International Journal of Artificial Intelligence & Machine Learning (IJAIML)
Volume 3, Issue 1, Jan-June 2024, pp. 102-112. Article ID: IJAIML_03_01_010
Available online at https://iaeme.com/Home/issue/IJAIML?Volume=3&Issue=1
Impact Factor (2024): 3.56 (Based on Google Scholar Citation)
Journal ID: 9339-1263

STUDYING OF EXPLORING BASED ON IMPACTS OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING ON ENTERPRISE RESOURCE PLANNING

Mohan Kunkulagunta
Research Scholar, Department of Computer Science,
B.E.S.T University, Anantapur, Andhra Pradesh, India.

ABSTRACT

Companies are not fully using Artificial Intelligence (AI) or Machine Learning (ML), which is the most well-known form of AI. This is especially true in marketing, where it can be used for more than just segmenting, personalizing, and making decisions. Two distinct strategic and behavioral vantage points are considered when discussing the role of AI and ML in marketing: that of marketers themselves (the "inside" perspective) and that of consumers (the "outside" perspective). Both the drivers and the barriers to the broad adoption of AI and ML in marketing can be better understood in light of this. We use a mixed-method approach that includes a Delphi study, surveys, and two focus groups to come up with research questions. These questions address the problems that marketing managers and organizations face in three areas: (1) Culture, Strategy, and Implementation; (2) Decision-Making and Ethics; and (3) Customer Management. Our goal in publishing these findings is to spark new lines of inquiry in several disciplines, including marketing, organizational behavior, psychology, and ethics. We can learn more about the human element of AI and ML from them as well.

Key words: Artificial Intelligence (AI) or Machine Learning (ML), ERP

Cite this Article: Mohan Kunkulagunta. Studying of Exploring Based on Impacts of Artificial Intelligence & Machine Learning on Enterprise Resource Planning. *International Journal of Artificial Intelligence & Machine Learning (IJAIML)*, 3(1), 2024, pp. 102-112.

https://iaeme.com/MasterAdmin/Journal_uploads/IJAIML/VOLUME_3_ISSUE_1/IJAIML_03_01_010.pdf

1. INTRODUCTION

The positive impacts that Machine Learning (ML) and AI in general can have across a variety of industries are attracting a lot of interest. Machine learning and artificial intelligence are discovering a plethora of real-world applications across distinct industries. Such examples include their usage in mental health monitoring and improvement (D'Alfonso, 2020; Bragazzi et al., 2020), in education for learning enhancement (e.g., Kumar, 2019; Mirchi et al., 2020), and in agriculture for better harvests and less hunger (Dharmaraj & Vijayanand, 2018). AI and ML have been found to have a number of negative impacts, including violations of data privacy, fears of job replacements, and even a reduction in well-being (Etkin, 2016). These negative effects are in addition to the positives that they offer. It appears that understanding what AI and ML should achieve, rather than what they can actually perform, is crucial to their overall beneficial impact (Bittu, 2018). To fulfill the requirements of users, artificial intelligence and machine learning must be deployed in a way that enhances human talents rather than replacing them

