



A SURVEY OF AI ETHICS IN BUSINESS:

Maps and trends from 2000 to 2021

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ABSTRACT

Artificial intelligence is spreading rapidly in business products and processes, with innovations that bring **great benefits** to society; however, **significant risks** also arise. AI-enabled systems make decisions autonomously and influence users and the environment, presenting multiple ethical issues. This work focuses on the ethics of AI use in business. We conduct **a survey of business journal articles published between 2000 and mid-2021** to identify the **most influential journals, articles, and authors, the most influential ethical schools, and the main ethical issues** of AI in business. It describes the state-of-the-art in the field and identifies trends in ethical issues arising from AI. Thus, we present maps and trends of the ethics in AI in business literature.

Keywords

Ethics, Artificial Intelligence, Bias, Privacy, Employment, Social Media

CONTEXT

- ❑ AI is reshaping **business, economy** and **society**; however significant **risks** also arise.
- ❑ The **data** needed to train AI systems is sometimes obtained **without people's consent**.
- ❑ The gig economy has fueled the **proliferation of precarious jobs**, and automation has led to the **substitution of humans** at work.
- ❑ AI **algorithms amplify human biases** that are inherited through training datasets.
- ❑ **Social media** platforms use this technology to keep their users engaged, with consequences that can **harm** their health and **society**.



THE NEED FOR ETHICAL THEORIES



- ❑ **Ethical concerns arise** when people realize that intentional or unintentional harm could occur (privacy, bias, employment, manipulation...)
- ❑ **Ethical assessment** is required to
 - ❑ **Understand the problems** of this 4th industrial revolution.
 - ❑ To identify **the right decision** where there is ambiguity.
 - ❑ **Justify and convince** organization's leadership.
 - ❑ Support better regulations and guidelines that **establish the minimum criteria** needed to develop and implement AI... but it is not enough...
- ❑ It is also necessary to establish **the desirable aspects** of these systems, which go beyond the minimum required and **push towards a flourishing society**.

METHOD

Research Questions

RQ1: What are the most influential **journals**?

RQ2: What are the most influential **articles**?

RQ3: Which are the most influential **authors**?

RQ4: What are the **major schools of thought** on the ethics of AI in business?

RQ5: What are the **main ethical issues** of AI in business?



METHOD: CLASSIFICATION

Thus, we

1. Applied bibliometric techniques to our data set to identify the most influential journals, articles, and authors.
2. Identified most influential ethical schools of thought and classified the articles according to their approach.
3. Classified AI ethical issues in literature into five categories.





DISCUSSION AND FINDINGS

THE ETHICS OF AI IN BUSINESS

OUR FINDINGS: MAPS AND TRENDS

We have organised our findings in ten propositions that describe maps and trends according to our Research Questions.

- **A map** describes how the conceptual space is distributed in terms of a journal, article, or author influence and the prominence of an ethical issue or school.
- **A trend** describes how the distribution of that conceptual space varies over time.

