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Please cite the original version: Santonen, T. & Kaivo-oja, J. 2024. Global Interest in Artificial Intelligence: A Big Data Study. In Iain Bitran; Steffen Conn ; Alex Mitsis ; Paavo Ritala ; Marko Torkkeli ; Meriam Trabelsi (Eds.) Proceedings of the XXXV ISPIM Innovation Conference.

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This paper was presented at the XXXV ISPIM Innovation Conference, held in Tallinn, Estonia on 09 June to 12 June 2024. ISBN 978-952-65069-6-8.

Global Interest in Artificial Intelligence: A Big Data Study

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Abstract: This study aims to assess and compare country-specific layman's interest in 17 AI technologies based on Google Trends big data. Government AI Readiness Index 2023 is utilized to evaluate the underlying factors influence on AI technology adoption. As a result, a total of 80 regions showed interest towards AI via Google searches. GDP had a weak correlation to Google trend results. The high-income regions were the most prominent regions (N=40), but the lower-middle-income regions (N=20) overcame the higher-middle-income region (N=16) whereas the low-income group consisted of only two countries. The list of top-ranking regions was somewhat surprising, since many lower-income regions such as Ethiopia, Pakistan, Sri Lanka and Nepal outperformed higher-income regions. Eleven out of 39 Government AI Readiness Index 2023 indicators had either weak or moderate correlation with Google Trends data.

Keywords: Artificial intelligence, big data, Google trends, digital geography, technology diffusion, innovation diffusion, global trend developments

1 Introduction

Where are the potential regional R&D hotspots for current Artificial Intelligence (AI) development in geographical and global spatial settings? The AI potential in the context of digital geography has aroused interest among scholars (Maalsen et al., 2023). Nowadays global digitalization trends are all connected to the technologies of artificial intelligence, AI (Bzhalava et al., 2021, Santonen & Kaivo-oja 2023), and, in all, AI technologies will have impacts on regional innovation systems and economies in many ways, directly and indirectly.

Today we know that key Industry 4.0 digital technologies in *the manufacturing industries* are Artificial Intelligence (AI), Augmented Reality, Cloud Computing, Internet of Things, Machine Learning, Virtual Reality, and 3D-printing. In *the education industry*, key Industry 4.0 digital technologies are Artificial Intelligence (AI), Augmented Reality, Blockchain, Internet of Things (IoT), Machine Learning, and Virtual Reality technologies. In *the healthcare industry*, key Industry 4.0 technologies are Artificial Intelligence (AI), Augmented Reality, Blockchain, Cloud Computing, the Internet of Things (IoT), Machine Learning, and Virtual Reality. In *the finance industry*, key Industry 4.0 technologies are Artificial Intelligence (AI), Blockchain, the Internet of Things, and Machine Learning (Bzhalava et al., 2021). A key conclusion of this big data study was that Artificial Intelligence is a driver technology in all four industrial clusters in disruption. These recent empirical findings are, of course, a very good reason to analyse global interest in artificial intelligence (AI)more deeply, in general.

Human behaviour and habits are changing in many ways, but at the moment, most people, even business leaders and CEOs, are not very familiar with the concept of AI. As an illustration, when 1,500 senior business leaders in the United States were asked about AI in 2017, only 17 per cent said they were familiar with it. Now, leaders are more aware of AI challenges (Davenport and Westerman, 2017, Davenport and Foutty, 2018, Loucks et al., 2018, McAfee et al. 2023, Feuerriegel et al., 2023). In general terms, general awareness about AI technologies is rising in the world (Santonen & Kaivo-oja, 2023).

The research problem of this study is related to the concrete question of which countries people, including laymen, are most interested in AI worldwide. This information is interesting not only from the perspective of developing AI technologies and apps but also from the point of view of innovation adoption and technology diffusion (see e.g. Rogers, 2010; Wejnert, 2002). If we want to develop knowledge management and better management of digital transformation, we must understand how people use and are interested in new technologies of Industry 4.0 like AI technologies (de Bem Machado et al., 2022).