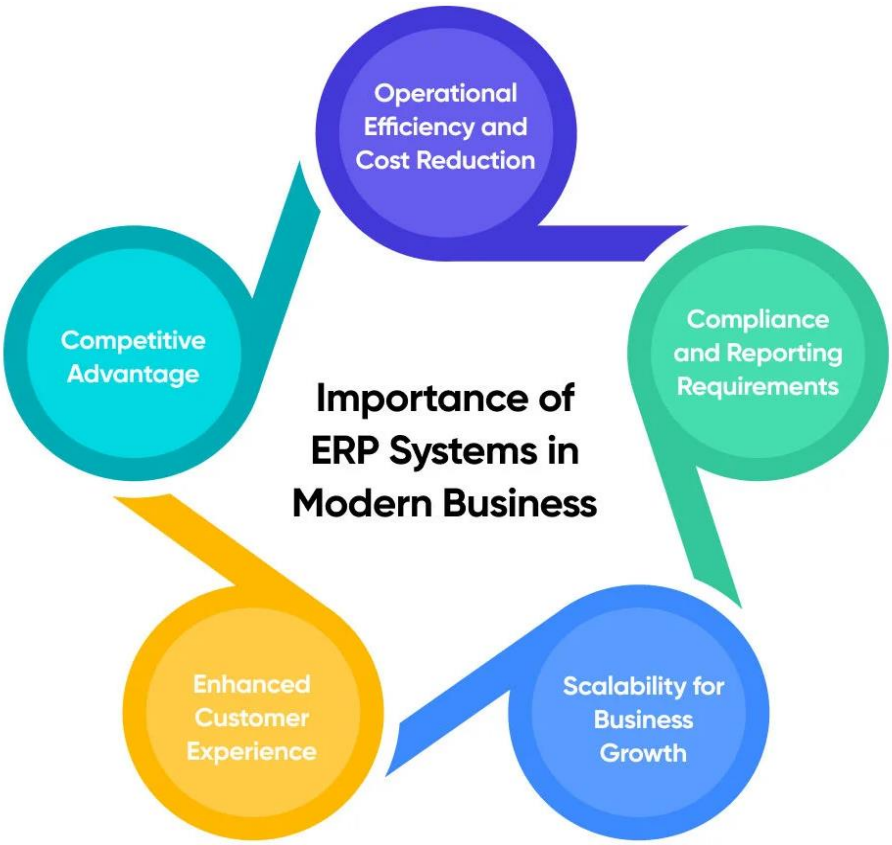

Fig 1: Importance of ERP systems in modern business

The current corporate climate is characterized by intense rivalry and rapid change, making the use of Enterprise Resource Planning (ERP) systems crucial. (ERP) stands for enterprise resource planning. The operational landscape of businesses in a wide range of industries is significantly influenced by these highly developed software solutions, which play a crucial role in developing them.

Before we delve into the ever-evolving trends in enterprise resource planning (ERP) systems, it is essential to appreciate the reasons why ERP systems are necessary for contemporary enterprises.

- **Operational Efficiency and Cost Reduction**: It is the capacity of enterprise resource planning (ERP) systems to simplify complicated procedures, get rid of redundant tasks, and maximize the utilization of available resources. The final result? A large decrease in expenses and a notable improvement in the operational effectiveness of the business system. ERP systems have emerged as the most important factor in the success of organizations in this day and age, where efficiency and cost-effectiveness are the most important factors.
- **Competitive Advantage**: The modern corporate environment is constantly shifting, and the level of competition is extremely high. Companies that are equipped with ERP systems that have been deployed effectively are the ones that stand out. These technologies give businesses the ability to make decisions quickly and with an accurate understanding of the situation. In addition, enterprise resource planning (ERP) solutions offer important insights into corporate operations, which enables firms to develop data-driven strategies that differentiate them from their competitors.
- **Compliance and Reporting Requirements**: The healthcare and financial industries are two examples of industries that have adopted stringent industry norms and reporting standards as the norm. In order to ensure that firms conform to these standards and to streamline compliance processes, enterprise resource planning (ERP) solutions play a vital role. ERP systems, which are used for enterprise resource planning, reduce the likelihood of regulatory violations and the penalties that are associated with them. This is accomplished by automating tasks and tracking data that are related to compliance.
- **Scalability for Business Growth**: Companies should strive for growth as their ultimate objective; but, growth also brings with it the difficulty of scalability. Companies want systems that are able to adapt to their ever-changing requirements in a smooth manner as they grow. In order to support business expansion, enterprise resource planning (ERP) systems are purpose-built. This ensures that processes continue to be efficient and effective, regardless of whether a firm is expanding its operations or diversifying its operations.
- **Enhanced Customer Experience**: Making ensuring customers are satisfied is essential to a business's success. The overall customer experience can be improved in a variety of different ways by implementing enterprise resource planning (ERP) systems. These features make it possible to reply to inquiries from customers in a more timely manner, to increase the amount of product tracking that is done, and to improve connecting with customers. As a consequence of this, businesses have the opportunity to strengthen their relationships, increase their degree of brand loyalty, and acquire a competitive advantage in the market.

