



# Automating Drupal Development with Patterns

David Rozas, Liao Hao and many others

This work was partly supported by the Future and Emerging Technologies Programme (FP7-COSI-ICT) of the European Commission through the project Qlectives (grant no.:231200).

# A brief presentation of us...

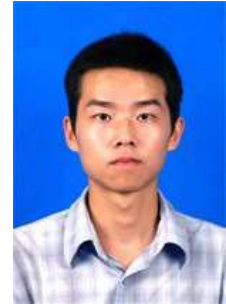
David Rozas Domingo (drozas)



- 2+ years working with Drupal.
- Recently joined CRESS (Centre for Research in Social Simulation) at University of Surrey (UK).
- Interest areas: free software, education and technology, distributed systems programming, CSCW, collaborative learning, socially intelligent information systems, ...
- +info: <http://www.davidrozas.com>

# A brief presentation of us...

Liao Hao



- 1+ Years working with Drupal
- Ph.D candidate in TIP Group(Theoretical Interdisciplinary Physics) of University of Fribourg, Switzerland

# the others...

- Stefano Balietti (ETH)
- Xiao Rui 肖锐 (Uni Science & Tech. China)
- Dengcheng Yan 严登程 (Uni Science & Tech. China)
- Matus Medo (Uni Fribourg)
- Zhou Yanbo 周彦博 (Uni Fribourg)
- Dirk Helbing (ETH)
- Vahe Tshitoyan (ETH)
- Vahan Hovhannisyan (ETH)
- Christoph Schwirzer (ETH)
- Christian Schulz (ETH)
- Sasa Tomic (ETH)
- Mark Jelasity (Uni Szeged)
- Kornél Csernai (Uni Szeged)
- Tamas Kojedzinszky (Uni Szeged)
- Nigel Gilbert (Uni Surrey)
- Alastair Gill (Uni Surrey)

# Outline

- The big picture: Qlectives and QScience
- Patterns:
  - Patterns overview: components and Patterns files
  - Differences between Patterns and other modules

# Outline

- Patterns:
  - The Future?
  - What can I do with Patterns?
  - How can I do it?
  - Future Work
- Demo
- Q&A

# The big picture: QLectives

- What is quality?
- If half a million people give a YouTube video the thumbs up, does that mean is good?
- Perhaps... but you would probably rather watch a recommendation from a friend
- Can we do it in a “P2P” way?

# The big picture: QLectives

- Take features of social networking to help groups of people share resources: from home videos to scientific papers
- Quality ratings in a distributed way



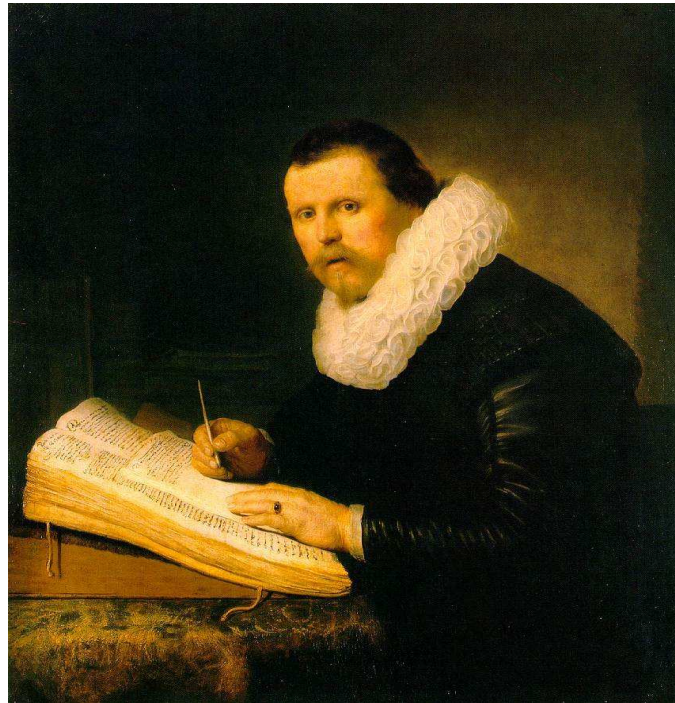
# The big picture: QLectives

Two application domains:

- QMedia: P2P media distribution fully decentralized
- QScience: distributed platform for scientists allowing them to locate or form new communities and quality reviewing mechanisms

# QScience: Science today

From...