2 Current understanding

AI allows businesses and multiple social groups to perform effectively in the digital age, influencing various innovations (Wamba et al., 2021). The current understanding of geographical interest in AI is quite limited. We know that global interest in AI has been growing, and we can talk about AI hype (Santonen & Kaivo-oja, 2023), but we do not know much about geographical interest in AI. There are various country comparison studies relating to AI, such as the following:

A bibliometric study by Obreja et al. (2024) revealed that countries that receive the highest number of references in the AI-I field are the United Kingdom, the United States, Germany, Australia, and China. Findings from a study by Vu and Lim (2022) suggested that macro factors, which constitute the broad techno-socioeconomic environment of a country, play a crucial role in the public's acceptance of AI/Robot. There are also cross-country studies comparing citizen trust and expectations of AI use (Gillespie et al., 2021), links between AI and employment (Georgieff and Hyee, 2021), legal status of AI (Atabekov and Yastrebov, 2018; Faúndez-Ugalde et al., 2020), managers' understanding of AI in relation to marketing financial services (Mogaji and Nguyen, 2022), public perception of AI (Kelley et al., 2021), AI impact on unemployment (Bordot, 2022), the

present state of AI management in terms of talent, infrastructure, business environment, development and research government policy, and commercial efforts (Ozkaya and Demirhan, 2023), sociological and economic determinants' impact on using AI (Waliszewski and Warchlewska, 2020), and the use of AI to estimate health indicators in public health studies (Haneef et al., 2020).

However, these prior studies have not addressed the diffusion of innovation aspect from the general population's point of view, which, in our opinion, is an important indicator of wider acceptance and interest in AI.

3 Research methodology

The main research problem in this study is to assess and compare country-specific interest and evolution in AI technologies through a big data study based on Google Trends data. AI has already had a profound impact on human lives and innovation ecosystems, and it will increasingly shape what we see, believe, and do. Therefore, it is also wise to analyze the geographical aspects of AI technology to gain a comprehensive understanding of the geographical setting of AI development.

3.1 Data source selection and ranking criteria

The data for this study were collected from Google Trends, which indicates how often a particular search term is entered relative to the total search volume across various regions of the world and in various languages. Scholars in various disciplines have utilized Google Trends to evaluate market and human interests and behavior (e.g., Ward and Barker, 2013; Jun et al., 2018; Choi and Varian, 2012; Preis et al., 2013). Google Trends can be considered a reliable indicator of general public behavior since it covers over 91 per cent of the search engine market (Fig. 1, Statcounter, 2024). The share of Bing is only 3.37%, and other competitors have much lower market shares (Statcounter, 2024). From this market share perspective, the Google trend data of our study is quite comprehensive compared to other search engines.

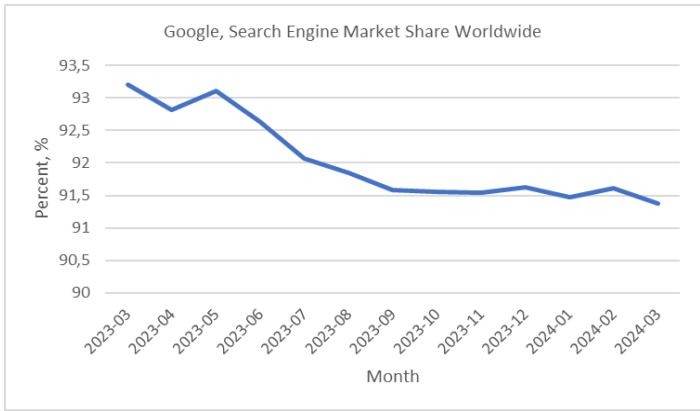

Figure 1. Search Engine Market Share of Google, Worldwide. (Source: Statcounter, 2024)

The Google Trends 'Interest by Region' ranking list results were utilized to identify the leading countries having the highest interest in different AI approaches. Google Trends normalizes search data and then scales the result on a range of 0 to 100. Each data point is divided by the total searches of the geography and time range to represent the relative popularity, controlling for absolute search volume differences (Google Support, 2021). A country having a value of 100 is the location having the highest fraction of total searches, while e.g., a value of 50 indicates a location, which is half as popular. Importantly, a higher value means a higher proportion of all queries, not a higher absolute query count. Therefore, also a small country can get a higher score than a large country if a large country has made many more queries.

3.2 Selection of Artificial Intelligence Technologies and countries

The AI phenomenon is large and has many technological sub-domains. The AI technologies ranked by Santonen and Kaivo-oja (2023) and presented in Table 1, were used as keywords for our study purposes to cover a multitude of AI phenomena.

