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Thought-Provoking Five Trends in Artificial Intelligence (AI) and Data Science: Negative Impacts of Vendor Hype

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ABSTRACT

Artificial Intelligence (AI) and data science are two closely related fields that have a significant impact on various industries. Data science provides the necessary data and insights that AI systems rely on. The five major trends are (1) the rise of agentic AI, (2) measuring the contribution of generative AI to productivity, (3) establishing a data-driven culture can not rely on technology alone, (4) the reappearance of the importance of unstructured data, (5) and the last one, the leadership of data and AI. However, some of them at the moment may just be vendor hype. Especially, the impacts of AI and Data Science on technological forecasting, social change, AI law, economy and popular psychology are surely profound and multifaceted. From their negative impacts due to vendor hype, AI is not omnipotent and is an exaggeration of its ability. Additionally, it is not good for the social and economic developments.

Keywords: Artificial Intelligence (AI) and Data Science; Agentic AI and Generative AI; Data-Driven Culture; Unstructured Data; Vendor Hype.

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1. INTRODUCTION

Artificial Intelligence (AI) is a branch of computer science (Collins et al., 2021) that aims to create systems capable of performing tasks that would typically require human intelligence. These tasks include learning from experience, understanding natural language, recognizing patterns, solving problems, and making decisions. AI systems can learn from data, improving their performance over time without being explicitly programmed. They can use logic and rules to make decisions and solve complex problems. AI can process and interpret sensory information, such as images, sounds, and text. AI can understand, generate, and translate human language. AI systems can adapt to new inputs and environments, making them versatile and useful in a wide range of applications. AI is transforming many industries, including healthcare, finance, transportation, and more, by automating processes, providing insights, and enhancing human capabilities. Data science (Castro et al., 2022; Căpușneanu, et al., 2025; Khan et al., 2025) is a multidisciplinary field that involves extracting insights and knowledge from data using various scientific methods, algorithms, and systems. Data can be collected from various sources such as databases. Data can be structured (e.g., tables) and unstructured (e.g., text, images).

Algorithms like linear regression, logistic regression, decision trees, and neural networks are used to predict outcomes based on labeled data. Labeled data refers to datasets where each sample is tagged with one or more labels. These labels provide information about the characteristics or categories of the data. Techniques like clustering and dimensionality reduction are used to find patterns in unlabeled data (Bekker and Davis, 2020; Sarker, 2021; Lin, 2022; Joergensen and Zaggi, 2024; Safitra et al., 2024). For the reinforcement learning, it involves training models to make decisions based on rewards and punishments (Naeem et al., 2020). A recent article called Five Trends in AI and Data Science (Costa and Aparicio, 2023; Safitra et al., 2024; Ramcharitar, 2025) for 2025 published by two experts (Dr. Thomas H. Davenport and Dr. Randy Beans). This study will reorganize the perspectives of the two experts and combine them with ours. At present, some leaders are clutching the vigorous developments of AI and hyping them. However, hype is negative for the promise of AI. Moreover, it is not also good for the social and economic developments because hype is an individuals' psychological factor and it will affect individual mind and behavior, which will influence social and economic condition. Therefore, the time has come to measure results from some AI experiments. For example, reality about data-driven culture sets in. Unstructured data is important again. Who should develop AI and data science? Expect continued struggle. By saying, no one seems to make some predictions about the future of AI and data science, and they won't do it. Indeed, so far, in terms of macroeconomic and integrated technology forecasts, they are still more inclined to believe the results summarized by human experts from experience, empirical research and field observations. This is the case in this study to analyzes the five major trends in AI and data science in 2025 from the perspectives of the two experts and combine them with ours.

AI and data science (**Figure.1**) are two closely related fields that have a significant impact on various industries. Data science provides the necessary data and insights that AI systems rely on. Data scientists collect, clean, and analyze data to uncover patterns and trends that can be used to train AI models. AI techniques, such as machine learning and deep learning, are used in data science to automate the process of data analysis and interpretation. AI algorithms can handle large and complex datasets more efficiently than traditional methods. AI algorithms are used to build predictive models that can forecast future outcomes based on historical data. This is useful in various fields, such as finance for predicting market trends and healthcare for predicting disease outbreaks. AI can automate tasks such as data cleaning, inputting, and management, allowing data scientists to focus more on analysis. Natural Language Processing (NLP) a subset of AI (Khurana et al., 2023), helps in extracting information from unstructured text data. This is useful for tasks like sentiment analysis and information extraction from documents. AI-powered computer vision enables the analysis and interpretation of visual data, such as images and videos. This has applications in fields like autonomous driving and facial recognition. Increasing Integration: As data becomes more abundant and diverse, the integration of AI and data science will continue to grow. This will lead to more advanced analytics and insights. With the increasing use of AI in data science, there are growing concerns about data privacy, bias, and ethical implications. Ensuring responsible AI development is crucial. But what is interesting is that they are not limited to the development of AI and data applications, but also reveal their observations between the lines. The five major trends are (1) the rise of Agentic AI (Acharya et al., 2025; Kshetri, 2025; Zou and Topol, 2025), (2) measuring the contribution of generative AI to productivity (Sengar et al., 2025), (3) establishing a data-driven culture can not rely on technology alone (Cristofaro et al., 2025; Hashim et al., 2025; Ozawa et al., 2025), (4) the reappearance of the importance of unstructured data (Haan et al., 2024), (5) and the last one, the leadership of data and AI (Bevilacqua, et al., 2025).

