Connecting the dots
Development Lifecycle integration with open standards

Florian Georg
Solution Architect, IBM Software
Software Delivery / devOps / Cloud

@florian_georg
florian.georg@ch.ibm.com
Example: IBM Software Group – Agile Transformation at Large

New York, NY  Piscataway  Pittsburg  Poughkeepsie  Princeton  Somers  Southbury
Edmonton  Vancouver  Victoria
Bedford, NH  Cambridge  Littleton  Marlborough  Waltham  Westford
Cork  Dublin  Galway
Edinburgh  London/Staines  Milton Keynes  Hursley  Warwick
Kista  Delft
Kassel  Mainz
Bangalore  Gurgaon  Hyderabad  Mumbai  Pune
Sao Paulo
West Perth
Beaverton  Kirkland  Seattle  Almaden  Agoura Hills  Costa Mesa  El Segundo  Emeryville  Foster City  San Francisco  SVL/San Jose  Las Vegas
El Salto
Rochester  Minneapolis  Eden Prairie  Chicago  Ann Arbor  Dublin  Boulder  Denver  Lenexa  Phoenix  Tucson
Austin  Dallas  Houston  Irving
Valbonne  Paris  Pommichet  Toulouse
Herndon  Raleigh  Charlotte  Lexington, KY  Atlanta  Boca Raton  Tampa
Kanata  London  Markham  Ottawa
Edmonton  Vancouver  Victoria
Kissimmee
Rochester
81 Acquisitions
91 Labs
1198 products
506 releases / year
92% Growth Since 2001
10,000 resources from acquisitions
# customers - 11,867
% Efficiencies – 7% YoY

US  10,218
Canada  2,988
Latin America  262
EMEA  4,409
AP  6,394
Japan  276
Total  24,547*

Growth Market  7,092 (29%)
Major Market  17,455 (71%)

*as of 09/30/2011
<table>
<thead>
<tr>
<th>Metric</th>
<th>Goal</th>
<th>2006 Measurement</th>
<th>2011 Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance / Innovation</td>
<td>50/50</td>
<td>42% / 58%</td>
<td>31% / 69%</td>
</tr>
<tr>
<td>Customer Touches / Product</td>
<td>100</td>
<td>~10</td>
<td>~ 400</td>
</tr>
<tr>
<td>Customer Calls</td>
<td>-5% YoY</td>
<td>~ 135,000</td>
<td>~86,000 (-14% since 2010)</td>
</tr>
<tr>
<td>Customer Defect Arrivals</td>
<td>-15% YoY</td>
<td>~ 6,900</td>
<td>~2200</td>
</tr>
<tr>
<td>On Time Delivery</td>
<td>65%</td>
<td>47%</td>
<td>94%</td>
</tr>
<tr>
<td>Defect Backlog</td>
<td>3 Months</td>
<td>9+ Months</td>
<td>3 months</td>
</tr>
<tr>
<td>Enhancements Triaged</td>
<td>85%</td>
<td>3%</td>
<td>100%</td>
</tr>
<tr>
<td>Enhancements into Release</td>
<td>15%</td>
<td>1%</td>
<td>21%</td>
</tr>
<tr>
<td>Customer Sat Index</td>
<td>88%</td>
<td>83%</td>
<td>88%</td>
</tr>
<tr>
<td>Beta Defects Fixed Before GA</td>
<td>50%</td>
<td>3%</td>
<td>85%</td>
</tr>
<tr>
<td>Cost of Poor Quality</td>
<td>~ $10,000,000</td>
<td>~ $5,600,000 (-13% since 2010)</td>
<td></td>
</tr>
<tr>
<td>Lifecycle Measurements</td>
<td>2008</td>
<td>2010</td>
<td>2012 – 2013</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>----------</td>
<td>----------</td>
<td>-------------</td>
</tr>
<tr>
<td>Project Initiation</td>
<td>30 days</td>
<td>10 days</td>
<td>2 days</td>
</tr>
<tr>
<td>Groomed Backlog</td>
<td>90 days</td>
<td>45 days</td>
<td>On-going</td>
</tr>
<tr>
<td>Overall TTD</td>
<td>120 days</td>
<td>55 days</td>
<td>3 days</td>
</tr>
<tr>
<td>Iteration Length</td>
<td>6 weeks</td>
<td>4 weeks</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Number of Iterations</td>
<td>6</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>Composite Build Time</td>
<td>36 hours</td>
<td>12 hours</td>
<td>8 hours</td>
</tr>
<tr>
<td>BVT Availability</td>
<td>N / A</td>
<td>18 hours</td>
<td>&lt; 1 hour</td>
</tr>
<tr>
<td>Iteration Test Time</td>
<td>5 days</td>
<td>2 days</td>
<td>4 hours</td>
</tr>
<tr>
<td>Total Deployment Time</td>
<td>2 days</td>
<td>8 hours</td>
<td>2 hours</td>
</tr>
<tr>
<td>Overall TTP</td>
<td>9 days</td>
<td>3 days</td>
<td>15 hours</td>
</tr>
<tr>
<td>Time Between Releases</td>
<td>12 Months</td>
<td>12 Months</td>
<td>3 Months</td>
</tr>
</tbody>
</table>