Rembrandt, "A Scholar" (1631)

# QScience: Science today

To...



Trends discovery



Communication



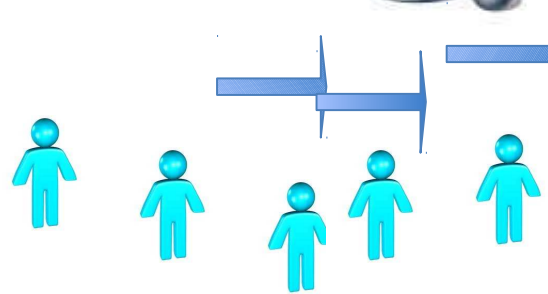
rank	author	$h_m$ Index	percentile
1	S FREUD psychology	164.02	99.96
2	P BOURDIEU sociology	138.58	99.96
3	E WITTEN physics, particles & fields	114.57	99.93
4	N CHOMSKY philosophy	88.20	99.91
5	P KRUGMAN economics	95.37	99.89
6	<b>ANTIKARI</b> computer science, information systems	94.00	99.87
7	A GIDDENS sociology	87.83	99.84
8	K MARX philosophy	85.95	99.82

Indexes of scientific productivity

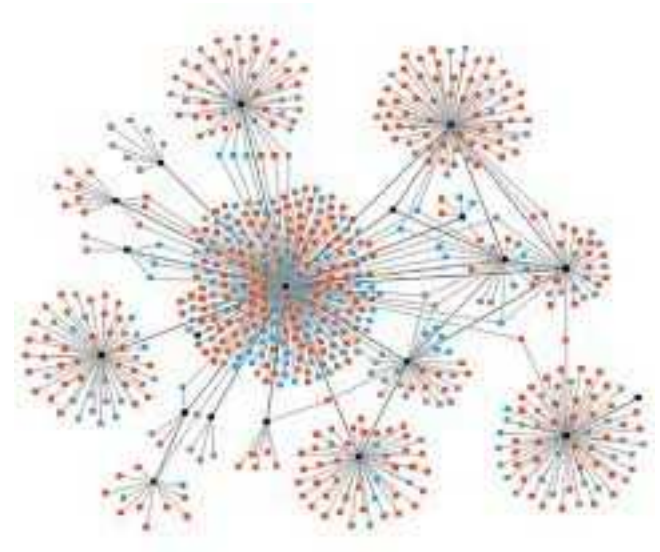
# QScience: Science today



Community



Big Data



Networks

# Can we have it all?



- Many software packages are available that fit one (or more) of those needs, but not all.
- QScience is an attempt to pull them all together in a modular fashion: a **Drupal distribution**
- EconoPhysics forum:
  - <http://www.unifr.ch/econophysics/> (old version)
  - <http://134.21.2.151/drupal-7.14/> (new Drupal version)