Table 1: Keywords for Google Trend 'Interest by Region' Analysis.

Main Category	*Subcategory*
Artificial Intelligence	
Machine Learning	Supervised Learning
	Unsupervised Learning
	Reinforcement Learning
	Deep Learning
Natural Language Processing	Tokenization
	Entity Recognition
	Sentiment Analysis
	Machine Translation
	Speech Recognition
Computer Vision	Object Detection
	Facial Recognition
	Image Segmentation
	Pose Estimation

Google Trends identifies 250 regions, encompassing 193 UN countries and 57 self-governing territories or regions with similar status. Among those 250 regions, 80 (32 per cent) showed values higher than zero for at least one of the chosen.

3.3 Government AI Readiness Index 2023

Government AI Readiness Index 2023 consisting of 193 countries was utilized to evaluate the possible underlying factors influencing AI technologies related to Google

searches. The index includes 39 indicators across 10 dimensions, which are summarized into 3 pillars.

Government-pilar is constructed from 12 individual indicators which are classified into Vision, Governance and Ethics and Digital Capacity dimensions. *Technology Sector* is includes 15 individual indicators which are grouped into Maturity, Innovation Capacity and Human Capital dimensions. *Data & Infrastructure* has 12 individual indicators which are separated into Infrastructure, Data availability and Data Representativeness dimensions.

4 Results

4.1 Region ranking

Figure 1 presents the TOP 30 region ranking order comparison. Sum of Google Trend results variable (orange colour) summarises together all 17 AI technologies results for each region. Individual variables values in this case varied from 0 to 100. The ranking order mean (blue color) was calculated by determining a ranking position for each country based on the mean value of its ranking order across all 17 AI technologies. These values ranged between 1 to 74. Since some countries didn't have data for all technologies, they were assigned the last position ranking value, which depended on the number of regions with available data. Last position values ranged between 22 to 74.

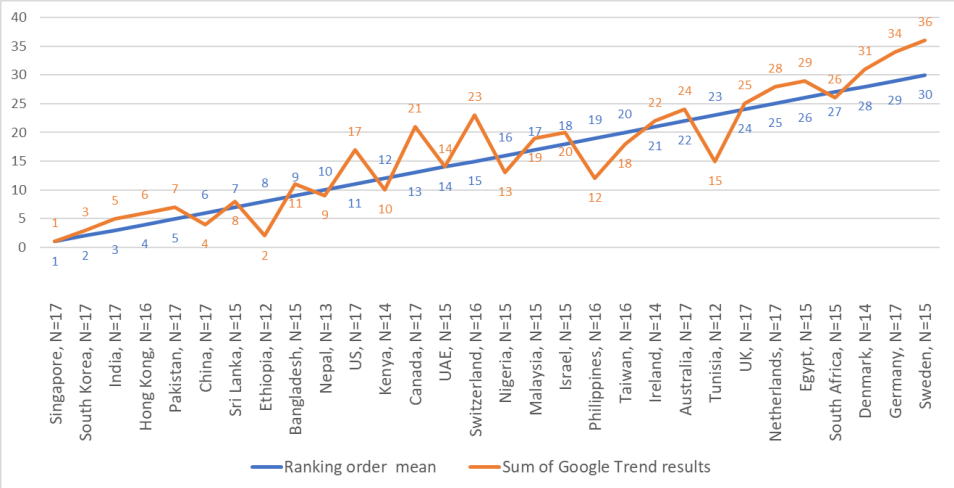

Figure 1: TOP 30 region ranking comparison based on the ranking order mean and the sum of Google Trends results for all 17 AI technologies between 1/1/2004 to 5/2/2024

The TOP 30 list of regions was somewhat surprising. Countries like Singapore, South Korea, China, and the United States could be expected, as they have appeared high in various AI indexes (e.g. Oxford AI index). However, countries like Nepal, Ethiopia, Nigeria, Kenya, Sri Lanka, Pakistan and Bangladesh could be considered as a surprise, since their ranking has been low in indexes. As a result, it appears that also the less

developed countries are experiencing a growing interest and awareness in AI-related topics.

4.2 Region x Income Group Classification

Table 2 presents "Region x Income group" classification results where region classification and income group information are based on World Bank data. Since data for Taiwan and St. Helena were not available in World Bank data, they were excluded from the table.

