Learning XoWiki

A Tutorial to the XoWiki Toolkit

Gustaf Neumann, Stefan Sobernig

Vienna University of Economics and Business Administration

Table of Contents

- Using XoWiki
- Some XoWiki Showcases
- XoWiki as Development Toolkit

What is XoWiki?

- Wiki for OpenACS
- Full text search, categories, general-comments etc
- Stores everything in the content repository
- Revisions, reusable content, multi-language, user-tracking
- Easy to use, few markup commands, Xinha rich-text editor
- Customizable
- Easy integrated into existing applications
- Performance

Using XoWiki

Basic Concepts

- Block-markers
- Links
- Page Types
- Prototype Pages
- Composite Pages
  - Includelets
  - Forms, Form-Pages, Form-Fields

Markup for Block-markers

- Divide page into section with DIV-tags
- CSS formats the DIV tags
- Predefined block markers
  - >>left-col<<
  - >>left-col30<<
  - >>right-col<<
  - >>right-col70<<
  - >>box<<
- Block markers are be closed with >><<

Using Block-Markers

Links

- Intra-Wiki links : *[[pageReference|?link label?]]*
- File link : *[[file:fileName|?label?]]*
- Image link : *[[image:Filename|?label?|?options?]]*
- Flash link : *[[swf:flashFile|label|?options?]].*
- Glossary link : *[[glossary:pageReference|?label?]]*
- Sub-class XoWiki::Link to create custom link types!

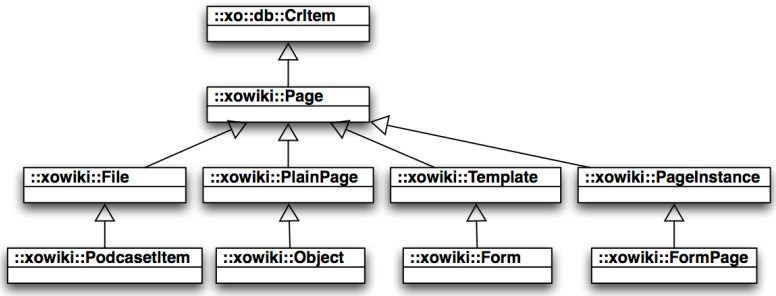
Glossary Link

- Used for definitions
- Browser reads pages using AJAX
- One XoWiki instance has to be named "glossary"
- Search sister-nodes then parent nodes until "glossary" is found
- Pages from other XoWiki instances refer to pages with the glossary link : *[[glossary:pageName|?label?]]*

Page Types

- XoWiki defines defines several different page types
- Most prominent page type ::xowiki::Page
- Other page types are subtypes, extending the basic functionality in various ways
- Differences:
  - Different Methods
  - Additional Attributes

Predefined Page Types



Page Types (2)

- xowiki::Page
  - most used page type, using rich-text editor (Xinha)
- xowiki::PlainPage
  - specialization of xowiki::Page, using plain textarea
- xowiki::File
  - stored files in XoWiki (images, documents etc.)
  - Linked to as file (download) or image (display in page)
- xowiki::PodcastItem
  - Specialization of xowiki::File
  - Extra meta data, different syndication
  - Published as podcast (http://server/xowiki/podcast)

Page Types (3)

- xowiki::Page Template predecessor of ::xowiki::Form
- xowiki::PageInstance predecessor of ::xwowiki::FormPage
- older versions for backward compatibility
- Provide means to develop mini-apps (end-user programming)
- ::xowiki::Form and ::xowiki::FormPage introduced in next section

Page Types (3)

- xowiki::Object is a XOTcl object saved in the CR
- Contains code for dynamic pages
- Method "content" is called when rendered
- Require admin permissions to change
- Used for e.g the Weblog portlet

Example for ::xowiki::Object

```
# -*- tcl-*-
# Small example for demonstrating an ::xowiki::Object
# When the prototype page is loaded, the object named
# CGI will be added to the XoWiki package

::xowiki::Object new -title "CGI" -text {
  proc content {} {
    return "Hello \[\[Wiki\]\]-World. It is now [clock format [clock seconds]]."
  }
}
```

Rendered Content looks like:

Hello Wiki-World. It is now Di Feb 12 23:04:55 CET 2008.