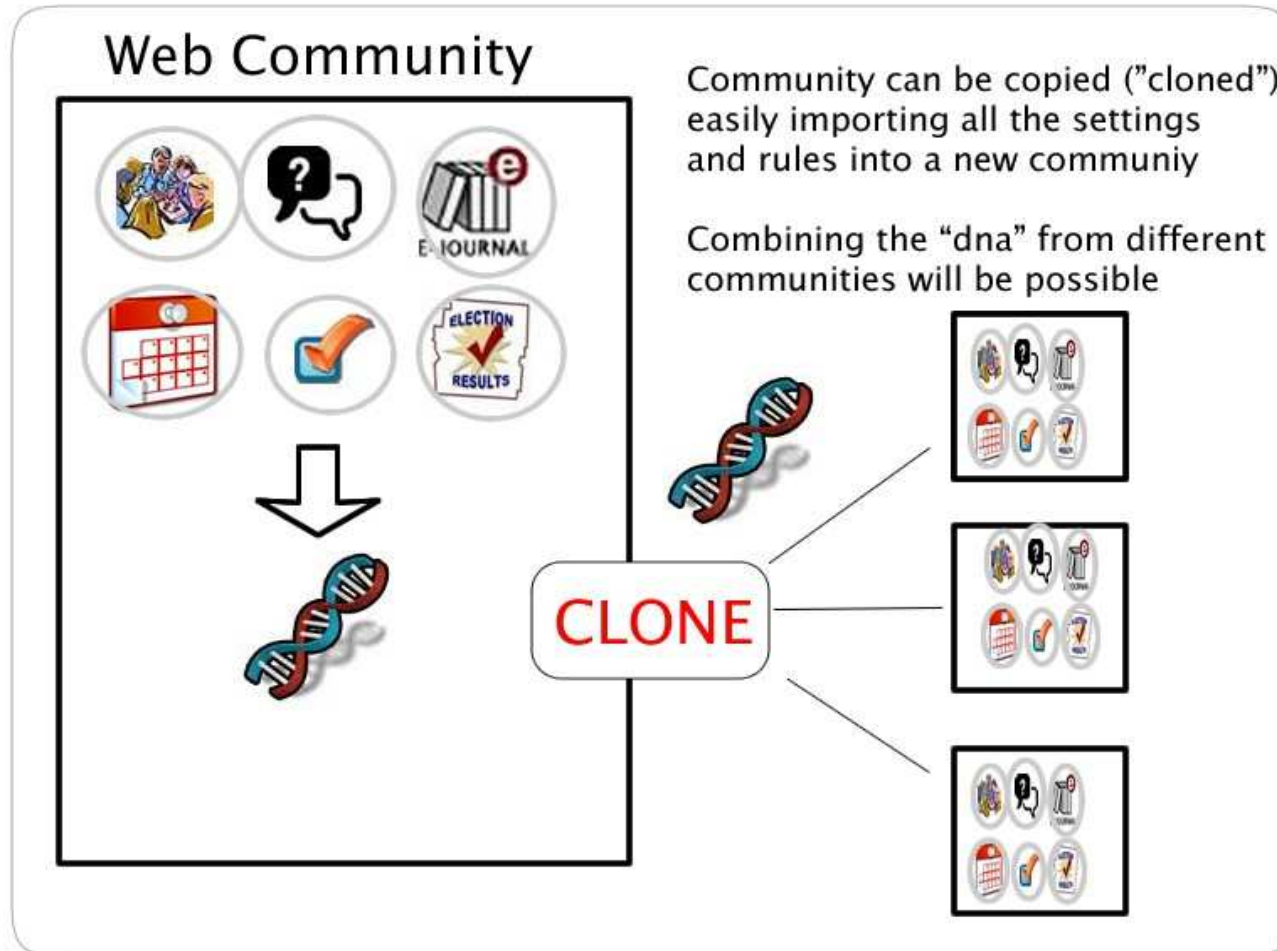
# QScience: contributing back

- **Patterns:** configuration management
- **D2D** (DrupalToDrupal): secure exchange of information between different Drupal instances *(to be released soon)*
- **Living Science:** Drupal based search and visualization tool *(to be released soon)*

# QScience Patterns

- What we want: reuse and share modules configuration
- The main issue: configuration and data are mixed up in the DB

