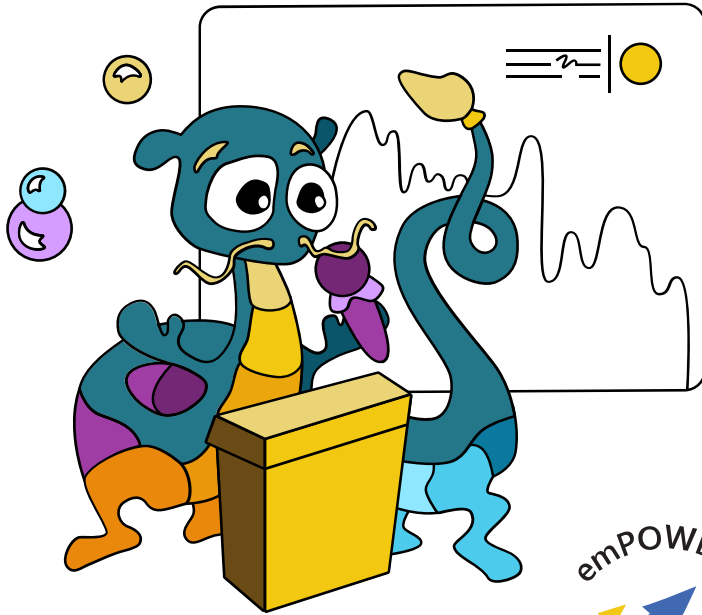


Developing Custom Code Websites for Power Pages

September 21st | 11:00am



Nick Doelman

Senior Content Developer, Microsoft

Dushyanthkumar Chandramouli

Technology Director, PricewaterhouseCoopers LLP (PwC LLP)



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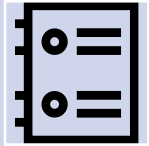
Discover the difference being part of the Microsoft Power Platform Community can make for you.

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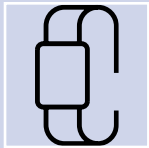
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Agenda



27.5 minutes – Developers guide to Power Pages (Nick Doelman)



27.5 minutes - Real world example – PWC (Dushyanthkumar Chandramouli)



5 minutes Q & A

Speaker

Nick Doelman

Senior Content Developer
Microsoft

- 20 Years Experience with Power Platform
- Former Microsoft MVP (2017-2021)
- Microsoft Certified Trainer (MCT)
- Competitive Powerlifter (Team Canada)
 - 3rd place Canadian National Championship
 - 1st place North American Championship



<https://www.linkedin.com/in/nickdoelman/>



<https://readyxrm.blog>



@readyxrm



<https://github.com/readyxrm>



Speaker

Dushyanthkumar
Chandramouli

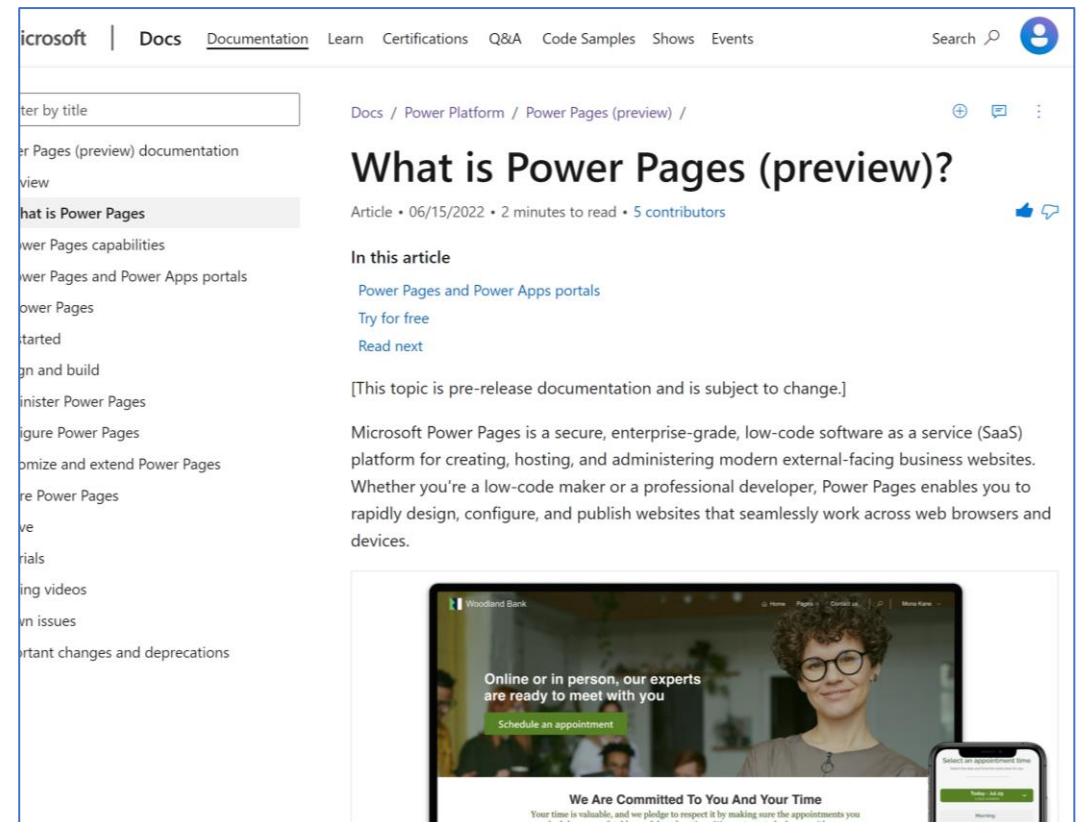
Technology Director, PricewaterhouseCoopers LLP
(PwC LLP)

I'm the Lead Architect at PwC's Power Platform Center of Excellence, driving the rollout of Power Platform to the firm. I come from a ProDev (Full-Stack) software engineering background. I'm very passionate about leading, mentoring, and empowering fusion teams to solve enterprise business problems and reimagine the possible by embracing the Microsoft ecosystem. The Power Platform ecosystem invokes innovation and big-picture thinking at the grassroots level. A perfect description of what drives me! My goal is to be a trendsetter. I want to play a pioneering role in changing the paradigm of software development to solve business problems through re-imagined Rapid Application Development (RAD) .

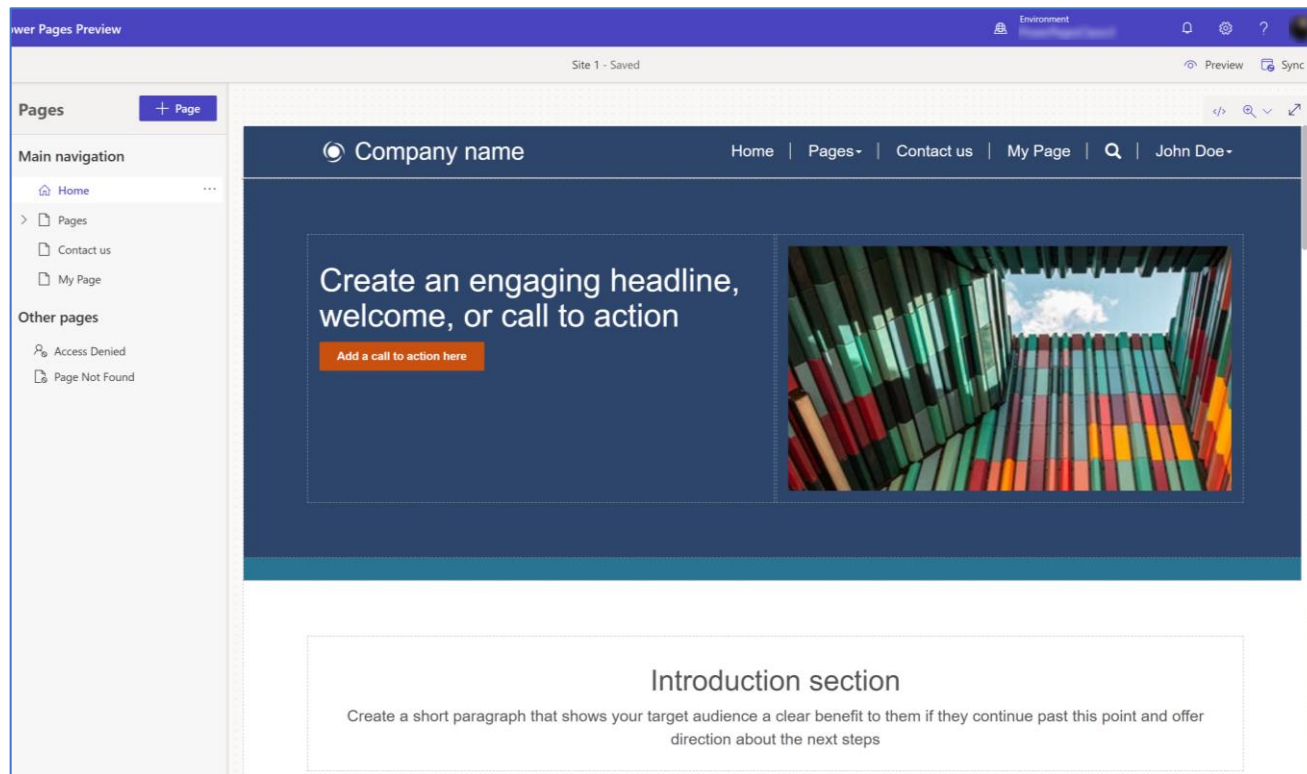


What is Power Pages?

