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"AI diffusion in firms – what do we know and what does it mean for policy?"

Spotlight on EU medium-sized businesses

(An AI practitioner's anecdotal evidence-based perspective)

Benoit Bergeret
OECD, February 3, 2021

Ordre du jour

What are we talking about when we talk about AI?

What does “adopting AI” mean for EU MSEs?

Obstacles to AI adoption by MSEs

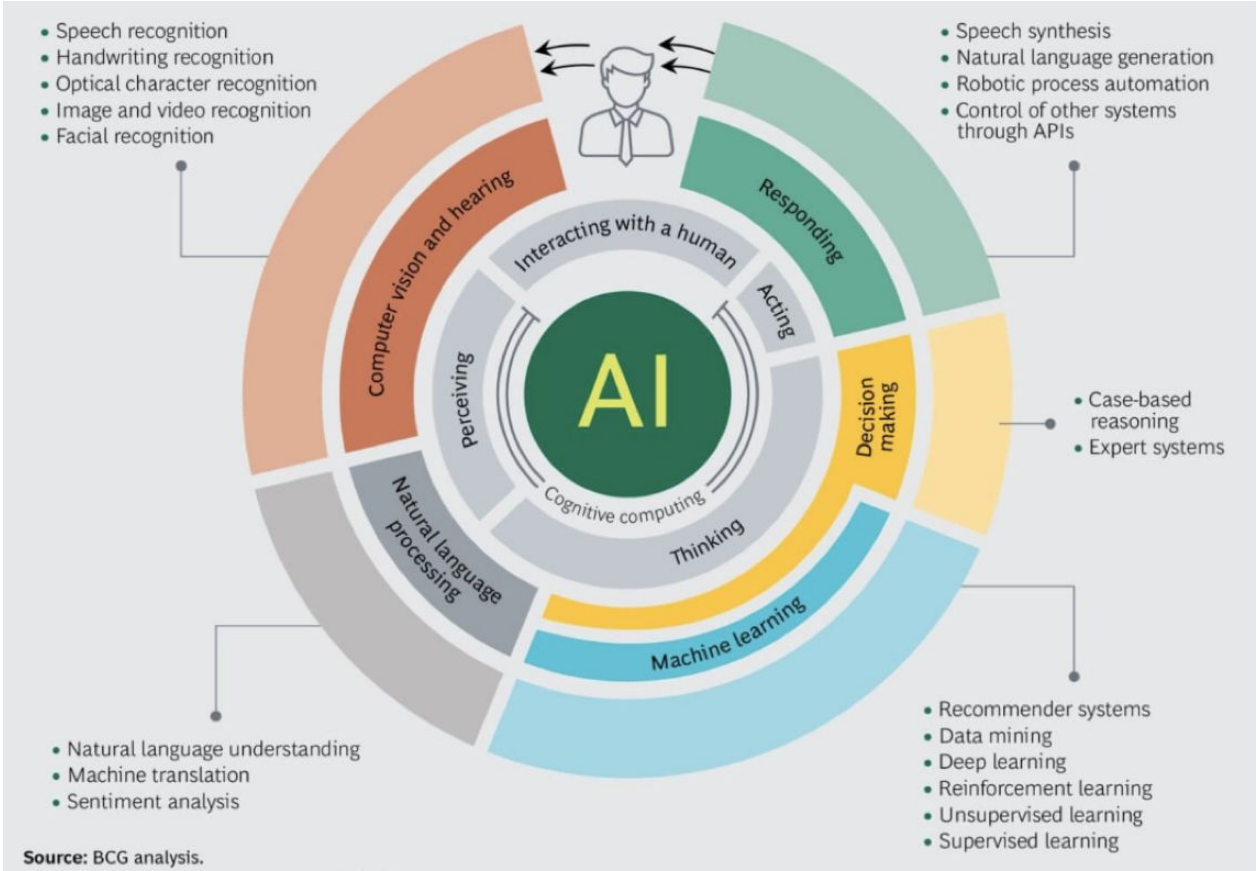
“Just as electricity transformed almost everything 100 years ago, today I actually have a hard time thinking of an industry that I don’t think AI will transform in the next several years.”

(Andrew Ng, Stanford University)

“The biggest pain for AI in the coming 10 years is the need for business executives in low-tech companies to access AI in an easy-to-use way that still gives them customized solutions from tier-1 technologies and the world’s best AI-talent.”

(2018 McKinsey report on AI)

What are we talking about when we talk about AI?



