

The future of ERP

The technology journey toward
an AI-driven autonomous ERP

**A Microsoft technology whitepaper based on
recent developments and customer feedback**

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A new ERP concept is needed

After five decades of relying on previous century technology and merely adding more features, ERP systems have become a monolithic obstacle rather than a facilitator of change.

Emerging business models driven by hyper-personalization, new sales channels, globalization and supply chain complexities necessitate innovative outcomes from ERP systems.

Simultaneously, emerging technologies such as Generative AI, composable engines, integrated low-code/no-code platforms, and advanced data services offer innovative approaches for implementing these new requirements.

This document outlines Microsoft's vision for the future of ERP, recognizing that each customer embarks on this journey from a distinctive starting point. It delineates the various evolutionary paths, the technical steps, and the critical considerations necessary to achieve this vision.

Our future vision - An autonomous ERP

As Georg Glantschnig, VP of Dynamics 365, stated "ERP must now run business processes, not just support them¹."

For decades, ERP platforms have remained largely consistent in one critical way: users input data into forms, and systems output reports. This traditional model is now being transformed by new technological advancements.

"We're moving into an AI-first architecture," he explains, "where agents—not just users—interact with ERP systems."

This AI-first architecture will lead to two significant dimensions of change:

- System: ERP is evolving toward an intelligent autonomous system
- User: Interactions will shift from current system-centric to a multi-modal approach.

ERP is evolving toward an intelligent autonomous system

The first dimension of change concerns the system's capabilities. An AI-driven system possesses the ability to reason, understand, and process data. In the next future various digital agents will handle about 75% of current tasks autonomously by interpreting data inputs, determining subsequent steps, and executing required actions. The user's role will become more focused on managing exceptions, new concepts, outliers, and unique cases. It will be a new user role that emphasizes value delivery rather than the completion of specific tasks within the system.

User interactions will transition to being user-centric (multi-modal), rather than system-centric (mono-modal)

The second dimension of change concerns user interaction. As of today, users open their ERP suites, productivity tools, and reporting dashboards each morning and navigate through them to complete their tasks. *"Is this the right figure?, let's run the report for that account. Ups, I see, I haven't approved the transaction..."*

New digital agents are not limited by system boundaries; they can efficiently work across various solutions, integrating ERP data, productivity elements, analytics, and approval processes. Future users will directly ask agents "Why is this figure so high?" and the agent will provide explanations regarding approval status and whether further action is required *in any system*. Future users will interact with backend systems without needing to navigate them directly, just with one centralized user interface.

¹ https://www.linkedin.com/posts/georgglantschnig_your-next-erp-will-think-for-itself-microsoft-activity-7324236248234045440-cW0J

We know the target but not the path

"The goal of transitioning to an AI-driven autonomous ERP is clear," states Jordi Rua Gonzalez, Senior Business Applications at Microsoft. "However, achieving this goal largely depends on two critical technological factors: the capabilities provided by the customer's existing landscape and the choice of appropriate agentic solutions available in the market."

The landscape source estate

The initial dimension of our point of departure involves two critical aspects for thorough analysis: the *architectural landscape* and the *modernization level* of such landscape.

When considering the architectural view, it is ideal to have an ERP system that is well-integrated with the overall non-ERP components, which clear data and process boundaries and in which the ERP system functions as such.

However, it is common to observe "expanded" monolithic ERP systems extending beyond core ERP processes including multiple business domains with indistinct boundaries. Consequently, process-related data is often dispersed across various domains, blending customer-specific and vendor-standard components.

When assessing the modernization level of a landscape, it is essential to consider both its inherent technical capabilities and its customer modifications. The landscape's technical capabilities include features like a database with metadata descriptions, which facilitate semantic analysis and reasoning or a native LCNC integrated platform.

Customer modifications, such as hardcoded validation rules or user workflows may affect the capacity of large language models (LLMs) to determine the optimal action in process workflows.

