



# 21. The SAP R/3 Framework

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# References

- ▶ Thomas Aidan Curran, Gerhard Keller. SAP R/3 Business Blueprint. Addison-Wesley 1999.
- ▶ W.M.P. van der Aalst. Formalization and verification of event-driven process chains. Information and Software Technology, 41(10):639-650, 1999.



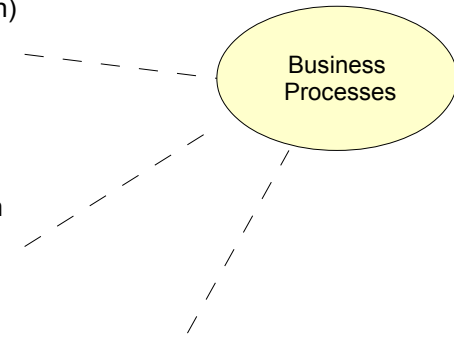
# Problem

- ▶ How to build a framework for Business Software?
- ▶ Software/Anwendungen/Produkte (SAP) Walldorf, founded 1972
  - Most of the Fortune 500 companies use SAP
- ▶ SAP R/2: Mainframe solution
- ▶ SAP R/3 1988-today. Client-server 3-tier
  - ABAP language with simple use of databases
  - Workflow specifications with Ereignis-gesteuerte Prozessketten (EPK)
  - Business blueprint: prefabricated processes for installation of the framework at the customer
- ▶ Future: SAP NetWeaver
  - Fully Java- and web-based



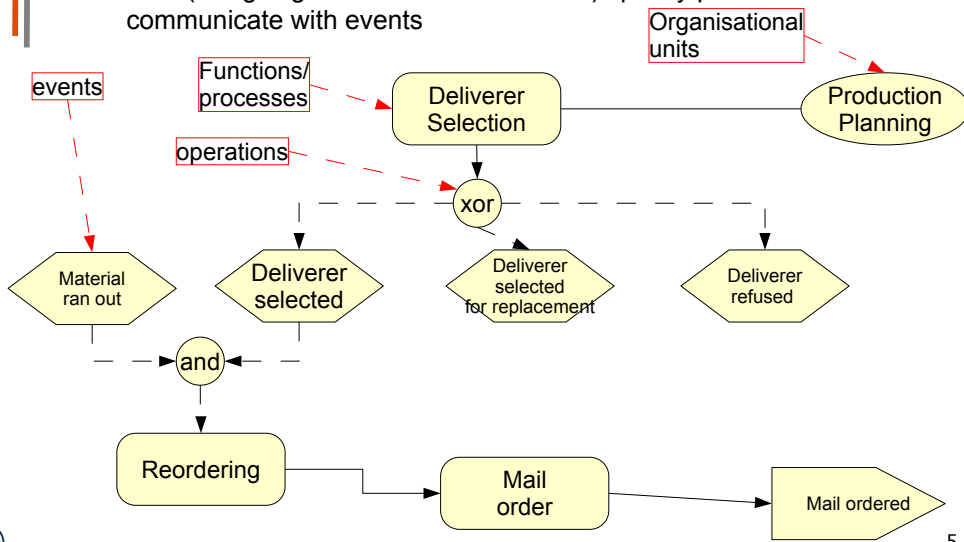
# Modules of R/3 3.0

- ▶ Internals
  - FI Financials (Finanzwesen)
  - CO Controlling
  - AM Anlagenwirtschaft
  - PS Projektsystem
- ▶ Miscellaneous
  - OC Office&Communication
  - IS Branchenlösungen
- ▶ Core
  - SD Distribution (Vertrieb)
  - MM Material management (Materialwirtschaft)
  - PP Production planning
  - QM Quality management
  - PM Instandhaltung
- ▶ HR Human Resources (Personalwirtschaft)



# Workflow Specifications with EPK

- ▶ The SAP framework is steered by business workflow specifications
  - EPK (Ereignisgesteuerte Prozessketten) specify processes that communicate with events



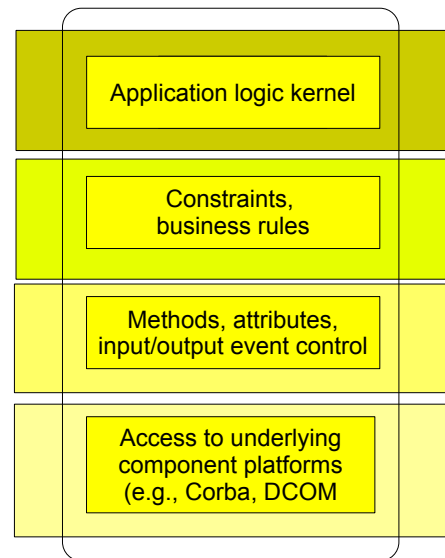
# Business Blueprint

- ▶ The Business Blueprint are a collection of business process templates
  - EPK specification templates with *hooks*
  - The specifications are parameterized and adapted for concrete business processes
- ▶ They form a *framework* for business process based applications
  - They conform to the template/hook principle, but rely on substitution
  - They are invasive specification components (see *invasive composition*, CBSE in summer).