APPLIED AI

Human capabilities augmentation

Business performance augmentation

Impact augmentation

We've all seen the numbers

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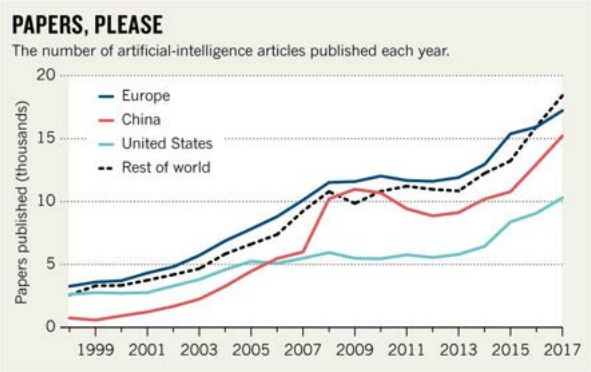
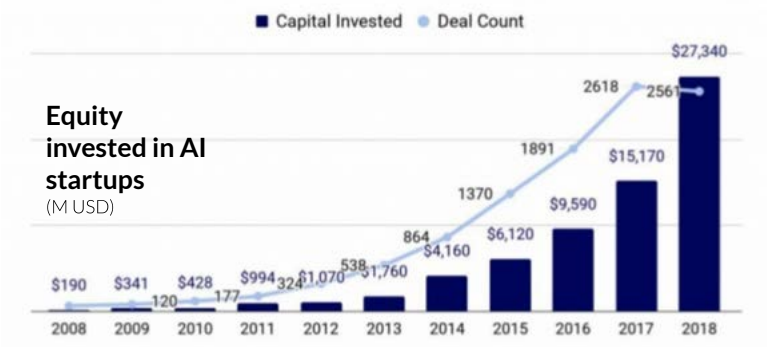
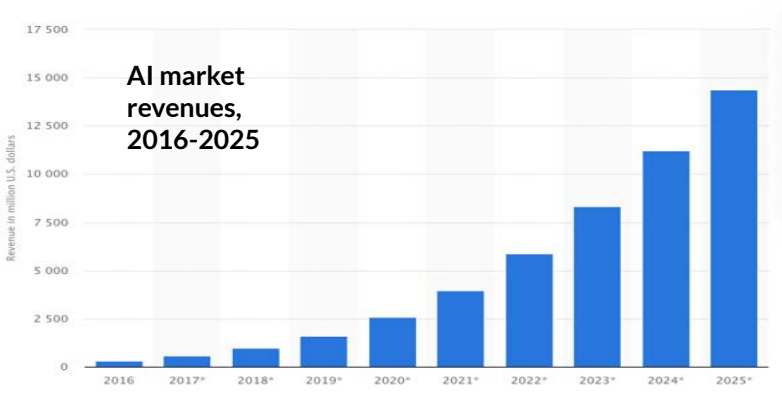
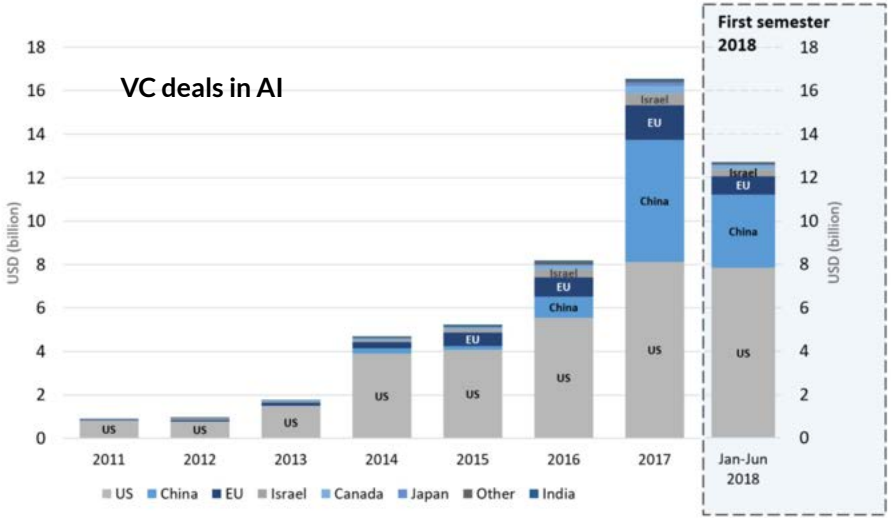




