Enterprise Resource Planning

Northeastern University
College of Professional Studies

ITC6020 81205 Info Sys Design and Development
Individual Student Presentation

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Presentation Outline

- Enterprise Resource Planning
- Real world application of ERP
- Conclusion

Historical development of ERP

- The origins of **Enterprise Resource Planning (ERP)** goes back to the 1960s when manufacturing organizations employed information technology for inventory control and master production schedules.
- In the 1980s Manufacturing Resource Planning (MRP) was born which encompassed the entire production process.
- With steady decline in the cost of IT assets, the emergence of client/server model, ERPs became mainstream.
- In the 1990s the **Gartner Group** coined the term Enterprise Resource Planning. ERP system included inventory control, manufacturing, accounting, finance, and sales.

Source: https://avenueart.wordpress.com/

Source: https://en.m.wikipedia.org/

J.I.Case tractor manufacturer and IBM collaborated to create the first MRP system to track inventory and production.

Definition of Enterprise Resource Planning

- Enterprise system is a modular, integrated software platform that covers all organizational functions and uses a central database at its core.
- The objective of an ERP is to make all business functions of an enterprise work together as one system.
- Enterprise systems can the following modules: Production, Inventory, Service, Human Resources, Material Requirements Planning, Procurement, Customer Relations Management, Sales, Financials etc.

Source: stock.adobe.com

Principal characteristics of ERP

Modularity

- Enables organizations to decide which functionalities to buy and use
- Necessary because of size and scope
- No single vendor can be the best in each module

Configurability

- Application integration allows modules of the application interact with each other manually and automatically.
- Module data stored in multiple physical data stores and locations are treated as one.

Integration

- Enterprise systems have parameters configurable to the needs of different organizations in the industry
- Capabilities can be extended with “bolt-on” modules

Advantages and Limitations of ERP

Advantages

Efficiency – improves efficiency through the reduction of indirect costs by streamlining business processes and operations

Responsiveness – improves the firm's ability to respond to customers and market demands thanks to application and data integration

Knowledge infusion – includes "best practices" knowledge in the industry which can be used to improve business processes in the adopting firm

Adaptability – offers adaptability to each unique organizational context

Limitations

Standardization and Flexibility – the high level of integration decreases the flexibility of individual units and processes in the firm

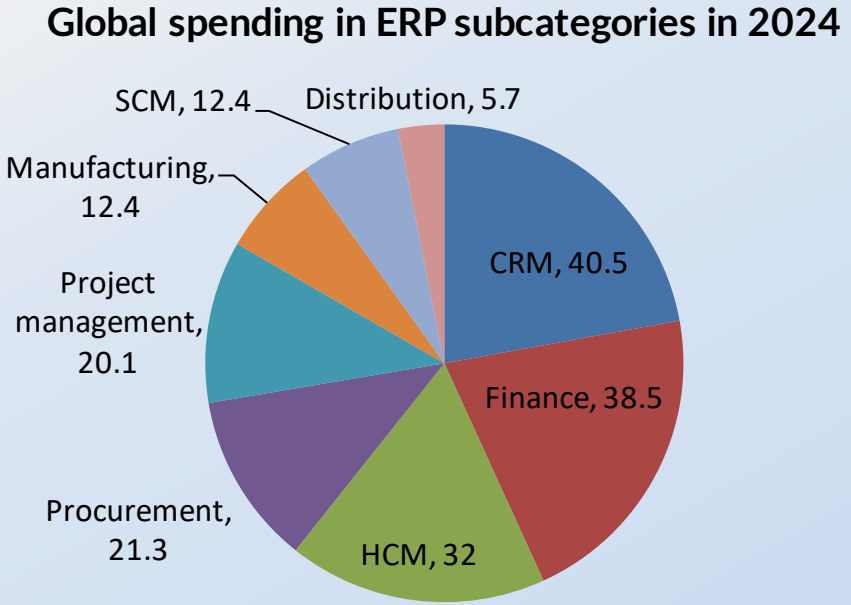
Incompatibility of "best practices" – one cannot be certain that the best practices are good for the adopting firm

Strategic Clash – highly unique business processes that define competitiveness of the firm may not be supported by system

High Costs and Risks – ES are large-scale systems which can be costly to implement, and leads to a number of technical and behavioral challenges

