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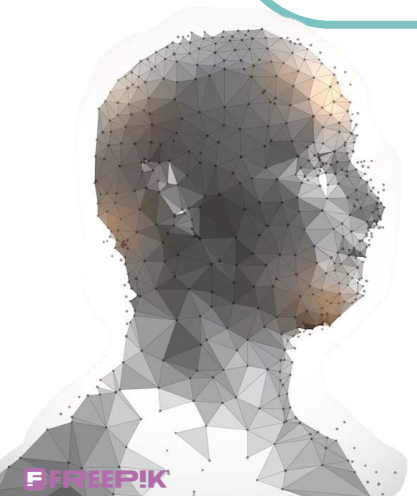
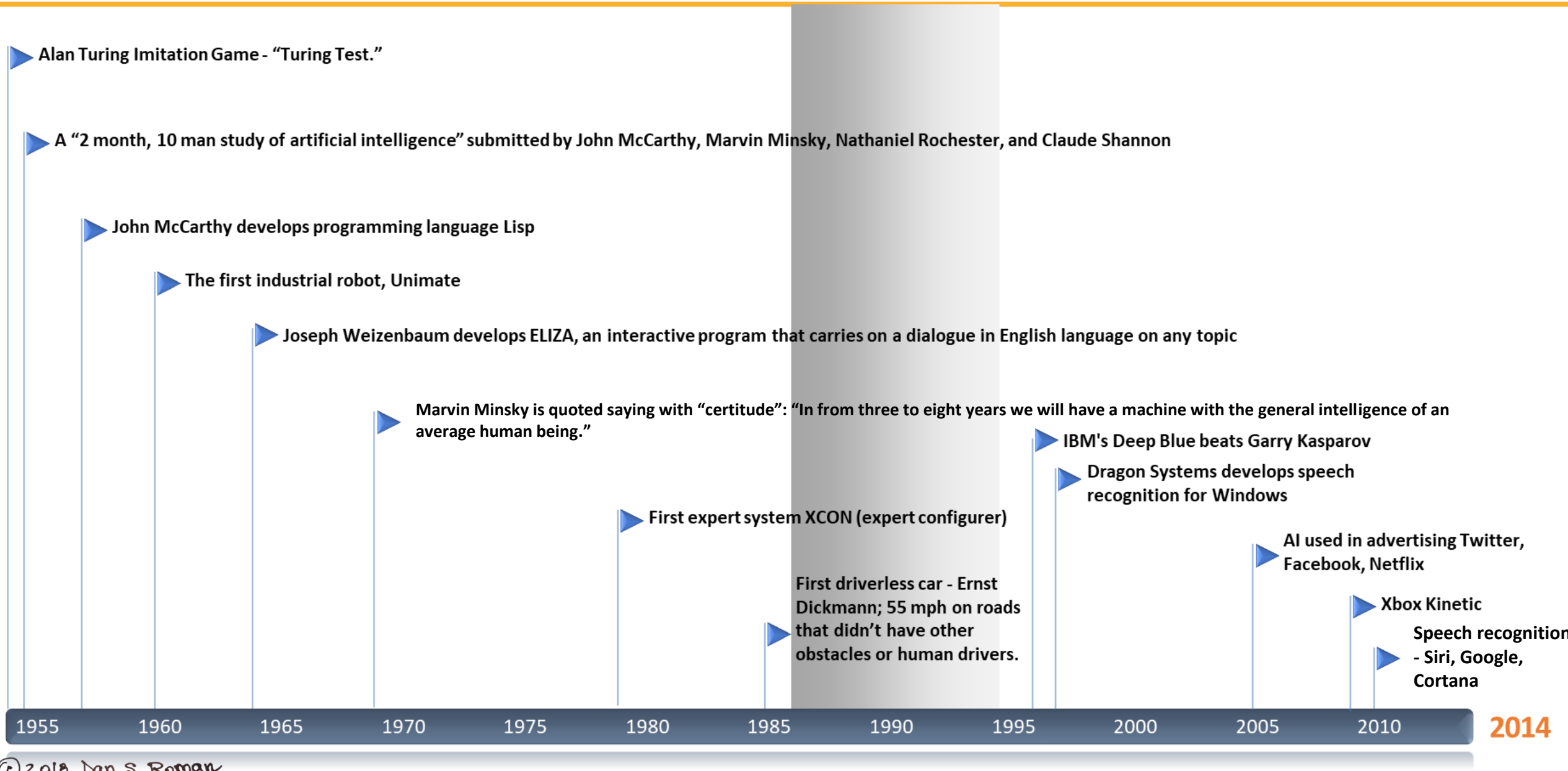
Artificial Intelligence Challenges in Agile Project Management

