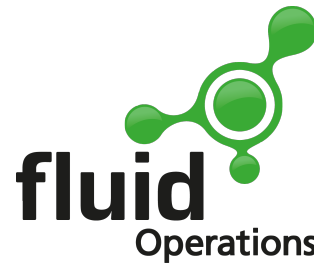


Transformation of Enterprise Data Islands into Linked and Living Knowledge



Business
Architecture
Sandbox for
Enterprise

Michael Schmidt and Yefim Zhuk

SemTech, June 5, 2012, San Francisco

Outline

Enterprise Data Management

- Current State and Challenges
- Potential and Benefits of Semantic Technologies and Linked Data

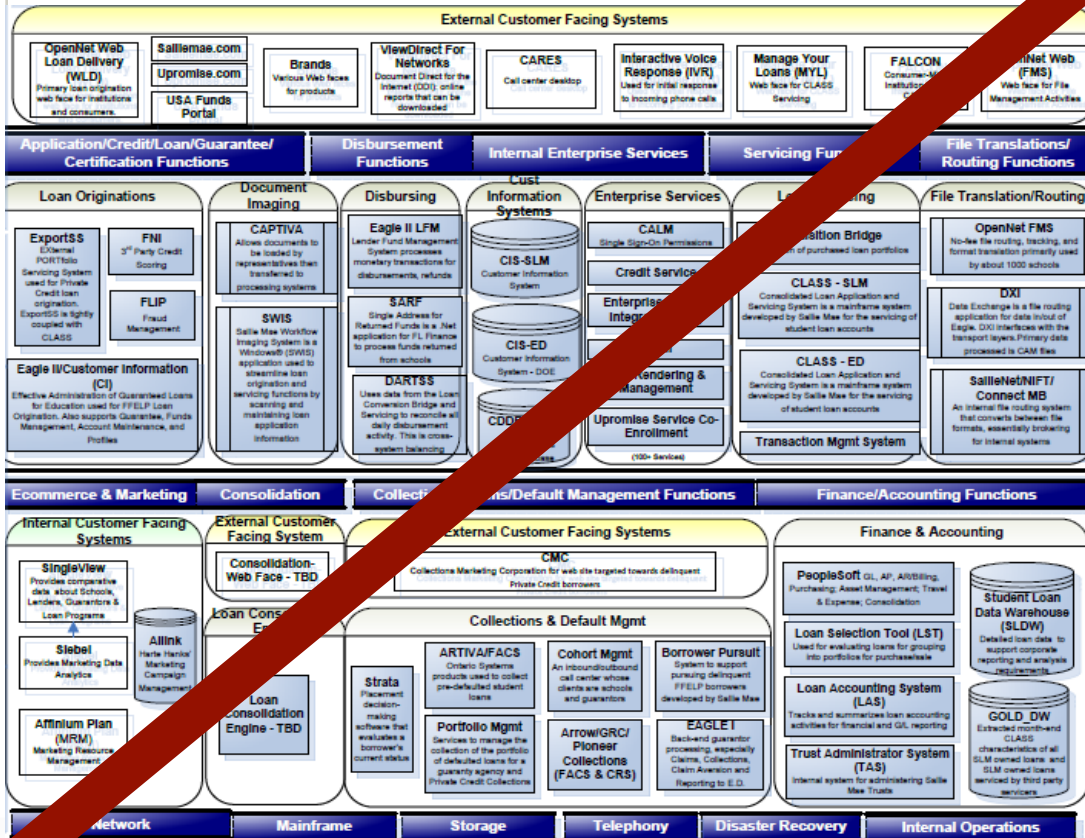
Transforming Enterprise Data Islands into Linked and Living Knowledge

- Architecture: Linked Data Technologies for Enterprise Data Management
- Business Architecture Sandbox for Enterprise (BASE)
 - Bringing Together Business and IT
 - Conversational Semantic Decision Support
 - Demo
- Information Workbench
 - Centralized and Federated Data Integration
 - Application Development Based on Semantic Wiki Technology
 - Demo

Conclusion

IT Transitioning to Cloud with Semantic Enterprise Architecture

Linked Data
+
Conversational
Semantic
Decision
Support



Current Situation

- Data scattered among data silos across the enterprise
- Different data formats, different APIs for data access
- Global, integrated view on company information missing
- Isolated applications, typically making use of single data source