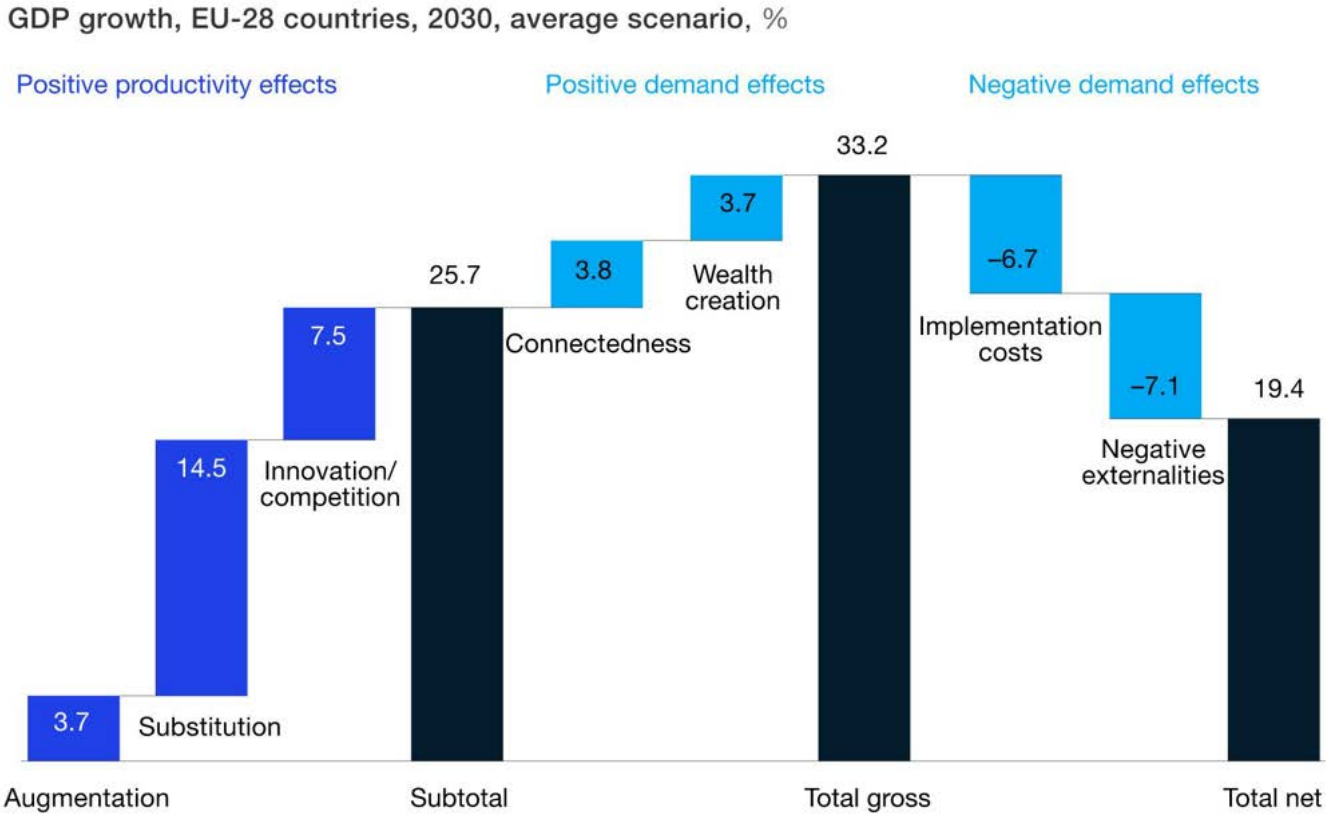


((source Statista)



(all stages, includes VC+PE) (source: OECD 2018)