According to Huang and Rust (2021), there is a great deal of potential for marketers to utilize AI and ML technologies to automate processes, improve market forecasting, and aid managerial decision-making. The supply of real-time personal recommendations, the development of services, and the production of unique replies to consumers' wants are additional ways apps can provide value (Davenport et al., 2020; Rust, 2020). Research on the technical capabilities of AI and ML in marketing is abundant, but there is a lack of knowledge when it comes to the human perspective, particularly from the perspective of a marketing manager.

2. LITERATURE REVIEW

Both TF&SC and its predecessor, Technology Forecasting, have published AI-based articles. This section provides a perspective on both publications. It is clear from a thorough examination of the articles that have been published in TF&SC that artificial intelligence has had an impact on several facets of human existence, society, and corporate enterprises. In general, artificial intelligence has had the same impact on individuals as it has on companies. (D. Sivabalaselvamani, et. al,. 2024) Artificial intelligence has revolutionized production at the organizational level, making it more intelligent and eco-friendly (Zeba et al., 2021).

Smart agents, expert systems, blockchain, big data analytics, and the Internet of Things are all highlighted by the revolutionary implications of artificial intelligence on production within the context of Industry 4.0.According to Truong and Papagiannidis (2022), artificial intelligence (AI) provides assistance to enterprises across the entire innovation process, which includes concept generation, idea screening, experimentation, and, finally, the development and commercialization of an idea. (Hari Gonaygunta, Pawankumar Sharma, (2021) Furthermore, decision-making, recruiting, and customer relationship management are among the crucial tasks that firms have started to hand off to artificial intelligence (Allal-Chérif, 2022).

In the context of medical services, it was mentioned that artificial intelligence may make predictions about potential difficulties and discover strategies to deal with unforeseen circumstances. (Sri Charan Yarlagadda 2023) In a similar vein, it has been proven that artificial intelligence enables businesses to recognize trends in the vast amounts of data that customers submit and to present them with the most effective answers to their questions. (B. Nagaraj et. al,. 2023) At the individual level, artificial intelligence has had an impact on virtually every service that customers use, including healthcare, retailing, and providing assistance to retired individuals and people with disabilities (Vieira et al., 2022).

Relatively recent research has demonstrated that the combination of human-like characteristics and technology characteristics of artificial intelligence leads to para-social interactions and smart-shopping impressions among consumers. Nadella, G. S. (2023). In a similar vein, it was mentioned that artificial intelligence applications are being used to deliver enhanced healthcare services.(Madhawa Herath, et. al., 2023)

In contrast, the literature has also addressed the negative implications of AI applications. For example, according to Walton and Nayak (2021), some academics are worried about the possible negative impact of AI on the job market, especially for individuals lacking in knowledge. Ramya Manikyam (2016). People will be forced to acquire new skill sets in the future as a result of the tremendous labor displacement that will occur in the future. R. Manikyam (2019). In addition, the excessive use of artificial intelligence is causing a number of ethical and trust difficulties to emerge, both on the level of organizations and on the level of individuals.(Sri Charan Yarlagadda 2023) Sharingef et al. (2021) argued that a clear set of regulations and guidelines for AI and other technologies would help increase public trust in these fields. (Gonaygunta, Hari. 2023) It is clear from the literature that AI has been significantly developed and used in many different areas, including business, society, and individual lives. (Hari Gonaygunta, Pawankumar Sharma, (2021) Having a cohesive view of the information's conceptual and intellectual framework is crucial for developing a future agenda that addresses the far-reaching effects of AI on individuals, businesses, and society. (Amol Kulkarni 2023).

3. METHODOLOGY

To prevent misunderstandings, it is important for the people who participated in the Delphi study to have at least a basic comprehension of the fundamental ideas. As a result of this, we came to the conclusion that we should improve the AI framework, make it available to all of

the specialists, and use it as a starting point for our Delphi study without limiting the breadth of the probe. AI methodologies, AI capabilities, and AI applications are all included in the framework, which also establishes connections between them (Fig. 2). Machine learning techniques are utilized in order to process and organize various kinds of data. The majority of the work is based on machine learning, which is a core subfield of artificial intelligence (AI approaches include statistical methods to endow computer programs and systems with the ability to learn or acquire new knowledge).