- Bottom line: complex & expensive

Transition Benefits

- Simplicity, cost efficiency, and more

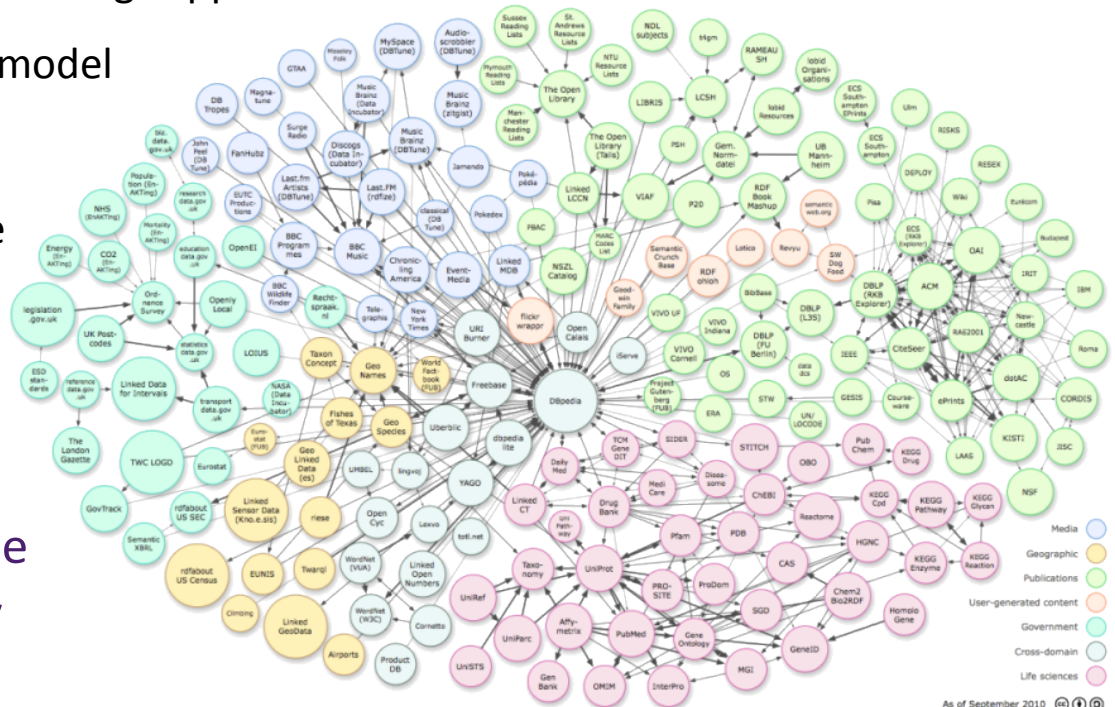
The Potential of Linked Data

Linked Data

- Set of principles for publishing, sharing and interrelating structured knowledge
- Established technologies, standardized by the W3C
- From data silos to a Web of Data
- Machine-readable data with reasoning support
 - RDF and OWL as data model
 - SPARQL for querying
 - Ontologies to describe the semantics

Our Vision:

A unified information landscape
for a company and industry
based on Linked Data



As of September 2010

Benefits of Linked Data

Enterprise Data Integration

Semantically integrate scattered data in a unified platform for knowledge management, leading to streamlined information management with less layers and better information focus

Collaborative Knowledge Management and Analytics

Enable cross-organization analysis on top of a collaborative platform

Time-to-market Acceleration and Development Savings

Minimize coordination efforts, integrated support for search, decision support & reporting