- Build business websites
- Part of the Power Platform
- Build standalone sites or extend existing Power Platform solutions
- Design studio provides tools for low-code, no-code makers to build sites
- Power Pages = Power Apps portals



Tools for the low-code, no-code website maker and admins



- Home page
- Design studio
 - Pages workspace
 - Styling workspace
 - Data workspace
 - Set up workspace
- Portals Management app
 - Directly update portal metadata
- Power Platform admin center + portals admin center

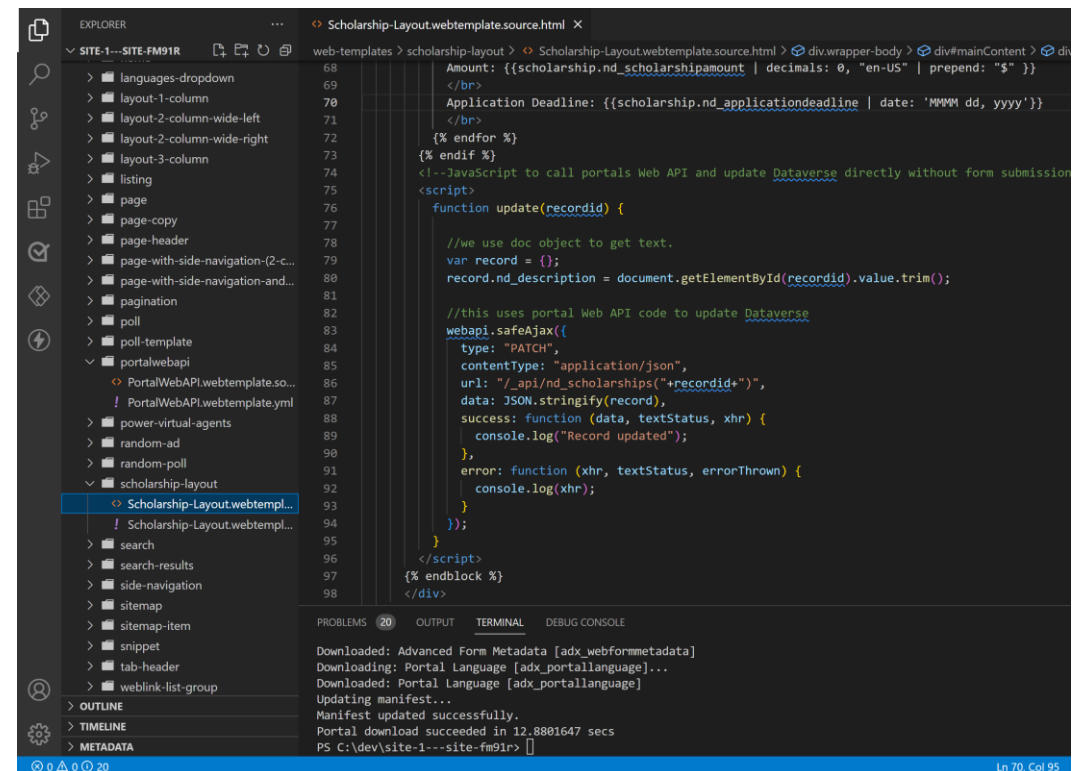
Do we even need pro-developers?

- Photo by [bruce mars](#) on [Unsplash](#)



Answer: YES! The role of pro-developers

- Custom page layouts
- Advanced CSS
- Integrations (e.g. Payment gateway)
- Code components (PCFs)
- Specialized UX functionality
- Backend functionality (Dataverse plugins)
- And more...



The screenshot shows the Visual Studio Code interface with the Explorer pane on the left displaying a project structure for 'SITE-1---SITE-FM91R'. The main editor displays the file 'Scholarship-Layout.webtemplate.source.html'. The code includes HTML markup with placeholders for scholarship amount and application deadline, and a JavaScript function 'update(recordid)' that uses the 'webapi.safeAjax' method to send a PATCH request to the Dataverse API. The bottom status bar indicates the file is at line 70, column 95.

```
Amount: {{scholarship.nd_scholarshipamount | decimals: 0, "en-US" | prepend: "$" }}
</br>
Application Deadline: {{scholarship.nd_applicationdeadline | date: 'MMMM dd, yyyy'}}
</br>
{% endfor %}
{% endif %}
<!--JavaScript to call portals Web API and update Dataverse directly without form submission-->
<script>
function update(recordid) {
    //we use doc object to get text.
    var record = {};
    record.nd_description = document.getElementById(recordid).value.trim();
    //this uses portal Web API code to update Dataverse
    webapi.safeAjax({
        type: "PATCH",
        contentType: "application/json",
        url: "/_api/nd_scholarships("+recordid+")",
        data: JSON.stringify(record),
        success: function (data, textStatus, xhr) {
            console.log("Record updated");
        },
        error: function (xhr, textStatus, errorThrown) {
            console.log(xhr);
        }
    });
}
</script>
{% endblock %}
</div>
```

Downloaded: Advanced Form Metadata [adx_webformmetadata]
Downloading: Portal Language [adx_portallanguage]...
Downloaded: Portal Language [adx_portallanguage]
Updating manifest...
Manifest updated successfully.
Portal download succeeded in 12.8801647 secs
PS C:\dev\site-1---site-fm91r> []

Ln 70, Col 95

Key Power Pages developer skillsets

Traditional web skills

- HTML
- JavaScript
- CSS

Power Platform developer skillsets

- Microsoft Dataverse plug-ins
- Dataverse Web API => Portals Web API
- FetchXML
- Code components (PCF)
- JavaScript*
- Liquid

What is Liquid?



Open Source markup language for dynamically showing content



Can be placed in any "content" areas (Web Page content, Content Snippets, headers, footers, etc)



