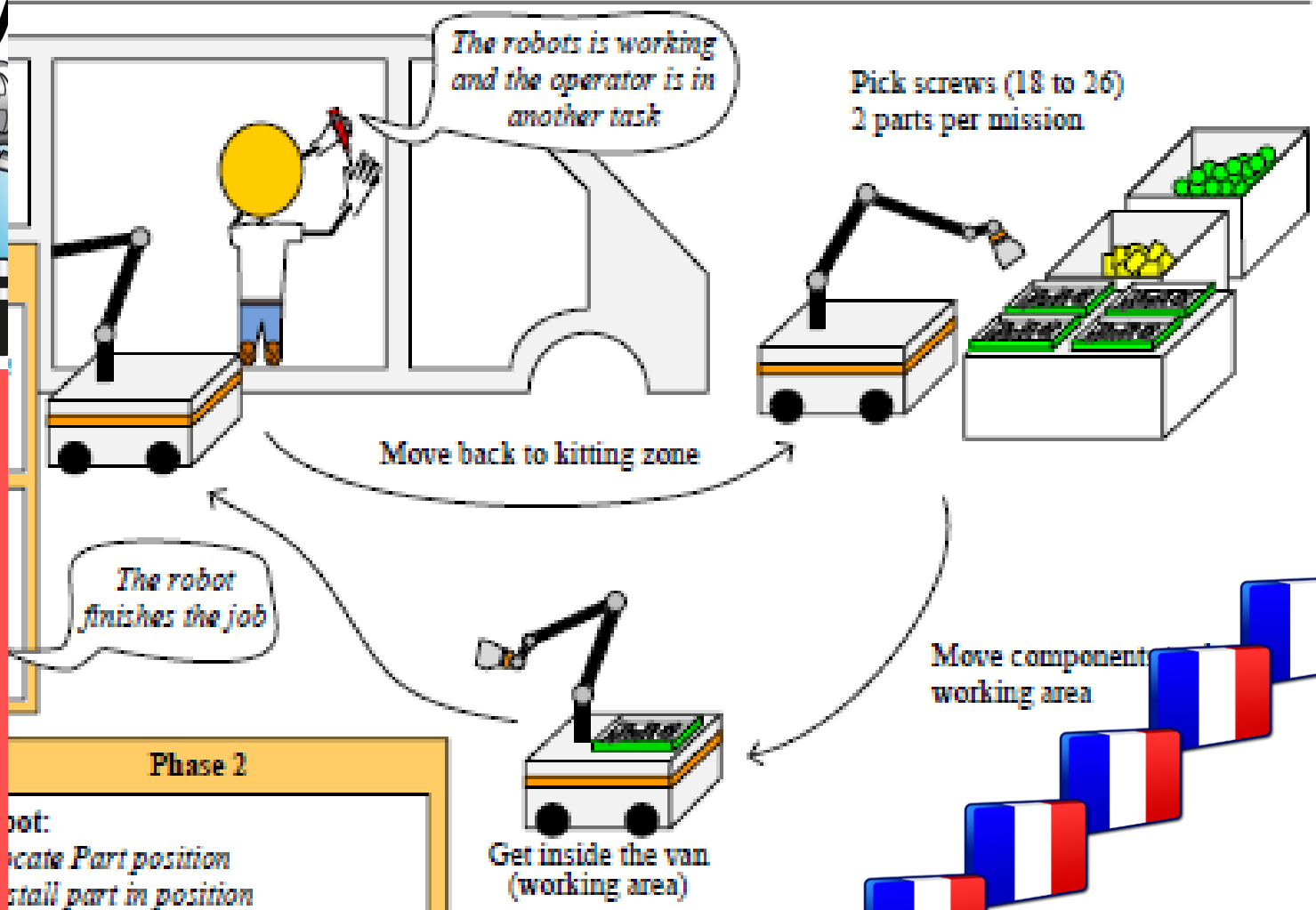
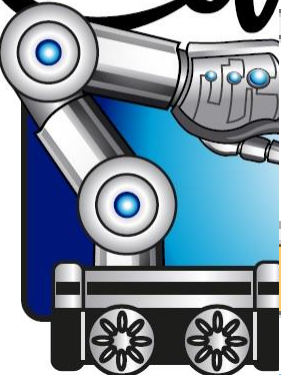
# LOGISTICS & TRANSPORT