# QScience Patterns

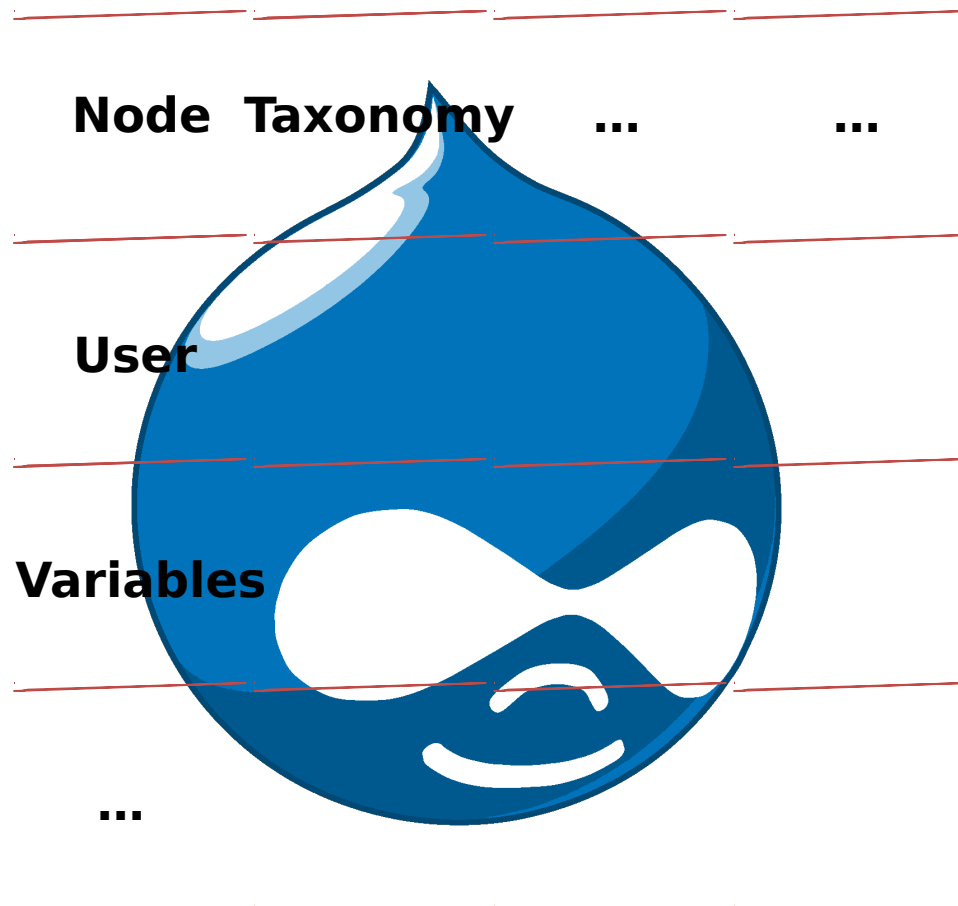




# QScience Patterns

- Patterns is built to bypass this bottleneck by managing and automating site configuration
- Patterns' approach to solve it:
  - Components (“Software driver concept”)
  - Storage the configuration in files – decoupled architecture

