Measuring Artificial Intelligence(AI) in Israel

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the story

- Defining AI
- Developing an AI measurement framework
- Survey questions

Defining AI

- Reviewed AI definitions, concepts and uses.
- Reviewed the definition used by national statistic offices: Canada, USA, South Korea, France and the OECD.
- Consulted with several leading AI companies in Israel.

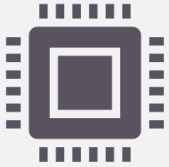
Defining AI

- AI is an emerging technology that's implemented across many sectors, measurement and definitions **need to be broad enough** to capture the full scope of AI applications and future changes.
- At the same time they **need to be detailed enough** so they can capture specific activity and provide useful insight for public policy.

Defining AI

Being that Intelligence is a well known and defined characteristic, follow Nils J. Nilssons definition used in OECDs Digital Economy Outlook 2017 that merely links intelligence to machines.

"Artificial intelligence is that activity devoted to making machines intelligent, and intelligence is that quality that enables an entity to function appropriately and with foresight in its environment". (Nilsson in OECD Digital Economy Outlook 2017, OECD Publishing, Paris pp.295)



Similar to the one used by the US Census Bureau in the 2018 Annual Business Survey:

"Artificial intelligence is a branch of computer science and engineering devoted to making machines intelligent. Intelligence is that quality that enables an entity to perceive, analyze, determine response and act appropriately in its environment."

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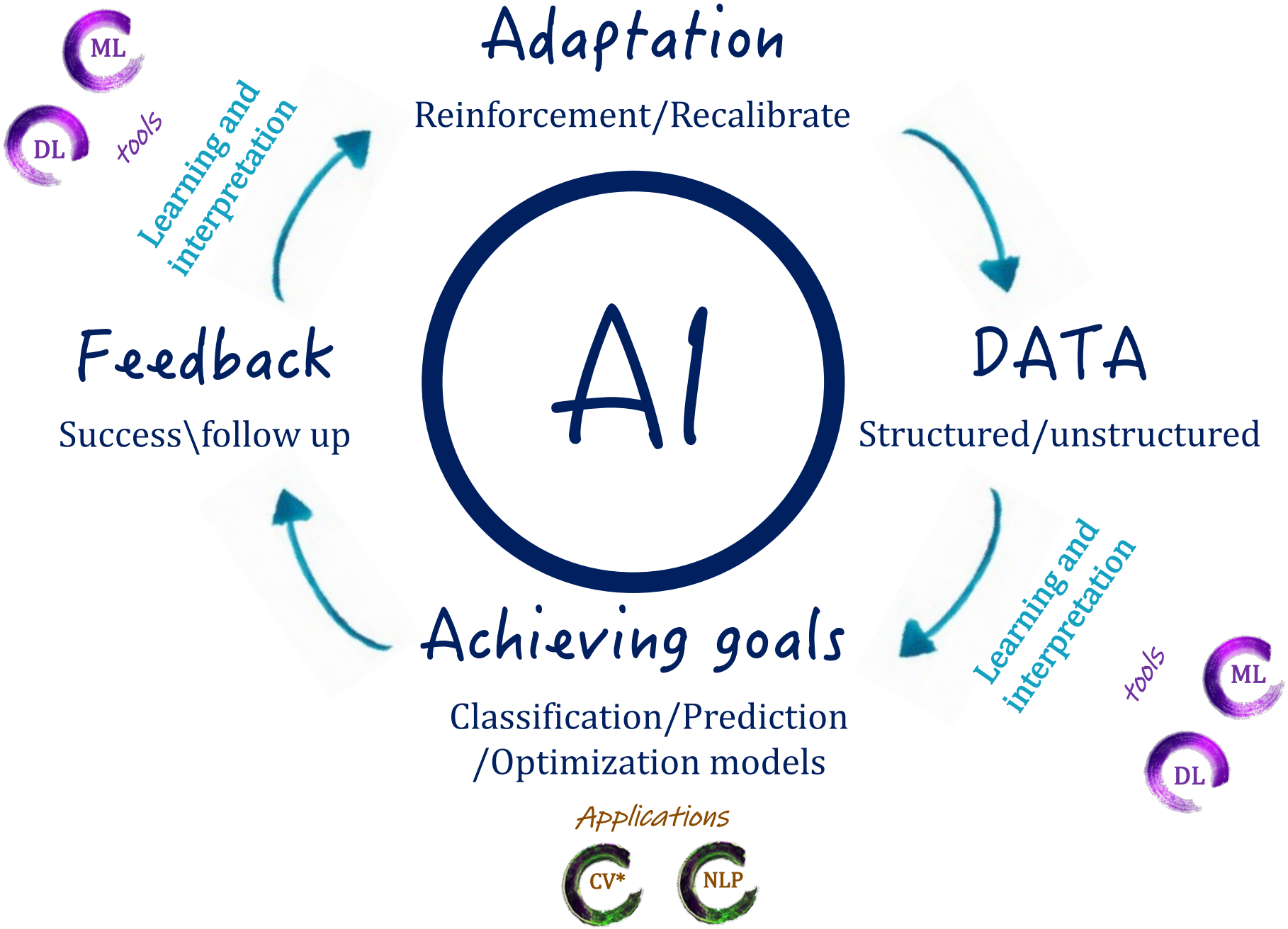
Defining AI

