MIGRATING 10,000 BOOKS TO D8
Princeton University Press Case Study

WITH ALEX DERGACHEV & JIGAR MEHTA
Alex Dergacheva
CO-FOUNDER

- Co-founded Evolving Web 10 years ago
- @dergachev on twitter + github
- Co-organizer of Drupal Montréal meetups
Jigar Mehta
FULL-STACK DEVELOPER AT EVOLVING WEB

- Using Drupal since 2004
- mvc on Drupal.org, IRC, slack
- @jigarius on Twitter
• 9 years of great Drupal dev.
• Enterprise level projects
• Extensive training program
• Based in Old Montréal
• We’re hiring (even remote!)
OUR APPROACH

• Training & Knowledge Transfer
• MVP, Iterative approach
• Expertise through the technology stack.
• Collaboration tools: Redmine/JIRA, Basecamp, Google Suite, Slack

OUR EXPERTISE

• Great design and theming
• Large scalable infrastructure
• Multilingual CMS
• Search UI
• Content migration and sync
• Custom Drupal development
“Princeton University Press is an independent publisher with close connections, both formal and informal, to Princeton University. As such it has overlapping responsibilities to the University, the academic community, and the reading public. Our fundamental mission is to disseminate scholarship (through print and digital media) both within academia and to society at large.”
PROJECT GOALS

- Move legacy site to stable, secure, maintainable platform
- Already considering Drupal 8
- Responsive goals
- Prepare for digital rebranding and design overhaul in 2018/2019
DATA TO MIGRATE

- 9,000 published titles
- 15,000 pages in Einstein Papers
- 3,000 quote pages
- 2,000 sample chapters
- 2,000 ToCs pages
- 600 bird section pages
- 6,000 PDFs
- 6,000 blog pages
- 18,000 content pages, catalogues, sales pages, videos, and other ancillary materials.
MOVING PARTS

- Minisites
- Wordpress Blog
- phpList newsletter
- Search (CGI + Google Books)
- Two external shopping carts (US/UK)
- ONIX XML feed + images
  - (distributor FTPs)
- Videos and audios
WHAT WE DID

- Analysis of the SQL Server DB, VB scripts, and current website
- Content audit - identify pages to drop
- Deploy Drupal CMS to organize the content
- Updated responsive design
- Nightly synchronization of book data from SQL Server
- Deploy to Pantheon
SCOPING A COMPLEX MIGRATION
## EXISTING DATABASE AUDIT

<table>
<thead>
<tr>
<th>Column</th>
<th>Type</th>
<th>Type notes</th>
<th>Description</th>
<th>Examples</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOOKID</td>
<td>float</td>
<td></td>
<td>Effective primary key, maintained manually</td>
<td>9651</td>
<td></td>
</tr>
<tr>
<td>LOC</td>
<td>nvarchar(20)</td>
<td>Unused/inconsistent</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PUB_DATE</td>
<td>datetime</td>
<td>Unused/inconsistent</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PUB_YEAR</td>
<td>nvarchar(4)</td>
<td>Unused/inconsistent</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PUB_MONTH</td>
<td>nvarchar(10)</td>
<td>Unused/inconsistent</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TITLE</td>
<td>nvarchar(254)</td>
<td>Not NULL, may have HTML, usually short</td>
<td>Primary part of title</td>
<td>War of the Sexes</td>
<td>Title: TITLE + VOLUME + SUBTITLE + Edition Statement</td>
</tr>
<tr>
<td>SUBTITLE</td>
<td>nvarchar(254)</td>
<td>May be NULL, may have HTML, often quite long</td>
<td>Secondary part of title</td>
<td>How Conflict and Cooperation Have Shaped Men and Women from Prehistory to the Present</td>
<td>Title: TITLE + VOLUME + SUBTITLE + Edition Statement</td>
</tr>
<tr>
<td>volume</td>
<td>nvarchar(84)</td>
<td>Usually NULL</td>
<td>Secondary part of title</td>
<td>Volume 4</td>
<td></td>
</tr>
<tr>
<td>Volumnent</td>
<td>int</td>
<td>Usually NULL</td>
<td>Integer part of volume, usually NULL</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>ACOED</td>
<td>nvarchar(50)</td>
<td>Acquiring editor name, usually NULL</td>
<td>APPEL, FRED</td>
<td></td>
<td>Books from this series have a special symbol before title, eg: <a href="http://press.princeton.edu/titles/8234.html">http://press.princeton.edu/titles/8234.html</a></td>
</tr>
<tr>
<td>BORM</td>
<td>nvarchar(1)</td>
<td>Either 'B', 'T' or NULL</td>
<td>B means a book from the Bollingen Series</td>
<td>B</td>
<td>Annotations are now in description field of series - no longer needed.</td>
</tr>
<tr>
<td>SEASONTEXT</td>
<td>nvarchar(4000)</td>
<td>Rarely NULL, contains HTML, usually &gt; 1000 characters</td>
<td>Main book description</td>
<td></td>
<td>Avi: Information that work is in a series can be determined from series table - this flag not needed.</td>
</tr>
</tbody>
</table>
LEGACY VB SCRIPTS

