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 plueprint: 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
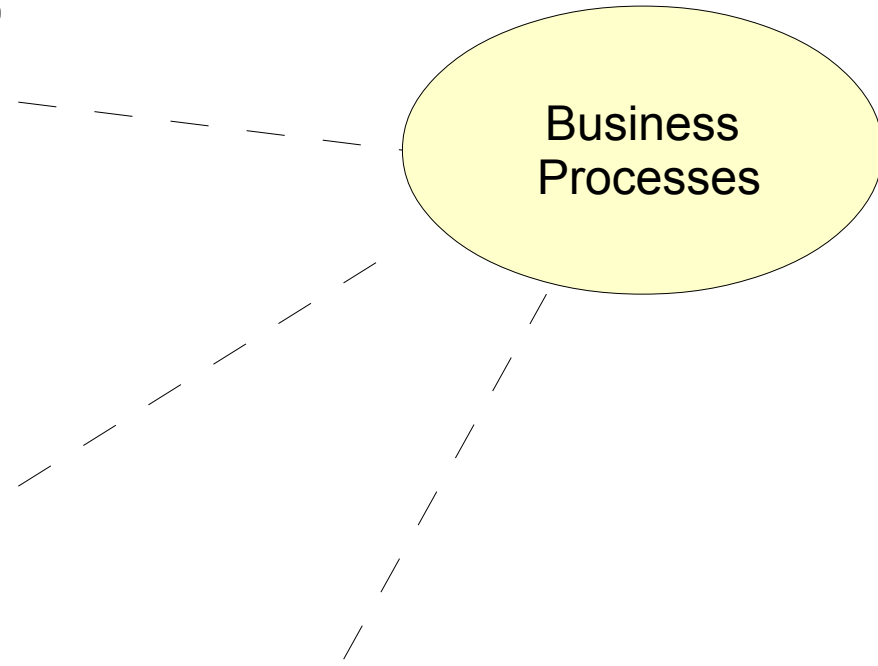 - PS Projektsystem

- ▶ Miscellaneous
  - OC Office&Communication
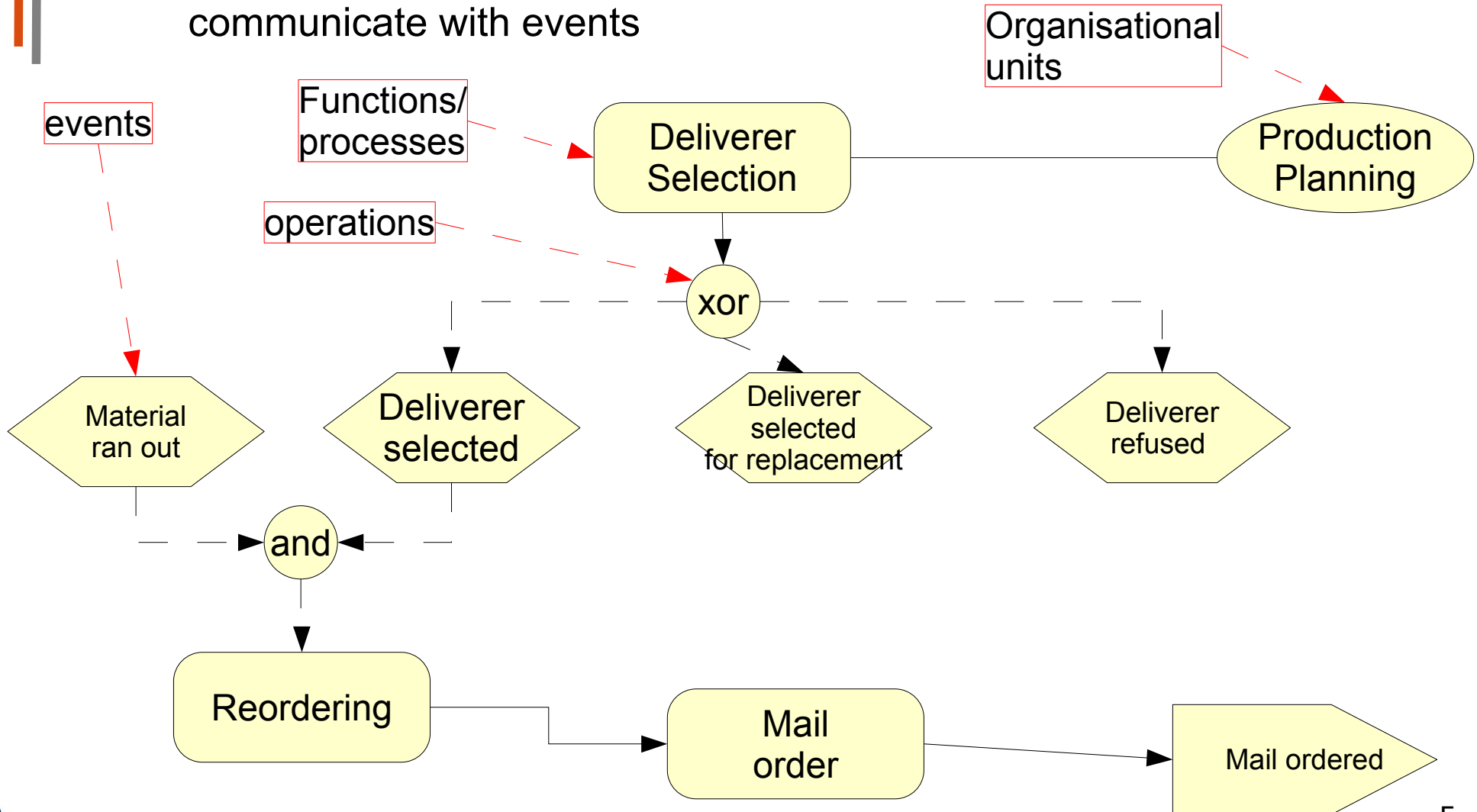 - IS Branchenlösungen