Prototype Pages

Background:

- Prototyping is a Form of reuse in Programming Language Design
- Alternative to Inheritance

Idea:

- Take a full-functional Artifact
- Modify it to your needs

XoWiki Prototype Pages

Stored in the file system (packages/xowiki/www/prototypes/)

Can be loaded into the CR of an xowiki instance (version control after the initial import)

Typical prototype pages:

- index page
- news
- book
- podcast
- sitemap.xml

Composite Pages

XoWiki Pages can contain reusable units, such as

- other XoWiki pages
- configurable, dyamic content creators

Every includelet is configurable

- -decoration portletlplainlnone
- -title ...

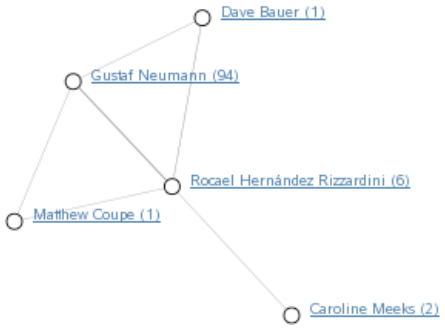
Content Creators

Embeddable, configurable dynamic content

- Calling interface with default values, values from url, provided values
- List all : *{{available-includelets}}*
- Examples:
  - {{rss-button -span 10d -name_filter -title}} RSS
  - {{digg -description "" -url}} Digg This Story
  - {{recent -max_entries 10}}
  - {{get -variable title -source cover}}

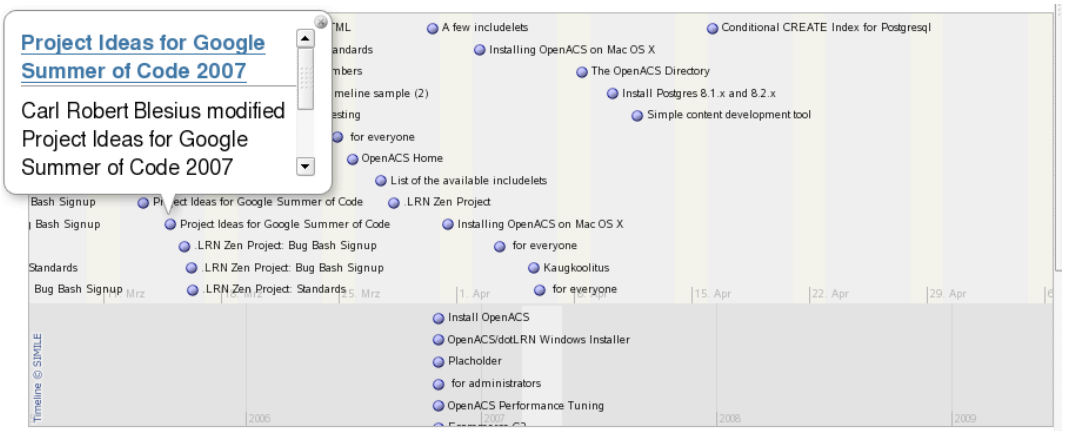
Example Includelet: Activity Graph

- {{activity-graph -max_activities 200 }}



Example Includelet: Timeline

- {{user-timeline -interval1 WEEK -interval2 YEAR}}



XoWiki Forms

::xowiki::Forms defines **input and output** behavior for ::xowiki::FormPages

Input:

- What variables should be gathered, when the page is edited

Output:

- How are is a page to be presented (with the embedded variables)

Relation between ::xowiki::Form and ::xowiki::FormPage

Two collaborating page types

- xowiki::Form:
  - specifies additional variables,
  - validators,
  - renderers,
  - mandatory parts, ...
- xowiki::FormPage:
  - associated data,
  - for one Form exist typically n FromPages

Properties of ::xowiki::Forms

- Bi-Directional Linkage between Form and FormPage
- Forms and Form-entries are stored in the CR
- One step definition of form entries (optional text content, optional attributes)
- attributes are defined via form fields (can be subclassed)
- Many more features: named/unnamed entries, summary tables, categories per form, entry specific localization of form fields, ...