# Patterns Components



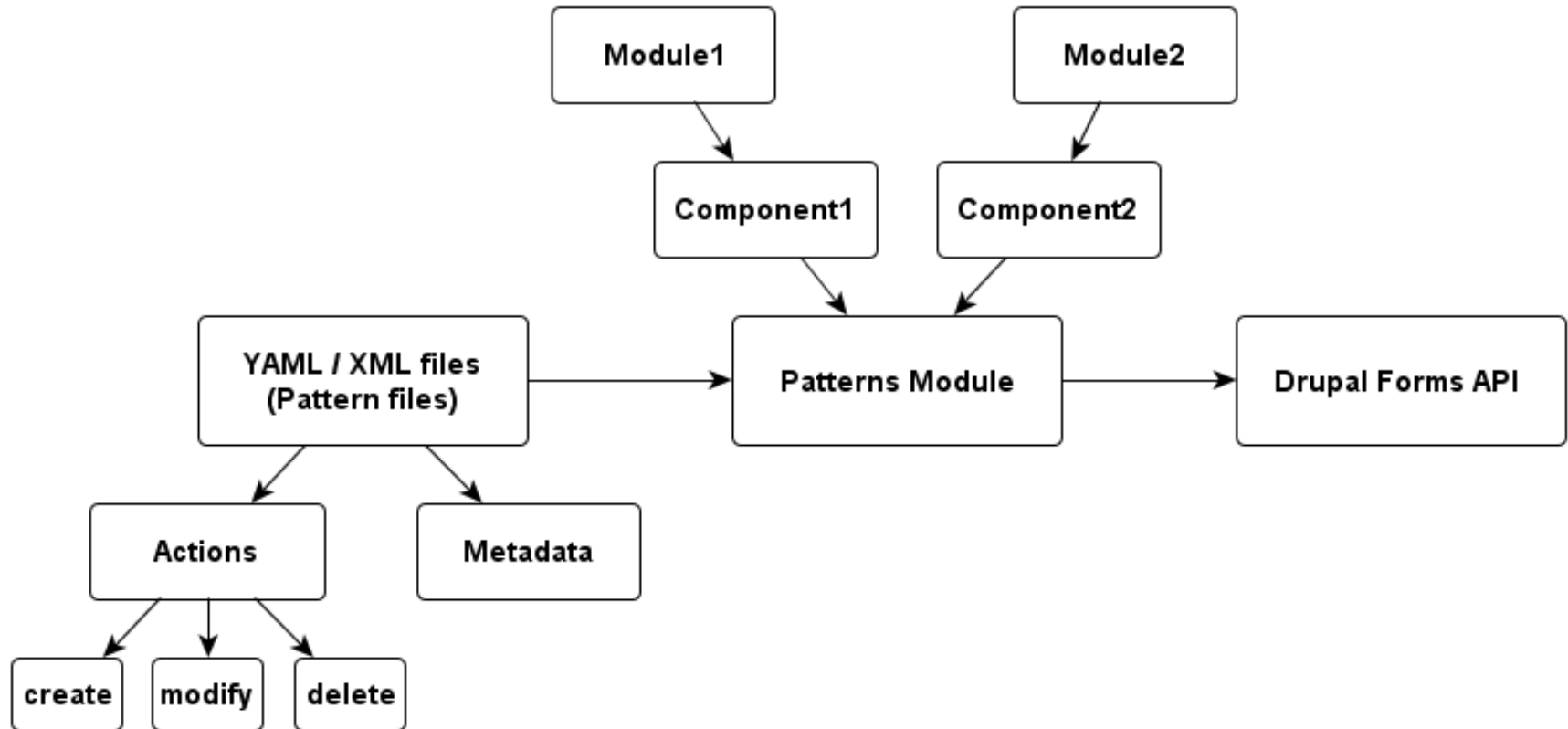
# Patterns Components

- Each Drupal **module** can have a corresponding component, e.g. Blocks, Nodes, Taxonomy, Users, System settings.
- The component handles tasks directed at the module, acts much like a **software driver**.

# Patterns Components

- It has to define a set of hooks which are accessed by the Patterns core during the different phases: prepare, validate, callbacks, execution, cleanup...
- **Actions are preprocessed and reformatted** so that they can be the input of one or more Drupal forms.

# Patterns Overview



# Patterns Files

- Store **configuration in files**
- There is not any dependency with any specific format: `hook_patterns_parser()`: <http://drupal.org/node/1545346>
- Currently supported formats
  - **YAML**: easy to read and write (human-readable data serialization format)
  - **XML**: interoperability
  - **PHP arrays**: performance

# Patterns Files: structure

- Divided in sections:
  - Metadata: author, category,
  - Sub-sections:
    - Actions: create, modify, delete, include

# Patterns Files

- Demo: taking a look to a couple of patterns examples in **YAML**

```
1 # This is a comment
2 # Example Pattern
3
4 info: # mandatory name
5   title: Create, modify and delete a Vocabulary
6   description: as title
7   author: QScience
8   category: Taxonomy
9   version: 1.0
10  core: 7.x
11  author_email: sbalietti@ethz.ch
12  author_website: qllectives.eu
13
14 actions: # any name is good for this category
15
16 - create:
17   tag: vocabulary
18   name: Another Vocabulary
19   machine_name: anothervoc
20   description: Another interesting vocabulary
21   hierarchy: 0
22
23 - modify:
24   tag: vocabulary
25   machine_name: anothervoc
26   description: It was not that interesting after all
27   # vid: 2
28
29 - delete:
30   tag: vocabulary
31   machine_name: anothervoc
32   # vid: 2
33
```



# So, what is the difference between Patterns and...?

- **Distribution/Installation Profile:**
  - *Granularity*: the configuration can be split into smaller definitions
  - *Simplicity*: easier to write YAML files than an installation profile
  - Can be used in existing sites

# So, what is the difference between Patterns and...?

- **Features+Strongarm:**
  - *Paradigm: Features is 'use case oriented', Patterns is 'CM oriented'*  
(Interesting blog post from Tom Friedhof about this at <http://activelamp.com/blog/new-way-manage-configuration-your-site>)

# So, what is the difference between Patterns and...?

- **Features+Strongarm:**

*“Don’t get me wrong, I love the features module, but I have to admit that I’ve run into my share of issues using features module for configuration management and deployment. Fortunately others in the community have ran into these issues too and have released modules such as features override, features plumber, and Features Tools. Not to mention entire workflows have been created around how to use Features to manage configuration for deployment that don’t even come close to creating KIT compliant features. **Features module is really being misused, it’s not being used to create features, it’s being used to manage configuration and deployment.**”*

