

21. The SAP R/3 Framework

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References (non-oblig.)

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- ▶ W.M.P. van der Aalst. Formalization and verification of event-driven process chains. Information and Software Technology, 41(10):639-650, 1999.
- ▶ Thomas Aidan Curran, Gerhard Keller. SAP R/3 Business Blueprint. Addison-Wesley 1999.
- ▶ Gerhard Keller, Thomas Teufel. SAP R/3 prozessorientiert anwenden. Addison-Wesley, 1998. Enthält die Haupt-Workflows des Business Blueprint.



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

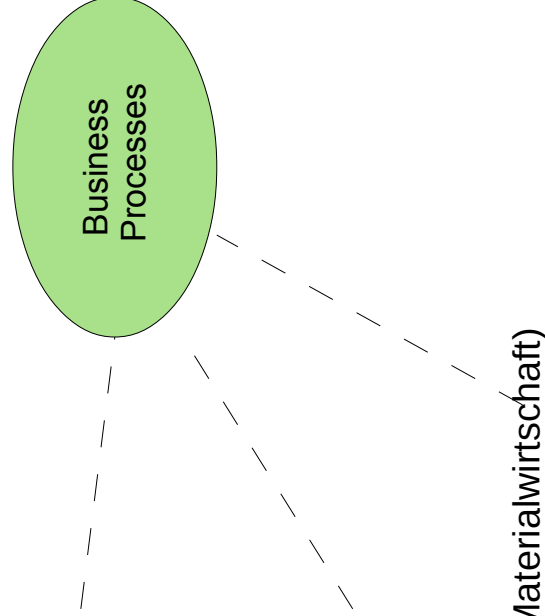
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Modules of R/3 3.0

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

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Workflow Specifications with EPK

(Ereignisgesteuerte Prozessketten)

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- ▶ The SAP framework is steered by business workflow specifications
 - EPC (Event-driven process chains) specify processes that communicate with events



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Business Blueprint Process Framework

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- ▶ 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 **process 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

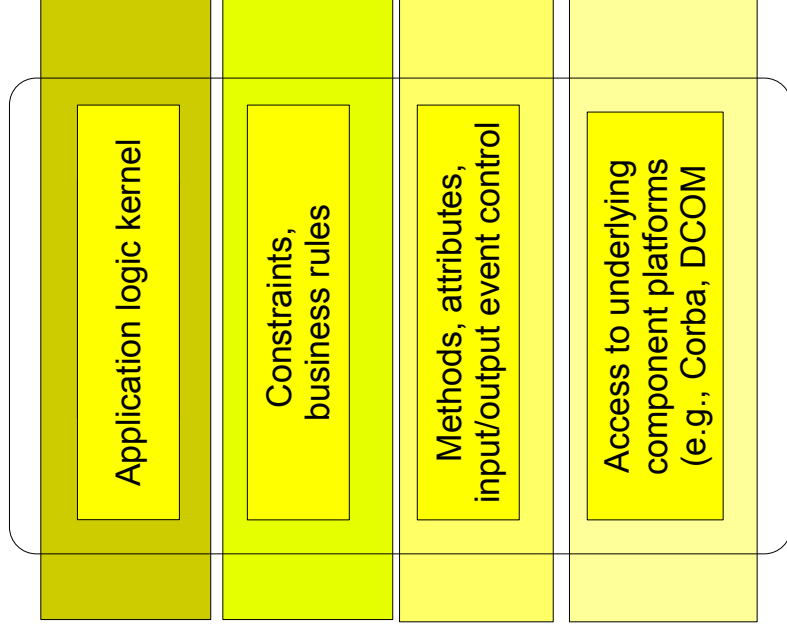
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R/3 Repository

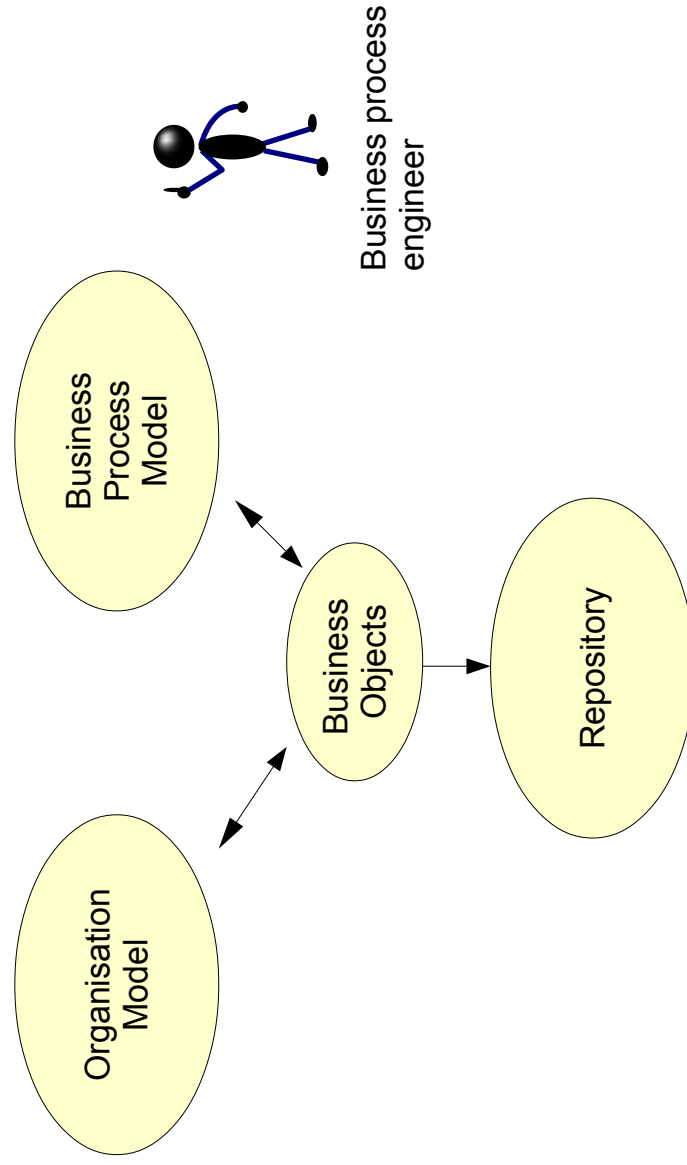
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- ▶ Distributed with Application Link Enabling (ALE)
 - An intelligent middleware layer that distributes repositories over several databases
- ▶ Stores Business Objects with interfaces (business application interfaces, BAPI)
 - > 170 Business Objects 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