Form Properties (2)

- Values are filled into HTML forms via tdom
- Forms can be built by a form-composer
  - example: Compound Excercise Compound Excercise Answer
- Combination of HTML and auto-generated form fields possible (e.g. submit button added automatically)
- Form-fields can be rendered full (with label) or inline
- HTML-Form-part can contain auto-generated fields as well
  - Example of inline rendering: Scales Scale-Entry
- Categories can be displayed on a per-form basis

Form Properties (3)

- Forms and FormPages are kept in the content repository
- Content repository keeps revisions of forms and answers (also answers can be corrected)
- Content-item lifecyle useful for questionnaires and exams
  - during fill-out: *production*
  - final submission: ready
- Approach independent, how the HTML form-content was generated
  - e.g. some xinha plugin
  - rendered form some xml (learn@wu-xml-format)
  - by hand...

Form Constraints

Form-constraints is a per-Form information specifying properties of form fields

Form-constraints define

- Semantic properties and output formats for form-fields
- Types from content-repository attributes are inherited, wherever applicable (e.g. boolean type for field "anonymous instances")
- Form fields can define validators, which are checked on auto-generated fields and on HTML fields

Syntax of Form Constraints

Syntactical Ideas:

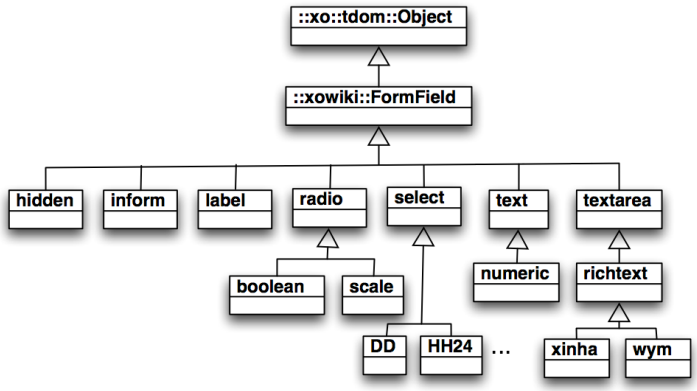
- Similar interface for specifying form-fields like in non-positional arguments Use e.g. `some-field:boolean,required` as usual
- Simple syntax, address non-programmers as well (not so many curley braces like ad_form)
- Multiple refinements of form-fields possible
- Technically: Tcl list of form-field-specs

Form Fields

Building blocks of ::xowiki::Forms

- Based on XOTcl classes (use inheritance, can be specialized, work with mixins...)
- All form-fields can be rendered inline or full (with label)
- Form-fields distinguish between internal and external representation (for e.g. sorting by month)
- Localization possible not only on connection locale, but also on entry-locale
- Uses DotLRN ZEN CSS

Predefined Form Field Types



Mini Applications based on Forms

FormPages can be used for developing small applications (mini-apps)

Two examples:

- Voting
- News

Voting

- Basic, down-stripped example
- User can give a vote
- No check, if the user voted already (could be realized via e.g. a prototype page)
- Modification of entries by other users could be realized via `creator` privilege in policy (everyone is allowed to create an entry, only creator and admin are allowed to change it)
- Entries are un-namned, no need to input a name

Vote: FormPage

News

- More elaborate example:
  - prototype page in xowiki cvs
  - modifying publish-state via form
  - set publish-date (used for sorting)
  - use unnamed entries
  - provides image url
  - summarizer: prototype page news, similar to weblog

What did we not talk about...

