

MESOCA 2013

Platform based approach for automation of workflows in a system of systems

Tarmo Ploom (Credit Suisse), Axel Glaser (Postfinance), Stefan Scheit (Telstra)

September 25, 2013

Key Messages

- Emergence of workflow automation platforms its next natural evolutionary step after the emergence of SOA platforms
- Difficulty on handling workflows in landscapes is that workflows evolve continuously
- Platform-based approach for the automation of workflows can be used for transforming SOA-based system of systems to SOA + BPM-based system of systems



Agenda

- Introduction
- Problem
- Solution variants
- Platform approach
- Results
- Further work

Introduction

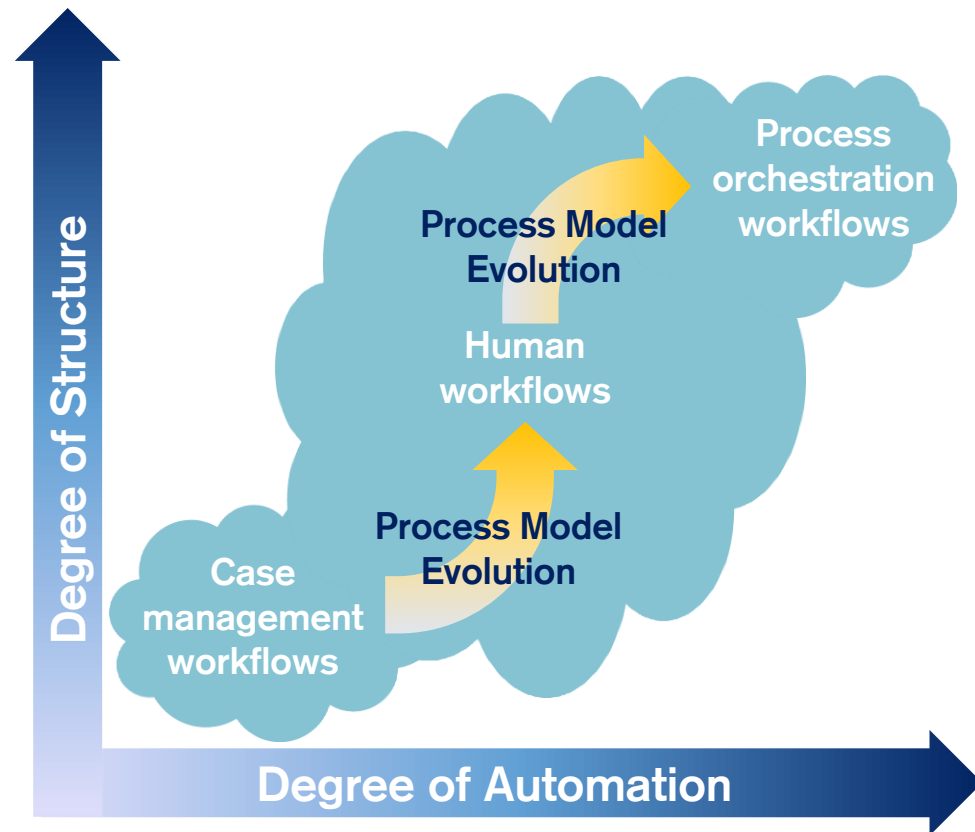
- System of systems characteristics
 - Operational independence of its elements
 - Evolutionary development
 - Emergent behavior
 - Geographic distribution
- Directed system of systems
 - Central controller/steering body
 - Credit Suisse IT-Landscape is a directed system of systems
- SOA has been seen a main architectural style for handling complexity of system of systems
- But what about business processes? How do we automate business processes in system of systems?