2. FIVE TRENDS IN AI AND DATA SCIENCE

(1) Agentic AI **(Figure.2)** is a form of AI that can make decisions, take autonomous actions, and continually learn from interactions. It operates through autonomous AI agents designed to perform tasks by interpreting context, making decisions, and executing actions aligned with preset objectives. This type of AI bridges the gap between static programming and dynamic adaptability, enabling the automation of complex workflows at scale. Agentic AI leverages machine learning algorithms to learn from data and improve performance over time. It uses supervised, unsupervised, and reinforcement learning to identify patterns and make predictions. NLP enables agentic AI to understand, interpret, and generate human language. This allows for seamless communication between humans and AI systems. Large Language Models (LLMs) (Shahzad, et al., 2025): These models provide a robust foundation for understanding context and generating human-like responses. They are trained on vast amounts of text data and can be fine-tuned for specific tasks. Agentic AI interprets information based on the surrounding context, using attention mechanisms and memory networks to focus on relevant data and retain information over time. These frameworks combine insights from machine learning, NLP, and contextual understanding to make autonomous choices. They use rule-based systems (Artiemjew, et al., 2020) and probabilistic models to assess outcomes and make informed decisions. Agentic AI automates complex workflows, reducing the need for human intervention and allowing for quick responses to changing conditions. Agentic AI continuously learns from new data and adapts to evolving environments, improving decision-making processes over time. By automating repetitive tasks and providing data-driven insights, agentic AI frees up employees to focus on higher-value activities. Agentic AI is used for risk management, fraud detection, and optimizing investment strategies. It assists with patient care, diagnostics, and automating administrative workflows. Agentic AI powers advanced chatbots and virtual assistants capable of handling complex interactions. It detects cybersecurity threats and implements countermeasures autonomously. Agentic AI is evolving from task-specific agents to multi-domain systems capable of managing interconnected workflows. Future developments will focus on improving contextual understanding, ethical reasoning, (Johnson, et al., 2022) and collaborative capabilities.

(2) Generative AI **(Figure.2)** is a subset of AI that uses generative models to produce text, images, videos, or other forms of content. It has seen significant development in recent years, with various models and applications emerging. Generative AI models use neural networks to identify patterns and structures within existing data to generate new and original content. They can leverage different learning approaches, including unsupervised or semi-supervised learning, allowing them to work with large amounts of unlabeled data. These models use an encoder to map input to a latent space and a decoder to map latent vectors back to the input space, generating outputs that resemble the input. These consist of a generator and a discriminator. The generator creates fake data to fool the discriminator, while the discriminator tries to distinguish between real and fake data. Through training, the generator improves its ability to produce realistic data. These models, known for their self-attention mechanisms, have revolutionized natural language generation. They are used in LLMs to generate human-like text. Generative AI has a wide range of applications across different fields. Used in chatbots, content creation, and natural language processing. For example, ChatGPT uses text generation to provide human-like responses in conversations. Used in entertainment, sports analysis, and virtual assistants. Traditional cloud computing frameworks can lead to high latency due to data transmission and high volumes of user requests. Edge-cloud computing is being explored as a solution to provide adequate computation power and low latency. Successful generative AI models need to produce high-quality, diverse outputs quickly to be effective in real-time applications. As generative AI becomes more powerful, there are increasing concerns about its ethical use, including the potential for generating misleading content or violating intellectual property rights. Generative AI

is a rapidly evolving field with significant potential to transform various industries and creative processes.

(3) A data-driven culture **(Figure.3)** is a workplace environment where decisions are consistently made based on data analysis and interpretation. It treats data as a primary resource for leveraging insights across departments. Data is made readily available to all staff, not just a select few, to help them schedule day-to-day tasks more efficiently. This fosters a sense of ownership and understanding of the "big picture" among employees. Decisions are based on factual evidence rather than assumptions or gut feelings. This ensures that initiatives are more impactful and competitive advantages are amplified. There is a focus on critical thinking, data interpretation skills, and improved communication of findings. Organizations with a data-driven culture are constantly looking for ways to improve their data use and analysis. Different teams within the organization work together to extract insights from data and apply them to their respective fields. This promotes a holistic approach to problem-solving and innovation. Data-driven cultures enable organizations to make precise and timely decisions based on factual evidence. This leads to better outcomes and increased efficiency. By streamlining processes, reducing inefficiencies, and optimizing resource allocation, organizations can improve their productivity. Automation of mundane tasks also minimizes errors and improves coordination between departments. Data-driven organizations can uncover revenue opportunities and enhance the effectiveness of their marketing efforts. They can also develop and launch new products based on company data, which can lead to increased profitability. Personalized customer experiences can be achieved through data analysis, resulting in higher satisfaction rates. A transparent and logical decision-making process can lead to increased collaboration, innovation, and employee buy-in. This, in turn, can attract and retain top talent. Shifting to a data-driven culture may face resistance from employees who are accustomed to traditional decision-making methods. It requires a significant change in mindset and behavior. Ensuring high-quality data and proper governance over its usage is crucial. Poor data quality can lead to incorrect insights and decisions. Organizations may need to invest in training and hiring to ensure that employees have the necessary data literacy skills. This includes skills in data analysis, interpretation, and communication. Leaders must actively support and model data-driven behaviors. They should clearly articulate the importance of data and AI initiatives and ensure that everyone in the organization considers data a part of their job. Organizations need to define clear goals and key performance indicators (Nunes, et al., 2024) for their data initiatives. This helps in measuring success and ensuring that data is collected and analyzed effectively. Investment in Technology and Training: Investing in the right tools for data collection, analysis, and visualization is essential. Additionally, providing training and development opportunities for employees can help build a data-literate workforce. Recognizing and celebrating achievements in data-driven initiatives can motivate employees and build momentum for further innovation.