- 30-50 scripts in MS Access
- Took **days** to run
- Code duplicated, out-of-date
- “Special” books
  - (edited in Dreamweaver)
- “Ann’s Biblio” MsSQL DB
- HTML files moved to W:\
- COMPLEX! (5k-10k Lines of code)
## VB SCRIPT AUDIT

<table>
<thead>
<tr>
<th>Script that is run</th>
<th>Full path to file on J: drive</th>
<th>Full destination path on W: drive</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>a book description all pages - F17</td>
<td>J:\aWebDev\files\Ann1234.htm</td>
<td>W:\prefix\ids\books\Ann1234.html</td>
<td>our bread and butter scripts because creates our book description pages</td>
</tr>
<tr>
<td>a book description single page - F17</td>
<td>J:\aWebDev\files\Ann1234.htm</td>
<td>W:\prefix\ids\books\Ann1234.html</td>
<td>our bread and butter scripts because creates our book description pages</td>
</tr>
<tr>
<td>a book description all pages - F17</td>
<td>J:\aWebDev\specials\92233.htm</td>
<td>W:\prefix\ids\specials\92233.html</td>
<td>compare to W:\prefix\ids\specials\NewDesign (where the special formatting needed is located); Edited before being copied (see “Special Books” sheet)</td>
</tr>
<tr>
<td>a book description single page - F17</td>
<td>J:\aWebDev\specials\92233.htm</td>
<td>W:\prefix\ids\specials\92233.html</td>
<td>compare to W:\prefix\ids\specials\NewDesign (where the special formatting needed is located); Edited before being copied (see “Special Books” sheet)</td>
</tr>
<tr>
<td>a book description x range of pages - F17</td>
<td>J:\aWebDev\files</td>
<td>W:\prefix\ids\books\Ann1234.html</td>
<td>when adding weekly reviews and/or chapters this script relies on the reviews and/or chapters tables. In these tables there is a reference. For reviews, we look at what was added for the week (entry date) and then use first item in that week. E.g., two entities for entry date 6/1/2017, item id’s are 9214 and 9215. In a book description x range of pages - F17 script enter 9214 in the (form view) where is says “Last Chapter ItemID No.” Both 9214 and 9219 book description pages are created. Ditto for reviews, for everything since and including 6/2/17 choose revid # 92074 and add to (form view) where it says “Last Review ItemID No.” and run script. In these cases about 40 book description pages were created.</td>
</tr>
<tr>
<td>a book ceps new pages or Single Page - ebook only fb</td>
<td>j:\aWebDev\toppages\ebooks-only\special/</td>
<td>W:\prefix\ids\special\10152.html</td>
<td>We only show ceps (out-of-print) titles that have live ebook links from eisbn table. The eisbn table is populated by links from the various vendors we receive in an excel document. These specialc ceps are listed on the “special books” sheet</td>
</tr>
<tr>
<td>a catalog Season Menu files without wrapper</td>
<td>j:\aWebDev\web\season.htm</td>
<td>W:\prefix\ids\catalog\f17nade.html</td>
<td>manually broken out to 1 of 6 catalog html pages the script creates</td>
</tr>
<tr>
<td>a catalog Season Menu files without wrapper</td>
<td>j:\aWebDev\web\season.htm</td>
<td>W:\prefix\ids\catalog\f17nace.html</td>
<td>manually broken out to 2 of 6 catalog html pages</td>
</tr>
<tr>
<td>a catalog Season Menu files without wrapper</td>
<td>j:\aWebDev\web\season.htm</td>
<td>W:\prefix\ids\catalog\f17nath.html</td>
<td>manually broken out to 3 of 6 catalog html pages</td>
</tr>
</tbody>
</table>
CURRENT WORKFLOW