- ▶ Core
  - SD Distribution (Vertrieb)
  - MM Materia management (Materialwirtschaft)
  - PP Production planning
  - QM Quality management
  - PM Instandhaltung

- ▶ HR Human Resources (Personalwirtschaft)

Business Processes

Workflow Specifications with EPK

▶ The SAP framework is steered by business workflow specifications

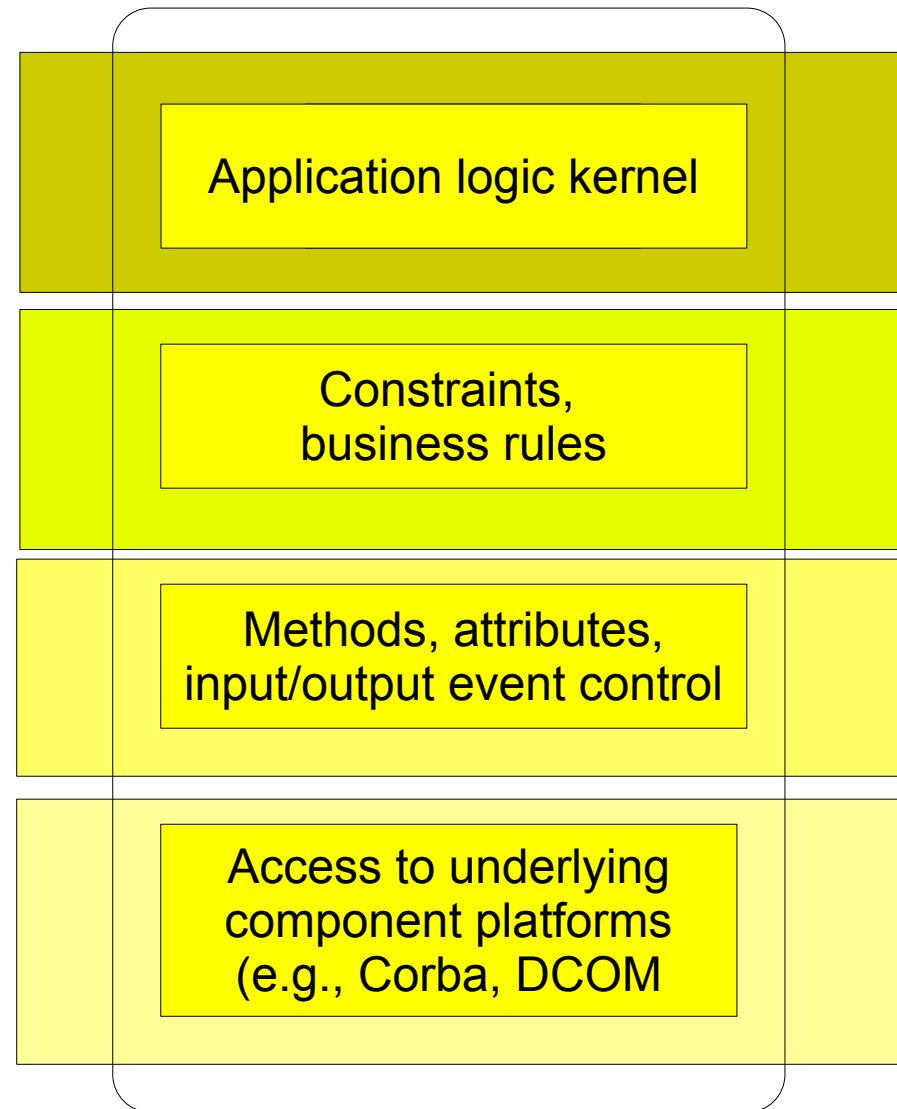 ▪ EPK (Ereignisgesteuerte Prozessketten) specify processes that communicate with events

