21. The SAP R/3 Framework

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13-0.1, 02.01.14

References (non-oblig.)

► 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.

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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

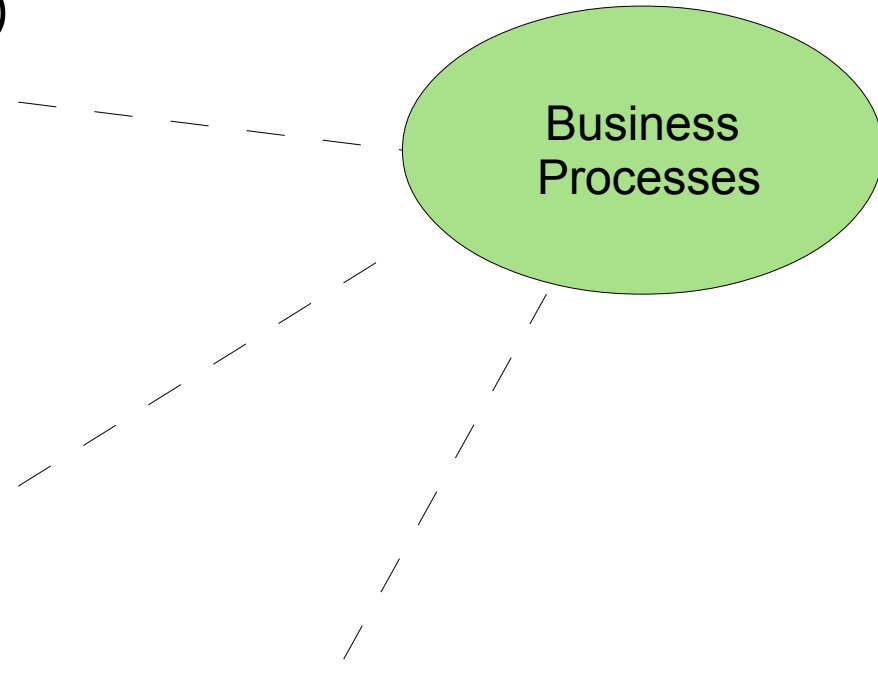 ▪ AM Anlagenwirtschaft

  ▪ 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
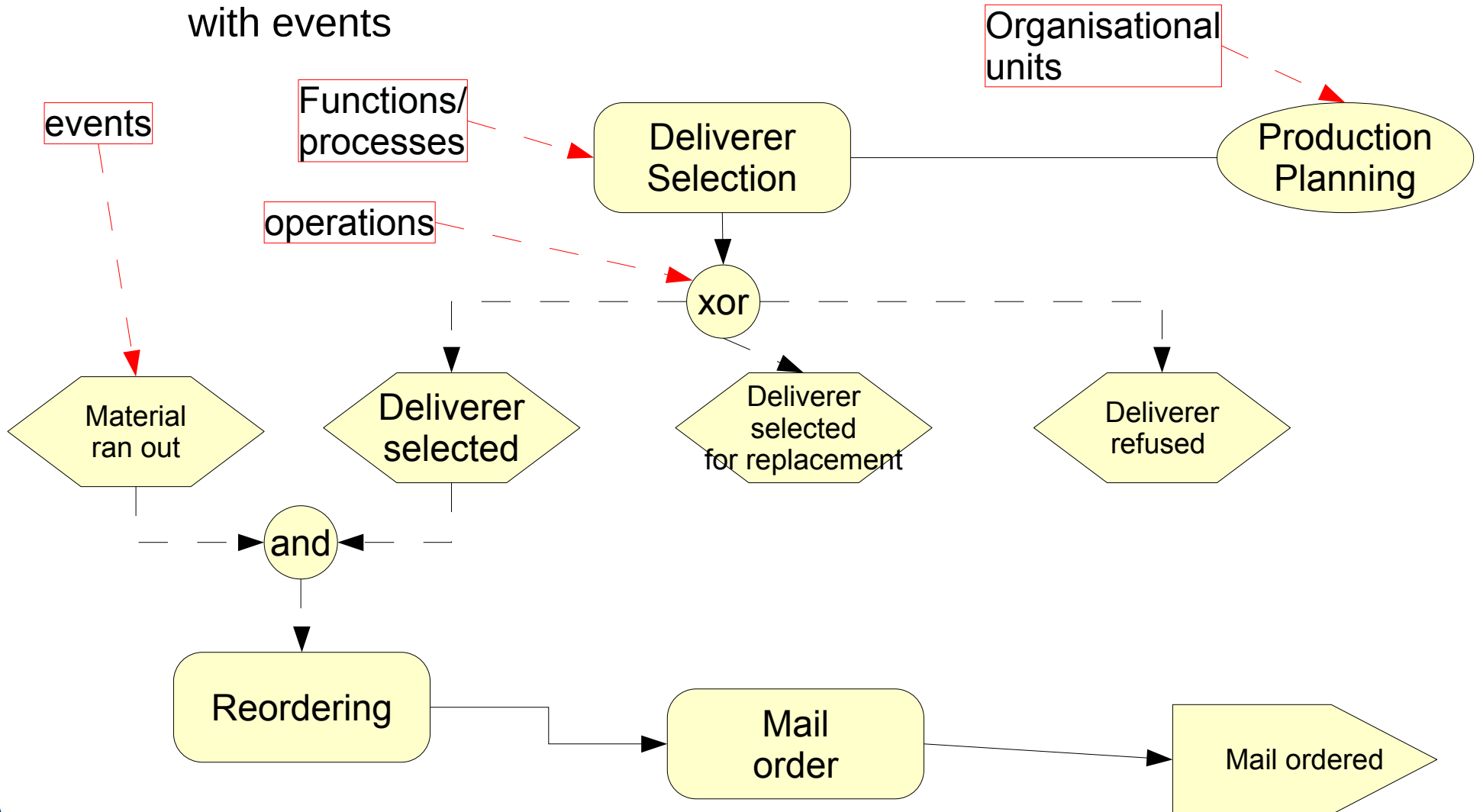
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Workflow Specifications with EPK