Static HTML
Dynamic HTML Works
Dynamic HTML Pages
Website

Biblio
SQL Server

VB Scripts

PDFs
Illustrations
Cover Images
NEW WORKFLOW

- Biblio
  - SQL Server
    - Export
- CSVs
  - on FTP
  - Migrations (sync)
- Static Files
  - on FTP
  - One-time import
- Dynamic Views
- Works
- Cover Images
- Basic Pages
- PDFs
  - Illustrations
  - Static HTML
- Drupal
- Static Files
  - on FTP
  - One-time import
- Export

EvolvingWeb
<table>
<thead>
<tr>
<th>Table</th>
<th>Query</th>
</tr>
</thead>
<tbody>
<tr>
<td>allmathsubs</td>
<td>SELECT BookID, Acro, [Key] as Pkey FROM AllMathSubs ORDER BY BookID ASC</td>
</tr>
<tr>
<td>audible</td>
<td>SELECT [Book ID] as BookID, [Key] as Pkey, Snippet FROM Audible ORDER BY BookID ASC</td>
</tr>
<tr>
<td>bookclub</td>
<td>SELECT BookID, Serin, Rank, [Key] as Pkey FROM BookClub ORDER BY BookID ASC, Rank ASC</td>
</tr>
<tr>
<td>chapters</td>
<td>SELECT BookID, Filename, Type, [Desc], Heading, ItemID FROM Chapters WHERE Web &lt;&gt; 0 ORDER BY BookID ASC</td>
</tr>
</tbody>
</table>
## CONTENT CLEAN-UP

<table>
<thead>
<tr>
<th>Category</th>
<th>Number of Files</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dynamic Pages - Books and Book Lists</td>
<td>20,163</td>
</tr>
<tr>
<td>Static Pages to Keep</td>
<td>2,478*</td>
</tr>
<tr>
<td>Pages to Delete</td>
<td>53,929</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>76,570</strong></td>
</tr>
<tr>
<td>Location on the webserver inside Wipress/htdocs</td>
<td>User/pass</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>about_pup</td>
<td>pup</td>
</tr>
<tr>
<td>about_pup/Au_guide_files</td>
<td>Contents</td>
</tr>
<tr>
<td>about_pup/Au_guide_files1</td>
<td>Contents</td>
</tr>
<tr>
<td>about_pup/authors</td>
<td>Contents</td>
</tr>
<tr>
<td>about_pup/authors/old_files</td>
<td>Contents</td>
</tr>
<tr>
<td>about_pup/editorial</td>
<td>Contents</td>
</tr>
<tr>
<td>about_pup/interimbackup</td>
<td>Contents</td>
</tr>
<tr>
<td>about_pup/PUP100</td>
<td>Contents</td>
</tr>
<tr>
<td>about_pup/PUP100/book</td>
<td>Contents</td>
</tr>
<tr>
<td>about_pup/PUP100/scriptcheck</td>
<td>Contents</td>
</tr>
<tr>
<td>auxski</td>
<td>Contents</td>
</tr>
<tr>
<td>chapman</td>
<td>Contents</td>
</tr>
<tr>
<td>dir_test</td>
<td>Contents</td>
</tr>
<tr>
<td>apps</td>
<td>Contents</td>
</tr>
<tr>
<td>apps/barrington-atlas</td>
<td>Contents</td>
</tr>
<tr>
<td>apps/barrington-atlas/Slides-SlidesJS-3</td>
<td>Contents</td>
</tr>
<tr>
<td>apps/mammals-of-north-america</td>
<td>Contents</td>
</tr>
</tbody>
</table>
IMPLEMENTATION
BENEFITS OF NEW SITE