(4) Unstructured data **(Figure.4)** is information that does not have a predefined format or structure. It can be either human-generated or machine-generated and includes a wide variety of data types such as, emails, text documents, social media posts, call transcripts, and message text files, image files, audio files, video files, and other rich media. Unlike structured data (Guha et al., 2016; Dekhtiar et al., 2018) which fits neatly into rows and columns, unstructured data does not conform to a specific schema. Unstructured data accounts for the majority of data generated by organizations, often comprising 80% to 90% of enterprise data (Haan et al., 2024). This high volume and variety make it difficult to manage and analyze using traditional tools. Due to its diverse and non-uniform nature, specialized skills and tools are required to parse and analyze unstructured data. Data lakes are highly scalable and cost-effective, making them suitable for storing large volumes of unstructured data. Object storage systems are well-suited for storing unstructured data due to their ability to handle large volumes of data and their scalability. Unstructured data is used in various applications, such as, analyzing social media

posts, emails, and other textual data to understand customer preferences and sentiments. Using machine learning algorithms to process unstructured data and make predictions or recommendations. Unstructured data can be stored in its native format and used for multiple purposes. The lack of predefined structure allows for quick and easy collection of large volumes of data. Solutions like data lakes and object storage offer scalable and cost-effective storage options. The large volume and non-uniform structure of unstructured data can lead to inconsistencies and inaccuracies, requiring data cleaning before analysis. Managing and analyzing unstructured data often requires specialized skills and tools. Unstructured data is a valuable but complex resource that requires specialized tools and techniques to manage and analyze effectively.

(5) The leadership of data and AI is a multifaceted and increasingly important area for modern organizations. Data and AI are becoming central to business strategy. Leaders need to leverage these technologies to gain a competitive edge. With the rise of AI, ethical issues such as data privacy and bias in algorithms are critical. Leaders must navigate these challenges to build trust. Organizations need to foster a data-driven culture where decisions are based on insights derived from data. This role has evolved from a focus on compliance to driving business outcomes. The Collateralized Debt Obligations (CDOs) **(Figure.5)** (Hu and Park, 2019; Beavrstock et al., 2023) are now responsible for integrating data and AI into core business processes. Some organizations are creating this new role to specifically manage AI initiatives. However, the effectiveness of this role varies, and its necessity is still being debated. Attracting and retaining top AI talent is crucial. Leading companies invest in hiring experts with both technical skills and business acumen. Establishing robust data governance frameworks is essential. This includes ensuring data quality, and security. Leaders must focus on scaling AI use cases across the organization. This involves creating data ecosystems and partnerships to generate new value. Leaders should empower business units to innovate using data and AI. This includes running structured ideation sessions and prioritizing initiatives. Corporate boards and other stakeholders need to be educated on the opportunities and risks associated with AI. Regular updates and training can help build a common understanding. Data and AI initiatives should be aligned with business objectives. This means focusing on use cases that drive significant financial impact and operational efficiency. The rapid evolution of AI means leaders must be adaptable and continuously learn. Organizations need to be prepared for an AI-driven future. Ensuring AI is used responsibly and ethically will be a key differentiator. Leaders must establish guidelines and guardrails to prevent misuse. The leadership of data and AI is crucial for organizations aiming to thrive in the digital economy. It requires a strategic approach, a focus on talent, and a commitment to ethical practices.

3. DISCUSSION

Interestingly, the article lists five major trends, and they do not point out a clear standard answer. On the contrary, it can be seen from their narratives that since AI technology and applications are still developing, most companies are also in the trial and exploration stage when facing new fields. They use the term Agentic AI in the article, and some people think it is somewhat different from AI Agent. But on the one hand, both terms are in the early stages of development, and there may be some differences in autonomy and scope of application, but their attributes and core functions are the same. Indeed, agentic AI is a hot trend in AI applications in 2025. However, some of them at the moment may just be vendor hype. Vendor hype refers to exaggerated marketing, buzzwords (like AI-powered), and promises made by technology or service providers to generate excitement, often overstating capabilities and benefits, making it hard for buyers to discern real value from clever sales pitches and potentially leading to poor purchasing decisions, especially with new tech like AI where AI washing is common. It's the gap between glossy demos/sales talk and actual product performance or post-sale support, requiring buyers to focus on specific business problems, not just features, to avoid buying into inflated