However …
Example: Lifecycle Tools @ Ericsson

http://open-services.net/resources/presentations/should-i-link-or-should-i-sync/
Example: On Premise Delivery

- Deployment Design
- Continuous Integration
- Environment Configuration Management
- Change Management
- Continuous Delivery
- Cloud-based Provisioning
- Quality Management
- Service Simulation
- Application Monitoring
- Incident Management
- Cloud

Actions:
- Notify change
- Notify application build
- Update configurations for deployment
- Provision environment
- Provision pattern
- Apply configurations
- Generate automation
- Plan tests
- Execute tests
- Notify application
- Configure service stubs
- Invoke services
- Configure monitoring agents
- Monitor application
- Create development defect
- Create incident
Example: Mobile Quality Assessment

1. Over the air build distribution
2. In app bug reporting
3. In app user feedback
4. Crash log reporting
5. Sentiment Analysis

- User Feedback
- Crash logs
- Bugs vs. Crashes
- Builds
- LOB/Digital Marketer
- Developer
- Tester
- End Users
Example: IBM DevOps Services PaaS Delivery on Bluemix
Software Delivery and DevOps

Involves different disciplines, roles and tasks across heterogeneous tools and repositories
Some Tool Integration Approaches

Single Repository

Point-to-Point

Universal Metadata

Common Platform
Open Services for Lifecycle Collaboration (OSLC)

Access all lifecycle data without moving it out of the repositories it was created in

http://oasis-open.org/
### Domain Workgroups

#### Automation
- **Automation 2.0**
  - Status: Final

#### Change and Configuration Management TC
- **Configuration Management 1.0**
  - Status: Scope
- **Change Management 3.0**
  - Status: Draft

#### Change Management
- **Change Management 2.0**
  - Status: Final

#### Estimation and Measurement
- **Estimation and Measurement 2.0**
  - Status: Converge

#### Performance Monitoring
- **Performance Monitoring 2.0**
  - Status: Final

#### Quality Management
- **Quality Management 2.0**
  - Status: Final

#### Reconciliation
- **Reconciliation 2.0**
  - Status: Final
Semantic Web and Linked Data
The data is the thing

Resources and relationships

Tools operate on the data

Tools execute the process

Tools expose their data in a common way (REST)
Linking Data – „Things“

Alice \is_a\ Person

Bob \knows\ Alice

Bob \based_near\ London
Linking Data – „Relationships“

http://www.w3.org/1999/02/22-rdf-syntax-ns#type

Person

Alice

<http://xmlns.com/foaf/0.1/knows>

Bob

<http://xmlns.com/foaf/0.1/based_near>

London
RDF - Resource Description Format

```xml
<rdf:RDF
   xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
   xmlns:foaf="http://xmlns.com/foaf/0.1/">
   <foaf:Person rdf:about="http://sample.org/alice.rdf">
     <foaf:name>Alice</foaf:name>
   </foaf:Person>
</rdf:RDF>
```
Names and email of all people that Alice knows
Example: Implementation of Cross-Discipline Traceability
Learn more at: https://jazz.net/wiki/bin/view/Main/CAŁM2010LinkTypes
# BRM Sprint 2 (1.0) Plan

<table>
<thead>
<tr>
<th>Actions</th>
<th>Summary</th>
<th>Owned By</th>
<th>Implements Requirement</th>
<th>Tested By Test Case</th>
<th>Affected by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requests sent in form of email</td>
<td>Unassigned</td>
<td>Unassigned</td>
<td>Requests sent in form of email</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Frequency of dividend transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization must provide justification for why funds are needed</td>
<td>Marco</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizations must apply for funds</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization must identify how much money is desired</td>
<td>Marco</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Donor Dividend Allocation Criteria</td>
<td>Deb</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizations may apply with an initial request</td>
<td>Bob</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JKE Charity Coordinator will respond to request in the website</td>
<td>Marco</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customers can Nominate an Organization</td>
<td>Marco</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Change Management Artifacts**

**Requirements Management Artifacts**

**Quality Management Artifacts**
Task 76

Summary: Make UI for selecting multiple organizations more accessible

Type: Task
Filed Against: JKE/WEB UI
Project Area: JKE Banking (Change Management)
Team Area: JKE Banking (Change Management)
Creation Date: Mar 27, 2012 6:39 AM

Created By: cimaadmin
Owned By: Unassigned

Priority: Medium
Planned For: Release 1.0
Estimate:
Time Remaining:
Due Date:
44: Donor Chooses Multiple Organizations

Card: Donor may identify one or more organizations.
The Donor(s) identifies one or more organizations to donate Dividend funds.
Conversation:
Registered User accesses account information via JKE.com ().