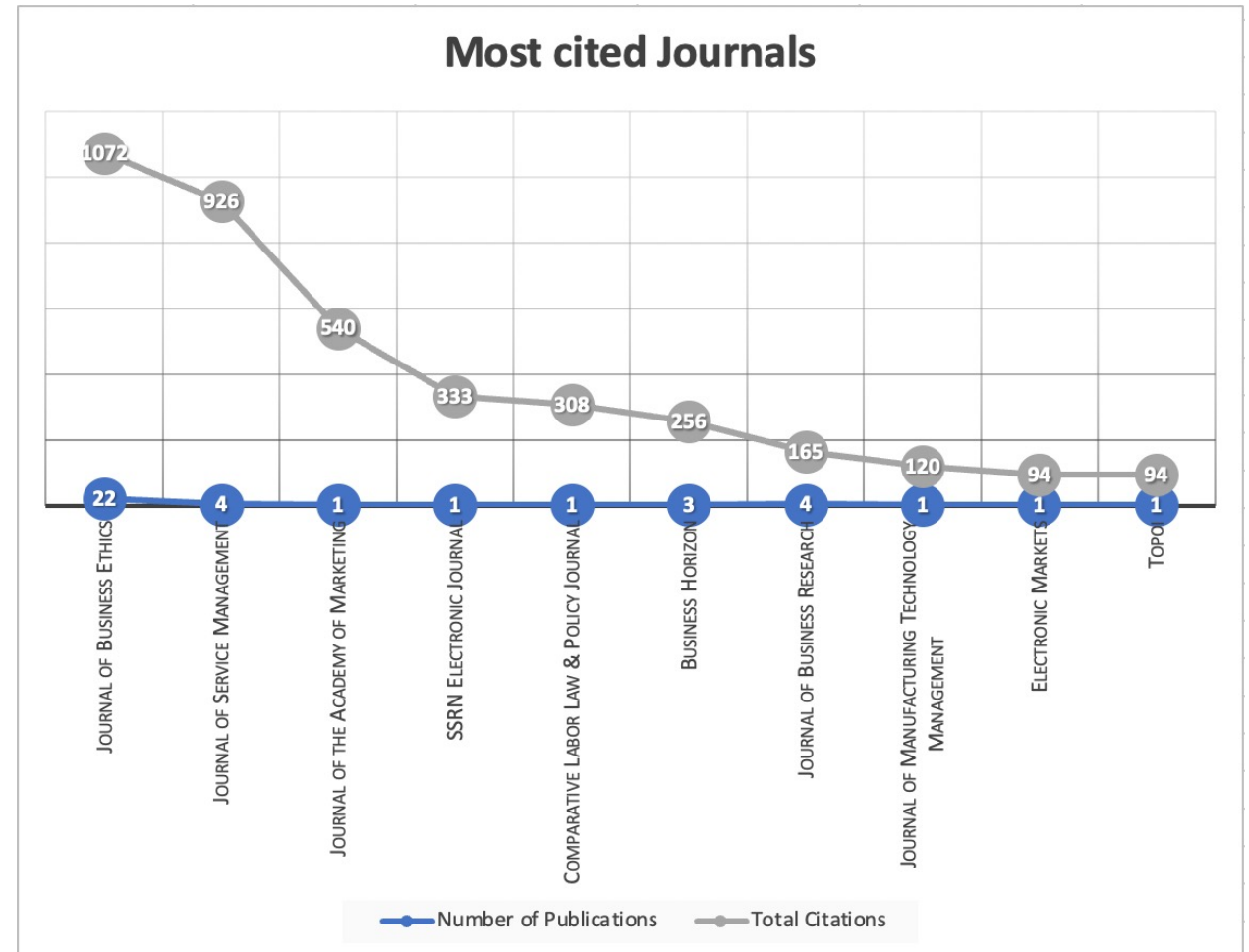




MOST INFLUENTIAL JOURNALS

Map	JBE is the most influential (by number of citations), productive (by number of articles), and comprehensive (by breadth of topics and schools) journal.
Trend	JBE is the most consistent journal publishing articles from 2000 to 2021.

1. Journal of Business Ethics (22)
2. Journal of Business Research (4)
3. Journal of Service Management (4)
4. Business Horizons (3)
5. Business Ethics Quarterly (3)



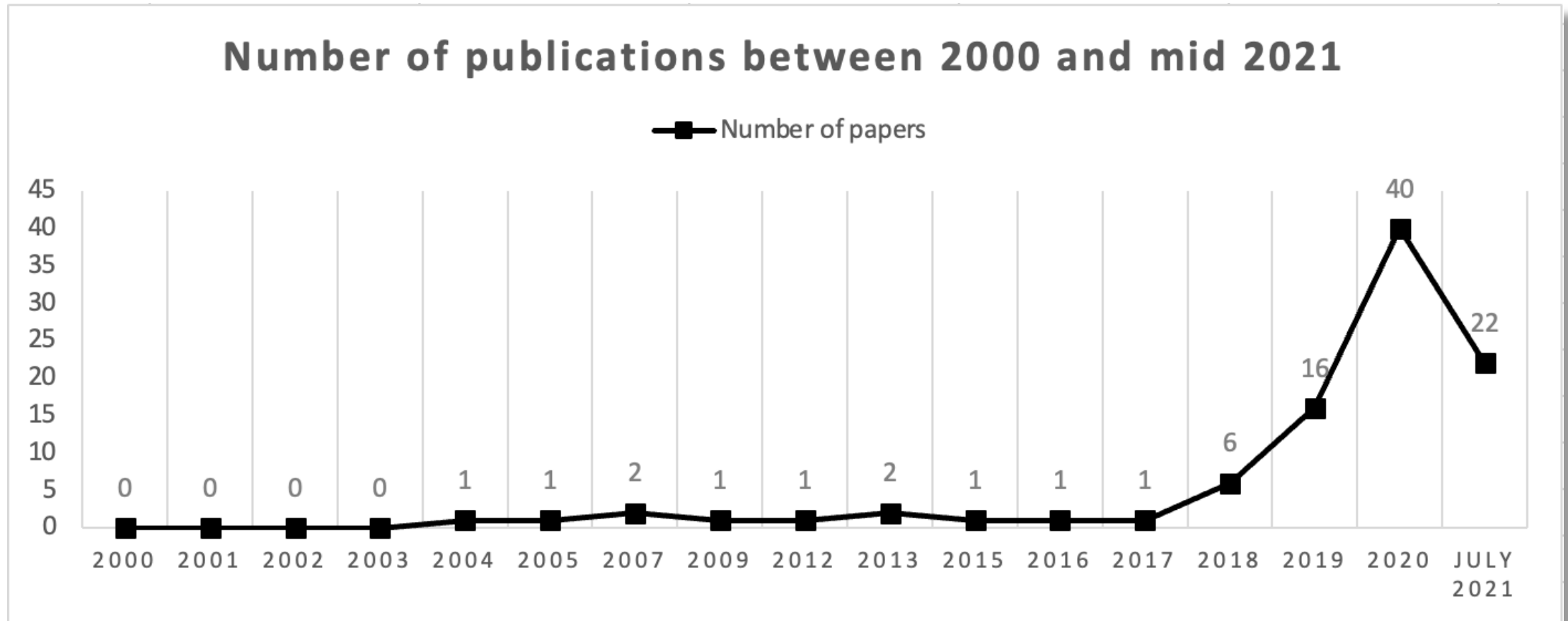
MOST INFLUENTIAL ARTICLES

Map	<p>The most influential articles (by number of citations) are distributed almost equally among business functions and foundational issues. Among the business functions, the top slot belongs to marketing, human resources, and production and finance afterward. The foundational issues discuss AI's current and future capabilities, accountability, and trustworthiness.</p>
Trend	<p>Hardly any articles were published until 2018 when there was a surge. Possible causes are a) the beginning of the widespread use of consumer AI and b) the shift in perception from AI as an object or tool to AI as a subject or agent.</p>