Table 2: Region x Income Group Classification

	Low income	*Lower middle income*	*Upper middle income*	*High income*	*Total (N)*	*% Of all**
East Asia & Pacific	0	3	4	6	13	35.1
Europe & Central Asia	0	1	5	25	31	53.4
Latin America & Caribbean	0	0	5	1	6	14.3
Middle East & North Africa	0	7	1	6	14	66.7
North America	0	0	0	2	2	66.7
South Asia	0	5	0	0	5	62.5
Sub-Saharan Africa	2	4	1	0	7	14.6
Total (N)	2	20	16	40	78	35.9
% of all*	7.7	37.0	29.6	48.8	35.9	

* Compared to a total number of World Bank "Region" and "Income group" regions (N=217), which includes also overseas territories and special administrative regions such as Hong Kong, Bermuda and Gibraltar.

Unsurprisingly the high-income regions were the most prominent regions having a total of 40 regions in the Google Trend data, which represent nearly half of all high-income regions (48.8 per cent). The lower-middle-income region (N=20, 37.0 per cent) overcomes the higher-middle-income region (N=16, 29.6 per cent) whereas the low-income group consist of (N=2, 7.7 per cent) only Ethiopia and Uganda.

Both "North America" (N=2, 66.7 per cent) and "Middle East & North Africa" (N=14, 66.7 per cent) regions covered two-thirds of all their regions. South Asia regions were closely following them with a 62.5 per cent share (N=5). Europe & Central Asia regions covered a bit over half of the regions (N=31, 53.4 per cent). For the rest of the regions a clear gap was identified. About one-third of the East Asia & Pacific (N=13, 35.1 per cent) regions were included in Google Trend data. The weakest regions were Sub-Saharan Africa (N=7, 14.6 per cent) and Latin America & Caribbean (N=6, 14.3 per cent), with less than 15 per cent share.

4.3 Correlation with GDP

Spearman correlation (Table 3) was conducted to determine the relationship between the mean value of the 'Google Trend ranking order average,' 'the sum of Google Trend results,' and 'the average annual GDP' calculated based on data from 2004 to 2022 across 78 regions. These regions were included in both the Google Trend and World Bank datasets. There was a weak positive correlation between the average GDP and the sum of Google Trend results (.290**). A moderate negative correction was detected between 'Google Trend ranking order average' and the average GDP (-.367**). As a result, it is argued that higher-income countries were more interested in AI technologies, but the impact on GDP is weak to moderate.

Table 3: '*Ranking order mean*' *and* '*the sum of Google Trends*' *correlation with GDP average (year 2004 to 2022)*

	Spearman's rho		Spearman's rho
Google Trend ranking order average	-.367**	The sum of Google Trend results	.290**

* Correlation is significant at the 0.05 level (2-tailed), ** Correlation is significant at the 0.01 level (2-tailed)

Table 4 presents 17 AI technology ranking order position correlations with 'the average annual GDP'. A total of 15 technologies correlated. 'Artificial intelligence' and 'Computer vision' were the only technologies which didn't have correlation. In the case of Sentiment Analysis, a weak correlation was detected (-.236*), while the remaining technologies all had moderate correlation ranking between Tokenization (-.302**) to Pose estimation (-.661**).

Table 4: *AI technologies correlation with GDP average (year 2004 to 2022)*

	Spearman's rho		Spearman's rho
Artificial intelligence		Computer vision	
Sentiment Analysis	-.236*	Natural Language Processing	-.379**
Tokenization	-.302**	Deep Learning	-.389**
Speech Recognition	-.314**	Reinforcement Learning	-.397**
machine learning	-.355**	Image Segmentation	-.464**
Supervised learning	-.363**	Facial Recognition	-.517**
Object Detection	-.363**	Entity Recognition	-.628**
Machine Translation	-.370**	Pose Estimation	-.661**
Unsupervised Learning	-.371**		

* Correlation is significant at the 0.05 level (2-tailed), ** Correlation is significant at the 0.01 level (2-tailed)

4.3 Correlation with Government AI Readiness Index 2023

Correlation results between 'Google Trend ranking order average position' and Government AI Readiness Index 2023 indicators, dimensions and pillars are presented in Table 5.

