

Synchronizing Art with Technology

Data Integration at the Amon Carter Museum of American Art

Who am I?

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Bluecadet

What is Amon Carter

Located in the heart of Fort Worth's Cultural District, the Amon Carter Museum of American Art (the Carter) is a dynamic cultural resource that provides unique access and insight into the history and future of American creativity through its expansive exhibitions and programming. Admission is always free. To learn more about the Carter, visit cartermuseum.org.



AMON
CARTER
MUSEUM OF
AMERICAN
ART

What is Data Syncing?



What is Data Syncing?

Bringing external data into your site for a specific purpose



What is Data Syncing?

Bringing external data into your site for a specific purpose

It is NOT migration



Why are we talking about this today?

- We're developers at a conference.. duh
- Current state of technology
- We have seen a surge in organizations wanting to digitize

Why are we talking about this today?

- In the museum space, a typical museum has about 95% of their collection in storage



the Amon Carter

Purpose

Create an easy-to-use and accessible collections explorer. The collections explorer will highlight the Carter's dynamic collection and act as a digital extension of the in-gallery experience.

the Amon Carter

Tech

- CMS: Drupal 8
- Hosting: Pantheon
- Collection Management: EMu
- DAMs: Piction
- Search: Pantheon Search (Solr)

Collection

All Works Collection Groups Artists

the Amon Carter

Data

the Amon Carter Data

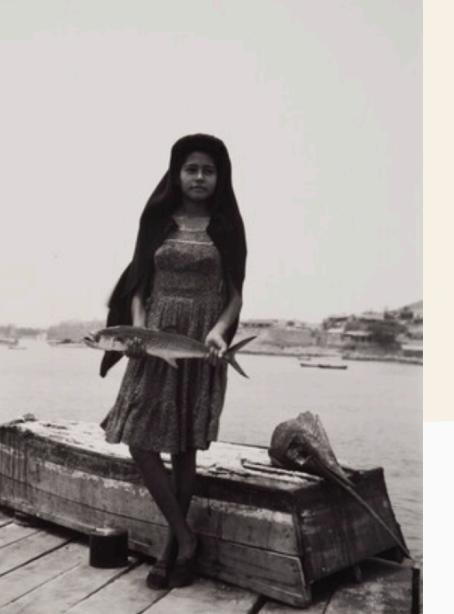
- Artworks

cartermuseum.org/collection/fish-called-sawun-pez-que-llaman-sierr... Incognito New Chrome available

How to Make Fres... Work Enablis Drupal Comics presentation Church Games Finances All Bookmarks

The Carter is open today, from 10 a.m. to 5 p.m. Shop Join Blog

Visit Events Exhibitions Collection

 A black and white photograph of a woman standing on a wooden dock by a body of water, holding a large fish.



"...a Fish Called Saw"/"...un Pez Que Llaman Sierra"

Manuel Álvarez Bravo (1902-2002)

Date 1942, printed 1977

Object Type Photographs

Medium Gelatin silver print

Contributors Published by Acorn Editions Limited

Object Format Portfolio

Dimensions Image: 9 7/16 x 6 7/8 in.
Sheet: 9 15/16 x 7 15/16 in.

Edition portfolio 39/100

Inscriptions Print Verso:
I.r. signed in graphite: M. Alvarez
Bravo. \ Mexico.

Location: Off view

See more by [Manuel Alvarez Bravo](#)

Photographs Portfolio women

Teenagers portraits Fish

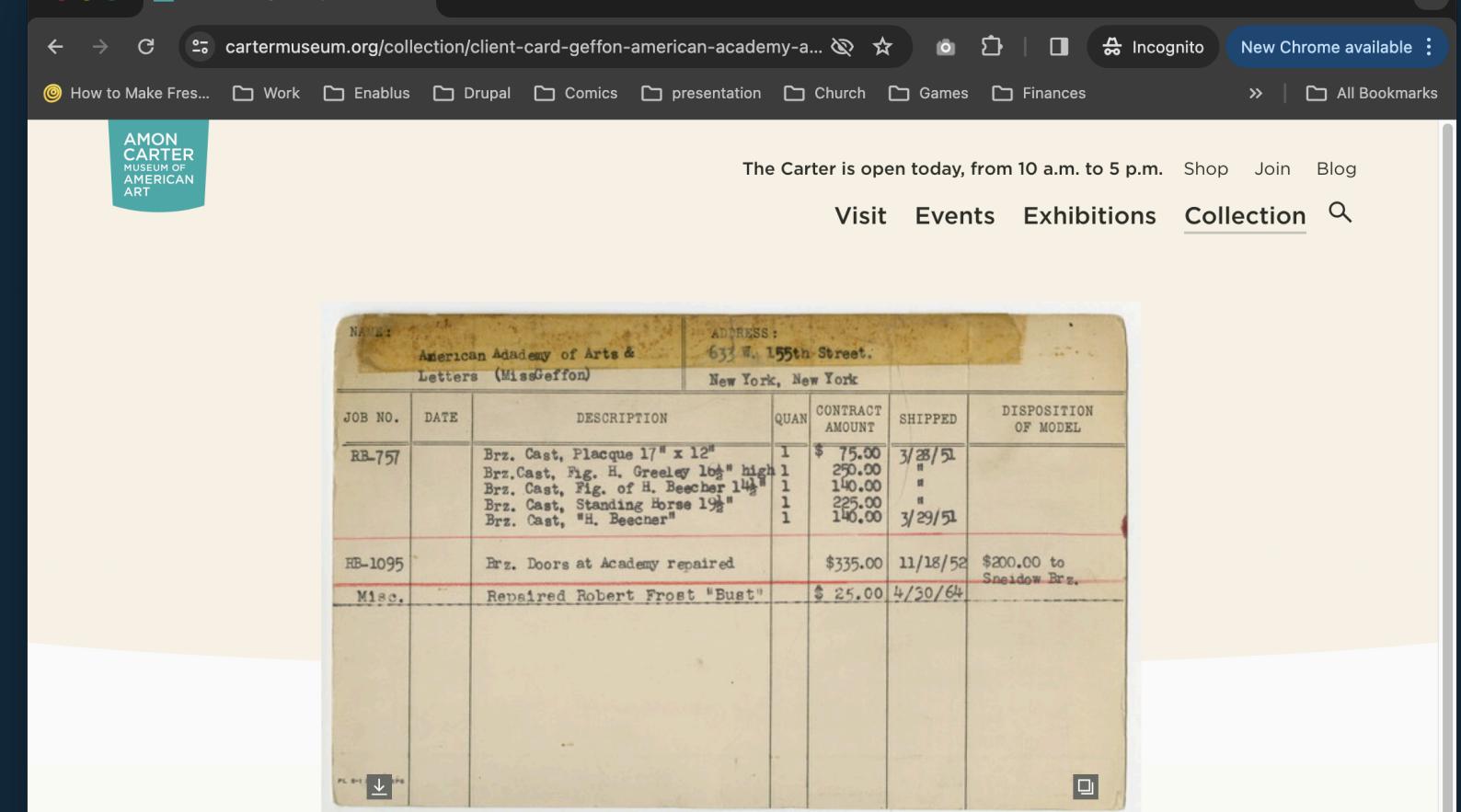
fishing docks boats Animals

Mexico

black-and-white photographs

the Amon Carter Data

- Artworks
- Archive object (pdfs, letters, etc)