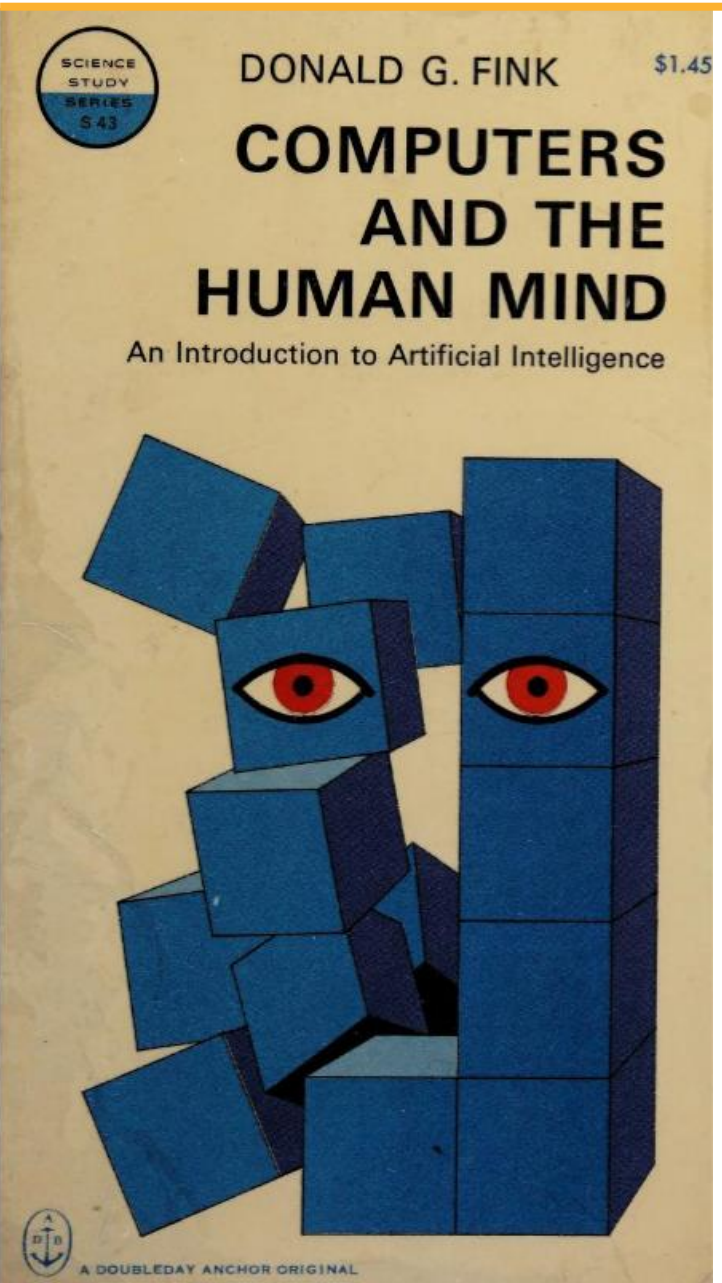
Dan Stelian Roman



HISTORY OF ARTIFICIAL INTELLIGENCE



WHAT IS ARTIFICIAL INTELLIGENCE?



The ability of machines to ***organize information into meaningful patterns***; ability to recognize, store, recall , and manipulate such patterns in solving problems, answering questions etc. and in controlling actions of other mechanisms.

The ability of a machine to ***adapt to its environment***, particularly to respond to patterns of stimulation not explicitly foreseen in its design.

The observed performance of such machines, as ***measured by comparison*** with, or in competition against, ***human intelligence.***

Fink (1966) Computers and the human mind

Humanlike intelligence programmed into a computer or robot. Involves ***more than just the speed and vast memory*** that make the computers of today seem smart.

A machine is considered artificially intelligent if it can act like a living creature, ***sense the world around it***, and learn.

