

# Development the OO-Framework for OpenACS:

Improving Scalability and Applicability

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## Summary

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### Overview

- Summary Improvements to the Framework
- Complex Page Types and Compositions
- Towards an XoWiki based Portal System

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## Improvements to the Framework

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- Object oriented access/development for all types of acs-objects
- Ability to subclass packages (make packages first class citizens, reusability of package parameters)
- Scalability of property management (package parameters, portal parameters)
- Subclassing of Widgets
- More flexible cluster management

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## OO Interface for DB

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OO Interface for existing and application specific acs-object-types

Loading schema information from acs-object-types and acs-attributes and create automatically XOTcl classes from this information

Creating new XOTcl Classes as persistent classes using the OpenACS conventions by subtyping existent classes

```
# Fetch base classes from OpenACS Schema
::xo::db::Class get_class_from_db -object_type party
::xo::db::Class get_class_from_db -object_type person

# Create new Object type with two additional attributes
::xo::db::Class create ::demo::employee \
    -superclass ::xo::db::person \
    -slots {
        ::xo::db::Attribute create salary -datatype integer
        ::xo::db::Attribute create dept_nr -datatype integer -default "0"
    }
```

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## Class Definition and generated SQL Table

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```
# Create new Object type with two additional attributes
::xo::db::Class create ::demo::employee -superclass ::xo::db::person -slots {
    ::xo::db::Attribute create salary -datatype integer
    ::xo::db::Attribute create dept_nr -datatype integer -default "0"
}

dotlrn-test5=# \d demo_employee

Table "public.demo_employee"
 Column | Type | Modifiers
-----+-----+-----
dept_nr | integer | default 0
salary | integer |
employee_id | integer | not null

Indexes:
"demo_employee_employee_id_pk"
    PRIMARY KEY, btree (employee_id)

Foreign-key constraints:
"demo_employee_employee_id_fkey"
    FOREIGN KEY (employee_id)
    REFERENCES persons(person_id)
    ON DELETE CASCADE
```

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## Subclassing Packages

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Why subclassing of Packages?

Use Case s5-package:

- Inherits most from XoWiki, some own functionality
- No need to duplicate e.g. package parameter etc.