Client Card [Geffon, American Academy of Arts and Letters, New York City, NY; Sheidow Bronze]

Roman Bronze Works Archive

Contributors Collected by Roman Bronze Works

Date 1902-1977

Genre/Form Inventories

Accession Number A2012.010.3.0068

Description Geffon, American Academy of Arts and Letters, New York City, New York; Sheidow Bronze; 757 Plaque 1951 1951 17" x 12"; 757 Figure of H. Greeley 1951 1951 16.5"; 757 Figure of H. Beecher 1951 1951 14.5"; 757 Standing Horse 1951 1951 19.5";

This object is part of the Carter Archives and is [available for research](#).

Location: Off view

the Amon Carter

Data

- Artworks
- Archive object (pdfs, letters, etc)
- Artists

Search | Amon Carter Museum | Remington's celeb status | Amon Carter Museum

cartermuseum.org/blog/remingtons-celeb-status

How to Make Fres... Work Enablis Drupal Comics presentation Church Games Finances Drupal/Pantheon

Incognito New Chrome available

Remington's celeb status

Feb 15, 2021

 Maggie Adler, Curator of Paintings, Sculpture, and Works on Paper

 Part of: [Exhibitions](#), [Collection](#)

[Frederic Remington](#) made a reputation for himself as an illustrator and a painter. Not one to rest easy with his original success at illustrating and painting, Remington decided to try his hand at bronze sculpture—not exactly the simplest thing to teach yourself. With the help of the leading bronze foundries in the United States, most notably Roman Bronze Works, whose master craftsmen would be Remington's collaborators for life, Remington created sculptures that have perhaps been even more celebrated than his paintings.

How did this happen? A lot might have to do with frequent cameo appearances. The Remington sculpture with the most celebrity status is Remington's [The Broncho Buster](#) because a cast of it has been a constant Oval Office fixture through party shifts and for presidents of differing personalities and objectives.



Pete Inge | Bluecadet | Synchronizing Art with Technology

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the Amon Carter

Data

- Artworks
- Archive object (pdfs, letters, etc),
- Artists
- Exhibition Data

Exhibitions | Amon Carter Museum

cartermuseum.org/exhibitions

How to Make Fres... Work Enablis Drupal Comics presentation Church Games Finances Drupal/Pantheon

Incognito New Chrome available

Exhibitions

Current Exhibitions Upcoming Exhibitions Past Exhibitions

Temporary gallery closures

The second floor galleries will be closed for maintenance January 23 through April 28, 2024.

[Learn more →](#)

CLOSED TEMPORARILY FEBRUARY 13 THROUGH MARCH 3. EXTENDED THROUGH MAY 12, 2024

Trespassers: James Prosek and the Texas Prairie

Trespassers: James Prosek and the Texas Prairie features more than 20 new works, including a new large-scale silhouette painting; watercolor portraits of plants collected during his travels across the state of Texas; and trompe l'oeil clay and bronze sculptures of wildflowers.



ON VIEW THROUGH MARCH 31, 2024

Re/Framed

Re/Framed gives visitors to the Carter a new way to look at the Carter's collection. Several times a year, artwork will be rotated allowing guests to see the works through a different lens.





*First, define the state
and the constraints*

*Second, decide on an
execution strategy*

*Third, decide on
the right tools*

Say it again

1. First, *define* the **state** and the **constraints**
2. Second, *decide* on an execution **strategy**
3. Third, *decide* on the right **tools**

First, define the state and the constraints

Starting Development

- The Carter's IT team had set up a pipeline for their Collection Data to sync to their DAMs
- Custom Data Structures, in JSON format
- Low volume of updates
- Did not need immediate updates
- Wanted all the imagery **in** the CMS

