

How Should DOD be Preparing for Artificial Intelligence (AI)

Katherine Hammack

10 June 2019



Defining AI – “the study of the computations that make it possible to perceive, reason, and act”

The boundaries of AI are somewhat subjective and evolve over time

“AI is whatever hasn’t been done yet”

– L. Tesler

AI builds increasingly autonomous systems which are more and more able to:

- ▶ Adapt to an **uncertain and changing** complex environment

Perception



Extracting information from a camera, microphone or other sensors

Reasoning



Logical and orderly thinking (deduce, plan, decide, interpret, ...) to achieve a goal

- ▶ **Interact naturally** with humans

- ▶ Deal with **complex and heterogeneous** data

Acting



Transforming itself or its environment by moving, moving objects, communicating with people or information systems, etc.

- ▶ Combine **several tasks** in the most integrated way possible

AI

The key components categorized from algorithms to integrated applications

Algorithms



Machine Learning

- Supervised learning
- Reinforcement learning
- Unsupervised learning



Reasoning

- Problem Solving
- Automated planning and scheduling
- Logical inference
- Knowledge engineering

Fundamental applications



Natural Language Processing

- Text classification
- Language understanding
- Language generation
- Automated translation



Machine perception

- Computer vision
- Speech processing

Integrated applications



Virtual agents

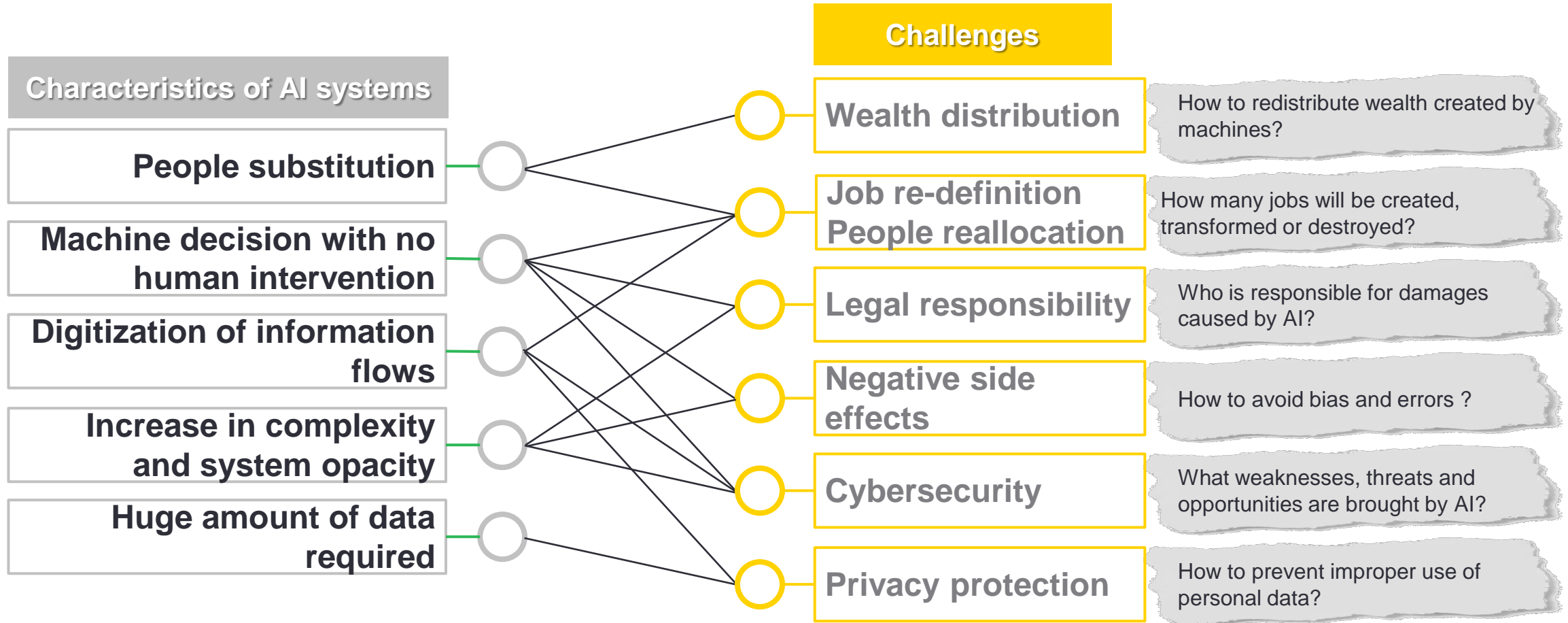
- Conversational agents
- Virtual assistants
- Software agents



Autonomous objects

- Autonomous vehicles
- Robots

An unqualified good? These applications may have significant legal and social implications



A woman with blonde hair tied back, wearing a patterned pink and white blouse, is speaking into a microphone. She is standing in front of an audience of people seated at tables in a conference room. The background is slightly blurred, showing other attendees and conference equipment.

**The World Economic Forum
noted that AI technologies
could displace 75 million
mundane or repetitive jobs.**

**But they could also create 133
million new jobs, which would
be more skilled or creative**

... but the impact of AI is being felt and will increase

1

Spectacular improvements in AI performances

Thanks to new technologies and the increase in data generation significant improvements in AI research are made

2

Increasing adoption of AI in business and daily life

The performance improvements brought especially by deep learning has enabled the development of more sophisticated applications fit for business and daily life use

3

Growing awareness of AI importance and social implications

The emergence of daily life applications of AI have risen awareness of its importance for the future and its social implications

Projected global AI market revenue

