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Knowledge integration as a factor of production

How structured knowledge platforms
reduce downtime, error costs and lead times

Management summary

Today‘s manufacturing enterprises possess extensive data sets, digitized processes, and powerful IT systems. Transparency has been achieved in many areas. Nevertheless, decision-making processes often remain slower than necessary, error patterns recur, an coordination efforts are increasing.

The root cause rarely lies in a lack of information.
It lies in the lack of context for that information.

A recent study by **Fraunhofer Austria** shows that **78 %** of companies experience a loss of essential knowledge, and **69 %** diew this as a significant impediment to their business processes.*
At the same time, many organizations are investing in digital tools and expect substantial benefits from the use of AI. However, only a fraction of companies are able to structurally embed these technologies into their operational workflows.**

Competitiveness is thus increasingly determined by another factor: the ability to systematically structure and contextualize knowledge and make it available at the point of need within business processes. Knowledge integration is becoming a production factor in its own right.

It is not additional data that determines competitiveness, but rather the ability to make knowledge usable in a structured, contextualized, and process-oriented manner.

Companies that strategically design their knowledge architecture:

01 reduce friction losses

02 accelerate decisions

03 reduce error costs

04 create the foundation for productive AI

Now is the time to understand knowledge integration not as a subsidiary function, but as a structural management task.

It is not a lack of data that limits the performance of modern production, but the missing knowledge context.

01

Transparency has been achieved. Decision-making capability has not.

In modern production environments, high-quality key performance indicators, process data, and documentation are available. ERP, MES, and PLM systems provide structured information; deviations become visible; performance indicators are accessible.

Yet transparency alone does not necessarily lead to faster or better decision-making.

In practice, deviations often require an initial clarification of the following:

- **Which process stage is affected.**
- **Which specification applies.**
- **what prior experience is available.**
- **what dependencies exist.**

This need for contextual clarification creates additional effort. Additional effort creates friction.

The fact that knowledge management exists formally does not automatically mean that knowledge context is integrated. According to Fraunhofer Austria, **92 %** of companies practice knowledge management in principle. Meanwhile **78 %** report the loss of essential knowledge*.

The discrepancy can be explained structurally: Knowledge is managed, but not consistently integrated.

02

The economic dimension of fragmented knowledge

Knowledge loss is not merely a theoretical risk. It has a direct impact on operational processes. 69% of respondents rate the disruption to their business processes caused by knowledge loss as severe *

This impairment does not manifest itself in isolated, high-profile incidents, but rather in cumulative effects:

- extended lead times due to coordination efforts
- recurring errors despite existing documentation
- increased coordination costs between departments
- growing dependency on individuals

The greater the complexity of product variants, regulatory requirements, and global value networks, the more significant the impact of missing knowledge context becomes.

Friction losses do not occur on the factory floor. They occur within the system.

Fragmented knowledge landscape	Integrated knowledge architecture
Document oriented	Context-oriented ✓
Dependent on individuals	structurally anchored ✓
event-driven	decision-enabling ✓
coordination-heavy	process integrated ✓

03

Why tools alone do not guarantee integration

In many organizations, collaboration tools, document management systems and knowledge bases are already in place*. These systems provide key functions. They store, structure, and distribute information. However, information is not synonymous with integrated knowledge. The fact that **61 %** of companies do not have a clearly defined knowledge management strategy* points to a structural deficit: The overarching contextual logic is often missing.

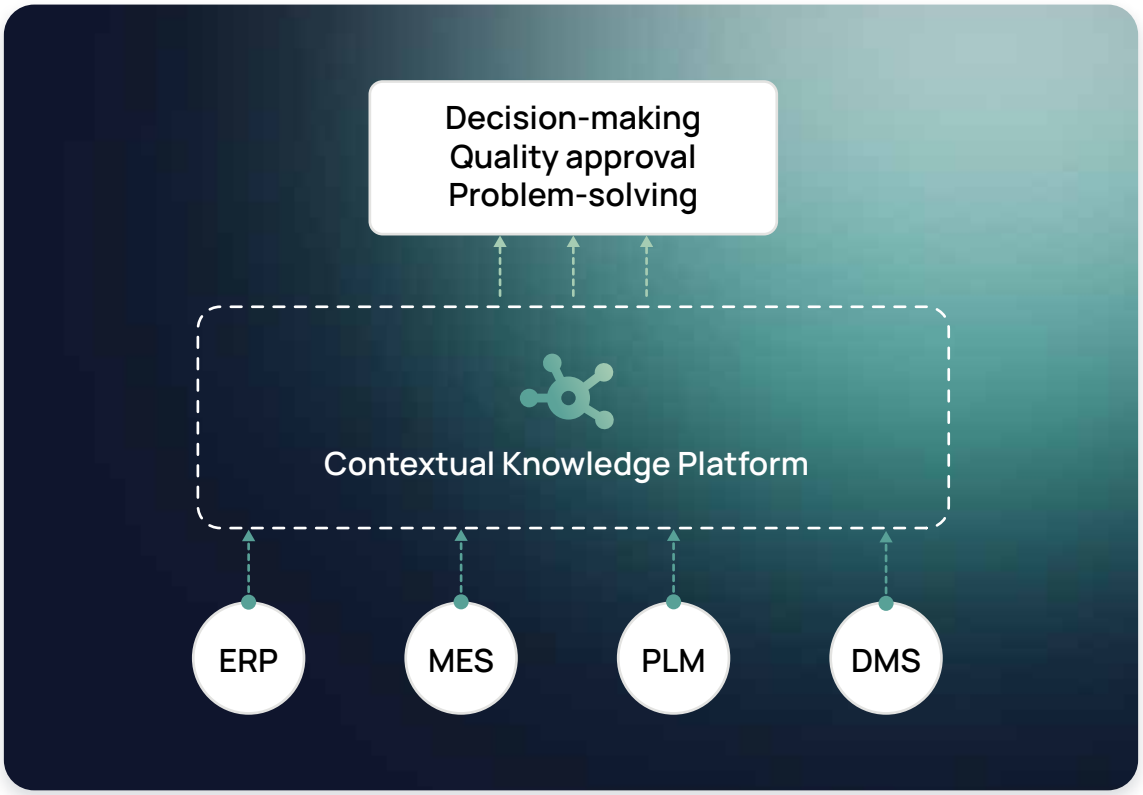
Knowledge integration means not just storing content, but systematically linking it across processes, roles, product contexts, and decision-making requirements.

