Experiences with Open-Source BPM/SOA-based Stack using Java EE

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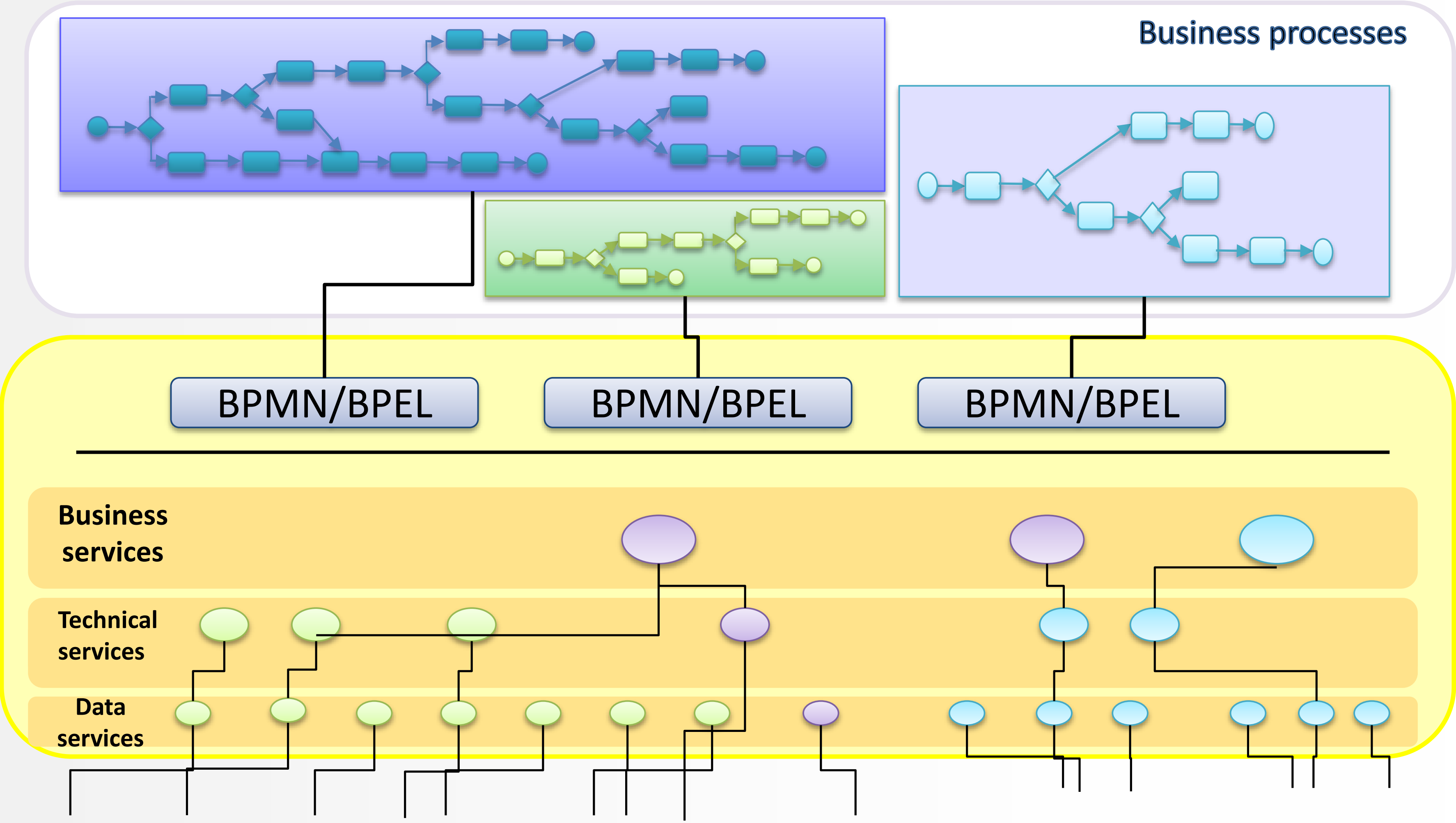
SOA/BPM

- SOA
  - Service reuse
  - Loose coupling
  - Service granularity
  - Service encapsulation
  - Building composites
  - Standardization of service interfaces
  - Flexible integration
  - ESB
  - …

SOA/BPM


Business processes
BPMN/BPEL
BPMN/BPEL
BPMN/BPEL
Business services
Technical services
Data services

SOA/BPM

- SOA approach to BPM
  - Supports all phases of BPM lifecycle
    - Modeling (BPMN)
    - Simulation
    - Optional transformation to BPEL
    - Implementation
    - Monitoring (BAM)
    - Optimization
- Flexible architecture
- Lower semantic gap
- Promotes re-use

Data and Application layer

- **JPA - JPA 2.0** (JSR 317)
  - ORM
  - Loose coupling between application and data layer
  - JPQL
- **JDBC** in certain scenarios
  - Stored procedures
- **Java EE application server**
  - JBoss Application Server
  - Glassfish
- **EJB**
- **Expose** session beans as **services** (EJB, RMI, REST, SOAP)
- **Messaging systems (JMS)**
  - **Point-to-point (PTP)**
  - **Publish/subscribe**

