# Position Paper

Brussels, 04/04/2018

**Artificial Intelligence: a pillar of Europe's future competitiveness**


**Executive Summary**

The European Union (EU) approach to Artificial Intelligence (AI) should be founded on a recognition that AI, and in particular AI that is embedded in industrial and consumer products, will be a central pillar of Europe's future competitiveness and its ability to address critical societal challenges

**To achieve this, Orgalime makes the following recommendations to policy makers:**

- Clear definitions should be set at EU level as a prerequisite for designing an effective common EU policy framework
- Capital and R&D&I investments (using Horizon 2020 and the future FP9, as well as other relevant instruments) and education should be given priority to support Europe's jump into this new era of industry's development
- No hurried decisions should be made on the need to revise the existing regulatory framework, which is fit for purpose to address potential risks to workers, businesses and consumers that may be reasonably expected to arise from embedded AI applications
- The EU should create the preconditions for a meaningful debate on the ethical considerations around AI
- A better dialogue is required around social aspects of AI. Practical examples and data should be used to showcase the multiple benefits of embedded AI applications to society and job creation, to help ensure an informed discussion on AI's impact on employment.


## Introduction: AI as a pillar of Europe's future competitiveness

In the conclusions of its meeting on 19 October 2017, the European Council called for the EU to develop a "sense of urgency to address emerging trends" and invited "the Commission to put forward a European approach to Artificial Intelligence (AI) by early 2018"[1].

Anticipating the Commission delivery of such an approach by April of this year, Orgalime provides below its contribution to this process.

AI forms an integral part of our industry's digitisation process and its continued competitiveness. Embedded AI, in particular, is already, and increasingly, used across manufacturing processes to perform specific tasks according to a programmed purpose. Figures by the McKinsey Global

[1] http://data.consilium.europa.eu/doc/document/ST-14-2017-INIT/en/pdf






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Institute[2] demonstrate the transformative impact of AI on manufacturing processes: a 10% yield improvement for integrated-circuit products using AI to improve R&D process; a 30% improvement of material delivery time using machine learning to determine timing of goods transfer; and a 13% improvement in Earnings Before Interest & Tax (EBIT) by using machine learning to predict sources of servicing revenues and optimise sales efforts.

In addition, embedded AI applications manufactured by European engineering and technology companies are an integral part of the technology solutions required to address critical societal challenges, from climate change and the energy transition to the future of mobility, an ageing society, and security in the digital age. With numerous global leaders in this field, the EU is well positioned to reap major competitiveness gains for its industry while paving the way to a smarter, cleaner, healthier future for its citizens.

As both users and providers of embedded AI applications, our companies therefore require a thoughtful and forward-looking approach from policy makers that ensures these opportunities for the EU can be realised. In particular, Orgalime needs policy makers to establish the common definitions required to design a workable EU policy framework; to support research & investment in AI and promote its uptake throughout the value chain, including SMEs; to define a supportive legal framework that builds on existing requirements and fundamental ethical values and allows for innovation to flourish; and to enable a better dialogue around social aspects.

## 1. The importance of establishing common definitions

Definitions of AI today vary substantially according to sources. For Orgalime, the term AI should be understood as “narrow AI”, meaning intelligence programmed by human developers. The manufacturer remains the creator of the logic and sequence of steps that allow machines to perform a specialised purpose, such as welding or assembly in a factory. We hope that this conception of AI will be recognised by EU policy makers.

We acknowledge the fact that the public debate already includes such concepts as “general AI" and “super AI”, but such debate should aim at setting a clear distinction between the current and foreseeable reality and what remains for now science fiction. This debate should also help fine-tuning the ethical and social discussions on different types of AI, so that any possible future legislation remains proportionate to the issues addressed.

Orgalime calls on the Commission to support the development of common definitions at EU level, at a minimum to prevent the proliferation of different definitions at Member State level which would make a common EU policy approach to AI virtually impossible.

As an example, it would be necessary to ensure the term AI is not used interchangeably with some of its subsets (e.g. autonomous robots, machine learning, deep learning), and to maintain a difference between AI which requires human involvement and that which does not.

## 2. Promoting an EU Strategy on R&D and Investments

There is a global race for AI leadership.

The USA adopted a National AI R&D strategic plan in May 2016 with seven key priorities, including making long-term investments in AI research, developing effective methods for human-AI collaboration, understanding and addressing the ethical, legal, and societal implications of AI,

[2] Quoted in the European Commission Digital Transformation Monitor of November 2017 “Harnessing the economic benefits of Artificial Intelligence” https://ec.europa.eu/growth/tools-databases/dem/monitor/sites/default/files/DTM_Harnessing%20the%20economic%20benefits%20v3.pdf

ensuring the safety and security of AI systems, developing shared public datasets and environments for AI training and testing, measure and evaluate AI technologies through standards and benchmarks, and better understanding the national AI R&D workforce needs.

China published a "Next generation AI Development Plan" in order to become the world leader in the field of AI in 2030, building on "tackling key problems in R&D", developing a range of products and applications in AI, and "cultivating an AI industry".