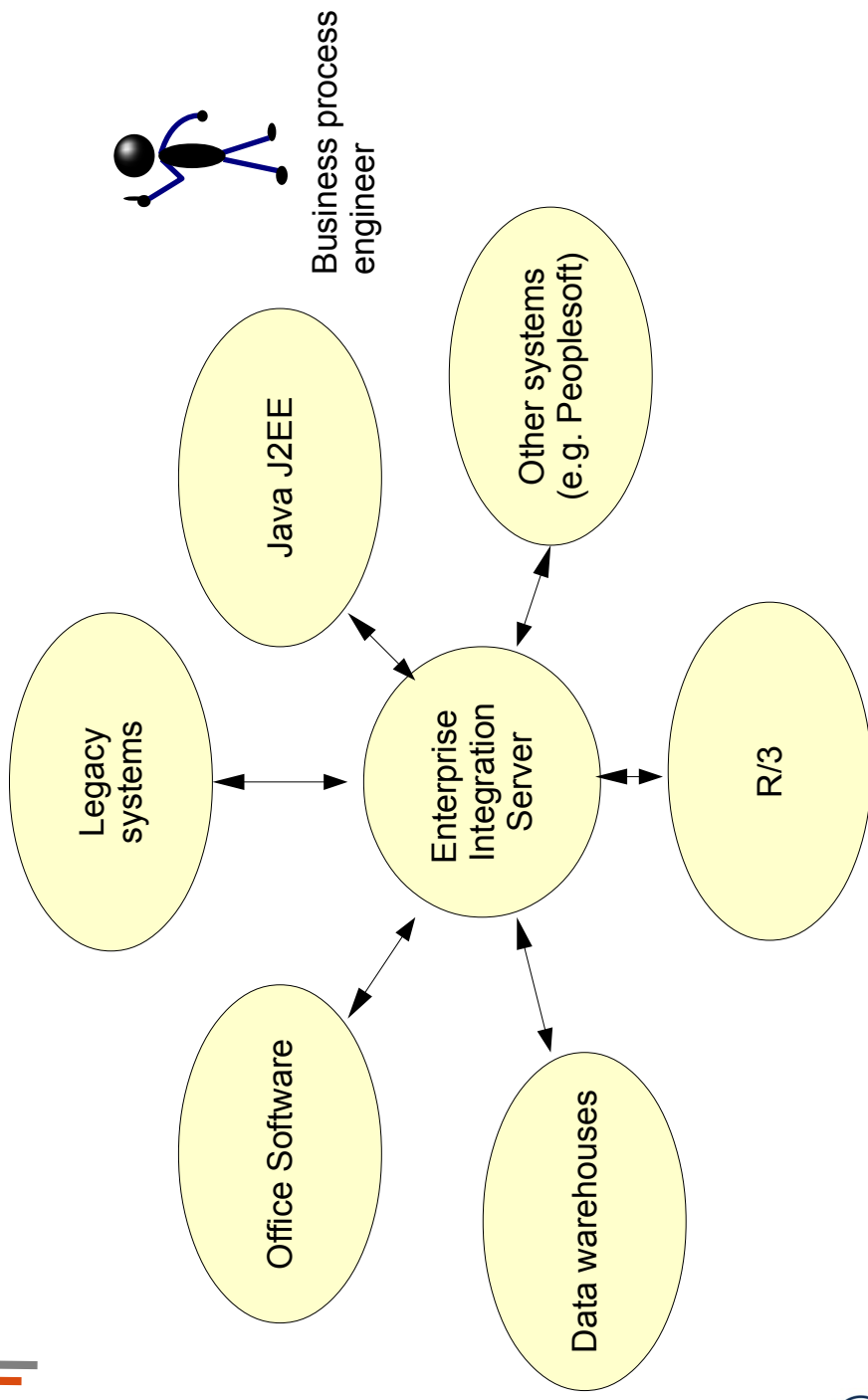
Engineering with R/3

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Business Application Integration

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Insight: A Process Framework needs a Process Specification Language

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- ▶ 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



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- ▶ www.sap.com
- ▶ SAP's research lab at TU Dresden
 - Director Dr. Hackenbroich
 - Chemnitz Str 43, 3rd floor
 - Thematic area "Future Manufacturing Systems"
- ▶ Course "Enterprise Software" in winter period (Prof. Dr. Uwe Kubach)