expectations. Vendors promise revolutionary features or seamless integration that doesn't materialize in real-world use. Overuse of terms like AI, Machine Learning or Zero Trust without demonstrating concrete application or benefit. Moreover, Organizational psychology is a data-driven science that applies psychological principles and research methods to optimize human behavior and the work environment, improving performance, well-being, and job satisfaction. It provides an evidence-based counterpoint to the "hype" often generated by vendors promoting unvalidated solutions, particularly with new technologies like AI. The Role of Organizational Psychology use scientific methods to address workplace challenges and foster successful organizations. Designing evidence-based assessment processes and using psychometric assessments to identify candidates with the necessary skills and abilities. Employee Well-being and Motivation: Applying theories like Social Exchange Theory and Equity Theory to understand fairness and motivation, and improve overall mental and physical health in the workplace. Hype in the business context occurs when expectations for an emerging technology or solution exceed its current reality, often driven by optimistic projections from entrepreneurs and vendors to attract investment and market attention. The Gartner Hype cycle (Dedehayir and Steinert, 2016) is a well-known model that describes the typical progression of a new technology from inflated expectations to a plateau of productivity. The problem with vendor hype is that companies might invest heavily during the "peak of inflated expectations" without a systematic framework for adoption, leading to costly missteps and unmet expectations. In this paper, we discuss and focus on marketing hype. Marketing hype is a strategy using intense publicity, buzz, and emotional triggers to build excitement and demand for a product before launch, often relying on scarcity, exclusivity, and social media to create a cultural phenomenon and strong desire, sometimes exaggerating benefits to attract attention but risking disappointment if reality doesn't match the buildup. It shifts focus from informational advertising to creating a cultural event, driving sales through anticipation rather than just features.

Marketing hype also refers to the use of exaggerated or sensational language and promotional tactics to generate excitement and buzz around a product, service, or event, often with the goal of increasing sales or brand awareness (Wind and Mahajan, 1987). Therefore, it is not good for the social and economic developments. A classic example of AI hype in economics that is, on March 6, 2025, the startup Manus announced the launch of "the world's first general-purpose AI agent." A press release stated: "It surpasses OpenAI Deep Research in performance, can autonomously complete complex tasks, and usher in the ChatGPT moment for AI agents." Following the announcement, the A-share "AI agent" sector surged over 20% within two days, and several brokerage research reports listed Manus as a "disruptive innovation." However, Industry insiders dissected the product and found that its core logic was still based on the existing LLMs and plug-in tool calls, lacking any breakthroughs in "general intelligence." The Chinese MetaGPT team released an open-source clone the day before Manus's release, with 90% functional overlap. In actual testing, Manus's "cloud-based autonomous execution" was only able to complete fixed SOP processes and immediately failed in unknown scenarios. Therefore, if AI is not hyped and is regulated by AI laws, then the development of AI will be sustainable. Hype can also indeed be viewed as a psychological behavior (Ahadzie et al., 2025; Ali et al., 2025; Costello and Kim, 2025; Hoang et al., 2025; Soto-Sanfiel et al., 2025). It often involves creating a sense of excitement, anticipation, or urgency around a particular product, event, or idea (Markelius et al., 2024). Although according to Randy's "2025 AI & Data Leadership Executive Benchmark Survey", 37% of IT leaders claim to have this technology, then we believe that no one is actually completely sure how to operate. At the same time, because existing generative AI systems operate based on the technology of "predicting the next word", which still leads to errors and inaccuracies, manual review mechanisms are still necessary. We believe, for enterprises, they tend to use it for low-risk internal tasks, such as leave applications for human resources systems and password changes for

information systems. As long as the work involves actual customers and real money transactions, it is unlikely to use AI agents entirely.

In addition, the impacts of AI and Data Science on technological forecasting and social change are profound and multifaceted because these five major trends are associated with technological forecasting and social Change. AI-driven machine learning algorithms can analyze vast datasets to identify patterns and trends that traditional methods might miss. This leads to more accurate and dynamic predictions of future market conditions, helping businesses and policymakers make better-informed decisions. AI and Data Science automate routine forecasting tasks, reducing the time and resources required. This allows forecasters to focus on more strategic and complex analyses. The integration of AI and Data Science has led to the development of new forecasting techniques, such as deep learning models, which can handle large volumes of data and complex relationships between variables. AI-powered forecasting tools can provide real-time insights, enabling organizations to respond quickly to changing market conditions and consumer behavior. AI and Data Science have revolutionized healthcare through early disease detection, personalized treatment plans, and improved diagnostics. However, concerns about data privacy and algorithmic bias remain. Personalized learning platforms and adaptive assessments are transforming education by tailoring content to individual student needs and providing real-time feedback. This enhances learning outcomes and makes education more inclusive. AI is reshaping the job market by automating routine tasks and creating new roles in data science, healthcare, and software development. While this offers new opportunities, it also necessitates workforce adaptation and raises concerns about job displacement. AI algorithms control the content users see on social media platforms, shaping how information is consumed and shared. This can influence public opinion and societal dynamics, but also raises concerns about misinformation and echo chambers.

AI is used in predictive policing and surveillance systems, which can help reduce crime but also raise ethical concerns about privacy and civil rights. AI shapes consumer choices through personalized recommendations and targeted advertising. While this can enhance consumer experiences, it also raises concerns about manipulation and loss of personal agency. AI systems can perpetuate biases present in the data they are trained on, leading to unfair outcomes. Ensuring fairness and reducing bias is crucial for ethical AI adoption. The use of AI and Data Science involves handling large amounts of personal data, raising significant concerns about privacy and data security. Protecting individual privacy and ensuring data is used responsibly are key challenges. The complexity of AI models can make it difficult to understand how decisions are made. Ensuring transparency and accountability in AI systems is essential to build public trust. Overall, AI and Data Science offer immense potential for positive social change and improved technological forecasting, but they also come with significant ethical and societal challenges that need to be carefully managed.