Location
JKE Banking (Requirements)  Elaborated Stories
Extended Functionality, Release 1

Attributes
Type: User Story Elaboration
Format: Text
Origin: Customer
Product Owner: Bob

Priority: High
Status: Approved

Links
Constrained by (2): 82, 93
Embeds (1): 41
Illustrated By (7): 19, 21, 35, 35, 39, 41, 48
Implemented By (1): ...
Donor Chooses Multiple Organizations
OSLC Specification Components

- Discovery
- HTTP C.R.U.D. for Resources
- Delegated UI for Create and Select
- Query
- UI Previews for Resource Links
- Standard Resource Representations
OSLC Service Providers (core spec)
Rootservices document

[...]

<oslc_cm:cmServiceProviders
   xmlns:oslc_cm="http://open-services.net/xmlns/cm/1.0/"
   rdf:resource="https://jazz.net/sandbox01-ccm/oslc/workitems/catalog" />

<oslc_config:cmServiceProviders
   xmlns:oslc_config="http://open-services.net/ns/config#"
   rdf:resource="https://jazz.net/sandbox01-ccm/rtcoslc/catalog" />

<oslc_scm:scmServiceProviders
   xmlns:oslc_scm="http://open-services.net/xmlns/scm/1.0/"
   rdf:resource="https://jazz.net/sandbox01-ccm/oslc-scm/catalog" />

[...]

Spec versioning through HTTP-Headers

curl --header "OSLC-Core-Version: 2.0" https://jazz.net/sandbox01-ccm/rootservices
Service Provider Catalog

• Service Provider <-> “Container” (e.g. one project)
• Catalog lists all available Providers for this application
Services – Creation Factories

- ResourceType may be OSLC “core”, or “tool specific”
- Resource Shapes define “understood” properties
Services – Query Capability

<oslc:queryCapability>
  <oslc:QueryCapability>
    <dcterms:title rdf:parseType="Literal">Change request queries</dcterms:title>
    <oslc:usage rdf:resource="http://open-services.net/ns/core#default"/>
    <oslc:resourceType rdf:resource="http://open-services.net/ns/cm#ChangeRequest"/>
    <oslc:resourceShape rdf:resource="https://jazz.net/sandbox01-ccm/oslc/context/_YkY34mDfEeSfwac2Vc1tig/shapes/workitems"/>
    <oslc:queryBase rdf:resource="https://jazz.net/sandbox01-ccm/oslc/contexts/_YkY34mDfEeSfwac2Vc1tig/workitems"/>
  </oslc:QueryCapability>
</oslc:queryCapability>

OSLC core query spec: http://open-services.net/bin/view/Main/OSLCCoreSpecQuery
Services – Creation / Selection Dialogs

<oslc:creationDialog>
  <oslc:Dialog>
    <dcterms:title rdf:parseType="Literal">New Defect</dcterms:title>
    <oslc:label>Defect</oslc:label>
    <oslc:usage rdf:resource="http://open-services.net/ns/core#default" />
    <oslc:usage rdf:resource="http://open-services.net/ns/cm#defect" />
    <oslc:resourceType rdf:resource="http://open-services.net/ns/cm#ChangeRequest" />
    <oslc:dialog rdf:resource="https://jazz.net/sandbox01-ccm/oslc/contexts/_YkY34mDfEeSfwAq">
      <oslc:hintWidth>680px</oslc:hintWidth>
      <oslc:hintHeight>505px</oslc:hintHeight>
    </oslc:dialog>
  </oslc:Dialog>
</oslc:creationDialog>

<oslc:creationDialog>=
<oslc:creationDialog>=
<oslc:creationDialog>=
<oslc:creationDialog>=
<oslc:selectionDialog>=
<oslc:selectionDialog>=
<oslc:dialog>
  <dcterms:title rdf:parseType="Literal">Select Plan Item</dcterms:title>
  <oslc:label>Plan Item</oslc:label>
  <oslc:usage rdf:resource="http://open-services.net/ns/cm#planItem" />
  <oslc:resourceType rdf:resource="http://open-services.net/ns/cm#ChangeRequest" />
  <oslc:dialog rdf:resource="https://jazz.net/sandbox01-ccm/_ajax-modules/com.ibm.team.work">
    <oslc:hintWidth>550px</oslc:hintWidth>
    <oslc:hintHeight>460px</oslc:hintHeight>
  </oslc:dialog>
</oslc:dialog>
Delegated UI Explained

#1 Click to launch delegated UI

#2 iframe's `src` set to delegated UI's URL

#3 Selection made

#4 OK pressed – sends message (link+label) to parent window
Eclipse Lyo

Eclipse Lyo is an SDK to help the Eclipse community adopt OSLC (Open Services for Lifecycle Collaboration) specifications and build OSLC-compliant tools.

