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LEVERAGING CRITICAL TECHNOLOGIES IN EMERGENT AI IN BUSINESS PROCESSES

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Purpose: The primary objective of this article is to examine and clarify the transformative potential of emergent and generative artificial intelligence (AI) concerning the current business environment. The article explores the practical applications of emergent AI, with a particular emphasis on its flexibility and ability to analyze real-time data. Furthermore, it discusses generative AI, highlighting its role in promoting innovation, automating the generation of ideas, and contributing to the development of new products and services. The article seeks to provide insights into how these AI approaches can support strategic decision-making, improve organizational adaptability, and facilitate innovative problem-solving in the dynamic and data-driven realm of modern business. Throughout its analysis, the article also addresses the challenges and ethical considerations associated with the implementation of AI.
Design/methodology/approach: The techniques employed for carrying out a literature review encompass systematic and structured methodologies that aim to collect, analyze, and amalgamate prevailing research and information about a specific subject matter.
Findings: The findings demonstrate that emergent AI systems exhibit adaptability when analyzing real-time data, thereby improving decision-making in crucial fields. Moreover, the creative abilities of generative AI contribute to innovation by automating the generation of ideas and accelerating the creation of new products and services. The existence of challenges in implementing AI, such as transparency concerns and employee reluctance, underscores the importance of considering ethics and enacting strategic changes within organizations. In terms of prospects, the article stresses the significance of responsible AI development and the use of vigilant evaluation tools.
Originality/value: This article offers an examination of emergent and generative AI in the business domain. The article provides an analysis of emergent and generative AI and their respective roles in the business sector as well as challenges the organizations. The article serves as a valuable resource for decision-makers who are navigating the ever-evolving area of AI technologies.

Keywords: emergent AI, generative AI, modern business.

Category of the paper: Literature review.

1. Introduction

In today's business environment, the focus on data-driven insights is of utmost importance. Organizations recognize the value of using large amounts of data to identify meaningful patterns, correlations, and predictions. The ability to convert raw data into actionable insights not only informs strategic decision-making but also drives innovation. Companies that effectively use data analytics and AI-driven technologies can quickly adapt to market changes, identify emerging trends, and proactively respond to customer demands.

In recent times, the incorporation of AI into business operations has undergone a significant transformation (Kuzior, Kwilinski, Tkachenko, 2019; Kwilinski, Tkachenko, Kuzior, 2019; Tkachenko, Kuzior, Kwiliński, 2019; Kuzior, Kwilinski, 2022). AI technology, including machine learning algorithms and natural language processing, has become an essential part of organizational strategies. Companies from various industries use AI to streamline processes, improve efficiency, and gain a competitive advantage in the fast-paced global market.

Within this context, this study aims to explore the transformative potential of emergent and generative AI. Emergent AI refers to systems that exhibit behaviors or patterns that are not explicitly programmed but emerge through interactions and learning. On the other hand, generative AI involves autonomously creating new content or ideas. By understanding and harnessing these capabilities, businesses can optimize their strategic decision-making processes and foster a culture of continuous innovation. This investigation seeks to uncover how emergent and generative AI can be utilized to drive strategic decision-making, enhance organizational agility, and stimulate creative problem-solving in the ever-changing landscape of modern business.

2. Methods

A combination of methods for analysis, synthesis, and organization was used to conduct a literature review. A systematic search for relevant literature on the information employed academic databases, reports, and other materials. An examination was conducted to analyze the collected information. Every literary work went through an assessment to determine its relevance, reliability, and influence on the thorough understanding of the research topic. By conducting a comparative analysis of various viewpoints and discoveries, a synthesis was attained, facilitating the extraction of valuable insights and the identification of significant themes.

3. Emergent AI and Data-Driven Insights

The concept of emergence has been studied in various fields such as physics, biology, mathematics and, more recently AI. Such word combinations as “emergent behaviour” or/and “emergent abilities” are met. The emergent behaviour is specified as the unforeseen or unintended abilities of a large language model that are enabled by the model's ability to learn patterns and rules from its training data (Pasick, 2023). It is worth mentioning that models trained specifically on programming and coding platforms can generate new code (Pasick, 2023). Emergent abilities encompass the capacities that manifest unexpectedly because of complex interactions among elementary components (Babu, 2023). These attributes cannot be anticipated solely by examining the individual elements but instead reveal themselves when these parts engage in collective behaviour (Babu, 2023). In recent times, the notion of emergence has gained prominence in machine learning, particularly with large language models (LLMs) like GPT, PaLM, and LaMDA, where they display "emergent abilities" not directly deducible from a detailed understanding of their microscopic components (Schaeffer et al., 2023).

Therefore, emergent AI encompasses a group of artificial intelligence systems that possess the ability to adapt and develop in correlation with dynamic and real-time data inputs. In contrast to conventional AI models, which depend on pre-established rules and unchanging algorithms, emergent AI systems possess the capability to acquire knowledge and autonomously adapt their functioning as they encounter novel information. So, the term "emergent" denotes the capacity of these systems to showcase behaviours or insights that were not explicitly programmed but arise because of the sophisticated nature of the data they analyse.