The agentic technology estate

When assessing the agentic technology estate, we focus on the "agentic" perspective of our challenge. This includes all technology assets that can be deployed on top or within an ERP system to become an "agentic" ERP system.

- Pre-configured frameworks: These assets are crucial for creating single-agent tasks or data and information retrieval agents. They spread from OOB agents like Dynamics 365 Finance Agents to the ability to create own agents based on custom processes. In the latter scenario, it is expected that the development of proprietary agents, including deep reasoning capabilities, connectors to transactional, analytical and information sources, as well as integration with ERP security roles, will be conducted within a Low Code-No Code environment.
- External frameworks: External frameworks refer to advanced programming frameworks designed for multi-agent systems that facilitate the implementation of sophisticated communication patterns among agents. These frameworks are expected to offer seamless or straightforward integration with the existing ERP landscape. Examples of such frameworks are Microsoft Semantic Kernel, Autogen, Lanchain/Langgraph, and others.

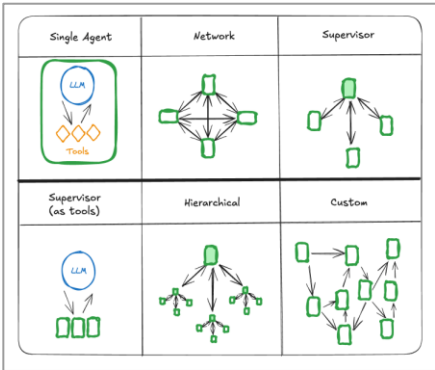


Figure 1 - Multi agent patterns (@Langchain)

- Reasoning tools: Deep reasoning tools are essential for enabling an agent to comprehend the subsequent steps of a process or the semantic meaning of a field within a transactional system or the information on a knowledge article. These reasoning tools are typically large language models (LLMs). The expectation is to have the capability to choose the appropriate LLM for our agents, in both low-code/no-code (LCNC) and coded (ProCode) agents.
- Backend connectors: Transactional systems involving reading, locking, and writing processes differ significantly from analytical ones. Ensuring data consistency is essential, as the agents transition from L5 to L3/L4 processes, the number of involved data fields may exceed hundreds, which need to be read, locked, written, or rolled back. How can we ensure that the data remains intact?

Defining the journey to success

Although each customer and landscape are unique, making it impossible to outline a single path for all, we can identify three key steps that lead to success.

These three key steps consider the two dimensions previously described and create a three-phased approach toward the ERP of the future.

1. The initial step involves enabling your backend system to support agentic transformation if your architectural and modernization assessment results in an unsuitable landscape for agents. First step is to seek a modularized backend with distinctly defined ERP vs other operational capabilities. Upon successful enablement, the backend system will be more streamlined, with compact process, and transparent boundaries, facilitating effective agent operations.
2. When beginning the agentic transformation, consider that you might be dealing with processes that have been heavily personalized over time,

where rules have been explicitly hardcoded and data schemas significantly expanded. Our idea, start identifying use cases that provide value and can be managed by single agents on L4-L5² processes. This would be an easy-to-reach scalable baseline for the next phase.

3. Once the backend has clear data and process boundaries and single-agent processes are mastered, it becomes possible to extend previous use cases to L3/L4 processes with multi agent frameworks. At this stage, a shift in mindset is required; users will handle exceptions and agents will act by default. This should be taken into account when designing new user experiences and change management.

The three phases

Enabling the landscape

Our goal on this phase should be to transition from a "expanded" monolithic ERP to a well-defined three-layer architecture consisting of a streamlined ERP core, efficient and tailored business platforms, and innovative custom-made digital products.