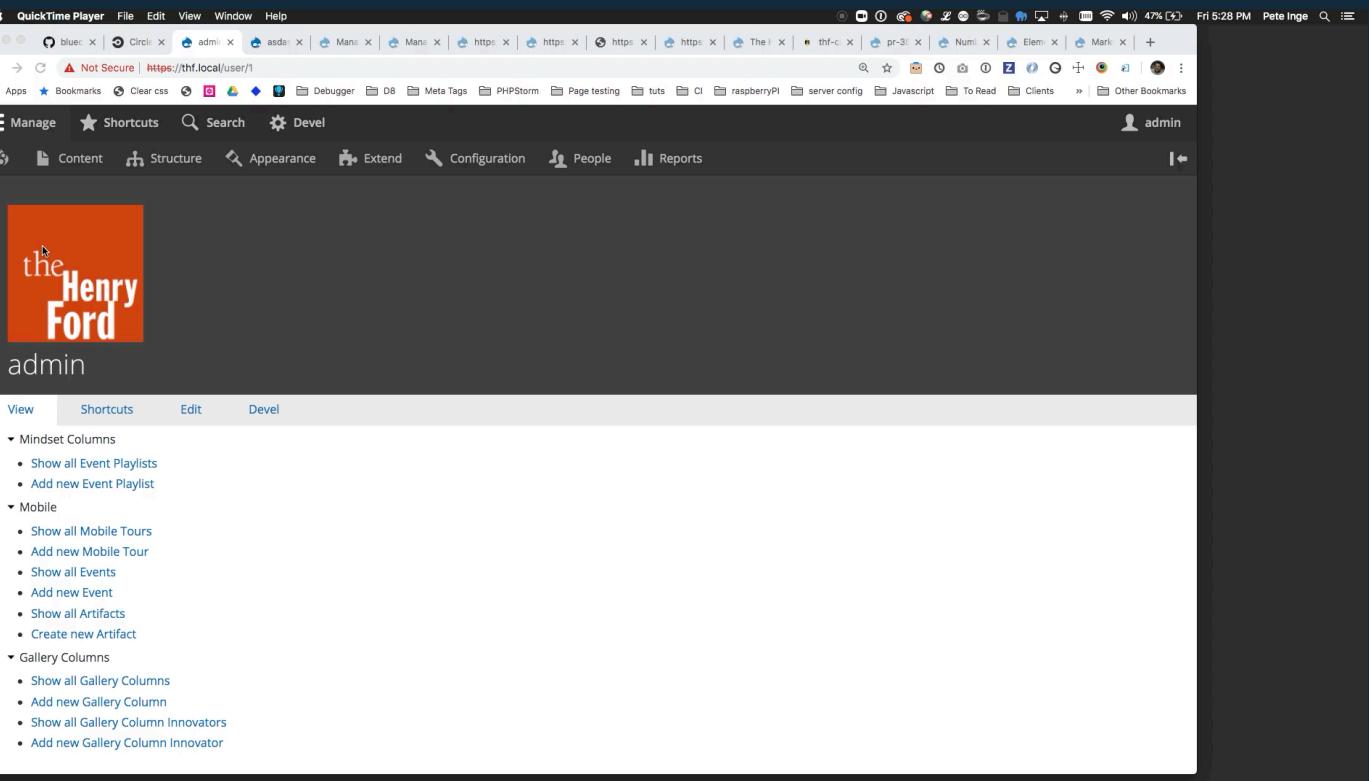
Second, decide on an execution strategy

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1. Use live external endpoints