Most cited articles between 2000 and mid 2021

Author(s)	Year	Title	Citations	Source
Wirtz, J.; Patterson, Paul G.; Kunz, W.; Gruber, T.; Lu, V.; Paluch, S.; Martins, A.	2018	Brave new world: service robots in the frontline	734	Journal of Service Management
Davenport, T.; Guha, A.; Grewal, D.; Bressgott, T.	2020	How artificial intelligence will change the future of marketing	540	Journal of the Academy of Marketing
Capelli, P.; Tambe P.; Yakubovich, V.	2019	Artificial intelligence in human resources management: challenges and a path forward	333	SSRN Electronic Journal

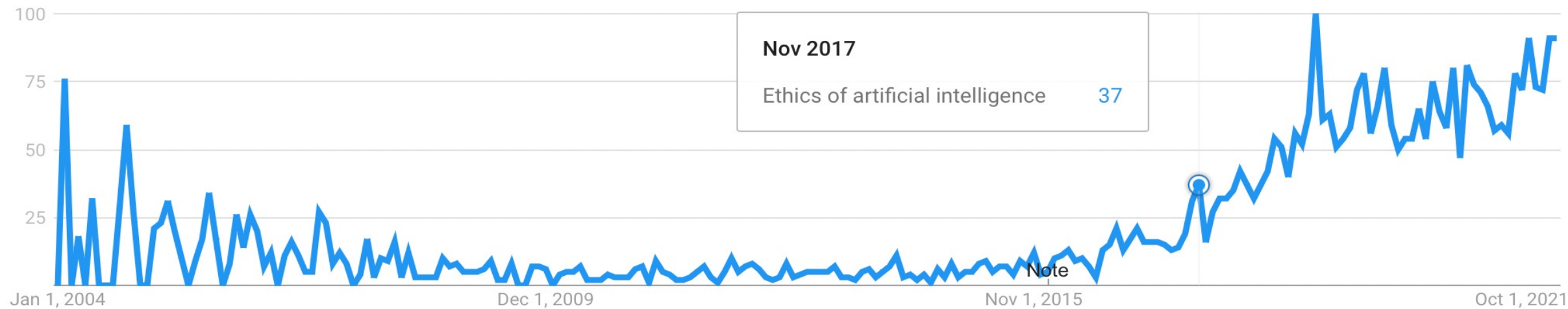
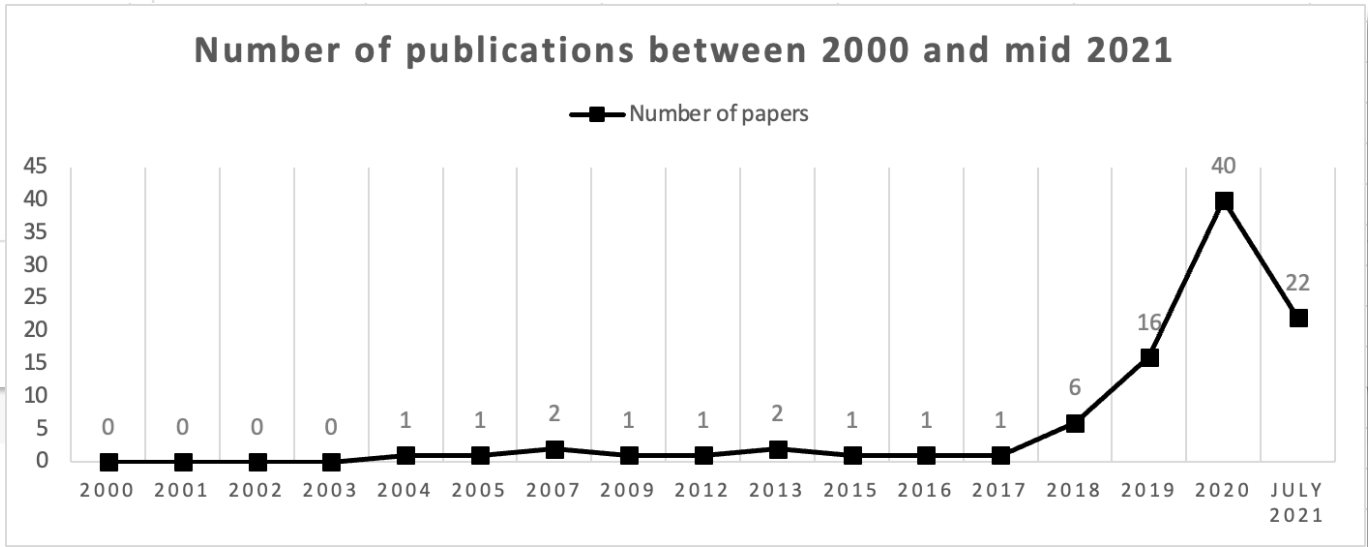
PUBLICATION OF SCIENTIFIC PAPERS IN TIME