In 1950 Alan Turing devised a test to determine how "intelligent" a computer really is, or at least how close or at least how close to simulating a human it is. According to the Turing Test, ***a machine is artificially intelligent if it can fool someone who is talking to it into thinking that it is human***.

D'Ignazio (1984) The science of artificial intelligence

REMOTE VIEWING . . . 2020 VISION

The reason that mathematicians are not perceptive is that they do not see what is before them.

Mathematicians wish to treat matters of perception mathematically, and make themselves ridiculous ... the mind... does it tacitly, naturally, and without technical rules.

Blaise Pascal, 1660

The field of artificial intelligence is divided into two subfields, Cognitive Simulation (CS) and Artificial Intelligence (AI), and has led to the treatment of two separate but interrelated questions:

(1) Does a human being in "processing information"' actually follow formal rules like a digital computer?, and

(2) Can human behavior, no matter how generated, be described in a formalism which can be manipulated by a digital machine?

Dreyfus (1972) What computers can't do; a critique of artificial reason

WHAT AI CAN DO?

- ✓ Writing and Content Creation
- ❖ Coding
- ✓ Meetings
- ❖ Image Design
- ❖ Video
- ❖ Customer support and sales
- ❖ HR and Recruiting

- ❖ Human expertise
- ❖ Large amount of data

REMOTE VIEWING . . . 2020 VISION

Joe felt like some fresh air before starting work, so he took the surface route to his office. At the far end of his garden, he opened a door and descended the steps into his newly installed Cyberspace meeting room. Inside, it was almost as pleasant as out. The electronic blinds were ‘open’ and Joe had selected a view of the Swiss Alps for his ‘windowpanes’.

- ✓ Electronic meeting systems
- ✓ Pen and voice interface
- ✓ Wireless LAN/WAN
- ✓ Multimedia presentation
- ✓ Graphics processing
- ✓ Video and audio teleconferencing
- ❖ Group memory/Artificial intelligence
- ✓ Virtual reality
- ✓ Group to group interface (groups in different locations)
- ✓ Wall sized video
- ✓ Illusion of presence created by using three adjacent walls
- ✓ Audio, video, data links and display

It was lunch time. Joe closed the meeting, restoring his windowpanes to the sea-view in the Virgin Isles. He left the Cyberspace and strolled back to the house… switched on the cinema wall and selected today’s news… showing video of a 10-lane motorway which had only 15 years ago been so congested that traffic was often at a standstill. Now it was empty except for the occasional electric bus and a few eco-taxis. Joe only travelled once a year for his lo-week vacation away from the high technology; but even then he was never without his solar powered personal pocket workstation.

Helbrough, B. (1995). Computer assisted collaboration — the fourth dimension of project management

INTELLIGENT ACTIVITIES CLASSIFICATION

	Associations	Simple formal	Complex formal	Nonformal
Characteristics of Activity	Irrelevance of meaning and situation	Meanings completely explicit and situation independent	Internally situation dependent but independent of external situation	Dependent of meaning and situation which are not explicit
	Innate or learned by repetition	Learned by rule	Learned by rule and practice	Learned by perspicuous examples
Field of activity	Memory games	Computable of quasi computable games, like tic-tac-toe (seek algorithm or count out)	Un-computable games, like chess or go	Ill defined games, like riddles (perceptive guess)
	Maze problems (trial and error)	Combinatorial problems (non-heuristic means/ends analysis)	Complex combinatorial problems like planning and maze calculation (critical path, Monte Carlo)	Open structured problems (insight)
	Word-by-word translation (mechanical dictionary)	Proof of theorems using mechanical proof procedures (seek algorithm)	Proof of theorems where no mechanical proof procedure exists (intuition and calculation)	Translating a natural language (understanding in context of use)
	Response to rigid patterns (Innate releasers and classical conditioning)	Recognition of simple rigid pattens, like reading typed page (search for traits whose conjunction defines class membership)	Recognition of complex patters in noise (search for regularities)	Recognition of varied and distorted patterns (recognition of generic or use of paradigm case)
Kind of program	Decision tree, list search, Template	Algorithm	Search-pruning heuristics	None

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INTELLIGENT ACTIVITIES CLASSIFICATION

	Project Coordination		Project Management	
	Associations	**Simple formal**	**Complex formal**	**Nonformal**
Characteristics of Activity	Irrelevance of meaning and situation	Meanings completely explicit and situation independent	Internally situation dependent but independent of external situation	Dependent of meaning and situation which are not explicit
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❑ Loss of human connection

Increasing reliance on AI-driven communication and interactions could lead to diminished empathy, social skills, and human connections. To preserve the essence of our social nature, we must strive to maintain a balance between technology and human interaction.