The impacts of AI and Data Science on AI law are profound and multifaceted, influencing how laws are created, interpreted, and enforced. AI and data science can automate routine legal tasks such as document review, redaction, and research, reducing the time and resources required while minimizing human error. This allows legal professionals to focus on more complex and strategic aspects of their work. By analyzing large volumes of data, AI can provide predictive analytics that help lawyers forecast case outcomes, assess risks, and develop more effective legal strategies. This data-driven approach can lead to better-informed decisions and improved client outcomes. AI-powered tools can make legal services more accessible and affordable by automating certain processes and reducing the need for extensive manual labor. This can potentially bridge the gap between those who can afford legal representation and those who cannot. AI can assist in monitoring and ensuring compliance

with evolving AI laws and regulations. It can cross-reference contracts and documents against regulatory requirements, alerting legal teams to any discrepancies or changes in the law. The use of AI in law raises ethical concerns such as bias, transparency, and accountability. Ensuring that AI systems are fair, unbiased, and explainable is crucial to maintaining trust in the legal system. Legal frameworks need to address these issues to prevent discrimination and protect individual rights. AI systems rely on large amounts of data, which can include sensitive personal information. Ensuring the privacy and security of this data is paramount to comply with regulations like GDPR and CCPA. Legal professionals must work closely with cybersecurity experts to safeguard against data breaches and unauthorized access. Determining liability in cases involving AI can be complex. Legal frameworks need to clarify who is responsible when AI systems make errors or cause harm, whether it is the developers, users, or the AI itself. While AI can enhance productivity, it may also lead to changes in the legal workforce. Some routine tasks traditionally performed by lawyers and paralegals may be automated, potentially affecting job roles and requiring legal professionals to develop new skills. AI and data science have the potential to significantly transform AI law by improving efficiency, accuracy, and decision-making. However, they also pose challenges related to ethics, privacy, security, and liability. Legal professionals and policymakers must work together to navigate these impacts and develop appropriate frameworks to ensure the responsible and beneficial use of AI in the legal domain.

AI and Data Science have profound impacts on economy. AI and Data Science can automate routine tasks, optimize processes, and make data-driven decisions, thereby improving overall efficiency. For example, in manufacturing, AI-powered robots can work around the clock with high precision, increasing production speed and reducing errors. Data Science can analyze production data to identify bottlenecks and optimize workflows. They enable the development of new products and services. AI can generate creative ideas, design new materials, and develop new drugs. Data Science helps in understanding customer needs and preferences, leading to the creation of personalized products and services. This innovation can open up new markets and industries, contributing to economic growth. Data Science provides businesses and governments with valuable insights based on large amounts of data. This helps in making more informed decisions, reducing risks, and improving outcomes. For example, financial institutions can use Data Science to better assess credit risks and detect fraud. AI and Data Science can predict future trends and behaviors. This allows businesses to anticipate market changes, adjust strategies in advance, and stay competitive. For instance, retailers can use predictive analytics to forecast demand and optimize inventory management. The rise of AI and Data Science has given birth to numerous new job roles, such as Data Scientists, AI Engineers, Machine Learning Specialists, and AI Ethicists. These roles require specialized skills and knowledge, creating opportunities for employment and career development. Entire new industries are emerging around AI and Data Science, such as AI-powered healthcare, autonomous vehicles, and smart cities. These industries not only create jobs but also drive economic growth and transformation. By analyzing customer data, AI and Data Science can provide personalized experiences and recommendations. This improves customer satisfaction and loyalty, leading to increased sales and revenue. AI-powered chatbots and virtual assistants can provide 24/7 customer support, quickly addressing customer inquiries and issues. This improves customer service efficiency and reduces costs. AI has the potential to replace certain jobs, especially those involving routine and repetitive tasks. AI may disproportionately benefit high-income workers and capital owners. Workers who can effectively utilize AI may see their productivity and wages increase, while those who cannot may fall behind. Additionally, gains in productivity and capital returns from AI adoption may favor high earners, exacerbating income inequality. There is a risk that the benefits of AI and Data Science may not be evenly distributed across countries. Advanced economies, which have better digital infrastructure and skilled workforces, are more likely to harness the advantages of AI. In contrast,

emerging market and developing economies may face challenges in adopting and benefiting from these technologies, potentially widening the economic gap between nations. The extensive use of Data Science involves collecting, storing, and analyzing large amounts of personal data. This raises concerns about data privacy and the potential misuse of personal information. Data breaches and unauthorized access to data can have serious economic and social consequences. AI systems can inherit biases present in the data they are trained on, leading to unfair or discriminatory outcomes. This can have negative impacts on individuals and communities, and may lead to legal and reputational risks for businesses.