Services layer

- **Apache ServiceMix**
  - Based on JBI specification and OSGI framework (Apache Karaf)
  - Includes ActiveMQ (JMS), CXF, ODE

- **WS02 ESB**
  - Based on Apache Synapse for message transformation and routing
  - No support for JBI

- **Mule ESB**
  - No integrated messaging system
  - Mediation, routing in integration is based on proprietary solution

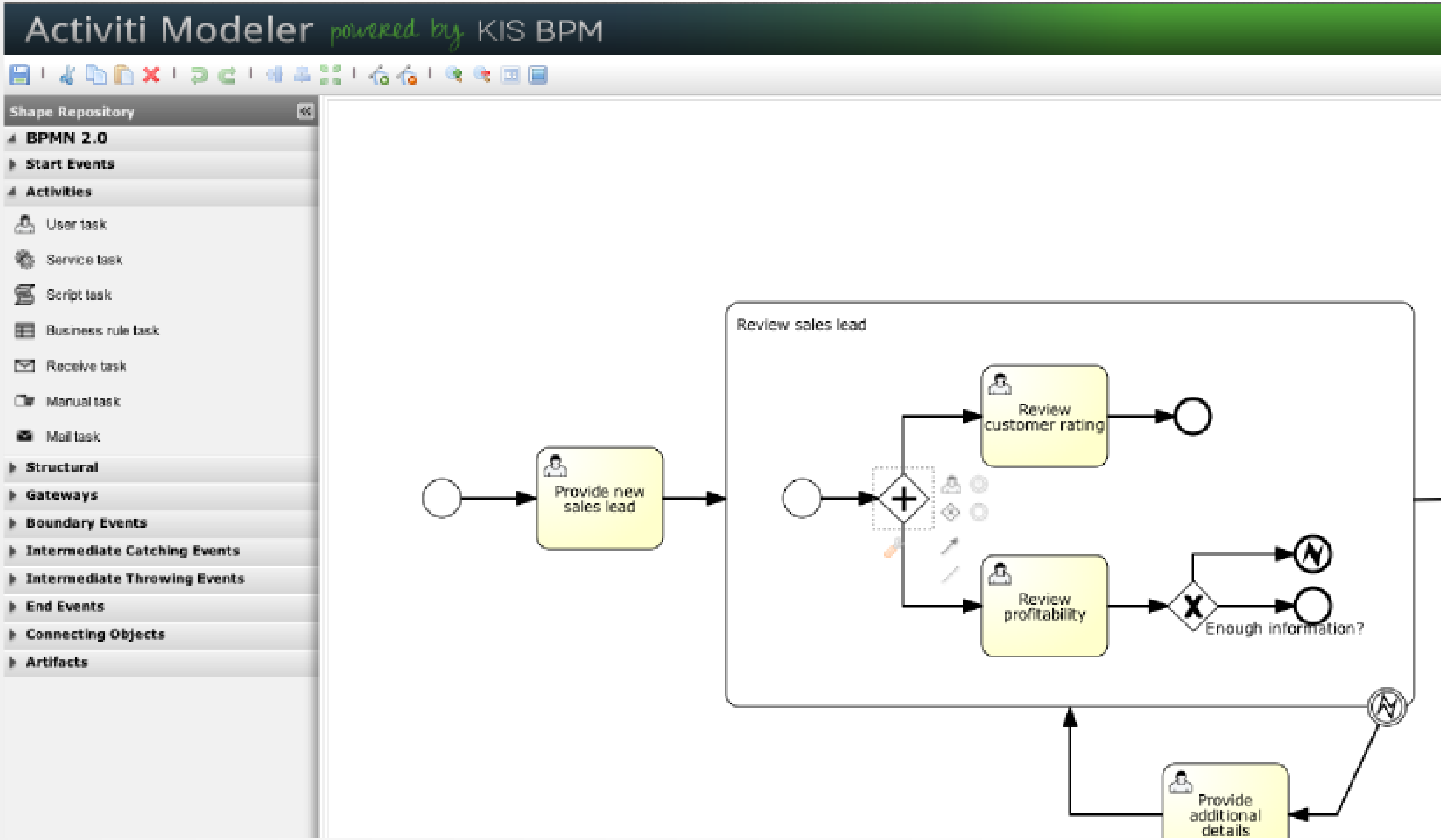
- **JBoss SwitchYard**
  - Includes Apache Camel, CXF, jBPM, ActiveMQ
  - Expose services by annotations

Process layer

- Products with support for BPMN 2.0 modelling and execution:

- Bonitasoft is a tool-based solution
- Activiti and jBPM expose API for communicating with the engine

Process layer



Process layer

- **Console**
  - Very basic console included in jBPM 5
  - Well organized console in Activiti (better than jBPM 5)

- **jBPM API**
  - **Java API, REST API** with less functionality compared to Activiti

- **Activiti**
  - **Java API**
  - Well-documented **REST API** http://www.activiti.org/userguide/#N12B3B