- Modernized, responsive design
- Accessible and good UX
- SEO
- Stable, secure, maintainable platform
- Easy to update web content, WYSIWYG
- Images are auto-resized
- Clear navigation
- Automatic nightly sync
HOMEPAGE REFRESH

- Existing branding + look-and-feel
- Adapted to standard modern responsive template
- Changed side menu to consistent drop-down UI
- Clean, accessible footer
- Search box collapsed
OLD MENU STRUCTURE
NEW MENU STRUCTURE
BOOK TEMPLATES

- Simplified UI (less in header)
- Displays books consistently
- Adapts based on the fields available for each book
- Integrates with shopping carts, Google Book search
- Renders videos + materials
- Collapses long sections of text
• Includes migration of ~8,000 books and ~4,000 jpgs*
• Process is optimized to prevent downtime/inconsistency on the live site
• Migrations can be run manually or automatically
• Out-of-print books are removed
ONLY CUSTOM MODULE: pup_migrate

- Includes migration of works, editions, reviews, contributors, etc.
- Handle source deletion
- Multi-CSV “join”
- SFTP + FTP support, with source change detection
- Nightly cron via queue API
- Fixed encoding
- Resolved many issues with legacy data and legacy book logic

$ drush migrate-status
Group: PUP Biblio (pup_biblio)
  pup_math_subjects                                      Idle    30     30        0
  pup_textbooks_by_author_redirects                      Idle    7      7         0
  pup_catalog_by_math_subject_order_by_author_redirects  Idle    30     30        0
  pup_subjects                                           Idle    50     50        0
  pup_work_chapters                                      Idle    4241   4242      -1
  pup_chapters_by_subject_redirects                      Idle    50     50        0
  pup_contrib_roles                                      Idle    37     52        -15
  pup_contribs                                           Idle    10357
  pup_prizes                                             Idle    11386   11407      -25
  pup_series                                             Idle    3096    3094      0
  pup_textbook_cats                                      Idle    225     225       0
  pup_trans_languages                                    Idle    7      7         0
  pup_work_contribs                                      Idle    45     45        0
  pup_work_contribs                                      Idle    16058   15941     117
  pup_work_covers                                        Idle    7540   7560      -23
  pup_work_illustrations                                 Idle    125     125       0
  pup_work_interviews                                    Idle    569    357       212
  pup_work_interview_by_author_redirects                 Idle     5      5         0
  pup_work_interview_by_title_redirects                  Idle     5      5         0
  pup_work_links_header                                  Idle    125     124       0
  pup_work_links_mixed                                   Idle    2872   1677      95
  pup_work_reviews                                       Idle    42328   42220       5
  pup_works                                             Idle    8219   8231      -12
CONTRIB MODULES

- admin_toolbar
- context
- context_active_trail
- devel
- entity_reference_revisions
- metatag
- migrate_source_csv
- paragraphs
- token
- ctools
- entity_browser
- inline_entity_form
- migrate_plus_migrate_tools
- pathauto
- views_slideshow
- editor_file
- redirect
- redis
- stage_file_proxy
IMPORTED BOOK FIELDS

- ISBN
- Number of Pages
- Price UK/US
- Region
- Season
- Status
- Type
- Affiliation
- Audible
- Book Club
- Sub-authors
- Book ID
- Co-publisher
- Sub-title
- Table of Contents
- Cover Caption
- Cover Image
- Description
- Tagline
- Title
- Need Textbooks
- Edition Notes
- Title (formatted)
- Volume
- Primary Authors
- Math Subject
- Prior Editions
- Reviews
- Links
- Illustrations
- Chapters
- Prizes
- Interviews
- Contributors
- Subjects
- Translation language

Biblio
SQL Server
Export to CSV
CSVs on FTP
Migrate to website

Strings Attached
Three Stones Make a Wall
Collected Works of C.G. Jung
How to Solve It
The Power of Networks
Terror in France

The Catholic Church in World Politics
Three Views of Logic
Collected Works of C.G. Jung
The Flood Year 1927
Drawing in Silver and Gold
The Vanishing Irish
BOOK DATA CLEANUP

