

Information Economy

37E00100

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Topics of the day

- Essay assignment (essay clinic on Monday 8th April), teaching case assignment (final report) & exam
- Defining AI and applications of AI
- Article of the day:
 - Davenport, T.H. & Ronanki, R. (2018), "Artificial Intelligence for the Real World", Harvard Business Review. Jan-Feb 2018

Week	Date	Topic	Review article
1	26.2.2024	Introduction to course - information goods	NA
	28.2.2024	Platform-mediated networks 1	Eisenmann, T., Parker, G. & Van Alstyne, M.W. (2006). "Strategies for Two-Sided Markets", <i>Harvard Business Review</i> , October 2006, pp. 92-101
2	4.3.2024	Platform-mediated networks 2	Cusumano, M.A., Yoffie, D.B. & Gower, A. (2020). "The Future of Platforms", <i>MIT Sloan Management Review</i>
	6.3.2024	Sharing economy platforms - visiting talk by Virpi Tuunainen	Constantiou, I. Marton, A. & Tuunainen, V.K. (2017). "Four Models of Sharing Economy Platforms", <i>MIS Quarterly Executive</i> , Dec 2017 (16:4)
3	11.3.2024	Crowdsourcing the era of Internet - visiting talk by Wael Soliman	Blohm, I., Leimeister, J.M. & Krcmar, H. (2013). "Crowdsourcing: How to Benefit from (Too) Many Great Ideas", <i>MIS Quarterly Executive</i> , December 2013 (12:4)
	13.3.2024	Data platforms and information infrastructures	Otto, B., & Jarke, M. (2019). Designing a multi-sided data platform: findings from the International Data Spaces case. <i>Electronic Markets</i> , 29(4), 561-580.
4	18.3.2024	Digitalization of transportation - visiting talk by Niina Mallat & Kari Koskinen	Rowe, F., Jeanneret Medina, M., Journé, B., Coëtard, E., & Myers, M. (2023). Understanding responsibility under uncertainty: A critical and scoping review of autonomous driving systems. <i>Journal of Information Technology</i> , 02683962231207108.
	20.3.2024	Teaching case Autonomous Vehicles: Smooth or Bumpy Ride Ahead?	NA
5	25.3.2024	Applications of AI	Davenport, T.H. & Ronanki, R. (2018), "Artificial Intelligence for the Real World", <i>Harvard Business Review</i> . Jan-Feb 2018.
	27.3.2024	Blockchain - visiting talk by Venkata Marella	Iansiti, M. & Lakhani, K.R. (2017). "The Truth about Blockchain", <i>Harvard Business Review</i> , January-February 2017
6	8.4.2024	Essay clinic	NA
	10.4.2024	Information society	Zuboff, S. (2015), "Big other: surveillance capitalism and the prospects of an information civilization", <i>Journal of Information Technology</i> (2015) 30, 75-89.

Definition of Artificial Intelligence

AI is typically defined as

*the ability of a machine to **perform cognitive functions** that we associate with human minds, such as perceiving, reasoning, learning, interacting with the environment, problem solving, decision-making, and even demonstrating creativity.*

Source: Rai, Arun; Constantinides, Panos; and Sarker, Saonee. 2018. "Editor's Comments: Next-Generation Digital Platforms: Toward Human–AI Hybrids," *MIS Quarterly*, (43: 1) pp.iii-ix.

