Proposal for the ICD Beta Platform

Stanford team

12.04.2011

WHO, Geneva
Outline

• Requirements for the Beta platform
• Background: The Tool Landscape
• Our proposal:
  • What is a portal
  • Liferay
  • How do all these fit together
• Open questions
Outline

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High level goals for the Beta phase (as we see it)

• Involve the larger expert community in the development of ICD-11

• Ensure high level quality of the ICD-11 content

• Support the goals of the ICD-11 revision
Going deeper...

- **Involve the larger expert community in the development of ICD-11**
  - Open, web-based platform accessible to the crowds
  - Social process
  - Find good incentives to keep people involved
Going deeper… (cont.)

• **Ensure high level quality of the ICD-11 content**
  → Enable content reviewing by external and internal experts
  → Reviewing workflow: (first define it! then) make sure the reviewers have also the right incentives to participate
  → Smooth integration of review results into the ICD-11 content
Going deeper… (cont.)

- **Support the goals of the ICD-11 revision**
  - “To produce an international disease classification that is ready for electronic health records that will serve as a standard for scientific comparability and communication.”
    - Validate the *content model* with real use cases
    - Validate the *content* with real use cases
    - Check/review linkages to external terminologies (SNOMED CT)
    - Support automatic content checks (constraint checks, classification checks, level of completion, etc.)
    - Be backwards compatible (as much as possible)
    - Generate printed versions
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Terminology

- **iCAT** – editing tool for the ICD content (alpha and beta phase) for the WHO experts
- **iCAT Beta** – social platform for ICD-11 crowd-sourcing
- **Public Platform** – Can's platform that is used as an intermediary for the beta platform
- **BioPortal** – the ontology repository developed by NCBO
- **(iCAT Lite** – Sean's UI mock-up for the beta platform, non-functional)
More than one platform for more than one purpose…

- Public Platform: Alpha -> Beta
- iCAT Beta
- Other tools: Beta
- iCAT: Alpha and Beta
- BioPortal: Alpha and Beta
The platforms and their role

iCAT

- Alpha and Beta

- WHO internal editing tool for the ICD-11 content
- Management tool for proposals:
  - Display proposals from beta tools (*)
  - Approval/rejection of proposals (*)
  - Automatic import of approved proposal content (button click)
- Publishing new ICD-11 revisions to BioPortal
- Alpha reviewing
  - Content validation & statistics
  - Printing (*)

BioPortal

- Alpha and Beta

- Repository for different revisions of ICD-11, content accessible by Web services to beta tools
- Stores the public version of ICD-11 that is exposed in the beta tools
- Value set repository
- Diffs and mappings to other sources
- Store notes and proposals for the beta platform (*)
The platforms and their role (cont.)

Public Platform

*Alpha -> Beta*

- Expose ICD-11 alpha to the public
- Unstructured and structured **proposals**
- Commenting
- Reviewing
- Transition tool to beta (*)

iCAT Beta

*Beta*

- **ICD-11 beta platform** for the public and crowdsourcing
- **Social features** (commenting, voting, communities, wikis, message boards, facebook integration, etc.)
- **No content editing!** But, **structured proposals**
- Beta reviewing (*)
How will the tools interact?

Public Platform

iCAT Beta

Other tools

iCAT

BioPortal
Workflow is important and needs to be decided early!!!
Some considerations

- Use web services for communication between the tools – loose coupling, technology independent
- Still, we need to define the exact interactions and the service structures
- So: Workflow is important!
Our philosophy for the Beta platform

• Use out-of-the-box, open source technologies
• Don't reinvent the wheel
• Don't lock on a technology: enable the meshing up of multiple technologies (use service oriented architecture)
• Flexible and customizable software
• Infrastructure: proven, robust, scalable, easy to maintain
• Start simple!
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What is a portal? (and why do we care...)

- Web platform
- Web Content Management system (WCM)
- Integration Platform
- Collaboration Platform
- Social Apps Platform

Source: http://www.liferay.com/
A Portal is...

Websites that require the presentation of different pages depending on a user’s login status (i.e., whether the user is logged in).