Process layer

- **Human Task support**
  - Human tasks are supported in jBPM and Activiti
  - **jBPM** implements **WS-HumanTask**

- **Business rules:**
  - Good integration of **jBPM** with **JBoss Drools**.
  - Experimental support for **Drools Expert in Activiti**

- **JBoss Drools Guvnor**
  - Centralized repository for Drools Knowledge Bases
  - Tools to manage rules, models, functions, processes and other artifacts

- **Business calendar**
  - **No support** for business calendar **in Activiti**

Service registry and repository

- **Service registry and repository**
  - WSO2 Governance Registry
    - Repository for several different artefacts (XSD, WSDL…)
    - Integration with jBPM/Switchyard?
  - Membrane SOA Registry
    - No repository
    - Less rich with features
  - JBoss Overlord
    - S-RAMP repository, also allowing to store BPMN 2.0 processes
    - Supports integration with JBoss Guvnor
  - JBoss Guvnor
    - Limited to repository

Presentation layer

- **Approach:**
  - Server-side
  - Single-page client-side
  - Portal solutions
  - Mobile clients

- **Server-side**
  - Open-source Java EE servers:
    - Glassfish
    - JBoss AS
  - JSF extensions for building front-end:
    - Richfaces
    - Primefaces

Presentation layer

- **Single client-side web**
  - Based on **HTML5** in **JavaScript**
  - **Responsive Web Design** – Design rules for different device types
  - **Fluid concept** – Adapt and fit to full screen

- **Application navigation:**
  - AngularJS, Knockout and Backbone.js
- **User interface composition:**
  - AngularJS, Bootstrap
- **Buisness objects modeling framework :**
  - Dojo – Object oriented framework suitable for business applications
- **Framework for REST communication:**
  - Dojo – REST communication framework is included
  - Breeze.js – Additional functionalities: paging, filtering, OData...

Presentation layer

- **REST services for presentation layer**
  - Implementation in **JAX-RS**

- **CSS3 styles**
  - CSS3 languages:
    - **LESS** (http://lesscss.org/), **SAAS** (http://sass-lang.com/)

- **Portal solutions for enterprise environments**
  - eXo Platform
  - GateIn Portal (JBoss Portal)
  - Jetspeed-2
  - Liferay Portal

Presentation layer

- **Native clients**
  - Common REST layer allows reuse of web services for mobile development
  - Native solutions with dedicated SDK
  - Hybrid solution: HTML 5 app using REST services and packed as native App
    - Phonegap (http://phonegap.com/)
    - All main platforms are supported (iOS, Android, Windows Phone, Blackberry, Symbian…)

Support services

- **Caching**
  - **Distributed caching** (in-memory data grid)
  - High-availability
  - JBoss Infinispan

- **Identity management**
  - **LDAP** (Lightweight Directory Access Protocol)
  - Connector for **database**
  - JBoss PicketLink

- **Monitoring**
  - JMX (Java Management Extensions)
  - JBoss RHQ

Do more with SOA Integration: Best of Packt

Carl Jones (Editor)

WS-BPEL 2.0 for SOA Composite Applications with IBM WebSphere 7

WS-BPEL 2.0 for SOA Composite Applications with Oracle SOA Suite 11g

Matjaz B. Juric Marcel Krizevnik

Oracle Fusion Middleware Patterns

Harish Gaur Markus Zirn

Business Process Driven SOA using BPMN and BPEL

Matjaz B. Juric Kapil Pant

SOA Approach to Integration

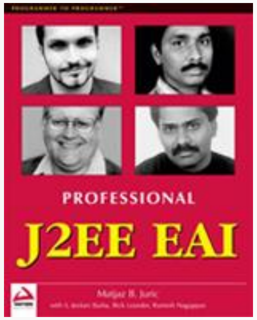
BPEL Cookbook

Business Process Execution Language for Web Services

Second Edition

J2EE Design Patterns Applied

Real World Development with Pattern Frameworks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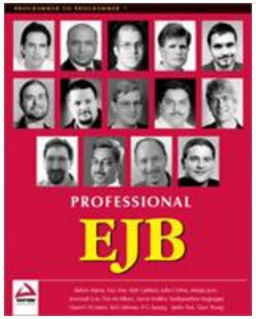
J2EE EAI

Matjaz B. Juric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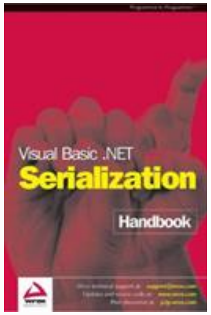
EJB

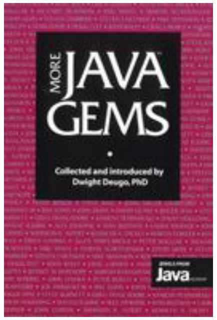

Visual Basic .NET Serialization Handbook

Advances in Computation: Theory and Practice Volume 14

Technology Supporting Business Solutions

Rafael Corchuelo
Antonio Ruiz-Cortés
Robert Wrembel
(Editors)

Nova Science Publishers, Inc.


MORE JAVA GEMS

Collected and introduced by Dwight Deugo, PhD

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