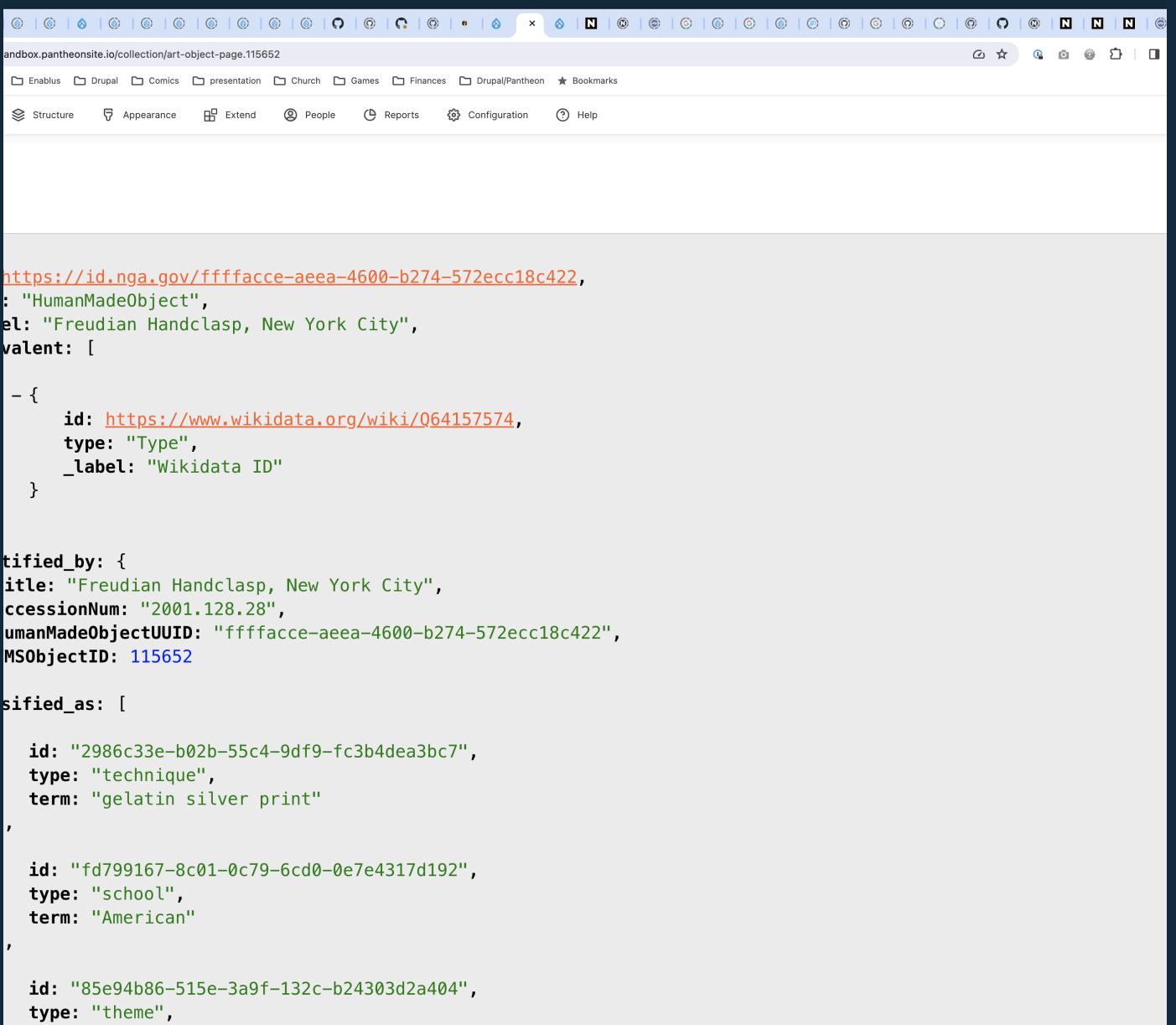
Second, decide on an execution strategy

1. Use live external endpoints



Second, decide on an execution strategy

1. Use live external endpoints
2. Save raw data, process on the fly

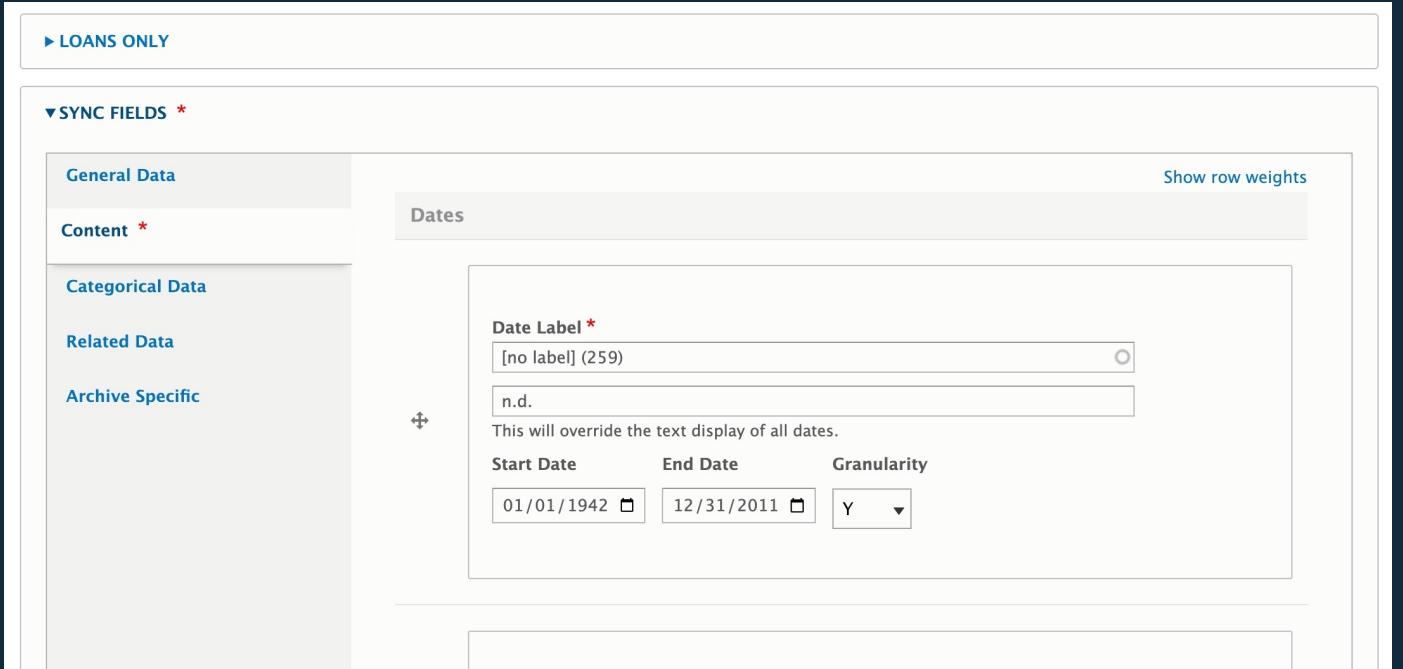


The screenshot shows a web browser window with a URL like `andbox.pantheonsite.io/collection/art-object-page.115652`. The page displays a large amount of JSON data representing an art object. The JSON includes fields such as `id`, `label`, `type`, `term`, `title`, `accessionNum`, `humanMadeObjectUUID`, `MSObjectID`, and lists of `classified_by` and `classified_as` relationships.

```
https://id.nga.gov/ffffacce-aeea-4600-b274-572ecc18c422,  
: "HumanMadeObject",  
el: "Freudian Handclasp, New York City",  
valent: [  
  - {  
    id: https://www.wikidata.org/wiki/Q6415754,  
    type: "Type",  
    _label: "Wikidata ID"  
  }  
  
tified_by: {  
  title: "Freudian Handclasp, New York City",  
  ccessionNum: "2001.128.28",  
  umanMadeObjectUUID: "ffffacce-aeea-4600-b274-572ecc18c422",  
  MSObjectID: 115652  
  
sified_as: [  
  id: "2986c33e-b02b-55c4-9df9-fc3b4dea3bc7",  
  type: "technique",  
  term: "gelatin silver print"  
,  
  id: "fd799167-8c01-0c79-6cd0-0e7e4317d192",  
  type: "school",  
  term: "American"  
,  
  id: "85e94b86-515e-3a9f-132c-b24303d2a404",  
  type: "theme",
```

Second, decide on an execution strategy

1. Use live external endpoints
2. Save raw data, process on the fly
3. Bring all data into Drupal
Entities, nodes and taxonomies etc. (Drupalize the data)



The screenshot shows a configuration interface for a 'LOANS ONLY' entity. On the left, there's a sidebar with sections for 'General Data', 'Content *', 'Categorical Data', 'Related Data', and 'Archive Specific'. The main area is titled 'Dates' and contains a 'Date Label' field with '[no label] (259)' and a radio button, followed by a text input for 'n.d.'. A note states: 'This will override the text display of all dates.' Below are date range fields: 'Start Date' (01/01/1942), 'End Date' (12/31/2011), and a 'Granularity' dropdown set to 'Y'.

Second, decide on an execution strategy

1. Use live external endpoints
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Second, decide on an execution strategy

We wanted to “Drupalize” all the data

- Needed related data, the data was not in a silo

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We wanted to “Drupalize” all the data

- Needed related data, the data was not in a silo
- Content was going to be *enhanced* in the CMS
- Content was going to be indexed through the Search API²

² honestly not needed, but I didn't fully understand that at the time

Third, decide on the right tools

What tools exist?



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1. Migrate Module



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2. Feeds Module



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3. Custom Code



Third, decide on the right tools

What tools exist?

1. Migrate Module
2. Feeds Module
3. Custom Code
4. External to CMS



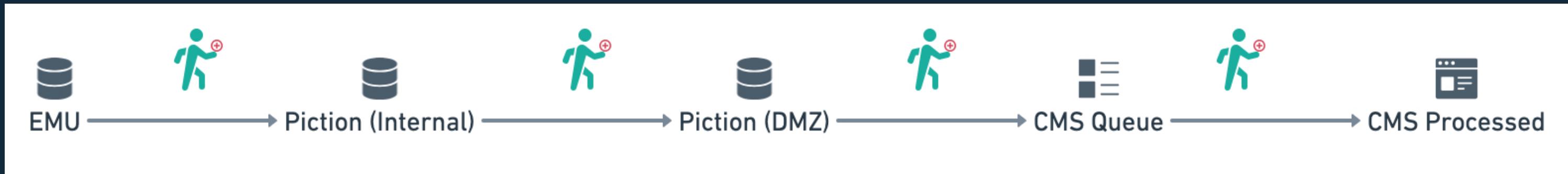
Third, decide on the right tools

1. Migrate Module
2. Feeds Module
3. **Custom Code**
4. External to CMS



Third, decide on the right tools

Timing and queueing the updates required a custom code solution



Third, decide on the right tools

Timing and queueing the updates required a custom code solution

1. Grab Data

2. Add item to a Queue
Worker(s)

3. Process Item in the queue at a
later time (cron)

```
...  
$queue_factory = \Drupal::service('queue');  
$queue = $queue_factory->get($queue_id);  
  
$queue_manager = \Drupal::service('plugin.manager.queue_worker');  
$queue_worker = $queue_manager->createInstance($queue_id);  
  
$start = time();  
  
// Run for 25 seconds or 10000 items.  
$count = 1;  
while ((time() - $start) < 25 && $count <= $total) {  
    $item = $queue->claimItem(43200);  
}  
...
```

Third, decide on the right tools

Custom Code

Actual ingestion of data could have been Feeds or Migration, but would have required some custom tampering, or migration processes³

Custom Code

All custom Code

Flexibility

Easily handle NCA specifics

Force Sync on multiple dimensions

Tech Debt.