- Tagging of pages
- Comments
- Notification
- Search
- Syndication (RSS, ...)
- etc ..

End of Part 1/3

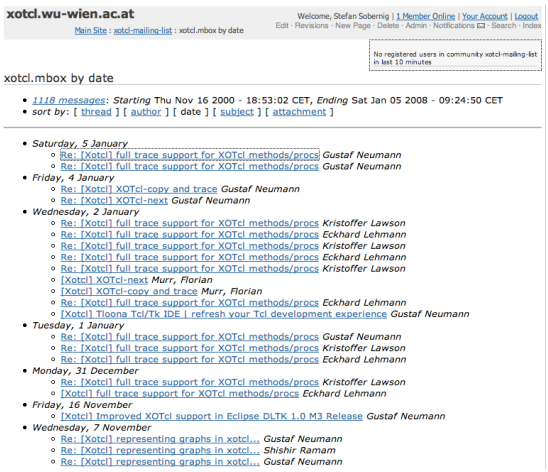
XoWiki based Applications

- Real-word and prototype **showcases**
  - Managing mailing lists
  - Keeping "learning diaries"
  - Providing web application "mash-ups"
- Developer tools
  - How to create your own **page types**
  - How to create your own **includelets**
  - How to create your own **link types**

Create your own XoWiki Application

- Why would you like to do that? Some teasing examples
  - Navigating through and managing mailing lists through XoWiki: *Hypermail2XoWiki*
  - Keeping a "learning contract" by means of XoWiki: *iLogue*
  - Creating "application mash-ups" based on XoWiki: *xomashup*
- XoWiki as development toolkit
  - xotcl-core + XoWiki-specific idioms available to the developer
    - Page types
    - Typed links
    - Includelets
    - Form Fields

Showcase / Hypermail2xowiki



Showcase / Hypermail2xowiki

Hypermail2xowiki allows for ...

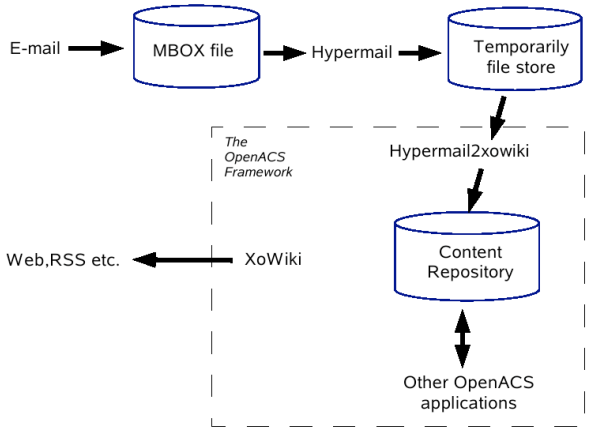
- tracking and archiving mailing lists (by replication)
- providing a convenient and enriched environment for interacting with archived postings:
  - Further structuring through category and tag facilities
  - Enhanced visibility: RSS feed generation, integration with full-text search facility of OpenACS
- Conversational enrichment: Support for comments and notifications

Showcase / Hypermail2xowiki

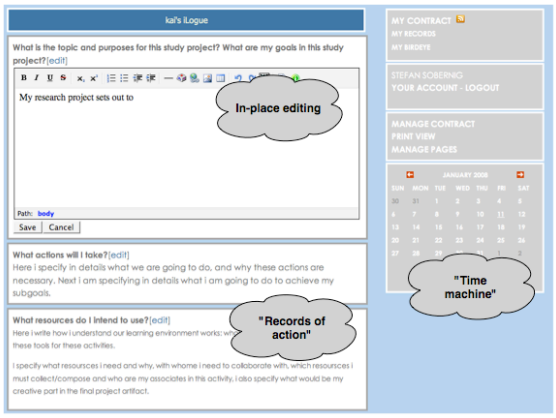
Design decisions:

- Conversion of lists' mbox files into HTML documents by means of hypermail (see http://www.hypermail-project.org/)
- Replication at regular intervals into representations of XoWiki pages (::xowiki::PlainPage); attachments to postings are preserved as ::xowiki::File instances.