- After consulting several leading AI companies in Israel we decided to add a more functional definition.
- "… a system's ability to interpret external data correctly, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation."
  in Kaplan, A. & Haenlein, M. (2018). *Siri, Siri, in my hand: Who's the fairest in the land? On the interpretations, illustrations, and implications of artificial intelligence*. Business Horizons. 62.



* Computer vision

Definition in Use

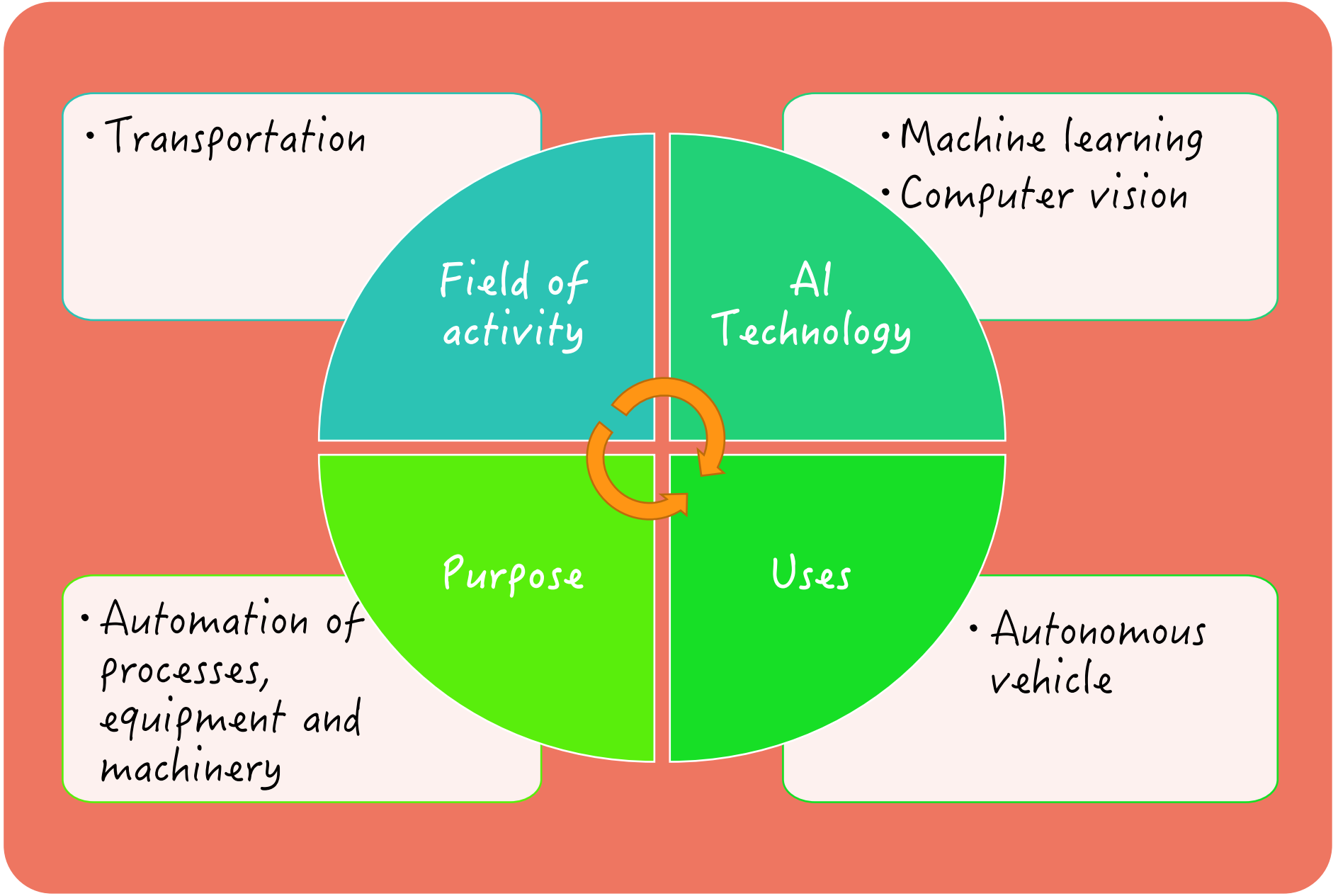
Artificial Intelligence is a multidisciplinary field devoted to making machines intelligent; intelligence being the quality that enables an entity to function appropriately in its environment.