Table 5: *AI technologies 'Google Trend ranking order position' correlation with Government AI Readiness Index 2023 Government and Technology sector dimensions and indicators*

Pillar	*Dimension*	*Indicator*	Spearman's rho
Government	Vision	AI strategy	
	Governance & Ethics	Data protection and privacy laws	
		Cybersecurity	
		Regulatory quality	
		Ethical principles	-.231*
		Accountability	
	Digital Capacity	Online services	
		Foundational IT infrastructure	
		Government Promotion of Investment in Emerging Technologies	
	Adaptability	Government Effectiveness	
		Government responsiveness to change	-.256*
		Procurement Data	
Technology sector (-.266*)	Maturity (-.247*)	Number of AI Unicorns log transformation	
		Number of non-AI Unicorns log transformation	-.365**
		Value of trade in ICT services per capita log transformation	
		Value of trade in ICT goods per capita log transformation	
		Computer software spending	-.261*
	Innovation capacity (-.356**)	Time spent dealing with government regulations	
		VC availability	-.356**
		R&D Spending log transformation	-.264*
		Company investment in emerging technology	-.277*
		AI research papers log transformation	-.473**
	Human capital (-.238*)	Graduates in STEM or computer science	
		Github Activity log transformation	
		Female STEM Graduates	
		Quality of Engineering and Technology Higher Ed	-.369**

* Correlation is significant at the 0.05 level (2-tailed), ** Correlation is significant at the 0.01 level (2-tailed)

In 'Government pilar' - only 'Ethical principles' (-.231*), which belong to 'Governance & Ethics' dimension and 'Government responsiveness to change', which belong to

'Adaptability' (-.256*) were weakly correlating with 'Google Trend ranking order position' average value.

The 'Technology sector pillar' (-.266*) itself as well as all three dimensions including 'Maturity' (-.247*), 'Innovation capacity' (-.356**) and 'Human capital' (-.238*) were also correlating with 'Google Trend ranking order average position'. Moderate correlations were detected with following indicators: 'Number of non-AI Unicorns log transformation' (-.365**), 'VC availability' (-.356**), 'AI research papers log transformation' (-.473**) and Quality of Engineering and Technology Higher Ed (-.369**). 'Computer software spending' (-.261*) and 'Company investment in emerging technology' (-.277*) correlated weakly.

'Data & Infrastructure' pillar results in Table 6 were similar to 'Government' since only the following two weak correlations were detected: 'Supercomputers log transformation' (-.238*) and 'Data governance' (-:237*).

Table 6: *AI technologies correlation with Government AI Readiness Index 2023 Data & and Infrastructure sector dimensions and indicators*

Pillar	*Dimension*	*Indicator*	Spearman's rho
Data & Infrastructure	Infrastructure	Telecommunications Infrastructure	
		Supercomputers log transformation	-.238*
		Broadband Quality	
		5G Infrastructure	
		Adoption of Emerging Technologies	
	Data availability	Open Data	
		Data governance	-.237*
		Mobile-cellular telephone subscriptions	
		Households with internet access	
		Statistical Capacity	
	Data representativeness	Cost of cheapest internet-enabled device PROS of monthly GDP per capita	
		Gender gap in internet access	

* Correlation is significant at the 0.05 level (2-tailed), ** Correlation is significant at the 0.01 level (2-tailed)

5 Conclusions

Google Trends analysis results on artificial intelligence (AI) technologies provide real-time, user-generated data that can enrich and refine existing innovation management theories in the field. The big data study helps researchers stay updated on the evolution of AI and identify new trends, historical turning points, and surprising findings that may have not been captured by traditional theories. Results also show regional variations in AI adoption and encouraged us to seek other macroeconomic factors besides GDP influencing the general public behaviour in future studies.

In conclusion, the positive impact of various factors on the public adoption of AI is evident. Responsive governments with strong national ethical principles play a role in shaping the direction of AI integration while stimulating people's interest in seeking information on AI. Data is a cornerstone of AI development. Therefore, governments must be responsive by implementing policies that foster innovation and AI adaptation via robust data governance frameworks and supercomputer resources. However, the most important stimulant was the mature technology sector with high innovation capability. The presence of non-AI Unicorns, indicative of successful tech ecosystems, contributes to the momentum of AI adoption and is further supported by increased computer software and R&D spending and the availability of venture capital. The number of AI research papers indicates the growing interest to AI technologies, as well as the quality of engineering and technology education. Collectively, these factors illustrate a multi-dimensional landscape of influences driving the widespread adoption of AI among people.

