

SAP Joule with BTP Architecture: Empowering intelligent enterprises

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Abstract

SAP Joule is an innovative and groundbreaking generative AI assistant that has been seamlessly integrated into SAP's expansive cloud ecosystem. Launched in the year 2023, Joule utilizes advanced natural language processing techniques along with large language models to significantly enhance and transform various business operations. These operations span critical areas such as finance, procurement, supply chain management, human resources, and customer experience.

This article aims to provide a comprehensive overview of Joule's diverse capabilities, detailing how it integrates with the SAP Business Technology Platform (BTP) to create a cohesive and efficient user experience. Furthermore, it will explore the real-world applications of Joule, illustrating how it empowers organizations to drive intelligent enterprises forward and achieve greater operational efficiency and effectiveness.

Keywords: SAP Joule With BTP Architecture; Enabling Intelligent Enterprises; SAP Joule on BTP Framework; Empowering Smart Businesses; SAP Joule Integrated with BTP, Driving Enterprise Intelligence

1. Introduction

In today's rapidly changing enterprise landscape, artificial intelligence (AI) has emerged as a fundamental cornerstone of digital transformation initiatives. A prominent example of this evolution is SAP Joule, which was introduced in September 2023. SAP Joule serves as a generative AI copilot that is seamlessly embedded within SAP's extensive cloud portfolio. This innovative tool empowers users by simplifying complex operations, providing intelligent recommendations tailored to specific needs, and optimizing workflows across a diverse range of domains, including human resources (HR), software development, and procurement processes. [7]

This paper delves into the comprehensive functionality of SAP Joule, highlighting its seamless integration with the SAP Business Technology Platform (BTP). Furthermore, it presents practical use cases that illustrate the substantial impact of SAP Joule on enhancing intelligent enterprise operations. By leveraging the capabilities of this generative AI copilot, organizations can significantly improve efficiency, drive innovation, and achieve a higher level of operational excellence across their various business functions.[7]

2. Literature review: sap joule: practical applications in the sap landscape

SAP Joule represents a significant advancement in enterprise artificial intelligence by integrating natural language understanding and generative capabilities throughout the various SAP Cloud solutions. Functioning as an AI copilot, Joule enhances user experience by effectively interpreting user queries, analyzing the contextual information surrounding those queries, and providing actionable insights that can drive decision-making and improve operational

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efficiency. This innovative approach not only streamlines interactions with SAP systems but also empowers users to leverage AI-driven insights for enhanced productivity and strategic planning within their organizations. [1]

In the realm of Human Resources, Joule offers a robust and seamless integration with SAP SuccessFactors, which significantly enhances the way employees interact with HR policy documents through conversational interfaces. This advanced integration empowers employees to efficiently execute a wide array of administrative tasks while addressing their HR inquiries in a timely and effective manner. By leveraging Joule's user-friendly interface, routine HR activities such as approving time-off requests, updating personal information, and managing HR workflows are streamlined to a remarkable extent. [5,6]

This transformation not only boosts operational efficiency but also greatly improves the overall employee experience by ensuring quick and easy access to essential HR functions. Such accessibility fosters a more engaged and satisfied workforce, as employees can easily navigate their HR needs without unnecessary delays or complications. The ability to interact with HR processes through intuitive conversational interfaces encourages a more dynamic relationship between employees and the HR department, ultimately leading to higher productivity and a more positive workplace culture.[4]



Figure 1 SAP Joule application in SAP Landscape [3]

In the dynamic and ever-evolving field of software development, Joule plays an essential and pivotal role in providing robust support to developers who utilize SAP Build Code. It accomplishes this by efficiently generating code snippets and extensions that are meticulously aligned with SAP's Clean Core strategy. This strategic integration is not merely a technical enhancement; it significantly simplifies the development process, making it more streamlined and user-friendly. Furthermore, it encourages the side-by-side extensibility of SAP S/4HANA Cloud, which is a critical feature for modern enterprises.

As a result of these capabilities, developers experience a substantial improvement in both the agility and the overall quality of the custom business applications they create. This enhanced agility allows for quicker adaptations to changing market demands and business needs, while the focus on quality ensures that the solutions developed are not only functional but also reliable and efficient. Ultimately, this empowers developers to craft innovative solutions that are increasingly attributed to the evolving requirements of businesses, thereby driving growth and success in a competitive landscape. [4,6,5]

The leading SAP managed services provider, Industry, has achieved a remarkable milestone by successfully migrating more than 25% of its diverse client base to the advanced SAP S/4HANA platform. This significant accomplishment not only showcases the substantial adoption of SAP's latest technologies but also reflects Industry's unwavering commitment to staying at the forefront of digital transformation in the industry. By leveraging their extensive expertise in SAP solutions, Industry enables organizations to effectively harness the powerful capabilities of SAP S/4HANA, which in turn helps to optimize their operations and drive meaningful innovation across various business processes. [5,8]