(Ereignisgesteuerte Prozessketten)

▶ ## The SAP framework is steered by business workflow specifications

- EPC (Event-driven process chains) specify processes that communicate with events
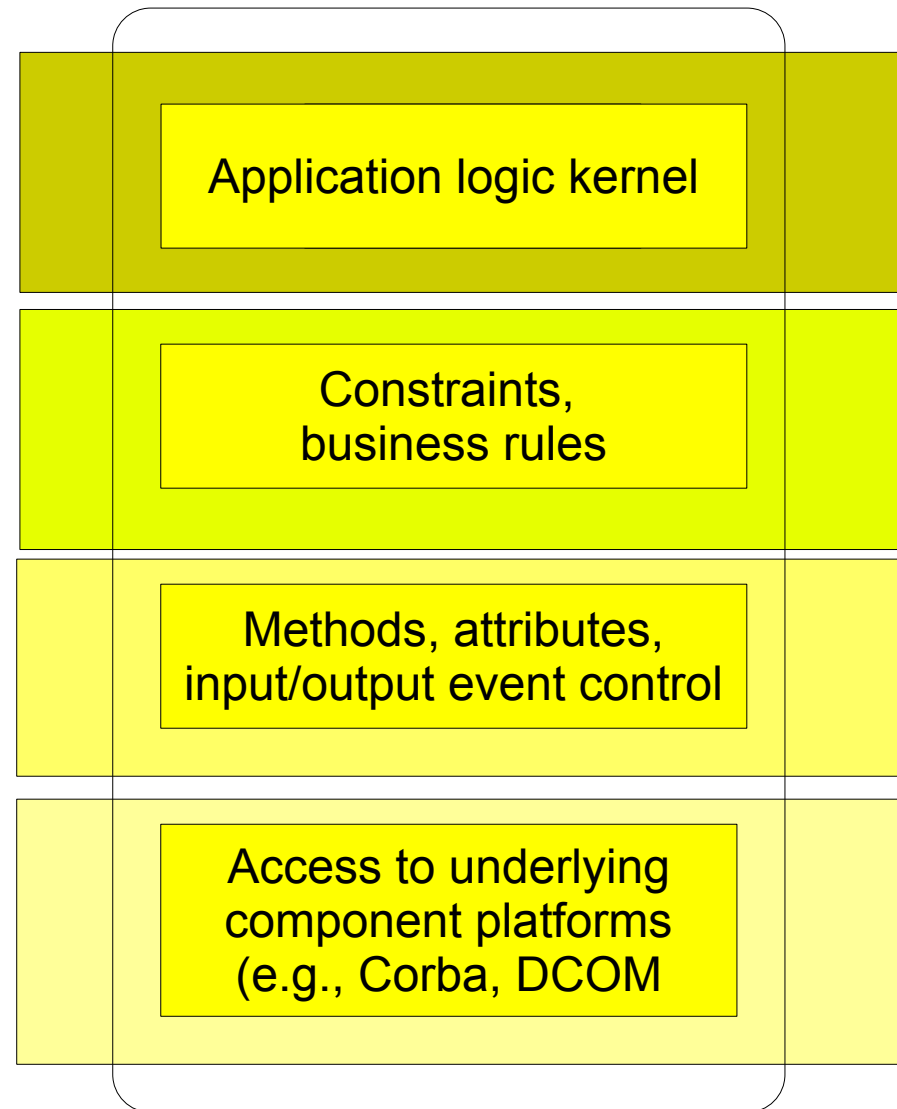
Business Blueprint Process Framework