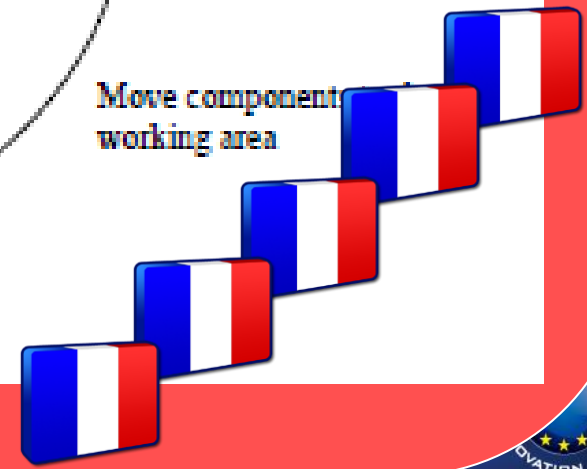
**UP-DRIVE**

# LOGISTICS & TRANSPORT

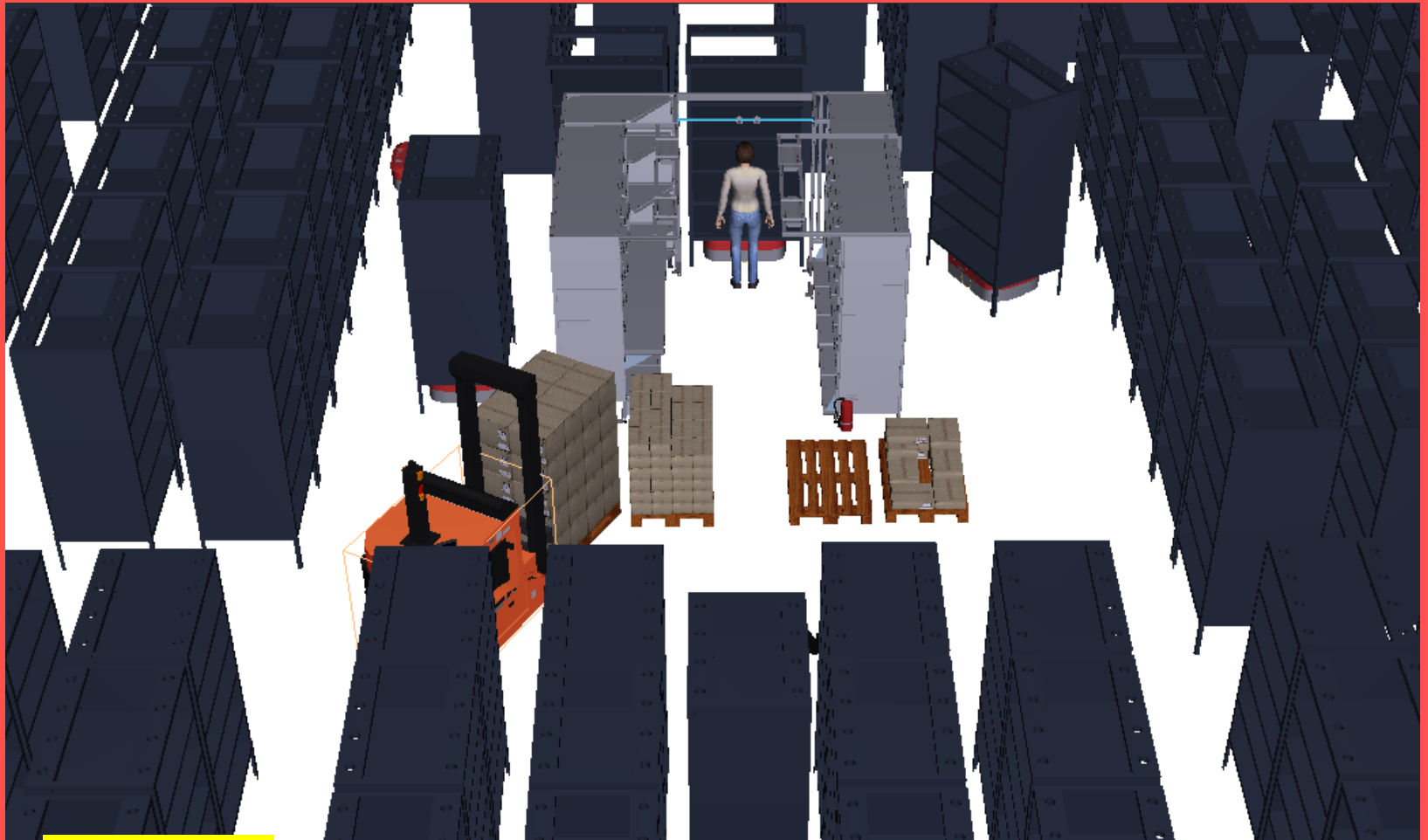
# Edi Robot



Foot:  
locate Part position  
install part in position



# LOGISTICS & TRANSPORT



**Safelog**



# MANUFACTURING



Robotic  
Automation  
Modules

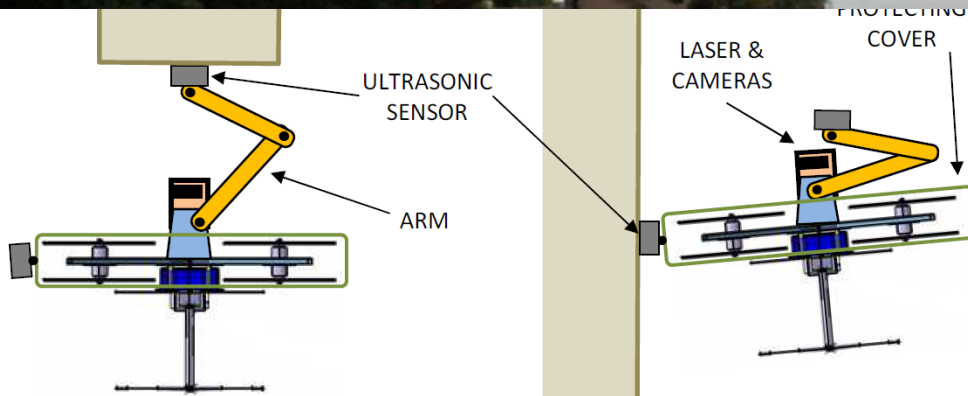


Reusable  
robotic  
platform



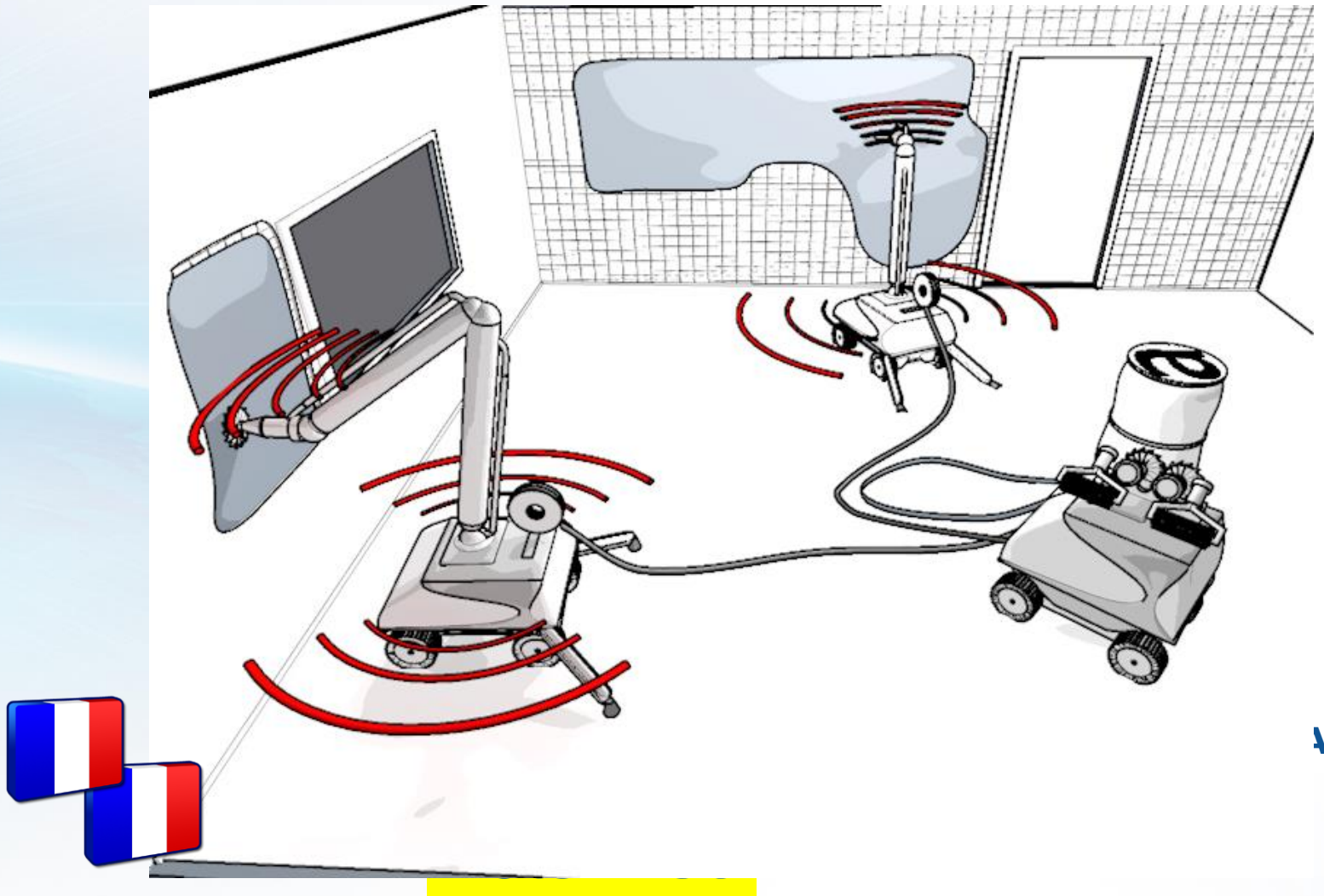
Module  
exchange  
infrastructure

**RAMP up**



Note: picture to illustrate the concept – not from the project

JUILLET  
2020



AL

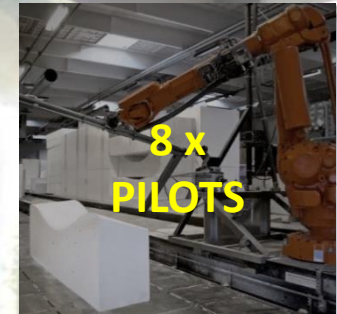
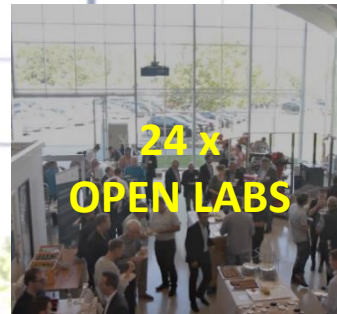
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# ROBOTT-NET

Robot Technology  
Transfer Network



A shared infrastructure to sustainably optimise **technology transfer** throughout Europe: ROBOTT-NET exists to help make the best ideas in industrial robotics a reality; for the benefit of **technology developers** and **European manufacturing**.



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# COORDINATION ACTION

RockEU2



EUROPEAN  
ROBOTICS  
LEAGUE

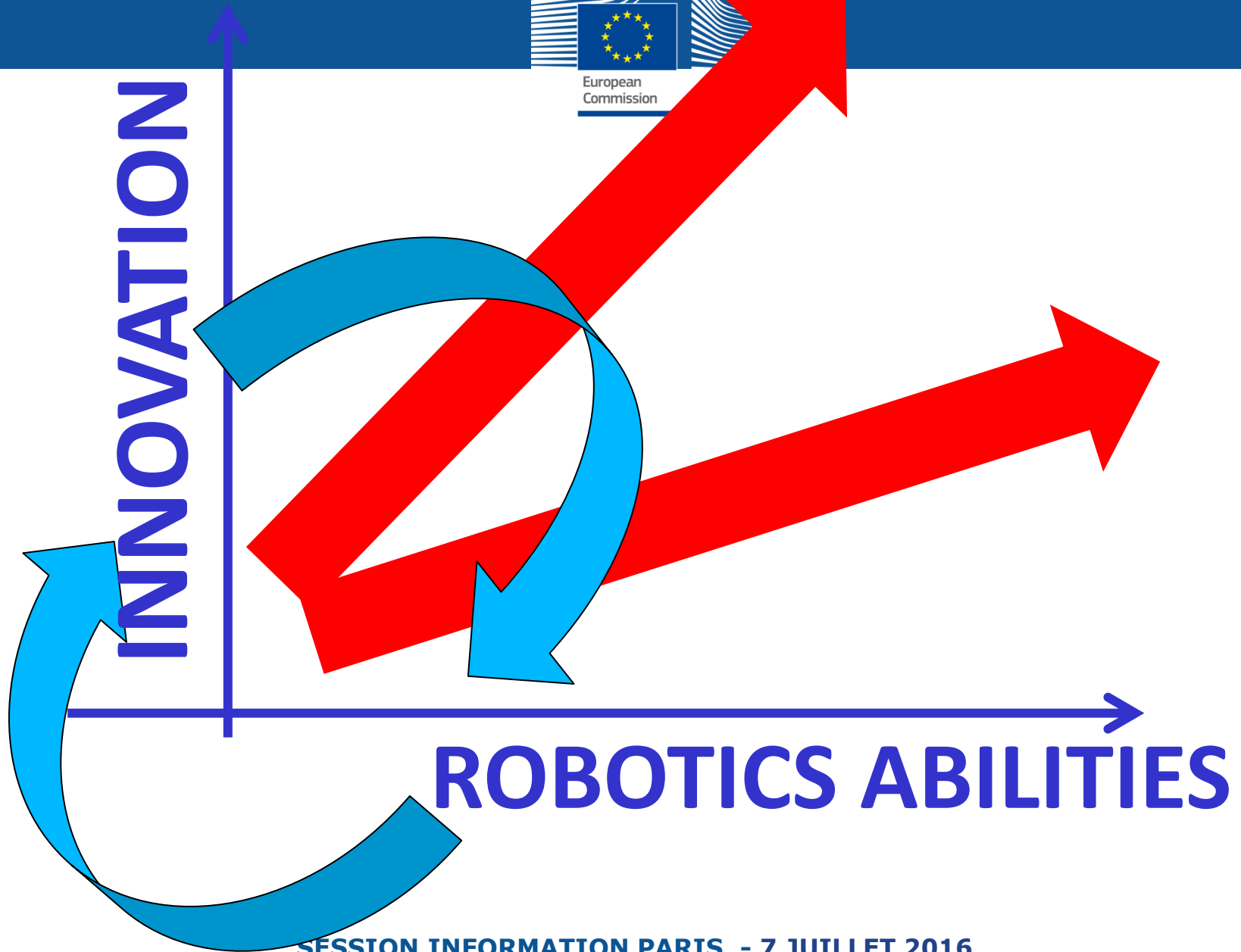
Brought to you by SPARC



# Outline

- Robotics activities in the EU programme
- SPARC - The Partnership for Robotics in Europe
- H2020 programme & projects
- **H2020 – next steps**
- DEI (Digitising European Industry) strategy







**ICT 25-2017: Advanced robot capabilities research and take-up**

**ICT 27-2017: System abilities, SME & benchmarking actions, safety certification**

**ICT 28-2017: Robotics competition, coordination and support**



## **ICT 25-2017: Advanced robot capabilities research and take-up**

<b>RIA</b>	<b>15M€</b>	a) Open, generic research
		b) Technical capabilities: Systems development, HRI, mechatronics, perception, navigation and cognition
<b>IA</b>	<b>19M€</b>	c) End User driven application development
		d) Filling technology / regulatory gaps