- PDF links rewriting (assets)
- Merged denormalized records for ebooks and print books
- Added publication type for book apps
- Encoding problems
STATIC HTML MIGRATION

- Imported most-visited static pages
- Can be easily cleaned up using the Drupal website admin interface by client team
- Left other lower priority pages can be migrated manually
DYNAMIC LISTINGS (Views)

- Lists of books, dynamically updated after Biblio sync
- Search pages
- In future, can replace some static listings with Drupal views (eg. books published in the last month, have won a prize)
GOING LIVE
DEPLOYMENT CHECKLIST (1/2)

- Deploy on PANTHEON
- Set legacy asset domain to assets.press.princeton.edu
- Test migrations / cron sync on Pantheon
- Ensure uploaded files stored in subdirectories per field
- Google Analytics, etc.
- Enable/disable extensions: admin_toolbar, devel, ...
- Ensure that the live site domain is white-listed as trusted host in $settings
- Change redirects to use live domain in settings.site.inc
DEPLOYMENT CHECKLIST (2/2)

- Performance audit (frontend + backend)
- Enable page cache, CSS/JS aggregation
- Broken link checker, Fast 404
- Soft launch: DNS, remove HTTP Auth
- Pantheon Launch Checklist: https://pantheon.io/docs/guides/launch
- Setup backups & recovery
- Monitoring (Pingdom)
- Admin training & docs
POST-LAUNCH
FUTURE WORK

- Support agreement
- Friendly URLs & redirects
- Advanced search
- Convert static pages to dynamic pages, Webforms
- More admin training + UI improvements
- SEO enhancements - social media tags, XML sitemap
- Annual sale (discounts), shopping cart simplification
- Additional homepage content (eg. news in slideshow, events)
- Migration to VirtuSales Biblio
- Rebranding/ redesign
NOT SO FAST...
LOGGING AND MONITORING

- We built verbose logging to track migration progress and performance.
- Kept an eye on the log messages for a month or two.
- Set up a script to track all CSV files and push their diff to GitHub.
- Found newer corner cases and problems we had never imagined!
• Behold the bug hides, disguised as a feature
• Blackfire lets you see what goes on under the hood
• We found some issues which were making the migrations very very slow
When a migration starts, the relevant CSV file is downloaded.

When working with certain plugins (migration_lookup), the same file was being downloaded once per row for ~10,000 rows.

We fixed this immediately and there was over ~80% improvement.

SFTP FILE DOWNLOAD COUNT? OVER 9,000!
We were using a 3rd party library for downloading files over SFTP.

There were 9,000 files in an FTP directory.

For downloading one file, the 3rd party library was processing all files in the directory and then returning the one we wanted.

We overrode some functionality of the library and gained ~50% improvement!
While migrating books, we had to generate some text using various author names.

The code required us to load some “nodes” in a specific code file (source plugin).

With Blackfire we realized it would be better to move the code from a “source plugin” to a “process plugin”.

After this change, migration became 70%+ faster!
MSSQL AND RANDOMNESS

- PowerShell generated CSV files from a bunch of SQL statements
- MSSQL doesn’t guarantee fixed ordering with a loose ORDER BY clause
- Every night, records were being rearranged and migrations were importing things even though nothing had actually changed!
- We strengthened the ORDER BY clause to overcome this issue
PROJECT MANAGEMENT
PROJECT TEAM

Matt Corks
Technical PM

Jigar Mehta
Backend dev

Jorge Diaz
Front-end dev

Matt Wahba
Designer

Dave Vasilevsky
Backend dev

Alex Parker
QA (Intern)