► 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
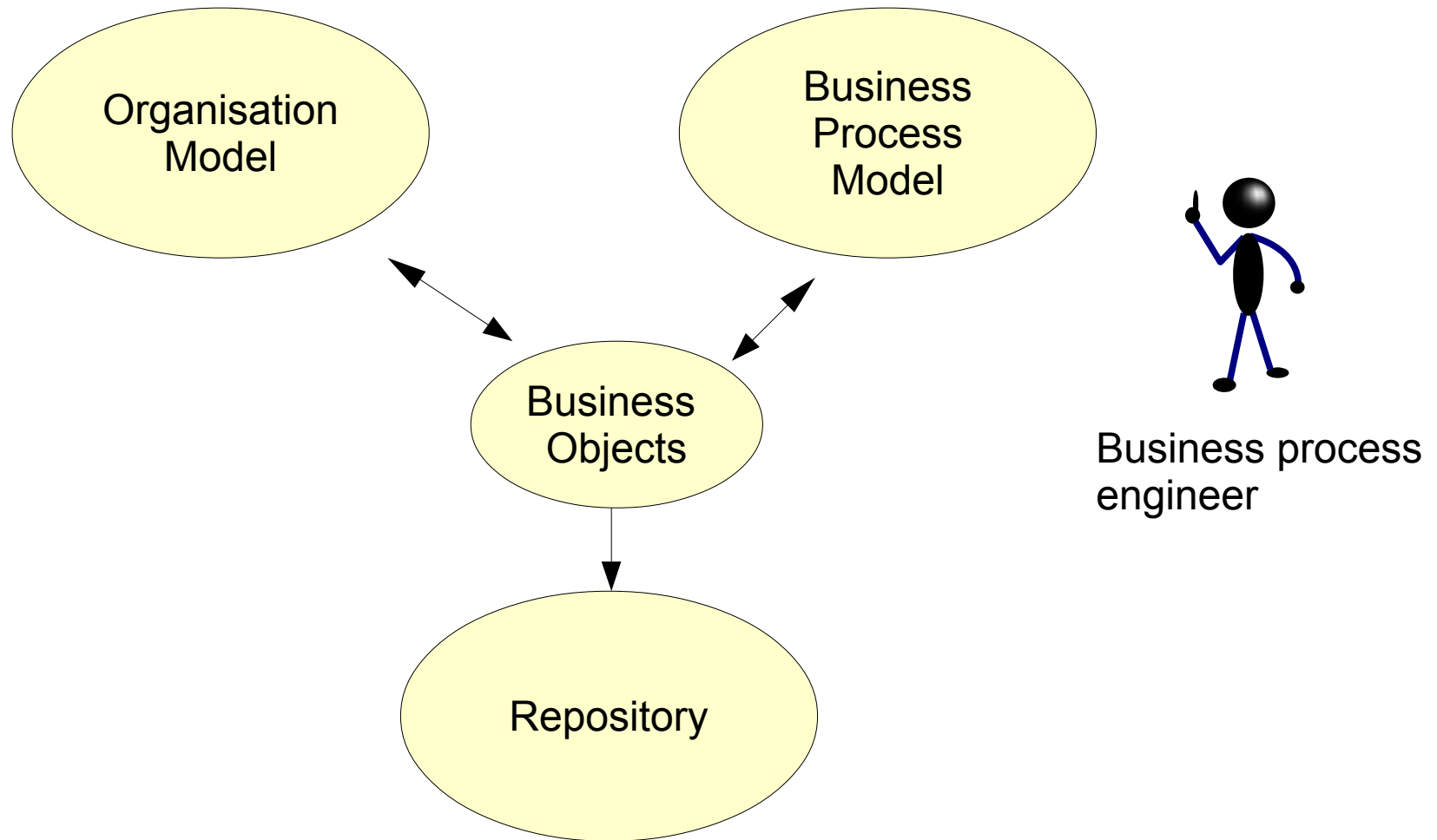
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R/3 Repository

▶ 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)

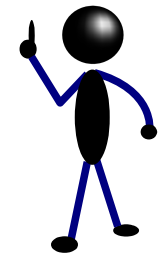▶ The set of business objects forms a layered framework