*Tom Friedhof (“A new way to manage configuration on your site”)*

# So, what is the difference between Patterns and...?

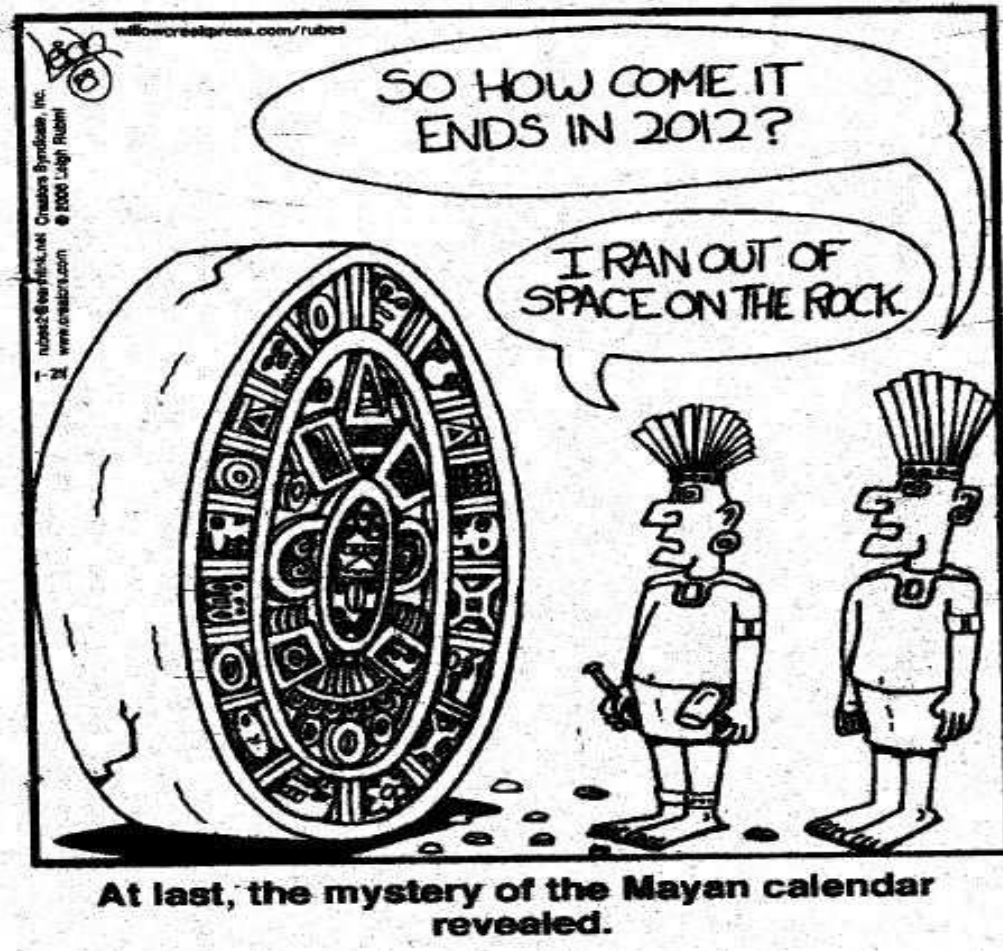
- **Features+Strongarm:**
  - *Storage*: Features stores the configuration in Drupal modules, patterns stores it in files as D8 will (see D8 Config Management Initiative)

# So, what is the difference between Patterns and...?

- **Features+Strongarm :**
  - *Implementation:* Features uses module specific APIs (e.g: Views API), Patterns uses mostly FAPI (although can use specific ones as well).
  - The “trick” is **drupal\_form\_submit()**
  - Advantage: Validation for free!
  - Disadvantage: Performance

# The future...?

# The future...?



# The future...?

- Configuration Management Initiative (D8):
  - <http://groups.drupal.org/build-systems-change-management/cmi>
  - <http://drupal.org/community-initiatives/drupal-core#cmi>
- Can Patterns concepts be useful for it?. Proof of concept?



# The future...?

Posted by laurencefass on October 5, 2012 at 12:45pm

The CM management for Drupal 8 is being backported to D7 in the CM module, and (apparently) features is going to be re-written on top of it. From what I understand (so far) ***Patterns looks more suited to the configuration management use case and source control than Features (in its present form as it was not intended for CM)***. Patterns may already provide some of the solutions proposed Features/CM integration.  
[...]

<http://groups.drupal.org/node/259013>

# Ok... so what can I do with Patterns for the moment?

- Module ported from **D6 to D7**:
  - From spaghetti code to modular code
  - Improved **GUI**
  - **Drush support**
  - Added automatic **export API**
  - **Parser Module**
  - Simple test battery
  - More powerful syntax
  - Include patterns
  - Settings page
  - Patterns D2D

# Ok... so what can I do with Patterns for the moment?

- Components already developed for:
  - Content Types
  - Fields
  - Menus, Menu Items
  - Blocks
  - Content
  - Users
  - Vocabularies, Terms
  - Pathauto
  - System settings (eg.: enable modules)
  - Permissions/Roles
  - Color
  - Toolbar and Shortcut

