Umbraco Anti-Patterns

Jason Prothero and Mark Bowser PROWORKS

uWestFest ‘17 - Denver, CO

Who Are We?

ProWorks

Jason Prothero

CEO / Lead Developer

Umbraco Master

Mark Bowser

Software Developer

Umbraco Master

Who Are We?

- Started using Umbraco in 2009 - version 4.0.3
- Built many sites of various sizes and types
- Inherited several sites to maintain and extend

Design Patterns

In software engineering, a design pattern is a general repeatable solution to a commonly occurring problem in software design.

-- https://sourcemaking.com/design_patterns

What is an Anti-pattern?

> *An antipattern is just like a pattern, except that instead of a solution it gives something that looks superficially like a solution but isn't one.*
>
> *-- Andrew Koenig*

Seemed like a valid path to take at the time and only after extending or maintaining the solution do they appear as anti-patterns

Doesn’t mean you’re a “bad” developer

What is an Anti-pattern?

Anti-Patterns have amazing names - http://wiki.c2.com/?AntiPatternsCatalog

- AlcoholFueledDevelopment
- BearTrap
- ContinuousObsolescence
- EmperorsNewClothes
- PoliticsOrientedArchitecture
- StandingOnTheShouldersOfMidgets
- VoodooChickenCoding
- RubeGoldbergMachine
- PhatWareAntiPattern
- TheGrandOldDukeOfYork
- DesignForTheSakeOfDesign
- RollYourOwnDatabase
- SumoMarriage
- GoldenHammer

Umbraco Anti-Patterns

- Lava Flow
- Tower of Voodoo
- Yet Another Cache Will Solve It
- Roll Your Own API

Lava Flow

Flickr: Tumanc

Lava Flow Anti-Pattern

“At this point, we began calling these blobs of code "lava," referring to the fluid nature in which they originated as compared to the basaltlike hardness and difficulty in removing it once it had solidified. Suddenly, it dawned on us that we had identified a potential AntiPattern.”

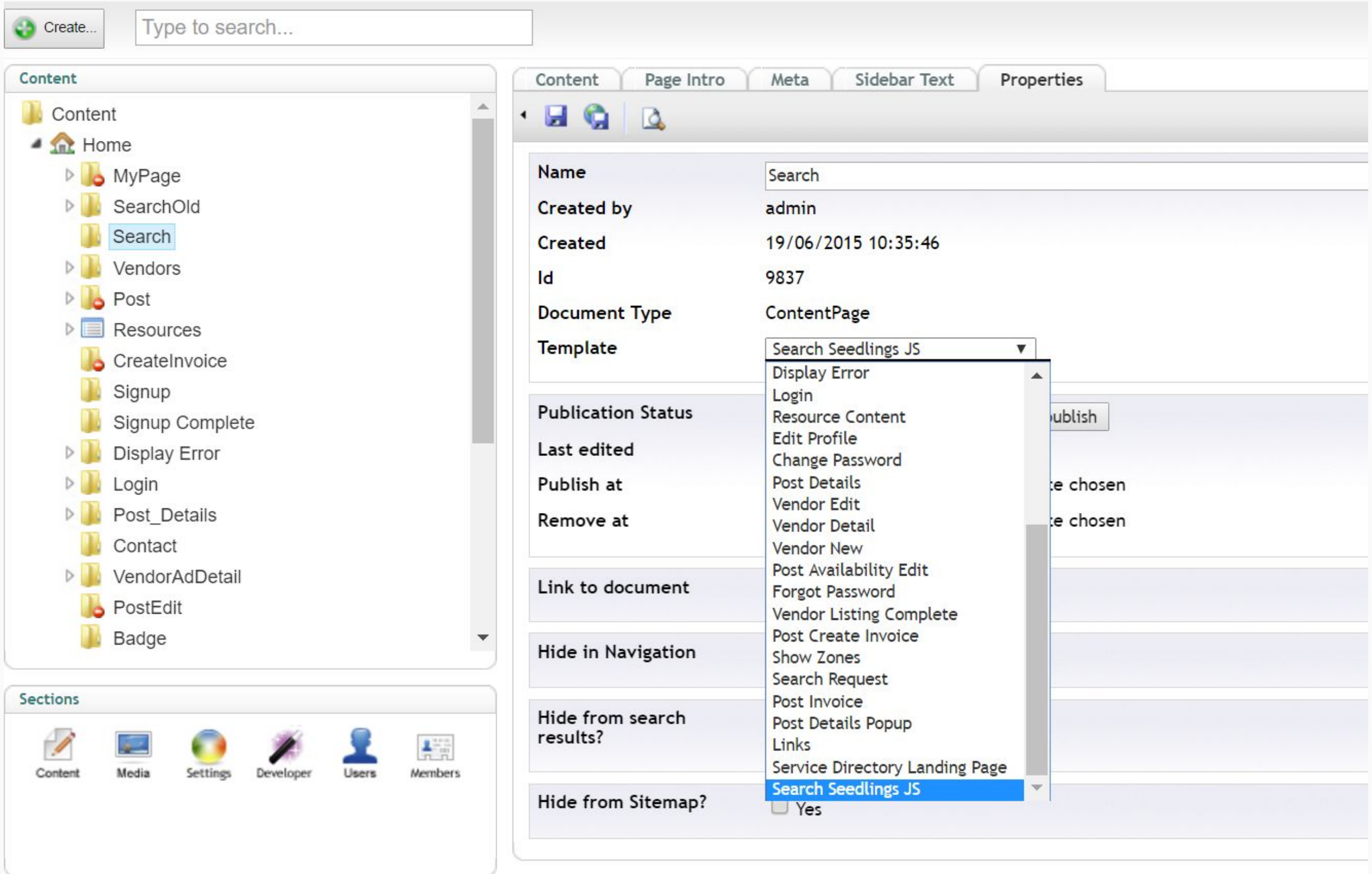
- https://sourcemaking.com/antipatterns/lava-flow