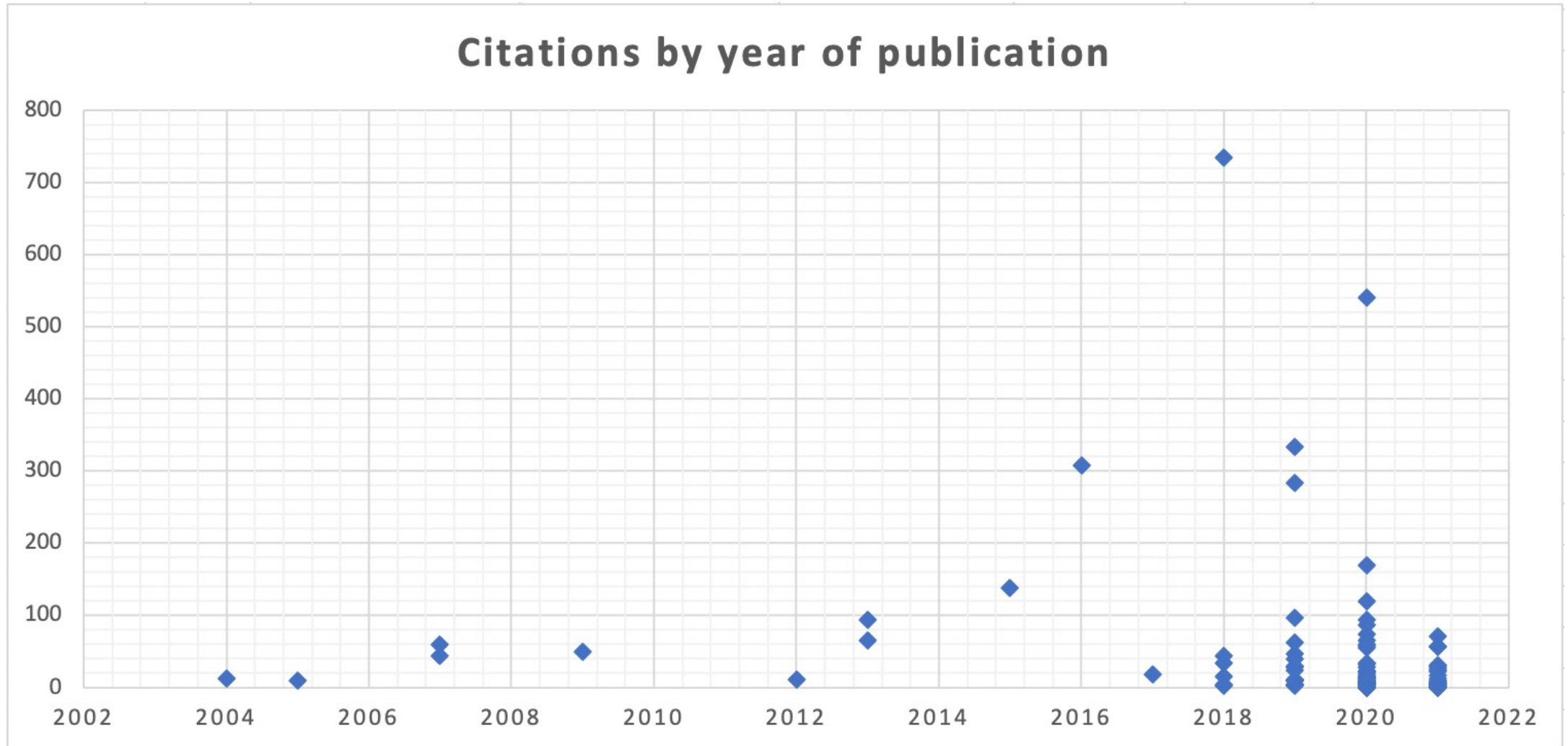
Ethics of artificial intelligence
Topic

Worldwide ▾ 2004 - present ▾ All categories ▾

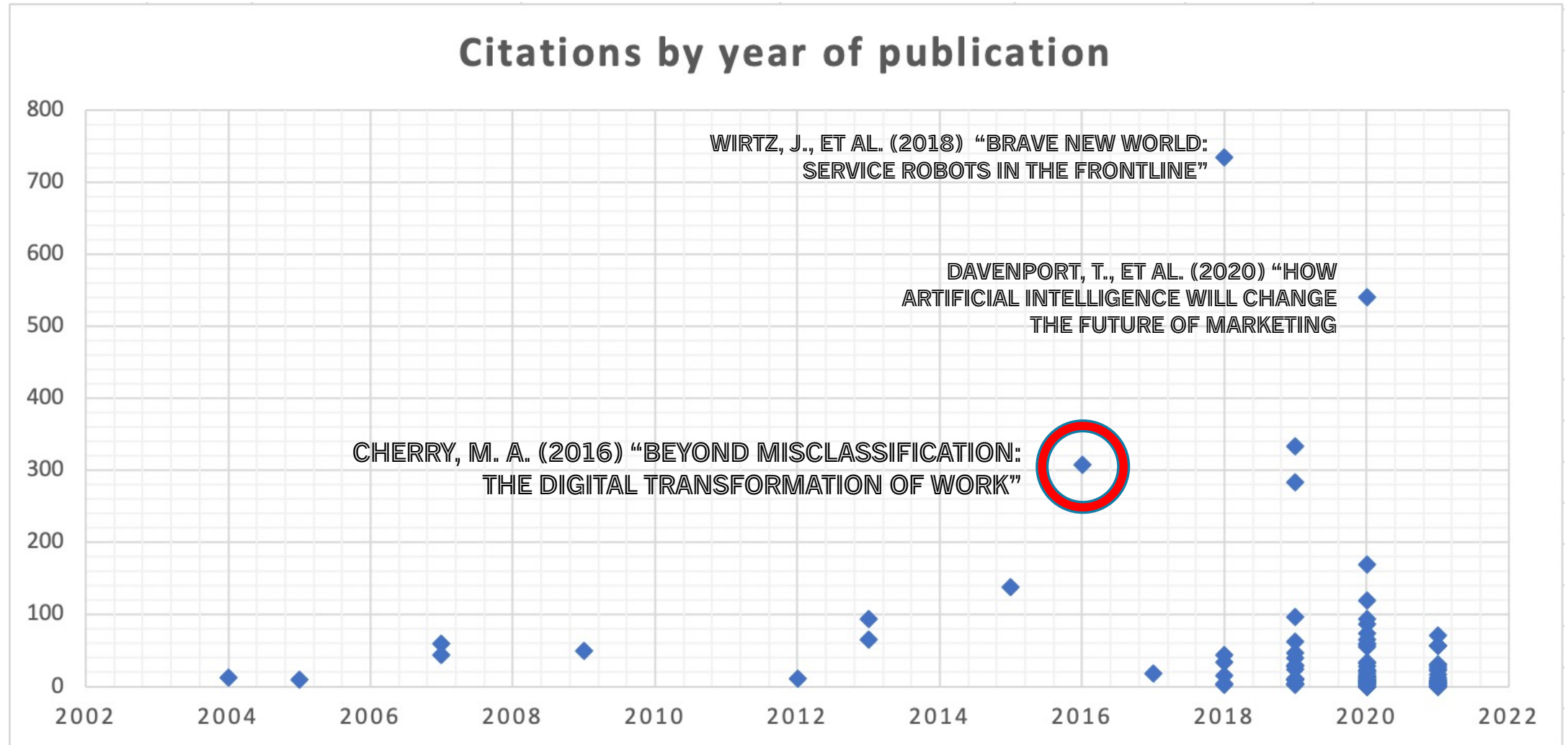
Interest over time



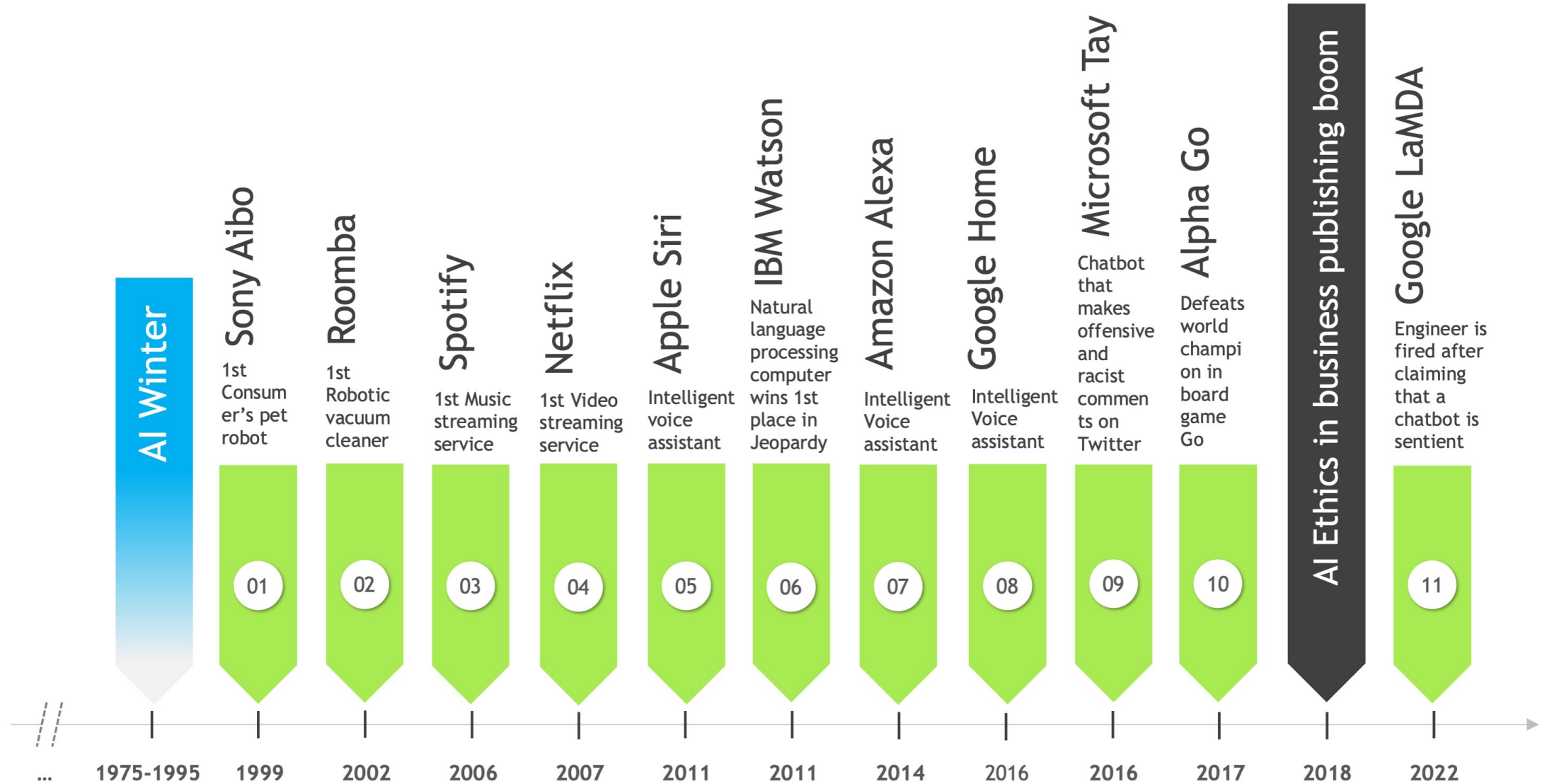
MOST INFLUENTIAL ARTICLES



MOST INFLUENTIAL ARTICLES



AI IN CONSUMER PRODUCTS & SERVICES





A CHANGE IN CONVERSATION

- ❑ We have been around AI tech for long before 2018
- ❑ First, articles had a **hypothetical approach**, and later papers **addressed specific issues**.
- ❑ AI-enabled products were **first perceived as an object**, but **after**, as it gained capacity and complexity, **as a subject** (anthropomorphism).
- ❑ An increase in interest in ethics may be due to our **concern of being overtaken or harmed** by this technology.