Enrichment and Contextualization Through Interlinking

Value add by linking to free Linked Open Data sources

Simplified Publishing and Sharing of Data

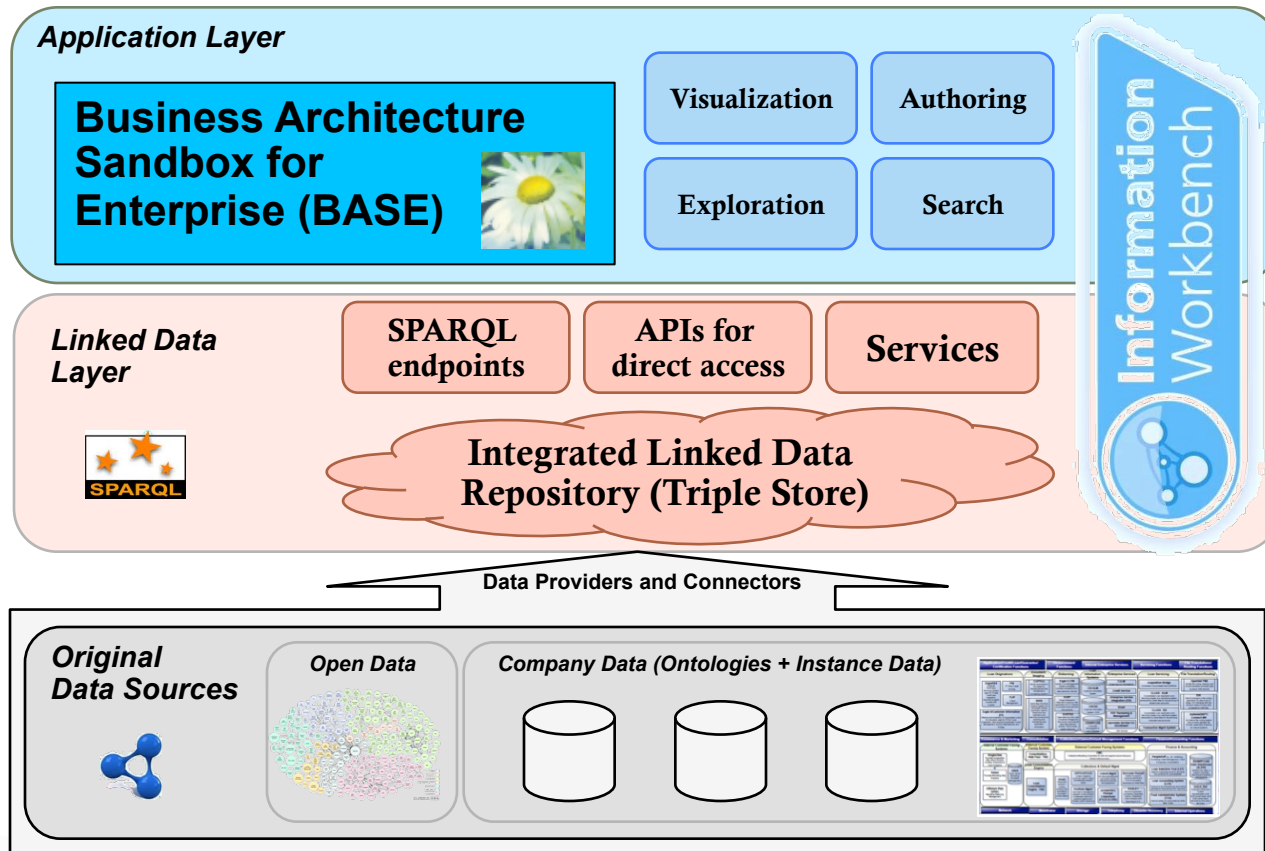
Increase openness and accessibility of enterprise data to clear the way for new integration and partnership capabilities.

Significant Infrastructure Cost Savings

Unified semantic information landscape simplifies the storage and management solutions to (ideally) a single triple store and a conversational semantic decision support system; simplification of infrastructure makes the cloud more attractive and leads to cost savings

Architecture

Transformation of Enterprise Data Islands into Linked and Living Knowledge



Application Layer

- New era of applications that exploit the integrated data graph

Linked Data Based Integration Layer

- Unified view on previously isolated data silos
- APIs for integrated access on data