Most applications in the field are based on the ability of machines and systems to interpret data, to learn and derive insights from data, and to use these insights to perform tasks and achieve goals all in an adaptive process.

Framework

- Our framework is built on three dimensions: **technology, field of activity and purpose**.
  - Technology refers to the technological means required to carry out business functions.
  - The field of activity refers to the category of business activity in which AI is being used.
  - Purpose refers to the objectives enterprises wish to achieve when using AI.

Framework


• Transportation
• Machine learning
• Computer vision
Field of activity
AI Technology
Purpose
Uses
• Automation of processes, equipment and machinery
• Autonomous vehicle

Our Work

- We reviewed leading real-life cases of AI business applications.
- From these cases we comprised a list of most prominent AI business uses or developments today.

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Our Work

- We categorized uses by **field of activity**, and then shortlisted the major fields.
- We found common themes among purposes for different uses and grouped **purposes** together into more general purposes and grouped them to apply to multiple fields.
- We decided **not to ask about specific AI technology**. Our understanding is that different technologies have negligible policy implications.

Partial list of Major AI Uses

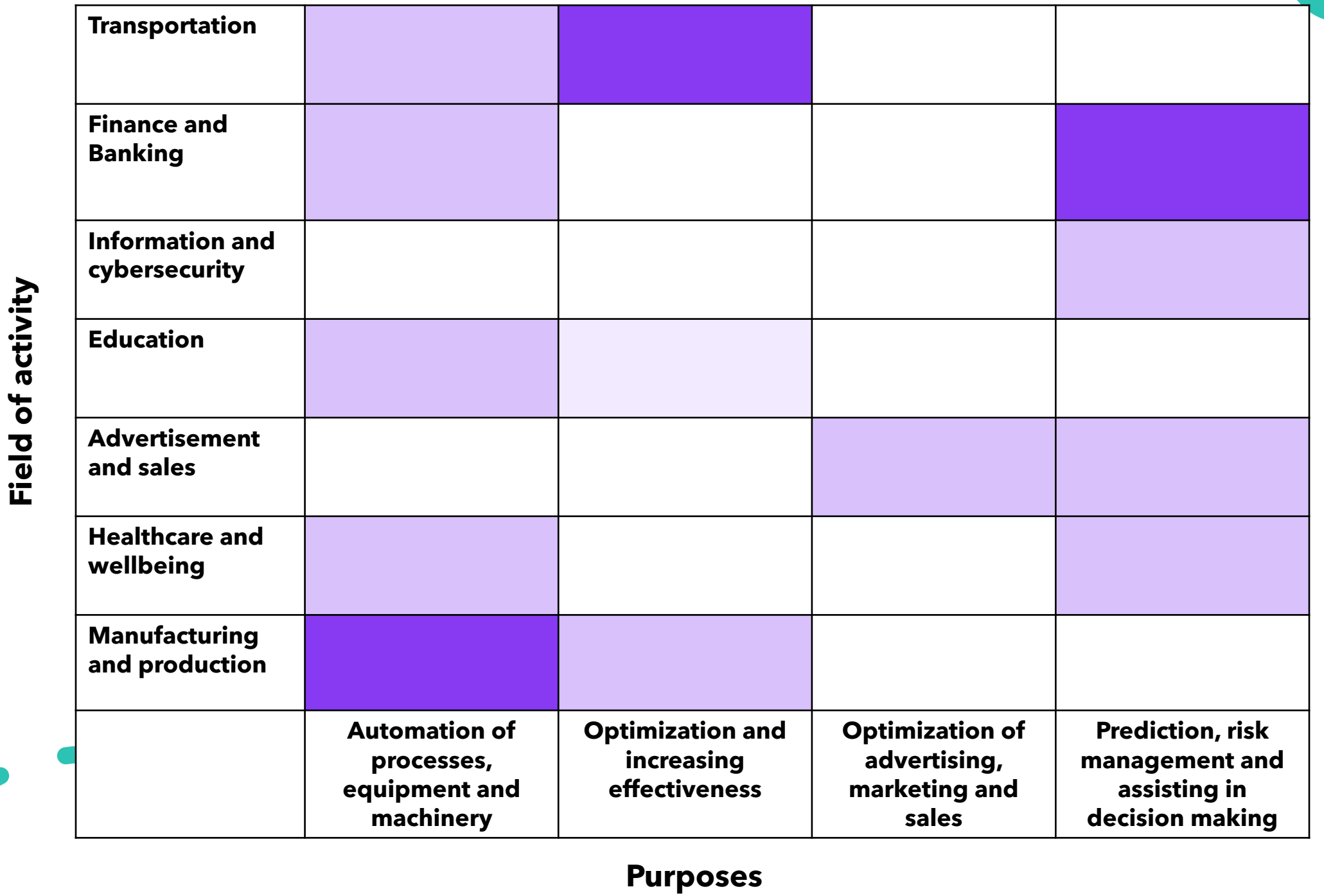
Field of Activity	Use
Transportation	Autonomous vehicles
	Traffic flows management
	Public transportation and ride sharing
	Navigation and optimized route planning
	Vehicle maintenance
Finance and banking	Identifying fraud and money laundering
	Risk assessment and predicting earnings
	Banking and finance customer service
Cybersecurity	Early identification of vulnerabilities
	Identifying and managing security breaches
	Backup and data recovery