Need to document Well

harder for freelancer to work on

Not restricted to ID mapping

Feeds / Migrate

Core Code is contrib.

Both developed for specific use case & have been Drupalized

Still need custom code tamper

Current "Status"

Tech Debt.

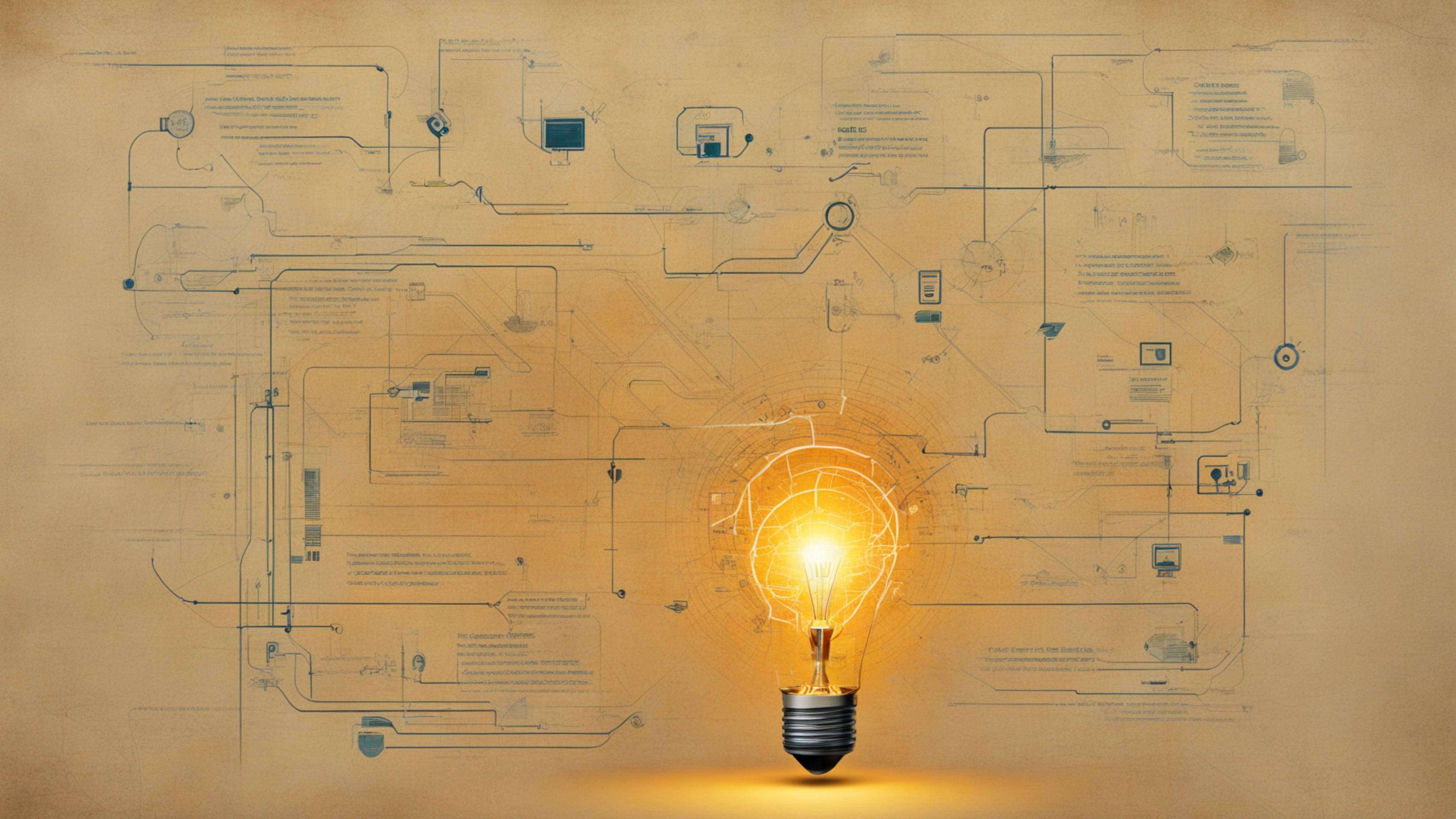
"Easier" for Drupal developer
but still need to document well

(and get freelancer to work on.)

³I always go back and forth, b/c I want to do it the “Drupal way” but reality is you will still need custom code.

Say it again

1. First, *define* the **state** and the **constraints**
 - Create a dynamic collections explorer to highlight the Carter's collection.
2. Second, *decide* on an execution **strategy**
 - Bring all data into Drupal Entities, *nodes* and *taxonomies* etc.
3. Third, *decide* on the right **tools**
 - Custom Code



Things We Learned

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 - Text is fast, images (files) are not
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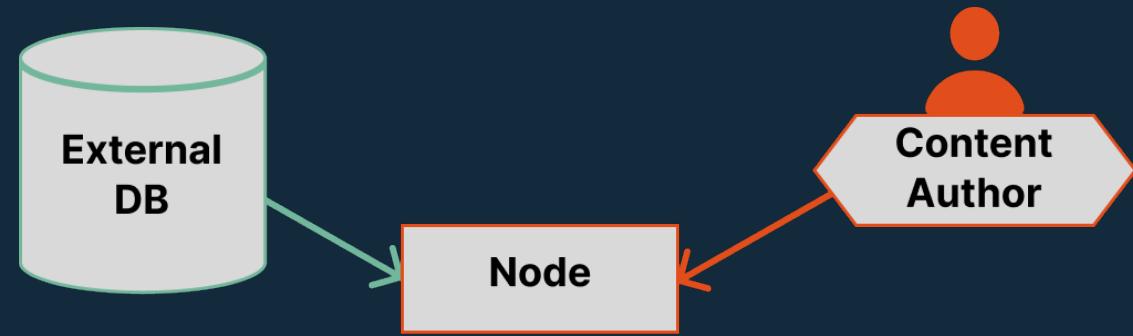
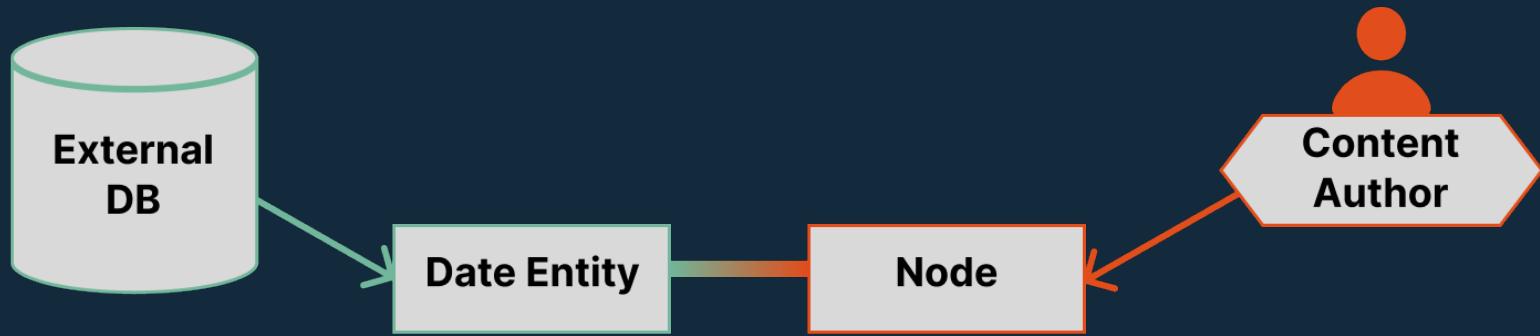
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- Dealing with Image files
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 - Error catching and handling
 - Proper reporting for what fails
- Reliability of the external data source
 - Availability and speed
 - Dates
 - Pre-caching