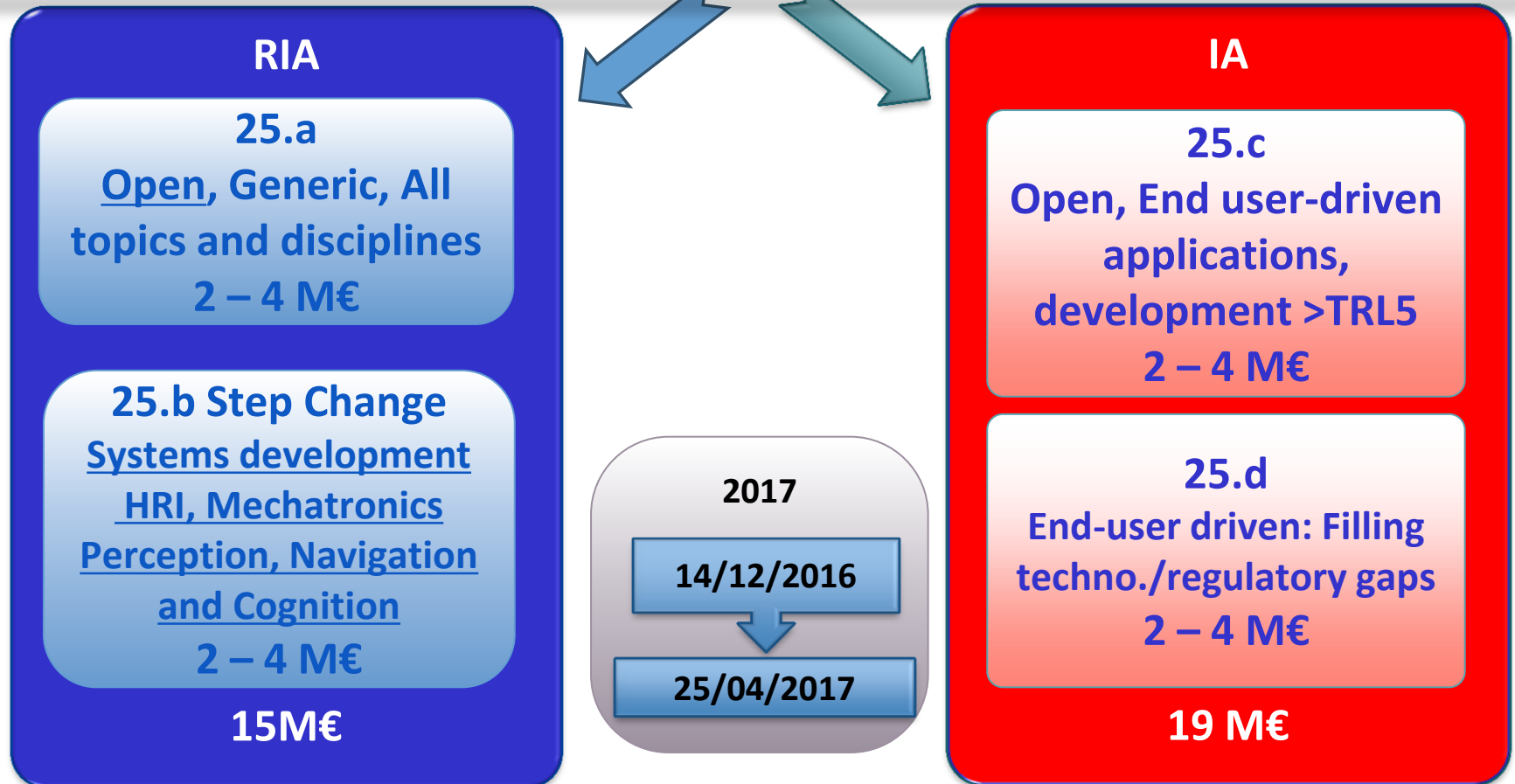
## **ICT 27-2017: System abilities, SME & benchmarking actions, safety certification**

## **ICT 28-2017: Robotics competition, coordination and support**

# H2020 – ICT-25-2017

European  
Commission

## Advanced robot capabilities research and take-up



**!!! Identify center of gravity (RIA: a. or b. / IA c. or d.)**



## ICT 25-2017: Advanced robot capabilities research and take-up

## ICT 27-2017: System abilities, SME & benchmarking actions, safety certification

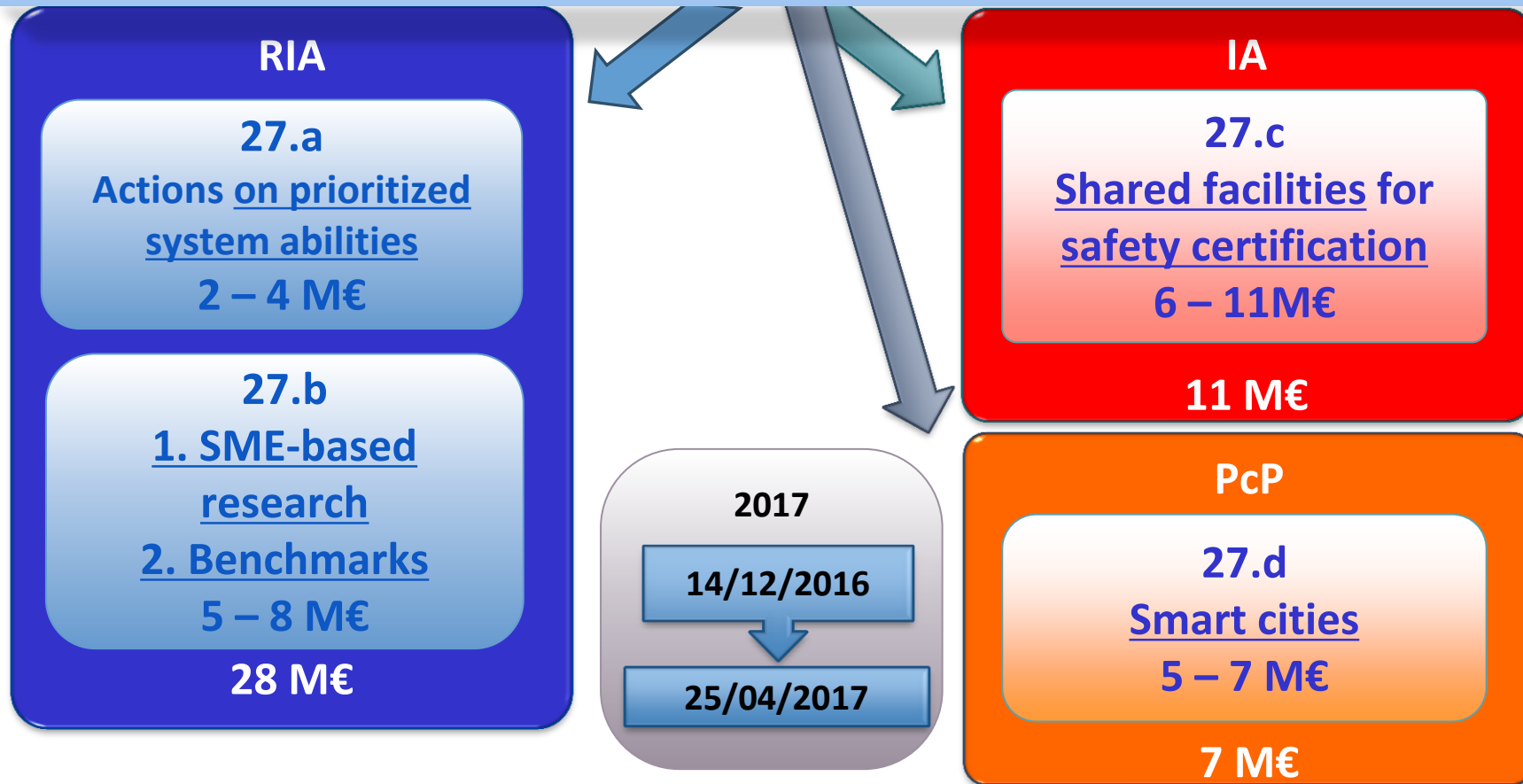
RIA	28M€	a) System Abilities: Perception ability, decisional autonomy, increasing dependability levels, self-verifying behaviour
		b) SME-based research and benchmarks
IA	11M€	c) Shared facilities for safety certification
PcP	7M€	d) Pre-commercial procurement: smart cities