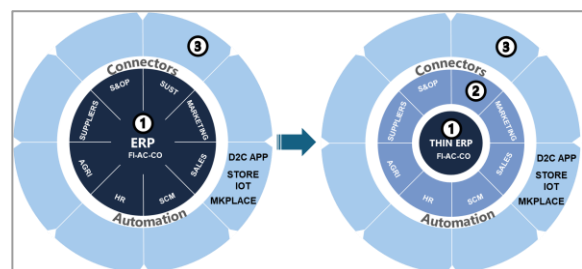


Figure 2 - Enabling the landscape. A thin ERP core

Microsoft Dataverse and Dynamics 365 composable engines facilitate the creation of well-defined, semantically rich data schemas and modular processing engines.

² In Business Process design processes are described in hierarchies broken down into levels. A L1 process defines the end-to-end process, i.e. *Record to Report*. The L2 defines the process areas, i.e. *Record Financial Transactions* or

Close Financial Period. The L3 are the actual business processes, i.e. *Allocate Transactions* or *Allocate Ledger Balances*. L4 are the patterns or use cases like *Allocation Transaction with manual splits*, *Allocate based on terms*, etc... L5 are the final user or system tasks

L4/L5 improved efficiency

During this phase, we will begin integrating agents into our system landscape by concentrating on the individual L4/L5 processes.

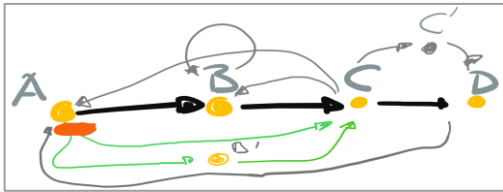


Figure 3 - Agents (orange) introduction

We should initiate this phase by addressing L4/L5 process level with OOB frameworks. In the depicted case the original process defined in black as "happy path" has undergone several hardcoded integrations. The agent takes over part of the process (green flows) combining deep reasoning and actions on the data to be processed.

In this phase, the agents will still be seen as "automation bots on LLMs," meaning human behavior and current UI interactions will remain unchanged. However, this should not be viewed as a low-value phase. For instance, in this initial step, Microsoft has achieved a 60% reduction in case resolution time for cash collections and a 5% reduction in external spending for regulatory work, among other improvements³.

L3/L4 agentic on multimodal

In this phase, we will be transforming our ERP system to enable multiple agents to perform a large number of tasks, with human intervention occurring only in exceptional cases.



Figure 4 - Multi agents multi modal systems

At this stage we will transform the whole process with three different agents (orange) that will take over the decision points minimizing the non-required deviations from the happy path (black flow) and automating the needed workflow tasks (green flows).

Achieving a large number of coverage through digital agents will influence user interactions.

User behavior is expected to shift towards addressing exceptions not managed by agents, decreasing the need for traditional ERP UI system navigation.

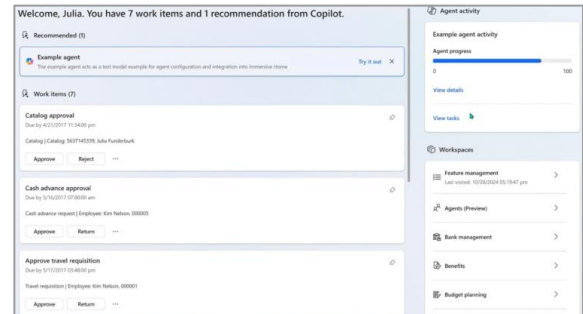


Figure 5 - New centralized UI combining different transactional, productivity and reporting items

This change will necessitate the development of new centralized and immersive UIs, like the one shown developed with Microsoft Power Apps, that consolidate all user tasks such as ERP exception handling, approval processes, reporting views, etc.

³ AI Is Already Changing Work—Microsoft Included

A case story – Nestlé

Nestlé is recognized globally as *The Good Food, Good Life Company*, driven by a deep belief in the power of food to enrich lives. The company's philosophy centers on the idea that good food nourishes the body, delights the senses, and supports well-being across all stages of life—from helping children grow healthily to enabling adults to age gracefully. Nestlé also emphasizes the importance of sustainability, ensuring that its practices respect the planet and preserve resources for future generations.