MOST INFLUENTIAL AUTHORS

Map

Davenport and Grewal from Babson College in the US are the most influential authors on the ethics of AI in business. Half of the ten most influential authors are marketing professors. We observe a dominance of authors affiliated with US and EU institutions, and China's absence is notable given its government's manifest interest in leading AI development.

Trend

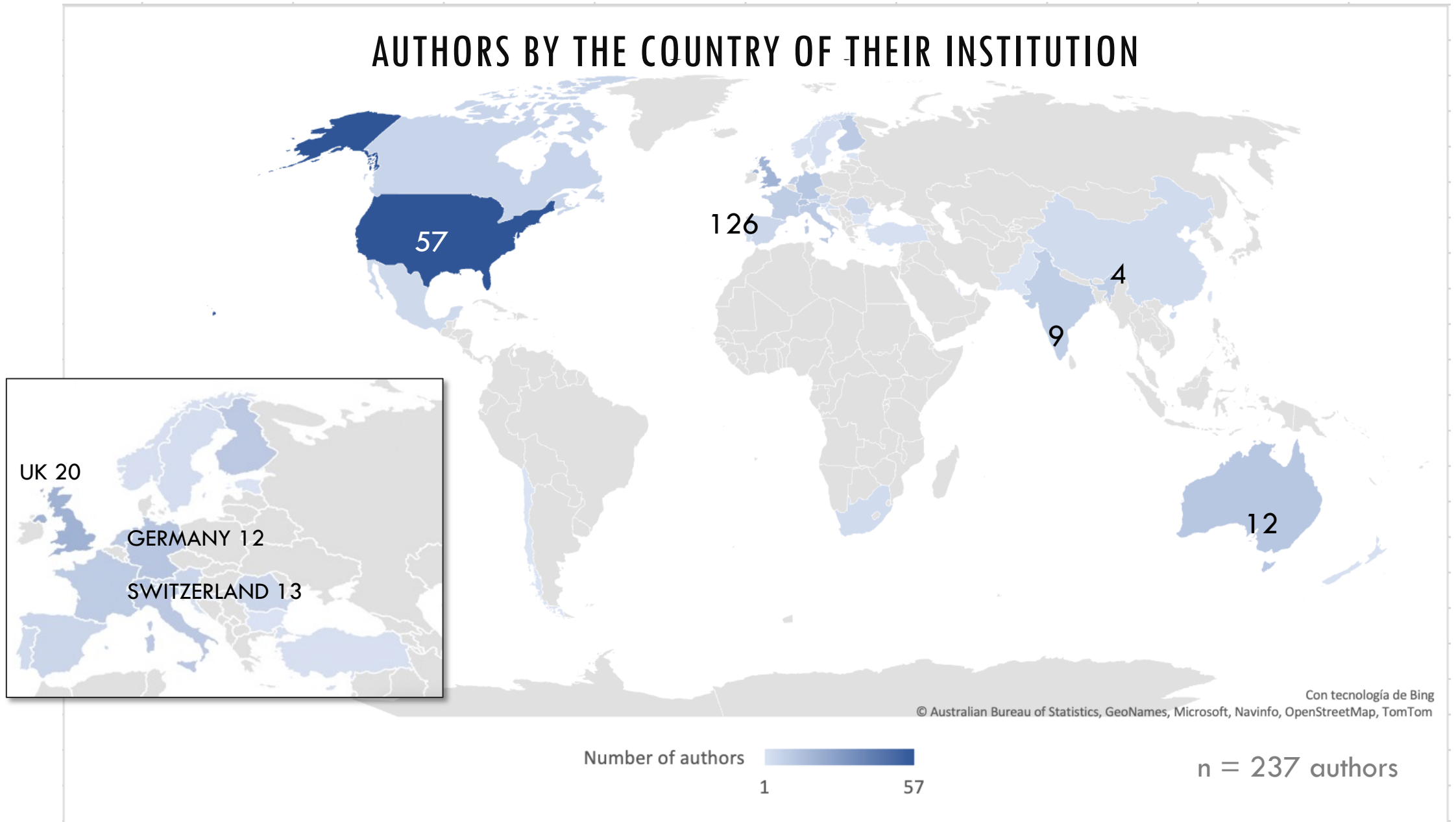
Most influential **authors had a solid research record even before the AI ethics** in business boom in 2018. Their research on AI ethics is an extension of their previous works.

Author(s)	Citations	University	Country
Davenport, T.	123746	Babson College	USA
Grewal, D.	75942	Babson College	USA
Haenlein, M	41737	ESCP Business School, Sorbonne Alliance	France
Ferrell, O.C.	40751	Auburn University	USA
Kaplan, A;	39393	ESCP Business School, Sorbonne Alliance	Germany

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Kaplan, A;	39393	ESCP Business School, Sorbonne Alliance	Germany
Wirtz, J.	37186	National University of Singapore	Singapore
Patterson, P. G.	26773	University of New South Wales	Australia
Jansen, B.	26226	Qatar Computing Research Institute, HBKU	Qatar
Chau, P.	24947	University of Nottingham Ningbo	China
Capelli, P.	22817	University of Pennsylvania	USA

AUTHORS BY THE COUNTRY OF THEIR INSTITUTION



ETHICAL THEORIES

DEONTOLOGY,
CONSEQUENTIALISM,
AND VIRTUE ETHICS



DEONTOLOGY AND THE ASSASSIN PROBLEM

- ❑ Deontology is an ethical theory that emphasizes the moral duty and obligation to follow certain rules or principles, regardless of the consequences.
- ❑ In the context of the situation where an assassin comes to your door looking for a man, a deontologist might argue that it is always wrong to lie, even if it could prevent harm to oneself or others.
- ❑ A deontologist might argue that the wife should tell the truth to the assassin, even if it means that her husband would be harmed or killed, because lying would violate the moral duty to tell the truth.