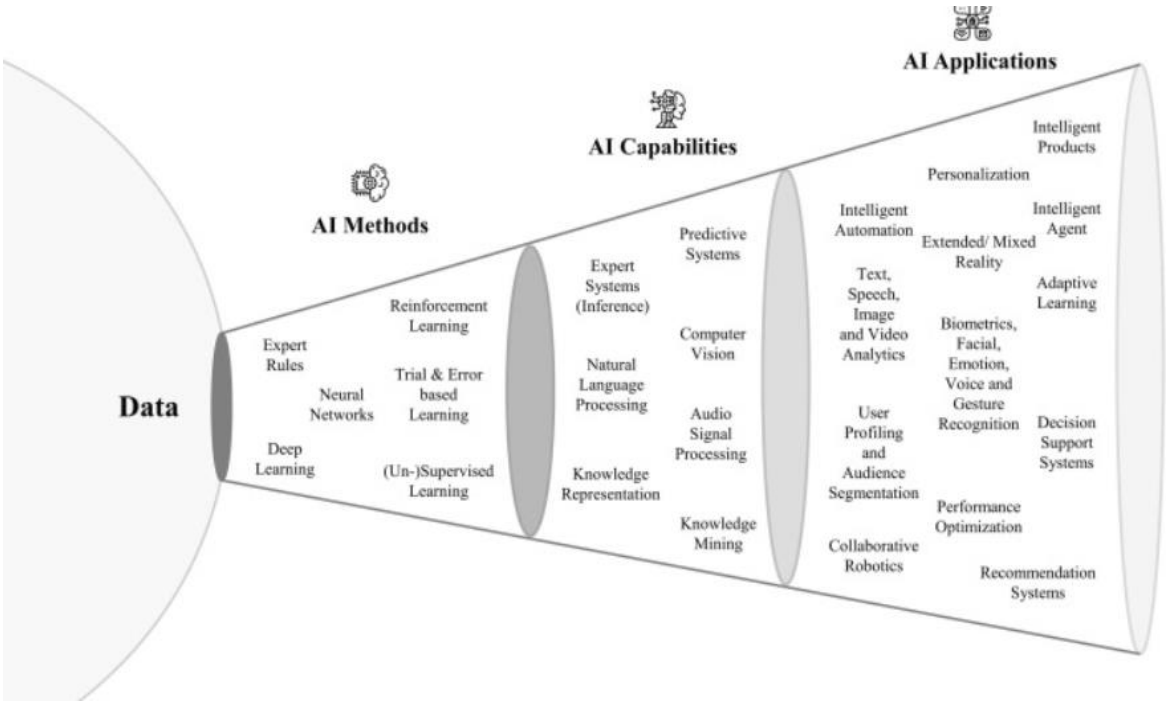

Fig. 2. AI and ML Framework

3.1 Data collection and procedure

Interviews lasted anywhere from thirty to ninety minutes (mean = forty-two minutes, standard deviation = fifteen minutes). They adhered to a guideline that was only semi-structured in order to facilitate the emergence of innovative ideas and concepts. For the purpose of minimizing interviewer bias, we utilized three interviewers who came from a variety of backgrounds, including business administration, psychology, and engineering/technology among others. For the purpose of ensuring that interviewers are competent in the subject matter, our literature study was reviewed. Interviews started off with broad questions on the trends, possibilities, and issues that are associated with artificial intelligence and machine learning in marketing. The next step was for them to concentrate on the elements, including ethical concerns, that influence the decision-making process of managers.

An extended framework for artificial intelligence and machine learning was offered to the experts, which served as a common platform for discussion after the framework was explained. Transcripts were compiled after interviews were taped with the participants' consent (which could be revoked after the interview). The emphasis of their attention shifted depending on the responses, which is typical of semi-structured qualitative research methods. Throughout the process of data gathering, we made adjustments to the interview guide as well as the AI and ML architecture in order to include the insights that were obtained.