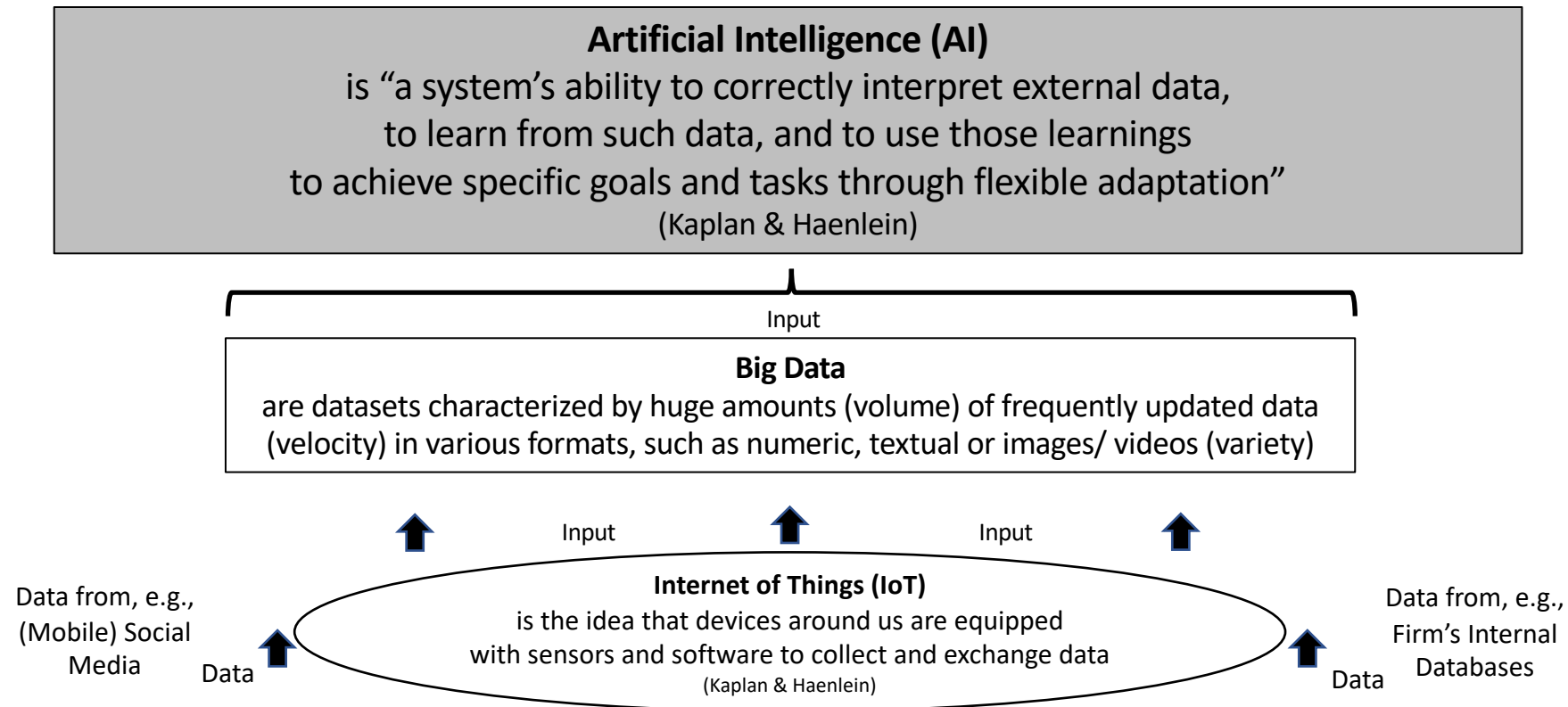
What is artificial intelligence?

- Debate in academic and practitioner literature as to what constitutes AI
 - Inclusive definition: AI refers to most technologies that portray human-like actions
 - Strict definition: AI must encompass the notion of learning based on data
- Recommendation: go beyond definitional debates and be specific and talk about tools and technologies by using their names
 - E.g., “3D sensing technology coupled with neural network” instead of “AI tool”