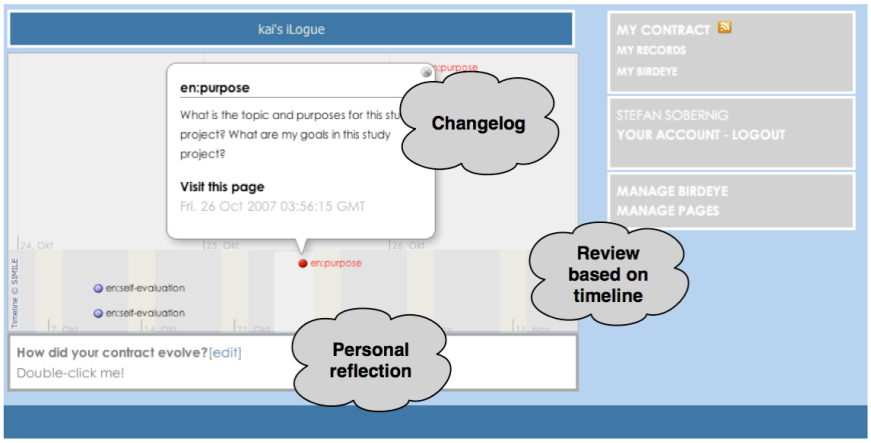
Showcase / Hypermail2xowiki



Showcase / iLogue



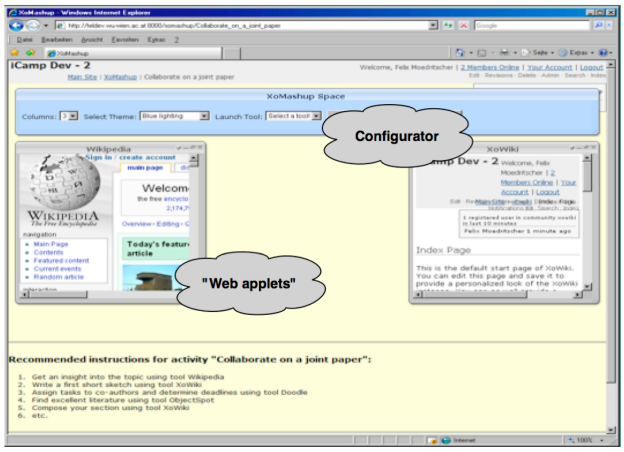
Showcase / iLogue



Showcase / iLogue

- iLogue is an attempt to ...
  - support the pedagogical intervention instrument of "personal learning contracts", originally proposed by ...
  - realize "personal learning contracts" that comprise ...
    - "Records of action": On-going reflection on learning progress
    - "Contract conversation": Elaboration and articulation of "goal sets"
    - "Review report": A reflection phase on the evolution of the contract and goal achievement
- Entirely built upon pre-existing XoWiki functionality which was simply refined by specializing toolkit features
- Added "in-place editing" on-top
- Get it from iLogue@sourceforge.net

Showcase/ Mupple



Showcase/ Mupple

- Mupple: infrastructure for personal learning environments based on the mash-up metaphor
  - Presentation layer based on JS/Ajax toolkit adaptations
    - Grid-based screen with sortable columns
    - Windows presenting URLs (web application, includelets or feeds)
    - Windows can be reloaded, minimized, maximized or closed
    - New URLs can be added and launched
- XoWiki is used at the application/ data layer:
  - Prototypical use of XoWiki templates to share mash-ups of "web applets"
  - "Web applets" are realized using XoWiki's includelets
- Contact: felix.moedritscher@wu-wien.ac.at

End of Part 2/3

XoWiki as Development Toolkit

- What are the most important ingredients for your XoWiki-empowered application?
  - **Custom Content Types**: XoWiki allows to define refined types of pages, so-called "page types"
  - **Customized Link Types:** You may also provide dedicated navigation units, so-called "typed links"
  - **Custom Includelets:** In case you want to enrich the authoring environment of users by "programmatic" elements that go beyond mere mark-up re-use
  - **Custom Form-Fields:** Provide Input/Output behavir