Can be mixed with HTML, CSS and JavaScript



Runs server-side



Read-only execution



Foundation of Web Templates

Using the portals Web API



Based on Microsoft Dataverse Web API



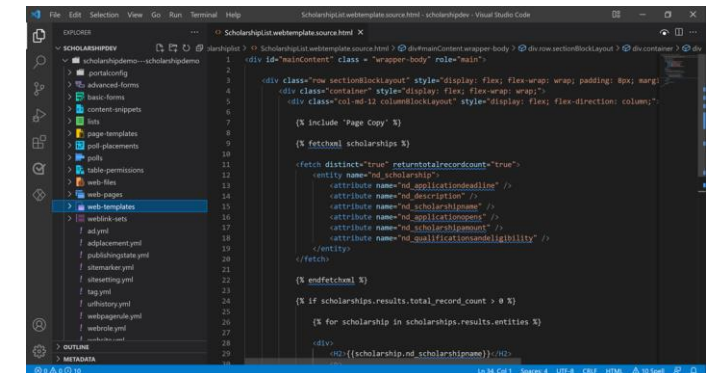
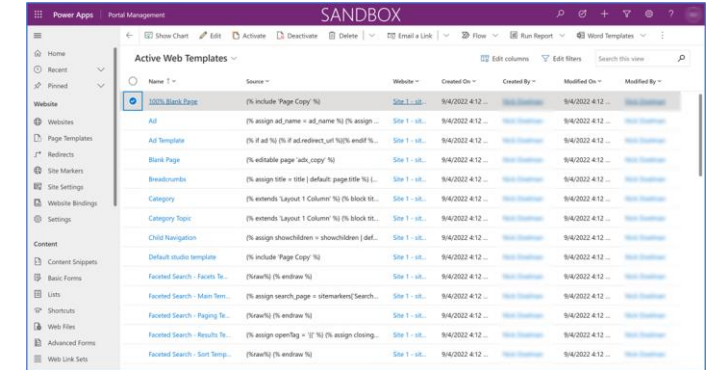
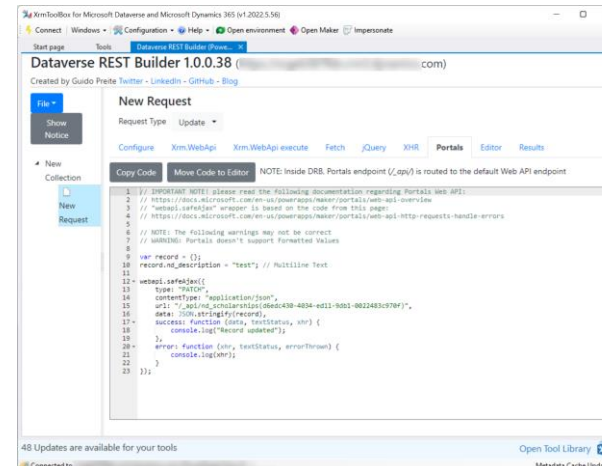
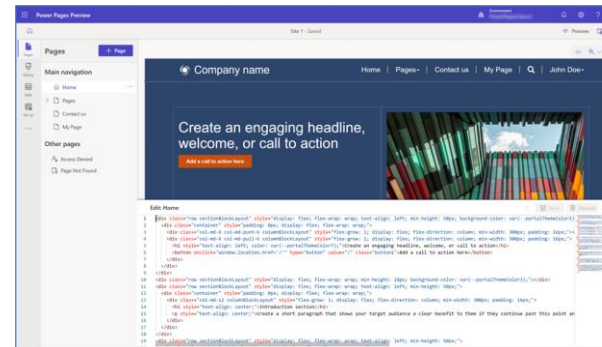
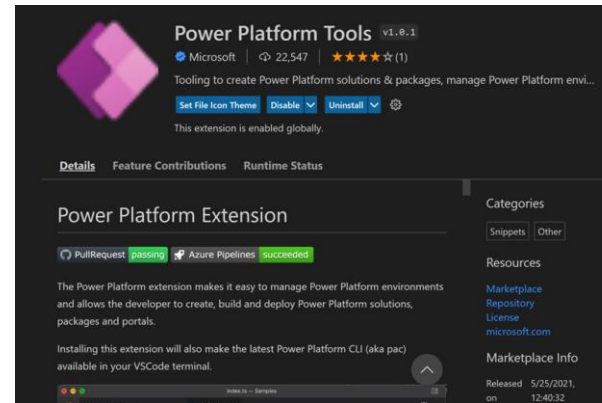
Allows create, read, update and delete of Dataverse data without submitting a form



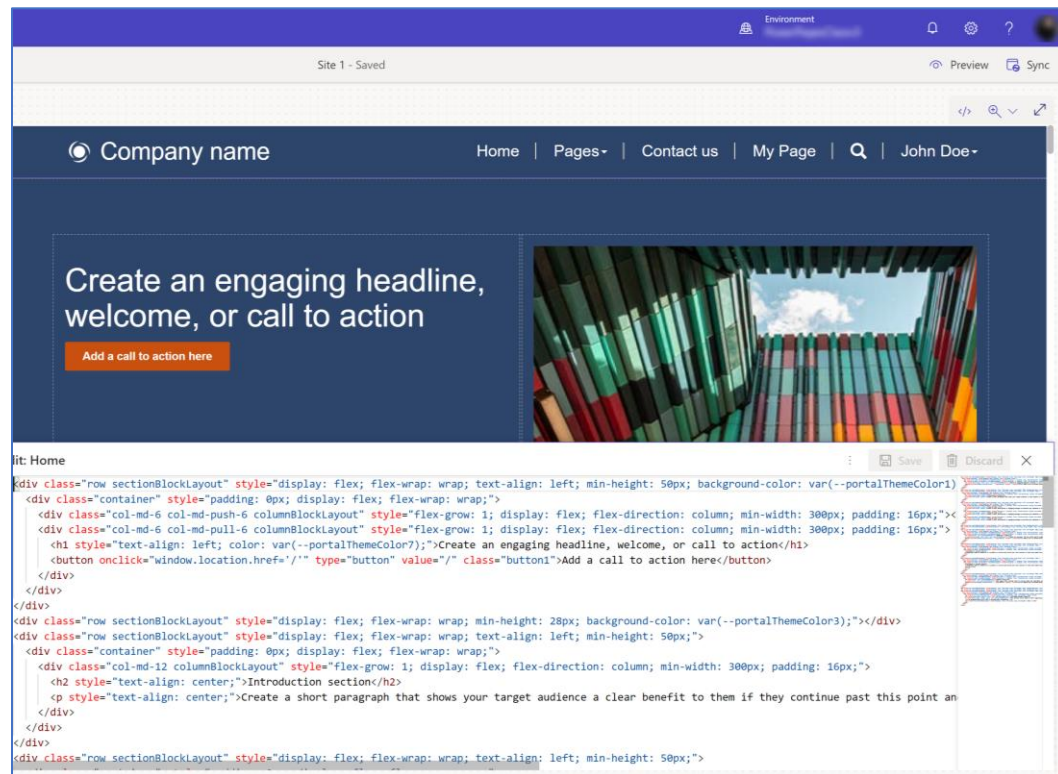
Meant for functionality within the site itself, not meant to update other sites

Power Pages developer toolbox

- Design studio
- Portal Management app
- Power Platform CLI
- Visual Studio Code
- Azure Dev Ops/GitHub
- Other helpful community tools



Design studio



- Workspaces
 - Pages
 - Data
 - Styling
 - Set up

Portal Management app

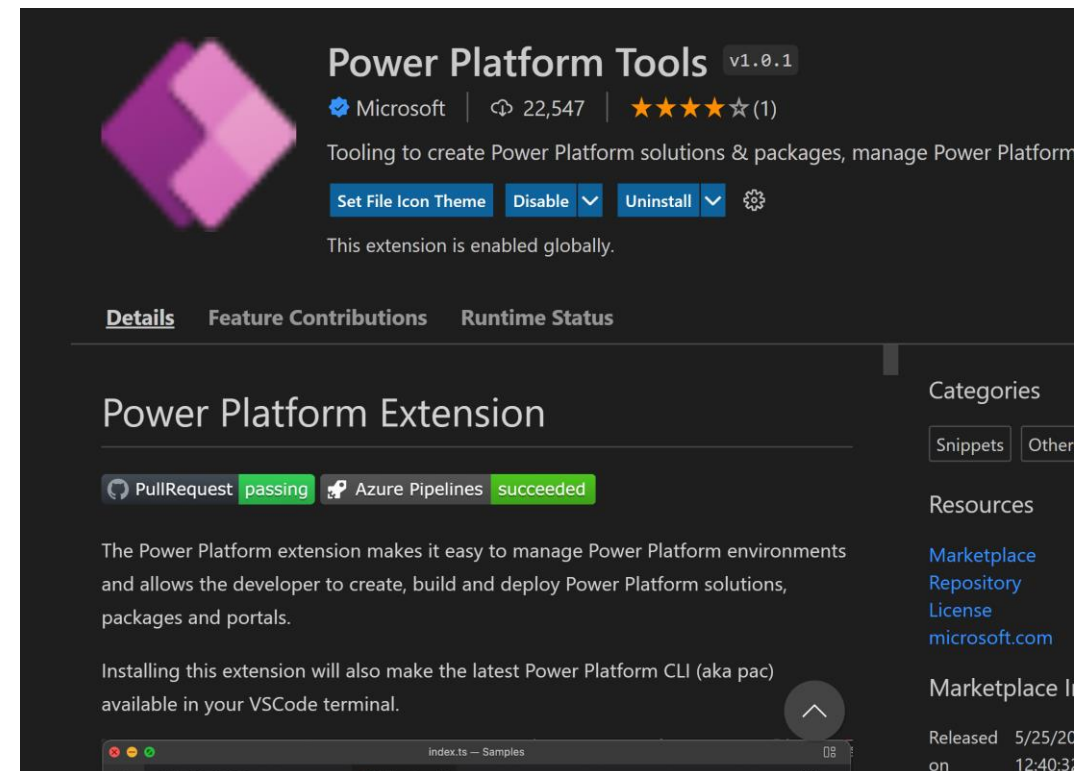
The screenshot shows the Power Apps Portal Management app interface. The top bar is purple with the text 'Power Apps | Portal Management' and 'SANDBOX'. Below the top bar is a navigation pane on the left with icons for Home, Recent, Pinned, Website, Websites, Page Templates, Redirects, Site Markers, Site Settings, Website Bindings, Settings, Content, Content Snippets, Basic Forms, Lists, Shortcuts, Web Files, Advanced Forms, and Web Link Sets. The main area displays a table of 'Active Web Templates'. The table has columns for Name, Source, Website, Created On, Created By, Modified On, and Modified By. The first row is selected, showing '100% Blank Page' as the Name, '{% include 'Page Copy' %}' as the Source, 'Site 1 - sit...' as the Website, and '9/4/2022 4:12 ...' as the Created On date. The table lists various templates including Ad, Ad Template, Blank Page, Breadcrumbs, Category, Category Topic, Child Navigation, Default studio template, Faceted Search - Facets Te..., Faceted Search - Main Tem..., Faceted Search - Paging Te..., Faceted Search - Results Te..., and Faceted Search - Sort Temp....

