

# THE POTENTIAL OF LANGUAGE TECHNOLOGY AND AI – WHERE WE ARE, WHERE WE SHOULD BE HEADING

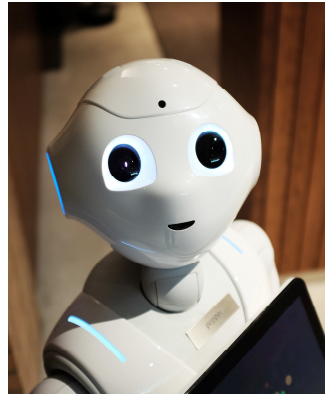
[KEYNOTE SPEAKER NAME AND AFFILIATION]



## THE POTENTIAL OF ARTIFICIAL INTELLIGENCE (AI)

- AI represents one of the greatest opportunities for global societal and economic progress <sup>[1]</sup>
- Focus on AI in various new initiatives and projects across Europe, e.g.
  - AI4EU: First European AI On-Demand Platform and Ecosystem
  - Recent ICT-48-2020 Calls: Towards a vibrant European network of AI Excellence centres
  - Face2Face Virtual Agora: EU Artificial Intelligence Excellence Centres (29 May 2020 in Brussels)
- Already now there are very prominent examples of AI in our every day lives...

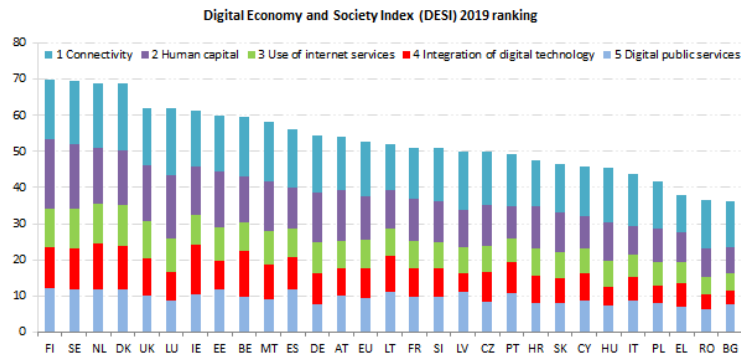
## EXAMPLES OF AI IN OUR LIVES



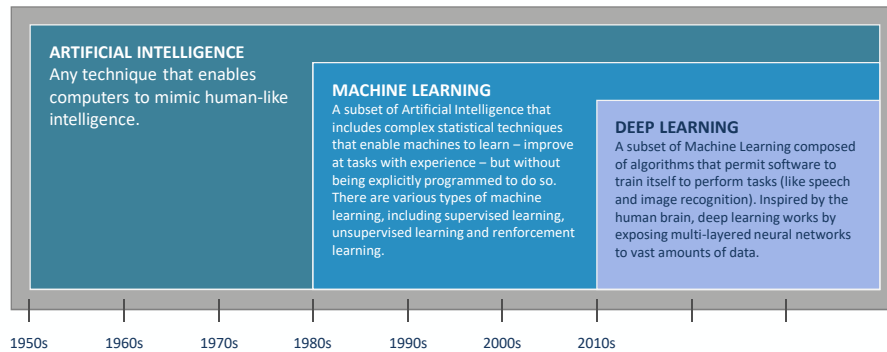
- Digital personal assistants (Siri, Alexa, ...)
- Intelligent cars
- Marketing (see e.g. Netflix, Amazon etc.)
- Chatbots (e.g. in banking, customer support and management, ....)
- Finance (e.g. stock trading)
- Agriculture (optimal use of resources, population growth)
- Health care
- Space, ....