Problem: Imperfect Information

Need to configure Umbraco to support the project. However, the site at the end of the project may not look like the requirements at the start.

- Lack of Information => Too generic
  - Parent Document Types have too many properties
- Assumption of perfect requirements => May resist change
  - When requirements change, there could be bloat locked in to your document types

Under Architecting

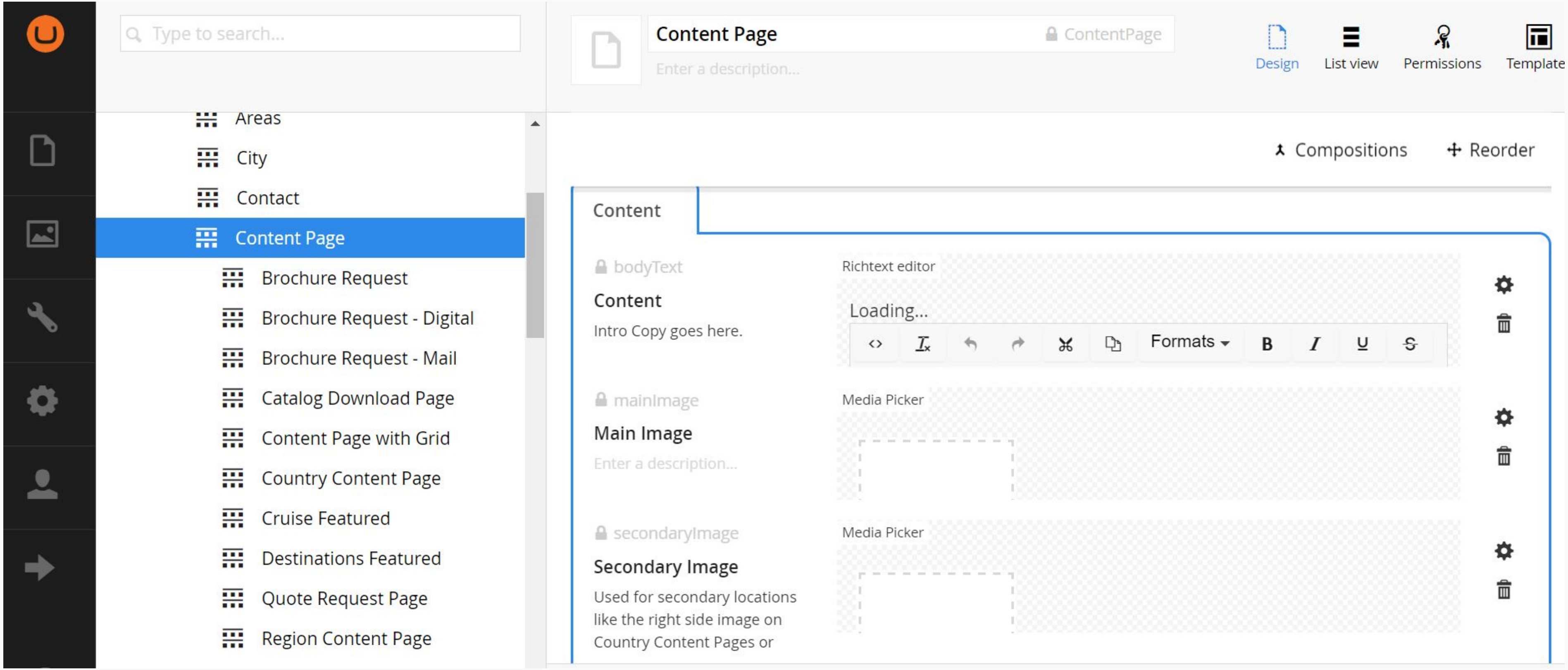


Name	Search
Created by	admin
Created	19/06/2015 10:35:46
Id	9837
Document Type	ContentPage
Template	Search Seedlings JS

Publication Status	
Last edited	
Publish at	e chosen
Remove at	e chosen
Link to document	
Hide in Navigation	
Hide from search results?	
Hide from Sitemap?	□ Yes

#h5is

Inheritance - Extra Properties



Content Page — ContentPage

Enter a description...