Name	Source	Website	Created On	Created By	Modified On	Modified By
100% Blank Page	{% include 'Page Copy' %}	Site 1 - sit...	9/4/2022 4:12 ...	Mark Davidson	9/4/2022 4:12 ...	Mark Davidson
Ad	{% assign ad_name = ad_name %} {% assign ...	Site 1 - sit...	9/4/2022 4:12 ...	Mark Davidson	9/4/2022 4:12 ...	Mark Davidson
Ad Template	{% if ad %} {% if ad.redirect_url %}{% endif %}...	Site 1 - sit...	9/4/2022 4:12 ...	Mark Davidson	9/4/2022 4:12 ...	Mark Davidson
Blank Page	{% editable page 'adx_copy' %}	Site 1 - sit...	9/4/2022 4:12 ...	Mark Davidson	9/4/2022 4:12 ...	Mark Davidson
Breadcrumbs	{% assign title = title default: page.title %} [...	Site 1 - sit...	9/4/2022 4:12 ...	Mark Davidson	9/4/2022 4:12 ...	Mark Davidson
Category	{% extends 'Layout 1 Column' %} {% block tit...	Site 1 - sit...	9/4/2022 4:12 ...	Mark Davidson	9/4/2022 4:12 ...	Mark Davidson
Category Topic	{% extends 'Layout 1 Column' %} {% block tit...	Site 1 - sit...	9/4/2022 4:12 ...	Mark Davidson	9/4/2022 4:12 ...	Mark Davidson
Child Navigation	{% assign showchildren = showchildren def...	Site 1 - sit...	9/4/2022 4:12 ...	Mark Davidson	9/4/2022 4:12 ...	Mark Davidson
Default studio template	{% include 'Page Copy' %}	Site 1 - sit...	9/4/2022 4:12 ...	Mark Davidson	9/4/2022 4:12 ...	Mark Davidson
Faceted Search - Facets Te...	{%raw%} {% endraw %}	Site 1 - sit...	9/4/2022 4:12 ...	Mark Davidson	9/4/2022 4:12 ...	Mark Davidson
Faceted Search - Main Tem...	{% assign search_page = sitemarkers['Search...	Site 1 - sit...	9/4/2022 4:12 ...	Mark Davidson	9/4/2022 4:12 ...	Mark Davidson
Faceted Search - Paging Te...	{%raw%} {% endraw %}	Site 1 - sit...	9/4/2022 4:12 ...	Mark Davidson	9/4/2022 4:12 ...	Mark Davidson
Faceted Search - Results Te...	{% assign openTag = '[' %} {% assign closing...	Site 1 - sit...	9/4/2022 4:12 ...	Mark Davidson	9/4/2022 4:12 ...	Mark Davidson
Faceted Search - Sort Temp...	{%raw%} {% endraw %}	Site 1 - sit...	9/4/2022 4:12 ...	Mark Davidson	9/4/2022 4:12 ...	Mark Davidson

- Model-driven Power App
- Used to create and update site metadata
- Addresses gaps where tools don't exist in design studio
- Need to configure components such as content snippets, site settings, web templates, page templates, security when creating custom solutions

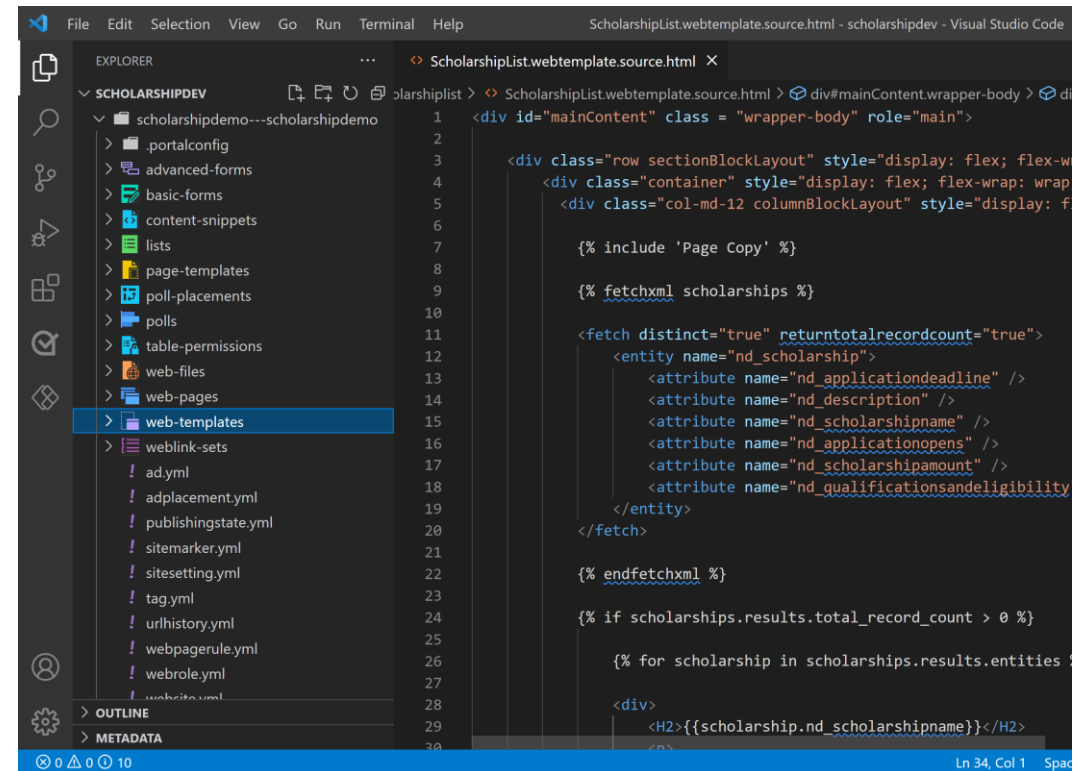
Developer Tools: PAC CLI

- Power Platform Command Line Interface
- Recommend to install as part of the Power Platform Tools in Visual Studio Code
- <https://docs.microsoft.com/en-us/powerapps/developer/data-platform/powerapps-cli>