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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).
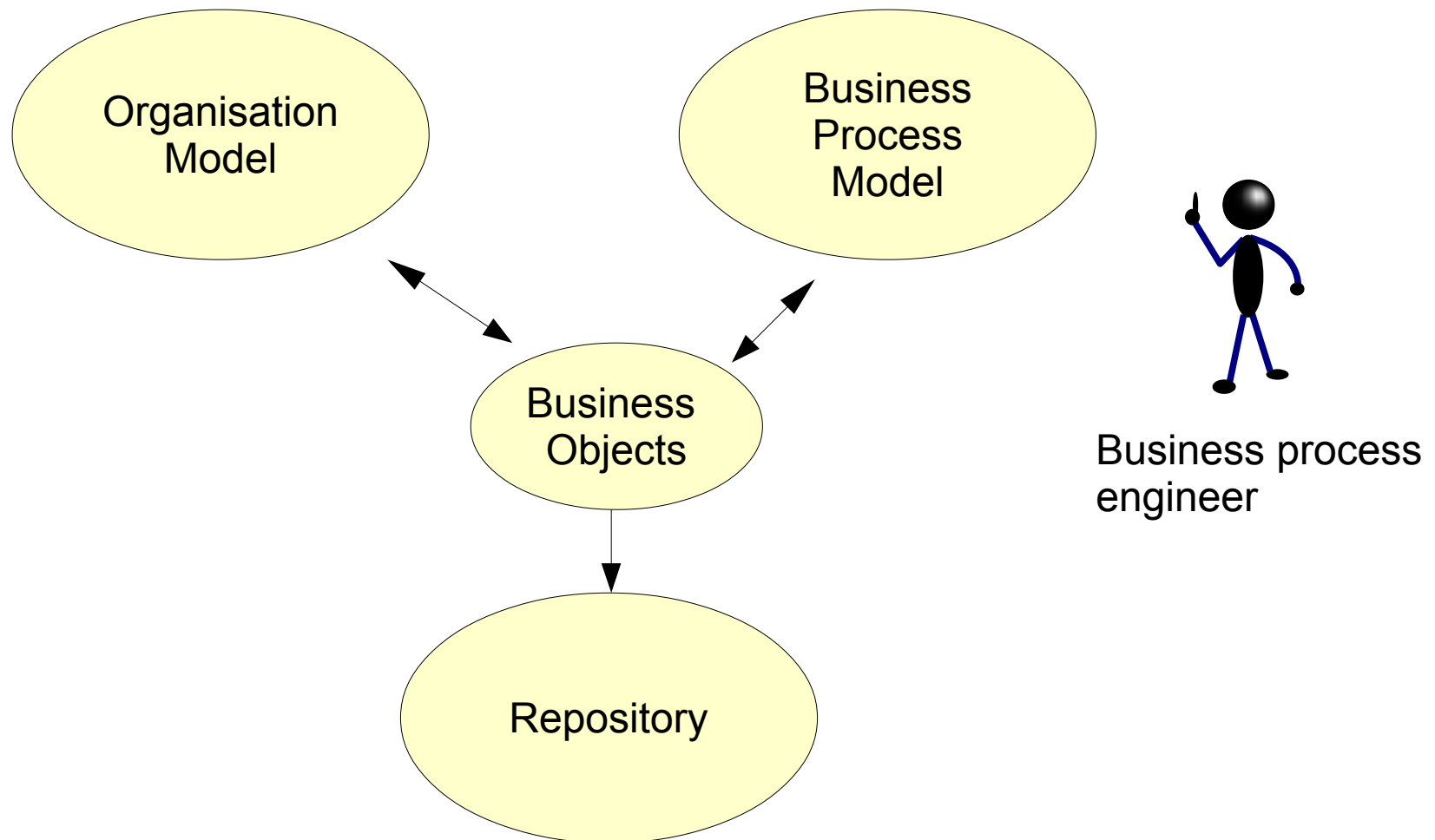
Business blueprints are business process frameworks