Problem: Workflows in System of Systems are hidden

- In the past, mostly single applications were built:
 - Workflows in single applications were hidden in code
 - Workflow definition in single application was unknown
- Meanwhile, systems get larger, and landscapes transform to system of systems
 - Workflow implementation in system of systems are hidden
 - Cross application workflows are implemented randomly in invocation chains
 - Global workflow definitions are unknown
 - Flow state of the workflow is unknown
 - Data state of the workflow is unknown

Problem: Workflow Evolution

- Workflows evolve by
 - Degree of structure
 - Degree of automation
- Workflow type evolves
 - Case management workflow to human workflow
 - Human workflow to process orchestration workflow
- Approaches which focus on automation of single type inhibit overall evolution



Problem: End-to-End Workflow Automation

- End-to-end process
 - Process which starts with initial incoming request and ends with ultimate response i.e. no post processing steps
- End-to-end processes in a system of systems involve tens to hundreds of different applications
 - End-to-end processes integrate application sub-processes into one central defined process
- How to automate end-to-end processes?

Solution Variants for Workflow Automation

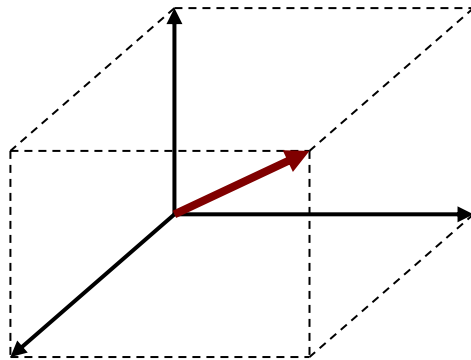
- a) Each application selects (different) workflow automation approach
 - Each application integrates (different) workflow engine
 - End-to-end workflows are achieved by integration of processes from different workflow engines
 - Distributed workflow state

- b) Same workflow engine is used by each application
 - Each application integrates (the same) workflow engine
 - End-to-end workflows are achieved by integration of processes from the same workflow engines
 - Distributed workflow state

- c) One centralized workflow platform is defined which provides integrated environment for workflow automation