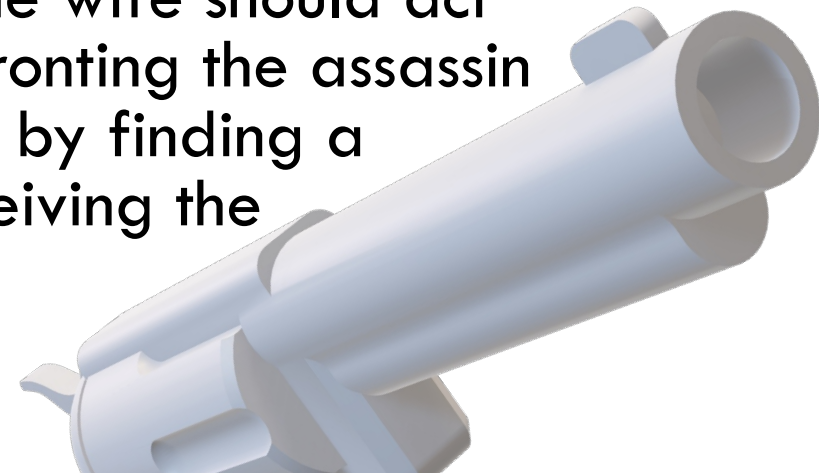
CONSEQUENTIALISM AND THE ASSASSIN PROBLEM

- ❑ Utilitarianism is an ethical theory that emphasizes the greatest good for the greatest number of people.
- ❑ In the context of the hypothetical situation, a utilitarian might argue that the morally right action is the one that produces the greatest overall happiness or well-being for everyone involved.
- ❑ For example, a utilitarian might argue that the wife should lie to the assassin and say that her husband is not at home if it would prevent harm to her husband and promote the greatest good for the greatest number of people.



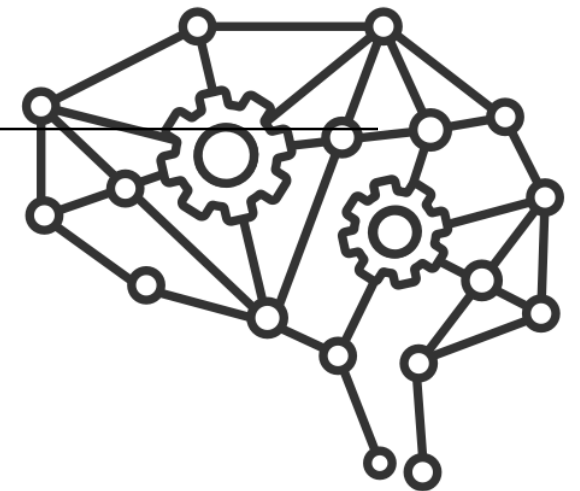
VIRTUE ETHICS AND THE ASSASSIN PROBLEM

- ❑ Virtue ethics is an ethical theory that emphasizes the development of moral character and virtues, such as courage, wisdom, and compassion.
- ❑ In the context of the hypothetical situation, a virtue ethicist might argue that the morally right action depends on the specific situation and the virtues that are most important in that context.
- ❑ For example, a virtue ethicist might argue that the wife should act with the virtues of courage and wisdom, by confronting the assassin and persuading him not to harm her husband, or by finding a way to protect her husband without lying or deceiving the assassin.



CRITERIA TO CLASSIFY ARTICLES

Question	School of thought
a) Are the solutions given to the ethical issues raised in the article derived from a rule-based approach?	Deontologist
a) Are there references to outcomes, utility, or the primacy of consequential methods for establishing ethical principles?	Consequentialist
a) Does the author suggest the approach of AI ethics from the standpoint of eudaimonia/flourishing? While tackling different ethical issues, are there references to virtues/moral virtues/virtuous machines/virtues of an AI developer.	Virtue Ethics



ETHICAL THEORIES IN LITERATURE

Ethical Theory	Articles
Deontological	4
Virtue Ethics	7
Consequentialist	8
Multiple (deontological, consequentialist and virtue ethics)	5
No ethical theory	72



Only 24% of the articles used an ethical theory perspective

Dataset n=95

DAZA, M. T., & ILOZUMBA, U. J. (2022). A SURVEY OF AI ETHICS IN BUSINESS LITERATURE: MAPS AND TRENDS BETWEEN 2000 AND 2021. *FRONTIERS IN PSYCHOLOGY*, 13.



MAJOR SCHOOLS OF ETHICAL THOUGHT

Map

Most authors (71) do not use an ethical theory to support their positions on the ethics of AI in business. However, among those who do use a school of thought, consequentialists (8) dominate, closely followed by virtue ethics (7) and deontology (4), and there are five that use a combination of them. The small number of articles with an ethical theory approach makes the connection between AI ethics and other, more comprehensive ethical domains more difficult.

Trend

Almost all articles using an ethical theory were published after 2019. The first articles placed the responsibility for the outputs of the technology exclusively on the user. After the adoption of consumer AI and the shift to understanding AI as a subject or agent, articles deal with AI, and the firms and developers are added as accountable instances.