The transition to SAP S/4HANA represents a pivotal opportunity for Industry's clients, enabling them to harness a wide array of benefits that include significantly improved performance, enhanced analytics capabilities, and streamlined operational processes. This transition is particularly noteworthy, as it equips organizations with the ability to leverage real-time data and sophisticated analytics tools, which in turn fosters better decision-making and enhances their responsiveness to the ever-evolving market dynamics. [9,10]

By migrating to SAP S/4HANA, Industry's clients can take advantage of advanced features such as integrated analytics and machine learning capabilities, which empower them to gain deeper insights into their business operations. This not only allows for more informed strategic planning but also enables a more agile response to changing customer demands and market conditions. Furthermore, the streamlined processes inherent in SAP S/4HANA reduce operational complexity, allowing organizations to focus on their core competencies while achieving greater efficiency. [7,5,8]

As a specialist in converting SAP customers from SAP ECC to SAP S/4HANA, Industry has successfully assisted numerous clients in this transition, ensuring they are well-prepared to fully exploit the capabilities of SAP S/4HANA. With more than a quarter of Industry's customers already running SAP S/4HANA as of April 2022, the benefits of this transition are clear, positioning organizations for sustained growth and success in a competitive landscape. [7,8]

Moreover, the successful implementation of SAP S/4HANA strategically positions Industry's clients for success in a marketplace that is becoming increasingly competitive and challenging. By providing essential tools and resources tailored to meet the unique needs of each business, this transition empowers organizations to enhance their operational efficiency significantly and drive sustainable growth in their respective sectors. With Industry's expert guidance and unwavering support throughout the entire migration process, including detailed planning, execution, and post-implementation assistance, companies can confidently navigate the complexities of enterprise resource planning. This enables them to embrace the transformative potential of digital innovation, ensuring they are well-prepared to adapt and thrive in the rapidly evolving business landscape of the future.

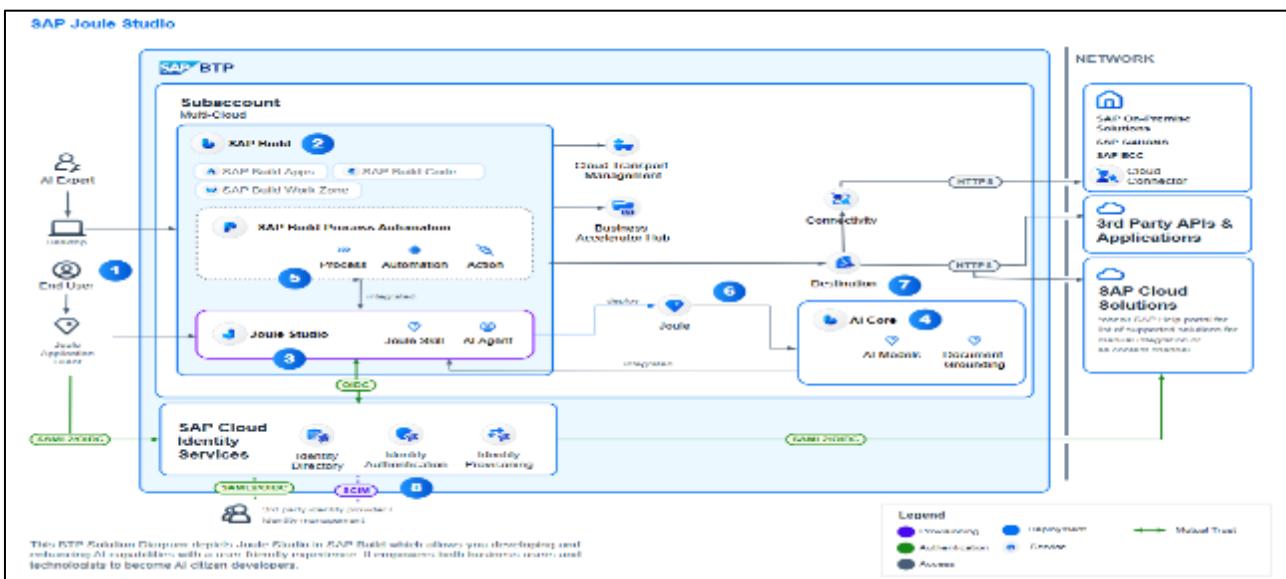


Figure 2 SAP BTP S/4 HANA Architecture [1]

Joule is an advanced and powerful tool that has been seamlessly integrated into a variety of SAP applications, including SAP S/4HANA, SAP SuccessFactors, SAP Ariba, and SAP Concur. Users can typically recognize Joule by its distinctive icon, which is conveniently positioned in the top-right corner of the user interface, ensuring easy accessibility for all users. SAP has implemented significant enhancements to Joule, specifically tailored to address high-frequency tasks. The clear objective of these enhancements is to facilitate the handling of 80% of these interactions through Joule by the end of the current year. This strategic improvement is designed to streamline processes and boost overall efficiency for users across these platforms. Ultimately, this initiative aims to enhance the user experience and productivity in their daily operations, allowing users to navigate their tasks with greater ease and effectiveness.