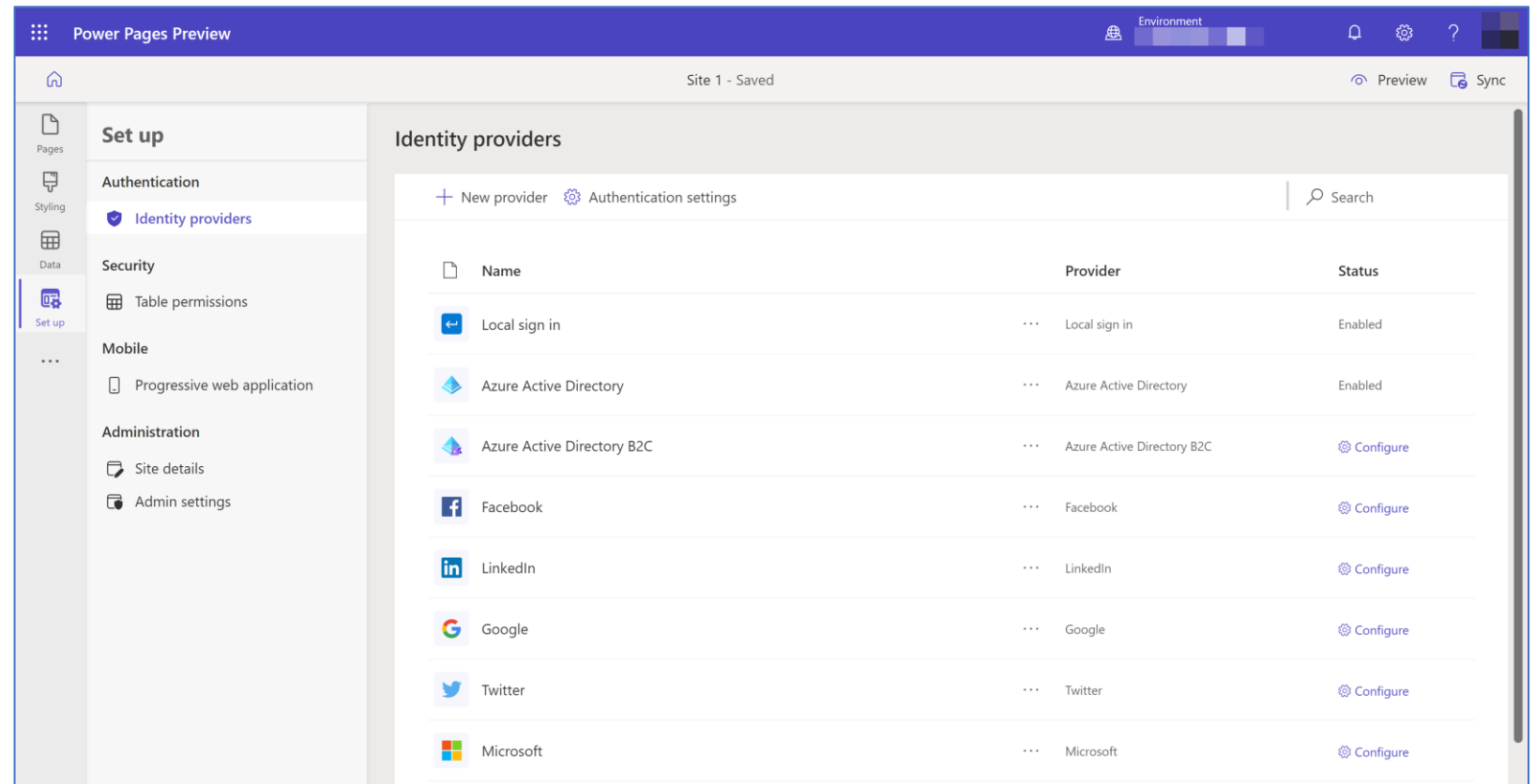
DEVELOPER TOOLS: VS CODE

- Edit Web Template code + other portal configuration locally, upload updates and commit to source control
- Intellisense



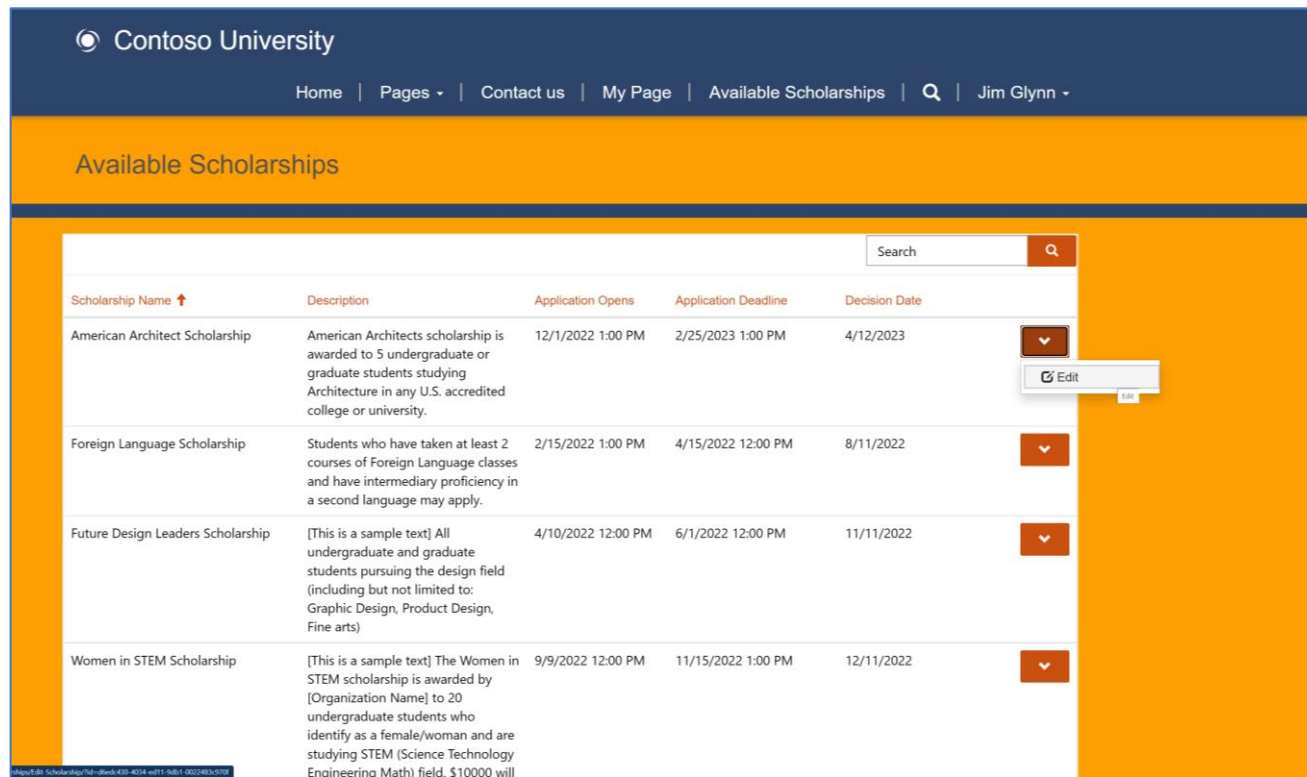
Power Pages Authentication

- Power Pages utilizes a variety of external authentication providers
- Additional security, such as table permissions, page permissions, web roles to protect content and data
- Sites are marked private by default (new)