The analysis demonstrates that the perceived emerging capabilities of LLMs are probably attributable to the application of rigorous metrics (Miller, 2023). The implication for the future is reassuring: the risk of accidentally encountering artificial general intelligence (AGI) seems low (Miller, 2023). While AGI could have significant societal impacts, the argument is that if it does emerge, there should be discernible signs in advance.

Aside from generative AI, several other emerging AI techniques have the potential to greatly enhance digital customer experiences, improve business decision-making, and establish sustainable competitive differentiation (Gartner Places…, n.d.). These technologies encompass AI simulation, causal AI, federated machine learning, graph data science, neuro-symbolic AI, and reinforcement learning (Gartner Places…, n.d.). In the age of decision-making guided by data, the significance of emergent AI becomes crucial in enhancing understanding. In general, emergent AI, with its flexible ability to adjust, revolutionizes the process of analyzing data, enabling prompt decision-making, and enhancing predictive analytics for the identification of trends (Ninness, Ninness, 2020). Such three criteria as real-time data analysis and decision-making, predictive analytics and trend identification and improved accuracy and reliability are singled out.

Emergent AI demonstrates exceptional proficiency in conducting real-time data analysis through rapid processing and interpretation of extensive datasets. Its adaptable characteristics enable it to promptly modify its analytical approaches in response to immediate circumstances, facilitating rapid and well-informed decision-making. This attribute proves especially advantageous in situations where timely reactions to shifting conditions are essential, including domains like financial markets, cybersecurity, and emergency response systems (European Commission. Joint Research Centre, 2020). Through continuous learning and advancement, emergent AI can generate insights that not only align with present circumstances but also capture the most recent patterns in data.

Emergent AI is of great importance in predictive analytics as it utilizes past data to detect and comprehend patterns and trends. By engaging in ongoing learning processes, emergent AI can enhance its predictive models, thereby generating more precise forecasts over time. This aspect holds significant value in diverse domains such as finance, marketing, and healthcare, as the ability to anticipate future trends can offer strategic benefits. By exploring extensive datasets and identifying discrete associations, emergent AI augments its predictive proficiencies, thereby enabling organizations to proactively address emerging opportunities or obstacles.

One of the principal advantages of emergent AI originates from its capacity to enhance precision and dependability through ongoing learning (Harnessing the power of AI…, 2022). As it encounters novel information and refines its comprehension, the system becomes increasingly proficient at identifying pertinent data and disregarding irrelevant noise. By consistently updating its repository of knowledge, emergent AI becomes a trustworthy source of insights, providing organizations with a more resilient base for decision-making and strategic planning.

4. Generative AI and Advancing Innovation

Generative AI pertains to a segment within the domain of artificial intelligence that concentrates on the independent creation, production, or generation of content (What is generative AI?, 2023). In contrast to conventional AI systems, which are designed for specific tasks and rely on predetermined rules, generative AI exhibits creative capabilities, enabling it to generate outputs that are original and distinctive. This form of AI harnesses approaches like neural networks, deep learning, and machine learning to discern patterns, acquire knowledge from data, and generate content that surpasses mere duplication or mimicry.

Generative AI exhibits the capacity to generate a wide range of outputs, encompassing text, images, music, and even complete scenarios (García-Peñalvo, Vázquez-Ingelmo, 2023). Its capability to produce content that is not explicitly encoded but rather acquired from pre-existing datasets allows it to foster innovation by offering new viewpoints and inventive concepts.

Generative AI exhibits its creative capabilities in the realm of innovation by automating the process of generating ideas, offering alternative design possibilities, and enabling the development of novel products and services through the production of unique and perceptive content (The state of AI…, 2023). The integration of human creativity and generative AI in design processes not only supplements creative output but also accelerates the innovation timeline, enabling prompt progress in the development of pioneering ideas and products.

The utilization of generative AI is of great importance in the automated process of creating ideas and concepts. Through the analysis of extensive data, this technology can recognize patterns and connections that may not be readily observable to human individuals (Using Generative AI, n.d.). Consequently, this capability facilitates the generation of inventive ideas and concepts that can potentially be utilized as the basis for novel products, services, or solutions.

In addition, generative artificial intelligence can merge seemingly disparate data, thereby promoting interdisciplinary thought and stimulating innovative solutions (Eapen et al., 2023). Its capability to investigate multiple potentialities and iterate through diverse concepts quickly accelerates the phase of generating ideas in the innovation process (Kuzior, Sira, Brożek, 2023).

In the field of design, generative AI serves as an asset in augmenting the creative processes. It aids designers by offering alternative design choices, proposing enhancements, and even producing novel design concepts within predetermined parameters (Eapen et al., 2023). This cooperative interaction between human designers and generative AI yields more inventive and polished designs.