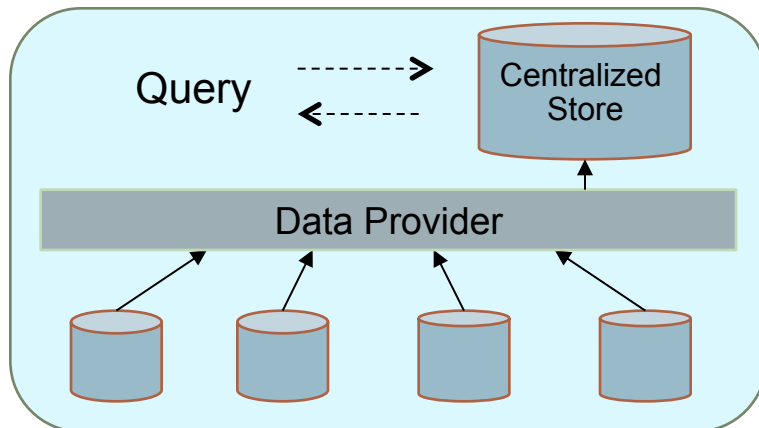
Internal & External Data Sources

- Various formats
- Different locations

Linked Data Integration Approaches

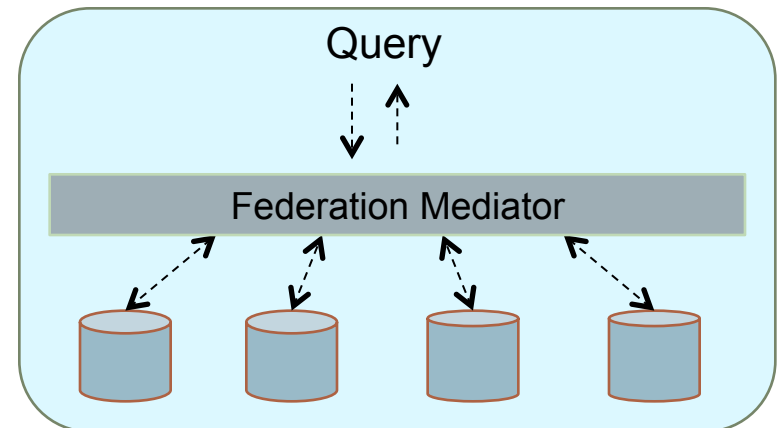
Centralized Integration

- Following a data warehousing approach
- Data providers periodically gather data from sources and lift it to semantic data formats
- Graph-based data format enables pay-as-you-go integration of legacy data sources
- Information Workbench comes with predefined providers for various formats and data sources (Spreadsheets, XML, ...)



Virtualized Integration

- Autonomous, distributed data sources linked through a federation layer
- No central integration required
- Data sources can be added ad hoc, on demand
- Federation mediator for query processing (routing sub queries to relevant sources)



Linked Data Federation with FedX

Application Layer



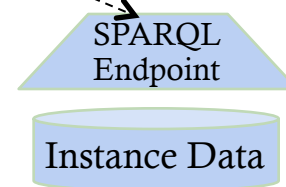
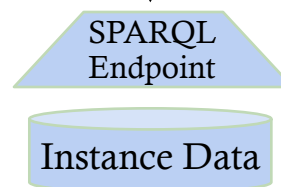
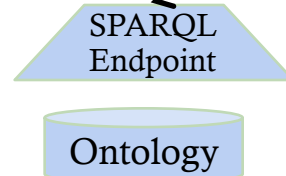
**Business Architecture
Sandbox for
Enterprise (BASE)**



Virtualization Layer



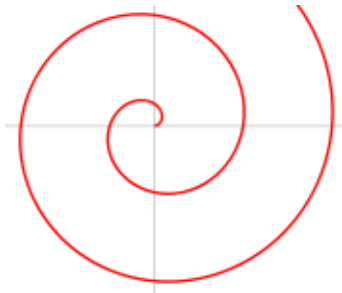
Data Layer



Metadata
Registry

See also: *FedX: Optimization Techniques for Federated Query Processing on Linked Data (ISWC2011)*