# Ok... so what can I do with Patterns for the moment?

- First Release Candidate: 7.x-1.0-rc1 (Sept. 9th)
- Write or re-use patterns using the already developed components
- Share your patterns (set public patterns page)
- Make your module “Patterns Ready”

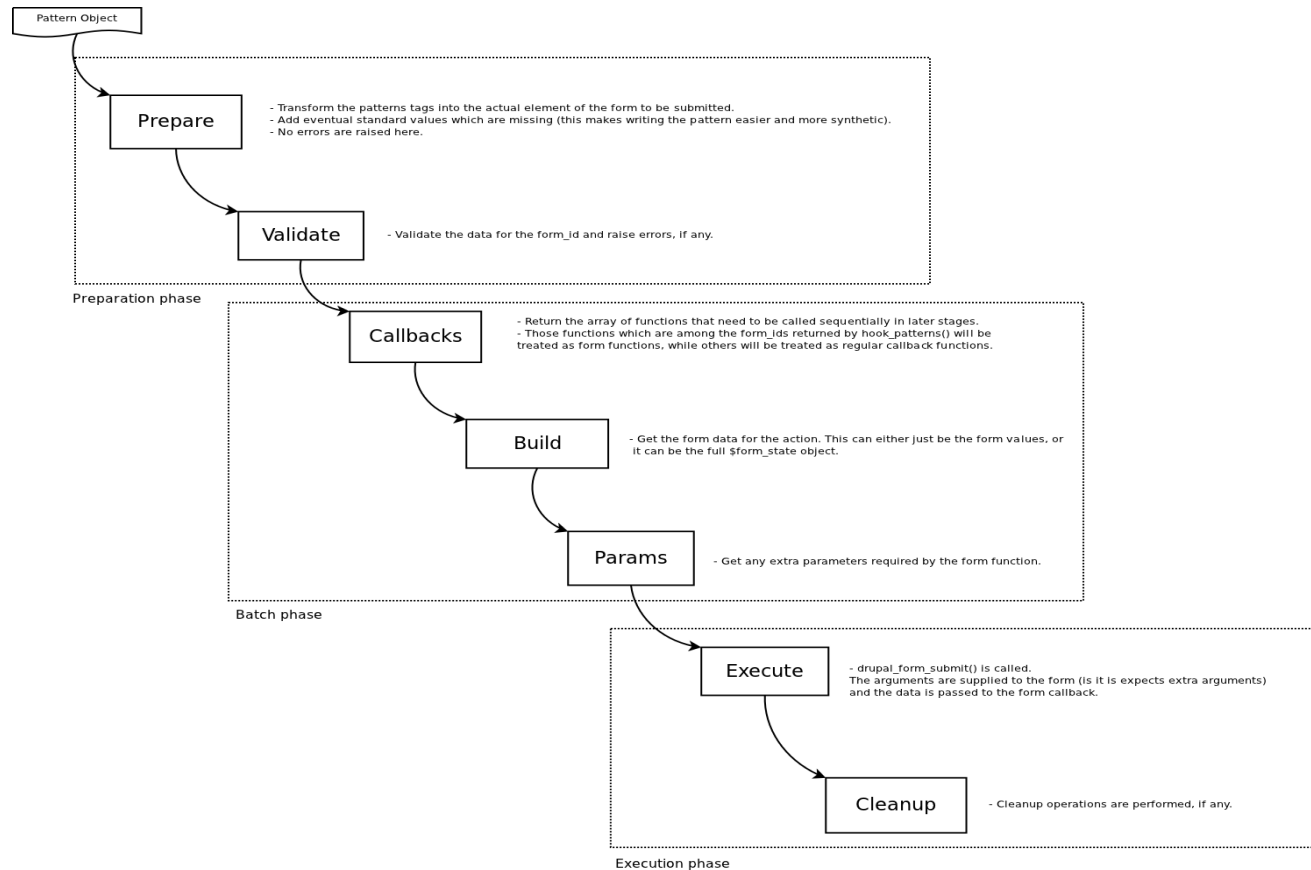


# How to make a module “Patterns Ready”?

- You need to implement `hook_patterns` to declare which actions your module is able to handle:

```
function fb_likebox_patterns($data = NULL) {  
  $actions['fb_likebox'] = array(  
    PATTERNS_INFO => t('Settings for Facebook Likebox module'),  
    PATTERNS_MODIFY => array('block_admin_configure'),  
    PATTERNS_EXPORT => array(PATTERNS_EXPORT_ALL => 'fb_likebox_patterns_export_all_settings'),  
  );  
  return $actions;  
}
```