Toolkit Components

- Beyond XoWiki extension infrastructure, the entire functionality of XOTcl is at your hand:
  - Package and scope management
  - Object-relational DB Access Layer
  - See tutorial on XOTcl Core + related materials

Operations on Pages

- Before focussing on advanced extension techniques (custom types etc.), some hints on basic interaction (CRUD) with XoWiki pages is appropriate:
  - (C)reate
  - (R)ead
  - (U)pdate
  - (D)elete
- This functionality is provided by xotcl-core through the Content Repository management layer, (see xotcl-core tutorial)

Prerequisites

- Prerequisites for managing XoWiki pages
  - Define, which package instance to use: e.g.: http://yoursite.org/xowiki
  - Locate its content folder (per-package-instance)
  - Every XoWiki instance has its own folder
- The ID of the folder object is also the folder id in the CR
- We need this for read/write/lookup operations on pages

CRUD Example

```
# Prerequisites
# - Initialize package instance
::xowiki::Package initialize -url /xowiki

# - Get the id of the Content Repository Folder (folder_id)
set folder_id [$package_id folder_id]

# READ operation: Check, whether a page_name is already used
set page_name "my_page_[clock scan now]"

if {[::xo::db::CrClass lookup -name $page_name -folder_id $folder_id] == 0} {
  # We can CREATE the page
  # First create an XOTcl Object in memory
  ::xowiki::PlainPage create $page_name \
     -set text {This is the content of the new Page} \
     -set title {This is the Title of the new Page} \
     -name $page_name \
     -parent_id $folder_id \
     -package_id $package_id

  # persist the page in the content repository
  $page_name save_new

  # optionally, destroy the XOTcl object
  $page_name destroy
}
```

Read Operations

::xo::db::CrClass lookup -name ... -folder_id ... :

- Check, if an item with the given name exists in the content repository. If yes, the item_id is returned

::xo::db::CrClass get_instance_from_db -item_id ... :

- Load a page from the content repository

Get information from the page

- $page title
- $page get_content

Creating/Updating Pages

Typical pattern

- Create an XOTcl page in memory
- Populate page object with actual values
- CREATE: persist page with method "save_new"
- UPDATE: create new revision with method "save"

Page Types

- Page types specify the following behavior for XoWiki-specific content items:
  - Rendering
  - Editing (by association of appropriate form types)

Subclassing XoWiki's Page Types

By refining XoWiki's page type, one can reuse its functionality.

Steps involved:

- Step 1: Define a new Page Type as a subtype of one of the XoWiki Page types
- Step 2: Define a Form for editing your values
- Step 3: Provide custom rendering behavior for the page type, i.e. by introducing a type-specific method *render*.

Example: Geo Page Type

Step 1: Define a custom page type

- A page that will be geographically tagged, by WGS84 geographic data (longitude, latitude)

Step 2: Provide a type-specific form declaration

- In our geo-annotated page type, we want to be allowed to provide longitude/ latitude pairs

Step 3: A refined rendering method

- In our example, we want to render the geo information into a "geo" microformat

Includelets

Includelets are

- **configurable content creators**, available to page authors.
- Included in pages via {{rss-button}}

Defining a custom includelet:

- Step 1: Define a custom includelet class
- Step 2: Provide an appropriate rendering method for this class

Example: Embedding microformat geo-data in ordinary XoWiki pages:
{{geo -longitude 90.516667 -latitude 14.616667}}