❑ Lack of Transparency

Lack of transparency in AI systems, particularly in deep learning models that can be complex and difficult to interpret, is a pressing issue. This opaqueness obscures the decision-making processes and underlying logic of these technologies.

When people can't comprehend how an AI system arrives at its conclusions, it can lead to distrust and resistance to adopting these technologies.

❑ Bias and Discrimination

AI systems can inadvertently perpetuate or amplify societal biases due to biased training data or algorithmic design. To minimize discrimination and ensure fairness, it is crucial to invest in the development of unbiased algorithms and diverse training data sets.

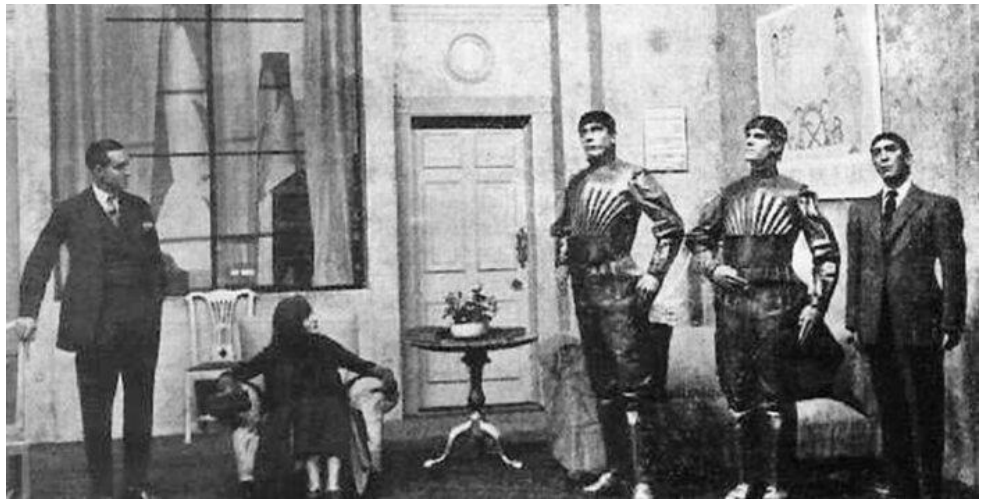
❑ Ethical Dilemmas

Instilling moral and ethical values in AI systems, especially in decision-making contexts with significant consequences. Ethical implications of AI technologies to avoid negative societal impacts.

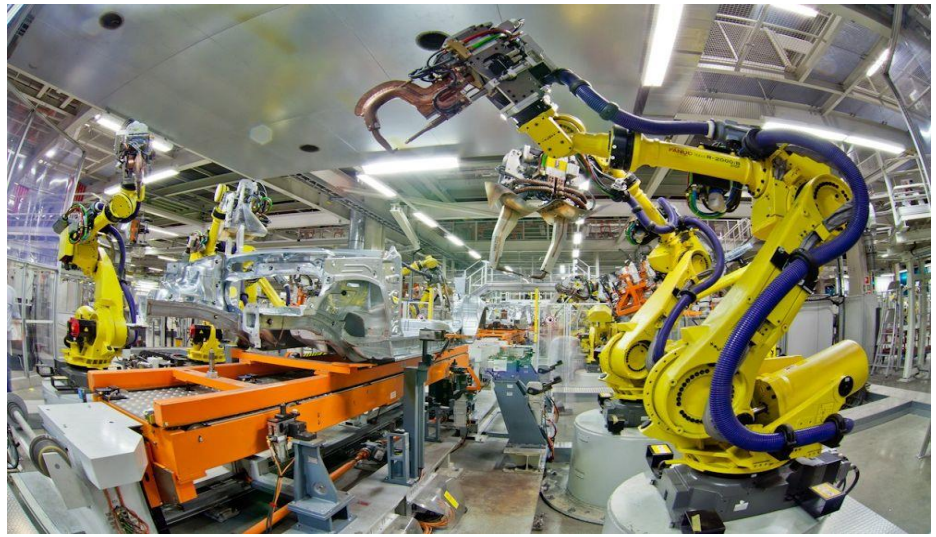
❑ Dependence on AI

Overreliance on AI systems may lead to a loss of creativity, critical thinking skills, and human intuition. Striking a balance between AI-assisted decision-making and human input is vital to preserving our cognitive abilities.