Future Thoughts and Strategies

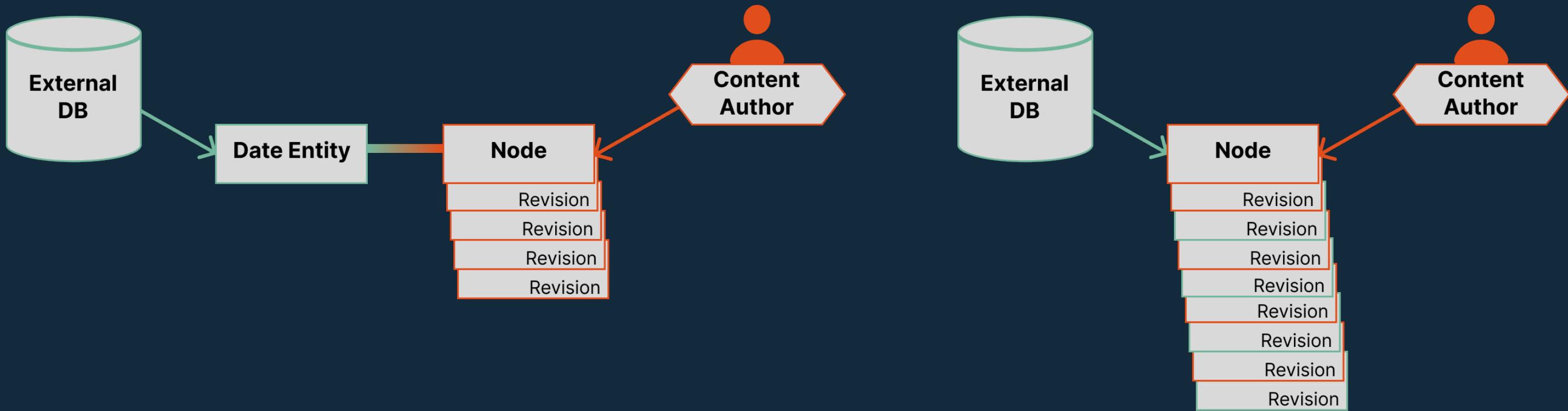
Future Thoughts and Strategies

- “Synced Data Entities” connected to “Enhanced Data Nodes”



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Future Thoughts and Strategies

- “Synced data Entities” connected to “Enhanced Data” nodes
- Bringing in majority of data to custom database tables