The capability of Generative AI to comprehend aesthetic preferences and design principles enables its contribution to visual, graphic, and product design. Through the automation of specific design elements, it liberates human designers to concentrate on more advanced levels of creative ideation and decision-making (Weisz et al., 2023).

Generative AI plays a crucial role in fostering the growth of novel products and services (How generative AI can drive…, n.d.). By examining market patterns, consumer actions, and records, generative AI can detect market gaps and propose potential pathways for innovation. Consequently, this aids organizations in making well-informed choices regarding the creation of new products or services and in devising strategies to distinguish them from already existing options.

Moreover, the implementation of generative AI has the potential to streamline the initial stages of prototyping and testing through the generation of virtual models or simulations, thereby diminishing the time and resources necessary for product development (Ammanath,

Barroso, Soral, 2023). This expedites the cycle of innovation, allowing companies to introduce novel and enhanced products or services to the market with increased efficiency.

The creative potential of generative AI renders it an asset in promoting innovation in diverse sectors. Throughout the stages of conceptualization, design, and product advancement, its capacity to produce original content and perspectives facilitates the emergence of inventive concepts, imaginative resolutions, and ultimately, the creation of offerings and solutions.

5. Discussion

While implementing AI-driven solutions organizations can face challenges connected to such issues as ethical dilemmas associated with AI and the importance of responsible AI use, concerns related to the privacy and security of data, employee resistance to AI adoption and the need for proper training.

The lack of transparency in certain AI models poses a significant challenge in comprehending their decision-making processes. This lack of clarity can engender distrust, particularly in critical domains such as healthcare or finance (Lewicki et al., 2023). AI systems possess the capacity to supplement existing societal biases present in the training data they rely on. It is crucial to actively acknowledge and mitigate these biases to guarantee fair and objective decision-making processes. As AI systems gain more autonomy, determining and assigning responsibility for their actions becomes a challenging matter. Identifying who should be held accountable for the consequences of AI decisions is a complex challenge that necessitates careful consideration. The implementation of AI technology can lead to job displacement, prompting concerns about unemployment rates and the broader societal impact of this technology. Mitigating these concerns involves designing strategies for job transition and enhancing individuals' skills.

The ethical concern of obtaining explicit and informed consent for the collection and use of personal data emerges as a crucial issue (Fui-Hoon Nah et al., 2023). The issue of determining rightful ownership of the data employed to train and operate AI models can give rise to legal and ethical conflicts.

Resistance from employees may arise from a lack of comprehension regarding the functioning and advantages of AI to their work. Implementing comprehensive training initiatives becomes fundamental to bridge the knowledge gap and establish trust. Employees may exhibit resistance towards the adoption of AI technology due to fears of job displacement. It is imperative to effectively convey the message that AI is designed to enhance human abilities rather than replace job positions. The incorporation of AI into existing workflows necessitates a shift in organizational culture (Kuzior, Kettler, Rąb, 2021). Employing change management strategies and receiving support from leadership are vital elements in successfully overcoming resistance.

Researchers envisage the hypothesis that emergent abilities are an illusion. Through the three analyses conducted, Schaeffer et al. presented substantial evidence indicating that purported emergent abilities diminish when alternative metrics or more robust statistical methods are employed. Consequently, it is plausible to argue that these abilities may not constitute an inherent characteristic of scaling artificial intelligence models (Schaeffer et al., 2023).

The conclusion for the future could be accepted as promising: the risk of accidental collision with artificial general intelligence (AGI) seems to be low. Although AGI may have a significant impact on society, the argument lies in the fact that if it does emerge, its signs should be noticeable in advance (AI's Ostensible Emergent Abilities Are a Mirage, 2023).

According to Schaeffer, the emergence of skills isn't necessary for AI models to become significantly more capable and potentially risky (Morris, 2023). He emphasizes the need for precise assessment tools to track AI development. Concerns are raised about the rapid advancement of AI research, surpassing traditional scientific controls. The challenge lies in the lack of access to the models controlled by private companies, hindering independent researchers. Schaeffer highlights a potential conflict of interest, as companies may be motivated to exaggerate AI capabilities to boost sales and downplay possible negative effects for business reasons (Morris, 2023).

The emergent abilities of LLMs have notably shaped Natural Language Processing (NLP), leading to a shift in research focus towards comprehending and enhancing these capabilities. Sociologically, they have influenced the broader landscape of NLP and AI, underscoring the significance of scale in current systems. Bommasani suggests the need for a shared understanding of these abilities, urging exploration of their unrealized potential and the ultimate limits of scale (Dickson, 2022).

6. Summary

This article investigates the potential for emergent and generative AI to bring about significant changes in the current business environment. It highlights how emergent AI systems can adapt to real-time data analysis, improving decision-making in crucial areas such as finance and cybersecurity. Additionally, generative AI, with its ability to be creative, aids in innovation by automating the generation of ideas and speeding up product development. The challenges of implementing AI are also discussed, including concerns about transparency and employee resistance, highlighting the importance of ethical considerations. The article considers the need for responsible AI development and thorough assessment tools in the future.

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