Overestimating AI's power



The product of the human brain has escaped the control of human hands
Karel Čapek *1921*



- People can't be managed by 'intelligent" machines
- Using Artificial Intelligence needs (more) skills and knowledge
- Artificial Intelligence is a Lean tool, it can be an inhibitor for Agile
- Like any new technology it will create more jobs that it replaces

ETHICAL DILEMMAS

In 1966, Joseph Weizenbaum an MIT professor created Eliza, the first chatbot. Humans could converse with the computer in a natural language (English). Based on the user input, "Eliza" applied a set of rules to generate a plausible response. Although the software was relatively simple even by 1970's standards Some subjects have been very hard to convince that Eliza is not human. ***Weizenbaum was shocked that his program was taken seriously by many users***, who would open their hearts to it and later became one of leading critics of AI.

In his 1976 book "Computer Power and Human Reason" he stated that "while Artificial Intelligence may be possible, ***we should never allow computers to make important decisions because computers will always lack human qualities such as compassion and wisdom".***

Weizenbaum makes the crucial distinction between deciding and choosing. ***Deciding is a computational activity***, something that can ultimately be programmed. ***Choice, however, is the product of judgment, not calculation.*** It is the capacity to choose that ultimately makes us human. Comprehensive human judgment is able to include non-mathematical factors, such as emotions. Judgment can compare apples and oranges, and can do so without quantifying each fruit type and then reductively quantifying each to factors necessary for comparison".

LACK OF TRANSPARENCY

D'Ignazio (1984) The science of artificial intelligence

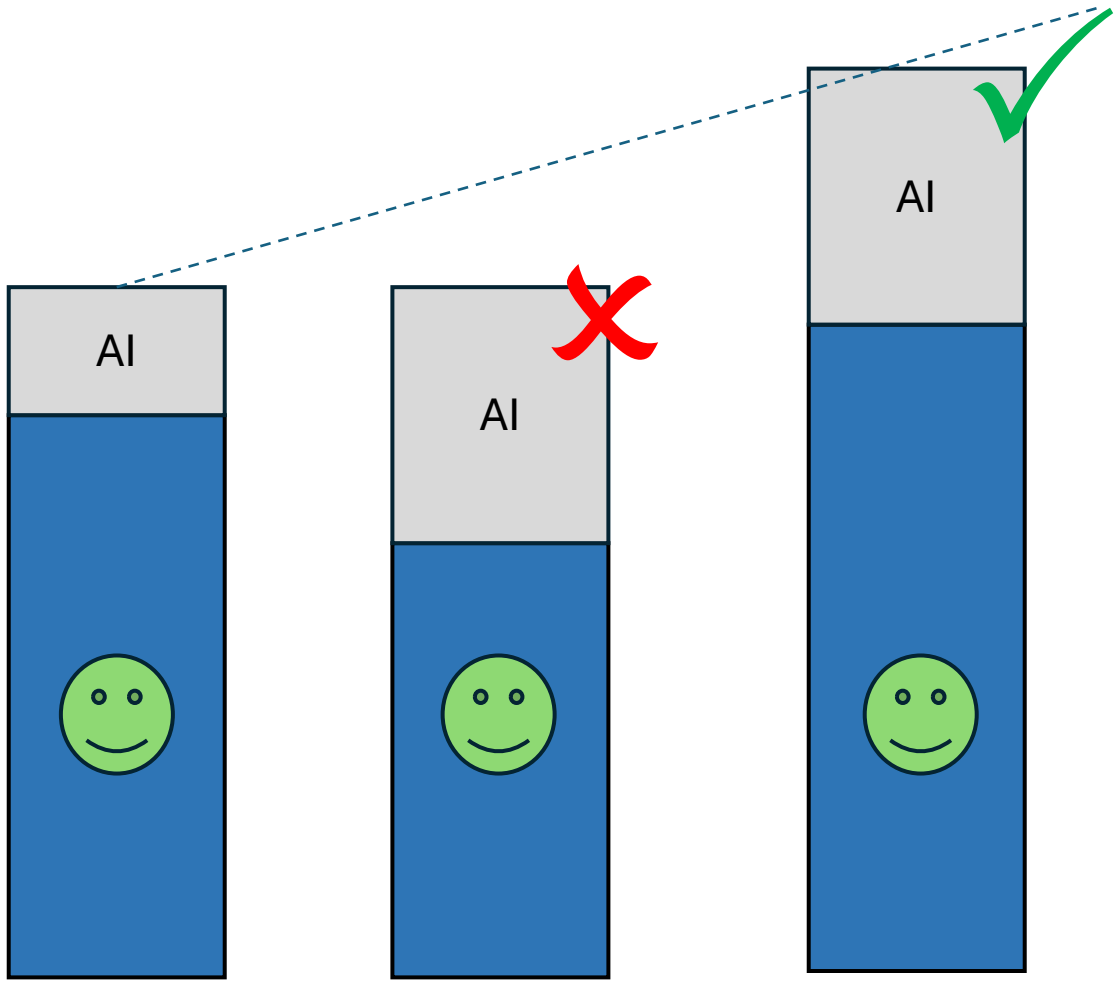
AI software is a black-box. Not only that it fails to explain the reasoning behind their decisions, but it's also challenging to determine accountability for AI recommendations in case of system errors and inflicted harm.