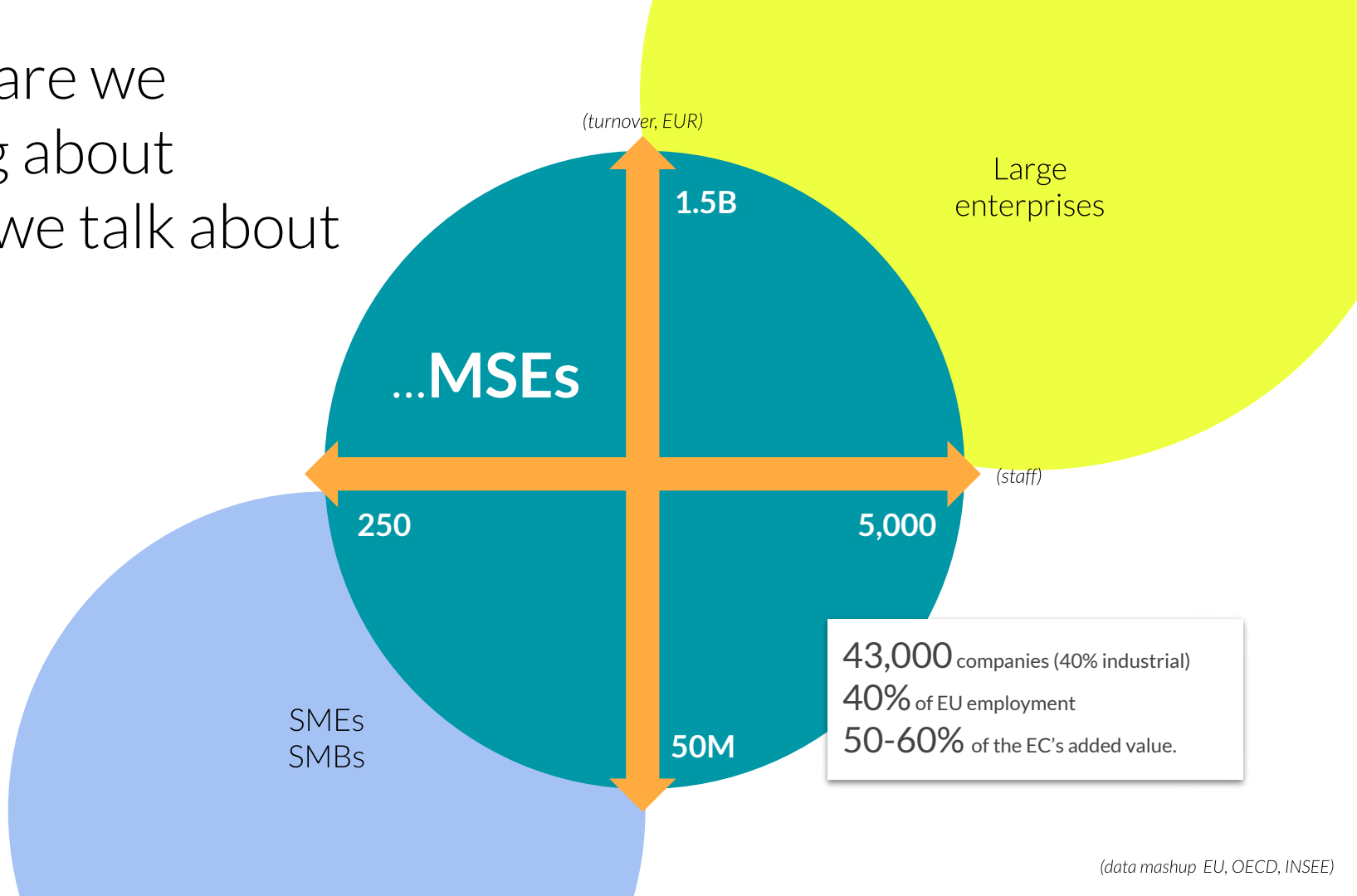
AI could give EU economies a strong boost



If done well, AI adoption could boost EU GDP by up to 20% by 2030

(source McKinsey 2019)

What are we talking about when we talk about



43,000 companies (40% industrial)
40% of EU employment
50-60% of the EC's added value.

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(data mashup EU, OECD, INSEE)