R/3 Repository
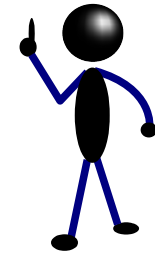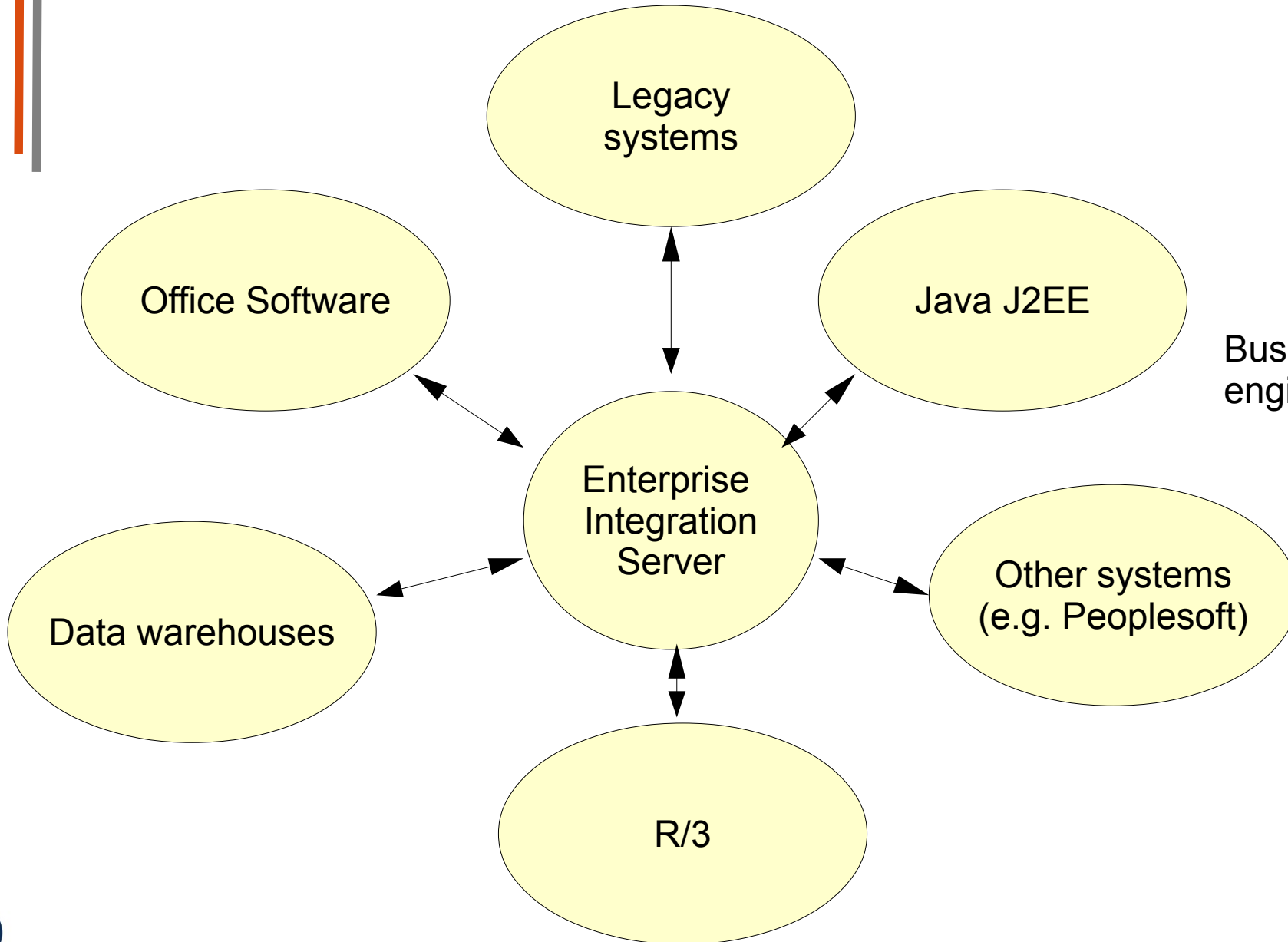
► Distributed with Application Link Enabling (ALE)

  ▪ 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

Application logic kernel
Constraints, business rules
Methods, attributes, input/output event control
Access to underlying component platforms (e.g., Corba, DCOM

Engineering with R/3

Business process
engineer

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

- SAP's research lab at TU Dresden

    - Director Dr. Kubach

    - Chemnitzer Str 43, 3rd floor

    - Thematic area "Future Manufacturing Systems"

- Course "Enterprise Software" in winter period