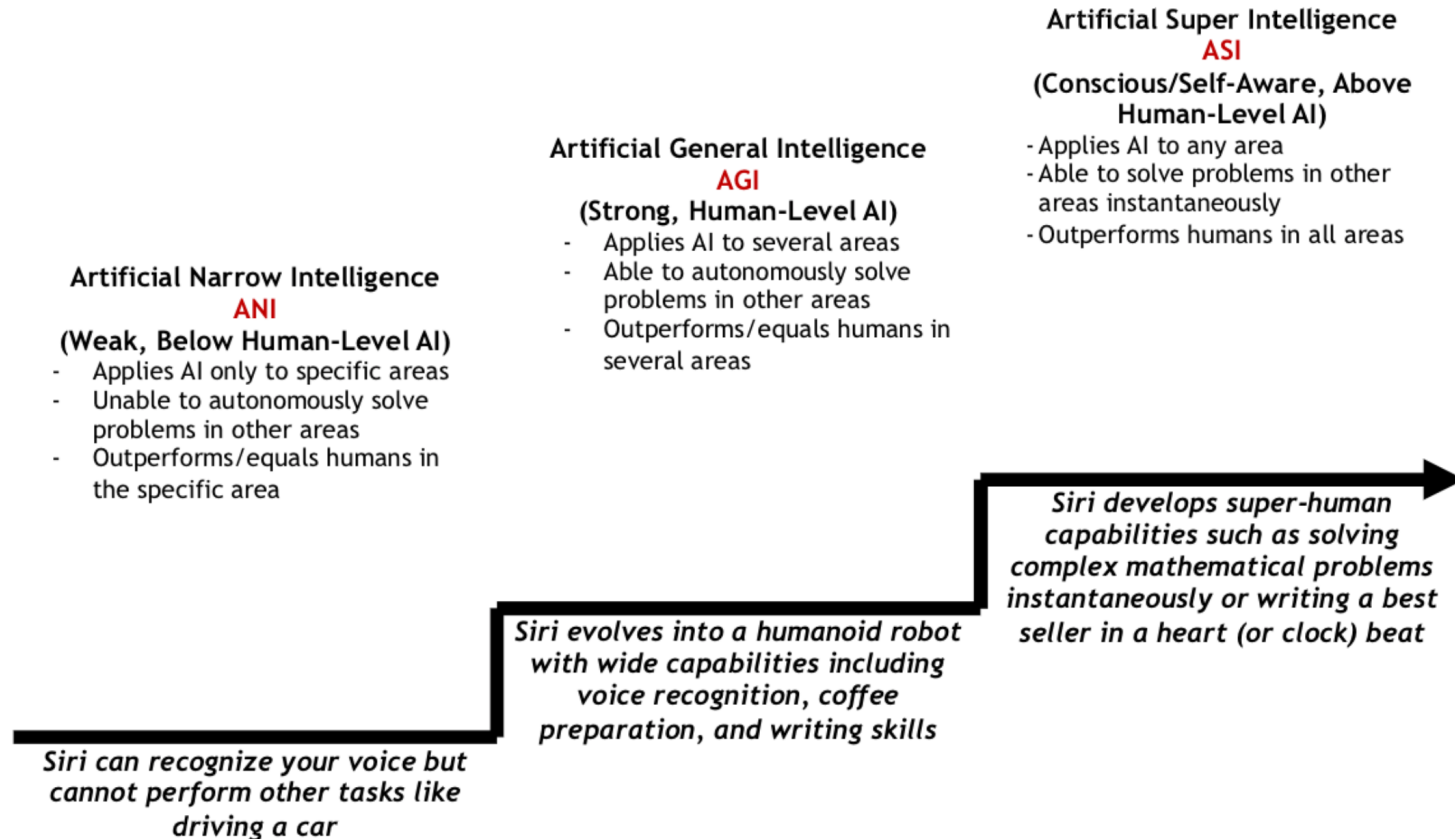
Inclusive Definition of Artificial Intelligence

Technology	Brief Description	Example Application
Machine learning <ul style="list-style-type: none"> • Reinforcement learning • Supervised learning • Unsupervised learning 	Learns from experience. Learns from a set of training data. Detects patterns in data that are not labeled and for which the result is not known.	Highly granular marketing analyses on big data.
Deep learning	A class of machine learning that learns without human supervision, drawing from data that is both labeled and unlabeled.	Image and voice recognition, self-driving cars.
Neural networks	Algorithms that endeavor to recognize underlying relationships in a set of data through a process that mimics the way the human brain operates.	Credit and loan application evaluation, weather prediction.
Natural language processing	A computer program able to understand human language as it is written or spoken.	Speech recognition, text analysis, translation, generation.
Rule-based expert systems	A set of logical rules derives from human experts.	Insurance underwriting, credit approval
Robotic process automation	Systems that automate structured digital tasks and interfaces.	Credit card replacement, validating online credentials.
Robots	Automatically operated machines that automate physical activity, manipulate and pick up objects.	Factory and warehouse tasks.