Walkthrough: Extending Power Pages using pro-developer tools

Demo – Developer Enhancement



Contoso University

Home | Pages ▾ | Contact us | My Page | Available Scholarships | 🔍 | Jim Glynn ▾

Available Scholarships

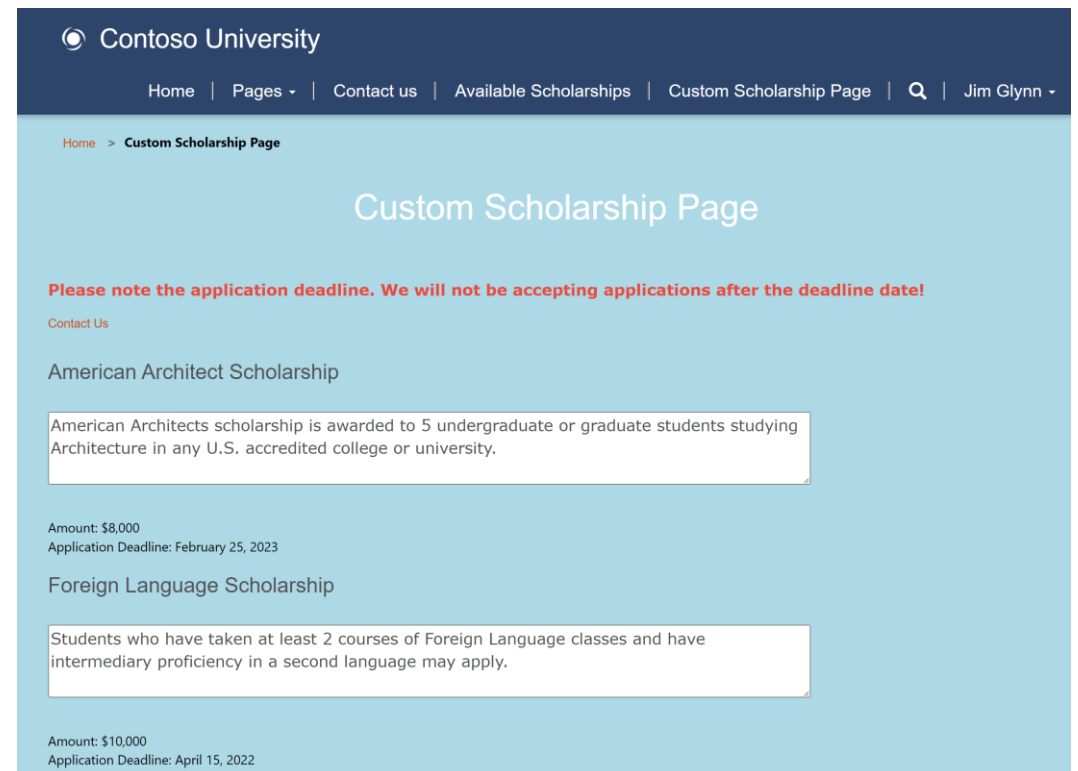
Scholarship Name ↑	Description	Application Opens	Application Deadline	Decision Date	
American Architect Scholarship	American Architects scholarship is awarded to 5 undergraduate or graduate students studying Architecture in any U.S. accredited college or university.	12/1/2022 1:00 PM	2/25/2023 1:00 PM	4/12/2023	▼ Edit
Foreign Language Scholarship	Students who have taken at least 2 courses of Foreign Language classes and have intermediary proficiency in a second language may apply.	2/15/2022 1:00 PM	4/15/2022 12:00 PM	8/11/2022	▼
Future Design Leaders Scholarship	[This is a sample text] All undergraduate and graduate students pursuing the design field (including but not limited to: Graphic Design, Product Design, Fine arts)	4/10/2022 12:00 PM	6/1/2022 12:00 PM	11/11/2022	▼
Women in STEM Scholarship	[This is a sample text] The Women in STEM scholarship is awarded by [Organization Name] to 20 undergraduate students who identify as a female/woman and are studying STEM (Science Technology Engineering Math) field. \$10000 will	9/9/2022 12:00 PM	11/15/2022 1:00 PM	12/11/2022	▼

[https://edit.scholarship?id=ibed6432-4214-e011-9b81-0002401c9700](#)

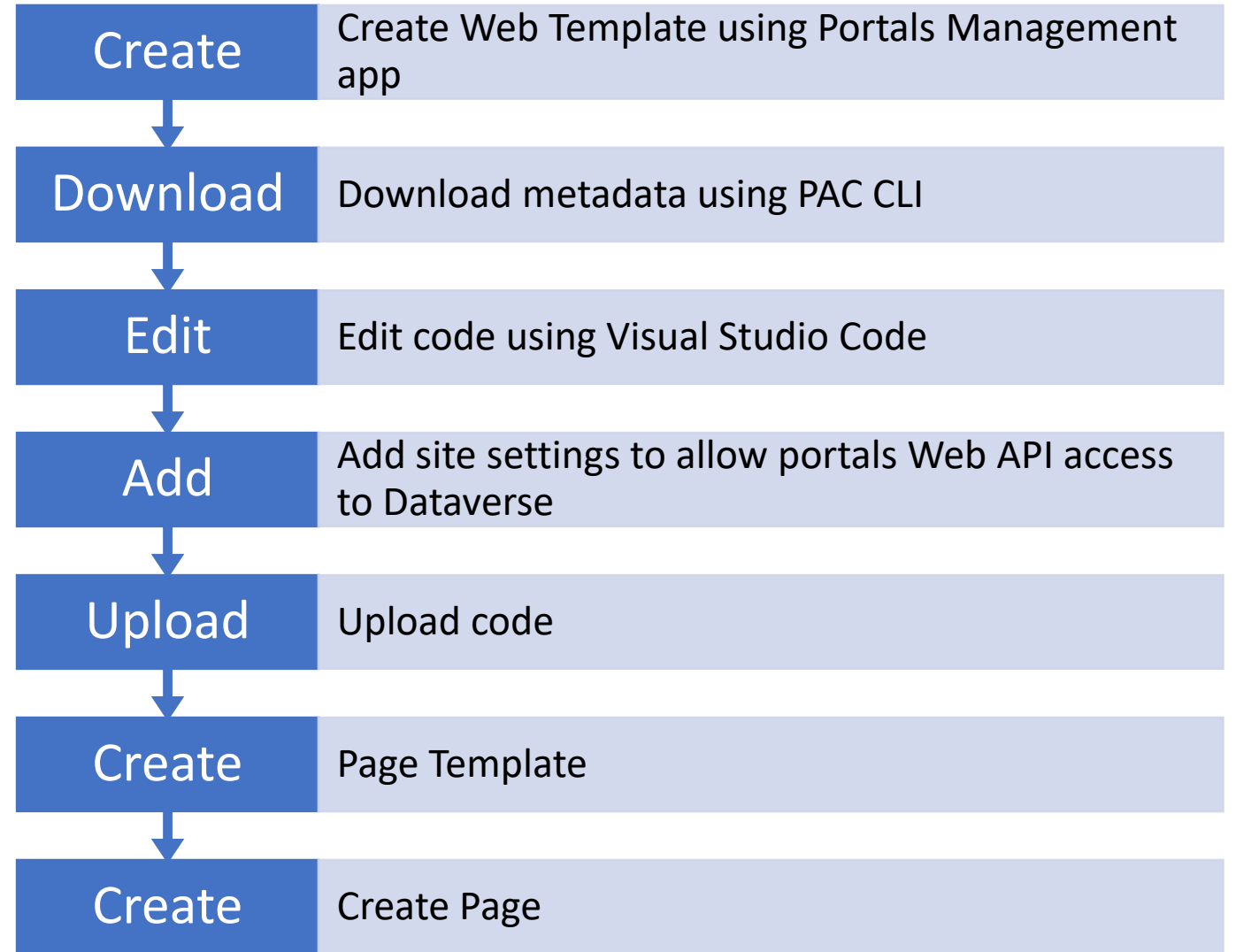
- Makers have used Data and Pages workspace to build a page with a list of scholarships
- Scholarships can be edited by authenticated users
- Business wants a “digest” view of scholarships, uniquely formatted + ability to edit directly

Solution

- Custom web template
- Use Liquid, HTML, CSS, and JavaScript
- Use portals Web API to update data