MAIN ETHICAL ISSUES OF AI IN BUSINESS

Map

We group the most critical issues of AI in business into five categories: 1) Foundational issues are the dominant category; they cut across different domains and are usually combined with other topics. Next is 2) Employment and automation, perhaps where the harms and benefits caused by AI are most immediate. However, 3) Transparency, privacy, and trust, 4) Bias, preferences, and justice, and 5) Social media's effects on participation and democracy follow closely, where harms are probably perceived as less severe.

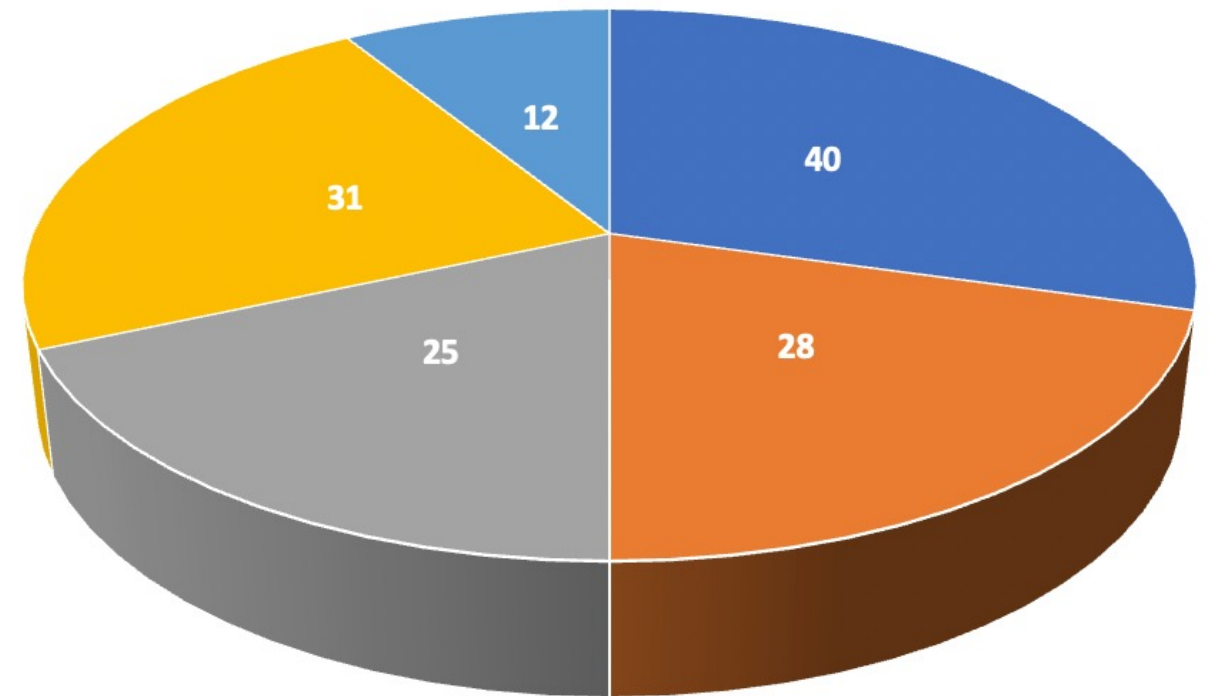
Trend

The work of Cherry (2016) marks a turning point between the hypothetical and the factual approaches in articles. And although the distribution of foundational issues papers covers the entire range of years, all works published before 2016 were within its domain. Subsequent works deal with issues such as privacy, bias, employment, and social media's effects on social participation.

MAIN ETHICAL ISSUES OF AI IN BUSINESS

A PROPOSAL FOR AN AI ETHICS TAXONOMY

	Issues	Total
1	Foundational issues of AI	40
2	Privacy, transparency, and trust	28
3	Bias, preferences, and justice	25
4	Employment and automation	31
5	Social media, public discourse and democracy	12



A PROPOSAL FOR AN AI ETHICS TAXONOMY

- Our proposed taxonomy for **ethical issues of AI in business** can be easily extended to **diverse fields**, including education, communication, and public policy.
- Moreover, it can be adapted to specific AI applications, such as **Generative AI, recommendation systems, and prediction models**, enabling a comprehensive analysis of ethical considerations across multiple contexts.





CONCLUSION

THE ETHICS OF AI IN BUSINESS

CONCLUSION

- ❑ This work presents an overview of the most influential journals, articles, and authors in literature. It allows us to understand the current state of publications on AI ethics in the field of business broadly and comprehensively.
- ❑ We propose a taxonomy for AI Ethics that can be applied in further research.
- ❑ We identified the most influential ethical theories in AI literature.
- ❑ However, the small number of articles that frame arguments from some of the main ethical schools of thought has made it challenging to connect the main issues with the main ethical theories.

CONCLUSION: FUTURE RESEARCH

- ❑ Further research is needed to verify if the results obtained in this current study apply to domains other than business, for example, political science or medicine.
- ❑ Further studies are needed to measure the impact of the political agenda on the productivity of scientific articles in Europe, the US, and China. Researchers could verify the hypothetical reasons we offer to explain the 2018 AI ethics in business publications boom.
- ❑ This work found that few articles explored AI ethics from a philosophical perspective; this represents an opportunity, particularly in production and finance, which are currently under-researched areas.
- ❑ The small number of articles using an ethical school in their arguments made it hard to establish connections between schools and specific issues. Future research is needed to close this gap.





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