AI and data science have had a profound impact on popular psychology in various aspects. Data science provides psychologists with powerful tools to analyze large and complex datasets, enabling more efficient and comprehensive research. For example, machine learning algorithms can identify patterns and correlations in data that might be missed by traditional statistical methods, leading to new insights and discoveries. By leveraging big data, researchers can better understand individual differences and tailor their studies to specific populations or subgroups. This allows for more personalized and targeted research, which can lead to more effective interventions and treatments. The integration of AI and data science has opened up new areas of research in psychology, such as the study of human-computer interaction, the impact of AI on human behavior and emotions, and the development of AI-based psychological assessment tools AI algorithms can analyze vast amounts of patient data, including medical records, genetic information, and behavioral data, to provide more accurate and early diagnoses of mental health conditions. For example, machine learning models have been developed to predict the onset of depression and anxiety disorders based on patterns in social media data. AI-powered tools, such as chatbots and virtual reality applications, can provide personalized and accessible mental health support. These tools can offer cognitive-behavioral therapy techniques (Xiang et al., 2025), mindfulness exercises, and other therapeutic interventions to individuals in need. Wearable devices and mobile applications equipped with AI can continuously monitor individuals' mental health and detect early signs of distress. This enables timely interventions and better management of mental health conditions. AI-driven platforms and applications can disseminate psychological knowledge and information to a wider audience in an easily understandable and engaging manner. This helps to raise public awareness about mental health issues and promote psychological well-being. AI-based systems can provide personalized mental health advice and recommendations based on individuals' specific needs and circumstances. This can empower people to take proactive steps to improve their mental health and seek appropriate support when needed. The use of AI and data science in psychology raises important ethical concerns regarding data privacy and security. Psychologists and researchers must ensure that sensitive personal information is protected and used responsibly. AI algorithms can inadvertently perpetuate biases present in the data, leading to unfair or inaccurate outcomes. It is crucial to address these biases and ensure that AI systems are fair and equitable in their applications. The increasing use of AI in psychological practice and research also raises questions about the nature of human-AI interaction and the potential impact on the therapeutic relationship. Psychologists need to carefully consider how to integrate AI tools in a way that enhances, rather than replaces, human expertise and empathy.

We must say, the current development around AI and data science is seen as a once-in-a-generation opportunity to reignite economic growth, but it has also sparked a fierce debate about how much of the promise is real, and it may be hype, how quickly governments and businesses should act, that is to say, what will go wrong if we overestimate the capabilities of AI and no safeguards are taken. Massachusetts Institute of Technology (MIT) economist Daron Acemoglu argued that the hype surrounding Venture Capital (VC) firms (Kato and Manchidi, 2025) chasing general AI has distorted investment into speculative automation rather than

productivity-enhancing, complementary AI, and then has prompted governments to adopt it too quickly. AI and data science do have a credible path to adding trillions of dollars to output, but the current hype risks overinvesting in pure automation solutions and underinvesting in complementary human capital and safeguards. In addition, hype will also affect business development (Humphreys et al., 2024). For example, in order to hype their stocks, some companies will promote the abilities of their AI products as omnipotent. Therefore, the benefits from correct and cautious use of AI will come only to companies that can combine active experimentation with careful governance. In this way, the application of AI can achieve sustainable development in the various fields (e.g. economy). Thus, in the high-pressure, high-speed, and highly volatile AI era, traditional business models may be failing. Companies need to comprehensively upgrade their management thinking. Consequently, if AI is not hyped, the five trends, which are mentioned in this study, will be the driving force behind economic growth. However ironically, in job market, for example, computer science degrees, once considered a guarantee of employment, are now facing a severe job search challenge for graduates due to the dual impact of AI technology adoption and layoffs at tech companies. Tech jobs, once touted as offering high starting salaries, are no longer readily available. Graduates are often unable to find relevant jobs after graduation, and are even turning to non-tech fields for employment. The widespread adoption of AI tools by tech giants like Amazon and Microsoft has reduced demand for traditional programming jobs, further compressing the job market. This will lead to unemployed problem especially in high-tech developed countries (Guliyev, 2023). That is, the application of AI will affect the unemployment rate with the potential for both job displacement and creation in the future (optimistically speaking). However, in AI-associated fields, the net impact on overall unemployment remains debated and this debate is not the subject of discussion in this study. Moreover, it is worth mentioning that bubble may also be the results of hype, then, when will the AI bubble burst? This question has been hotly debated lately, especially with the constant news of massive cross-investment between some companies like Nvidia Corporation (NVDA) and OpenAI raising concerns about the potentially far-reaching consequences of a burst bubble. However, some now argue that AI is more like a wildfire destroying vulnerable companies, redistributing resources, and reshaping the ecosystem. While painful, this is a crucial purification process for the ecosystem. Dion Lim, an advisor at AI startup Adept, recently argued in an article that AI is not a bubble, but a wildfire. Just as with every wave of technological fervor in the tech world, there will eventually be flames that burn down vulnerable companies, re-categorizing talent and leaving behind infrastructure to drive the next wave of development—much like how a forest fire provides nourishment for new growth. The question is; which companies will survive the fire, and which will become the dried-up undergrowth? This will be an important issue.

In addition, there are recent news about cases of AI being overhyped: (1) An MIT report indicates that as many as 95% of enterprise generative AI projects fail to generate tangible profits, leading to the stagnation of most pilot programs and a stark contrast to market optimism. (2) Research shows that the primary reason for the failure of enterprise AI adoption is the "learning gap" between tools and organizations. Furthermore, the success rate of in-house developed solutions is far lower than that of outsourced solutions, indicating that companies lack effective integration strategies. (3) OpenAI Chief Executive Officer (CEO) Sam Altman admitted that the current AI market is in a bubble, with investors overexcited and some startups' high valuations irrationally high, potentially leading to significant losses.