In a rapidly evolving world, Nestlé acknowledges that today's solutions must continuously evolve to meet tomorrow's challenges—such as sustainably feeding a global population projected to reach 10 billion by 2050. To address this, the company is committed to innovation across food, beverage, and nutritional health solutions, aiming to improve quality of life and contribute to a healthier future for all.

With approximately 277,000 employees, a portfolio of over 2,000 brands, and operations in 185 countries, Nestlé continues to lead the global food and beverage industry through its purpose-driven approach and relentless pursuit of excellence.

The starting point

Nestlé has selected Dynamics 365 as its primary ERP system for its acquired brands that necessitate swift time to value and deployment of new business models. Dynamics 365 offers Nestlé a robust layer of ERP data on Dataverse, which includes seamless integration and metadata fields for semantic indexing and analysis. It also features a native low/no code platform for automation, hyper-automation and extensibility, along with pre-built agents that support user processes across various domains such as finance, operations, sales, and supply chain management. Additionally, there is native integration with Azure tools for data analytics and Microsoft 365 for security, identity, and authentication processes.

Nestlé has adopted a modular implementation approach with distinct boundaries between ERP and core operational processes, allowing it to explore AI and agent-based solutions at an early stage.

The initial outcomes have been clear and highly successful.

Broadly speaking, a key achievement has been the ease with which transactional data can be read, analyzed, and processed—without the need for complex reporting frameworks or intensive change management efforts. Dataverse has proven instrumental in enabling semantic data analysis, while copilots and agents seamlessly manage user queries through natural language interaction.

On a more tangible level, a compelling example is the rapid and widespread adoption of agents supporting users in Nespresso South Africa. These agents have quickly become an integral part of the operational workflow—an outcome that would have been unimaginable just a few years ago.

Opportunities ahead

Three critical areas remain closely aligned with traditional ERP paradigms and require continued innovation: **scalability**, **integration**, and a **process-centric approach**.

- **Scalability** traditionally involved expanding systems through additional code, customizations, and hardware. While cloud infrastructure has streamlined hardware scalability, the question now is whether Generative AI and intelligent agents can similarly simplify process scalability.
- **Integration** is increasingly focused on building a cohesive, proprietary ecosystem. As demand grows for modular, flexible environments, the need for robust integration toolkits is surpassing that of conventional point-to-point solutions. Can Generative AI and agents offer a scalable, intelligent alternative to meet this evolving requirement?
- **Process Orientation** is being reimagined through the lens of AI. Generative AI has the potential to produce implementation assets dynamically. Could we return to a foundational methodology—capturing requirements, modeling process data, defining workflows—and then leveraging agents to generate the necessary components? This would not only streamline implementation but also significantly reduce ongoing maintenance.

Denis Kapetanovic - Head of IT, Nestlé M&A

Wrapping up – A technological journey



Phase 1 - A thin ERP core

Enable your ERP backend to the agentic transformation. Modularize your capabilities with clear delimited data and process boundaries



Phase 1 - Clear business platforms and digital products

Boost your business processes with agile and tailored core business platforms (SCM, O2C, HR, etc..) as differentiation layer. Build your most innovative assets as digital products on top of them



Phase 2- Human by default - L4/L5 task oriented agents

Introducing task oriented agents with LCNC capabilities like Copilot Studio or out-of-the-box agents like Copilot for Finance or Dynamics 365 agents



Phase 3 - Agent by default - L3/L4 process oriented agents

Upgrade to multi agent systems with Multi Agent Frameworks and large scale system integration. Scale to L3/L4 processes and prepare for user disruption



Phase 3 - No systems

The ERP and backend systems disappear as interaction touchpoint. User focuses on exceptions and value added tasks on a multimodal UI while agents autonomously on the backend systems

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