Websites that require presentation of different pages depending on a user’s role.

Websites that require the integration of multiple existing web applications.

Websites that allow groups of individuals to collaborate through applications, on content, or with documents.

Source: http://www.liferay.com/
Web Content

Community Pages

Multiple Languages, Multiple Platforms
Web Content Management System

Easy Updates with Role-Based Approvals
Support for workflows

Document Repository

- Case Study
- Sales Doc
- Marketing Doc
Collaboration Platform

Team Collaboration

Organizational Collaboration

Social Collaboration

Hi Bob
Add Joe as a friend? Yes No
Bob's Friend List

Joe
Joe's Friend Network

Steve
Steve's Friend Network
Social Apps Platform

Easily integrate with other social apps
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Why Liferay?
(and why do we like it)

- Used by Fortune 500 companies
- **Awards and recognition** (Leader in Gartner's Magic Quadrant for Horizontal Portal Products in 2010, most popular Java CMS in Water & Stone's "2010 Open Source CMS Market Share Report")
- Adheres to **open standards** for content, portlets, web services and front-end technologies to reduce development cost
- A **strong community** with roughly 3 million downloads and 250,000 worldwide deployments
- Flexible Scripting Support (runs PHP, Ruby, Python, Grails and other lightweight scripting technologies within a robust Java framework)
- User and developer friendly
- **Open source**
- And: provides **off-the-shelf features** that we need for ICD Beta
Liferay features

- Impressive list of features:
- OpenId and Single Sign On (SSO)
- Rules Engine Integration for “contextual personalization”
- User-driven Workflow and Approval
- Search & Tagging
- Multi-lingual support
- Support for templates & structured sites with custom fields
- Reuse portlets in other applications
- Integration with Facebook and iGoogle, supports OpenSocial
- Extremely well documented
- etc.
Liferay collaboration & social features

- Support for multiple communities
- Wikis
- Message Boards
- Blogs
- Activity tracking
- Instant Message
- Email
- Shared calendar
- Announcements & Alerts
- Polls
- Abuse reporting
- RSS
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Coming back to iCAT Beta...

• After this information overload, what do we do with all this?!
• Start simple!
• Investigate which Liferay features we can use out of the box (E.g. message boards, alerts, Twitter, Facebook integration, open id, reviews?, etc.)
• Set up a small prototype using the out-of-the-box features, and..
• See what crucial features are missing
Ideas of what we can reuse in Liferay (we still need to validate this in a prototype)

• **Communities:**
  • Each TAG/domain could have its own community with its own private/public pages
  • Could have its own message board, wiki, blogs, document repository
  • Could be managed by a community administrator

• Teams (or even communities) can be created ad-hoc based on common interests

• Use your friends from other social networks (already supported)
# Communities in Liferay

## My Communities

### Communities I Own

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Members</th>
<th>Online Now</th>
<th>Active</th>
<th>Pending Requests</th>
</tr>
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<tr>
<td>Freshman</td>
<td>Open</td>
<td>2</td>
<td>0</td>
<td>Yes</td>
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</tr>
<tr>
<td>Public Pages - Live (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Corporate Headquarters</td>
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<td>1</td>
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</tr>
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</table>

Showing 2 results.
Liferay reuse: Social features

• Plenty of social features in Liferay

• **Social equity**: support a “seniority” measure for your users, find out which users contribute more, use this as an incentive (flexible support in Liferay)

• **Advertise** your ICD-11 activities in external blogs, twitter, Facebook (already integrated with Liferay) – maybe an incentive to participate
## Social Equity Definition in Liferay

### Wiki Page

<table>
<thead>
<tr>
<th>Name</th>
<th>Information Value</th>
<th>Information Lifespan</th>
<th>Daily Limit</th>
<th>Participation Value</th>
<th>Participation Lifespan</th>
<th>Daily Limit</th>
</tr>
</thead>
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<td>365</td>
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</table>

Showing 3 results.

### Message Boards Message

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<th>Participation Value</th>
<th>Participation Lifespan</th>
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<tbody>
<tr>
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</tr>
<tr>
<td>Add Vote</td>
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</table>

Showing 4 results.
Liferay reuse: Rating and commenting on everything!