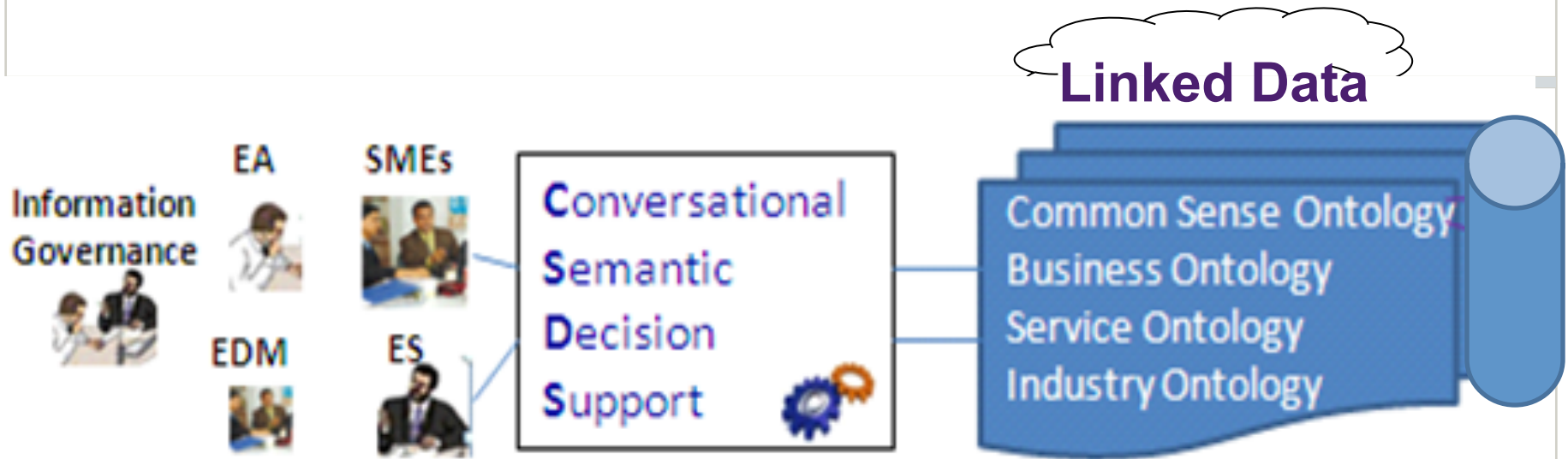
Engaging SMEs in Business Architecture



The BASE creates the framework to deal with Technology & Cultural Challenges

- Allows Business and IT collaborate on new approaches
- Engages SMEs in the Business Architecture activity, focusing on information, and transitioning to Semantic Enterprise Architecture:
 - Using built-in BASE Data Dictionary & Business Model Integrator
 - Using built-in BASE Rules Engine & Decision Modeling
 - Combining BASE and Information Workbench integration features

Focus on Information and Simplify IT

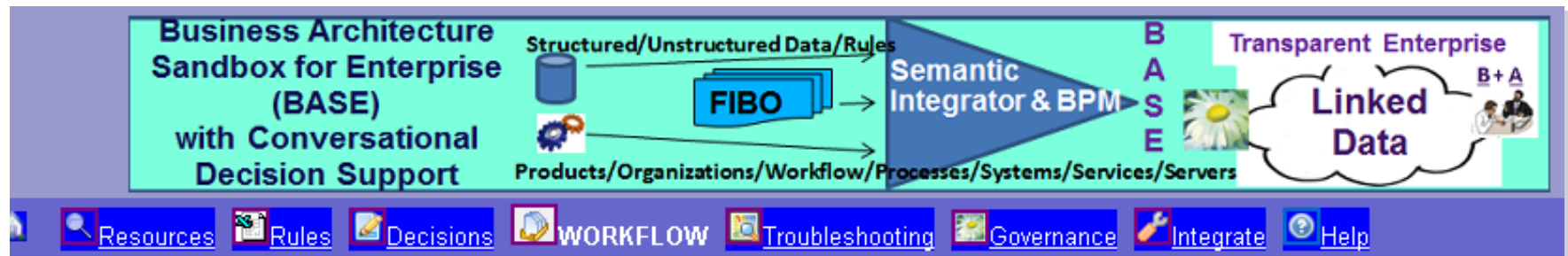


A Business Analyst (BA) writes a line of requirements: *“Users start with login”* and ... the CSDS system would reply: *“Do you mean the Authentication Service?”*

The BA would confirm and ... the CSDS system would ask: *“What Roles and Privileges do you have in mind for your users?”*

Conversational scripts initiate and support dialogs for collaborative information management

Transition from Enterprise Data Islands to Linked and Living Knowledge with BASE/Semantic Integrator Demo



Welcome Yefim Zhuk

Semantic Integrator with Conversational Support makes workflow management simpler

How this works:

Each workflow consists of several business states or work steps and each Business State implements the Workflow interface. A resulting state is stored in a cluster and serves as an input for the next state process. Conversational Semantic Decision Support (CSDS) helps to create and manage workflow processes with rule-based modeling. CSDS greatly benefits from the unified semantic information landscape created by the Semantic Integrator component of the BASE.