Application logic kernel

Constraints, business rules

Methods, attributes, input/output event control

Access to underlying component platforms (e.g., Corba, DCOM

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Organisation Model

Business Process Model

Business Objects

Repository

Business process engineer

Business Application Integration

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Legacy systems

Office Software

Java J2EE

Business process engineer

Enterprise Integration Server

Data warehouses

Other systems (e.g. Peoplesoft)

R/3
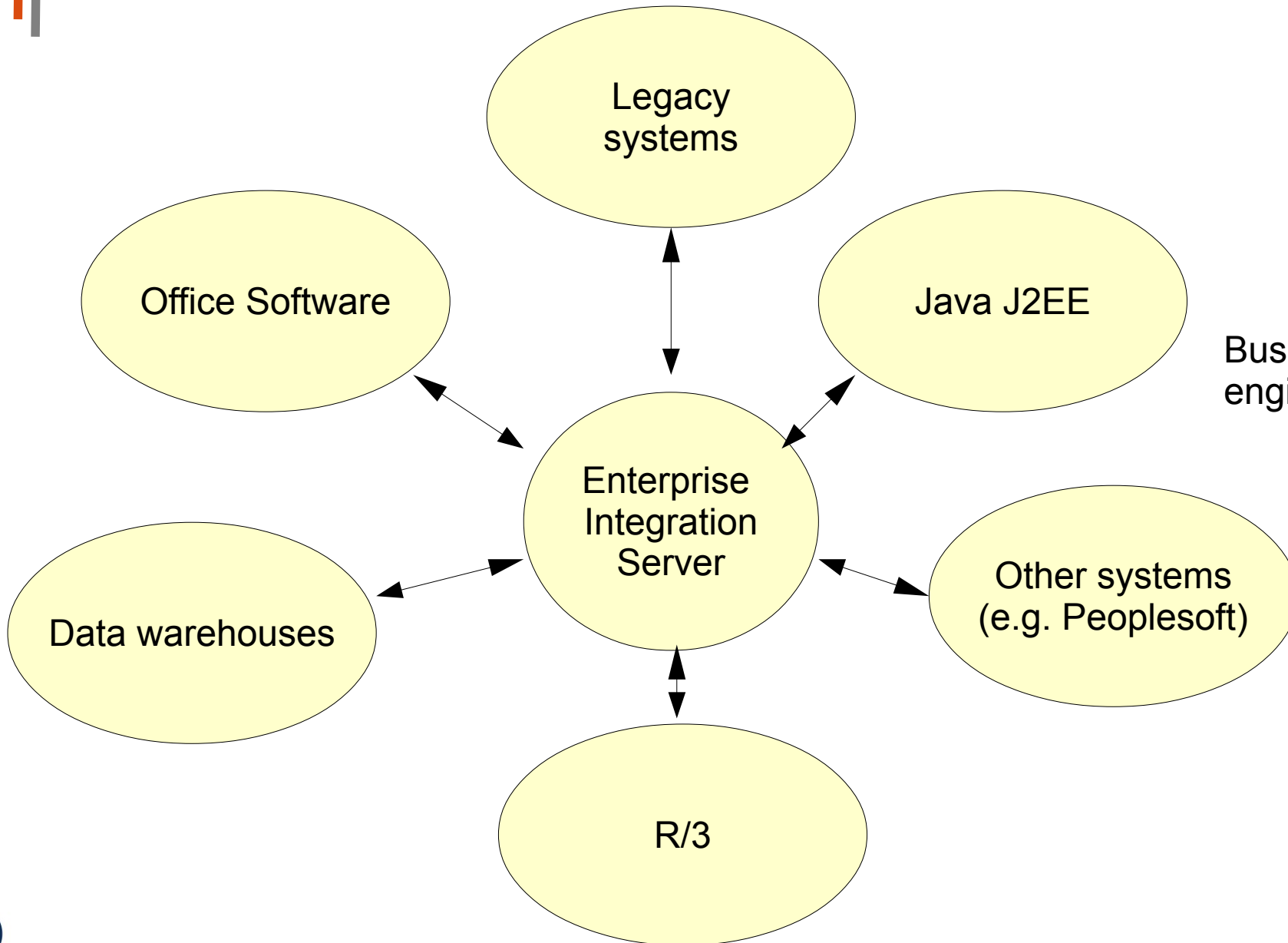
Insight: A Process Framework needs a Process Specification Language

▶ 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

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The End

► www.sap.com

► SAP's research lab at TU Dresden

  - Director Dr. Hackenbroich

  - Chemnitzer Str 43, 3rd floor

  - Thematic area "Future Manufacturing Systems"

► Course "Enterprise Software" in winter period (Prof. Dr. Uwe Kubach)

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