Table 1 Application of Joule in SAP & NON-SAP Landscape [2,3]

Aspect	Details
Application Name	SAP Joule
Type	AI Copilot (Generative AI Assistant)
Primary Function	Enhances productivity through natural language interaction, automation, and insights across SAP cloud applications.
Supported SAP Applications	<ul style="list-style-type: none"> - SAP SuccessFactors - SAP S/4HANA Cloud (Public & Private Edition) - SAP Analytics Cloud - SAP Customer Experience - SAP Ariba - SAP BTP (Build Process Automation, Build Apps, Build Code) - SAP LeanIX (planned) - Planned expansions to SAP Sales Cloud, SAP Commerce Cloud, SAP Service Cloud, and more.
Non-SAP Integrations	<ul style="list-style-type: none"> - Microsoft 365 Copilot (bidirectional data integration) - ServiceNow - Gmail - LinkedIn - Microsoft SharePoint (for document retrieval)
Availability	<ul style="list-style-type: none"> - Available in SAP cloud solutions only (not on-premises) - Initial release: SAP SuccessFactors (Nov 2023) - SAP Analytics Cloud (Mar 2024) - SAP S/4HANA Cloud (Q1 2024) - Free access for developers in SAP Build and ABAP tools until June/August 2025
Key Capabilities	<ul style="list-style-type: none"> - Contextual Responses: Based on user roles, permissions, and business data. - Cross-Application Reasoning: Maintains context across SAP products. - Natural Language Interaction: Supports navigational, transactional, and informational queries. - Automation: Joule Agents execute multi-step workflows (e.g., supply chain, procurement, finance). - Code Generation: Assists developers in ABAP, SAPUI5, and CAP applications. - Security: Inherits user authorization, uses guardrails against bias, and ensures data privacy (no customer data used for training).
Development Tools	<ul style="list-style-type: none"> - Joule Studio: Low-code/no-code platform in SAP Build for creating custom AI skills and agents. - SAP Build Code: Supports full-stack CAP application development. - SAP Build Apps: Enables freestyle SAPUI5 development. - SAP Build Process Automation: Enhances workflow automation. - ABAP Environment: Real-time code suggestions in Eclipse IDE.
Setup Requirements	<ul style="list-style-type: none"> - SAP BTP account with Joule entitlement. - System registration in SAP BTP System Landscape. - Cloud Identity Services configuration. - Subaccount creation for unified integration. - Joule Booster activation for simplified setup. - Specific configurations for SAP SuccessFactors and S/4HANA Cloud Private Edition.
Data Centers	<ul style="list-style-type: none"> - Supported in SAP-managed data centers only (not customer data centers for S/4HANA Cloud Private Edition). - Selection based on geographic proximity and SAP application landscape.
Use Cases	<ul style="list-style-type: none"> - HR: Create and publish job ads, manage HR requests. - Sales: Check order status, stock levels, delivery dates. - Purchasing: Identify optimal suppliers, trigger orders. - Production: Optimize supply chain, monitor processes. - Customer Service: Search knowledge bases, recommend solutions. - Finance: Fraud detection, risk management, financial forecasts. - IT/Development: Generate code, create applications, debug code.
Limitations	<ul style="list-style-type: none"> - Not available for on-premises SAP systems. - Requires SAP BTP and specific licenses for underlying tools. - Generated code may need review for accuracy. - Limited to SAP-managed data centers for some integrations.
Future Roadmap	<ul style="list-style-type: none"> - Over 400 AI scenarios and 1,600 Joule skills by end of 2025. - Integration with SAP Knowledge Graph and SAP HANA Vector Engine for enhanced data processing. - Expansion to additional SAP cloud applications.

