



FOUR KITCHENS

Outgrowing Content Types: Building Custom Entities

DrupalGovCon

July 24, 2019

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Four Kitchens builds websites and apps for organizations that depend on large-scale or unconventional content.

What is an entity?





► **Choose language**

Verify requirements

Set up database

Install site

Install 200+ modules

Finished

Drupal 6

- Added a DB abstraction layer.
- CCK module extended content types.
- The idea of *fieldable-content* pushed us toward making everything a node.

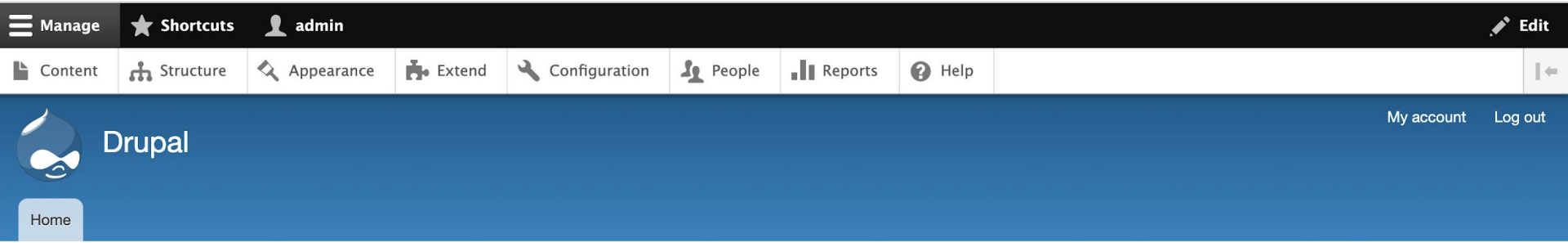


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Drupal 7

- Intentionally an abstract term, entities are objects that are used for *persistent storage of content and configuration* information
- Entities become a stdClass in core.
- Nodes, Taxonomy, Users, others are fieldable.



Drupal 8

- Entities are defined with typed objects.
- Interfaces enforce consistent implementations.
- Includes *Content and Configuration* entities. While both are relevant, this presentation will focus on content entities.

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Core & Contrib Entities



Core Entities

| Entity | Bundle | Module | Usage |
|---------------|--------------|--------------|---------------------------|
| Content | Content Type | node | Traditional content page. |
| User | <i>none</i> | user | Access accounts. |
| Custom Block | Block Type | custom_block | Ancillary content items. |
| Taxonomy Term | Vocabulary | taxonomy | Tagging and feeds. |
| Media | Media Type | media | Multimedia and metadata. |
| File | <i>none</i> | file | Files and metadata. |

Additional core entities include: Comment, Contact Form, Menu Link Content, and Shortcut among others.

Contrib Entities

| Entity | Module | Usage |
|------------------------|-----------|-------------------------------------|
| Paragraph | paragraph | Content components. |
| Webforms / Submissions | webform | Form builder / storage. |
| Pathauto Patterns | pathauto | URL alias definitions. |
| Metatag Defaults | metatag | Per content metatag settings. |
| Redirect | redirect | Redirect (4xx response) management. |
| Group | group | Define entity collections. |
| | | |

Why create custom entities?

- Presentation
- Performance
- Reducing Overhead
- Optimizing Builds
- Access
- Storage



Reason #1: Reducing Overhead

When content types are too big.



JIM VOMERO
SENIOR ENGINEER

At any given moment, the urge to sing, "The Lion Sleeps Tonight" is just a whim away, a whim away, a whim away.

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93%

SURVEY RESULTS

According to a recent survey, replacing words with the names of musical instruments in a sentence, often goes undetected.

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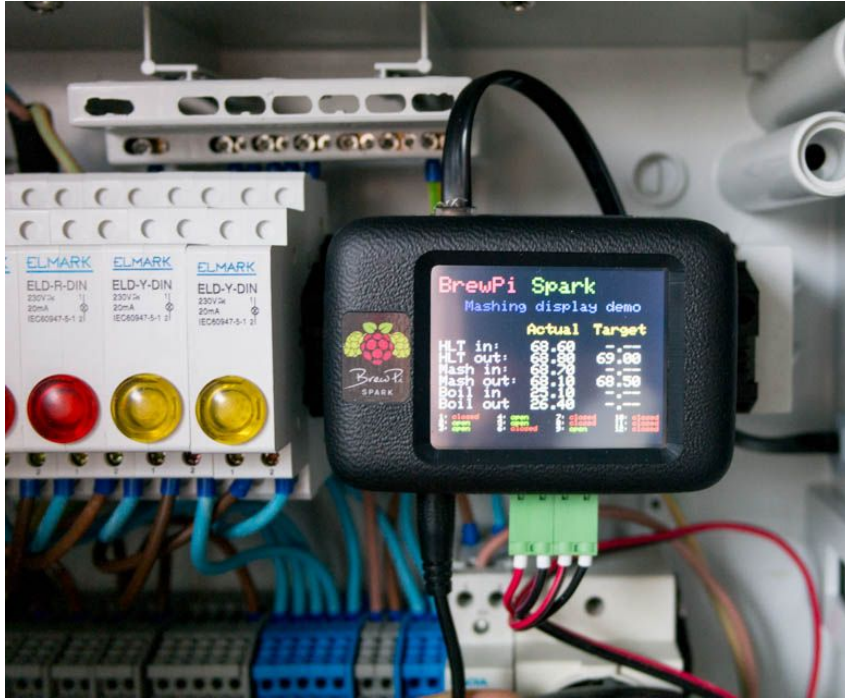