# Patterns Execution Flow



**Source:** <https://github.com/QScience/patterns-flowcharts/blob/master/running-pattern-workflow.dia>

# How to make a module “Patterns Ready”?

- Hooks available to interact on each phase:
  - `hook_patterns_prepare($action, $tag, &$data)`
  - `hook_patterns_validate($action, $tag, &$data)`
  - `hook_patterns_callbacks($action, $tag, &$data)`
  - `hook_patterns_build($action, $form_id, &$data, &$action_state)`
  - `hook_patterns_params($action, $form_id, &$data &$action_state)`
  - `hook_patterns_cleanup($action, $tag, &$data)`

# How to make the settings exportable?

- You need to declare in `hook_patterns()` a function that will gather the data
- Write that function: can be more or less complex depending on the component



# How to make the settings exportable?

```
$actions['content_type'] = array(  
  PATTERNS_INFO => t('Create/Modify/Delete Content Types'),  
  PATTERNS_CREATE => array('node_type_form'),  
  PATTERNS_MODIFY => array('node_type_form'),  
  PATTERNS_DELETE => array('node_type_delete_confirm'),  
  PATTERNS_FILES => $files_ct,  
  PATTERNS_EXPORT => array(PATTERNS_EXPORT_ALL => 'node_patterns_export_all_content_types', ),  
);
```

...

```
function node_patterns_export_all_content_types($args = NULL, &$result = NULL) {  
  // Load content types.  
  $types = _node_types_build()->types;  
  $result = array();  
  foreach ($types as $type) {  
    $type = (array) $type;  
    $data = array('tag' => 'content_type');  
    $data = array_merge($data, $type);  
    $action = array(PATTERNS_CREATE => $data);  
    array_push($result, $action);  
  }  
  return $result;  
}
```

# Future Work

- Improve the automatic extraction of configuration (pattern files): **WIP**
- Issues with some core components (e.g.: block)
- The extracted patterns may require minor corrections

# Future Work

- Write components for QScience custom modules
- Write components for the most important contrib modules:
  - Views
  - Rules
  - OG
  - Context
  - ...

# Future Work

- Documentation (D7):
  - Almost 30 pages already published at Drupal.org:  
<http://drupal.org/node/1464118>
  - Patterns guide: “Step by Step tour on the code”: **WIP, to be released very soon**
  - Screencasts, more tutorials, etc.

# Ideas

- E.g.:Collect Statistics about “the most popular patterns” ...
  - Possible to do it in a P2P way?/
  - Drupal2Drupal module?
- **Thanks for your ideas/suggestions/patches!**
- Patterns group at:  
<http://groups.drupal.org/patterns>

# Time for the demo!

LIST

EXPORT

IMPORT

LAB

SETTINGS

INFO

## SYSTEM

ENABLED	FORMAT	NAME	TITLE	VERSION	DESCRIPTION
Disabled	xml	<b>modules2.xml</b>	Enable/disable modules (XML)	1.0	Based on <a href="http://drupal.org/node/408960">http://drupal.org/node/408960</a>
Disabled	yaml	<b>variables.yaml</b>	Create and delete variables	1.0	Based on <a href="http://drupal.org/node/409180">http://drupal.org/node/409180</a>
Disabled	yaml	<b>fill_forms.yaml</b>	Fill in values for forms	1.0	Based on <a href="http://drupal.org/node/516332">http://drupal.org/node/516332</a>

# Links

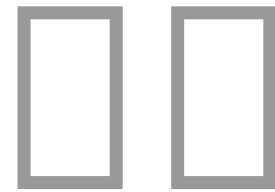
- Qlectives:
  - Main site: <http://www.qlectives.eu/>
  - Deliverable 4.2.3:  
<http://www.qlectives.eu/wiki/images/9/91/Qd4-2-3.pdf>
  - Econophysics Forum:  
<http://www.unifr.ch/econophysics/>

# Links

- Patterns:
  - Main Page: <http://drupal.org/project/patterns>
  - Documentation: <http://drupal.org/node/346509>
  - Group: <http://groups.drupal.org/patterns>
- Configuration Management Initiative:
  - <http://groups.drupal.org/build-systems-change-management/cmi>
  - <http://drupal.org/community-initiatives/drupal-core#cmi>



# Thanks!



# ¡Gracias!