Download  Source  Docs

Lyo Features

**SDK**

We’ll provide the pieces to get your client or server up and running with OSLC. We’re focusing on Java initially; however, JavaScript and other languages will soon follow.

Learn more

**Test suite**

Utilize a test suite to help build interoperable OSLC tools.

Learn more

**Reference Implementations**

See how OSLC works directly with working samples and with a simple server to test against.

Learn more

http://eclipse.org/lyo/
@OsloCreationFactory
{
    title = "Change Request Creation Factory",
    label = "Change Request Creation",
    resourceShapes = {OsloConstants.PATH_RESOURCE_SHAPES + "/" + Constants.PATH_CHANGE_REQUEST},
    resourceTypes = {Constants.TYPE_CHANGE_REQUEST},
    usages = {OsloConstants.OSLC_USAGE_DEFAULT}
}

@POST
@Consumes({OsloMediaType.APPLICATION_RDF_XML, OsloMediaType.APPLICATION_XML, osloMediaType.APPLICATION_JSON})
@Produces({OsloMediaType.APPLICATION_RDF_XML, OsloMediaType.APPLICATION_XML, osloMediaType.APPLICATION_JSON})
public Response addChangeRequest(@Context final HttpServletRequest httpServletRequest,
                                @Context final HttpServletResponse httpServletResponse,
                                final ChangeRequest changeRequest)
    throws URISyntaxException
{
    // Business logic for creating a new change request goes here

    return Response.created().entity(changeRequest).build();
}
protected void testRetrieve(final String mediaType)
    throws URISyntaxException
{
    assertNotNull(CREATED_CHANGE_REQUEST_URI);

    final OslcRestClient oslcRestClient = new OslcRestClient(PROVIDERS,
                                                                CREATED_CHANGE_REQUEST_URI,
                                                                mediaType);

    final ChangeRequest changeRequest = oslcRestClient.getOslcResource(ChangeRequest.class);

    verifyChangeRequest(mediaType,
                         changeRequest,
                         true);
}
Case Study: SPRINT
**SPRINT – Software Platform for Integration of Engineering and Things**

- FP7 Project (ICT-2009.1.3: Internet of Things and Enterprise environments)
- Project Website: [www.sprint-iot.eu](http://www.sprint-iot.eu)
- Launched October 2010
- Duration 36 months
- Budget: 3.46 Mio EUR

<table>
<thead>
<tr>
<th>Partner</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>EADS UK (Coordinator)</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>Israel Aerospace Industries</td>
<td>Israel</td>
</tr>
<tr>
<td>IBM Haifa Research</td>
<td>Israel</td>
</tr>
<tr>
<td>FRAUNHOFER FOKUS</td>
<td>Germany</td>
</tr>
<tr>
<td>Mathcore</td>
<td>Sweden</td>
</tr>
<tr>
<td>ALES</td>
<td>Italy</td>
</tr>
<tr>
<td>Elvier</td>
<td>Estonia</td>
</tr>
</tbody>
</table>

Our Roles:
- Andreas Keis: Project Coordinator
- Parham Vasaiely: Project Manager
- Uri Shani: Technical Manager
P2P towards “Hub”
Prototype: EverOpen

https://hub.jazz.net/project/florian.georg.ch.ibm.com/EverOpen2/overview

http://bluemix.net

Not using Eclipse Lyo
Architecture Overview

Evernote Cloud Service

Note Store

Notebook

Note

Tag

Jazz Team Server

Project Area

Work Item
(Story, Task, Defect ...)

Web Client

Mobile

Rich-Client

Team Member

Expose as RDF/XML:
Note \(\rightarrow\) OSLC Requirement
Tag \(\rightarrow\) OSLC Requirement Collection

Exposes as RDF/XML:
Note \(\rightarrow\) OSLC Requirement
Tag \(\rightarrow\) OSLC Requirement Collection

Creation Dialog

Selection Dialog

OSLC Bridge

Coll.

Req.

call delegated UI
(over HTTP)

implements / is implemented by
(URL link)
Resources

- http://open-services.net/
- http://www.oasis-oslc.org/
- http://wiki.eclipse.org/Lyo