3.2 Functionalities enhanced by ML in ERP

As a means of laying the foundation for a more in-depth investigation, we investigate the particular functionality inside ERP that the use of ML has enhanced. An essential machine learning algorithm would be utilized by ERP systems in order to automate processes that are both repetitive and time-consuming. Several applications exist for machine learning algorithms inside an enterprise resource planning (ERP) system. Some of these applications include production recommendation engines, inventory management, and quality control. Automation of these kinds of procedures through the use of machine learning algorithms that are implemented into an ERP system can help businesses save time, remove errors, and improve the process overall.

4. DEVELOPING AND VALIDATING MARKETING STATEMENTS REGARDING AI AND ML

It is an iterative procedure to gather and summarize the knowledge and views of participants in Delphi research before sharing this information with a group of peers. It is possible for expert panels to alter their initial ideas and opinions throughout the process of numerous rounds of data collecting and feedback. Anoymizing specialists reduces the likelihood of conflict between opposing viewpoints and makes it possible to acquire a variety of perspectives on a certain subject. Following the completion of each round, the researcher will update and compile the responses, evaluations, and reasons provided by the experts. In order to accomplish this, it is necessary to collect the thoughts and insights of experts and to generate unique viewpoints that are converging on an interdisciplinary subject. As a result, Delphi studies, which are well-suited to exploratory research with various facets, allow for multiple viewpoints to be considered without enabling a single opinion to take the lead. All of these are essential needs for our investigation.

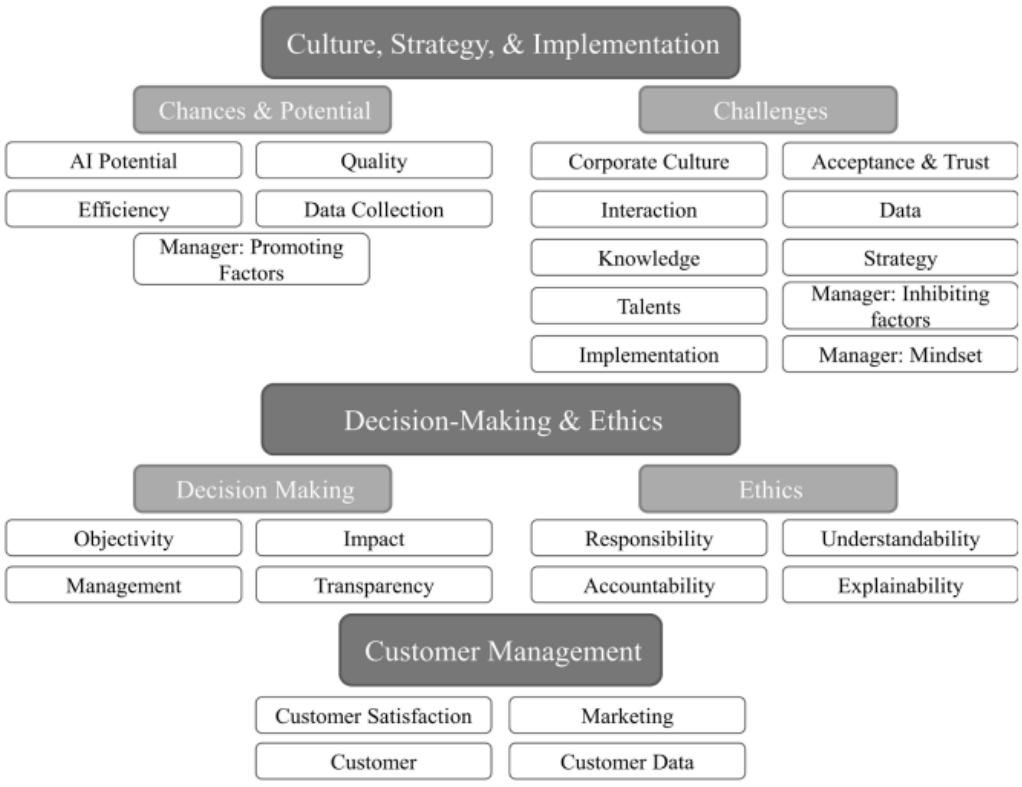

Fig. 3. Coding Categories.

