

# The Future of Enterprise resource planning (ERP): Harnessing Artificial Intelligence

Gaurav Kumar

Maryland, USA

Email : [gka.gaurav@gmail.com](mailto:gka.gaurav@gmail.com)

## ARTICLE INFO

### Article History:

Accepted : 20 June 2024

Published: 05 July 2024

### Publication Issue

Volume 10, Issue 4

July-August-2024

### Page Number

94-99

## ABSTRACT

A large pharmaceuticals corporation utilizing a complex IT infrastructure such as SAP ERP typically faces a substantial volume GMP and Serialization data annually, numbering in the hundreds of thousands. These inquiries, whether initiated over the phone or online via platforms like integration, seek assistance with various issues. Enterprise resource planning (ERP) software streamlines business processes by integrating technology, services, and human resources across interconnected applications. This research proposes implementing an intelligent system to streamline volume of the data and analyzation for the SAP ERP. This system aims to automate responses to user queries, reducing the time required for issue investigation and resolution, and enhancing user responsiveness. Employing machine learning algorithms, the system efficiently interprets and classifies text across multiple categories, facilitating accurate question comprehension. Additionally, it utilizes a specialized framework to retrieve relevant evidence, ensuring the delivery of optimal responses. Furthermore, its conversational AI capabilities enable the creation of chatbots, fostering collaborative problem-solving among user groups in real-time.

Keywords: Artificial Intelligence, Implementation, SAP, ERP, System Application Product, Conversational AI, Chatbots

## I. INTRODUCTION

In recent decades, significant technological advancements have led to the development of powerful computers that are not only more compact but also more cost-effective than ever before.

Consequently, sophisticated mathematical tools have become increasingly accessible to businesses. These tools, commonly referred to as "intelligent technologies," empower companies to delve deeper into their existing data reservoirs, enabling them to extract valuable insights and conduct thorough

analyses [1]. By leveraging algorithms and automation, businesses can augment their manual processes with digital and automated alternatives.

The term "digital transformation" denotes the shift from traditional manual workflows to digital processes within an organization. As a leading software provider, SAP has been at the forefront of this industry trend, integrating "smart" and intelligent technologies into its product offerings and functionalities. By embedding AI and machine learning capabilities into corporate systems, SAP assists clients in automating repetitive tasks and discovering innovative digital solutions. Rather than relying on explicitly programmed rules, these technologies leverage data organically. Integrated seamlessly into SAP applications, cloud infrastructure, and business networks, AI enhances the accessibility and usability of digital information across the entire enterprise [2, 3].

The software provided by SAP delivers a cloud-based machine learning platform that is tailored for enterprise use. Its user-friendly interface and seamless integration with SAP's suite of corporate software and machine learning tools make it a valuable asset for software developers. With this scalable and secure platform, developers can enhance corporate operations and applications by infusing them with intelligent capabilities.

## II. METHODS AND MATERIAL

### Various Digital Technologies:

SAP's suite of intelligent technologies and solutions comprises several crucial technologies that are platform-agnostic. These have the capability to help businesses achieve greater efficiency while simultaneously lowering costs.

### Internet of Things (IoT):

The term "Internet of Things" denotes a network of interconnected electronic devices and physical assets, facilitating communication and collaboration among them [4]. Consequently, various parties stand to benefit from this connectivity. In the realm of service provision, individuals and organizations involved in constructing and utilizing assets can greatly benefit from the feedback mechanisms enabled by IoT, such as insights into user behaviour, component wear, and maintenance requirements. Homeowners who have integrated IoT-enabled technology into their residences can streamline certain aspects of their daily routines. For instance, smart thermostats can learn from users' temperature adjustments over time and autonomously make these adjustments, eliminating the need for manual intervention [5].

### Artificial Intelligence (AI):

The term 'artificial intelligence' (AI) refers to the methodologies employed to imbue computers with human-like behavioural capabilities. AI has existed for many decades in various forms. For instance, automated phone directories have replaced traditional operators who used to connect calls to the appropriate department or individual. Moreover, online assistance portals such as Microsoft.com have integrated chatbots, which offer general assistance with problem-solving and provide links to relevant resources [6, 7]. Machine learning is centred around the identification and establishment of data relationships to aid stakeholders in making informed decisions. Machine learning algorithms can be configured to detect patterns and learn from data, enhancing their analytical prowess. These techniques are particularly valuable for processing large datasets where discernible patterns are not readily apparent.

## Blockchain

A distributed ledger technology, blockchain enhances transparency throughout the transactional process by leveraging a peer-to-peer network for its operations. The 2010s witnessed a surge in businesses adopting blockchain technology to enhance their capabilities in financial reporting [8]. Originating in the late 2000s with the creators of Bitcoin, blockchain technology gained mainstream recognition. Transactions on a blockchain are grouped into blocks, each block being hashed to establish a connection with its parent and any subsequent child blocks. Access to the ledger allows individuals to trace the origins and destinations of goods, providing a comprehensive overview of all ledger transactions. For instance, consumers interested in environmentally friendly food products may prefer companies utilizing blockchain to demonstrate the origins of their products, aligning with their ethical purchasing preferences [9, 10].