Industrial MSEs: a key foundation of the European economy

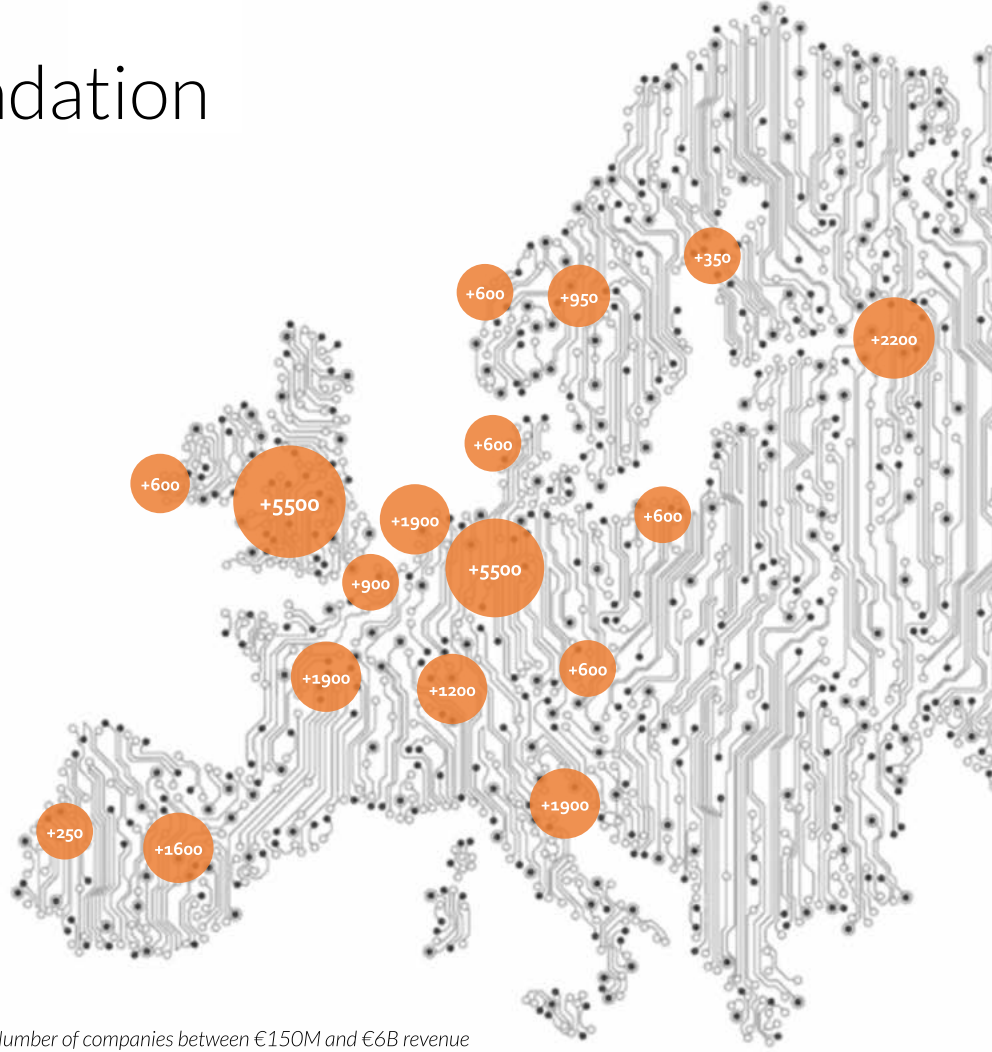
IIoT value chain = EC strategic priority for AI

70% of jobs (40 million) / **20 million industrial**

Industrial competitiveness top priority on European political agenda (€1,8 trillion revenue)

Underserved segment in the digital transformation of the economy

→ R&D expected to grow to 30% from 6% (source PWC)
→ Big data & AI biggest growth drivers



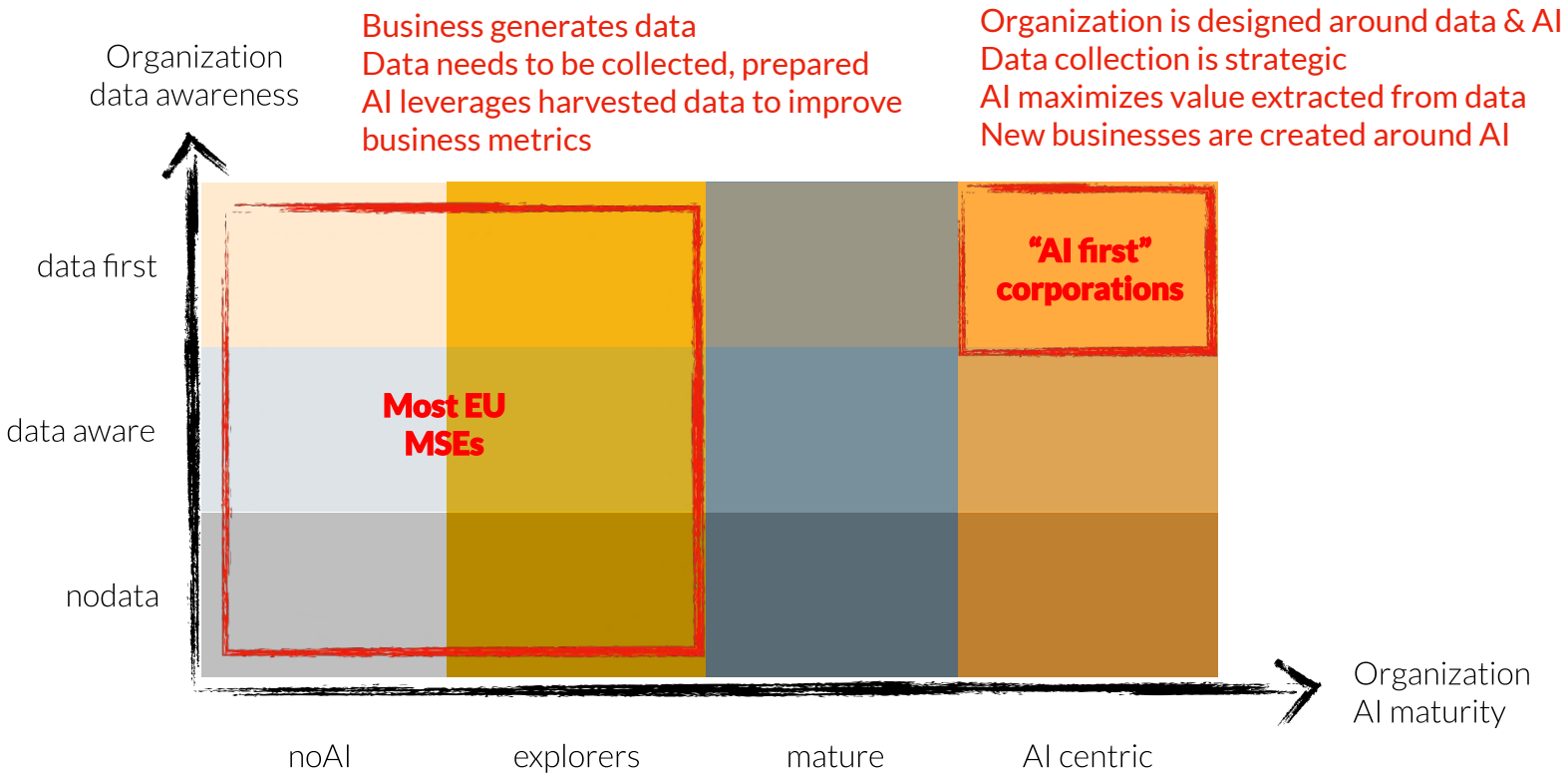
Number of companies between €150M and €6B revenue