BIAS AND DISCRIMINATION

D'Ignazio (1984) The science of artificial intelligence

AI algorithms can inherit biases present in the data used for training, leading to unfair or discriminatory outcomes. This challenge is particularly crucial as AI systems play an increasingly significant role in decision-making processes across various domains.

DEPENDENCE ON AI



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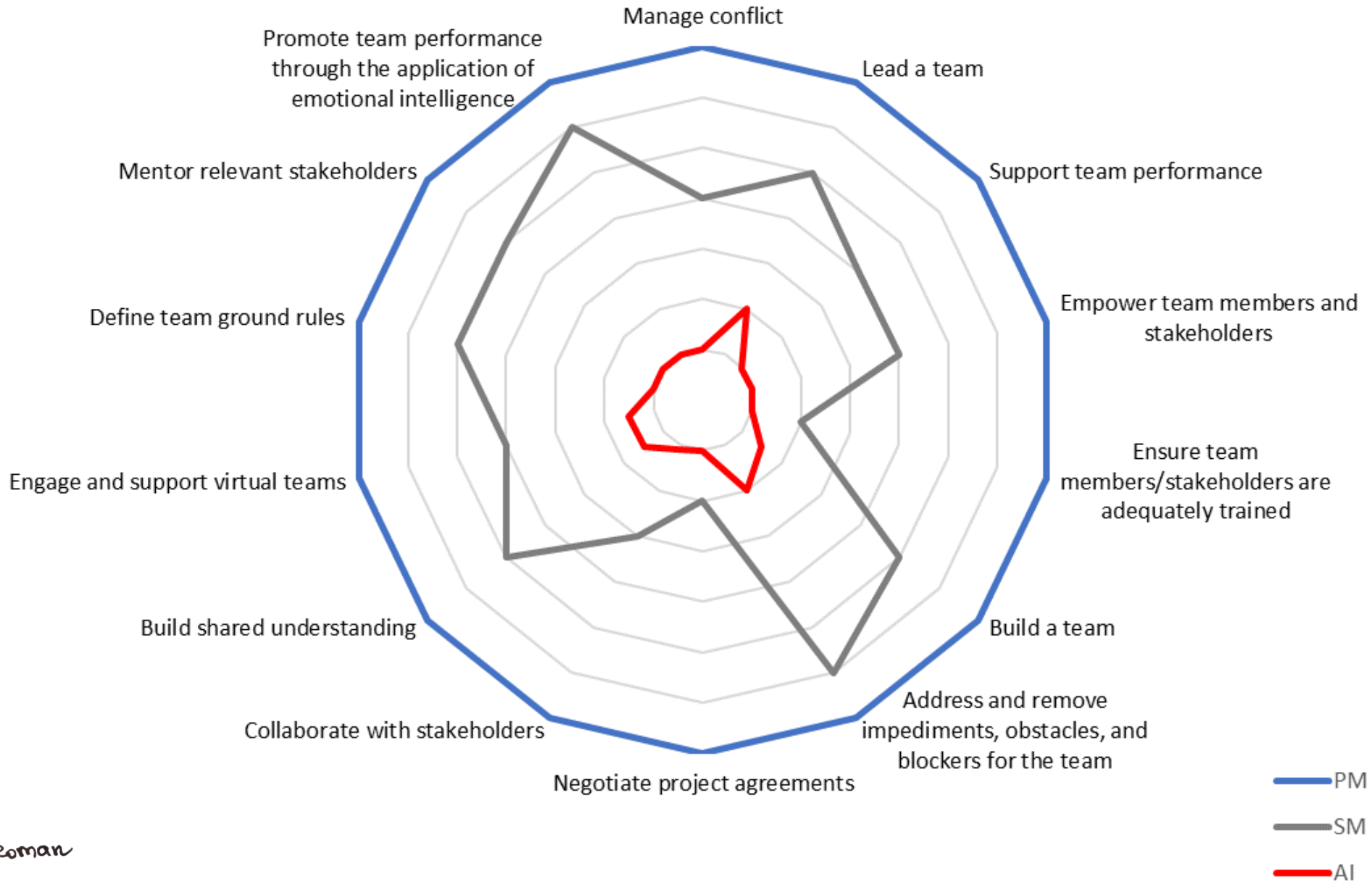
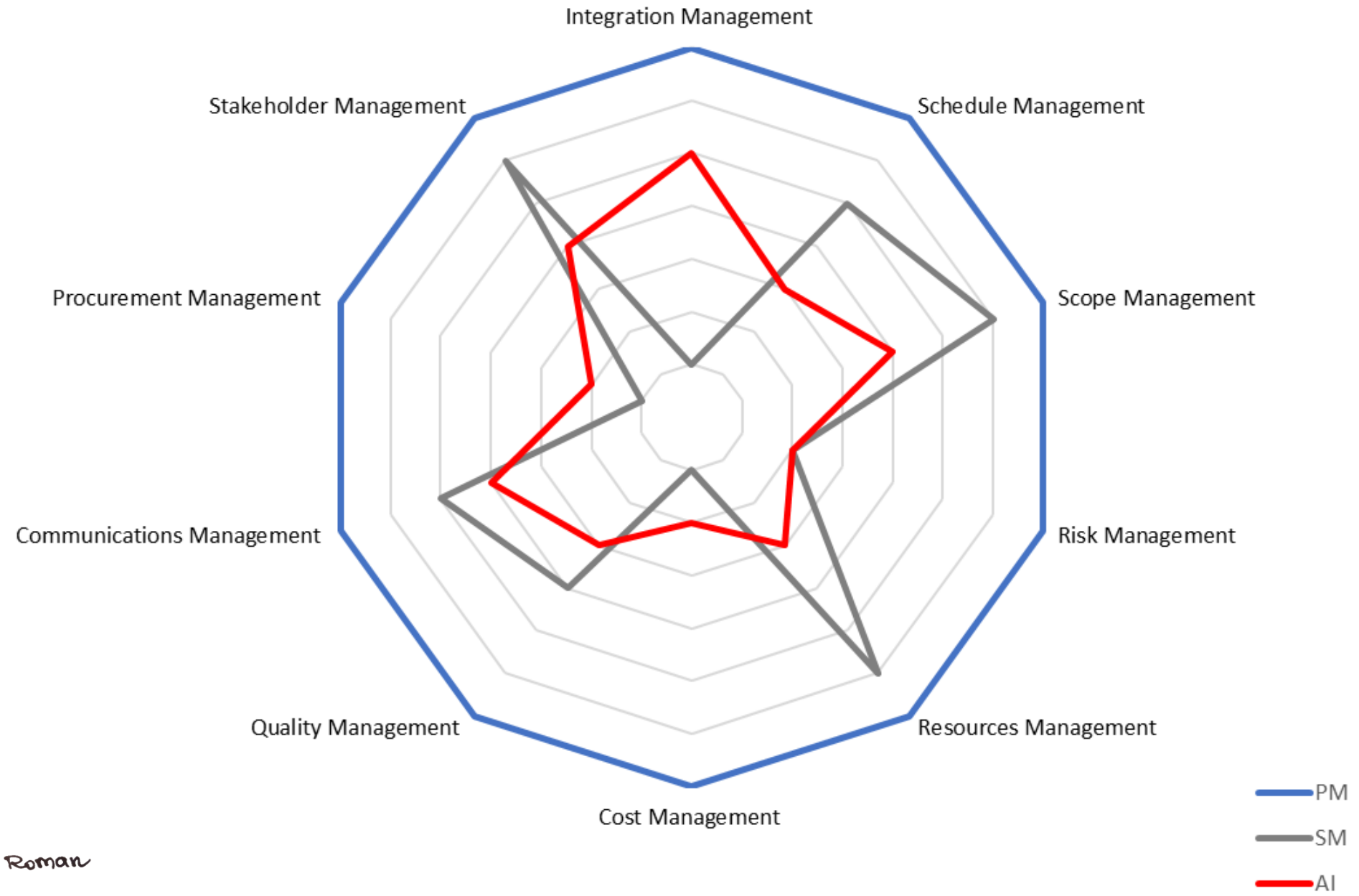
AI AND AGILE PROJECTS