**SAP Intelligent Technologies Products:** Over the past decade, SAP has progressively augmented its product suite with "smart" functionalities. As early as 2008, customers could leverage solutions like SAP Predictive Analytics and Intelligent Services to analyse historical data and forecast future outcomes.

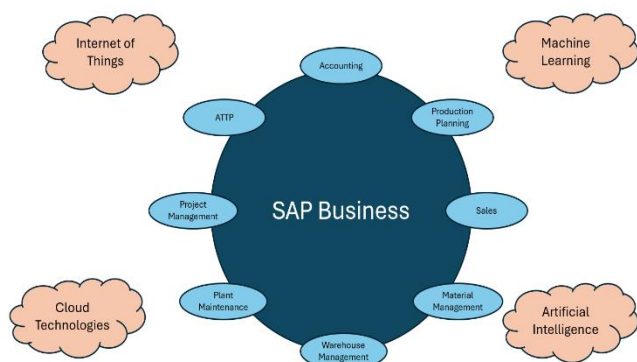


Figure 1: SAP System with digital technologies

## Intelligent Technologies Products provided by SAP

Over the past decade, SAP has consistently expanded the range of "smart" functionalities integrated into its product portfolio. Since as early as 2008, customers have been able to harness solutions like SAP Predictive Analytics and the Intelligent Services tool offered by SAP Success Factors to gather historical data and forecast future outcomes. This capability was achieved through the integration of SAP Success Factors and SAP Predictive Analytics, reflecting the ongoing evolution of available options [11]. The most recent release of SAP's business software, SAP S/4HANA, also incorporates intelligent technologies. For example, in 2017, machine learning capabilities were introduced to automate invoice assignment operations and simplify the reconciliation of goods receipts and invoices, thereby saving time.

Moreover, in 2018, SAP S/4HANA Finance introduced predictive accounting functionalities. The demand for intelligent technologies surged in the mid-2010s, leading SAP to develop the SAP Leonardo toolkit in 2017 [12]. This toolkit offers a comprehensive array of services covering various domains such as the Internet of Things (IoT), machine learning, analytics, blockchain, and big data. In 2019, SAP initiated the process of segmenting these services into individual research and development departments, each responsible for funding and conducting its own R&D activities. These components constitute the bulk of SAP's current offering of intelligent technology solutions, all developed and supplied by the company [13].

## Conversational AI by SAP

Formerly known as Recast.AI, this platform currently stands as the most popular AI bot platform for businesses. Alongside its world-class technology, SAP offers ready-made customer care bots and an end-to-end bot platform, aiming to spearhead the global

revolution in customer relations and enable intelligent organizations [9]. With over 30,000 developers and more than 60,000 bots, SAP possesses the capability to provide technology that competes with the best globally [14].

SAP Conversational AI can seamlessly integrate with various networks, including Facebook, Twitter, and Slack, to ensure smooth social connectivity. API integration serves as a method to achieve this objective. This marks the initial phase in the development of a digital assistant, aiding users in daily tasks by offering suitable action alternatives based on their location, context, and business environment. By analyzing these factors, the assistant enables users to search for company-related information or engage in discussions with industry experts to address existing issues. Users can create artifacts such as notes, objects, messages, screenshots, and quick actions based on the current screen context [15]. These artifacts can then be gathered, shared, and collaborated on with others.

Below are the features included in SAP Conversational AI:

- Digital Assistant: Recent advancements allow for interactions in natural language.
- Notes and Screenshots: Users can take screenshots and create notes within apps, providing the ability to revisit the app by clicking on the screenshot. Annotations can be added, and specific elements of the map can be concealed.
- Recognition of Business Objects: The system can identify business items within the context of the active application or those referenced in notes or conversations.
- In-Context Chat: Users can communicate with others while using business applications, with the Conversational AI framework serving as the foundation for developing chatbots.
- Train: Utilize natural language processing technology to develop intents and enhance the chatbot's language understanding.
- Build: With minimal data (around 20 sentences per intent), a functional bot can be created following rapid training. The bot's memory can be utilized to simulate human-like conversations.
- Connect: Integrate the bot with popular messaging channels such as Amazon Alexa, Teams, Twitter, and Slack. Additionally, establish a fallback channel for transferring conversations from the bot to a human agent if necessary.
- Test: Conduct ongoing testing to refine the bot without disrupting its existing functionality.
- Monitor: Utilize log feeds to monitor bot usage and analyze analytics to evaluate the performance of the bot's training dataset, facilitating continuous improvement.