Custom Includelet

```
# Define a custom includelet which receives as input location coordinates
# (longitude and latitude) according to the WGS84 specification
# and renders it in micro-format mark-up
::xowiki::IncludeletClass create geo \
   -superclass ::xowiki::Includelet \
   -parameter {
      {__decoration plain}
      {parameter_declaration {
        {-longitude}
        {-latitude}
      }}
   }

# Provide a custom renderer for the microformat output
# (following http://microformats.org/wiki/geo}
geo instproc render {} {
   my get_parameters
   return [subst {
     <div class="geo">Coordinates:
     <span class="latitude">$latitude</span>
     <span class="longitude">$longitude</span>
     </div>
   }]
}
```


Typed Links

- **Typed links** allow content authors to establish different relationship types between XoWiki pages
- Define different kinds of relationships (see e.g. in W3C link types)
- How to provide new relationship types to XoWiki content authors?
  - Step 1: Define a new link class type
  - Step 2: Provide a type-specific renderer that needs to support
    - *resolving* the referenced page and
    - *render* the link text to be embedded into the rendering page

Custom Link Types

- Example
  - Referring to other XoWiki pages as literature references: [[cite:<page>|<link text>]]
  - Rendered links will expand into a quotation microformat fragment, following an example from microformat.org

Custom Link Definition

```
# define link class
Class create ::xowiki::Link::cite -superclass ::xowiki::Link

::xowiki::Link::cite instproc render_found {href label} {
  # resolve the referenced page
  set item_id [my resolve]
  set reference [::xo::db::CrClass get_instance_from_db -item_id $item_id]

  # generate citation information
  set creation_date [::xo::db::tcl_date [reference set creation_date]]
  set creation_stamp [clock scan $creation_date]
  set user_id [$reference set creation_user]

  set author(url) [export_vars -base /shared/community-member {user_id}]
  set author(pretty_name)    [::xo::get_user_name $user_id]
  set published(pretty_date) $creation_date
  set published(raw)         [::xo::ical clock_to_iso $creation_stamp]

  return [subst {
   <cite class="hcite">
     <a class="fn url" href="$href">$label</a>
     <span class="author vcard">
       <a href="$author(url)" class="url fn">$author(pretty_name)</a>
     </span>
     <abbr class="dtpublished" title="$published(raw)">
     $publihsed(pretty_date)
     </abbr>
   </cite>
```

```
    }]
}
```


Rendered Result

- What do we get from this new "cite" link type?
- [[cite:marimba|See the Article on the Marimba]]

```
<cite class="hcite">
  <a class="fn url" href="/xowiki/en/marimba">See the Article on the Marimba</a>
     <span class="author vcard">
       <a href="/shared/community-member?user_id=512" class="url fn">Stefano Sober
     </span>
     <abbr class="dtpublished" title="20080210T164625">
     2008-02-10 16:46:25
     </abbr>
</cite>
```

Custom Form Fields

- Custom form field allow content authors to provide form entries and custom renderers in ::xowiki::Forms
- Required Steps:
  - Step 1: Define a class for a custom form field
  - Step 2: Provide a renderer
  - Step 3: Use custom Form Field in an ::xowiki::Form

Example: Pretty Printed Program Listings

Basic Idea:

- Use HTML textarea for input
- Use OpenACS pretty-printer (from api-browser) for output
- Define a new form field type "code_listing"
- Define a form using @listing@ in the content area
- Form constraints: listing:code_listing,required

Form-Field for Program Listings

```
namespace eval ::xowiki {
  ############################################################
  #
  # ::xowiki::FormField::code_listing
  #
  ############################################################

  Class FormField::code_listing -superclass ::xowiki::FormField::textarea -paramet
    {rows 20}
    {cols 80}
  }
  FormField::code_listing instproc pretty_value {v} {
    [my object] do_substitutions 0
    return "<pre class='code'>[api_pretty_tcl [my value]]</pre>"
  }
}
```


End of Part 3/3

References

- XoWiki Documentation
  - http://media.wu-wien.ac.at/download/xowiki-doc/
  - http://alice.wu-wien.ac.at:8000/xowiki-doc
  - http://alice.wu-wien.ac.at:8000/xowiki-faq
  - http://www.openacs.org/xowiki/XoWiki_User_Guide