## ICT 28-2017: Robotics competition, coordination and support



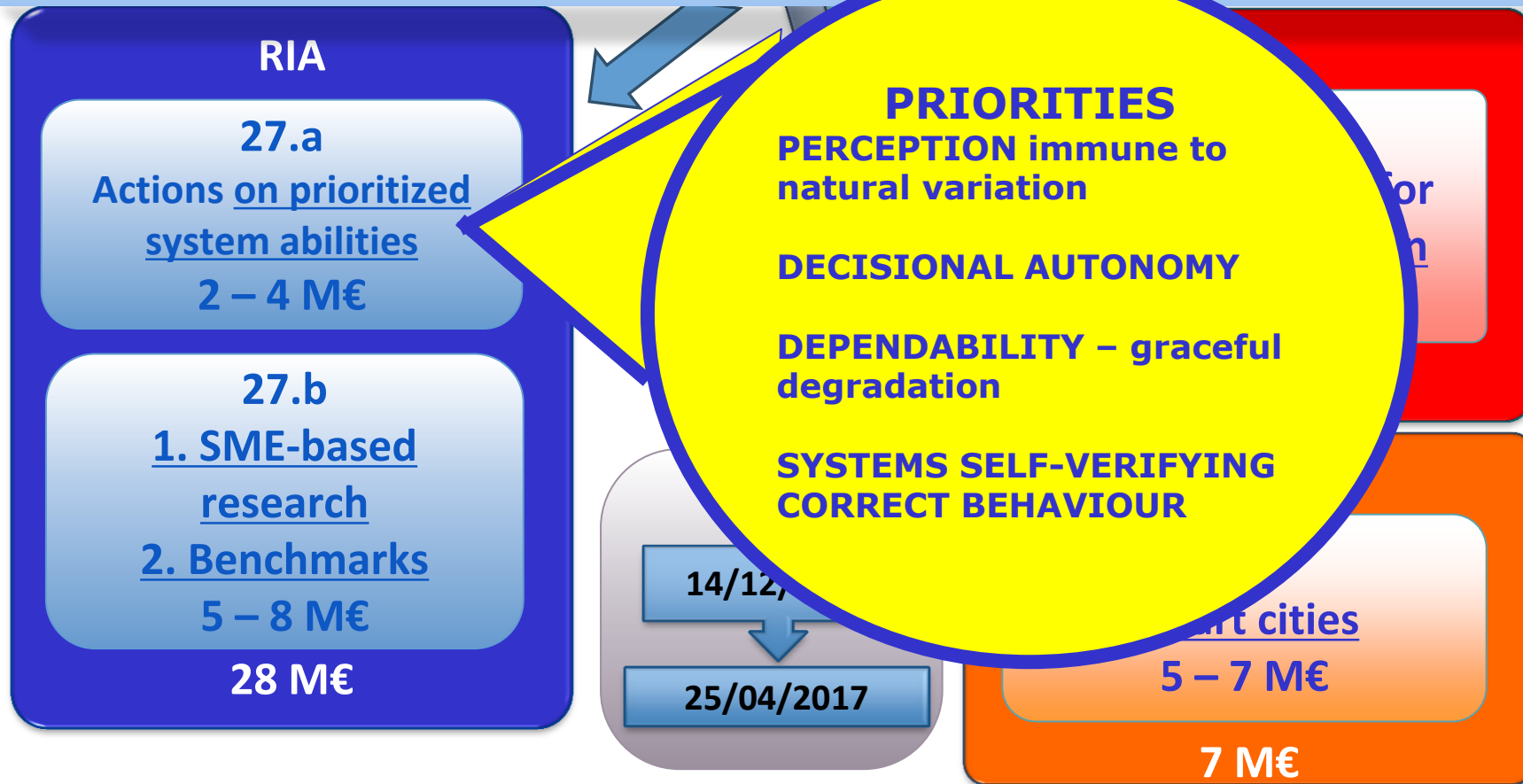
# H2020 – ICT-27-2017

## System abilities, SME & benchmarking actions, safety certification



# H2020 – ICT-27-2017

## System abilities, SME & benchmarking actions, safety certification



# H2020 – ICT-27-2017

## System abilities, SME & benchmarking actions, safety certification

**RIA**

**27.a**

Actions on prioritized system abilities

2 – 4 M€

**27.b**

**1. SME-based research**

Min 50%: Financial Support to Third Parties (50-100k€ each)

**2. Benchmarks**

Min 60%: Financial Support to Third Parties (50-100k€ each)

5 – 8 M€

**28 M€**

**IA**

**27.c**

Shared facilities for safety certification

Project size: 6-11M€

Min 50%: Financial Support to Third Parties (50-100k€ each)

**11 M€**

**PcP**

**27.d**

Smart cities

5 – 7 M€

**7 M€**

**2017**

14/12/2016

25/04/2017

## **Actions involving financial support to third parties (FSTP – Annex K)**

*Detail the **objectives** and the **results** to be obtained:*

- *list types of **activities***
- ***persons** or **categories** of persons which may receive financial support,*
- ***criteria** for **awarding** financial support*
- ***criteria** for **calculating** the exact amount of the financial support,*
- ***maximum amount** to be granted to each third party and the **criteria** for determining it.*

## Actions involving financial support to third parties (FSTP – Annex K)

- *must **publish** widely open calls*
- ***transparency, equal treatment, conflict of interest and confidentiality***
- *call -> clear **European dimension** – cross border experimentation or expanding the impact of local experiments to European scale.*



**ICT 25-2017: Advanced robot capabilities research and take-up**

**ICT 27-2017: System abilities, SME & benchmarking actions, safety certification**

**ICT 28-2017: Robotics competition, coordination and support**

CSA	5M€	a) Non-technical barriers
		b) Standards & regulation
		c) Community support and outreach
		d) Competitions

# H2020 – ICT-28-2017

European  
Commission

## Robotics Competition, coordination and support

CSA

28.a  
Non-technical  
barriers to robotic  
take-up

28.b  
Standards and  
Regulation

28.c  
Community support  
and outreach

28.d  
Competitions  
2 M€

3 M€

5 M€

2017

14/12/2016

25/04/2017



## ICT 25-2017: Advanced robot capabilities research and take-up

RIA	15M€	a) Open, generic research
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## ICT 27-2017: System abilities, SME & benchmarking actions, safety certification

RIA	28M€	a) System Abilities: Perception ability, decisional autonomy, increasing dependability levels, self-verifying behaviour
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## ICT 28-2017: Robotics competition, coordination and support

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# SFS-05-2017 - Robotics Advances for Precision Farming

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HORIZON 2020

Excellent Science  
(24.4 B €)

Industrial Leadership  
(17 B €)

Societal Challenges  
(29.7 B €)

LEIT = Leadership in  
Industrial

Health  
(7.5 B €)

Food  
(3.9 B €)

Energy  
(6 B €)

Transport  
(6.3 B €)

Climate  
(3 B €)

Inclusive Societies  
(1.3 B €)

Security  
(1.7 B €)

SC2: Sustainable  
Agriculture  
SFS-05-2017: **Robotics  
Advances for Precision  
Farming**

Types: RIAs

Funding for the call: 7M€

Deadline: 14 February 2017

...ellence (0.8 B €)

...for Society (0.5 B €)

EIT (2.7 B €)

JRC (1.9 B €)

Euratom (1.6 B €)

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# SCOPE

- Autonomous farm vehicles /sensors/ intervention mechanisms
- Selective harvesting, more targeted weed reduction or environment friendly fertilization, livestock management
- Tagging for traceability to optimise process

# IMPACT

- Increased productivity
- More environment-friendly
- increased safety, reliability, manageability, improving human working conditions

# Robotics in FoF-12-2017: ICT Innovation for Manufacturing

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HORIZON 2020

Excellent Science  
(24.4 B €)

Industrial Leadership  
(17 B €)

LEIT = Leadership in enabling and industrial technologies

new material

MEs

Societal Challenges  
(29.7 B €)

- Health (7.5 B €)
- Food (3.9 B €)
- Energy (6 B €)
- Transport (6.3 B €)
- Climate (3 B €)
- Inclusive Societies (1.3 B €)
- Security (1.7 B €)

Excellence (0.8 B €)

Research for Society (0.5 B €)

EIT (2.7 B €)

JRC (1.9 B €)

Euratom (1.6 B €)

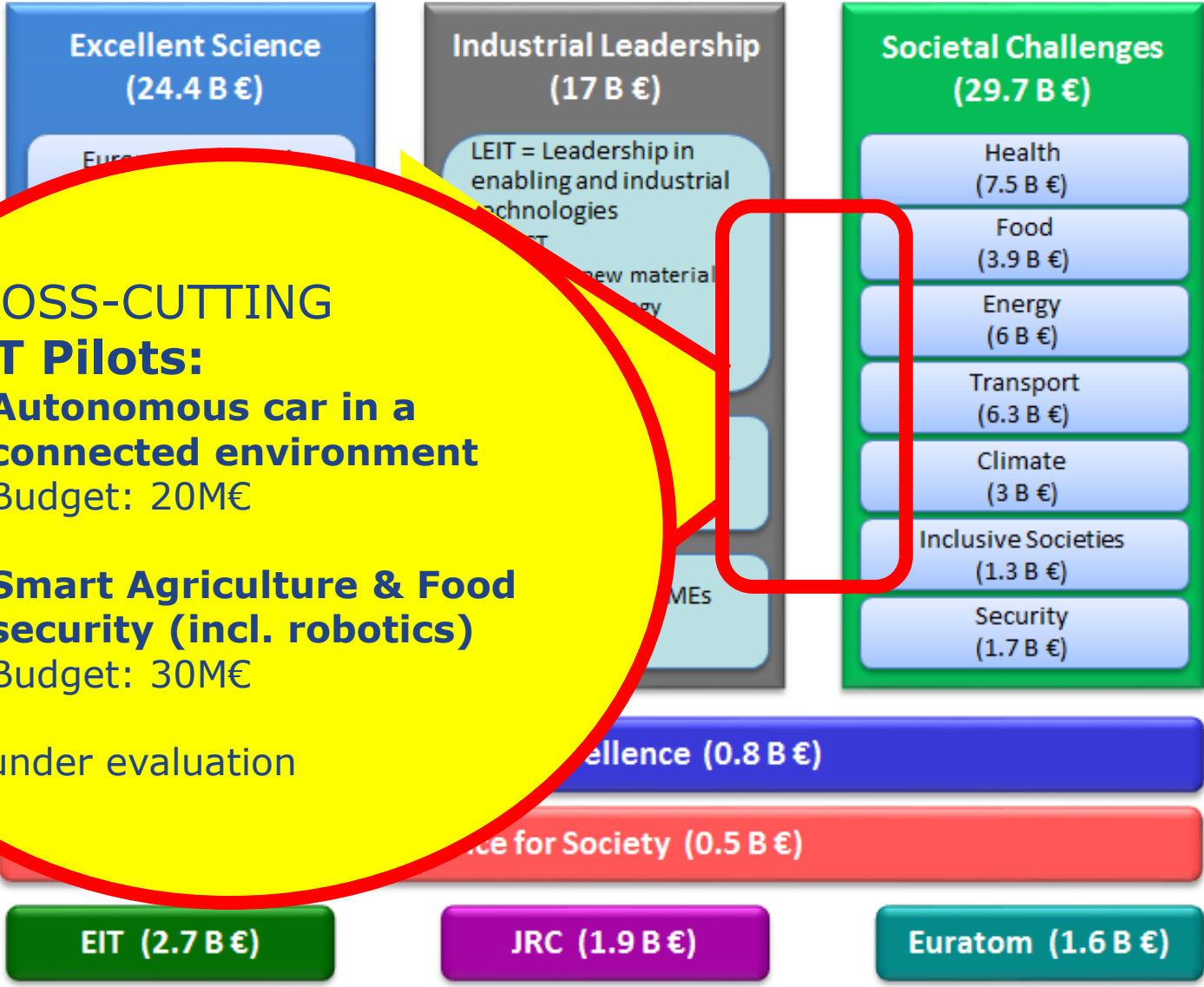
CROSS-CUTTING  
FoF-12-2017: ICT  
Innovation for  
Manufacturing  
**Robotics: cost  
effective @ lower lot  
sizes**