### SAP Intelligent Technology-Based Solutions

- Business Entity Recognition Service: This service, powered by machine learning, analyzes unstructured documents submitted for processing, extracting relevant information and executing actions based on the extracted data.
- SAP AI Business Services: This platform enables organizations to integrate AI and machine learning capabilities into their business processes, facilitating streamlined operations. Hosted on the cloud, this technology is accessible to businesses.
- SAP Analytics Cloud: Providing data visualization, analytical tools, and strategic planning functionalities, the SAP Analytics Cloud is a Software as a Service (SaaS) solution accessible to users through SAP.
- SAP Blockchain Business Services: This platform enables a wide range of business entities to collaborate effectively by providing an open and

transparent architecture that ensures all parties have access to the same version of business data. It supports the creation of blockchain-based applications and integration of SAP HANA databases with external blockchains.

- SAP Conversational AI: Formerly known as SAP CoPilot, SAP Conversational AI enables software developers to create chatbots, or digital assistants, capable of engaging in conversations with users. This platform was enhanced with features acquired through the acquisition of Recast.ai in 2018.
- SAP Data Intelligence: This cloud-based solution brings together IT and data science teams within organizations to optimize the utilization of siloed data and leverage artificial intelligence and machine learning capabilities, fostering collaboration between these teams [16, 17].

### III. CONCLUSION

In artificial intelligence, one of the most daunting challenges is referred to as "question answering," which involves the ability to interpret questions posed by humans and provide suitable responses. This challenge falls within the domain of computer science known as quality assurance (QA), which centres on information retrieval and natural language processing. In contrast to publicly available QA systems, the following outlines a SAP ERP user support solution driven by automated methods. It delineates a clear architectural framework to facilitate the system's evolution by elucidating the primary phases involved: corpus creation, issue identification, and solution derivation.

To ensure a high level of accuracy in comprehending and responding to natural language queries, the system necessitates collaborative efforts from human experts. These efforts encompass tasks such as data preparation, knowledge database construction, text mining techniques, and the utilization of machine learning

algorithms for multi-class classification. The system's scalability extends to various closed-domain question answering challenges across different domains. However, it remains flexible enough to address a diverse array of problems.

### IV. REFERENCES

- [1]. Klaus, Helmut, Michael Rosemann, and Guy G. Gable. "What is ERP?." *Information systems frontiers* 2 (2000):141-162.
- [2]. Schank, Roger C. "What is AI, anyway?." *AI magazine* 8,no.4(1987):59-59.
- [3]. SAP penalty in Oracle suit is excessive, analyst says – Tomorrow Now, software, sap, oracle, IT industry, Government/Industries, government, applications. *Tec world*. Retrieved on 24 April 2011.
- [4]. Biddlecombe, E. (2009) UN Predicts "Internet of Things". Retrieved July 6.
- [5]. Internet of Things Agenda (2019), Available at: <  
<https://internetofthingsagenda.techtarget.com/definition/Internet-of-Things-IoT> >.
- [6]. Peng Y, Zhang Y, Wang L. Artificial intelligence in biomedical engineering and informatics: an introduction and review. *Artif Intell Med.* (2010) 48:71–3. doi: 10.1016/j.artmed.2009.07.007
- [7]. Topol EJ. A decade of digital medicine innovation. *Sci Trans Med.* (2019) 11:7610. doi: 10.1126/scitranslmed.aaw7610
- [8]. Zheng, Zibin, et al. "Blockchain challenges and opportunities: A survey." *International journal of web and grid services* 14.4 (2018): 352-375.
- [9]. Sung, Chang Soo, and Joo Yeon Park. "Understanding of blockchain-based identity management system adoption in the public sector." *Journal of Enterprise Information Management* 34.5 (2021): 1481-1505.
- [10]. Yang, Bingqing. "Prevention of business risks of internet information security platforms based on

- blockchain technology." *Computational Intelligence and Neuroscience 2022* (2022).
- [11]. Holcomb, Phillip J., Lindsay Reder, Maya Misra, and Jonathan Grainger. "The effects of prime visibility on ERP measures of masked priming." *Cognitive Brain Research* 24, no. 1 (2005): 155-172.
- [12]. Pomerol, Jean-Charles. "Artificial intelligence and human decision making." *European Journal of Operational Research* 99, no. 1 (1997): 3-25.
- [13]. Dash, Rupa, Mark McMurtrey, Carl Rebman, and Upendra K. Kar. "Application of artificial intelligence in automation of supply chain management." *Journal of Strategic Innovation and Sustainability* 14, no. 3 (2019): 43-53.
- [14]. Jurafsky D and Martin J H 2009 *Speech and Language Processing: An Introduction to Natural Language Processing, Speech Recognition, and Computational Linguistics* (2nd edition, Prentice-Hall).
- [15]. Kulikov, Alex (2022). "Chatbot Development on the Example of SAP Conversational AI." Master's Thesis. Technical University Munich.
- [16]. Lai S, Xu L, Liu K and Zhao J 2015 *Recurrent Convolutional Neural Networks for Text Classification* In *Proceedings of the Twenty-Ninth AAAI Conference on Artificial Intelligence* 333 p 2267–2273.
- [17]. Muro, Mark, Robert Maxim, and Jacob Whiton. "Automation and artificial intelligence: How machines are affecting people and places." (2019).