3. Integration of sap joule with BTP

With the anticipated release of the second half of 2023, Joule has now become natively available within the SAP SuccessFactors environment. This significant advancement is complemented by its integration with SAP Business Technology Platform (BTP), which facilitates seamless and efficient interaction between various SAP solutions and external data sources. This capability empowers organizations to adopt and implement advanced artificial intelligence use cases, such as question answering, text summarization, classification, and code generation, thereby enhancing their operational efficiency and decision-making processes. [9]

Moreover, the strategic partnership with SAP allows for tailored implementations of Joule, ensuring that the integration is not only smooth but also aligned with the existing enterprise architecture and the specific goals of the organization. This alignment is crucial for maximizing the benefits of the technology within the company's framework. [9]

In addition to these features, the integration with Microsoft Copilot significantly boosts productivity by effectively connecting SAP data with Microsoft 365 applications. This connection enables users to leverage their SAP data within familiar productivity tools, streamlining workflows and enhancing collaboration across teams. [4,11]

4. Conclusion

Industry offers an extensive array of comprehensive managed services that are specifically tailored for SAP customers who are eager to embrace and adopt the advanced capabilities offered by SAP Joule and the Business Technology Platform (BTP), which is powered by the latest advancements in artificial intelligence. By seamlessly integrating SAP Joule into a variety of critical functions, including but not limited to human resources operations, code development, and intelligent business processes, organizations are strategically positioned to significantly enhance their operational efficiency and foster innovation across their entire workflows.

- Expertise in SAP S/4HANA and Business Technology Platform ensures successful deployment of technologies.
- Organizations can achieve long-term value and benefits from their investment in advanced solutions.
- Independent cloud services and specialized technical services support digital transformation.
- Customers can optimize SAP environments effectively.

Leveraging SAP Joule and BTP drives meaningful business outcomes.

References

- [1] SAP Discovery Center. SAP Business Technology Platform Reference Architecture [Internet]. [place unknown]: SAP; [date unknown] [cited 2025 Jul 7]. Available from: <https://discovery-center.cloud.sap/ReferenceArchitectureResources/06ff6062dc/images/VVKDVGJDMH1NAWSJA8UFHDLNB2NZV5Z7KXRQXYN6XI>
- [2] SAP Press. What is SAP Joule? [Internet]: SAP Press; [date unknown] [cited 2025 Jul 7]. Available from: <https://blog.sap-press.com/what-is-sap-joule>
- [3] SAP Community. SAP Joule Community Page [Internet]. [place unknown]: SAP; [date unknown] [cited 2025 Jul 7]. Available from: <https://pages.community.sap.com/topics/joule>
- [4] SAP Help Portal. SAP Business Technology Platform [Internet]. [place unknown]: SAP; [date unknown] [cited 2025 Jul 7]. Available from: <https://help.sap.com/docs/BTP>
- [5] SAP Learning Hub. Using Joule: Becoming an SAP BTP Solution Architect [Internet]. [place unknown]: SAP; [date unknown] [cited 2025 Jul 7]. Available from: <https://learning.sap.com/learning-journeys/becoming-an-sap-btp-solution-architect/using-joule>
- [6] SAP Discovery Center. Home [Internet]. [place unknown]: SAP; [date unknown] [cited 2025 Jul 7]. Available from: <https://discovery-center.cloud.sap/index.html>
- [7] SAP Discovery Center. Reference Architecture Catalog: Joule [Internet]. [place unknown]: SAP; [date unknown] [cited 2025 Jul 7]. Available from: <https://discovery-center.cloud.sap/refArchCatalog/?searchValue=joule&sortBy=relevance>

- [8] SAP. SAP Joule with BTP Architecture: Empowering Intelligent Enterprises [Internet]. [place unknown]: SAP; [date unknown] [cited 2025 Jul 7]. Available from: https://www.sap.com/products/technology-platform.html?campaigncode=crm-ya22-int-1517065&source=ppc-1na-googleads-search-71700000111878744-58700008462631428-btp_bts-x-x-x&gad_source=1&gad_campaignid=20324908708&gbraid=0AAAAAp1XiZjh53zdCPkkZVenMvo0CaKka&gclid=Cj0KCQjwmK_CBhCEARIsAMKwcD7hPLFCZEyqYfjWNujmkAKfwzyNIE7H3Gi3Bto9SwKieYYvrigepF4aAu63EALw_wcB&gclsrc=aw.ds
- [9] SAP Community. Generative AI with SAP, Part 3: Joule, SAP's Generative AI Copilot [Internet]. [place unknown]: SAP; 2023 Oct 25 [cited 2025 Jul 7]. Available from: <https://community.sap.com/t5/technology-blog-posts-by-sap/generative-ai-with-sap-part-3-joule-sap-s-generative-ai-copilot/ba-p/13581304>
- [10] SAP Help Portal. BTP Basic Platform Concepts [Internet]. [place unknown]: SAP; [date unknown] [cited 2025 Jul 7]. Available from: <https://help.sap.com/docs/btp/sap-business-technology-platform/btp-basic-platform-concepts>
- [11] SAP Help Portal. SAP Joule for SAP S/4HANA Cloud [Internet]. [place unknown]: SAP; [date unknown] [cited 2025 Jul 7]. Available from: <https://help.sap.com/docs/joule?locale=en-US&state=PRODUCTION&version=CLOUD>