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Artificial intelligence in social big data for business owners' decision-making

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Abstract

Artificial intelligence (AI) and social big data have transformed the way entrepreneurs analyze information and make business decisions. This study develops and validates a research model to examine the relationships among perceived ease of use, perceived usefulness, social big data, artificial intelligence, and business decision-making. A quantitative, cross-sectional, correlational research design was employed. Data were collected from 133 entrepreneurs who use social media platforms, including Facebook, Instagram, LinkedIn, Messenger, TikTok, Twitter, WhatsApp, and YouTube, to promote and sell products or services. The proposed research model was analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The findings indicate that perceived ease of use and perceived usefulness positively influence the adoption of social big data. In turn, social big data significantly supports the implementation of artificial intelligence technologies and enhances organizational decision-making. The results demonstrate that the increasing volume of user-generated information creates opportunities for AI-driven applications, including predictive analytics, recommendation systems, chatbots, and intelligent algorithms, to transform large datasets into actionable business insights. By enabling real-time data analysis, process automation, pattern recognition, and improved information management, AI strengthens the quality, speed, and effectiveness of entrepreneurial decision-making. This study contributes to the information systems literature by providing empirical evidence that social big data serves as a key enabler of AI adoption and supports more agile, data-driven, and informed decision-making in digital entrepreneurship.

Keywords: ease of use, perceived usefulness, big data social, artificial intelligence, decision making.

Introduction

Big data is the ability to manage, process and analyze the six dimensions of data: 6V, volume, velocity, variety, value, veracity, and variability (Ahmad et al., 2020). The internet and social networks are sources of information that allow a two-way communication and in an almost immediate way. This information is generated through devices such as computers, cell phones, tablets, smartphones, televisions or watches (Bartosik-Purgat & Guzek, 2016). Social media platforms use artificial intelligence algorithms to market their products or services (Alton & Dinesh, 2021). Social media and networks have built communities where people can express themselves, or maintain communication or seeking assistance (Lloyd, et al., 2015). Through social networks it is possible to have and collect large amounts of data (Brock & Ullah-Khan, 2017). Big Data Social are technological and artificial intelligence tools for processing data

efficiently (Kumari, 2016). Social media process thousands of data per minute, with data analysis being the most important for companies (Villalobos-Lopez, 2022).

The use of artificial intelligence, in different fields, is able to provide people with a better quality of life and obtain greater benefits (Kosasi et al., 2023). Artificial intelligence has played an important role in economic activities, environment, medicine and education (Khan & Roberts, 2024). On the other hand, artificial intelligence is adopted by companies and organizations for the knowledge of the needs and preferences of individuals in terms of products, services or activities. Artificial intelligence has three main uses at the enterprise level: customer segmentation, business intelligence and better communication with customers (Gouveia & Santos, 2025).

Artificial intelligence enables better understanding for the development of information systems and for the performance of tasks, which are usually performed by humans, such as decision making. One of the applications that Artificial Intelligence enables is decision making (Agrawal & et al., 2018). Artificial intelligence is the ability of computers to learn without directly programming new skills, using available data sets, a machine learning algorithm, supported by a mathematical model, generates specific predictions or decisions (Brock & Ullah-Khan, 2017). Artificial intelligence algorithms are used to train models, classify or analyze text for decision making (Gupta, 2023).

Data need to be analyzed by companies, to achieve practical knowledge and application in decision making (Sharma & Singh, 2024). Entrepreneurs regularly make high-risk decisions, and in unpredictable situations keep their emotions in check (McMullen & Shepherd, 2025). Decision-making in companies of all sizes relies on the analysis of data to generate actionable knowledge and reduce risk. Recent research shows that organizations increasingly adopt data-driven decision-making practices to identify patterns, trends, and opportunities for growth (Sharma & Singh, 2024). Likewise, entrepreneurs often face high-risk and unpredictable situations, requiring emotional regulation and cognitive control to make effective decisions supported by data insights (McMullen & Shepherd, 2025; Song, et al., 2021).