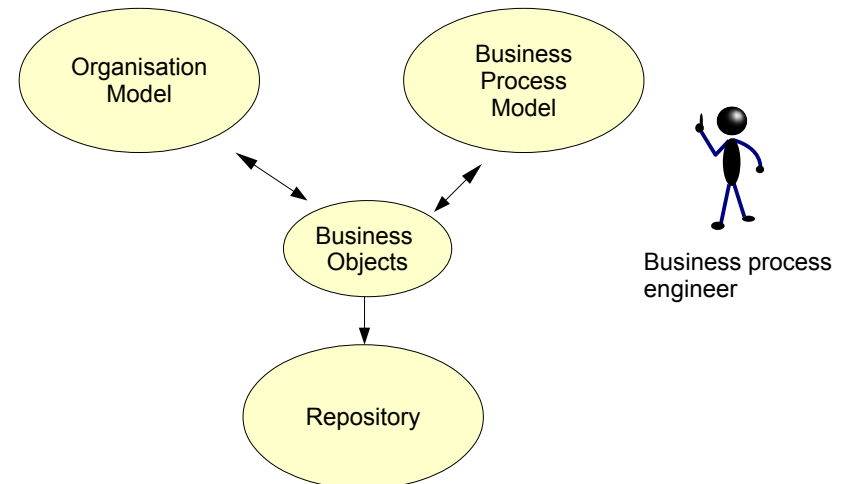
**Business blueprints are business process frameworks**

# R/3 Repository

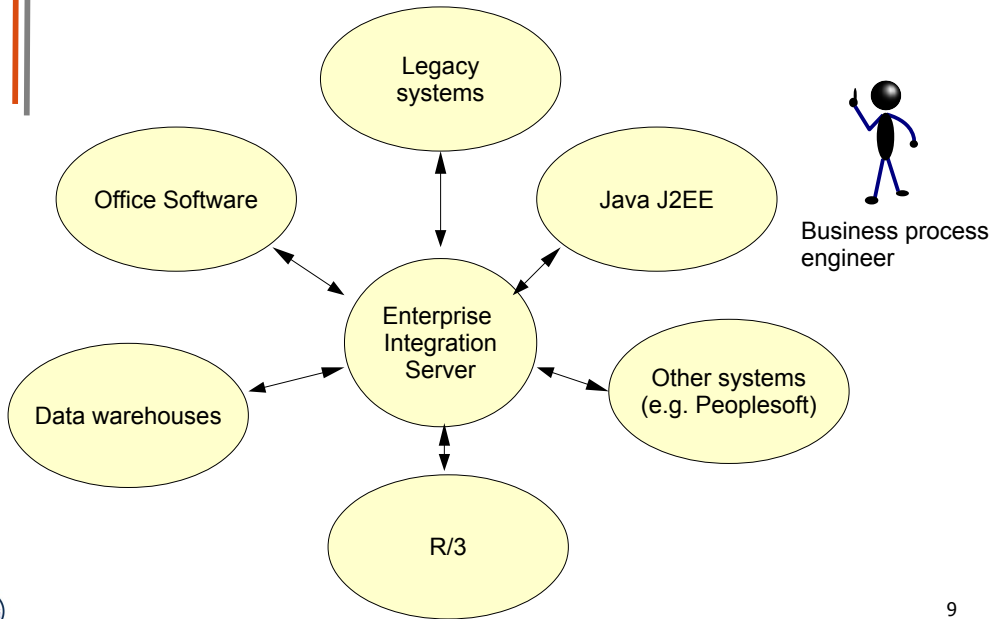
- ▶ Distributed with Application Link Enabling (ALE)
  - An intelligent middleware layer that distributes repositories over several databases
- ▶ Stores Business Objects with interfaces (business application interfaces, BAPI)
  - > 170 Business Objects are predefined
  - Encapsulate well-known business knowledge
- ▶ A business object is a layered object
  - Internally, it maintains an entire data model (business object data model)
- ▶ The set of business objects forms a layered framework



# Engineering with R/3



# Business Application Integration



# Insight: A Process Framework needs a Process Specification Language

- ▶ If the framework is used for processes, we need a process specification language
  - Similar to web service area (enterprise services)
- ▶ Process languages
  - Petri nets (YAFL), Process languages
  - More in summer (CBSE)

**Business frameworks rely on process execution engines**

# The End

- ▶ [www.sap.com](http://www.sap.com)
- ▶ SAP's research lab at TU Dresden
  - Director Dr. Kubach
  - Chemnitzer Str 43, 3<sup>rd</sup> floor
  - Thematic area "Future Manufacturing Systems"
- ▶ Course "Enterprise Software" in winter period