4. CONCLUSION

The five trends mainly focus on, agentic AI, generative AI, a data-driven culture, unstructured data and the leadership of data and AI, respectively. We predict that AI agents will not have a major impact on the job market in 2025. If we look at the current situation of companies introducing AI agents, it is quite consistent with what the two experts said. However, the more critical problems are the insufficient level of digitalization and unclear data governance strategies. For example, some companies use outdated software and hardware, and their data collection is incomplete; while others have been fully digitized, but the format is not unified and cannot be integrated. What is more common is that the current process is completely manual. How to transform it into a data system requires collaboration between business units and information departments. It also requires strategic support from senior executives and the board of directors, and the formulation of complete data and AI governance principles. A safe and robust AI agent cannot be created simply by importing the platform or services of a technology provider. AI agents are indeed the inevitable direction for the development of generative AI. They can not only generate content, but also further understand instructions, decompose them into tasks, and then obtain data or use tools to produce the answers that users need. But 2025 is still in the early stages of development, and neither over-optimism nor complete denial will allow us to see its true potential. However, some of them at the moment may just be vendor hype. Only by returning to corporate operation and development strategies, understanding the current limitations of AI technology, and identifying actual application scenarios, and after taking inventory of the process, splitting tasks, and organizing data training models, can the true functions of AI agents be unleashed. Especially, the impacts of AI and Data Science on technological forecasting, social change, AI law, economy and popular psychology are surely profound and multifaceted. In addition, the current development around AI and data science is seen as a once-in-a-generation opportunity to reignite economic growth, but it has also sparked a fierce debate about how much of the promise is real, and it may be hype, how quickly governments and businesses should act, that is to say, what will go wrong if we overestimate the capabilities of AI and no safeguards are taken. Therefore, from their negative impacts because of vendor hype, AI is not omnipotent. It may be an exaggeration of its ability. In addition, it is not good for the social and economic developments.

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Compliance with ethical statements consisting of conflicts of interest statements and informed consent

(1) All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

(2) The author declares that there are no conflicts of interest.

(3) Informed consent was obtained from all individual participants involved in the study.

(4) This work does not include animals as subjects.

(5) Declaration of generative AI in scientific writing: The author declares no AI in scientific writing.

