ERP Conceptual Model: An Integrated Framework

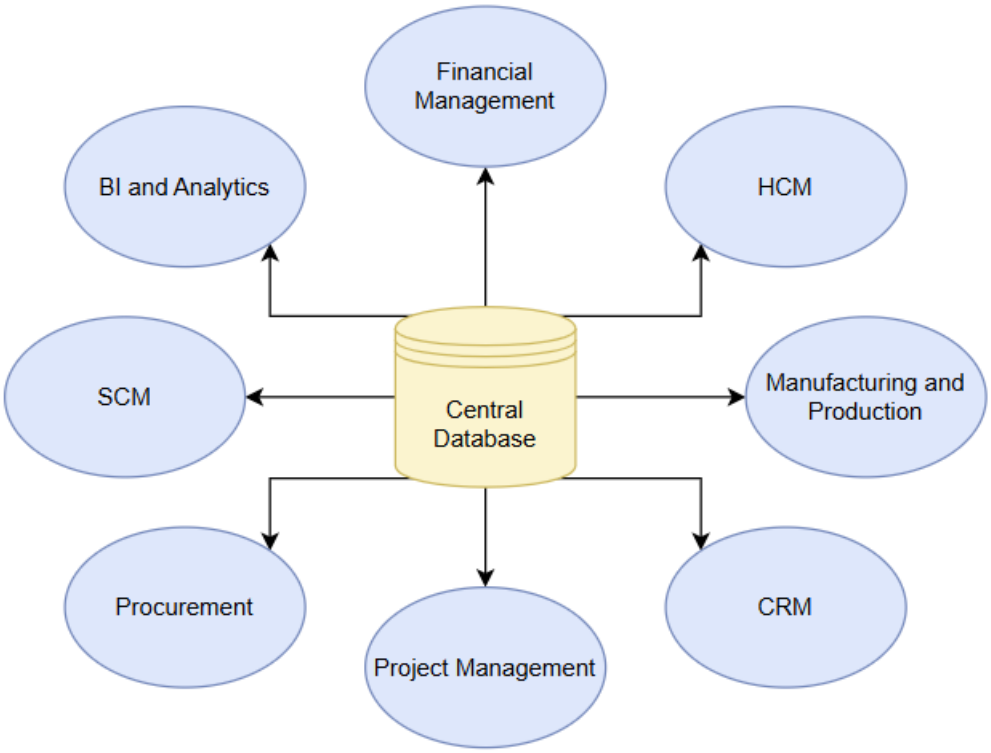

Figure 1: hub-and-spoke diagram of ERP conceptual model (Zeier, 2025)

An Enterprise Resource Planning (ERP) system is a type of integrated software can manage an organisation's core business processes. My conceptual model focuses on a central database, serving as a single source of truth, ensuring real-time data consistency across all modules. Key modules include:

- **Financial Management:** Handles ledger, payables, receivables, and reporting.
- **Human Capital Management (HCM):** Manages payroll, talent, and employee services.
- **Supply Chain Management (SCM):** Integrates procurement, inventory, and logistics.
- **Manufacturing/Production Planning:** Oversees scheduling, MRP, and quality control.
- **Customer Relationship Management (CRM):** Focuses on sales, marketing, and customer service.
- **Project Management:** Aids in planning, execution, and tracking projects.
- **Procurement:** Acquisition of goods and services, including vendor management, purchase order processing and contract management.
- **Business Intelligence (BI) & Analytics:** Provides insights for decision-making.

These modules are interconnected through the central database, enabling seamless data flow and eliminating silos, as highlighted in recent research on ERP integration (Jaradat et al., 2025).

Key Features

This model is characterised by:

1. **Integration and Centralised Data:** Unifies functions and ensures data consistency (Mossa et al., 2025).
2. **Real-time Information:** Supports proactive decision-making.
3. **Process Standardisation:** Promotes best practices and efficiency.
4. **Enhanced Reporting and Analytics:** Facilitates data-driven strategic planning.
5. **Scalability and Flexibility:** Adapts to growth and evolving needs (Vukman et al., 2024).
6. **Improved Compliance:** Strengthens regulatory adherence and governance.
7. **Optimised Resource Utilisation:** Ensures efficient allocation of resources.
8. **Enhanced Relationships:** Fosters stronger connections with customers and suppliers.

This integrated approach enhances operational efficiency, agility, and strategic insight for organisations. The key disadvantage of this approach is that, if all modules use the same database, they must be compatible with each other. This can be achieved in one of three ways: by using open-source software, by using a vendor solution or with a greenfield project solution. This issue could be addressed by implementing an architecture that utilises a central data lake and technologies such as Apache Kafka, Hazelcast or Apache Spark to facilitate real-time data streaming between modules.

Word count: 342

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Peer Response 1

Hi Gesine,

This is a truly comprehensive and insightful model of an ERP system, particularly its evolution into ERP II. I appreciate the clear breakdown of its components and how it ties into broader business concepts.

The way the core ERP modules (Sales and Marketing, Production, Accounting and Finance, HR) are presented as the central operational domains is very intuitive. It effectively shows how these fundamental areas are integrated, leading to that crucial "consistent flow of information" and "cross-departmental transparency."

However, while the model effectively highlights SCM and CRM as external bridges, I think the visual could do more to show the bidirectional data flow and dynamic interaction between these systems and the core ERP. More critically, there is no explicit mention of the aspect of data. Given the emphasis on information flow and analytics, the fundamental infrastructure for data management – be it cloud or on-premises, and the associated aspects of data quality, security, and integration – is a significant omission. Modern ERP systems heavily rely on robust data management practices for real-time insights and operational efficiency (Bonthu, 2025). This makes its absence in the model a notable gap.

Overall, this model offers a strong conceptualisation of ERP II, building well on established frameworks like the one from Chan, Abu Khadra, and Alramahi (2011). It highlights key integrations and analytical capabilities but would benefit from a more explicit acknowledgment on the aspect of data.

Word count: 233

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