The EU cannot afford to fall behind. Whereas some Member States are developing their own AI strategy, notably France, the UK, Finland or Germany, there is no common EU approach yet. But there is a very timely opportunity to bring this theme into the overall negotiations on the next Multiannual Financial Framework (MFF), particularly the 9th R&D Framework Programme (FP9), the Structural Funds and the European Fund for Strategic Investments (EFSI). Action can already start under Horizon 2020.

***Boosting R&D&I***

In the framework of the upcoming negotiations of a new EU Multiannual Framework Programme (MFF), there are opportunities to shape a future R&D Framework Programme (FP9) that effectively supports a strategy for the EU's leadership in AI. This requires:

- The right budget. Orgalime recommends doubling the current budget to 160 billion Euro. This needs to be in the form of grants, not loans.

- The right content and priorities. FP9 needs to support the EU's industrial strategy by developing and reinforcing the Industrial Pillar (LEIT) of Horizon 2020, focusing on collaborative industrial applied research and innovation projects

Particularly the work undertaken in the PPP "Factories of the Future" should be further supported: calls for 2018 and 2019 clearly indicate the central role of AI in the further development of advanced manufacturing, and this approach must be continued within FP9. A special focus should be devoted to the "Field device" area, meaning combining AI, automation and edge computing, since these techniques will be crucial for European manufacturing industries.

***Prioritising Capital and Human Investments***

Beyond FP9, Orgalime supports an EU AI strategy that makes effective use of all available financial and budgetary instruments. This could include the following:

- Reinforce the cooperation between the EU and the Member States in R&D&I (which does not necessarily mean full alignment but as a minimum would seek to avoid unnecessary duplication)

- Develop synergies between all EU instruments under the new MFF and particularly ensure complementarity and interoperability between all instruments available at EU level in the areas of R&D&I and investments, including the structural funds and EFSI. Figures from the Digital Transformation Monitor of the European Commission (November 2017)[3] show that in 2016 the USA absorbed around 66% of all AI external investments, China 17%, and Europe around 14%. Investment must be encouraged and supported in the EU not only to finance

[3] https://ec.europa.eu/growth/tools-databases/dem/monitor/sites/default/files/DTM_AI%20USA-China-EU%20plans%20for%20AI%20v5.pdf



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start-ups or large companies, but also to boost the uptake of AI by SMEs in the industrial domain, where digitalisation is still not sufficiently understood or accepted.

- Support Member States to further encourage initial and life-long education in Science, Technology, Engineering and Maths (STEM), particularly to educate new digital and data talents. It is particularly important to increase AI expertise in the financial sector, in order to ensure the understanding of projects seeking financial investments.

## 3. A legal, regulatory and ethical framework that is fit for purpose

Like in any other area, industry requires legal and regulatory certainty with a foreseeable horizon to be able to invest, innovate and deploy new AI-related products and services. This is why any consideration of new legislation should be based on genuine issues, and the principle of precaution should not be misused.

It should be recalled in this context that a large amount of data-related EU legislation, covering many AI-related aspects, is currently in the phase of implementation or under discussion between the EU institutions. Compliance with these new pieces of legislation will already be complex for industry, particularly as regards the processing of machine to machine (M2M) data.

It is Orgalime's understanding that the European Commission may use the presentation of its upcoming Communication on AI to propose an evaluation of both the Machinery Directive and the Product Liability Directive. As stated on several occasions, we strongly believe that a revision of either of these Directives is not necessary at this time, as they are both fully fit for purpose.

### *Machinery Directive*

Orgalime has carefully analysed[4] the final report on the evaluation of the Machinery Directive (2006/42/EC). In our opinion, the Directive is still fit for purpose. ICT and robots have been in use in the machinery sector for more than a decade without leading to "new" safety issues.

We believe the Directive effectively supports the overall digitalisation of numerous industry sectors. This is due to the format of the Directive: whereas it defines the essential health and safety requirements that machinery should meet to be placed on the market, manufacturers are free to use any technology that reflects the State of the Art. This therefore covers any technological development and innovation.

Where relevant for an "intelligent" piece of machinery or installation connected to the Internet, the risks that may arise as a result of a cybersecurity breach are already duly taken into consideration under the Machinery Directive, for instance through the incorporation of fail-safe procedures and safety devices.

### *Low Voltage Directive*

Orgalime has carried out the same analysis[5] on the European Commission's evaluation roadmap of the Low Voltage Directive (2014/35/EU), and concluded that its essential requirements are neutral and general enough to encompass any new product, whether the operation of the product is triggered manually or remotely, on specific request or automatically. Moreover, digital

[4] http://www.orgalime.org/position/orgalime-comments-final-report-evaluation-machinery-directive-200642ec

[5] http://www.orgalime.org/position/orgalime%E2%80%99s-answer-european-commission%E2%80%99s-evaluation-roadmap-low-voltage-directive-201435eu



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communications, which have been used for several decades in industrial products, are based on very low voltage level signals which do not create any hazard by themselves.