Strict Definition of Artificial Intelligence ... and Related Concepts



Stages of artificial intelligence



Source: Andreas M. Kaplan and Michael Haenlein, "Siri, Siri, in My Hand: Who's the Fairest in the Land? On the Interpretations, Illustrations, and Implications of Artificial Intelligence," *Business Horizons*, 62/1 (January/February 2019): 15-25.

Types of AI Systems

Artificial Intelligence (AI)

	Expert Systems	Analytical AI	Human-Inspired AI	Humanized AI	Human Beings
Cognitive Intelligence	x	✓	✓	✓	✓
Emotional Intelligence	x	x	✓	✓	✓
Social Intelligence	x	x	x	✓	✓
Artistic Creativity	x	x	x	x	✓

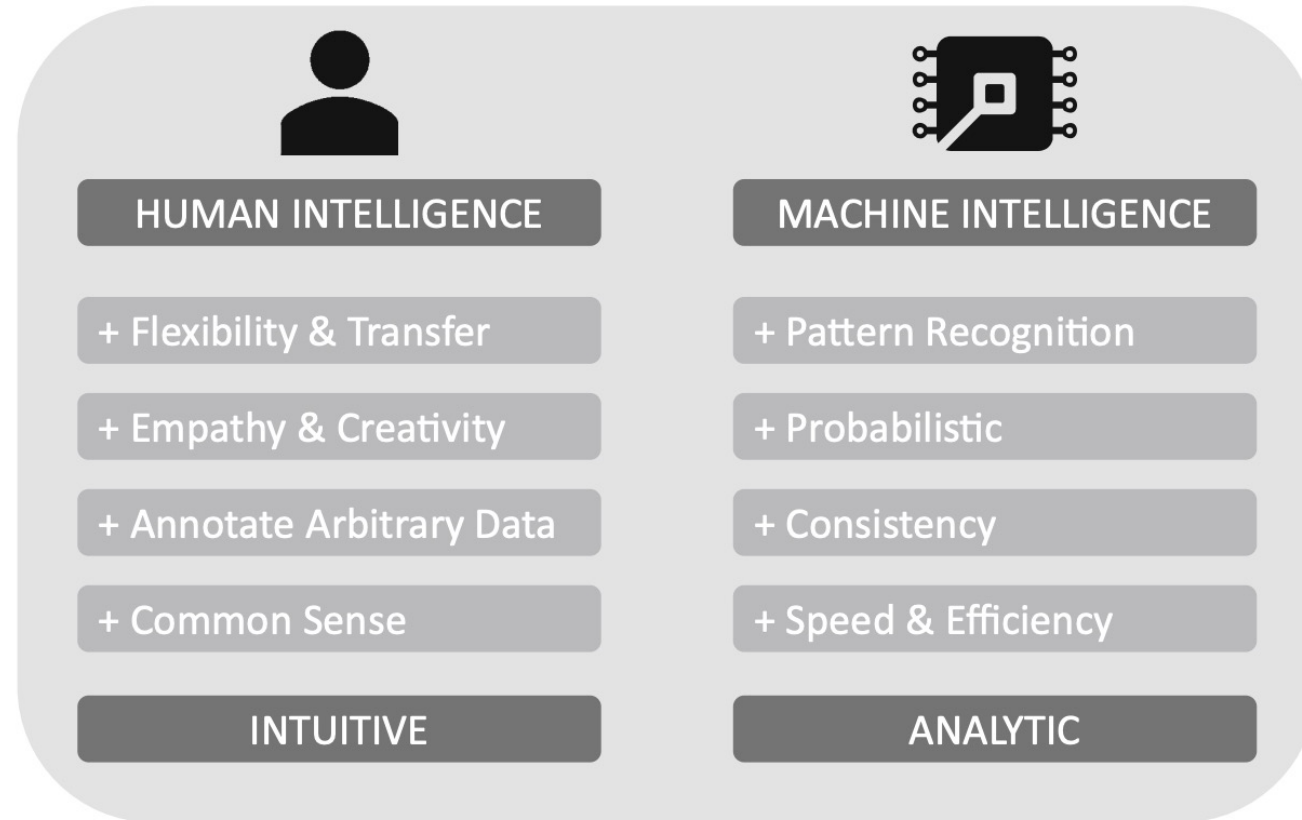
Kaplan A., Haenlein M. (2019) Siri, Siri in my hand, who 's the fairest in the land? On the Interpretations, Illustrations and Implications of Artificial Intelligence, Business Horizons, 62(1)