In the beginning, we compiled and arranged the assertions made by the specialists. We discovered and categorized second-order concepts, such as "Efficiency" and "Corporate Culture," by following a procedure that was iterative in nature. Step two involved merging these groups into two new superordinate dimensions we called "Chances and Potential" and "Challenges." Finally, we took a rigorous look at certain traits (typification) and looked into the topics and ideas that came out as a result of our inquiry. Three final overarching themes emerged from this grouping and thematic overlaps; we used these to categorize the situational statements: For a more detailed description, see Figure 3. First, CSI (Culture, Strategy, and Implementation); second, DME (Decision-Making and Ethics); and third, CM (Customer Management).

4.1 Managerial Contributions

4.1.1 Inward Perspective

Managers' lower tolerance for AI/ML failures compared to human ones is not exclusive to numerical and objective tasks, and organizations should be aware of this. In order to overcome managers' critical evaluations of AI and ML, businesses must first determine if managers are waiting for AI and ML to fail or if they have unreasonable expectations of the technology. To attain a more balanced perspective on AI/ML, separate approaches are necessary for the two mechanisms. When it comes to the former, businesses can institute training programs that help managers become more knowledgeable about AI and ML so they can recognize its limitations, curb their optimism, and set reasonable expectations. In terms of the second, cultural difficulties are a real possibility in most organizations. Similar to Stitch Fix, they should encourage productive interactions between humans and machines so that AI and ML are seen as enhancing rather than replacing managers' jobs. This will help avoid defensive decision-making, which is a result of a blame-AI mentality.

In addition, our findings show that companies should think twice about how much data they provide to decision-makers. AI and ML results ought to be customized. Our findings highlight the significance of hierarchy level in this context, even when preferences are subjective: Middle managers are more interested in probability and reasoning through possible courses of action, while top managers seek clear decisions. Last but not least, businesses should be cognizant that human bias is inherent in the majority of algorithms. This bias typically manifests itself during the AI system development process (e.g., when biased training data is chosen) and becomes more pronounced when AI/ML results are understood. Therefore, it is crucial to receive objective training data and to evaluate AI/ML decisions sensibly.

4.1.2 Outward Perspective

From an internal viewpoint, operational excellence and efficiency can be enhanced with the use of artificial intelligence and machine learning. However, from an external standpoint, they should also improve the consumer experience. It is imperative that businesses comprehend the fact that the enhancement of customer experience and operational efficiency can generate tensions, resulting in the need for delicate tradeoffs. For instance, as demonstrated, chatbots that are powered by artificial intelligence and machine learning should not be viewed solely as a means of reducing the amount of work that employees have to do. Instead, they should be viewed as a means of (1) improving the customer experience through the use of a new channel and (2) enhancing critical face-to-face customer touchpoints by allowing employees to devote more time to such interactions. When approaching AI and ML from a comprehensive strategic viewpoint, businesses need to take into account both the internal and external aspects of these technologies. In a similar vein, given that the availability of data is a necessary condition for the effective implementation of machine learning and artificial intelligence, one of the most

significant challenges that businesses will face is the task of treating and storing data in a responsible and secure manner, as well as persuading customers to enable access to their data. In this regard, our study indicates that businesses require a strategy that is open and honest.

CONCLUSION

The purpose of this study was to uncover broad themes and aspects, as well as research propositions, with the ultimate goal of stimulating additional innovative research designed to improve enterprises' approach to artificial intelligence. Though we want for our thirteen research proposals to suggest avenues for future investigation, we have identified four areas of inquiry that may prove to be of immediate and paramount importance: First, it seems like managers don't have much of a tolerance for AI and ML failing. This could be because they're defensive rather than having unrealistic expectations, but as these technologies advance, it would be interesting to see if giving managers more freedom to make mistakes or letting them blame AI lessens the blame culture and increases the tolerance for AI and ML failing. Second, the fact that experts continued to be cautious about the possibility of minimizing human bias in artificial intelligence and machine learning demonstrates the necessity for data scientists, psychologists, and specialists in artificial intelligence technology to work together to address this complex problem. Third, it is necessary for future study to investigate the roles that humans and artificial intelligence play in significant matters such as decision-making. In particular, we need to think about whether we prefer AI to have a low or high agentic role, and what factors may be key in determining this. In the end, it's up to future studies to raise consciousness of the tensions between internal and external goals and to unearth them. Furthermore, it would be beneficial for future research to explore methods of combining AI and ML to achieve better operational efficiency and customer experience.