```
::xo::db::require package xowiki

::xo::PackageMgr create ::s5::Package \
    -package_key "s5" -pretty_name "S5" \
    -superclass ::xowiki::Package
```

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## Property Management

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Property management (package parameters, portal parameters) of OpenACS/DotLRN is wasteful and not sufficiently scaling:

- For every package instance, one package value is copied for every package parameter
- Adding parameters is costly ( $\# \text{packages} \times \# \text{parameters}$ )
- Changing parameter defaults has no effect for existing packages

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## Package Parameter Redundancy

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Real world data (apm\_parameter\_values):

- Learn@WU: Currently 0.3 mio entries
- Galileo: > 2 mio entries
- Small OpenACS installations: 1000 entries (38 package instances)

High degree of redundancy (many values are stored 4000 with the default value)

Learn@WU: from 300000 entries → only 406 necessary entries needed  
(non-default)

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## OO Package Parameter Interface

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Implementation of base functionality without redundancy

- `parameter get_from_package_key`: 5x faster
- `parameter get`: 2x faster

Supports inheritance from different packages, uses oacs-datamodel, cluster-safe

Missing:

- user interface, alternate permissions for changing/deleting per-package-instance

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## Additional Developments

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### Generalized Cluster Management

- Basic OpenACS functionality: flush util-memoize caches
- New implementation: ability to perform configurable operations clusterwide
- Necessary for e.g. Univ.Valencia to make use of Ajax-based Chat in cluster configurations

### Subclassable Widgets

- Form-Fields (see XoWiki tutorial)

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## Improvements in XoWiki

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- Initial Microformat support for XoWiki
- Improved composability and personalization via Includelets and Form-fields
- Towards a more powerful portal system

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## Microformat support in XoWiki

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Microformats:

- Make Semantic Web reality
- Microformats define HTML markups for embedding semantic information in HTML pages
- Examples: events, geo-information, relationships, product reviews, ...
- Specialized search engines: e.g. place offers in google-maps, event-summaries, ...

# Microformat support in XoWiki

Current support in XoWiki:

- **hCalendar:** announcements of talks and workshops,
  - export e.g. via Firefox extensions *tails*, *operator*, and
  - *iCal* subscription (subscribe to XoWiki instance, similar idea as RSS)
- **rel-tags:** microformat for tags, see e.g. openacs.org/xowiki

# Form for Announcement of a Talk

ELearning und Gender im Web 2.0-Kontext

Title (required)	<input type="text" value="ELearning und Gender im Web 2.0-Kontext"/>
Details	<input type="text" value="http://www.bildungstechnologie.net/blog/elearning-und-gender-im-web-2-0-kontext"/>
Event	<p>Title of Lecture (required)</p> <p><input type="text" value="ELearning und Gender im Web 2.0-Kontext: Prof. Heike Wiesner, Harriet Taylor-Mill Institute der FH der Wirtschaft Berlin"/></p> <p>Start of Lecture (required) <input type="text" value="08   Januar   2008 at 17   00"/></p> <p>End of Lecture <input type="text" value="18   30"/></p> <p>Location <input type="text"/></p>
Abstract	<p><input type="text" value="Entscheidend für die Akzeptanz und die kreative Nutzung von Informationstechnik in Lern- und Arbeitskontexten ist, dass sich die Nutzenden mit der Technologie komfortabel und vertraut fühlen. Wie lassen sich Gender-Themen in Bereiche integrieren, deren inhaltliche Ausrichtung auf technische Handlungsfelder trifft, die ohne sichtbare Bezugnahme zur Kategorie Gender entwickelt wurden?"/></p>

# Page with embedded Microformats

The screenshot shows a news feed from xotd.wu-wien.ac.at. The first article is titled 'Blackboard, D2L square off for court fight' and discusses a patent infringement suit between Blackboard Inc. and Desire2Learn. The second article is titled 'eSN Special Report: Visual Learning' and discusses the use of video in education. A red circle highlights the text 'tails lighting up' in the second article's summary.

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# Export embedded events via tails

The screenshot shows a news feed from xotd.wu-wien.ac.at. On the left, there are three sidebar boxes: 'Learning und Gelernt im Web 2.0-Kontext', 'Klaus Schäfer - Großes Web 2.0-barrierefreies Lernen', and 'Adaptation in Mobile Learning'. A red circle highlights the text 'Easy selective import into e.g. calendar tools' above the news feed. The news feed itself contains two articles: 'Blackboard, D2L square off for court fight' and 'eSN Special Report: Visual Learning'.