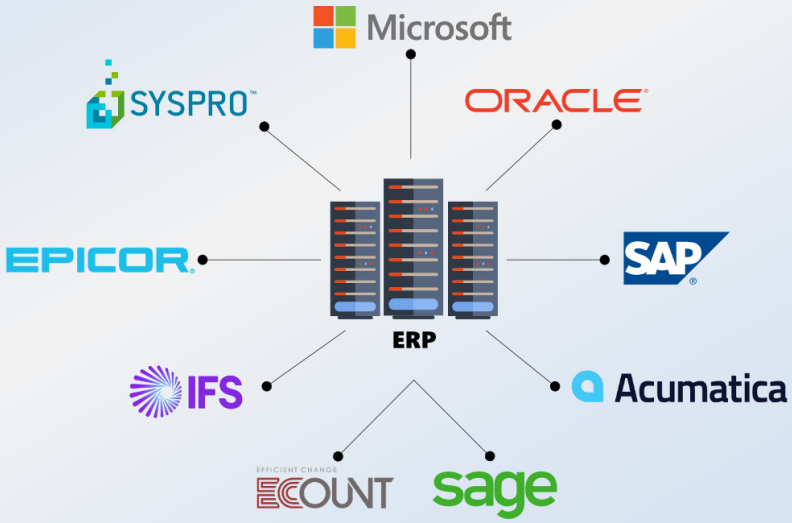
ERP in the Real World

- ERP systems reached a high degree of maturity and the industry consolidated around major vendors.
- Market share estimates depend on the categorization of enterprise systems. Sometimes CRM is categorized separately.
- Different leader vendors in different business functions.



Source: https://hginsights.com/blog/2024-erp-market-share-trends

Major ERP vendors



Source: https://adynamics.com.my/erp/vendors/

- Global leaders are SAP, Oracle, Salesforce, Microsoft, Sage.
- Some vendors try to offer an all-in-one solution, others specialize in one subcategory. ***Example:*** *Oracle – all-in-one, Atlassian – Project management*
- In some sectors, one vendor can offer two different platforms. ***Example:*** *SAP SE and SAP Concur in CRM category.*

Case Study: ERP at UNICEF

- UNICEF is the United Nations Children's Fund established in 1946.
- It is an international humanitarian response and development agency working 190 countries and territories.
- UNICEF has 13000 staff members.
- UNICEF is a complex organization for management of which an ERP system is necessary.
- UNICEF's annual expenditure for the year 2022 was a record $7.4 billion in goods and services for children in 162 countries and areas.

Source: https://www.unicef.org/reports/unicef-annual-report-2021

Origins of UNICEF's ERP system

- UNICEF started planning transition to ERP in 1997.
- The first SAP purchase was in 1998.
- Organization's HQ ERP went live in 1999.
- ERP was deployed globally in 2012.
- The initial cost estimates were $47,000,000.

Source: https://commons.wikimedia.org/wiki/

- *ERP vendor established in 1972 in Germany*
- *105000 employees in 157+ countries*
- *230 million cloud users*
- *100 million solutions*

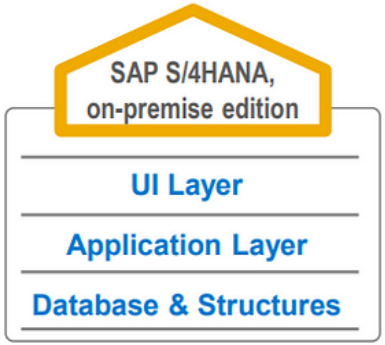
ERP platform of UNICEF

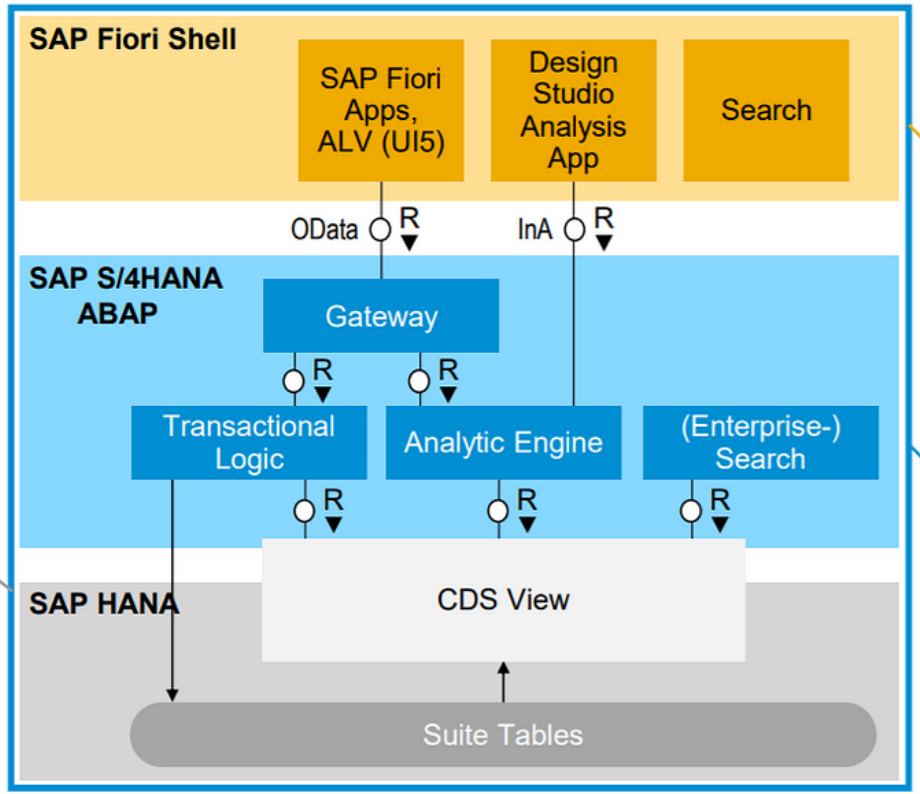
- A special division, Information and Communication Technology Division is responsible for implementing SAP VISION and making enhancements needed for business processes.