I was gonna tell a time travelling joke but you didn't like it

BY JIM VOMERO, JUNE 19, 2018

Reason #1: Reducing Overhead

When content types are too big.

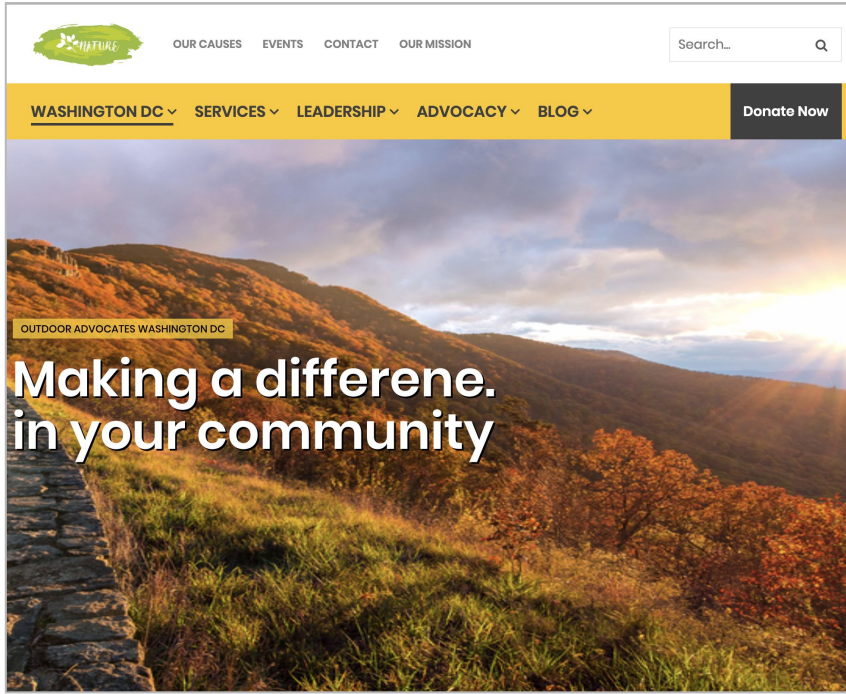


Raspberry Pi Data Feed

- New temperature reading every minute via API.
- Logs include temperature and timestamp only.
- No need for traditional editorial controls.

Reason #2: Optimizing

When content types are too small.



Regional Microsites

- Non-Profit is adding sites for each metro area.
- Organization wide content will mix with local.
- Stakeholders value consistency between sites.

Reason #3: Presentation

Presenting customized editorial experiences.

| For the week | Status | Talent | Report to | Date signed |
|-----------------------------|----------|--------------|---------------|--------------|
| Oct 30, 2017 - Nov 05, 2017 | Signed | Dylan McKay | Nick Peterson | Nov 06, 2017 |
| Oct 30, 2017 - Nov 05, 2017 | Approved | Maggie Patel | Nick Peterson | Nov 06, 2017 |
| Oct 23, 2017 - Oct 29, 2017 | Approved | Dylan McKay | Nick Peterson | Oct 30, 2017 |
| Oct 23, 2017 - Oct 29, 2017 | Approved | Maggie Patel | Nick Peterson | Oct 30, 2017 |
| Oct 16, 2017 - Oct 22, 2017 | Approved | Dylan McKay | Nick Peterson | Oct 23, 2017 |
| Oct 16, 2017 - Oct 22, 2017 | Approved | Maggie Patel | Nick Peterson | Oct 23, 2017 |
| Oct 09, 2017 - Oct 15, 2017 | Approved | Dylan McKay | Nick Peterson | Oct 16, 2017 |
| Oct 09, 2017 - Oct 15, 2017 | Approved | Maggie Patel | Nick Peterson | Oct 16, 2017 |
| Oct 02, 2017 - Oct 08, 2017 | Approved | Maggie Patel | Nick Peterson | Oct 09, 2017 |
| Oct 02, 2017 - Oct 08, 2017 | Approved | Dylan McKay | Nick Peterson | Oct 09, 2017 |

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Timecards

- Unique access for Staff, Manager, and Finance.
- Different forms based user role and workflow status.
- All changes logged for financial integrity.