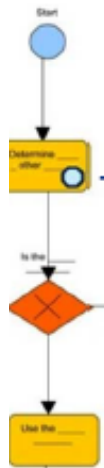
Operations:

List States {workflowName}, Start {requestID, workflowName}, Start {requestID, workflowName, stateName}

Monitoring:

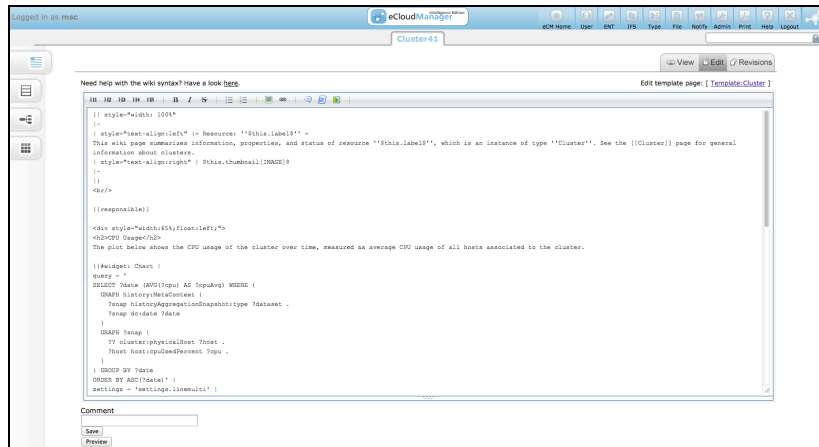
Share Status {toServerIP}, Display Status {all servers/selectedServerIP}

[List known workflow processes](#)

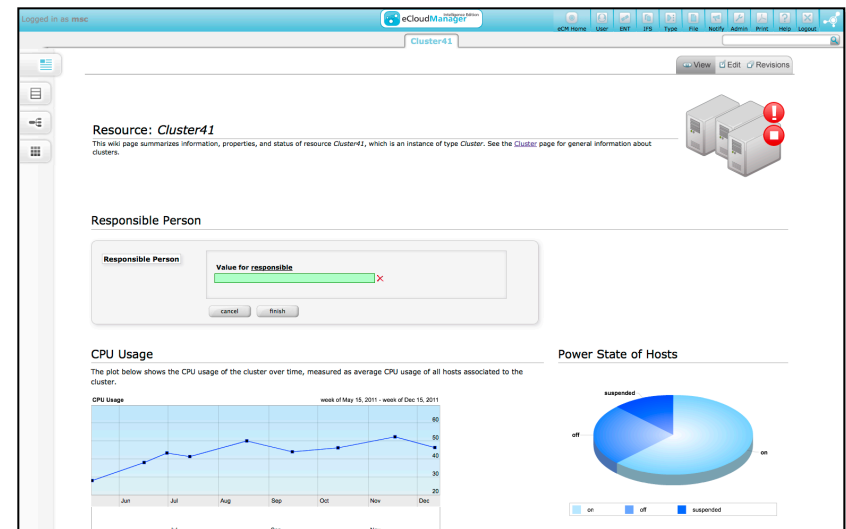


Semantic Wiki + Widgets as Self-service Linked Data Frontend

- Semantic Wiki for collaborative authoring and linking of unstructured and structured semantic data
- Declarative specification of the UI based on available pool of widgets and simple wiki-based syntax
- Widgets have direct access to the database
- Embedding of dynamic data, visualizations, forms, etc.
- Type-based template mechanism



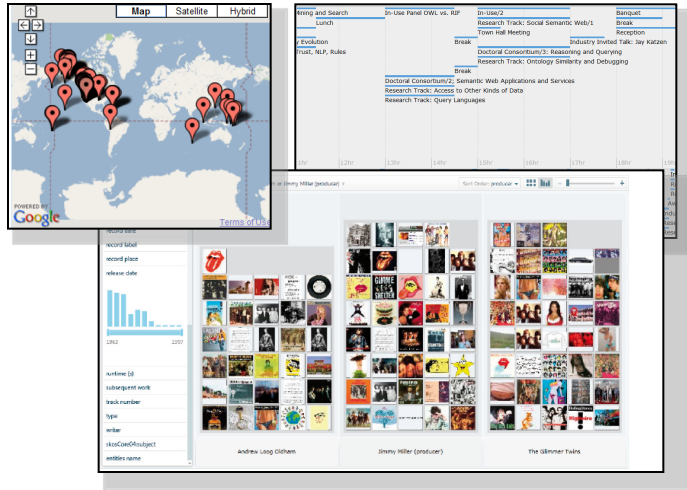
Wiki page in edit mode ...