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# Export embedded events via iCal

The screenshot shows a web-based calendar interface. At the top, there's a header with links for 'Welcome', 'Gustaf Neumann', 'Member Online', 'Your Account', and 'Logout'. Below the header is a navigation bar with buttons for 'Edit', 'Revisions', 'New Page', 'Delete', 'Admin', 'Notifications', 'Search', and 'Index'. A red circle highlights the text 'Subscription of iCal to XoWiki instance (like shared Web-Calendar)'. The main area is titled 'iCal' and shows a monthly calendar for 'Jänner 2008'. Events are listed in the calendar grid. On the left, there's a sidebar with sections like 'Blackboard', 'Private', 'ABONNEMENTS', and 'eSN Special'. The 'ABONNEMENTS' section has checkboxes for 'F1', 'events', and 'e-learning-news', with 'e-learning-news' checked. Below the sidebar, there's a list of events with their details and 'HTML | export' buttons.

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# XoWiki Portal System

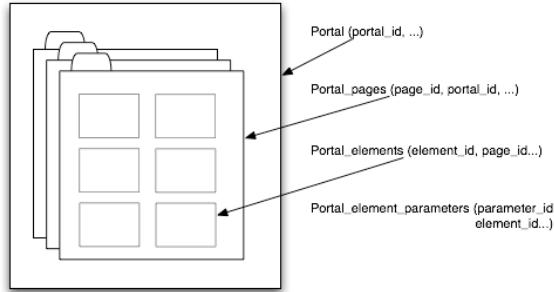
## Analysis of the DotLRN Portal System

### Rethink Concepts in a bigger picture

- composability
- personalization
- flexibility

Joint work with Michael Aram

# Structure of DotLRN Portal System



Minimal installation: 1 class instance, 1 club:  
12 portals, 31 portal pages, 99 portal elements, 722 portal element parameters

Real world installation:  
53438 portals, 129908 portal pages, 465813 portal elements, 4462542 portal element parameters

# Types of Portals in DotLRN

## 2 Types

- User Portal (home)  
*Personalization through all memberships*
- Community Portals
  - Classes
  - Communities
  - Subgroups

No personalization, *Member and Non-member Portals*

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## Structure of the DotLRN Portal System

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Shortcomings:

- Rigid 3 level structure (portal-pages are tabs, portal pages have to be in portals, portlets have to be in portal pages, etc.)
- Weak framework integration limits flexibility (e.g. it is not possible to use a "Portlet" on the Start-page, summarizing e.g. contents of two communities)
- Old-fashioned and limited portal page composition (quite complex to add new kinds of portlets, ...)

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## XoWiki based Portal System (1)

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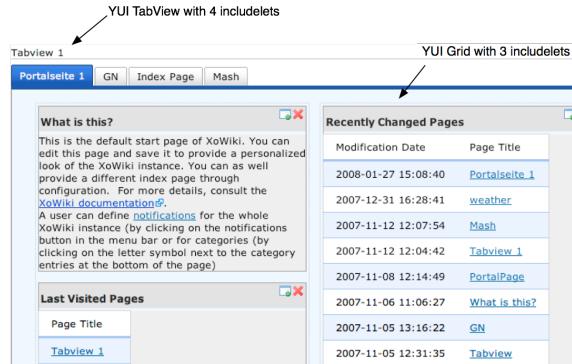
More flexible rendering of base units:

- Separate structure classes ("model" in MVC) from renderers ("views", implemented via mixin classes)
- Provide different kind of renderers:
  - *plain*
  - *mobile*
  - *CSS*
  - *ajax*

## XoWiki based Portal System (2)

- Provide new composite page types
  - for tabs (similar as portal + portal\_pages)
  - and composite pages (with flexible drag&drop interface in Ajax mode; similar as portal\_page and portal\_element)
- Every XoWiki page can be part of a composite page type
- Every includelet, every XoWiki page can be used as a portlet.
- Provide revisions of portals

## TabView and Composite Page in XoWiki



# XoWiki Page as Portal Page

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**Vita**  
Gustaf Neumann was appointed as Chair of [Information Systems and New Media](#) at the University of Economics and Business Administration (WU) in Vienna, Austria in October 1999. Before joining WU he was Chair of the department of [Information Systems and Software Techniques](#) at the University of Essen, Germany, from 1995 to 1999.  
Gustaf Neumann is native of Vienna, Austria. He graduated from the Vienna University of Economics and Business Administration in 1983 and holds a Ph.D. from the same university. He joined the faculty of WU...

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# 3 Column Layout, Mashup Elements

**What is this?**  
This is the default start page of XoWiki. You can edit this page or save it to provide a personalized look of the XoWiki instance. You can as well provide a different index page through the configuration. For more details, consult the [XoWiki documentation](#).  
A user can define [notifications](#) for the whole XoWiki instance (by clicking on the notification icon in the menu bar) or for categories (by clicking on the letter symbol next to the category entries at the bottom of the page).

**Last Visited**

- Page Title
- Tabview 1
- Portalseite 1
- Index Page
- weather

**derStandard.at**

- [+] [Fotball - Kreis-Hilfiker Kasjanow von Präsidentenwahl ausgeschlossen](#)
- [+] [Wahlkommission: 80.000 der zwei Millionen vorgelegten Unterstützungs-Unterschriften gefälscht - Kasjanow ruft zu Boykott des Wahlganges auf](#)
- [+] [Stürme - Sturm: "So etwas hat es in dieser Form seit 20 Jahren nicht gegeben"](#)