This study contributes to the information systems literature in three ways. First, it develops and empirically validates a research model that integrates perceived ease of use, perceived usefulness, social big data, artificial intelligence, and business decision-making. Second, it provides empirical evidence of the role of social big data as a critical enabler of AI adoption among entrepreneurs using social media platforms. Third, it demonstrates how AI-driven analytics can improve entrepreneurial decision-making by transforming large volumes of user-generated data into actionable business knowledge.

Literature Review

AI is continuously evolving, with researchers and practitioners exploring various algorithms to address diverse industrial challenges. Each type of AI algorithm has strengths and weaknesses, making them suitable for different tasks and applications. As their research delves deeper into the relationship between AI, social big data, and decision making, understanding the types of AI algorithms and their capabilities will be crucial to exploring how these algorithms leverage social big data to improve decision-making processes (Chauhan et al., 2021).

Evolutionary algorithms are a subset of evolutionary computation, a field of artificial intelligence that draws on biological evolution to solve complex optimization and search problems. These algorithms mimic the process of natural selection, in which the fittest individuals are selected to reproduce and produce the offspring of the next generation. The key components of Evolutionary Algorithms are selection, mutation,

recombination (or crossover) and survival of the fittest. They are particularly effective in solving problems with a large and complex solution space, which makes traditional optimization methods ineffective (Uzunbayir and Kurtel, 2024). Some techniques used in Evolutionary Algorithms are: (a) selection, which is a process similar to natural selection where a population of candidate solutions (often referred to as "individuals") is evaluated based on a fitness function, which measures how well they solve the problem and ultimately the fittest individuals are more likely to be selected for the next phase of the algorithm; b) crossover (recombination), where biological reproduction is mimicked and pairs of individuals from the selected group are chosen and parts of their data structures (representing solutions) are combined to produce new individuals (offspring), allowing mixing and interchanging characteristics between solutions, potentially creating better performing offspring; c) mutation, where random changes in some individuals and variability in the population are introduced, which helps the algorithm to explore new areas of the solution space and avoid local optima, i.e. points that are better than their immediate neighbors but not the best overall; d) survival and iteration, where the newly created population (after crossover and mutation) is evaluated and the process of selection, crossover and mutation is repeated in successive generations, causing the population to evolve and individuals with favorable traits that contribute to better solutions are more likely to be retained (Uzunbayir, and Kurtel, 2024).

Evolutionary Algorithms are widely used in various fields, such as engineering, economics, chemistry and biology. They are especially useful when the problem is complex, the solution space is poorly known or the search space is large and multimodal (with multiple potential solutions). Examples are the optimization of complex system design, the evolution of neural network architectures, and the search for solutions to multi-objective optimization problems.

An important aspect of Evolutionary Algorithms is their flexibility and adaptability. Unlike many traditional optimization methods, they do not require specific knowledge about the underlying problem. However, one of the challenges of EAs is their computational cost, as assessing the fitness of each in large populations over many generations can be resource intensive. In addition, the choice of parameters such as mutation rate, crossover rate and population size can significantly influence the performance of the algorithm, and finding the right balance may not be trivial. Despite these difficulties, EAs are a powerful tool for solving complex optimization problems (Chauhan et al., 2021).

Research Problem

Entrepreneurs use technological tools to achieve a change in the organizational economic situation. Technological implementation allows the identification of market trends, decision making and the dissemination of information (McMullen & Shepherd, 2025). Social media are platforms made up of groups of people, where anonymous profiles are created or to create relationships with people who share a common interest (Lloyd et al., 2015). Social media allow interactions between users, the content and information that is generated is extensive, so it must be debugged, explored and analyzed; with the aim of identifying patterns of behavior and trends for the creation and implementation of organizational digital marketing strategies (Lloyd, Cheshire, & Titheridge, 2015). There is a need to use the comments that are posted on social media, with the objective of analyzing consumer behavior and knowing their consumption preferences (Moreno et al., 2020).