Illustrations of AI applications

	Analytical AI	Human-Inspired AI	Humanized AI
Universities	Virtual teaching assistants able to answer student questions and tailor reactions to individual data	AI-based career services able to identify emotions to improve interview techniques of students	Robo-teachers animating a student group by acting as moderator and sparring partners
Corporations	Robo-advisors leveraging automation and AI algorithms to manage client portfolios	Stores identifying unhappy shoppers via facial recognition at checkouts to trigger remedial actions	Virtual agents dealing with customer complaints and addressing concerns of unhappy customers
Governments	Automation systems to set the brightness of streetlights based on traffic and pedestrian movements	Virtual army recruiters interviewing and selecting candidates based on emotional cues	AI systems able to psychologically train soldiers before entering a war zone

Source: Andreas M. Kaplan and Michael Haenlein, "Siri, Siri, in My Hand: Who's the Fairest in the Land? On the Interpretations, Illustrations, and Implications of Artificial Intelligence," *Business Horizons*, 62/1 (January/February 2019): 15-25.

Human vs Machine Intelligence



Source: Dellermann, D., Ebel, P., Söllner, M. *et al.* Hybrid Intelligence. *Bus Inf Syst Eng* **61**, 637–643 (2019). <https://doi.org/10.1007/s12599-019-00595-2>

Applications of AI

Robotic Process Automation

- Robotic process automation refers to the recent surge in organizational deployment of software robots which are rules-based systems that are implemented on top of an organization's existing IT architecture
- Software robots emulate human employees' actions
- Managers contemplating the deployment of software robots must take a stance on:
 - Sourcing model (outsource vs. inhouse)
 - Deployment (cloud vs. on premise)
 - Technology (proprietary vs. open source)