Reason #4: Access

Defining unique access controls & permissions.

| University Help Desk  | | | | | | |
|--|---------------------------------------|---|-----------------|----------|----------------|--|
| ID | SUBJECT | REQUESTER | STATUS | PRIORITY | UPDATED | |
| <input type="checkbox"/> | 1 Camera missing SD card | Pending Erin J. Cantrell | Pending Support | Low | 22 minutes ago | |
| <input type="checkbox"/> | 3 Tech podium lock broken | Pending Samuel V. Campbell | Pending Support | High | 17 minutes ago | |
| <input type="checkbox"/> | 4 New student access | Pending George D. | Pending Support | Low | 16 minutes ago | |
| <input type="checkbox"/> | 5 Request group study space | Pending James E. Foerster | Pending Support | Medium | 15 minutes ago | |
| <input type="checkbox"/> | 6 Cant find registration form | Pending Janie D. Fierro | Pending Support | Low | 15 minutes ago | |
| <input type="checkbox"/> | 7 NEED PHOTOSHOP | Pending Paul Wilson | Pending Support | Urgent | 14 minutes ago | |
| <input type="checkbox"/> | 8 TRAINING FOR VIDEO STUDIO | Pending JAMES LINEBERRY | Pending Support | Low | 13 minutes ago | |
| <input type="checkbox"/> | 9 Computer Crashed | Pending Elliot Bean | Pending Support | Low | 11 minutes ago | |
| <input type="checkbox"/> | 10 printer paper | Pending Rhonda Collins | Pending Support | Low | 11 minutes ago | |
| <input type="checkbox"/> | 11 Looking for audio adapter | Pending Carol Marie Earle | Pending Support | Medium | 10 minutes ago | |
| <input type="checkbox"/> | 12 Copier won't take access code | Pending Nielsen | Pending Support | Low | 2 minutes ago | |
| <input type="checkbox"/> | 13 Follow up on classroom training | Pending Jose J. | Pending Support | Low | 1 minute ago | |
| <input type="checkbox"/> | 14 Projector reservation finals week! | Pending Jeff Frailey | Pending Support | Low | Just Now | |

Ticketing System

- Multiple issue types with unique workflows.
- Dynamic permissions per role, type, and status.
- User, Help Desk, Admin Management roles.

Reason #5: Leveraging Bundles

Reusing content definitions through bundles.

Session

Title
Location
Timeslot
Description
Image
Track

Keynote

Title
Location
Timeslot
Description
Image
Banner Image

Workshop

Title
Location
Timeslot
Description
Image
Track
Registration

Social

Title
Location
Timeslot
Description
Image
Registration

BOF

Title
Location
Timeslot
Description

Reason #6: Performance Tuning

When performance is an high valued goal.

| node |
|----------|
| nid |
| vid |
| type |
| uuid |
| langcode |

| node_revision |
|--------------------|
| nid |
| vid |
| langcode |
| revision_timestamp |
| revision_uid |
| revision_log |
| revision_default |

| node__field_temp_high |
|-----------------------|
| bundle |
| deleted |
| entity_id |
| revision_id |
| langcode |
| delta |
| field_temp_high_value |

| node__field_temp_low |
|-----------------------|
| bundle |
| deleted |
| entity_id |
| revision_id |
| langcode |
| delta |
| field_temp_high_value |

| node__field_record_time |
|-------------------------|
| bundle |
| deleted |
| entity_id |
| revision_id |
| langcode |
| delta |
| field_temp_high_value |

| node_field_data |
|-----------------|
| nid |
| vid |
| type |
| langcode |
| status |
| title |
| uid |
| created |
| changed |
| promote |
| sticky |

| node_field_revision |
|---------------------|
| nid |
| vid |
| langcode |
| status |
| title |
| uid |
| created |
| changed |
| promote |
| sticky |