In any case, the application of Union harmonisation legislation to existing and future "intelligent" machines or electrical networks is and will be further supported by harmonised standards that are mandated by the European Commission. These standards are usually developed in line with European or international standards and technical specifications, so as to ensure that technological development stays in line with both EU legislative requirements and global market needs

***Product Liability Directive***

Orgalime is convinced that, thanks to its technology-neutral provisions, the Product Liability Directive (85/374/EEC) has created legal certainty while enabling technological development over the past years.

Further challenges related the increasing complexity of products may come from having to attribute a malfunction to a defect in a complex product. But the Directive, as it stands today, provides a practical framework under which these problems are solved and provides the context upon which parties to the distribution chain recognise their own role in relation to an incident and damage, including at a contractual level.

***Ethical aspects***

The debate on AI clearly raises ethical considerations, including in an industrial and engineering context. As an example, the IEEE launched in April 2017 a "Global Initiative for Ethical Considerations in Artificial Intelligence and Autonomous Systems", which aims at finding a broad consensus on how such technologies can be aligned to moral values and ethical principles prioritising human wellbeing[6].

Orgalime takes this discussion very seriously. Without a shared belief in both industry and civil society that fundamental ethical considerations are reflected, the EU will not be able to take full advantage of the opportunities of AI.

As a prerequisite for a productive continuation of this debate at EU level, Orgalime strongly believes that the following steps are required:

- First, clearer definitions of what is understood by AI should be provided. For Orgalime, AI in the engineering field is closer to "programmed intelligence". Machines, installations and systems are designed for a given purpose or task. Their intelligence and abilities are always constrained by both their initial or "master" programming and by the physical abilities for which they have been conceived: an autonomous lawn mower cannot be turned into race car, etc.

- Second, the debate on ethics must be organised to include all stakeholders: industry of course, including producers and users of AI tools; but also governments, public bodies and civil society. It must be structured in such a way that no part of society or industry can be accused of dominating or manipulating the debates.

- Third, the behaviour of an AI application or system is usually the result of negotiated parameters between a producer/provider and its (professional) customer. Accountabilty should be a guiding principle for the debate.

[6] https://www.ieee.org/about/ieee_europe/artificial_intelligence.pdfB



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### 4. A better dialogue around social issues

Available data suggests a very mixed picture of society's views on AI. In Spring 2017, the European Parliament's Committee on Legal Affairs (JURI) held a public consultation which provided some interesting figures: 79% of respondents had a positive view of robotics and 68% had a positive view of AI. 34% feared that robotics would eliminate jobs whereas 34% felt that it would not. 18% believed that AI would create inequalities whereas 56% did not. A Eurobarometer survey of 2017 indicated that 72% of respondents think that robots steal people's jobs.

Yet contradictory data and studies may nurture doubts in our society. Bruegel[7] compiled and analysed a series of studies on the impact of AI on employment, which contradict each other and do not allow any conclusion on the net gain or loss of jobs. Even experience from the past, where technology in the long run contributed to massive net employment gains, is not very useful since, contrary to previous technological waves, AI can replace highly skilled jobs, even if most often only partially.

A McKinsey Global Institute Report of December 2017 on "Jobs lost, jobs gained"[8] underlines that by 2030 there could be a massive shift of occupation, affecting 3-14% of the world workforce, and that the entire workforce will need to adapt.

Orgalime believes that all stakeholders, and particularly the social partners, must be involved in discussions regarding the employment related aspects of AI.

The debate will not only have to be focused on industrial and societal benefits of AI applications, notably those related to energy, healthcare, mobility, infrastructures, cybersecurity, circular economy, but also on where European industry can make an innovative and competitive difference at global level, notably embedded AI and industrial applications. These are areas where European industry, combining AI, automation and edge-computing, can carve out global leadership and create sustainable future employment.

### Conclusion

For Orgalime, the debate on Artificial Intelligence has two overall sides:

1. Artificial Intelligence will be a (if not the) major driver of our future industrial competitiveness. Europe must therefore ensure that the policy framework in place (legal, financial, educational, etc.) supports our companies and industries in achieving global leadership, particularly as regards investments, R&D&I, and speeding up the uptake of AI by European industry.

2. AI also raises societal/human questions, including in relation to jobs, safety, liability, etc. Where there are genuine concerns, an inclusive societal dialogue is needed to build consensus on the way forward.

To address these two aspects, decision-makers need to take a forward-looking and balanced approach. The societal discussion around AI now carries excitement and fears, often based on misconceptions, in equal measure. It is imperative for the EU to resolve this tension if the enormous benefits of AI for Europe are to be realised. In particular, there is a risk that disproportionate or ill-

[7] http://bruegel.org/2017/04/do-we-understand-the-impact-of-artificial-intelligence-on-employment/

[8] https://www.mckinsey.com/~/media/McKinsey/Global%20Themes/Future%20of%20Organizations/What%20the%20future%20of%20work%20will%20mean%20for%20jobs%20skills%20and%20wages/MGI-Jobs-Lost-Jobs-Gained-Report-December-6-2017.ashx



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advised measures would, if not paralyse, unduly slow down technological and economic developments at a time when other parts of the world are developing and deploying AI at full speed. The EU must create a policy framework which unlocks its global leadership at a technical, economic, legal and ethical level. Orgalime will continue to be fully engaged to help achieve this.