- UNICEF uses SAP HANA VISION as ERP system that manages and automates business processes related to planning, budgeting, finance, human resources, supply and logistics.

- SAP Fiori is used on desktop and mobile phones to access VISION backend at any time in any place.

SAP S4/HANA Architecture





Re-architecting for in-memory platform

- SAP HANA as platform
- OLAP & OLTP merge
- In-memory compression
- Code pushdown
- Increased speed for data

Responsive design

- SAP Fiori as user experience paradigm across applications
- Web-based, all devices
- Role-based
- Decisive, Predictive, Simulate

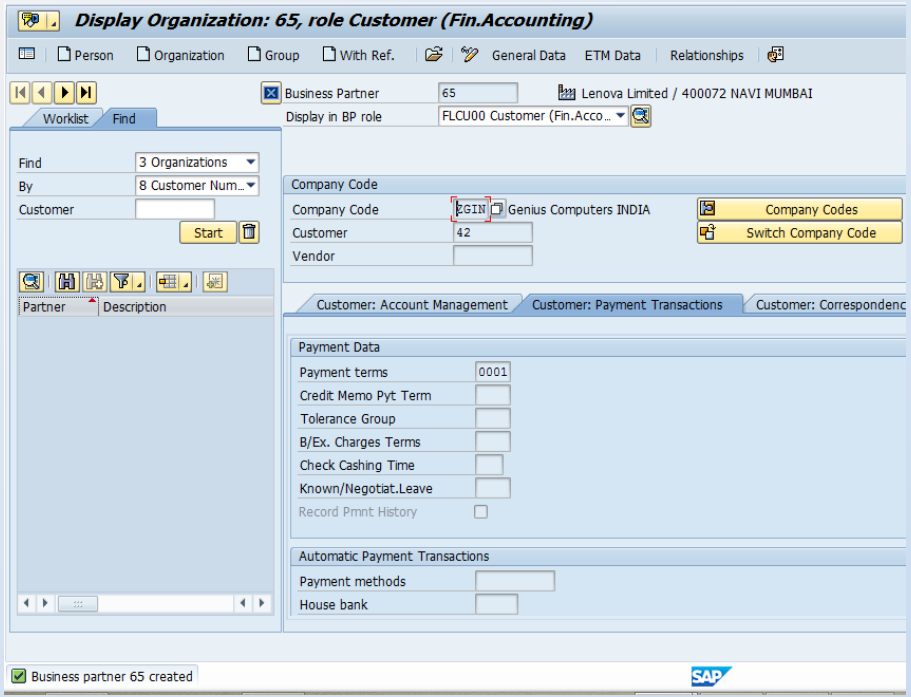
Principle of One

- Simplification of applications, data model
- 1 recommended solution (Principle of One)
- No aggregates & no indices
- Higher flexibility & throughput
- Data footprint reduction

Source: https://medium.com/@patoliyanitin/

Example: SAP HANA User Interface

- Mainly form-based applications that access and change certain business data.
- They are fully customized for the specific needs of the organization.
- They are accessible everywhere with enterprise user credentials.
- The UI tries to fit complex functions in one screen and looks complex and intimidating.



Source: https://community.sap.com/

Advantages of using ERP at UNICEF

- ✓ **Efficiency** – VISION streamlines business processes in 190 countries and territories
- ✓ **Responsiveness** – UNICEF's entire data is accessible in real time for all authorized users globally
- ✓ **Knowledge infusion** – Developing country offices of UNICEF can benefit from "best practices" learned from developed countries.
- ✓ **Adaptability** – VISION is adaptable to UNICEF's business processes and custom transactions can be created

Limitations of using ERP at UNICEF

- × **Standardization and Flexibility** – Users cannot adapt VISION to their tastes because it is standardized, centrally.
- × **Incompatibility of "best practices"** – "Best practices" infused from one country may not be applicable in other countries. This is not directly caused by ERP software.
- × **Strategic Clash** – This is not applicable in this case because UNICEF has capacity to fully customize the software to its unique needs.
- × **High Costs and Risks** – VISION is a complex system, it is difficult to change globally, learning VISION by new staff takes time

Conclusion

- Modern ERP systems provide **modularity, configurability, and integration** needed to run complex organizations and businesses.
- ERP systems have **advantages** and **limitations** related to their usage in enterprises.
- ERP systems require **huge resources** to implement and use.
- **SAP S/4 HANA** is an example of a large-scale ERP system that enable large organizations like UNICEF to run efficiently since 2012.
- There is **a continued demand** for ERP systems in the market due to existence of large organizations that need comprehensive and sustainable ERP solutions.

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Thank you!

Q & A