AMP PRO/nga-sandbox/nga_text_group

xt_group

PAI23 - Panth - LIVE/pantheon/node

artwork

work	group	type	content	content_inverted	year
2904	referred_to_by	bibliography	Wiebenson/Baines 1993, no. 128.		1993
2904	referred_to_by	attribution	Andrea Palladio and Pierre Le Muet (authors)		NULL
2904	referred_to_by	provenanceText	Mark J. Millard, New York; purchased by NGA, 1983.		NULL
2904	referred_to_by	creditLine	Mark J. Millard Architectural Collection		NULL
2904	referred_to_by	medium	2 parts in 1 vol: ill: part 1: engraved title page plus 32 engravings un...		NULL
2904	referred_to_by	dimensionsText	page size: 17.1 x 12.7 cm (6 3/4 x 5 in.) overall size (volume closed)...		NULL
2904	referred_to_by	attribution	NULL	Palladio, Andrea and Pierre Le Muet (authors)	NULL
2904	alternate_identifiers	Old CMS Object ID	62112.0		NULL
101724	referred_to_by	brief_narrative	<p>At the sixth impressionist exhibition in the spring of 1881, Edgar...		2024
101724	referred_to_by	bibliography	Kopper, Philip. _America's National Gallery of Art: A Gift to the Nati...		1991
101724	referred_to_by	bibliography	_National Gallery of Art Special Issue. Connaissance des Arts_. Pari...		2000
101724	referred_to_by	bibliography	Marks, Peter. "Peck to Bring Degas Piece to Life, and On Pointe." _T...		2013
101724	referred_to_by	bibliography	Morton, Mary. "Paul Mellon: Private collector for the public." In _Col...		2016
101724	referred_to_by	exhibition_history	Edgar Degas 1834-1917: Original Wax Sculptures, M. Knoedler & C...		1955
101724	referred_to_by	exhibition_history	Exposition Degas au profit de la Ligue Franco-Anglo-Américaine co...		1924
101724	referred_to_by	exhibition_history	Exposition des Sculptures de Degas, Galerie A.A. Hébrard, Paris, 19...		1921
101724	referred_to_by	exhibition_history	Possibly Trois siècles d'art français, Paris, possibly 1920s-1930s.		1920
101724	referred_to_by	bibliography	Lindsay, Suzanne Glover, Daphne S. Barbour, and Shelley G. Sturma...		2010
101724	referred_to_by	exhibition_history	_6me Exposition de Peinture_, 35 bd. des Capucines, Paris, 1881, n...		1881
101724	referred_to_by	exhibition_history	An Enduring Legacy: Masterpieces from the Collection of Mr. and M...		1999
101724	referred_to_by	exhibition_history	Sculpture by Degas, Virginia Museum of Fine Arts, Richmond, 1956.		1956
101724	referred_to_by	exhibition_history	Galerie A.A. Hébrard, Paris, 1920.		1920
101724	referred_to_by	exhibition_history	Art for the Nation: Gifts in Honor of the 50th Anniversary of the Nati...		1991
101724	referred_to_by	exhibition_history	Possibly on loan to the Musée du Louvre, Paris, 1929.		1929
101724	referred_to_by	bibliography	Goetschy, Gustave. "Indépendants et impressionnistes." _Le Voltaire...		1880
101724	referred_to_by	bibliography	Bertall [Charles-Albert d'Arnoux]. "Exposition: Des Peintres intransi..."		1881
101724	referred_to_by	bibliography	Champier, Victor. "La Société des artistes indépendants." _L'Année...		1882
101724	referred_to_by	bibliography	de Charry, Paul. "Les Indépendants." _Le Pays_ (22 April 1881): 3.		1881
101724	referred_to_by	bibliography	Claretie, Jules. "La Vie à Paris: Les Artistes indépendants." _La Vie...		1881
101724	referred_to_by	bibliography	Comtesse Louise. "Lettres familiaires sur l'art: Salon de 1881." _La...		1881
101724	referred_to_by	bibliography	Enault, Louis. "Chronique." _Moniteur des arts_ (15 April 1881): 1.		1881
101724	referred_to_by	bibliography	Berson, Ruth, ed. _The New Painting: Impressionism 1874-1886 --...		1996
101724	referred_to_by	bibliography	Czestochowski, Joseph S., and Anne Pingeot. _Degas--Sculptures....		2002
101724	referred_to_by	bibliography	Hargrove, June. "Degas's 'Little 14-year-old Dancer': Madonna of t..."		1998
101724	referred_to_by	bibliography	Hargrove, June. "Degas's 'Little Dancer' in the World of Pantomime....		1998
101724	referred_to_by	bibliography	Hargrove, June. "_Little Fourteen-Year-Old Dancer_: Madonna of th..."		2001
101724	referred_to_by	bibliography	Schaller, Catherine. "Edgar Degas et la physiognomonie." _Annales...		1999
101724	referred_to_by	bibliography	Druick, Douglas. "Framing _The Little Dancer Aged Fourteen_." In R...		1998
101724	referred_to_by	bibliography	Ephrussi, Charles. "Exposition des artistes indépendants." _La Chro...		1881
101724	referred_to_by	bibliography	Goetschy, Gustave. "Exposition des artistes indépendants." _Le Vol...		1881
101724	referred_to_by	bibliography	Mantz, Paul. "Exposition des œuvres des artistes indépendants."		1881
101724	referred_to_by	bibliography	de Mont, Élie [Elisée-Louis de Montagnac]. "L'Exposition du boulev...		1881
101724	referred_to_by	bibliography	Our Lady Correspondent. [Untitled, and unsigned, review of the Ex...		1881
101724	referred_to_by	bibliography	Trianon, Henry. "Sixième Exposition de peinture par un groupe d'art..."		1881
101724	referred_to_by	bibliography	de Villars, Nina [Marie-Anne Gaillard, Mme Hector de Callias Villard...		1881
101724	referred_to_by	bibliography	Huysmans, Joris-Karl. "L'Exposition des indépendants en 1881." In...		1883
101724	referred_to_by	bibliography	Gsell, Paul. "Edgar Degas, statuaire." _La Renaissance de l'Art Fran...		1918
101724	referred_to_by	bibliography	Kennicott, Philip. "As Disturbing as Enchanting." _Washington Post_...		2014
101724	referred_to_by	bibliography	Blühm, Andreas, et al. Essays by Wolfgang Drost and June Hargrov...		1996
101724	referred_to_by	bibliography	Callen, Anthea. _The Spectacular Body: Science, Method, and Mea...		1995
101724	referred_to_by	bibliography	Havemeyer, Louise B. _Sixteen to Sixty: Memoirs of a Collector_....		1961
101724	referred_to_by	bibliography	Luchs, Alison. "The Degas Waxes, c. 1878 - c. 1911." In _Art for the...		1991
101724	referred_to_by	bibliography	Loyrette, Henri. _Degas_ Paris, 1991: 387, 391-394, 402, 612-614,...		1991
101724	referred_to_by	bibliography	_Degas inédit: Actes du Colloque Degas, Musée d'Orsay 18-21 avril...		1989

Future Thoughts and Strategies

- “Synced data Entities” connected to “Enhanced Data” nodes
- Bringing in majority of data to custom database tables
- Caching strategies (in regards to large datasets)⁴

⁴ Permanent Cache Bin -> <https://www.drupal.org/project/pcb>

Support for Drupal 7 is ending on 5 January 2025—it's time to migrate to Drupal 10! Learn about the many benefits of Drupal 10 and find migration tools in our resource center.

Learn more

Add Issues for Permanent Cache Bin to dashboard +

Download & Extend

Drupal Core Distributions Modules Themes General projects

Permanent Cache Bin

View Version control View history Automated testing

At times we need to cache some values which are not related to Drupal config or data but are coming from external systems and which don't really need to be deleted when clearing (rebuilding) Drupal cache.

This module provides a way to use Drupal cache but still keep it separate from drush cr.

Code to use this new backend in your bin (here stock is just for example):

```
cache_stock:  
  class: Drupal\Core\Cache\CacheBackendInterface  
  tags:  
    - { name: cache.bin, default_backend: cache.backend.persistent_database }  
    factory: cache_factory:get  
    arguments: [stock]
```

Update 1: Memcache support is added through pcb_memcache sub-module.

Update 2: [18th Sep, 2018] Memcache version alpha7 is supported now in release 1.1, support for future versions of memcache will be added as soon as BLT supports them. Feel free to create an issue for support of beta version or new versions of memcache. There is no change done or required in main module (which uses database to store cache).

Update 2: Redis is supported now, thanks to szantog

Update 3: Use the 2.x branch for memcache 2.x, module is completely D9 ready now.

FAQ

1. How to clear permanent cache through drush?
To clear permanent cache drush pcb [bin] (e.g. drush pcbf stock)
2. How to clear permanent cache programmatically?
`\Drupal::service('cache.stock')->deleteAllPermanent();`
3. How to clear permanent cache through admin?
For each cache bin using pcb, there will be a button in Admin -> Development -> Performance page (admin/config/development/performance). Use them to clear cache for specific bins through Admin UI.
4. Will cache tags and cache expiration work?
Yes, everything works as is. Only difference is when we use drush cr or try to delete all cache entries.
5. How to know which cache bins are using permanent cache?
drush pcb-list
6. How to flush cache for all bins using permanent cache?
drush pcb-flush-all

Supporting organizations:

Acquia QED42 Axelerant

Project information

Minimally maintained
Maintainers monitor issues, but fast responses are not guaranteed.

Maintenance fixes only
Considered feature-complete by its maintainers.
Module categories: Developer Tools, Performance

1,120 sites report using this module

Created by nikunjkotecha on 11 August 2017, updated 6 February 2024

Stable releases for this project are covered by the security advisory policy.
Look for the shield icon below.