Partial list of leading AI uses by field

Field of activity

Transportation	Autonomous vehicles	Ride sharing Navigation and route planning		
Finance and Banking	Banking and finance customer service			Identifying fraud and money laundering Risk assessment and predicting earnings
Information and cybersecurity				Identifying and managing security breaches
Education	Virtual teaching assistant			
Advertisement and sales			Effective campaign management	Analyzing site-use patterns
Healthcare and wellbeing	Robot-assisted surgery			Diagnostics
Manufacturing and production	Automation of production processes Industrial Robots	Supply chain optimization		
	Automation of processes, equipment and machinery	**Optimization and increasing effectiveness**	**Optimization of advertising, marketing and sales**	**Prediction, risk management and assisting in decision making**

Purposes



Survey Questions

- Does your enterprise use AI technologies and/or services?

Yes

Survey Questions

- In which **fields of activity** does your enterprise use AI?

  Please select all that apply

  ❑Banking, financial services and insurance
  ❑Healthcare and wellbeing
  ❑Transportation
  ❑Information and cyber security
  ❑Sales and marketing
  ❑Manufacturing and industrial production
  ❑Professional, scientific and technical activities
  ❑Education
  ❑Communication and media

Survey Questions

- For what **purposes** is AI used by your enterprise?

  Please select all that apply

  - ❑ Automation of processes, equipment and machinery (including robotics, vehicles and drones).
  - ❑ Optimization and increasing effectiveness of resource usage, production, shipping, handling and distribution.
  - ❑ Recruiting, managing and developing human resources.
  - ❑ Optimization of advertising, marketing and sales.
  - ❑ Prediction, risk management and assisting in decision making.
  - ❑ Identifying, managing and preventing security incidents, fraud and money laundering.
  - ❑ Quality control and prevention of deviations and hazards.
  - ❑ Customer service and virtual service providers.
  - ❑ Development, design and customization of products.
  - ❑ Taxation, accounting and compliance with the law and regulation.
  - ❑ Other

AI Specialists

- Did your enterprise recruit or try to recruit AI specialists during 2019?
- During 2019, did your enterprise have difficulties filling vacant positions for AI specialists?

Please select all that apply

❑The recruitment process lasted longer than 6 months.
❑The job is vacant for over 6 months and has not yet been filled.
❑Bureaucratic difficulties in hiring a foreign worker.
❑Other difficulties.

System Development

- Who developed the AI applications in your enterprise?

	Yes	No
Enterprises own employees (incl. those employed in parent or affiliate enterprises).		
External suppliers, in a way that specifically meets the needs of your business.		
External suppliers, as part of “pre-packaged” software.		

Thenks for your time!

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