

## **Why should regions invest in structural funds in Robotics?**

Robotics has a huge potential to contribute to growth, job creation and to solving major societal challenges. Regions should fully exploit potential in terms of contribution to local economies, for instance advanced robotics technologies with increased flexibility can play a key role in making local manufacturing and production competitive again<sup>1</sup>, and also contributing to greener economy, with the potential to re-shoring some industries (e.g: food supply). The health and monitoring domains also show great potential at regional level, since these cannot be delocalised.

### ***Strategies for smart specialisation***

Smart specialisation can also play a key role: region should build on their strengths and ensure to maintain excellence where their leading position is acknowledged. Due to financial situation, some leading regions might be at risk due to brain drain in case the local conditions are not attractive enough. Regional investment steered by smart specialisation offers a unique opportunity not only to maintain excellence but develop new economies around them, developing cooperation along the entire R&I value chain, attracting additional investment, sparking entrepreneurship to create new companies, attracting new users, creating new jobs, involving local SMEs, local authorities (e.g.: as users to test the technology in public spaces, services, in PcP,...), etc.

The strategy is to build around existing excellence centres, cluster, regional initiatives or to develop new ones where the added value is demonstrated. Sharing physical infrastructure and resource not only at regional but at European level, has many advantages, reinforcing the leading position of the region, but also optimising resource and funding at EU level.

Network between these smart specialisation centres should also be developed to avoid duplication, ensure efficient use of funding and sharing of knowledge.

Each region choosing to specialise in a domain should take into account the specific added value of the specialisation. The strategy is to build on the strengths existing in specific areas and support their development to help them becoming world leaders by specialising and cooperating with the others.

The importance of robotics today is due to its expanding market size and application areas and to its strong impact on the competitiveness of the EU's main industries. Large sectors including automotive or agrofood, representing more than 17% of the EU GDP, 80% of EU exports, employing 25% of the workforce and accounting for 80% of private R&D spending, would have disappeared from higher-wage regions such as Europe without intensive use of robotics.

Since the beginning of the crisis, employment in manufacturing has fallen due to decreases in demand and productivity. Investment in the modernization of manufacturing is essential for Europe to reinforce its competitiveness. Given their direct impact on the competitiveness of manufacturing, robots play a crucial role in this process.

According to a recent study, one million industrial robots currently in operation have been directly responsible for the creation of close to 3.5 million jobs. The European robotics industry is not only a successful industry in its own right – European robotics manufacturers employ about 100,000 people – but it is responsible for creating and maintaining millions of manufacturing jobs in Europe.

In both industrial and service robotics, Europe has a strong market position and both markets continue to grow rapidly. By 2020, service robotics is expected to reach a market volume of more than €100bn per year.

### ***Links to the Digital Agenda for Europe***

The Digital Agenda for Europe acknowledges the position of robotics to maintain Europe's competitive edge through increased coordination and elimination of Europe's fragmented efforts, and provides a digital policy framework to regions.

Robotics is clearly part of Pillar V of the DAE, Research and Innovation, to attract Europe's best minds to research and develop world class infrastructure. The best research ideas must be turned into marketable products and services. The Digital Agenda seeks to maintain Europe's competitive edge through increased coordination and elimination of Europe's fragmented efforts. Therefore coordination of initiatives at regional and European level is key.

Specific action where Robotics can play a role:

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<sup>1</sup> Industrial Robots save production locations and millions of jobs <http://www.ifr.org/news/ifr-press-release/robots-to-create-more-than-a-million-jobs-by-2016-295/>

- [Action 51: Reinforce the coordination and pooling of resources](#), with Member States and industry, and put greater focus on demand- and user-driven partnerships in EU support to ICT R&I.
- [Action 50: Leverage more private investment for ICT research and innovation](#) with greater and more efficient use of structural/regional development funds for ICT research and innovation (see DAE Action 55).
- [Action 55: Member States to double annual public spending on ICT research and development](#) EU action will support a more targeted use of structural/regional development fund for ICT research and innovation and disclose new ways to increase national R&D investments. Increase the use of structural & regional development funds for ICT research facilities and development projects on ICT products, services and applications.

## **Barriers and challenges**

One of the challenges is to prioritise the topics and candidates for smart specialisation, then developing an ecosystem around them, mobilising all the necessary actors including academia, system integrators, industry, SMEs, potential users, involving local governments, as users, where relevant.

## **How to act?**

Based on an analysis of the strengths in robotics in the European landscape, develop a strategy to build smart specialisation in robotics, optimising the use of structural funds to complement efficiently the identified R&I topics (for example, in the strategic research agenda of the robotics PPP). Lessons should be learned from existing initiatives such as Robodalen and Robocluster: that is, how to focus on the right priorities and identify the mechanisms to attract the required stakeholders, closely involve the end-users and increase visibility of the sector to successfully create products and companies from research and ideas.

This should be done in close collaboration with the robotics PPP<sup>2</sup> (Public-Private Partnership) and with relevant projects, sharing infrastructures and resources, such as EUROCC<sup>3</sup> and ECHORD++<sup>4</sup>.

Different services can be offered via these shared resources and infrastructure: provide access to researchers to facilities, platforms and technical support, provide support for technology transfer, help cooperation between academia and industry to take full advantage of the leading edge expertise, support for spin-offs creation, build show-cases for attracting users, investors, public at large,...