Releases

3.1.0 released 29 December 2022
Works with Drupal: ^9 || ^10
✓ Recommended by the project's maintainer.
Install: composer require 'drupal/pcb:^3.1'

3.0.1 released 6 August 2022
Works with Drupal: ^9 || ^10
Install: composer require 'drupal/pcb:^3.0'

Development version: 3.0.x-dev updated 29 Dec 2022 at 11:31 UTC

Using Composer to manage Drupal site dependencies
View all releases
Report as spam

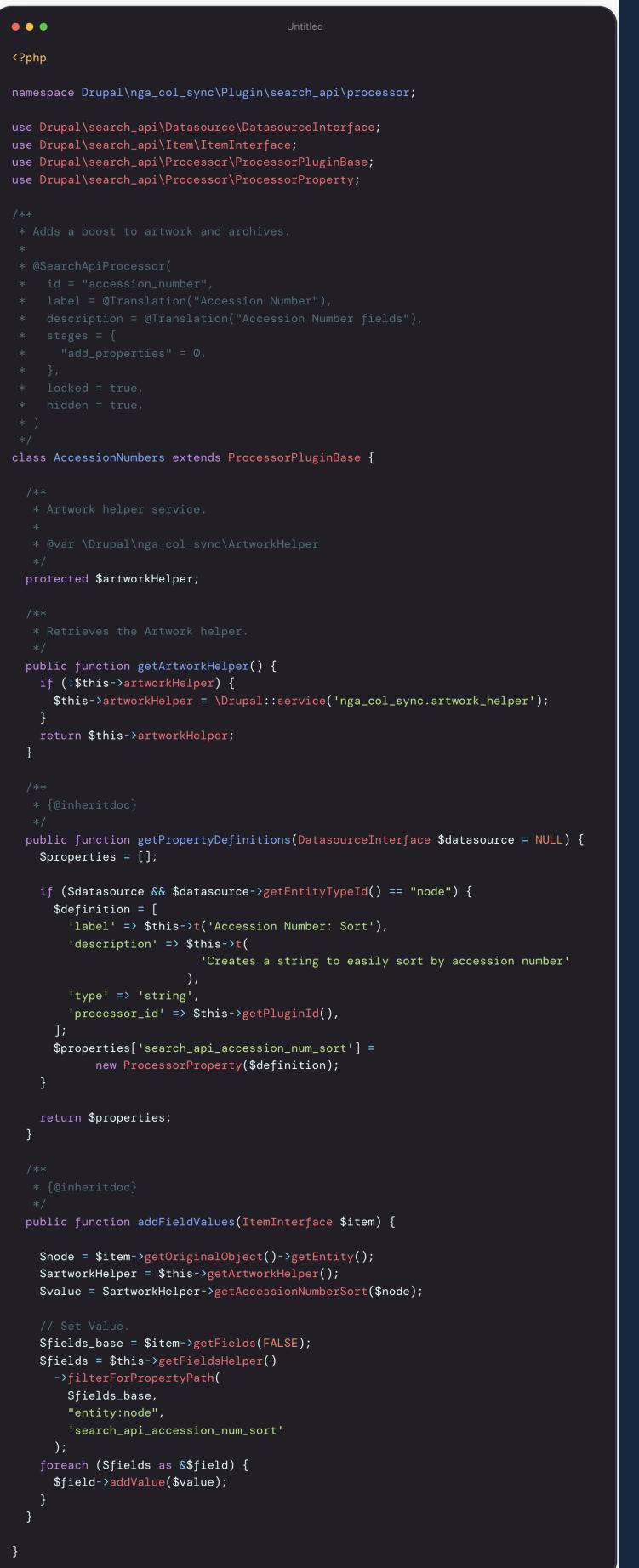
Thank you to these Drupal contributors

Top Drupal contributor Acquia would like to thank their partners for their contributions to Drupal.

THIRD GROVE srijan: acro Lullabot tag! PROFOUND TECH Full Fat Privacy.com

Future Thoughts and Strategies

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- Bringing in majority of data to custom database tables
- Caching strategies (in regards to large datasets)
- Re: Search API, writing custom index plugins is really "easy" (Once you figure it out)



```
<?php

namespace Drupal\nga_col_sync\Plugin\search_api\processor;

use Drupal\search_api\Datasource\DatasourceInterface;
use Drupal\search_api\Item\ItemInterface;
use Drupal\search_api\Processor\ProcessorPluginBase;
use Drupal\search_api\Processor\ProcessorProperty;

/**
 * Adds a boost to artwork and archives.
 *
 * @SearchApiProcessor(
 *   id = "accession_number",
 *   label = @translation("Accession Number"),
 *   description = @Translation("Accession Number fields"),
 *   stages = {
 *     "add_properties" = 0,
 *   },
 *   locked = true,
 *   hidden = true,
 * )
 */
class AccessionNumbers extends ProcessorPluginBase {

  /**
   * Artwork helper service.
   *
   * @var \Drupal\nga_col_sync\ArtworkHelper
   */
  protected $artworkHelper;

  /**
   * Retrieves the Artwork helper.
   */
  public function getArtworkHelper() {
    if (!$this->artworkHelper) {
      $this->artworkHelper = \Drupal::service('nga_col_sync.artwork_helper');
    }
    return $this->artworkHelper;
  }

  /**
   * {@inheritDoc}
   */
  public function getPropertyDefinitions(DatasourceInterface $datasource = NULL) {
    $properties = [];

    if ($datasource && $datasource->getEntityType() == "node") {
      $definition = [
        'label' => $this->t('Accession Number: Sort'),
        'description' => $this->t(
          'Creates a string to easily sort by accession number'
        ),
        'type' => 'string',
        'processor_id' => $this->getPluginId(),
      ];
      $properties['search_api_accession_num_sort'] =
        new ProcessorProperty($definition);
    }

    return $properties;
  }

  /**
   * {@inheritDoc}
   */
  public function addFieldValues(ItemInterface $item) {
    $node = $item->getOriginalObject()->getEntity();
    $artworkHelper = $this->getArtworkHelper();
    $value = $artworkHelper->getAccessionNumberSort($node);

    // Set Value.
    $fields_base = $item->getFields(FALSE);
    $fields = $this->getFieldsHelper()
      ->filterForPropertyName(
        $fields_base,
        "entity:node",
        "search_api_accession_num_sort"
      );
    foreach ($fields as &$field) {
      $field->addValue($value);
    }
  }
}
```

Thank you!

Questions?

Comments?

Discussion?

Feedback?



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github.com/pingevt/drupalcamp_nj_2024_data_sync