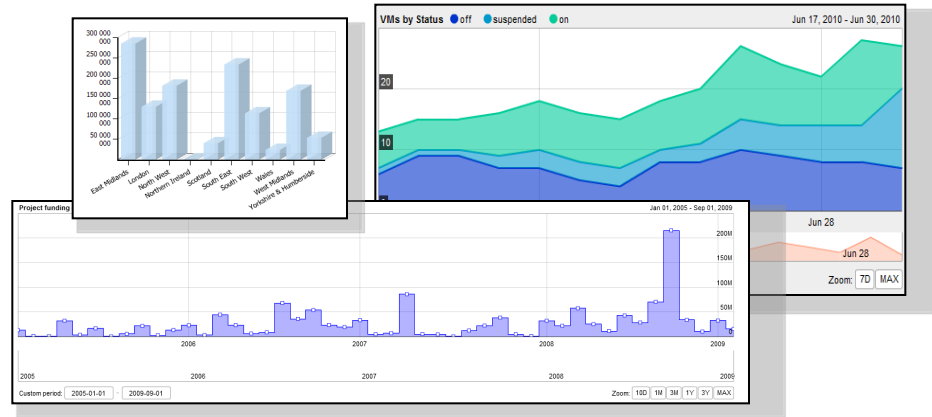
... and displayed result page

Rich Pool of Available Widgets for Interacting with the Integrated Data

Visualization and Exploration



Analytics and Reporting

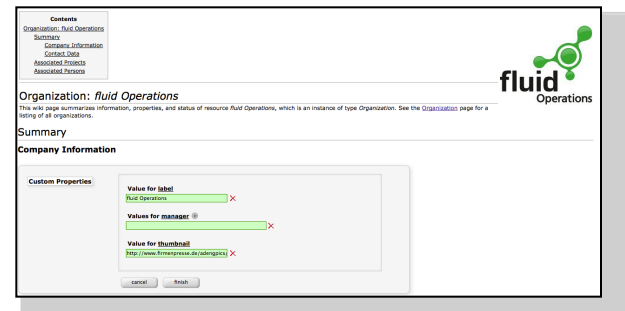


Authoring and Content Creation

Mashups with Social Media



Widgets can be integrated into Semantic Wiki pages using an intuitive, declarative syntax.



Demo Information Workbench

The screenshot displays the Information Workbench interface. At the top, there is a blue header bar with the 'Information Workbench' logo on the left and a navigation menu on the right containing icons for Print, Admin, Help, Login, and a user profile. Below the header, a 'Help:Start' tab is active. A sidebar on the left contains icons for a menu, a list, and a search function. The main content area features a 'Welcome to the Information Workbench™' section, followed by three columns: 'Getting Started', 'Administration', and 'Content Overview'. At the bottom, there is a 'Help' section. The interface uses a clean, modern design with light blue and grey tones.

Information Workbench

Print Admin Help Login

Help:Start

View Edit Revisions

Welcome to the Information Workbench™

The **Information Workbench** is a platform for Linked Data application development. Designed as a self-service platform, the Information Workbench provides you with all the tools and features you need to quickly build your personal Linked Data applications. It offers **semantic wiki** functionalities, an extensible, **widget-based UI**, **search** and **information access** and **data management** functionalities.

Getting Started

Get started right away with our brief **Getting Started tutorial** (recommended).

Or go through the getting started check list on your own:

- initial **import** of your own data
- set up data **providers** ([help](#))
- create wiki pages ([help](#))
- create wiki templates ([help](#))
- **create users** ([help](#))

Administration

You can always click on the admin symbol in the upper right corner to open **admin pages** ([help](#))

Do you want to...

- **create user accounts?** Go to **user management** ([help](#))
- **import data?** Use the **import page** or set up **providers** for ongoing imports ([help](#))

Content Overview

Do you need an overview of the data available in your Information Workbench? Have a look at the **Content Overview Page**. The overview contains:

- statistics about the available data,
- class hierarchy,
- properties overview,
- list of contexts.