Vision, Platform Approach

Case management workflows

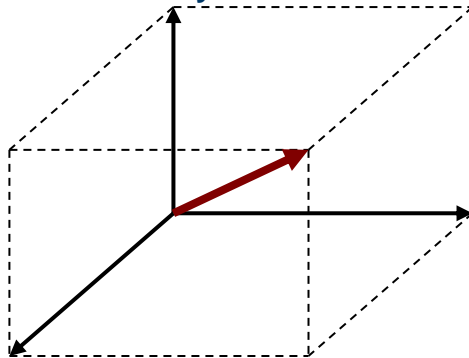


Human
Workflows

Process orchestration workflows

main non-functional requirements

Flexibility



Usability,
Comprehensibility

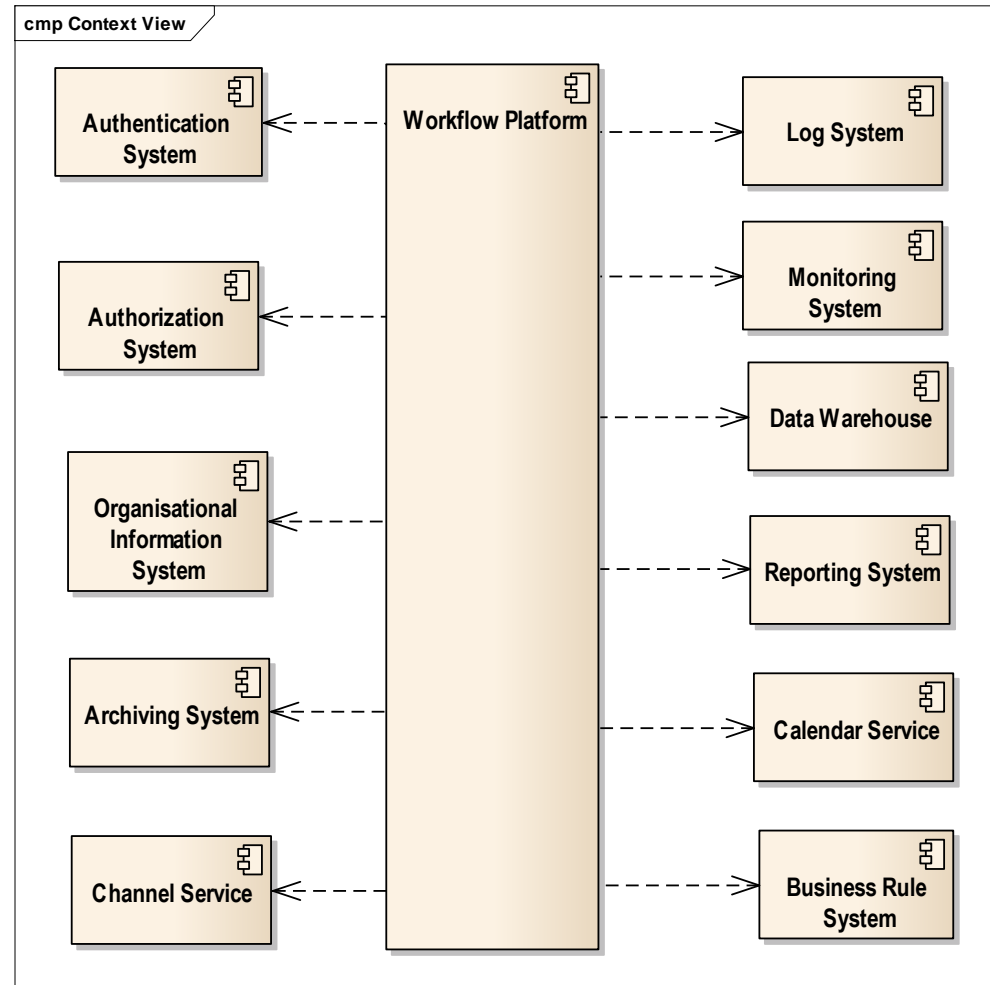
Throughput, Latency



- Our solution approach is not a best-of-breed for every requirement but **One Fits All**
- **Create one platform** for
 - Case Management
 - Human Workflow
 - Process Orchestration

Platform Context Diagram View

- Integrations on platform level
 - Once-only and as much as possible
 - Providing integrations as platform services
- Integrations on process level
 - Using platform services (configurative)
 - Focus on business process related integrations
- Software production line approach



Results, Load & Performance Tests

- Service calls
 - Approx. 100 Web service Tx per second*
 - Approx. 50 CORBA service Tx per second*
- Macro-flows
 - Persistent flows, after each activity the state is persisted
 - Max 46 test macro-flows per second*
- Micro-flows
 - Transient flows, in-memory
 - Max. 120 micro-flows per second*

* Setup: non-clustered, one engine and one database

Results, Global Deployment



* Singapore clients are currently hosted on HUB Zurich

Results, Applications

- Global view, applications per hub
 - Zurich (CH) – 19
 - Singapore (SG) – 1
 - London (GB) - 2
 - New York (USA) - 3
- Organizational unit view, applications per org unit
 - Investment Banking - 2
 - Private Wealth Management - 19
 - Technical Infrastructure Services - 4
- Ca one million workflow instances per month

Further Work

■ Workflow Platform

- Increase scalability to 800 macro-flows per second
- Leverage Credit Suisse SOA
- Transformation to software product line approach

■ Research

- Process automation in system of systems
- Migration of «spagetti process landscapes» to BPM based landscapes
- Workflow reference architectures
- Flexibility in workflow applications
- Workflow patterns for applications
- Workflow benchmarking

Questions and Answers



Authors



Tarmo Ploom holds Ph.D., MBA, Ms.Ec, Ms.Eng degrees. He is working as Senior IT Architect in the Integration Architecture department of Credit Suisse since 2006. He is The Open Group Master Certified IT Architect.



Axel Glaser holds a Master's degree on Computer Science of Chemnitz University of Technology. He filled several roles in Workflow Competence Center of Credit Suisse from 2007 to 2012. Today, he works as IT Architect for PostFinance.



Stefan Scheit holds a Master's degree on Economics and Computer Science of Friedrich-Schiller-University of Jena. He filled the role of Solution Architect in the Workflow Competence Center of Credit Suisse from 2007 to 2011. Today, he works as Domain Specialist at Telstra in Australia.