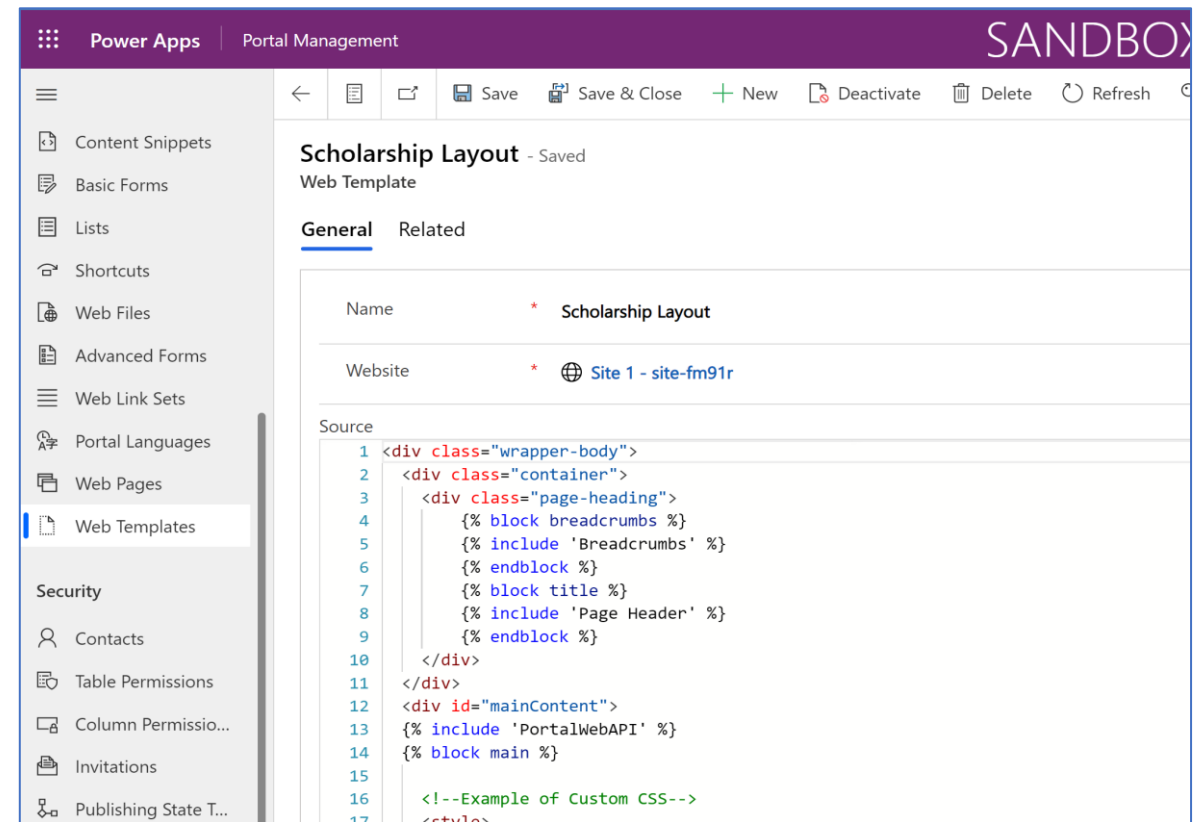


Steps to build solution

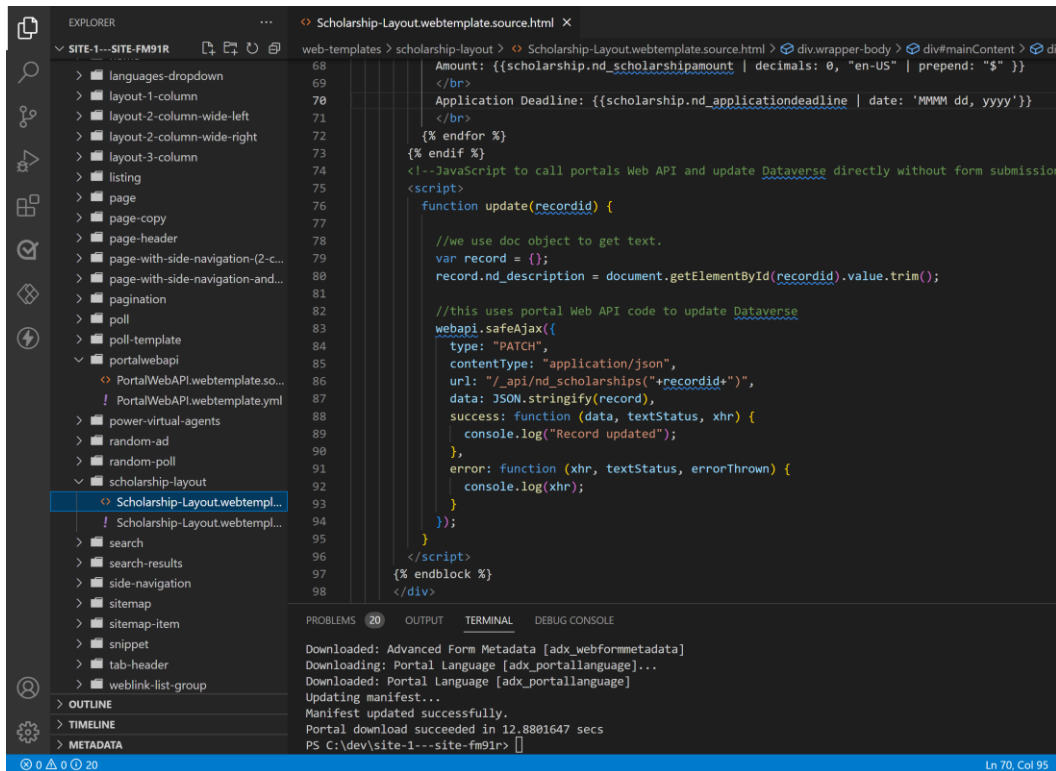


Create Web Template

- Currently need to create assets in Portal Management app
- You can add/edit code here, but VS Code is better



Edit in Visual Studio Code



- Download using PAC CLI
- Update web template
- Integration with GitHub other Dev Ops tools
- Upload using PAC CLI

Page Template

- Basic for Page Layouts
- Can define to use header and footer (or not)

The screenshot displays the 'Power Apps | Portal Management' interface in 'SANDBOX' mode. The left sidebar contains a navigation menu with categories: 'Website' (Recent, Pinned, Websites, Page Templates, Redirects, Site Markers, Site Settings, Website Bindings, Settings), 'Content' (Content Snippets, Basic Forms, Lists, Shortcuts, Web Files, Advanced Forms), and 'Page Templates'. The main area shows the configuration for 'Custom Scholarship Layout - Saved' under the 'Page Template' section. The 'General' tab is active, displaying the following fields:

Field	Value
Name	* Custom Scholarship Layout
Website	* Site 1 - site-fm91r
Type	* Web Template
Web Template	* Scholarship Layout
Use Website Header and Footer	<input checked="" type="checkbox"/>
Is Default	<input type="checkbox"/>
Table Name	---
Description	+ ---

Site Settings

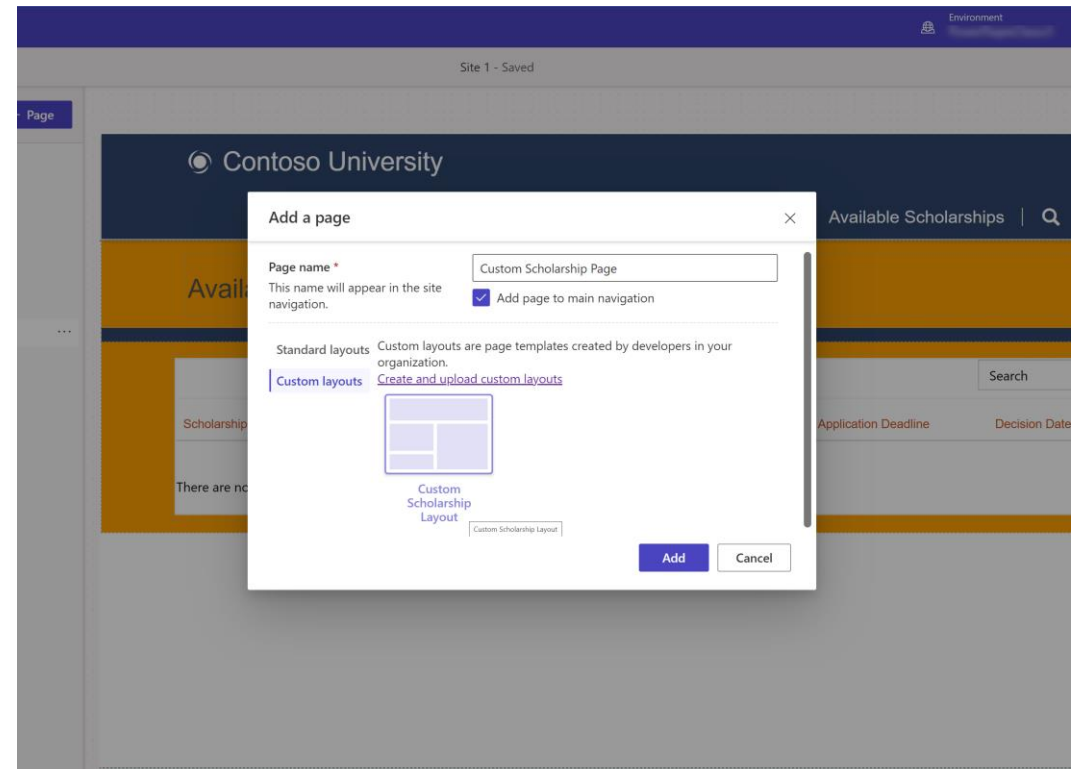
Need to specify tables + fields that can be accessed by portals Web API