AI applications domains in the IIoT value chain

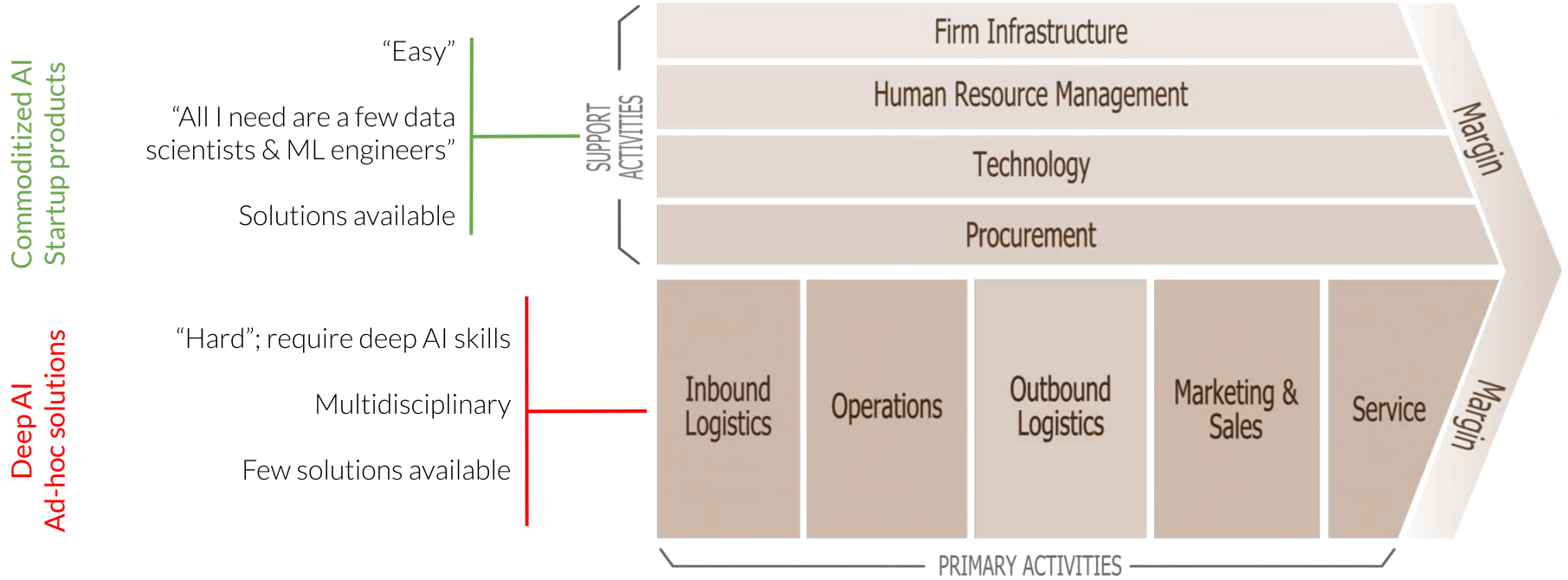
- Product development
- Manufacturing efficiency
- Automation & robotics
- Supply chain optimization
- Asset reliability
- Quality assurance, traceability
- IoT platform & infrastructure
- Cybersecurity

Readiness & maturity?
Primary vs. support functions?
Objectives?