These results provide benchmarks for understanding AI technologies' relative importance from peoples point of view and reveal that also less developed countries are highly interested in AI. The study's outcomes contribute valuable insights into the global landscape of AI transformation, offering a nuanced perspective on the popularity and interest in different AI technologies across countries.

This information can be beneficial for strategic planning, policy formulation, and further research in the field of AI. This study is a contribution to the field of geography of digitization and artificial intelligence technology development. This big data research paper offers also a human-centered perspective on the technological development of artificial intelligence in the world.

6 References

Atabekov, A. and O. Yastrebov, O. (2018) Legal status of artificial intelligence across countries: Legislation on the move. European Research Studies Journal, 2018, vol. XXI, issue 4, 773 – 782. https://doi:10.35808/ersj/1245

Bordot, F. (2022) Artificial intelligence, robots and unemployment: Evidence from OECD countries. Journal of Innovation Economics & Management, 37(1), 117-138. http://doi.org.10.3917/jie.037.0117

Bzhalava, L., Hassan, S.S., Kaivo-oja, J., Köping Olsson, B. and Imran, J. (2021) Mapping the wave of industry digitalization by co-word analysis: An exploration of four disruptive industries. International Journal of Innovation and Technology Management, Vol. 19, No. 2, 2250001-22500022 (22 pages) https://doi:10.1142/S0219877022500018

Choi, H. and Varian, H. (2012) Predicting the present with Google Trends. Economic Record. Volume 88, Issue SUPPL.1, June 2012, 2-9. https://doi.org/10.1111/j.1475-4932.2012.00809.x

Davenport, T.H. and Westerman, G. (2017) How HR leaders are preparing for the AI-enabled workforce. MIT Sloan Management Review, 12-15.

Devenport, T.H. and Foutty, J. (2018) AI-Driven leadership. MIT Sloan Management Review. https://sloanreview.mit.edu/article/ai-driven-leadership/

Feuerriegel, S., Hartmann, J., Janiesch, C. and Zschech, P. (2023) Generative AI. Business & Information Systems Engineering. 1-16. https://doi.org/10.1007/s12599-023-00834-7 .

de Bem Machado, A., Secinaro, S., Calandra, D. and Lanzalonga, F. (2022) Knowledge management and digital transformation for Industry 4.0: a structured literature review, Knowledge Management Research & Practice, Vol. 20, No. 2, 320–338. https://doi.org/10.1080/14778238.2021.2015261

Faúndez-Ugalde, A., Mellado-Silva, R. and Aldunate-Lizana, E. (2020) Use of artificial intelligence by tax administrations: An analysis regarding taxpayers' rights in Latin American countries. Computer Law & Security Review, Vol. 38 Article 105441. https://doi.org/10.1016/j.clsr.2020.105441

Gillespie, N., Lockey, S., and Curtis, C. (2021) Trust in artificial intelligence: A five country study. The University of Queensland and KPMG Australia. https://doi.org/10.14264/e34bfa3 .

Georgieff A. and Hyee R. (2022) Artificial intelligence and employment: New cross-country evidence. Frontiers in Artificial Intelligence, May 2022, 10(5): Article 832736. http://doi.10.3389/frai.2022.832736 . PMID: 35620279; PMCID: PMC9127971.

Google Support, 2021 https://support.google.com/trends/answer/4355212

Haneef, R., Delnord, M., Vernay, M., Bauchet, E., Gaidelyte, R., Van Oyen, H., Or, Z., Pérez-Gómez, B., Palmieri, L., Achterberg, P. Tijhuis, M., Zaletel, M., Mathis-Edenhofer, S., Májek, O., Haaheim, H., Tolonen, H., and Gallay, A. (2020) Innovative use of data sources: a cross-sectional study of data linkage and artificial intelligence practices across European countries, Archives of Public Health, 78(1), 55 http://doi.org.10.1186/s13690-020-00436-9

Jun, S-P., Yoo, H.S. and Choi, S. (2018) Ten years of research change using Google Trends: From the perspective of big data utilizations and applications Technological Forecasting and Social Change, Vol. 130, 69-87. https://doi.org/10.1016/j.techfore.2017.11.009