Comment and rate any content: wiki, web content, messages, blogs, etc.

Enable printing and conversion of document formats

We are here!!! No. 5 is alive!!!

http://protege.stanford.edu

Your Rating  Average (1 Vote)

Comments

I don't like this
Posted on 4/7/11 6:15 PM.

Joe Bloggs +1 (1 Vote)

Why not?
Posted on 4/7/11 6:16 PM in reply to Joe Bloggs.

Joe Bloggs -1 (1 Vote)
Many ways of keeping users engaged and create a dynamic web site.

Activity tracking

Alerts and announcements can be sent by email, IM or SMS
Liferay reuse: Structures and templates

• Liferay comes with support for defining structured forms and templates. The content is stored structured and is available through web services (no coding necessary).

• Proposals can be defined using the structures and displayed using the templates.

• Proposals are treated as “regular” web pages (assets), and can have voting and threaded discussions attached to them.

• Workflows can be defined on the proposal assets.
Liferay reuse: Workflow support

- Liferay comes with **integrated workflow support** that can be customized for our own processes (Kaleo workflow)
- **No coding necessary!** Workflow definition in XML
- A workflow describes:
  - the **asset** (content being reviewed)
  - **states** (stages in workflow, e.g. created, rejected, approved)
  - **transitions** (what is the next state)
  - **tasks** (steps in workflow that require user action)
- Users are announced of the actions expected from them (E.g. need to make a review, your proposal was approved, etc.)
- We could use this feature for the **beta reviewing support** (to be validated)
- More information: 
Liferay workflow examples

**Single approver workflow**

1. **Update**
2. **Resubmit**
3. **Automatic**
4. **Reject**
5. **Approve**
6. **Approved**

**Two approvers workflow**

1. **Initial State**
2. **Fork**
3. **Review 1**
4. **Review 2**
5. **Approve**
6. **Join**
7. **Approved**
Workflow UI in Liferay

Asset to review

Review: Welcome to TT's Liferay!

Preview of Web Content

Welcome to TT's Liferay!

Activities

Comments

No comments yet. Be the first
Imagine a beta workflow...

- Very high level overview of how the beta process could work
- Many more details are still needed in order to implement a prototype
- Workflow as a story..
Stage 1. New ICD-11 Public version published in BioPortal

Access all ontologies that are available in NCBO BioPortal: You can filter this list by category to display ontologies relevant for a certain domain. You can also filter ontologies that belong to a certain group. Subscribe to the NCBO BioPortal RSS feed to receive alerts for submissions of new ontologies, new versions of ontologies, new notes, and new projects. You can subscribe to feeds for a specific ontology at the individual ontology page. Add a new ontology to NCBO BioPortal using the Submit New Ontology link.

Version 7 of ICD11 published in BioPortal on 1 June, 2011

<table>
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<th>FORMAT</th>
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<th>AUTHOR</th>
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<td>OWL</td>
<td>Ver. 7</td>
<td>Tania Tudorache</td>
<td>07/01/2011</td>
<td></td>
<td>Explore</td>
</tr>
</tbody>
</table>

Showing 1 to 1 of 1 entries

Powered by NCBO BioPortal  Release Notes
Stage 1. iCAT Beta will show the new ICD-11 version.

iCAT Beta displays version 7 of ICD-11.

iCAT Beta retrieves the ICD-11 v.7 from BioPortal using web service calls.
Stage 2. Users discuss and add proposals to ICD-11 v.7 in iCAT Beta

- Ideally, communities, not single individuals, should propose changes
- Communities or teams can form for people with common interest -> **aggregate a proposal**
- Communities can serve as **first level reviewers**: a proposal needs to get the community vote before it can go to the next step (minimize the number of proposals that need TAG attention)

---

**Proposal 1.** Change definition ...
**Proposal 2.** Change signs and symptoms..
**Proposal 3.** Change place in hierarchy ...
**Proposal 4.** Add a child category ..