This research aims to identify the factors that involve Big Data Social, as well as the implications that artificial intelligence has on the decision making of entrepreneurs who use social media for the products or services they offer. This research, has the following specific objectives: 1) To identify and measure the factors involving Big Data Social, 2) To measure the effect that Big Data Social has on Artificial

Intelligence and 3) To measure the effect that artificial intelligence has on the decision making of social media entrepreneurs.

Research Questions

1. What are the factors and effects that determine social big data?
2. What is the relationship between social big data and artificial intelligence?
3. What is the benefit of artificial intelligence in decision-making for entrepreneurs using social media for product sales or services?

Methodology

The study of this research is identified as quantitative because it collects, processes and analyzes data on variables determined as ordinal. The research design is quantitative, non-experimental, cross-sectional and correlational. A questionnaire instrument through the platform, Microsoft Forms, was used to collect data for the research analysis. The profile of the population studied were people who are business owners using social media for the offering of their products or services with 21 or more years old. The participants are users of platforms such as Facebook, Instagram, LinkedIn, Messenger, Tik Tok, Twitter, WhatsApp or YouTube, to promote their products or services. The research included the participation of 113 participants who responded to the questionnaire instrument. The questionnaire included premises that were measured through the variables proposed in the research model with a 5-point Likert scale.

Results

Figure 1 shows that Ease of Use had a coefficient $\beta = 0.589$ regression with Big data social, which means that, for each unit increase in ease of use, Big data social increases 0.589 units. Perceived usefulness had a coefficient $\beta = 0.358$ regression with Big data social, meaning that, for each additional unit increase in perceived usefulness, Big data social increases 0.358 units. Big data social had a coefficient $\beta = 0.827$ regression with artificial intelligence, meaning that, for each additional unit increase in Big data social, artificial intelligence increases 0.827 units. Artificial intelligence had a coefficient $\beta = 0.902$ regression on decision making, meaning that, for each additional unit increase in artificial intelligence, decision making increases 0.902 units.

Figure 1 shows that the t-value for ease of use had a value of 6.080 and greater than 2.325, which means that it is significant with Big data social at 99% confidence. The t-value of perceived usefulness had a value of 3.606 and greater than 2.325, which means it is significant with Big data social at 99% confidence. The t-value of social Big data had a value 24.345 and greater than 2.325, which implies being positively related to artificial intelligence at 99% confidence. The t-value of artificial intelligence had a value 41.321 and greater than 2.325, which means it is significant with decision making at 99% confidence.