AI readiness / maturity: not all MSEs are equal



Primary & support functions require different AIs



Company 1

Brittany, France
500+ staff
2020 revenue (est.) 100 M Euro

Activity
Vertically integrated manufacturing of welding machines, battery chargers and car body repair equipment

Problem
- Too many defects on SMT PCBs

Actions
Implemented 3rd party artificial vision multi-defect detection system
Budget = 100k Euro (over 3 years)

Results
- Process: 30x acceleration of QC phase (1 min —> < 2 sec per PCB) with 100% detection rate
- ROI: significant reduction of customer returns

Perspectives
System still providing too many false positives
Next generation will improve accuracy, reduce false positives

Challenges
Internal skillset to manage solution and its evolution
Alignment of vendor product roadmap vs. GYS needs
One-shot project; no coherent, long term AI transformation vision

Company 2

Paris, France
5,000+ staff
2019 revenue 5,5M Euro

Activity

Infrastructure development and operations

Problem

- Cost of automatic vehicle classification too high
- Manual handling of classification mistakes too high

Actions

Setup AI R&D lab to develop original technology
Implemented in-house artificial vision system for on-the-fly vehicle classification in under one year

Results

- Reduced classification error rate from 2.5% of transactions to < 0.5%
- Error handling costs reduced by 80%
- Increased highway user satisfaction

Perspectives

Expansion to other markets, infrastructure operators
Improve accuracy of detection in edge illumination cases

Challenges

Time to assemble deep AI team & retention over time
Internal business cases: ROI can only be assessed after significant expenses have been committed

Obstacles to AI adoption by IIoT MSEs

- ➔ Difficulty understanding AI technologies & their potential benefits
- ➔ Unclear business cases and perceived low business relevance of AI applications
- ➔ Leadership culture & managerial capability
- ➔ Short timelines
- ➔ Difficulty hiring & retaining
- ➔ Inadequate infrastructure
- ➔ Unknown social impact & HR costs
- ➔ Cost of data sourcing, cleaning, preparation, and storage

- ➔ Lack of / access to relevant external skills
- ➔ Few relevant solutions, products
- ➔ Availability of suitable external funding
- ➔ Unproven or perceived low ROI of 3rd party solutions
- ➔ Lack of success stories in similar industry
- ➔ Lack of standards
- ➔ Regulatory barriers (GDPR, etc.)

Obstacles: the AI resources conundrum

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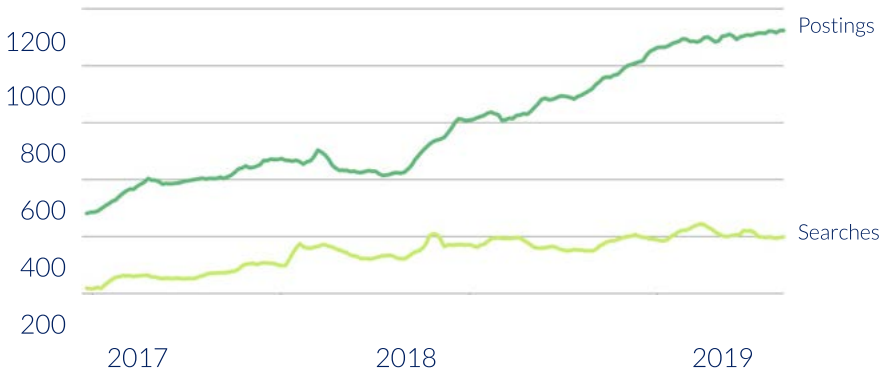
The growing gap of AI jobs openings vs. searches
(per million, 4-week moving average)

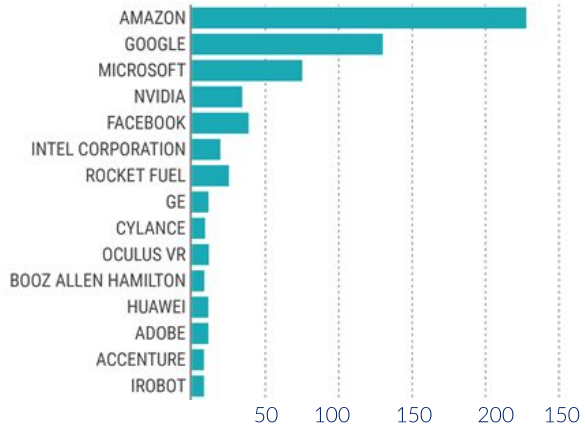


Currently 300,000 AI researchers and practitioners worldwide (30% of them still studying)

It takes 3 years to train an ML engineer and 5-7 years to train a relevant PhD in AI or data science.