Types: IAs  
Funding: up to 8M€/prop.  
Deadline: 14 Feb.2017

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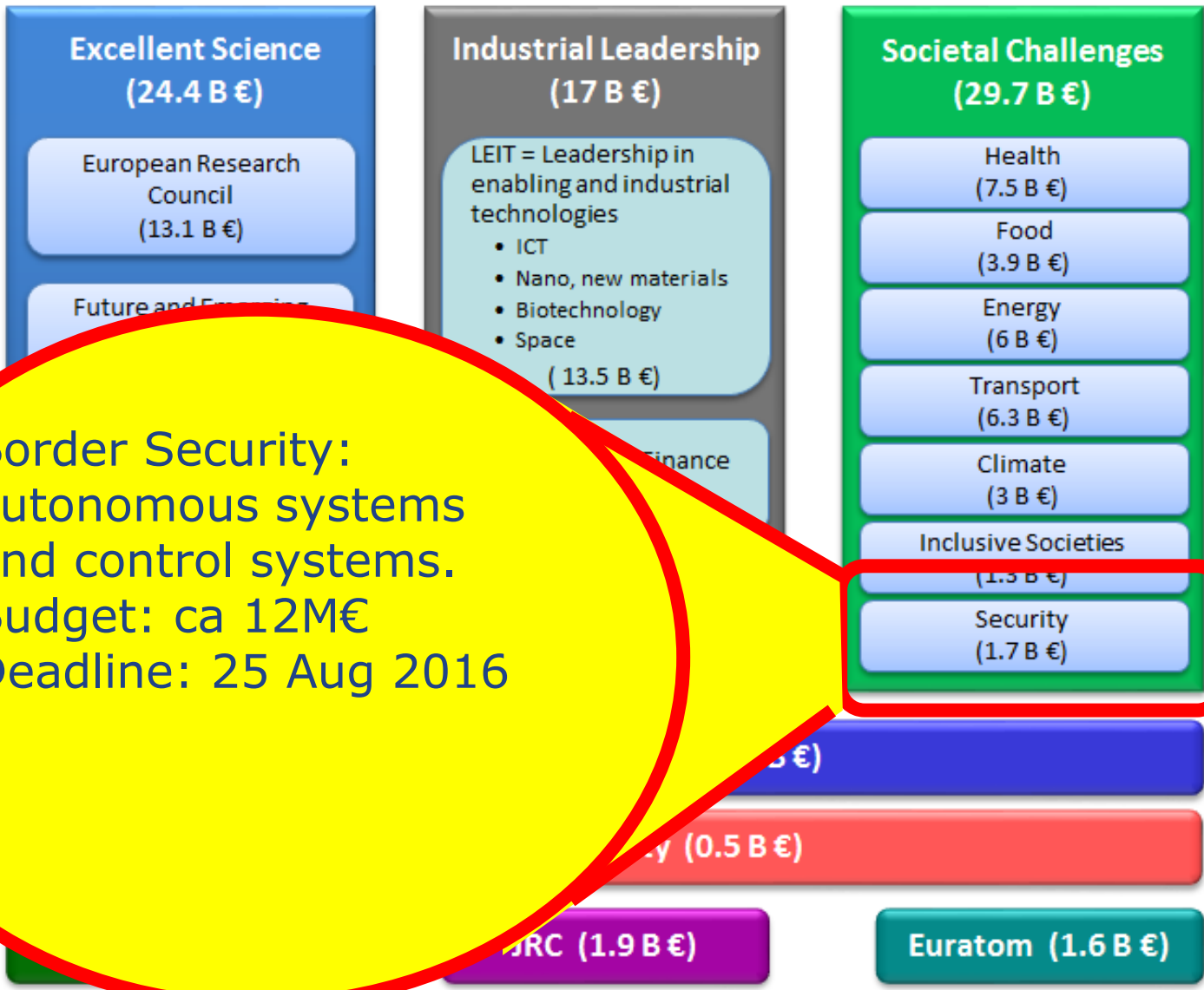