## **More in details**

1. Structural Funds support to individual projects in Robotics? Best Practices.
  - Robotdalen<sup>5</sup> - Sweden: Funding from ERDF: MSEK 24.6 - aims at enabling commercial success of new ideas and research within robotics and automation with a focus on solutions for the industry, heavy autonomous vehicles and technology for independent life. The goal is to create 35 new products and 35 new operational areas or companies.
  - ROBOCLUSTER<sup>6</sup> - Denmark: Funding from ERDF MDKK 6.3 (total budget MDKK 12.6) - aims at spreading the use of robotics and automation technology for existing and new sectors and at creating visibility. The focused areas are Biological production, Food Industry and Healthcare.
2. Structural Funds contribution to reaching EU goals in Robotics? Map out the impact of robotics from a regional viewpoint? In addition to the examples listed, to be analysed.
3. Benefits for MS/regions that develop capacity/expertise in robotics?

There is big potential to build on existing excellence in some specific regions. This could avoid brain drain, losing such capacity and creating growth. There is also potential for creating new industry, keeping jobs and enabling growth at

<sup>2</sup> <http://www.eurobotics-project.eu/robotics-ppp/about-robotics-ppp.html>

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<sup>4</sup> Coordinator: Alois Knoll ([knoll@in.tum.de](mailto:knoll@in.tum.de))

<sup>5</sup> <http://www.robotdalen.se/>

<sup>6</sup> <http://en.robocluster.dk/>

some specific location, sharing resources and (physical) facilities and benefitting from other similar initiatives in networking.

The benefit for the regions are to keep the excellence in their region, building on the existing knowledge and know-how, avoiding a brain drain, and creating new jobs, new spin-offs, developing entrepreneurs, attracting investors. This should cover the entire value chain, from the scientific basis, to the deployment either to benefit the citizen, or the service sector and the industry. If one region cannot cover the value chain it should seek complementarity, possibly teaming up with other regions.

4. Key documents to better understand the EU viewpoint

The robotics PPP is a key initiative for the future of robotics in Europe, it would be essential to position the regional strategy with respect to the PPP, to optimise synergies and avoid duplication. One of the goals of the PPP is to optimise the synergies with regional/national initiatives. Key document: SRA <sup>7</sup> and Roadmap edited by the PPP.

Other initiatives: EUROCC, ECHORD ++ and SILVER (a PcP in AAL).

5. Barriers and challenges to use Structural Funds? Preconditions for success

It would be essential to identify the specific added value of the region for robotics, either in providing unique contribution to the field or where robotics can contribute to the region (eg keeping some production locally, maintaining excellence).

One of the challenges is to bring all the necessary ingredients and stakeholders to build an ecosystem, developing entrepreneurship, initiating the snowball effect between user pull and technology push <sup>8</sup>.

It is essential to position the regional/MS contribution to the existing landscape and avoid duplication, but also optimising synergies, building on existing resources and initiative.

It is also useful to learn from existing successful initiatives and share knowledge and resources (including physical facilities, technical and administrative, legal support, when useful).

6. Criteria and indicators, data sources and techniques to analyse strengths, weaknesses and potentials for developing capabilities?

- Level and quality of the expertise in robotics (measured by objective factors)
- Potential for growth generated by robotics industry
- Uniqueness of the contribution/complementarity with other initiatives
- Coordination with/ and contribution to/ the robotics PPP initiative
- Potential to attract new industries/users/capital/create spin offs
- Added value of sharing resources
- Consider SWOT analysis and KPIs developed in other initiatives (PPP, ROBONED,...)

7. Which actors/stakeholders are typically involved in policy design and implementation in your policy area?

Member States ministry of Research, industry

8. Criteria and indicators to analyse potentials (SWOT) and to measure progress, success or failure in implementing Robotics R&I at the regional/ national level? Part of the Digital Agenda targets/monitored in the Scoreboard?

- For scientific excellence, number of high impact factor publications, and patents
- Capacity to develop excellence centres, including infrastructure and support to shared robotics platforms, maintain them and develop products, services, applications
- Capacity to involve all relevant actors from the value chain (from scientific excellence to system integrators, users (developing robotics solutions), end users – potential users of robotics solutions
- Number of jobs, number of new products, services, number of new companies, patents, number of successful technology transfers
- Potential benefit of robotics to local industry (production, monitoring, ...)

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<sup>7</sup> Strategic Research Agenda for robotics

<sup>8</sup> Progress in the technology triggered by more demanding user needs allows the development of more advanced products and services, generating more sophisticated needs, in turns requiring technological progress, capable to answer to more demanding applications,...

– Re-use the KPIs developed by the PPP, where relevant, or other initiatives such as the Roadmap developed by the Dutch initiative ROBONED <http://www.roboned.nl/en> .

**9. Potential synergies with other EU, national or regional initiatives**

– The robotics PPP – Regions and MS should establish a mechanism to contribute to its development, possibly as associate members.

– Running FP7 projects – in particular EUROOC, ECHORD++, SILVER

– The complementarities and added value will have to be identified by the relevant stakeholders in order to optimise the impact of the investment.

**10. Intra/inter-regional networks for efficiency and impact?**

It would be very instrumental to create a network of regions/ MS for which robotics is a priority. The analysis of the landscape of the local competences would be extremely useful to develop a strategy optimising the investments and avoid duplication - building synergies, joining forces, identifying complementarities, creating critical mass, exchanging best practices, sharing resources, making facilities available for additional actors in the value chain...

It would then be critical to assess the added value of building a network of smart specialisation centres.