REFERENCES

[1] N. Bragazzi, H. Dai, G. Damiani, M. Behzadifar, M. Martini, J. WuHow Big Data and Artificial Intelligence Can Help Better Manage the COVID-19 Pandemic. International Journal of Environmental Research and Public Health, 17 (9) (2020), pp. 1-8

[2] S. D'AlfonsoAI in Mental HealthCurrent Opinion in Psychology, 36 (6) (2020), pp. 112-117

[3] Kim, T., Ruensuk, M., & Hong, H. (2020). In Helping a Vulnerable Bot, You Help Yourself: Designing a Social Bot as a Care-Receiver to Promote Mental Health and Reduce Stigma. CHI Conference on Human Factors in Computing Systems, 1-13.

[4] N.S. KumarImplementation of Artificial Intelligence in Imparting Education and Evaluating Student PerformanceJournal of Artificial Intelligence, 1 (1) (2019), pp. 1-9

[5] N. Mirchi, V. Bissonnette, R. Yilmaz, N. Ledwos, A. Winkler-Schwartz, R. Del Maestro The Virtual Operative Assistant: An Explainable Artificial Intelligence Tool for Simulation-Based Training in Surgery and Medicine PLoS ONE, 15 (2) (2020).

[6] V. Dharmaraj, C. Vijayanand Artificial Intelligence (AI) in Agriculture International Journal of Current Microbiology and Applied Sciences, 7 (12) (2018), pp. 2122-2128

[7] J. Etkin The Hidden Cost of Personal Quantification Journal of Consumer Research, 42 (6) (2016), pp. 967-984

[8] Bittu, K. (2018). How Microsoft, Google, AWS and Facebook Are Battling to Democratize AI for Developers. Retrieved from https://www.bestdevops.com/how-microsoft-google-aws-and-facebook-are-battling-to-democratise-ai-for-developers/, Accessed March 1, 2021.

[9] M.H. Huang, R.T. Rust A Strategic Framework for Artificial Intelligence in Marketing Journal of the Academy of Marketing Science, 49 (1) (2021), pp. 30-50

[10] T. Davenport, A. Guha, D. Grewal, T. Bressgott How Artificial Intelligence Will Change the Future of Marketing Journal of the Academy of Marketing Science, 48 (1) (2020), pp. 24-42

[11] R.T. Rust The Future of Marketing International Journal of Research in Marketing, 37 (1) (2020), pp. 15-26

[12] Gonaygunta, Hari, Factors Influencing the Adoption of Machine Learning Algorithms to Detect Cyber Threats in the Banking Industry, DAI-A 85/7(E), Dissertation Abstracts International, Ann Arbor, United States, ISBN 9798381387865, 142, 2023.

[13] Nadella, G. S. (2023). Validating the Overall Impact of IS on Educators in U.S. High Schools Using IS-Impact Model – A Quantitative PLS-SEM Approach, DAI-A 85/7(E), Dissertation Abstracts International, Ann Arbor, ISBN 9798381388480, 189, 2023.

[14] Hari Gonaygunta (2023) Machine Learning Algorithms for Detection of Cyber Threats using Logistic Regression, 10.47893/ijssan.2023.1229.

[15] Hari Gonaygunta, Pawankumar Sharma, (2021) Role of AI in product management automation and effectiveness, https://doi.org/10.2139/ssrn.4637857

[16] R Pulimamidi, GP Buddha, Applications of Artificial Intelligence Based Technologies in The Healthcare Industry, Tuijin Jishu/Journal of Propulsion Technology 44 (3), 4513-4519.