Architecture is key. Not tool diversity.

Herein lies the crux:

Tools structure information.
Architecture structures context.

→ Without contextual logic, systems remain isolated.



The ability to act emerges at the intersection of systems and decisions.

04

AI: An accelerator requiring a solid foundation

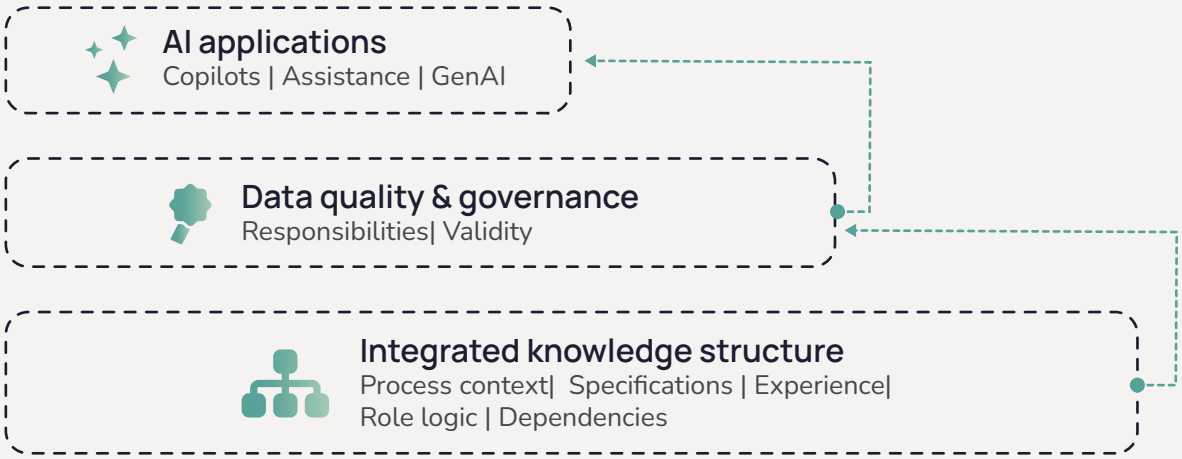
Expectations for AI are high. **89 %** of companies expect a positive impact on knowledge management.*
However, a European study** shows that only a small proportion has firmly integrated AI into daily tasks.

The greatest obstacles:

- security concerns
- legal issues
- lack of experience

AI can accerlerate access to information.
It cannot replace missing structure.

Architecture of productive AI



05
Strategic Implications for Management and Organization

AI reinforces existing structures. It does not replace them.
Knowledge integration operates on two levels:

Strategic

- Improved scalability
- Enhanced process resilience
- Greater quality consistency
- Robust AI implementation

Operational

- Reduced search effort
- Faster problem resolution
- Increased decision confidence
- Shorter onboarding times

→ Thus, knowledge integration is not an additional project.
It is organizational design.

From transparency to actionability

Digitalization has created transparency. The next stage of development is about enabling action.

Organizations that systematically integrate knowledge context reduce friction, enhance decision quality, and build the foundation for long-term competitiveness.

Knowledge integration is not a side initiative.
It is a core element of organizational architecture.

How to Act Now

01 **Define knowledge integration as a production factor**

02 **Identify critical desicion-making processes**

03 **Make context logic explicit**

04 **Embed governance**

05 **Scale AI only on an integrated foundation**

The next step

If knowledge integration is to become a structural factor of production, a well-founded assessment of the current state is the logical first step.

In a strategic evaluation meeting, we will analyze together

- how your organization currently handles knowledge context.,
- where structural friction losses arise,
- and what architectural options can be derived from this.

The question is not whether knowledge exists.
The question is whether it is integrated.

Start the conversation on knowledge integration →

* Wissensmanagement im Wandel: Eine Studie über den aktuellen Umgang mit Wissen in deutschsprachigen Unternehmen in Zeiten der künstlichen Intelligenz, Fraunhofer Austria Research, 2025

** Das Potenzial generativer KI im DokumentenManagement: Einschätzungen von Führungskräften im Digitalbereich, London Research und Adobe, 2024