## STATUS QUO: HOW DIGITAL ARE WE?

### Digital Economy and Society Index (DESI) [2]



## POSITIONING AI, MACHINE LEARNING, DEEP LEARNING [3]



## WHAT IS AI? LANGUAGE AND INTELLIGENCE

- “If a conversation with the device cannot be differentiated from a similar conversation with a human being then the device can be called intelligent” (Alan Turing)
- **Problem:** Human languages are incredibly elegant, efficient, flexible, complex!
  - One word may mean many things
  - Many ways of saying the same thing
  - Meaning depends on context
  - Literal and figurative language (metaphor)

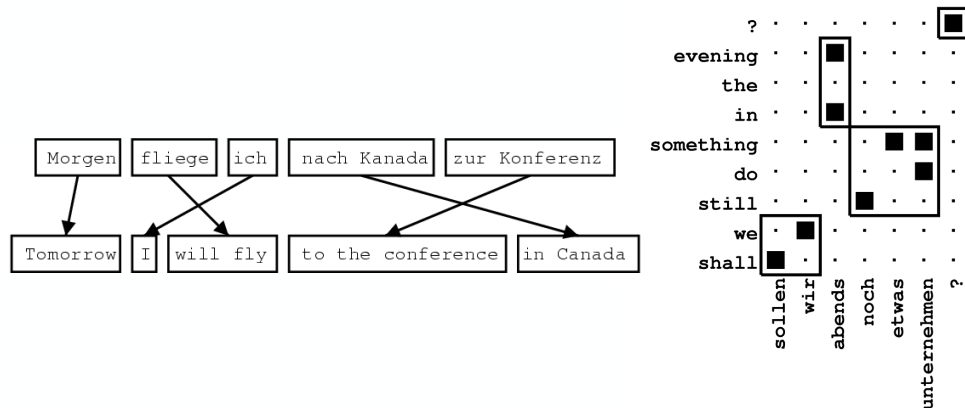
## WHAT IS AI? LANGUAGE AND INTELLIGENCE

Some interesting examples...

- Juvenile Court to Try Shooting Defendant
- Teacher Strikes Idle Kids
- Miners refuse to work after death
- Local High School Dropouts Cut in Half
- Red Tape Holds Up New Bridges
- Police: Crack Found in Man's Buttocks

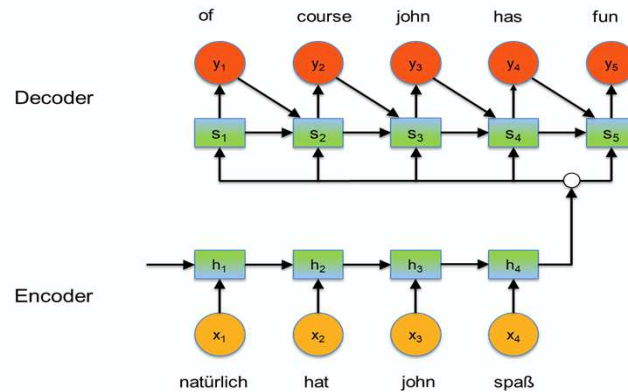
## DEEP LEARNING IN LANGUAGE TECHNOLOGIES

How machines used to translate:



## DEEP LEARNING IN LANGUAGE TECHNOLOGIES

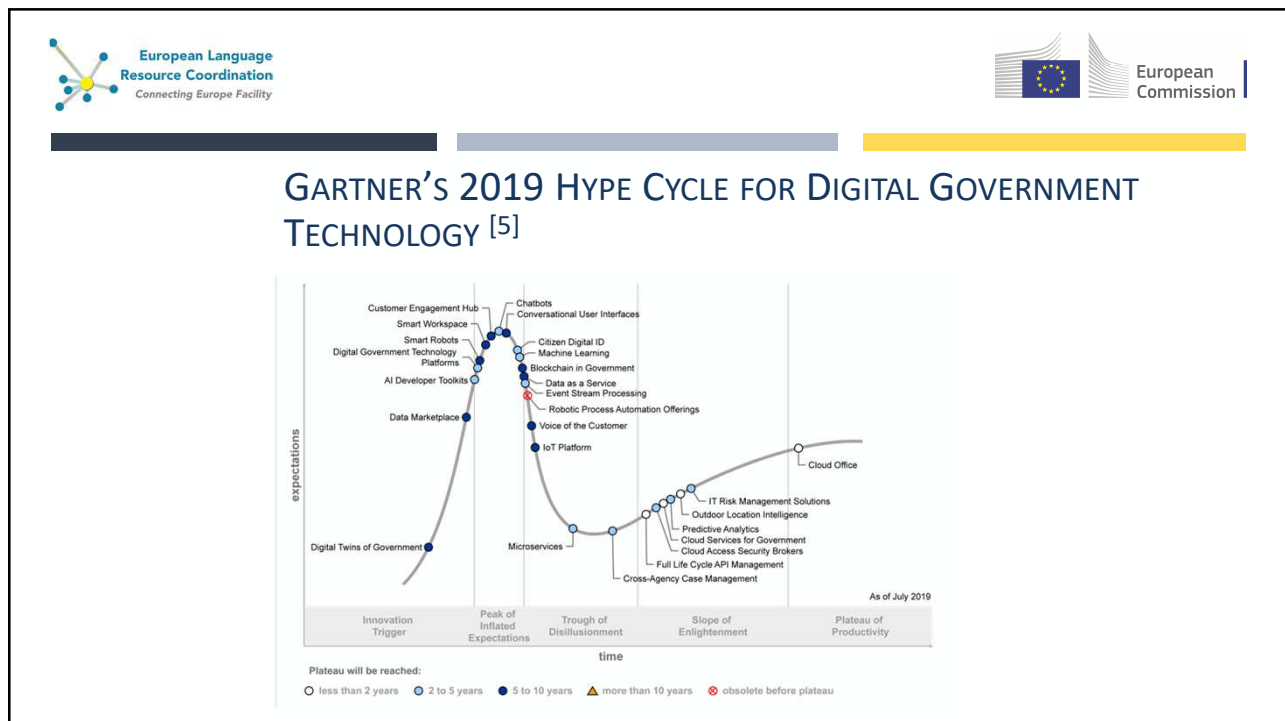
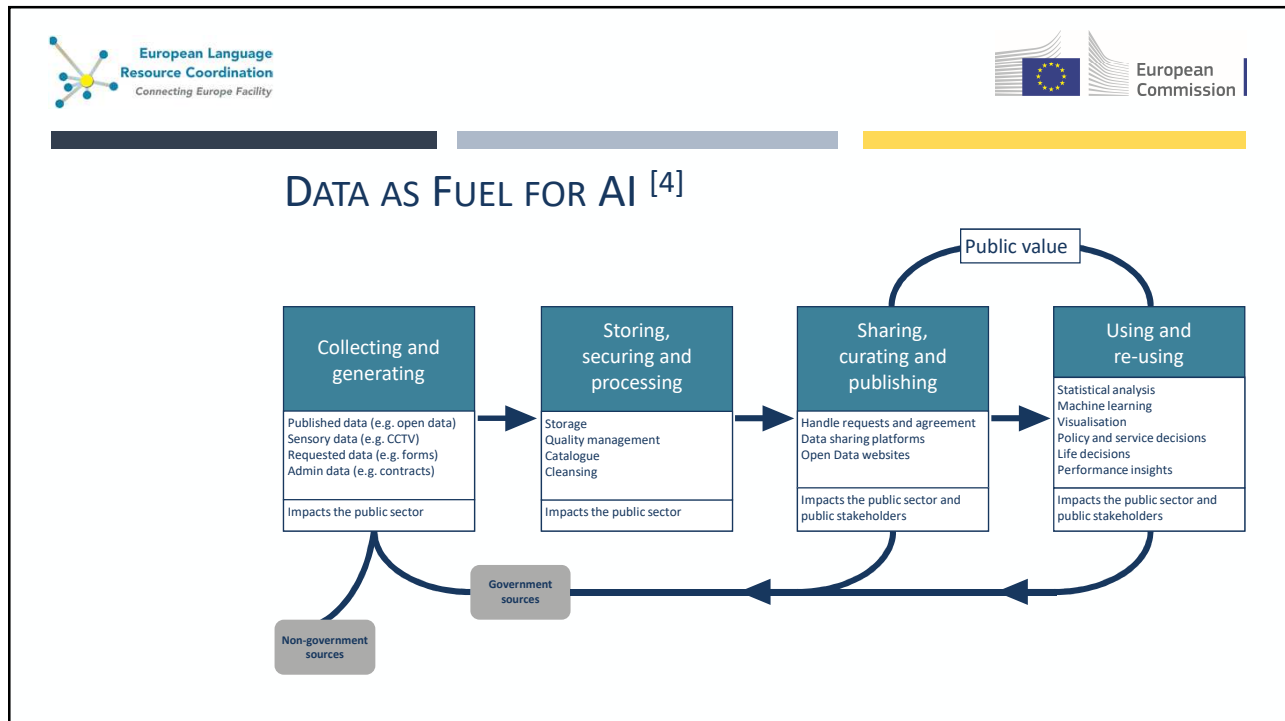
How machines translate today:



## DEEP LEARNING IN LANGUAGE TECHNOLOGIES

Deep learning applies to many language technologies, e.g.

- Acoustic Speech Recognition (ASR)
- Text to Speech Systems (TTS)
- Dialog Systems / Chat Bots
- Question-Answering Systems (QA)
- Named Entity Recognition (NER)
- Relation Extraction (RE)
- Text Summarisation
- Sentiment Analysis



## AI: WHERE WE SHOULD BE HEADING

AI FOR

**HUMANITY**

### Example: AI for Humanity (France)

- **Developing an aggressive data policy**
- Targeting four strategic sectors (health, transport, environment and defence/security)
- Boosting the potential of French research
- Planning for the impact of AI on labour
- Making AI more environmentally friendly
- Opening up the black boxes of AI
- Ensuring that AI supports inclusion and diversity

## AI: WHERE WE SHOULD BE HEADING

AI FOR

**HUMANITY**

### Example: AI for Humanity (France)

- **Developing an aggressive data policy**
  - ➔ Encourage companies to pool and share their data
  - ➔ Create data that is in the public interests
  - ➔ Support the right to data portability

## REFERENCES

[1] [https://ec.europa.eu/info/sites/info/files/commission-white-paper-artificial-intelligence-feb2020\\_en.pdf](https://ec.europa.eu/info/sites/info/files/commission-white-paper-artificial-intelligence-feb2020_en.pdf)

[2] <https://ec.europa.eu/digital-single-market/en/desi>

[3] Jamie Berryhil, Kévin Kok Heang, Rob Clogher, Keegan McBride (2019): „Hello, World: Artificial intelligence and its use in the public sector“, OECD Observatory of Public Sector Innovation, p.23. Available online at <https://oecd-opsi.org/projects/ai/>

[4] <https://www.oecd-ilibrary.org/docserver/09ab162c-en.pdf?expires=1583412591&id=id&acname=guest&checksum=DE3AC27D9E81DA0C3A35448B23FCC54E>

[5] <https://www.gartner.com/en/newsroom/press-releases/2019-08-28-gartner-2019-hype-cycle-shows-cloud-office-has-hit-ma>

## FURTHER READING

<https://trends.oecd-opsi.org/embracing-innovation-in-government-global-trends-2019.pdf>

[https://ec.europa.eu/info/sites/info/files/commission-white-paper-artificial-intelligence-feb2020\\_en.pdf](https://ec.europa.eu/info/sites/info/files/commission-white-paper-artificial-intelligence-feb2020_en.pdf)





## THANK YOU FOR YOUR ATTENTION!

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