Alex Dergachev
Business lead

Suzanne Dergacheva
Training
CLOSE COLLABORATION

- 7 calendar days of onsite meetings in Princeton
- 5 demos (in person or Zoom)
- Single point of contact (PUP + EW)
- Backlog of tasks with estimates for client prioritization
- Disciplined client control of scope
<table>
<thead>
<tr>
<th>Week of</th>
<th>High-level Task</th>
<th>Tasks performed (EW)</th>
<th>Deliverables from PUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 8</td>
<td>Content Audit &amp; Migration PoC</td>
<td>Proof of concept, initial content analysis</td>
<td>Approval of initial content analysis (May 12)</td>
</tr>
<tr>
<td>May 15</td>
<td>Content Audit &amp; Migration</td>
<td>Secondary content analysis, report and onsite meeting</td>
<td>Approval of report and content analysis</td>
</tr>
<tr>
<td>May 22</td>
<td>Discovery &amp; Content Audit</td>
<td>Final content analysis (dynamic vs. static pages)</td>
<td>Clarification of book data structure</td>
</tr>
<tr>
<td>May 29</td>
<td>Site Building</td>
<td></td>
<td>Clarification of special cover image handling</td>
</tr>
<tr>
<td>June 5</td>
<td>Site Building &amp; Migration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>June 12</td>
<td>Theming &amp; Migration</td>
<td>Access to demo site showing to book and static page migration</td>
<td>Feedback on migration, styling, and menu structure</td>
</tr>
<tr>
<td>June 19</td>
<td>Theming &amp; Migration</td>
<td>Presentation of work done to date, plus plan for work needed to launch site</td>
<td>Testing IA; Content cleanup</td>
</tr>
<tr>
<td>June 26</td>
<td>Theming &amp; IA refinement</td>
<td>Completion of launch essential tasks and adjustments based on feedback received</td>
<td>Feedback on import and prioritization, content cleanup, image processing, moving multimedia resources to external platforms</td>
</tr>
<tr>
<td>July 3</td>
<td>Theming &amp; IA refinement</td>
<td>&quot;</td>
<td></td>
</tr>
<tr>
<td>July 10</td>
<td>QA &amp; Fixes</td>
<td>&quot;</td>
<td></td>
</tr>
<tr>
<td>July 17</td>
<td>QA &amp; Fixes</td>
<td>&quot;</td>
<td></td>
</tr>
<tr>
<td>July 24</td>
<td>QA &amp; Fixes</td>
<td>&quot;</td>
<td></td>
</tr>
<tr>
<td>July 31</td>
<td>Pre-deployment &amp; content</td>
<td>Deployment to Pantheon staging</td>
<td></td>
</tr>
<tr>
<td>August 7</td>
<td>Content</td>
<td></td>
<td>Content fixes</td>
</tr>
<tr>
<td>August 14</td>
<td>Content</td>
<td></td>
<td>Content fixes</td>
</tr>
<tr>
<td>August 21</td>
<td>Beta-launch</td>
<td>Test in Pantheon &quot;live mode&quot;</td>
<td>DNS change</td>
</tr>
</tbody>
</table>
## DISTRIBUTION OF WORK

<table>
<thead>
<tr>
<th>Role</th>
<th>Month 1</th>
<th>Month 2</th>
<th>Month 3</th>
<th>Month 4</th>
<th>Month 5</th>
<th>Total time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frontend</td>
<td>1%</td>
<td>10%</td>
<td>12%</td>
<td>6%</td>
<td>0%</td>
<td>28%</td>
</tr>
<tr>
<td>Backend</td>
<td>4%</td>
<td>12%</td>
<td>7%</td>
<td>9%</td>
<td>5%</td>
<td>36%</td>
</tr>
<tr>
<td>Coordination, code review</td>
<td>1%</td>
<td>14%</td>
<td>15%</td>
<td>5%</td>
<td>2%</td>
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SUMMARY / CHALLENGES

- Successful migration of 50,000 records, thousands pages, validation of Drupal platform, stable sync

- **Phases:** Scoping, Design, Dev, Migration, Content, Deployment, Maintenance

- **Gotchas:** Migrations in cron, Legacy complexity, Content cleanup, Editor interface

- **PM:** Timeline, Scoping phase, Budget expectations
Upcoming Drupal Trainings

MAY 7-11, IN-PERSON
Drupal 8 Training in Princeton NJ

FEB 5-8, ONLINE
Drupal 8 Module Development

FEB 20-23, ONLINE
Migrate to Drupal 8

MARCH 1-2, ONLINE
Drupal 8 Site Building

MARCH 12-15, ONLINE
Drupal 8 Theming

evolvingweb.ca/training
training@evolvingweb.ca
Thank you

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@jigarius