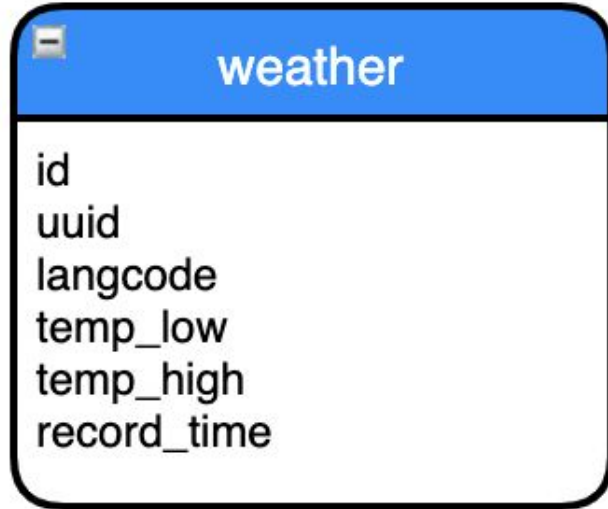
| node_revision__field_temp_high |
|--------------------------------|
| bundle |
| deleted |
| entity_id |
| revision_id |
| langcode |
| delta |
| field_temp_high_value |

| node_revision__field_temp_low |
|-------------------------------|
| bundle |
| deleted |
| entity_id |
| revision_id |
| langcode |
| delta |
| field_temp_high_value |

| node_revision__field_record_time |
|----------------------------------|
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| field_temp_high_value |

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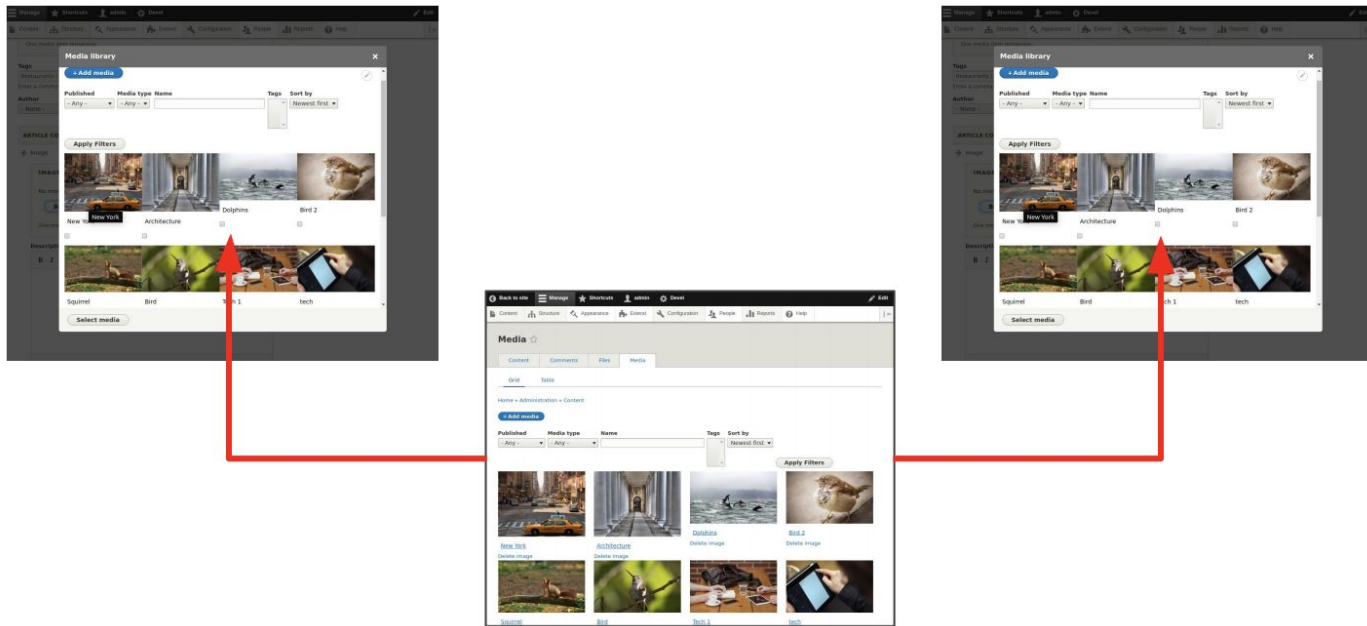


Denormalizing can:

- Enhance query performance.
- Make a database more convenient to manage
- Facilitate and accelerate reporting.

Reason #7: Unique Storage

Using non-standard storage for modeled data.



Example: https://www.drupal.org/project/external_entities



Are you Excited?
Feel Empowered?
Ready to create Entities?



***Chuckles* I'm in danger.**

Reasons not to build a custom entity.

1. Steeper learning curve compared to other Drupal APIs.
2. Less likely contrib modules will work with custom entities.
3. Custom entities may not inherit future Drupal features.
4. Responsible for maintaining custom code - plenty of potential for technical debt.

Building with ECK Module

Demo



Generating with Drupal Console

Demo



Thank You!



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