- [+] [Unwöhnliche lange Dauer und Stärke der Stürme in Graz - Zwei Schwerverletzte durch herabstürzendes Dach - Über 100.000 Haushalte ohne Strom](#)
- [+] [\[more...\]](#)
- [+] [Ski Damen-Weltcup - Marlies Schild geht oben](#)
- [+] [ÖSV-Läuferin gewinnt Slalom in Ofterschwang vor Schwindl Borsen und Teambegleiter Hosp, die Weltcup davonziehen](#)
- [+] [Australian Open - Erster Grand-Slam-Titel für Djokovic](#)
- [+] [Der Serbe Djokovic hat gegen Marin Momeni gegen den französischen Sensationsmann Jo-Wilfried Tsonga in vier Sätzen](#)
- [+] [Indonesien - Ex-Diktator Suharto tot](#)
- [+] [\[more...\]](#)

**Newspaper via RSS Client Includelet**

**Yahoo Weather**

**Yahoo Weather - Vienna, AU**  
Conditions for Vienna, AU at 1:00 pm CET

Current Conditions:  
, 6 C

Forecast:  
Sun - . High: 5 Low: 3  
Mon - . High: 5 Low: 3

Full Forecast at [Yahoo! Weather](#) (provided by The Weather Channel)

**Recently Changed Pages**

Modification Date	Page Title
2008-01-27 15:08:40	Portalseite 1
2007-12-31 16:28:41	weather
2007-11-12 12:07:54	Mash

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# Composite Page with different renderer



# Integration with DotLRN (1)

To use XoWiki portals in DotLRN:

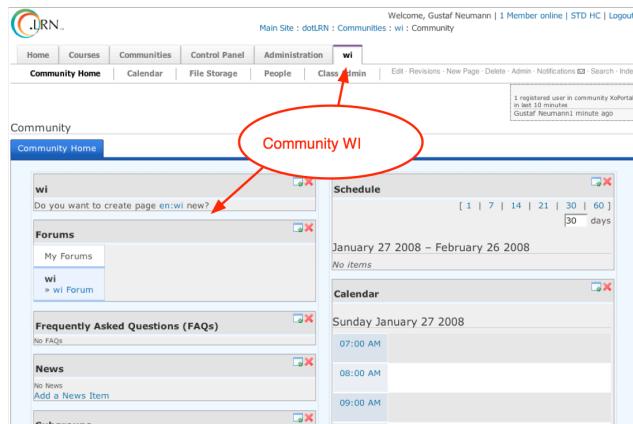
- Define one includelet per DotLRN portlet
- Linkage of portlets to communities:
  - Every dotlrn-includelet has parameter `community_id`
  - "all" ⇒ use communities, the user is a member
  - single or multiple `community_ids`
  - `Community_id` can be as well provided form the composite page or context

# Integration with DotLRN (2)

## Consequences:

- Possible to have a portlet with information about
  - the current community,
  - some arbitrary community
  - some arbitrary communities
- Use DotLRN portlets outside DotLRN community pages
  - place e.g. the announcements of some communities to a start-page
- Similar approach with subsites possible

# Community Portal



# Personal Portal

The screenshot shows a tabview interface with several tabs: Home, Courses, Communities, Control Panel (selected), Administration, and Tabview 1. The Control Panel tab has a sub-tab 'myHome'. The Tabview 1 tab is active, displaying the following content:

- Groups:** Shows a tree structure with 'Information Systems 1' expanded, containing 'Information Systems 1' and 'wi'. A red circle highlights this section with the text 'Information from all memberships'.
- Forums:** Shows 'My Forums' and 'wi > wi Forum'.
- News:** Shows an event titled 'Invited Speaker for IS 1 - 2007-11-12 00:00:00+01'.
- Schedule:** Shows a schedule from January 27, 2008, to February 26, 2008, with no items listed.
- Calendar:** Shows a calendar for Sunday, January 27, 2008, with time slots from 07:00 AM to 10:00 AM.

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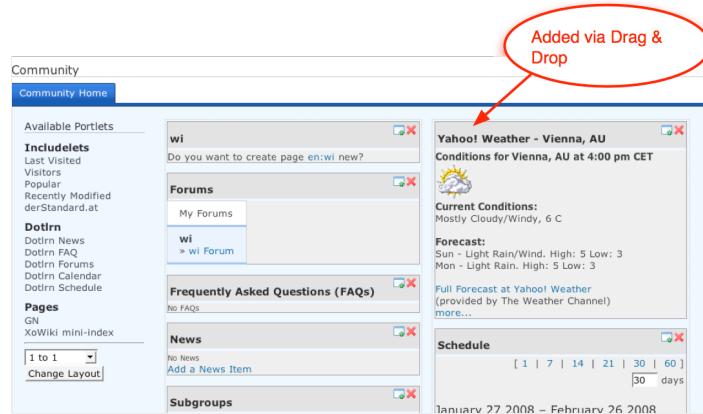
# Community Portal in Edit-Mode

The screenshot shows the Community Portal in edit-mode. The left sidebar includes sections for 'Available Portlets', 'Includelets' (with options like 'Last Visited', 'Visitors', 'Popular', 'Recently Modified', 'Weather Vienna', 'derStandard.at'), 'DotInn' (with links to 'DotInn News', 'DotInn FAQ', 'DotInn Forums', 'DotInn Calendar', 'DotInn Schedule'), and 'Pages' (with links to 'GN' and 'XoWiki mini-index'). A red circle highlights the 'Edit-mode: Additional Pane with Includelets and Layout' area, which contains a message 'Do you want to create page en:wi new?' and a list of portlets: 'My Forums', 'wi > wi Forum', 'Frequently Asked Questions (FAQs)', 'News' (with a link 'Add a News Item'), and 'Subgroups'.

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# Community Portal after Drag & Drop



# Personalization (1)

## Approach:

- Tabs and composite pages are implemented via Form-Fields
- Form-Fields can be personalized via Roles  
Currently defined roles: swa, register\_users, unregistered\_users admin, creator, app\_group\_member, community\_member
- Foreach role:
  - Possible to show/hide includelets
  - Possible to provide completely different sets of includelets

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## Personalization (2)

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*Consequences:*

Possible to have e.g. different portal pages for some communities

- for not logged in users
- for community admins
- for non-members (of communities or subsites)
- for ...

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## Plans and Ideas for the Portal System

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- Developing a recommendation system for includelets
- Learn from Netvibes, iGoogle
- Announce configuration of includelets or let people publish configurations
- Manage context of includelets
- Organization of XoWiki instances in respect to DotLRN communities
- Predefined portals as prototype pages
- Combine User Pages as portlets with Community Pages

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# Examples

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- [Portal Page](#)
- [DotLRN Club Page](#)
- [DotLRN Club Page, edit-mode](#)