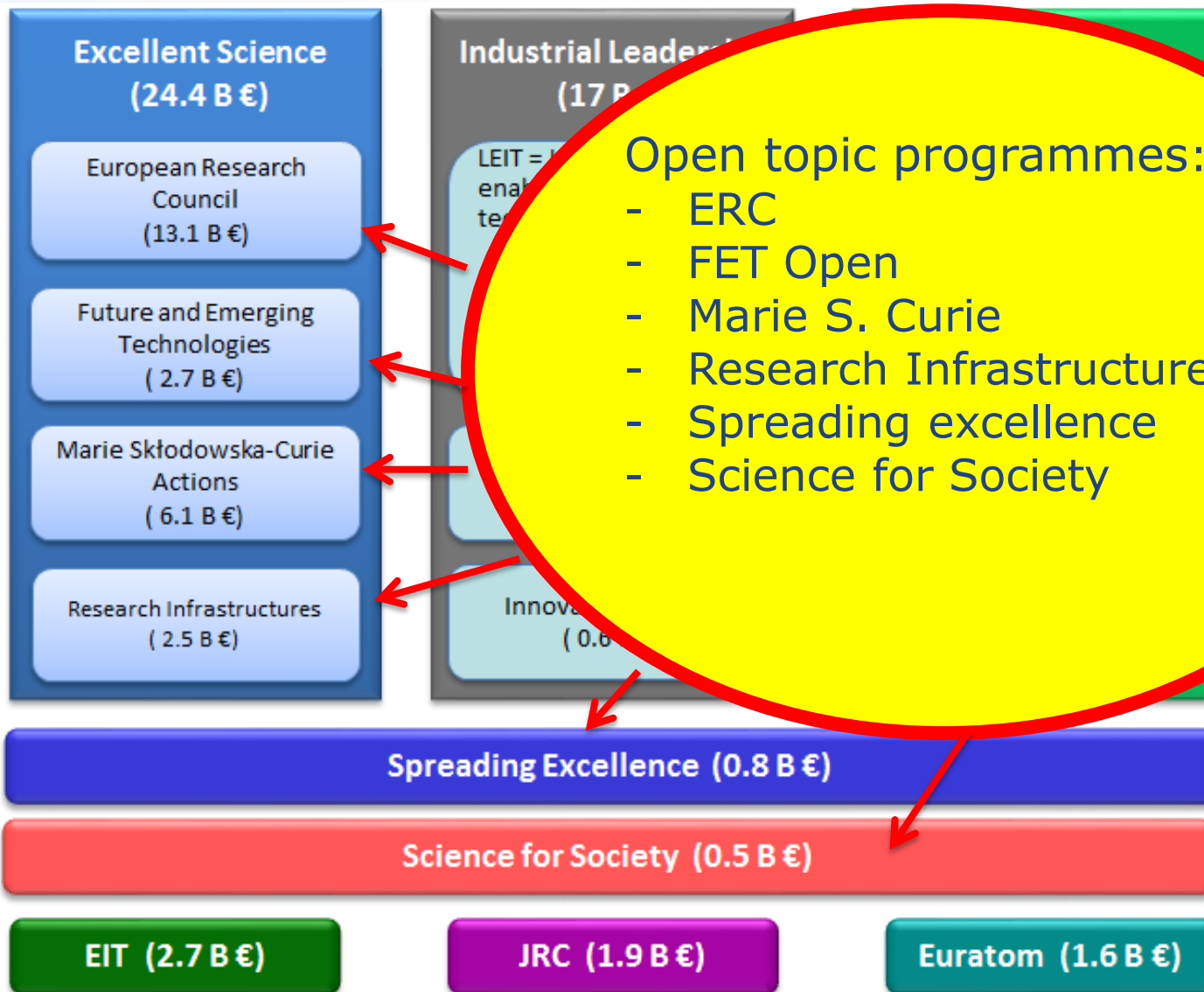
**CROSS-CUTTING IoT Pilots:**

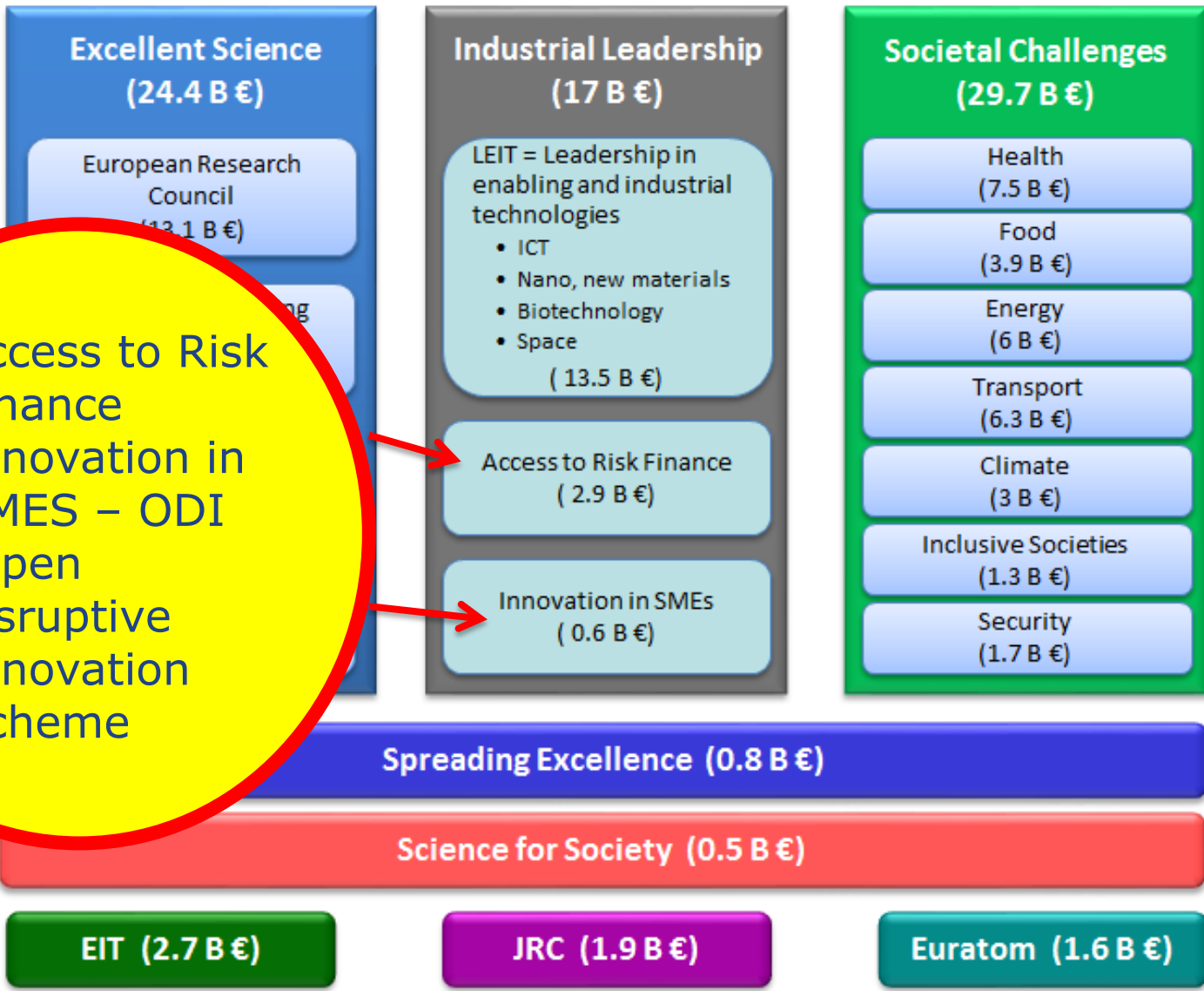
- **Autonomous car in a connected environment**  
Budget: 20M€
- **Smart Agriculture & Food security (incl. robotics)**  
Budget: 30M€

→ under evaluation









- Access to Risk Finance  
 - Innovation in SMES – ODI (open disruptive Innovation Scheme)

# PROPOSAL: Submission, Content and Evaluation

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# Horizon 2020 – Proposal content few tips for proposers

- *No negotiation → proposal = final project work plan, not a sales brochure*
- *The maturity, specificity and completeness of the work plan will be taken into account at the evaluation stage → weaknesses will be penalised*
- *Specific well-defined and challenging yet realistic objectives and how they will be reached and how you will assess progress*
- *Great idea not enough → credible work plan essential*

# Myths

- You need a partner from East West North South
- You need SME -> good but no artificial addition
- You need a consulting company -> only if more (cost) efficient
- You cannot have a partner with more than 30% of the budget
- A follow-up project gives you advantage -> must differentiate
- Declaring a re-submission is a bad thing -> freshly evaluated

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# Last evaluation – Lessons learned

- Right trade-off: focus/generalizability
- Right balance – timing milestones/deliverables → sufficient to manage the project
- End-User driven – sufficient involvement/commitment – during the whole project
- IA – don't invest massive research
- IPR Strategy! (especially High TRL)
- Don't spend massive effort in state of the art analysis -> bring the right competence
- Don't spend massive effort in requirements/specs -> does not show a good level of maturity

# Horizon 2020 – EVALUATION

- Evaluation criteria
  - 3 criteria: *Excellence, Impact, Implementation*
    - → **NOT ORTHOGONAL!!!**

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# IMPACT

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# Expected impact → check AGAINST WP TEXT

- No single proposal is expected to address the whole list
- Check whether the proposal is **concrete and specific** about what the project results would **achieve** in the areas described in the Work Programme (section "Expected Impact"), during the project lifetime and beyond
- Which concrete actions will be carried out **during** the project to **achieve such impact**?
- Do the proposers stress their (**competitive**) **positioning** / technical advantage in possible future markets or applications?
- Assess the **need for industry participation** and provide evidence of their **commitment**

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# Exploitation plan - Crucial

- Concrete exploitation strategy:
  - *well thought-out and properly resourced*
  - *involvement of people with the right expertise (for technology transfer, patents etc.) is highly encouraged where appropriate*
  - *projects closer to innovation: describe the path towards exploitation (at partner level & project level).*
  - *Also projects with a more scientific approach have to make clear what the eventual exploitation outcomes and impact will be.*

# Measures to maximise impact – exploitation of results

- Exploitation mechanisms – for example:
  - *Potential exploitable results*
  - *Target users*
  - *Mechanism planned DURING the project for attracting them*
  - *Credible business case*
  - *Analysis of current market*
  - *Management of the IPR*
  - *Analysis of existing patents – plans for patenting*

# Role of industries and end users

- **Industry** has a far **greater role** to play in R&I than before. Involvement of industry as **manufacturers, system suppliers, integrators** or **users** is welcome, as appropriate, depending on the needs of the project and on the technology readiness level addressed.
- The involvement of **end users** in projects is **welcome, as appropriate**. In some projects, such as "User driven IA", it is a **must**.

# Dissemination/exploitation

- If **industrial dimensions** -> not necessary to make all **deliverables public**. In that case, **justify** why and describe the plans to protect and exploit such results.
- H2020 rules on IPR assure that "Ownership of background is not affected by participation in a H2020 project", and "Results are owned by the beneficiary that generates them. "
- **BUT DISSEMINATION -> DEMONSTRATE IMPACT OF THE FUNDING**

# Measures to maximise impact – dissemination of results

- **Concrete** dissemination plan, scientific and non-scientific, with a coherent **vision**, not just a 'shopping list'
- Targeting **all types of** media channels and audiences (website, press releases, publications, exhibits at fairs, social media), **as relevant**

# Last but not least

- **Nothing artificial:**
  - *Number of partners, geographic coverage, budget, types of partners (SMEs,...)*
    - *ANY CHOICE DICTATED BY THE PROJECT NEEDS*
- Extremely competitive
- → **BE OUTSTANDING!**

# Horizon 2020 – Proposal Submission

- **Page limit** for technical content in Part B (excluding partner descriptions)
  - **70 pages** (IA/RIAs)
  - Pages exceeding the limit will be ignored
  - **IF REFERENCES ARE IN OTHER SECTION (4) -> IGNORED -> penalised!!!**
- Self-check of **SME status** & financial viability: do it carefully as might be very **critical** at a later stage



# SME status - Admin Form:

European Commission - Research - Participants  
Proposal Submission Forms

Proposal ID  Acronym  Short name

## 2 - Administrative data of participating organisations

**PIC**  **Legal name**

Short name: UMG-GOE

Address of the organisation

Street

Town

Postcode

Country

Webpage

Legal Status of your organisation

**Research and Innovation legal statuses**

Public body .....	yes	Legal person .....	yes
Non-profit .....	yes		
International organisation .....	unknown		
International organisation of European interest .....	unknown		
Secondary or Higher education establishment .....	yes		
Research organisation .....	yes		

**Enterprise Data**

SME self-declared status .....	unknown
SME self-assessment .....	unknown
SME validation sme .....	unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

SME self-declared status ..... unknown

SME self-assesment ..... unknown

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

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## Outline

- Robotics activities in the EU programme
- SPARC - The Partnership for Robotics in Europe
- H2020 programme & projects
- H2020 – next steps
- **DEI (Digitising European Industry) strategy**



# Europe's Future is Digital\*

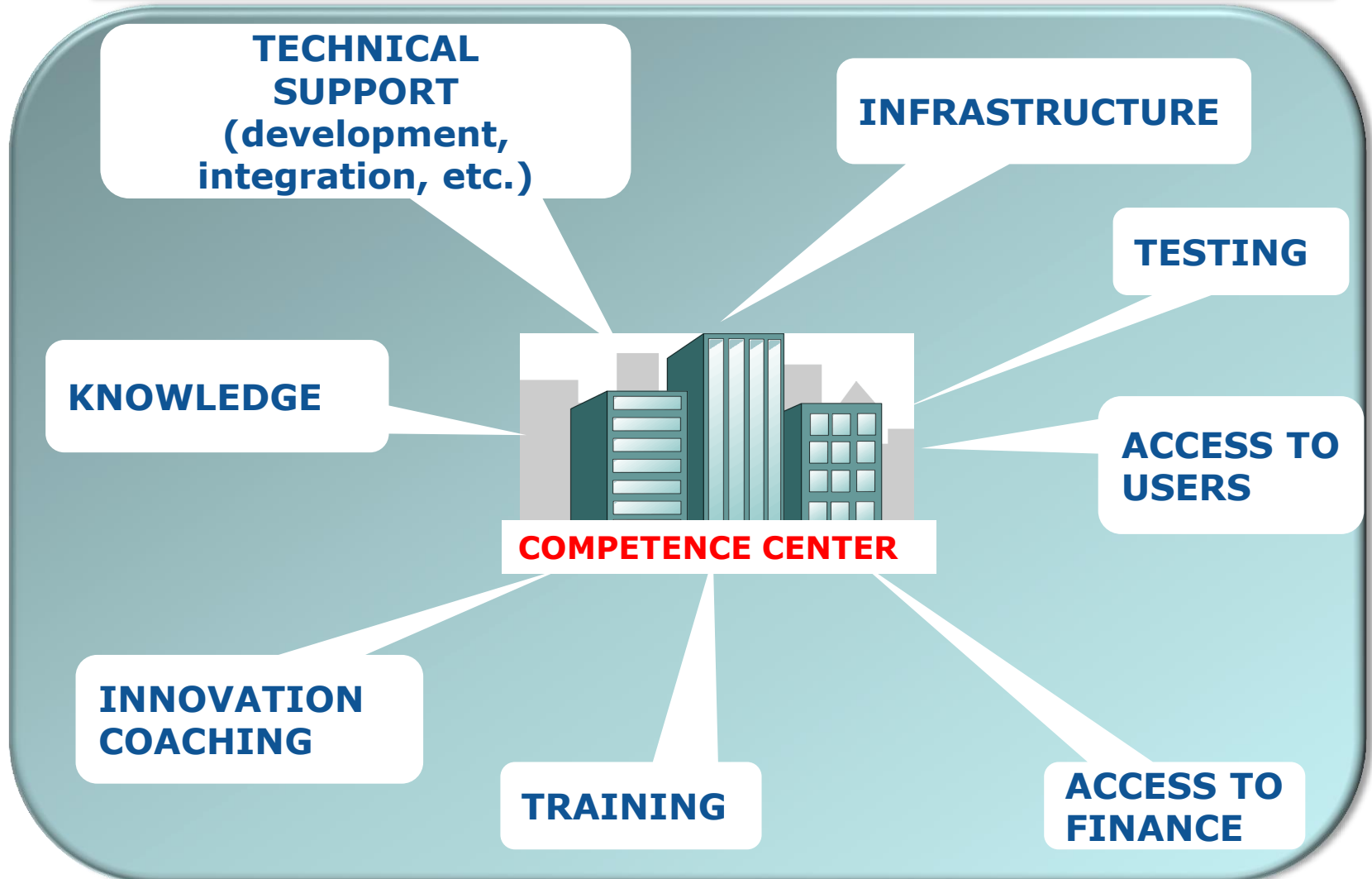
*Commissioner Oettinger: "My objective is to have at least **one world class digital innovation hub in every region in Europe.**"*