[17] R Pulimamidi, GP Buddha, AI-Enabled Health Systems: Transforming Personalized Medicine And Wellness, Tuijin Jishu/Journal of Propulsion Technology 44 (3), 4520-4526.

[18] R Pulimamidi, P Ravichandran, Connected Health: Revolutionizing Patient Care Through Artificial Intelligence Innovations, Tuijin Jishu/Journal of Propulsion Technology 44 (3), 3940-3947.

[19] R Pulimamidi, P Ravichandran, Enhancing Healthcare Delivery: AI Applications In Remote Patient Monitoring, Tuijin Jishu/Journal of Propulsion Technology 44 (3), 3948-3954.

[20] P Kanagala, Effective cyber security system to secure optical data based on deep learning approach for healthcare application, Optik 272, 170315.

[21] P Kanagala, Implementing cryptographic-based DH approach for enterprise network, Optik 272, 170252.

[22] P Kanagala, R Jayaraman, FAA-Cloud approach to minimize computation overhead using fuzzy-based crypto security, Soft Computing, 1-11.

[23] P Kanagala, R Jayaraman, Effective encryption approach to improving the secure cloud framework through fuzzy-based encrypted cryptography, Soft Computing, 1-10.

[24] Ramya Manikyam, J. Todd McDonald, William R. Mahoney, Todd R. Andel, and Samuel H. Russ. 2016.Comparing the effectiveness of commercial obfuscators against MATE attacks. In Proceedings of the 6th Workshop on Software Security, Protection, and Reverse Engineering (SSPREW'16)

[25] R. Manikyam. 2019.Program protection using software based hardware abstraction.Ph.D. Dissertation.University of South Alabama.

[26] B. Nagaraj, A. Kalaivani, S. B. R, S. Akila, H. K. Sachdev, and S. K. N, "The Emerging Role of Artificial intelligence in STEM Higher Education: A Critical review," International Research Journal of Multidisciplinary Technovation, pp. 1–19, Aug. 2023, doi: 10.54392/irjmt2351.

[27] D. Sivabalaselvamani, K. Nanthini, Bharath Kumar Nagaraj, K. H. Gokul Kannan, K. Hariharan, M. Mallingeshwaran, Healthcare Monitoring and Analysis Using ThingSpeak IoT Platform: Capturing and Analyzing Sensor Data for Enhanced Patient Care, IGI Global eEditorial Discovery, Pages: 25, 2024. DOI: 10.4018/979-8-3693-1694-8.ch008

[28] Sri Charan Yarlagadda, Role of Artificial Intelligence, Automation, and Machine Learning in Sustainable Plastics Packaging markets: Progress, Trends, and Directions, International Journal on Recent and Innovation Trends in Computing and Communication, Vol:11, Issue 9s, Pages: 818–828, 2023.

[29] Sri Charan Yarlagadda, The Use of Artificial Intelligence and Machine Learning in Creating a Roadmap Towards a Circular Economy for Plastics, International Journal on Recent and Innovation Trends in Computing and Communication, Vol:11, Issue 9s, Pages: 829-836, 2023.

[30] Amol Kulkarni, Amazon Athena Serverless Architecture and Troubleshooting, International Journal of Computer Trends and Technology, Vol, 71, issue, 5, pages 57-61, 2023.

[31] Amazon Redshift Performance Tuning and Optimization,International Journal of Computer Trends and Technology, vol, 71, issue, 2, pages, 40-44, 2023.

Citation: Mohan Kunkulagunta. Studying of Exploring Based on Impacts of Artificial Intelligence & Machine Learning on Enterprise Resource Planning. International Journal of Artificial Intelligence & Machine Learning (IJAIML), 3(1), 2024, pp. 102-112.

Article Link:
https://iaeme.com/MasterAdmin/Journal_uploads/IJAIML/VOLUME_3_ISSUE_1/IJAIML_03_01_010.pdf

Abstract Link:
https://iaeme.com/Home/article_id/IJAIML_03_01_010

✉ **editor@iaeme.com**