Help

You have various possibilities to get support or to discuss any issues concerning the Information Workbench:

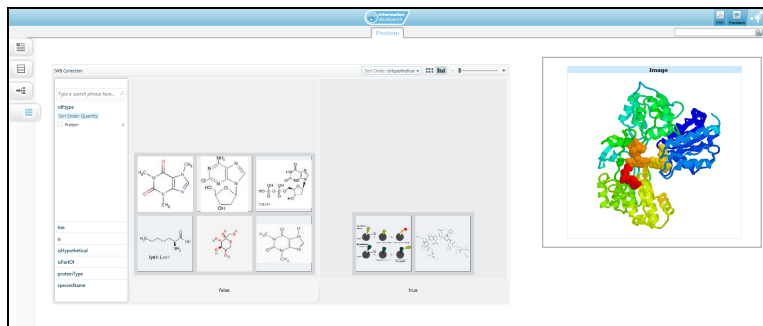
- **Help Section.** Our **help section** provides you with detailed information on how to set up, use and customize your installation of the Information Workbench. For first time users we recommend to try our **tutorial** when working through the documentation.
- **Mailing list.** Want to be always informed about the latest developments in the Information Workbench and reach out to other users and developers per e-mail? Register for our **mailing list**.
- **Contact.** Still have unclear issues and couldn't find a suitable answer? Ask your question using our **contact form**.

Possible Application Areas

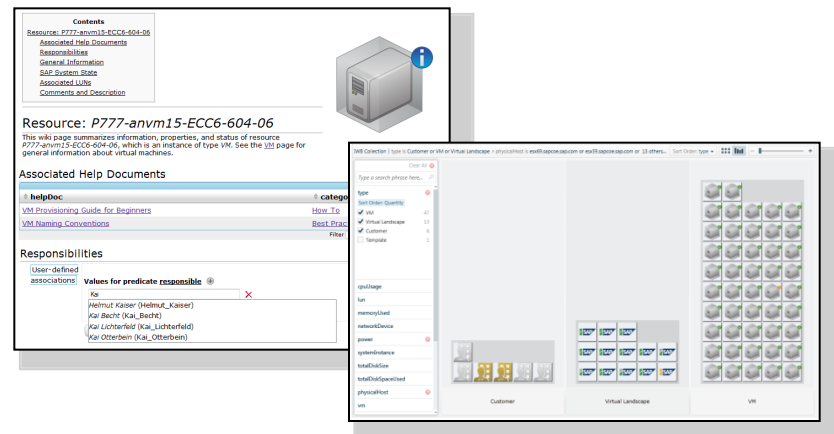
Transitioning to Semantic Enterprise and Engaging SMEs in the transition



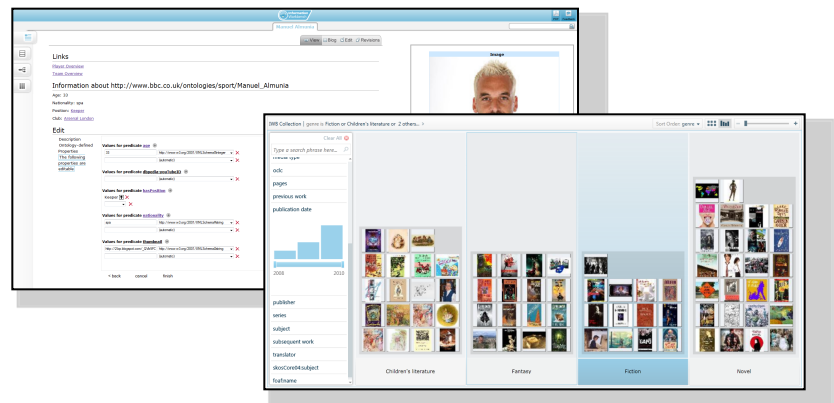
Knowledge Management in the Life Sciences



Intelligent Data Center Management



Digital Libraries, Media and Content Management



Conclusion

Semantic technologies offer great potential to overcome the challenges of today's enterprise IT landscapes

Linked Data technologies as a means to transition from previously isolated information silos to an integrated information landscape

Integrated view on data silos leverages new business opportunities

- Conversational semantic decision support
- Collaborative knowledge management and analytics
- Simplified publishing and sharing of data
- Time-to-market acceleration and cost savings

Business opportunities tackled by a new era of applications making use of the integrated data corpus; examples include

- **BASE** semantic integrator as a tool for conversational decision support bridging all departments of the enterprise
- **Information Workbench** as a flexible platform for application development on top of Linked Data

Thank you for your attention!



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