The gap isn't going to narrow quickly.

Top 15 companies investing in AI talent in 2018
($M/year)



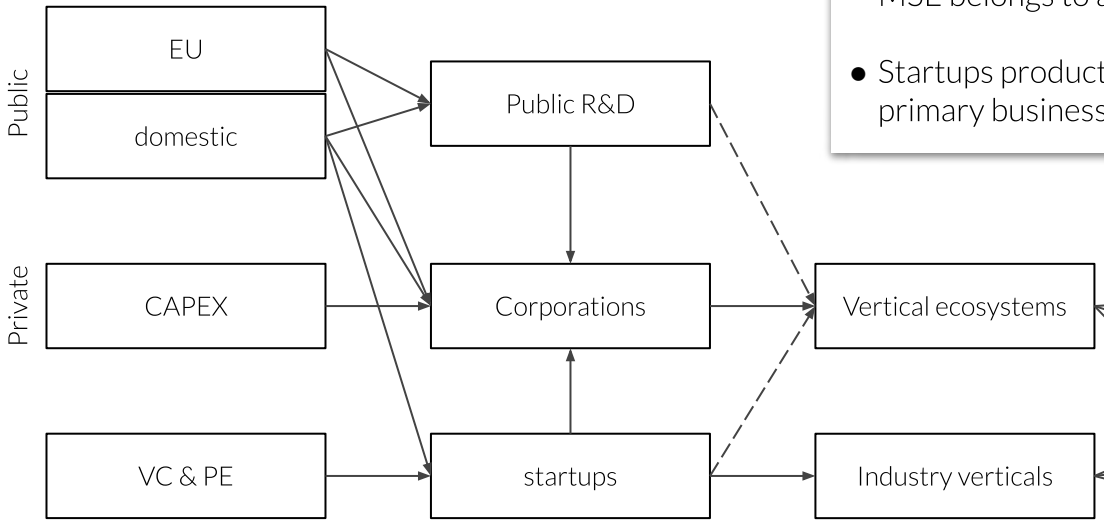
GAFAM & a handful "Digital Leaders" suck a majority of the skill base

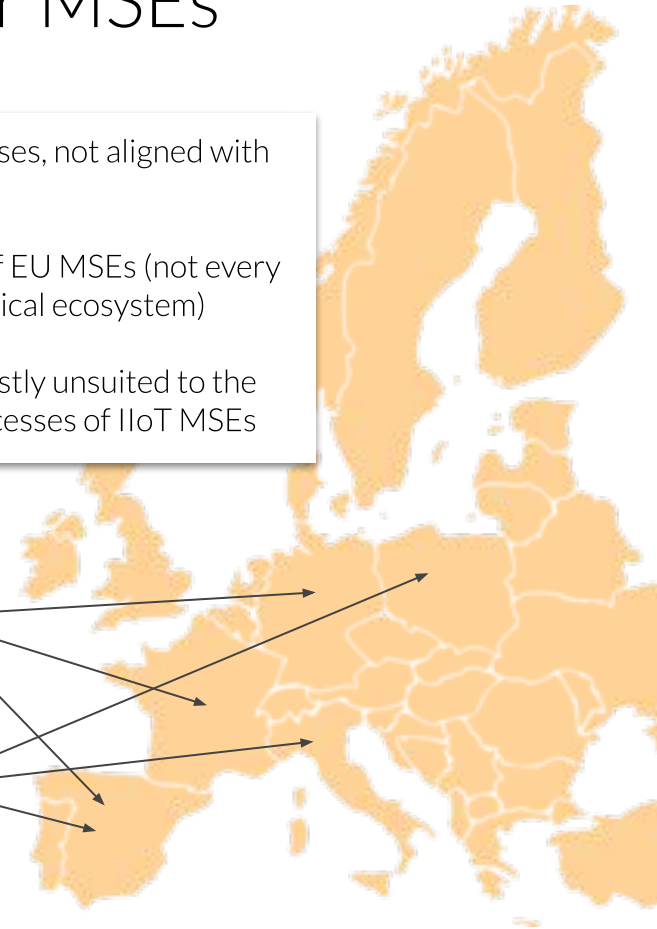
More than 30,000 mid-cap industrial companies operate in Europe as of 2019

The competition for talent will increase.

Lack of accessible, suitable funding for MSEs

- Slow financing processes, not aligned with MSEs' business pace
- Misses the majority of EU MSEs (not every MSE belongs to a vertical ecosystem)
- Startups products mostly unsuited to the primary business processes of IIoT MSEs





Thank you!

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Decoding the business of AI

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