***Empower any business, wherever it is located in Europe to master its digital transition***

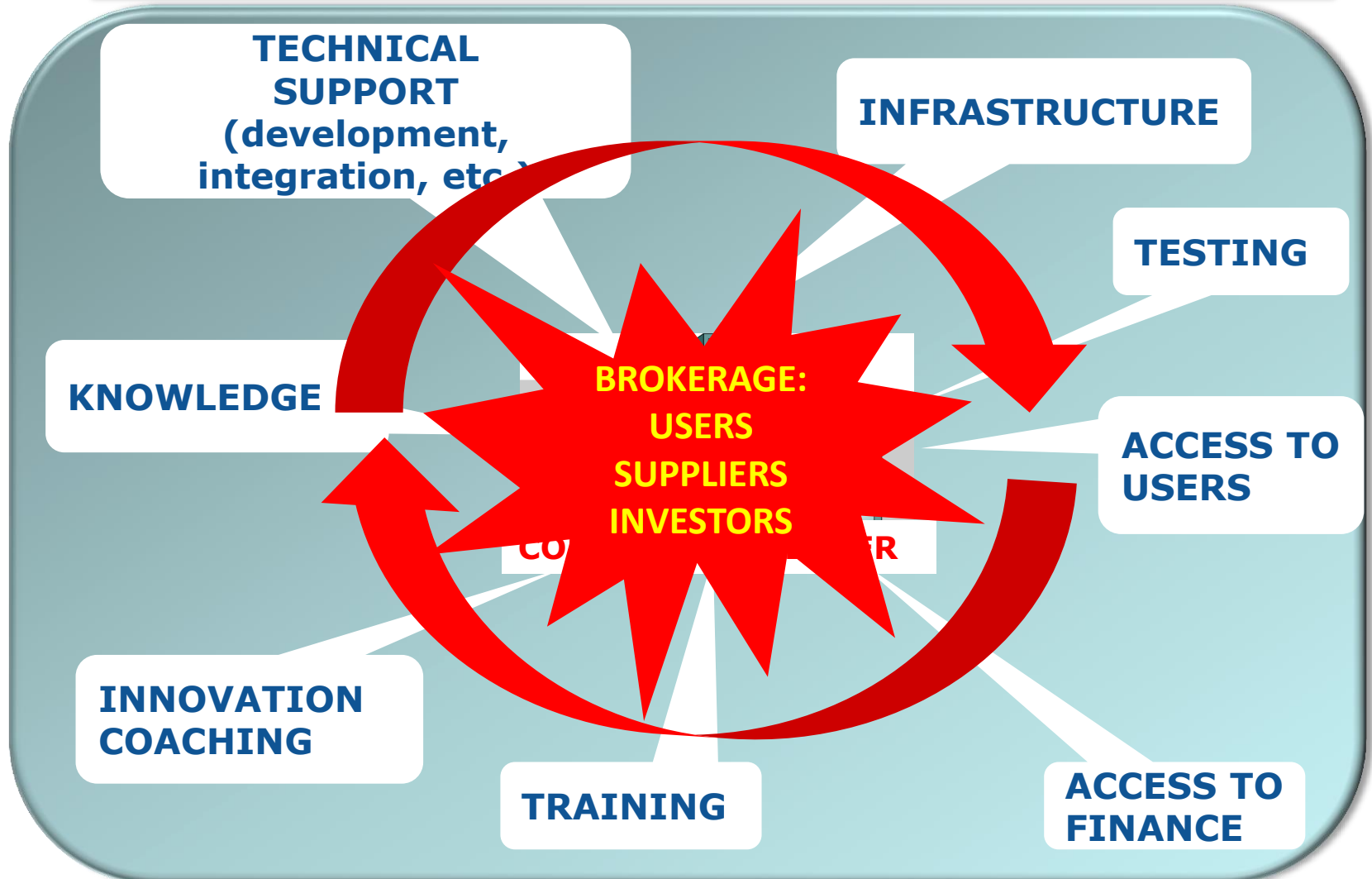
**MOBILISE CLOSE TO 50 B€ OF PUBLIC AND PRIVATE INVESTMENT FOR DIGITISING THE INDUSTRY**

\* Exerpts from Speech by Commissioner Oettinger at Hannover Messe 2015

## DIGITAL INNOVATION HUB: INGREDIENTS



## DIGITAL INNOVATION HUB: INGREDIENTS





# DIGITAL INNOVATION HUB: ACTORS



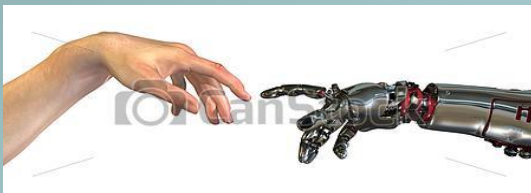
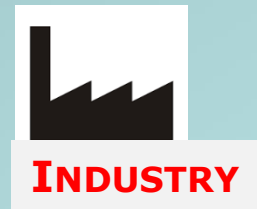
**ENTREPRENEUR**



**INCUBATOR**



**COMPETENCE CENTER  
SHARED PHYSICAL  
INFRASTRUCTURE & SUPPORT  
(TECHNICAL, LEGAL,  
ADMINISTRATIVE,  
BUSINESS,...)**