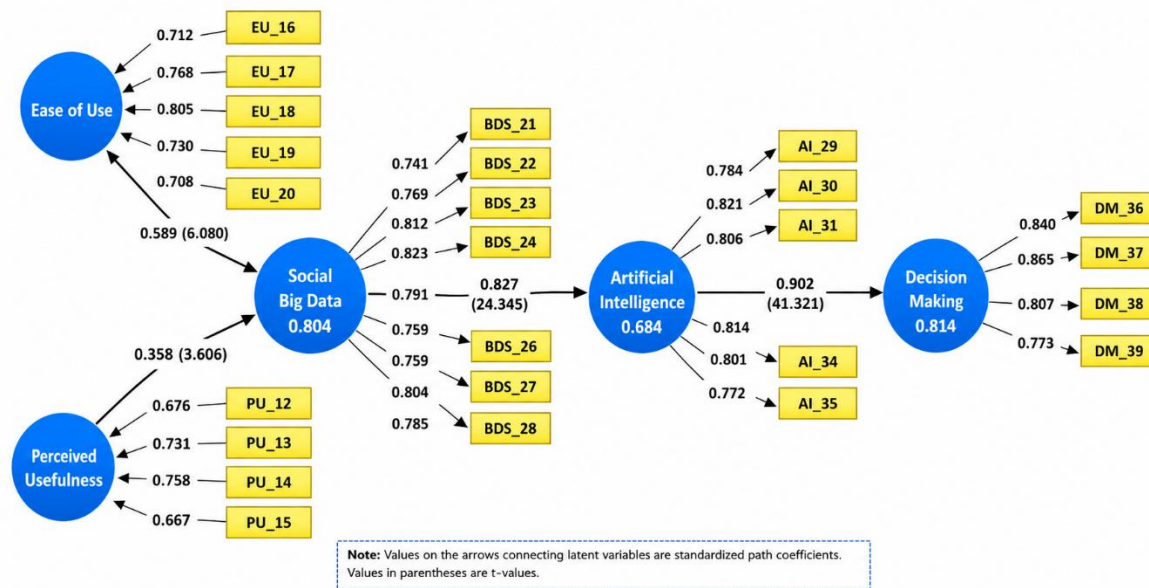


Figure 1. Structural Equation Model

Conclusion

Perceived ease of use and perceived usefulness indicate that they have a positive effect on social big data. These independent variables explain the use of social big data by 80.4%. Artificial intelligence tools were 68.4% explained by social big data. On the other hand, social big data was found to be positively related to artificial intelligence tools. Decision-making is 81.4% explained by artificial intelligence tools. Through social media, users exchange opinions, satisfaction, or reactions to the products or services they buy or obtain. The greater the ease of use of social media, the greater the use of the social network by entrepreneurs. The usability of social media is when users or entrepreneurs find it effective and efficient to use the interfaces to make their content available for efficient interaction. This fact explains that as platforms such as Facebook, Instagram, LinkedIn, Messenger, Tik Tok, Twitter, WhatsApp and YouTube, improve the usability of their interfaces, the greater will be the adoption of these tools by entrepreneurs and users. The greater the ease of use of social media platforms, the greater the input and information generated in social big data. What this means is that when entrepreneurs observe greater ease of use of social media, they will adopt it more frequently for the production of more data.

The more interactions or navigation on the platform, the more information is produced to gain knowledge. The greater the amount of information in the Big data social platforms, the greater the intervention of artificial intelligence tools will be required to analyze the information. The large amount of data generated in social networks by the interaction of users either by comments, sharing information, choosing "like", or performing searches, is what is called Big social data, to process this amount of information, artificial intelligence tools are used, which allow entrepreneurs to obtain valuable information and knowledge to make decisions in the company. The greater the amount of social big data, the greater the use and implementation of artificial intelligence tools. This means that when entrepreneurs use social networks more frequently, they generate a greater amount of data to generate social big data. The more information there is, the greater the implementation or use of artificial intelligence, either through algorithms for recommendations and preferences, "chat boots", suggestions or others.

The use of artificial intelligence tools in the analysis for decision making provides several advantages, such as the automation of various processes, quickly classifying information, identifying patterns, analyzing in real time and predicting results. The greater the complexity of the analysis for decision making, the more artificial intelligence tools will be required for the analysis of information for the transformation of knowledge for business decision making. The implementation of artificial intelligence helps to perform a more accurate analysis and fewer errors.

The findings of this study extend the understanding of how social big data and artificial intelligence jointly support entrepreneurial decision-making. By validating an integrated research model, this study demonstrates that perceived ease of use and perceived usefulness encourage the adoption of social big data, which serves as a critical enabler of AI implementation and more effective business decisions. From a practical perspective, the results provide guidance for entrepreneurs and organizations seeking to leverage AI-driven analytics to improve customer insights, identify market trends, and support faster, data-driven strategic decisions. From a theoretical perspective, this research contributes to the information systems literature by providing empirical evidence of the relationships among technology acceptance, social big data, AI adoption, and business decision-making within digital entrepreneurship.

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