- Timelines need to be very well defined and known (e.g. every month a new version of ICD-11 is published that contains the content of the approved proposals of the previous cycle)
- Contentious proposals might not make it in the next version
Stage 3. Proposals are analyzed by the editorial board (TAG) in iCAT Beta

Proposal 1. Change definition …
Proposal 2. Change signs and symptoms..
Proposal 3. Change place in hierarchy …
Proposal 4. Add a child category..

TAG decisions

Aggregate Proposal 1 and 2 and send to review
Send back Proposal 3 (is incomplete, more evidence is needed)
Proposal 4 to be sent for review

Reviewer 1,2,3
Proposal authors for update
Reviewer 4,5,6

- The proposal workflow needs to be well defined so that it can be implemented in the tool
- TAGs act as editorial board members and decide which proposals “deserve” an external review
- TAGs will send “deserving” proposals for external review from the pool of external reviewers
- Notifications are sent to the reviewer that they have some work to do
Stage 4. Reviews are made in iCAT Beta

Proposal 4 gets 3 reviews

Reviewer 4: Approve
Reviewer 5: Approve with comments
Reviewer 6: Reject

- Reviews are entered by the external experts in iCAT Beta
- Notifications are sent to the TAGs that new reviews are available
Stage 5. Editorial board (TAGs) decide on an action for each proposal

Proposal 1 has 3 reviews:
- Reviewer 4: Approve
- Reviewer 5: Approve with comments
- Reviewer 6: Approve with comments

Proposal 4 has 3 reviews:
- Reviewer 4: Approve
- Reviewer 5: Approve with comments
- Reviewer 6: Reject

Proposal 9 has 4 reviews:
- Reviewer 4: Reject
- Reviewer 5: Reject
- Reviewer 6: Reject
- Reviewer 6: Borderline

TAG decision

To be implemented and take into account reviewers comments

More clarification needed from authors. Resubmit proposal considering reviewers comment for short review cycle (only goes to TAG review)

Reject proposal
Stage 6. Implement approved proposals in iCAT

- TAG members can see the approved and rejected proposals in iCAT (the internal editing platform)
- iCAT retrieves the proposals from iCAT Beta through Web services
- For the approved proposals, they can click a button, and the changes are automatically integrated into iCAT (further manual edits are still possible, e.g. to address reviewers comments)
Stage 7. New version of ICD-11 is published in BioPortal and the whole cycle begins again

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</table>

Version 8 of ICD11 is published in BioPortal on 1 July, 2011

- Publishing a new version to BioPortal is done from iCAT with a button click
- Once a new version is published, it will be updated into iCAT Beta, and the whole cycle begins

We’re done!!
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Open issues and questions

• So many open questions, that is hard to know where to begin, but here are some:
• How long should a revision cycle take? (going from ver. 7 to ver. 8)
• NCI publishes a new baseline every 2 week – 1 month (short cycles)
• Too long cycles – progress will be slow, and the user gratification will be delayed; may be problematic
• Too short cycles - not enough time for reviewing
Open issues and questions (cont.)

• If editing will be allowed in iCAT during a revision cycle (e.g. 1 month), how will we ensure that the edits will not override the discussions and proposals in iCAT Beta?
• Do we want a strict process?
• No parallel editing in iCAT: - no chance of override, but slow progress
• Parallel editing in iCAT: - strict rules needed about what can be edited; rules are enforced to minimize override and overlaps with proposals in iCAT Beta (harder to implement)
Open issues and questions (cont.)

• How do we find the right balance for the Beta processes: we should allow communities to organize themselves as much as possible, and intervene little

• Have strict processes only for what is really necessary

• For example, allow a community to discuss in whatever form they want: wikis, message boards, emails, etc.

• But, have clear and strict rules about how to submit a proposal and what is a valid proposal
Closing remarks

• iCAT Beta socio-technical process is challenging
• The “right” technologies are out there, **BUT**!!!
• Nothing can be implemented if the workflows and processes are not defined **completely** (really, every detail counts, and needs to be specified clearly, if not software developers will have to make their own decisions, and they may not be the right ones)
• And just a small detail: who will do all this work? 😊