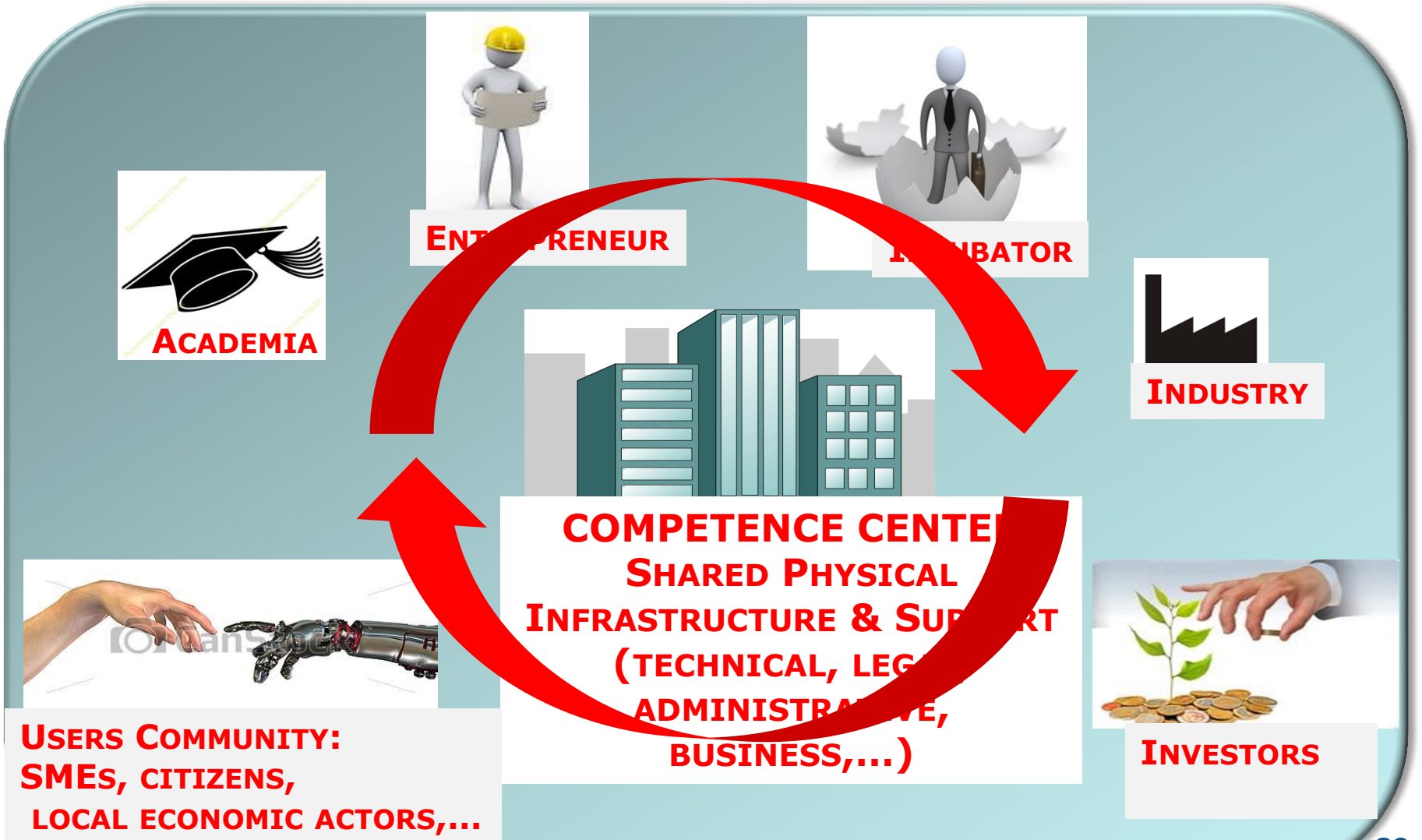
**USERS COMMUNITY:  
SMES, CITIZENS,  
LOCAL ECONOMIC ACTORS,...**

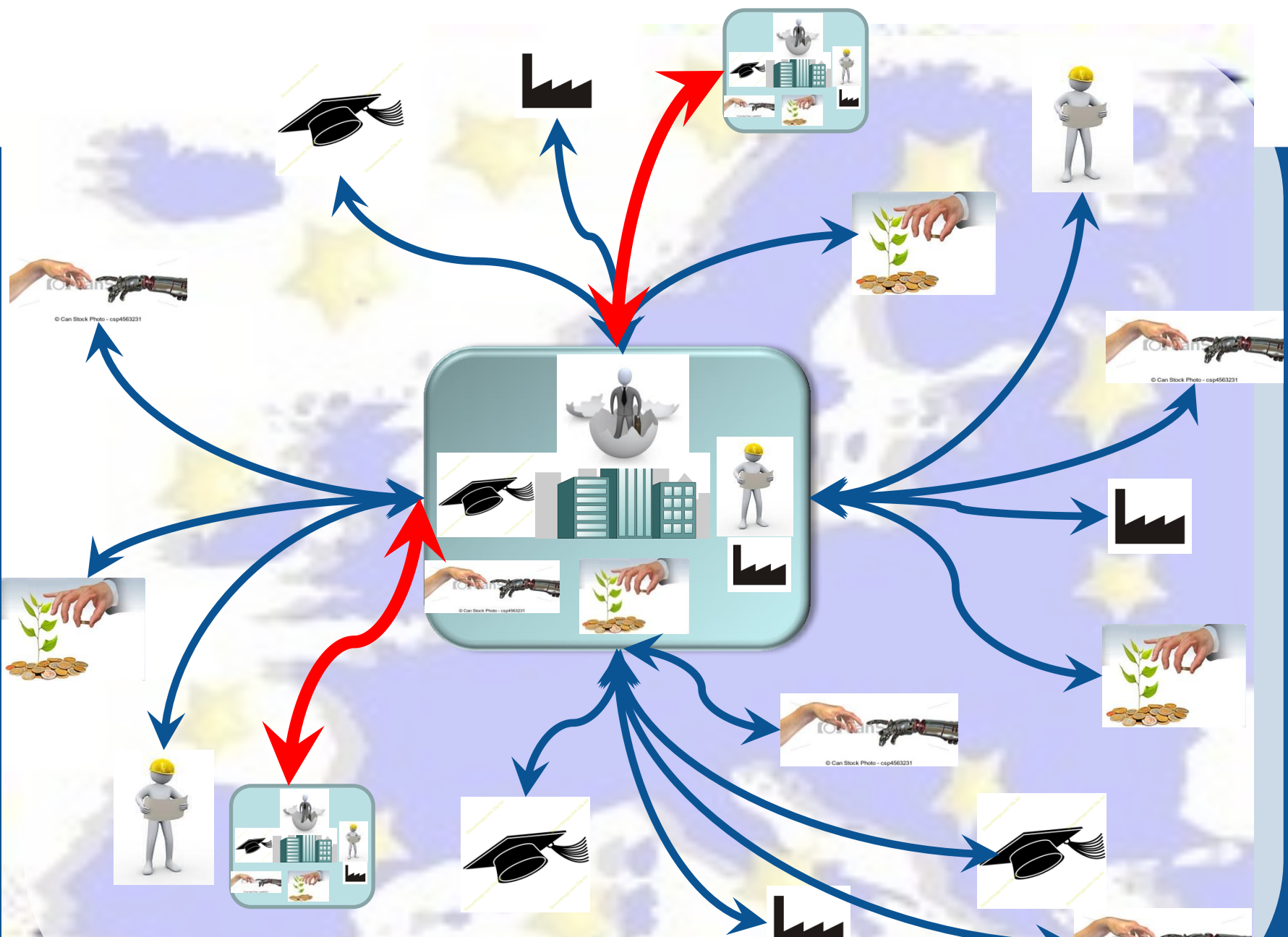


**INVESTORS**



# DIGITAL INNOVATION HUB: ACTORS





**COLLABORATION AND NETWORKING BETWEEN CENTRES  
→ ONE-STOP-SHOP FOR EXPERTISE, COMPLEMENTARITY & SPECIALISATION**



# COMBINED FUNDING: PRIVATE & PUBLIC



European  
Commission

## PRIVATE



National, regional,  
local Funding



EU Regional funding



EC Investment Plan

## PUBLIC

# On the way to **Digital Innovation Hubs**

→ Test cases in FP7 → **Shared facilities**  
**in**

→ **EuRoC** <http://www.euroc-project.eu/>

→ **ECHORD ++** <http://www.echord.eu/>

# FoF I4MS – European Robotics Challenges - EuRoC



- **Three industry-relevant Challenges**

- Open call framework
- Three stages of increasing complexity (incl. application experiments)
- Benchmarking and performance evaluation on **shared resources**



**Reconfigurable Interactive  
Manufacturing Cell (RIMC)**



**Shop Floor Logistics  
and Manipulation (SFLM)**



**Plant Servicing  
and Inspection (PSI)**

# RIF – ROBOTICS INNOVATION FACILITY

**ECHORD++** European Clearing House for Open Robotics Development Plus Plus

Experiments

Facilities (RIFs)

PDTI

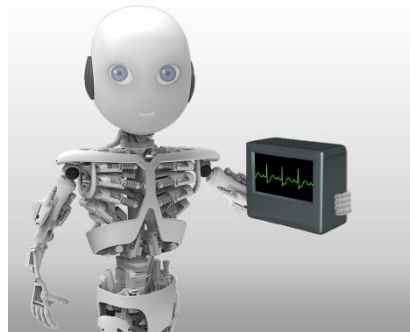
News

Services

About Us



**RIF = Robotics  
Innovation Facility ->  
Bristol, Pisa, CEA LIST Paris**



**PDTI - Public end-user Driven  
Technological Innovation**



<http://www.echord.eu/>



# Instruments at EU level in H2020

## H2020:

- **ICT24: ROBOTT-NET** → Technology transfer: Industry-academia cross-fertilisation (including "shared research infrastructures")
- **FoF: HORSE/RECONCELL**
- **ICT-26-2016: Pilot installations** →
  - d. Innovation Actions on pilot installations for robot testing
- **ICT-27-2017: Safety certification** →
  - c. Innovation Actions on shared facilities for safety certification

# Additional information

## Background documents

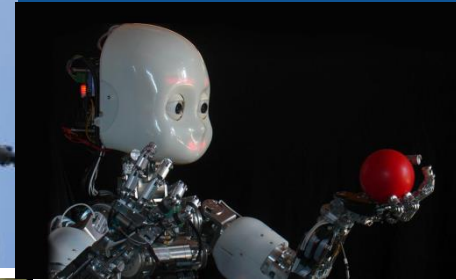


1. SRA / MAR - <http://sparc-robotics.eu/about/>
2. Q&A document – check participant portal
3. ICT Proposers' Day 2016: 26-27 September, Bratislava <https://ec.europa.eu/digital-single-market/en/ict-proposers-day-2016>
4. Brokerage event – ROBOTICS, Brussels, December 2016 (TBC) last edition: <http://sparc-robotics.eu/eurobotics-brokerage-day-2015/>

STAY TUNED

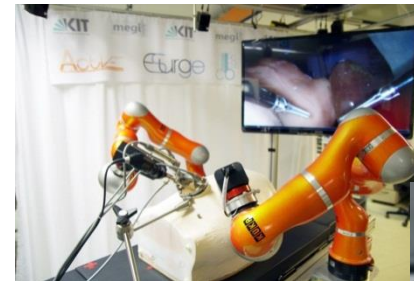
<https://eu-robotics.net/>

<https://ec.europa.eu/digital-single-market/en/robotics>



## Current project portfolio (project factsheets - Robotics)

<http://ec.europa.eu/digital-agenda/en/node/72886>

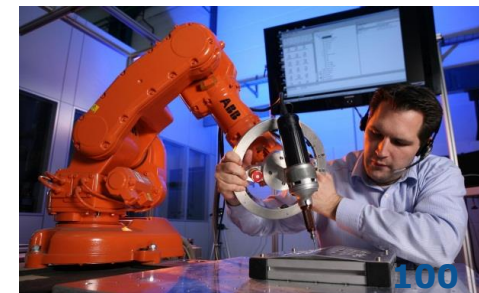


H2020 ICT-23 /ICT-24 : summaries of selected projects:

<https://ec.europa.eu/digital-agenda/en/news/first-robotics-projects-h2020-starting>

[http://ec.europa.eu/newsroom/dae/document.cfm?doc\\_id=12948](http://ec.europa.eu/newsroom/dae/document.cfm?doc_id=12948)

→ SITUATE YOUR PROPOSAL WRT STATE OF THE ART INCLUDING ALREADY FUNDED PROJECTS







**THANK YOU**

**Cécile Huet, PhD**  
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**European Commission**  
**[Cecile.Huet@ec.europa.eu](mailto:Cecile.Huet@ec.europa.eu)**

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