The screenshot displays the Power Apps Portal Management interface. The top navigation bar includes 'Power Apps', 'Portal Management', and a 'SANDBOX' environment label. A left-hand navigation pane lists various portal management options: Recent, Pinned, Website (with sub-items: Websites, Page Templates, Redirects, Site Markers, Site Settings, Website Bindings, Settings), and Content (with sub-item: Content Snippets). The 'Site Settings' option is currently selected. The main content area shows a specific site setting titled 'Webapi/nd_scholarship/enabled' with a status of '- Saved'. Below the title are tabs for 'General', 'Administration', 'Notes', and 'Related'. The 'General' tab is active, displaying a table with the following details:

Name	* Webapi/nd_scholarship/enabled
Website	* Site 1 - site-fm91r
Value	true
Description	---

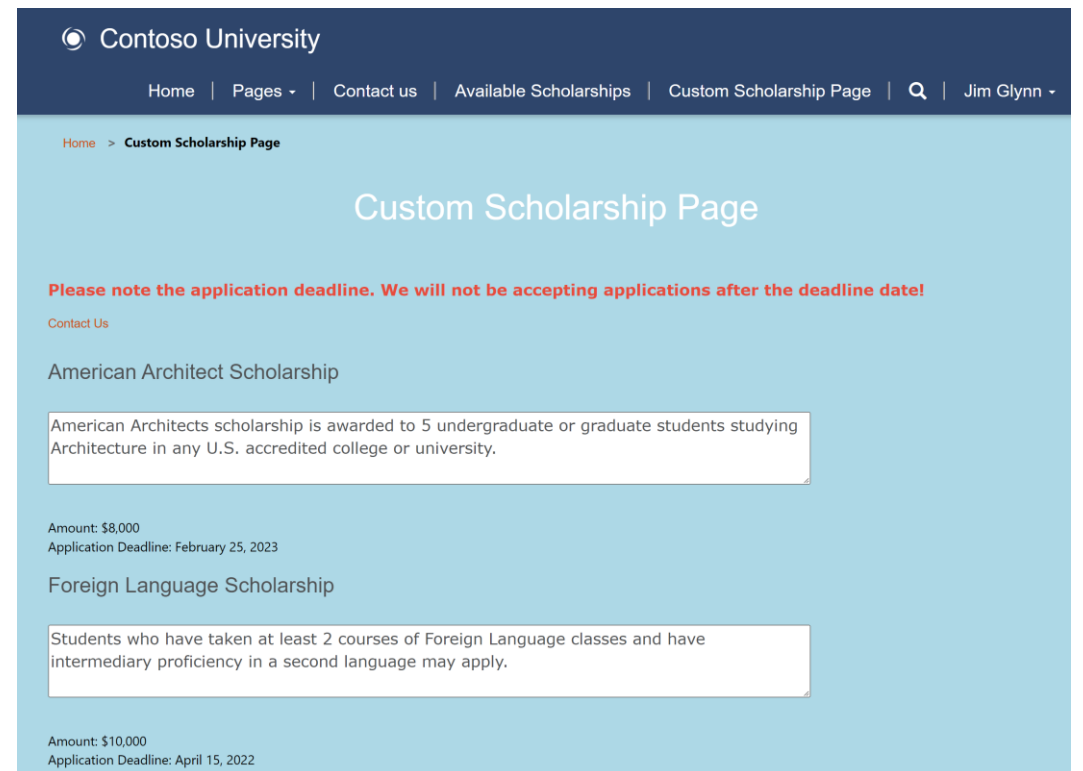
Add Web Page using custom layout

- Add the page
- Choose custom layout
- Preview the page



End result

- Test functionality using browser developer tools
- Can update code, upload, sync, preview



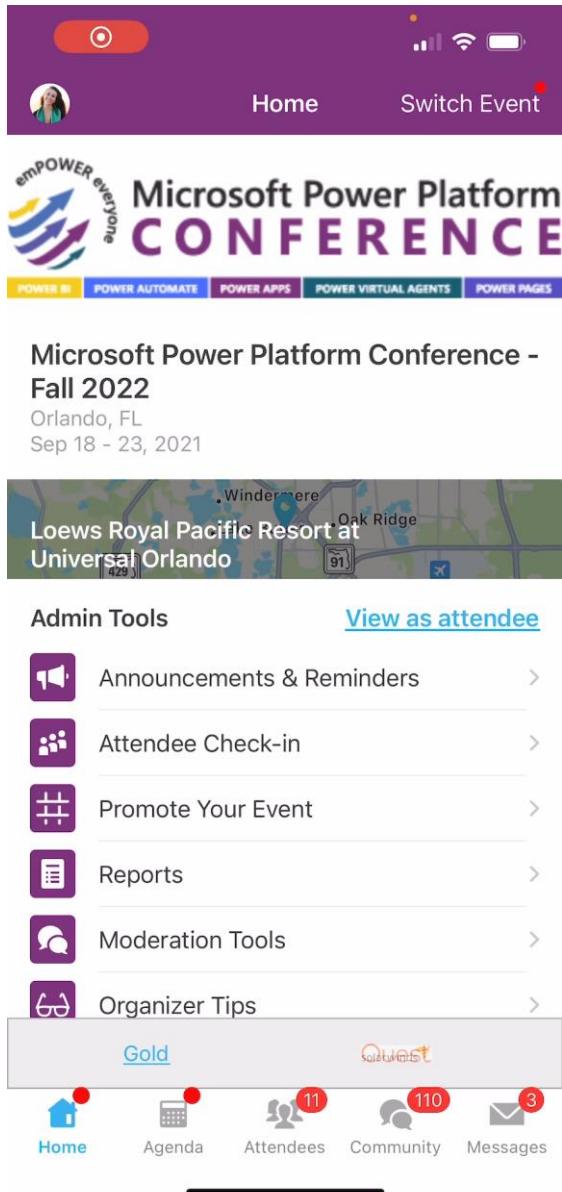
Code breakdown

- HTML page for overall structure
- Embedded CSS for specific styling
- Liquid objects to render content snippets, site markers
- Liquid FetchXML to retrieve Microsoft Dataverse records
- JavaScript to trigger update to call portal Web API to update Dataverse

```
7      {% block title %}  
8      {% include 'Page Header' %}  
9      {% endblock %}  
10     </div>  
11     </div>  
12     <div id="mainContent">  
13     {% include 'PortalWebAPI' %}  
14     {% block main %}  
15  
16     <!--Example of Custom CSS-->  
17     <style>  
18     body {  
19         background-color: lightblue;  
20     }  
21     h1 {  
22         color: white;  
23         text-align: center;  
24     }  
25     p {  
26         font-family: verdana;  
27         font-size: 18px;  
28     }  
29     </style>  
30  
31     <!--utilizing divs to organize the page -->  
32     <div class="row sectionBlockLayout text-left" style="display: flex; flex-wrap: wrap; margin: 0px; min-height: auto; padding: 8px;">  
33     <div class="container" style="padding: 0px; display: flex; flex-wrap: wrap;">  
34     <div class="col-md-12 columnBlockLayout" style="flex-grow: 1; display: flex; flex-direction: column; min-width: 300px; margin: 5px 0px; padding: 5px;">  
35  
36     <!-- Example of Content Snippets -->  
37     <p>{{ snippets["banner_message"] }}</p>  
38  
39     <!-- Example of Site Markers -->  
40     {% assign contactus_marker = sitemarkers["Contact Us"] %}  
41     <p><a href="{{contactus_marker.url}}">Contact Us</a></p>  
42  
43     <!-- FetchXML Liquid Tag -->  
44     {% fetchxml scholarships %}  
45     <fetch returntotalrecordcount="true">  
46     <entity name="nd_scholarship">  
47         <attribute name="nd_scholarshipamount" />  
48         <attribute name="nd_applicationdeadline" />  
49         <attribute name="nd_description" />  
50         <attribute name="nd_scholarshipname" />  
51         <attribute name="nd_applicationopens" />  
52         <attribute name="nd_scholarshipid" />  
53     </entity>  
54     </fetch>  
55     {% endfetchxml %}  
56  
57     <!--Liquid to go through results of FetchXML-->  
58     {% if scholarships.results.total_record_count > 0 %}
```

Real world case study – PwC LLP





Session Feedback Surveys

In the pursuit of making next year's Microsoft Power Platform Conference even better, we really want to hear your feedback about this session.

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- *Simply go to the Whova App on your smartphone*
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- *Scroll down on the homepage to 'Additional Resources' and click 'Surveys'.*
- *Click 'Session Feedback'.*
- *Scroll down to click on this session title.*
- *Complete the session feedback survey.*
- *Finally, click 'Submit'*