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Figure Captions

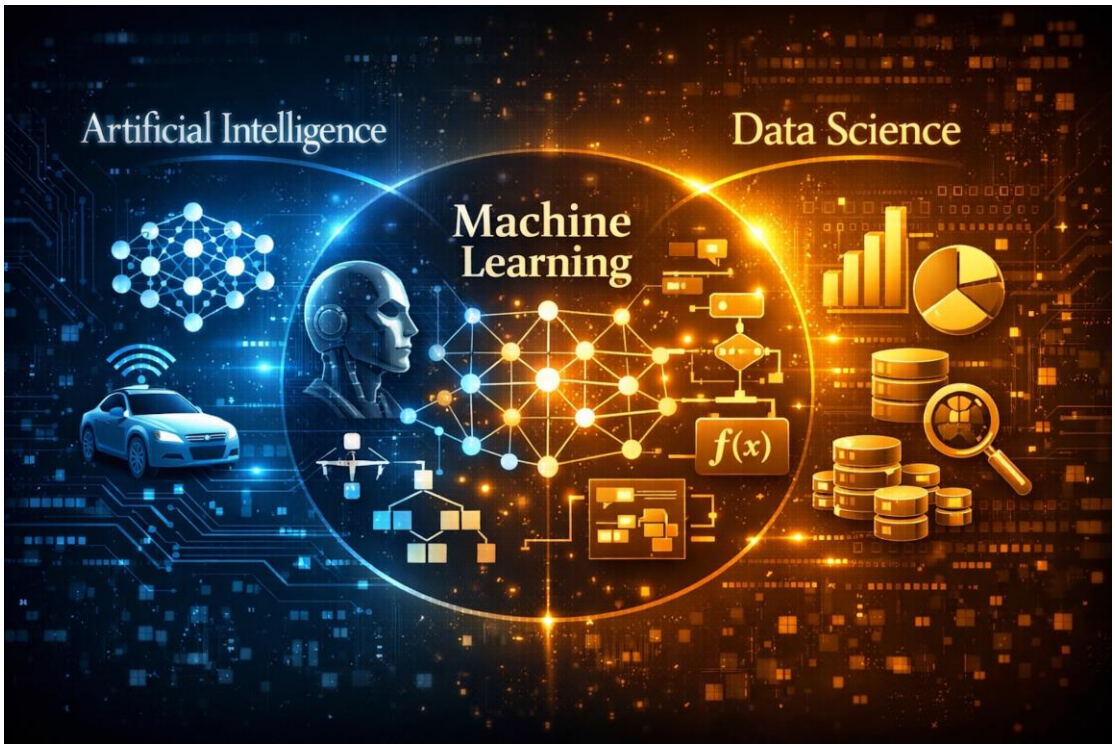

Figure.1 Artificial Intelligence (AI) vs. Data Science

Figure.2 Generative AI vs. Agentic AI

Figure.3 A data-driven culture

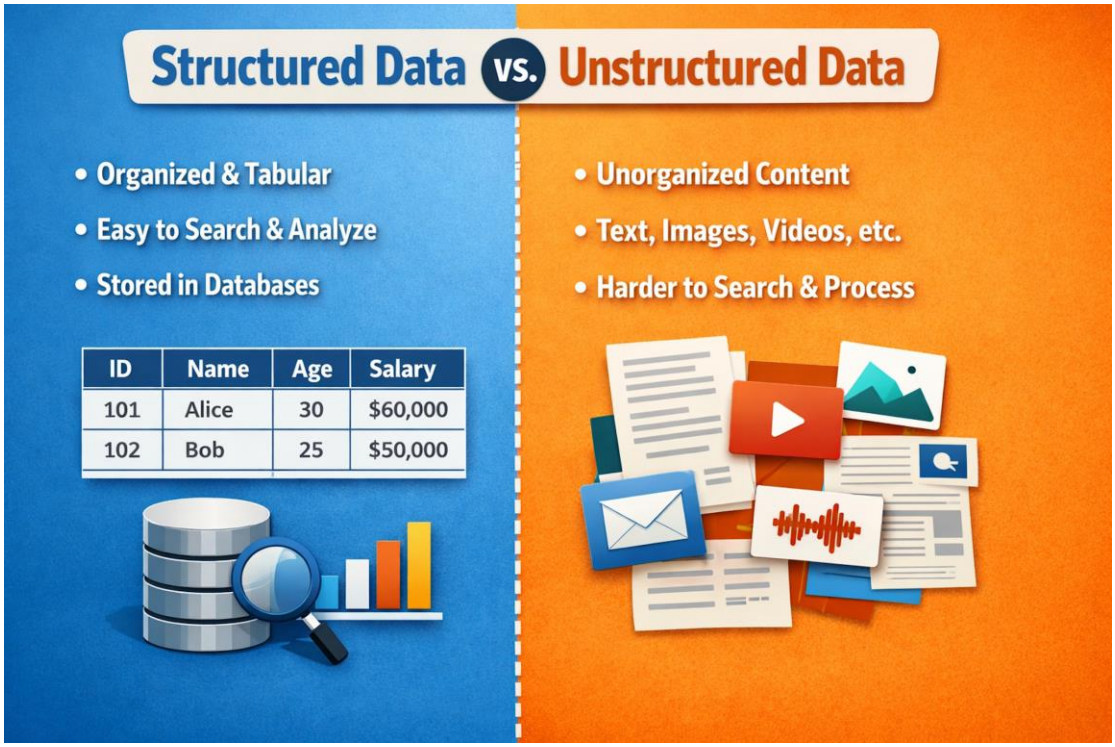

Figure.4 Structured data vs. Unstructured data

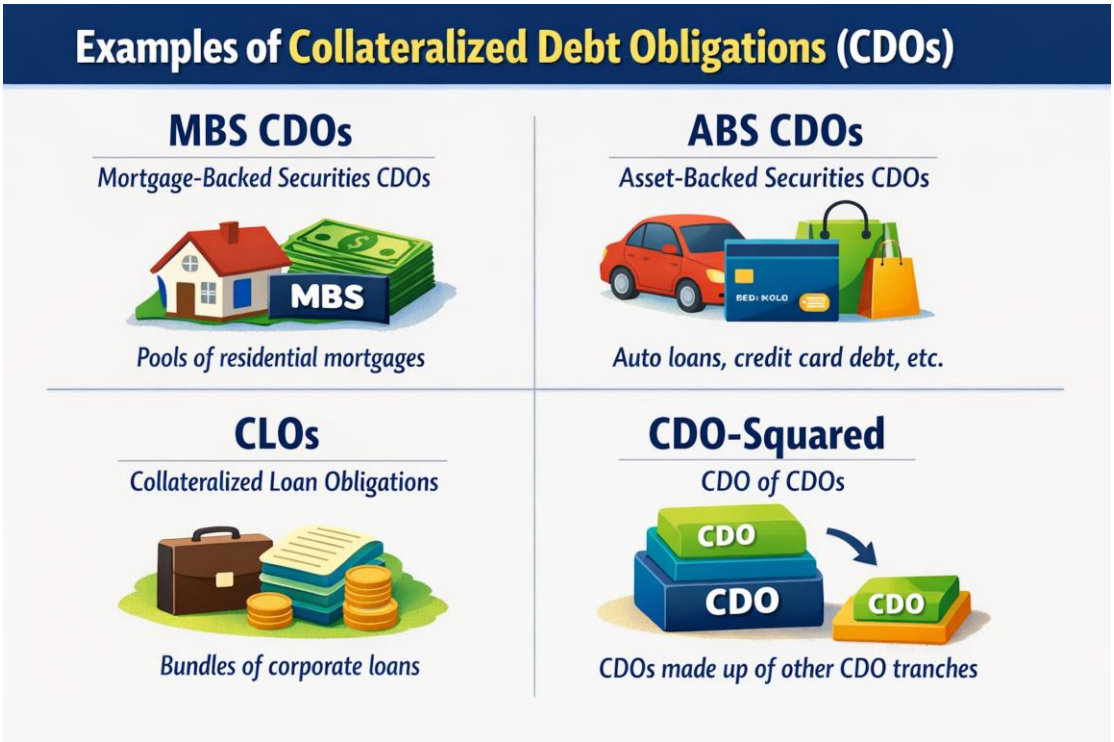

Figure.5 Examples of Collateralized Debt Obligations (CDOs)