Kelley, P.G., Yang, Y., Heldreth, C. Moessner, C. Sedley, A-. Kram A., Newman, D.T. and Woodruff, A. (2021). Exciting, Useful, Worrying, Futuristic: Public Perception of Artificial Intelligence in 8 Countries. Poster Session. AIES '21, May 19–21, 2021, Virtual Event, USA. https://dl.acm.org/doi/pdf/10.1145/3461702.3462605

Loucks, J., Davenport, T. and Schatsky, D. (2018) State of AI in the Enterprise. 2nd Edition: Early Adopters Combine Bullish Enthusiasm with Strategic Investments. New York: Deloitte Insights, 2018, https://www.dxlatest.com/state-of-ai-in-enterprise-deloitte-report/

McAfee, A., Rock, D. and Brynjolfsson, E. (2023) How to capitalize on generative AI, Harvard Business Review, Spotlight Series, What's Your Gen AI Strategy? https://hbr.org/2023/11/how-to-capitalize-on-generative-ai

Mogaji, E. and Nguyen, N.P. (2022) Managers' understanding of artificial intelligence in relation to marketing financial services: insights from a cross-country study, International Journal of Bank Marketing, Vol. 40 No. 6, 1272-1298. https://doi.org/10.1108/IJBM-09-2021-0440

Obreja, D.M., Rughiniș, R. and Rosner, D. (2024) Mapping the conceptual structure of innovation in artificial intelligence research: A bibliometric analysis and systematic literature review. Journal of Innovation & Knowledge. Volume 9, Issue 1, January–March 2024, Article 100465. https://doi.org/10.1016/j.jik.2024.100465

Ozkaya, G. and Demirhan, A. (2023) Analysis of countries in terms of artificial intelligence technologies: PROMETHEE and GAIA method approach. Sustainability, 15(5), Article 4604, https://doi.org.10.3390/su15054604

Preis, T., Moat, H. and Stanley, H. (2013) Quantifying trading behavior in financial markets using Google Trends. Scientific Reports, 3, Article 1684. https://doi.org/10.1038/srep01684

Rogers, E.M. (2010) Diffusion of Innovations. 4th Edition, Simon and Schuster, New York.

Santonen, T. and Kaivo-oja, J. (2023) Understanding Global AI Hype Phenomena with Big Data Analytics. Understanding Global AI Hype Phenomena with Big Data Analytics. ISPIM Connects Salzburg – The Sound of Innovation, on 11-13 December 2023. Event Proceedings. Lappeenranta University of Technology. https://www.theseus.fi/bitstream/handle/10024/818157/Santonen_Kaivo-Oja.pdf?sequence=1&isAllowed=y

Statcounter (2024) Search Engine Market Share Worldwide. Mar 2023 - Mar 2024. https://gs.statcounter.com/search-engine-market-share

Vu, H.T. and Lim, J., (2022) Effects of country and individual factors on public acceptance of artificial intelligence and robotics technologies: a multilevel SEM analysis of 28-country survey data. Behaviour & Information Technology, 41(7), 1515-1528. https://doi.org/10.1080/0144929X.2021.1884288

Waliszewski, K. and Warchlewska, A. (2020) Attitudes towards artificial intelligence in the area of personal financial planning: a case study of selected countries. Entrepreneurship and Sustainability Issues; Vilnius Vol. 8, Issue 2, (Dec 2020), 399-420. https://doi.org/10.9770/jesi.2020.8.2(24)

Wamba, SF., Bawack, R.E., Guthrie, C., Queiroz, M.M. and Carillo, K.D.A. (2021) Are we preparing for a good AI society? A bibliometric review and research agenda. Technological Forecasting and Social Change, 164 (2021), Article 120482, https://doi.org/10.1016/j.techfore.2020.120482

Ward, J.S. and Barker, A. (2013) Undefined by data: A Survey of big data definitions. ArXiv, abs/1309.5821, https://arxiv.org/pdf/1309.5821 https://api.semanticscholar.org/CorpusID:14311093

Weinert, B. (2002) Integrating models of diffusion of innovations: A conceptual framework, Annual Review of Sociology 28(1), 297-326 https://doi.10.1146/annurev.soc.28.110601.141051