AI AND AGILE PROJECTS



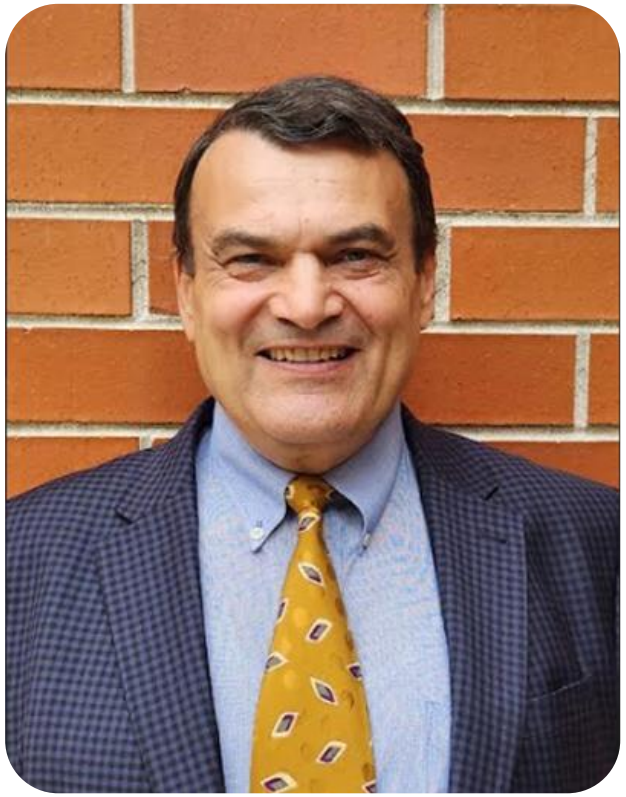
CONCLUSIONS

In 1929, asked about his thought process Einstein did not speak of careful reasoning and calculations.

I believe in intuition and inspiration. Imagination is more important than knowledge. Knowledge is limited. Imagination encircles the world."

- Artificial Intelligence is a tool, not a replacement for intelligence
- Using Artificial Intelligence needs (more) skills and knowledge
- People can't be managed by 'intelligent" machines
- People are the most important area of Project Management
- Artificial Intelligence is a Lean tool, it can be an inhibitor for Agile
- Like robots, Artificial Intelligence should focus on tasks that:
  - Don't have a social impact
  - Can be done better than a human
  - Can be done cheaper than a human
- Like any new technology it will create more jobs that it replaces

DISCLAIMER



The views and opinions expressed in the following PowerPoint slides are those of the presenter.

This is not a training course, nor intended to provide advice on how to manage a project. It is a knowledge sharing experience intended for Project Management practitioners, responsible for project delivery.

The presentation is based on presenter's experience, books and articles published mainly before the publication of the Manifesto for Agile Software Development, in attempt to help project teams that are considering Agile adoption to avoid mistakes that were already made, learn from the past and from their own attempts to use Agile practices.

The focus is on using tools and processes that can enable Agility in Enterprise Level Projects, scaling down practices that worked in the past for large and complex projects and combining them with Agile frameworks developed for small software development teams.

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