Checklist for managers

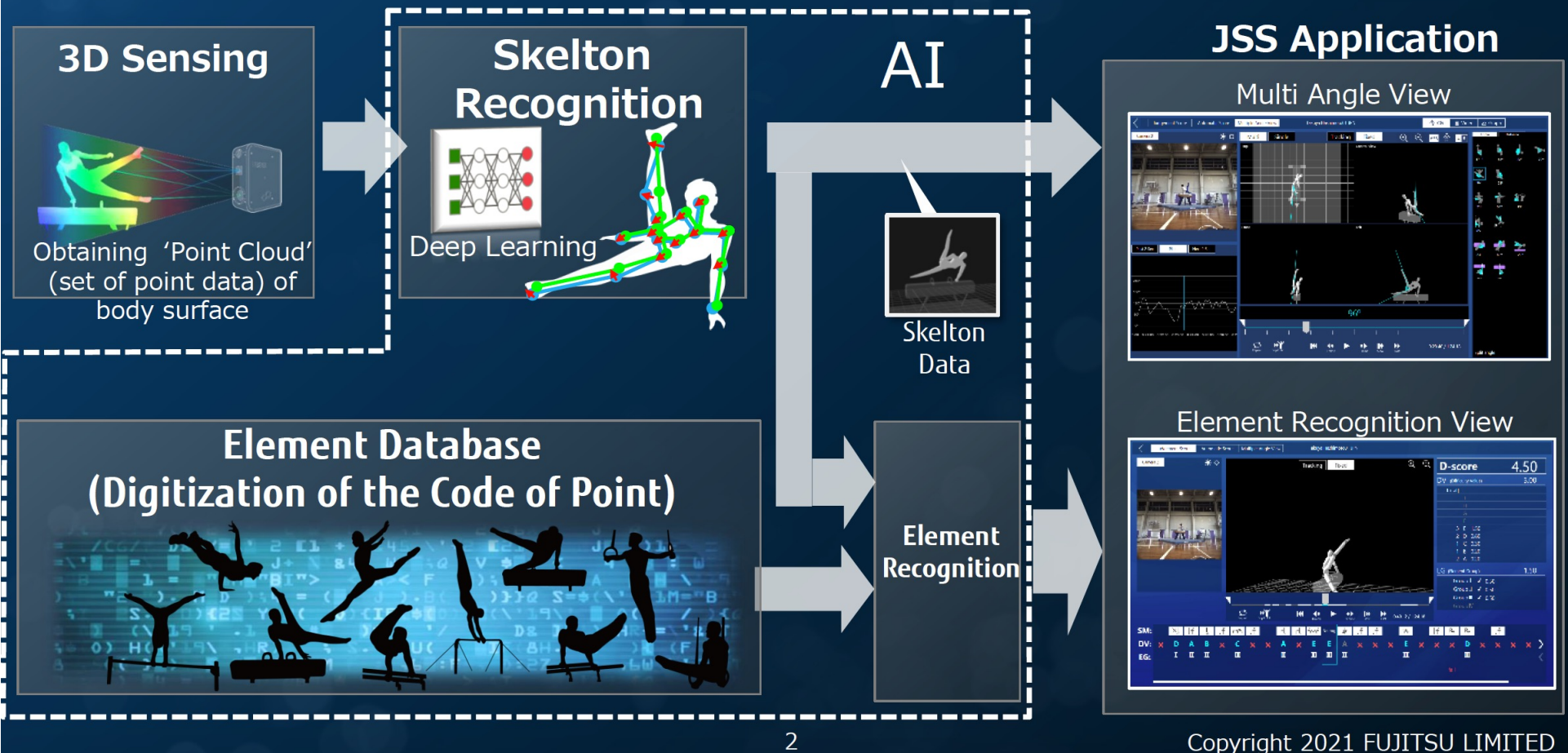
Decision	Check...
Sourcing	What are your organization's relevant software-development capabilities at present?
	What are your organization's relevant process-development capabilities at present?
	Does your organization have the required software- and process-development resources available?
	Does your organization have a sourcing policy or strategy in place that prescribes a specific sourcing model for IT projects?
	Do you foresee a need for rapidly scaling the RPA projects up/down?
Deployment	Does your organization have established practices, policies, or strategies for IT deployment?
	Does your RPA project require robots to be situated at a specific location?
	Does your RPA project require direct control over the robot while it is performing the tasks?
	What are the RPA reliability requirements for the project?
	Do you foresee a need for rapidly scaling up/down the number of robots deployed?
Technology	What are the feature requirements for your RPA project?
	What add-on services does your RPA project require beyond the features of generic RPA software?
	Do developers within your organization prefer to work with any particular RPA technology?
	Do the external consultants prefer to work with any specific RPA technology?
	Do you require technical and customer support from the RPA software vendor?
	How sensitive is your project to costs associated with IT procurement?

Aleksandre Asatiani, Olli Copeland, & Esko Penttinen, Deciding on the robotic process automation operating model: A checklist for RPA managers, Business Horizons, 2023 (66:1, pp. 109-121)

Gymnastics

- As in many other sports, in gymnastics, the athletes' rising skill level means that it is increasingly difficult for human judges to evaluate the athlete's performance
- As a result, an AI-powered judging system is being developed by Fujitsu

Judging Support System for Gymnastics



Dark side of AI?

- What are the risks related to AI?
- Trust and accountability
- Hidden bias
- Societal implications



Davenport, T.H. & Ronanki, R. (2018), "Artificial Intelligence for the Real World", Harvard Business Review. Jan-Feb 2018



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