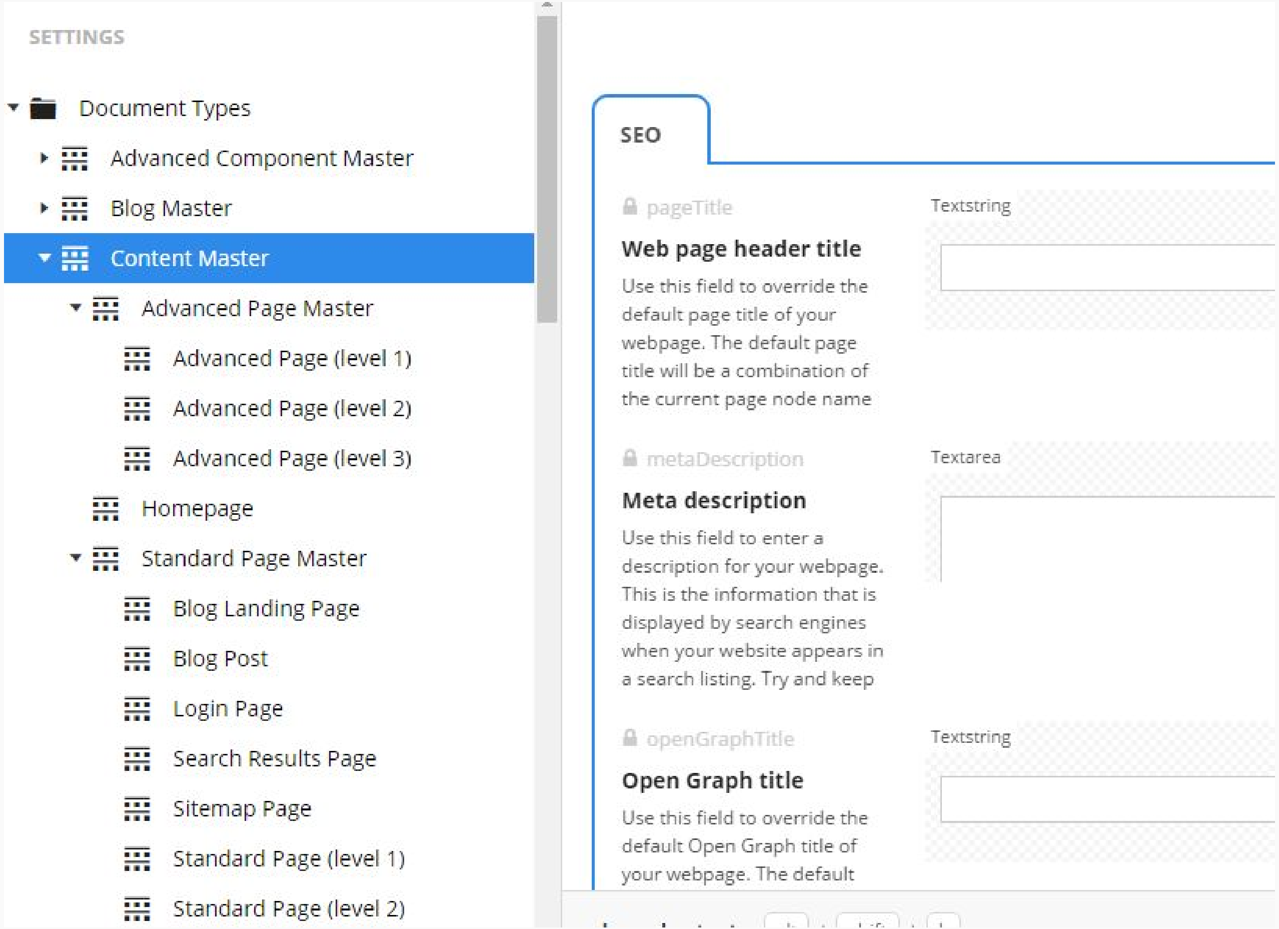
Content

bodyText — Richtext editor
Content
Intro Copy goes here.

mainImage — Media Picker
Main Image
Enter a description...

secondaryImage — Media Picker
Secondary Image
Used for secondary locations like the right side image on Country Content Pages or

Over Architecting



SETTINGS

- Document Types
  - Advanced Component Master
  - Blog Master
  - Content Master
    - Advanced Page Master
      - Advanced Page (level 1)
      - Advanced Page (level 2)
      - Advanced Page (level 3)
    - Homepage
    - Standard Page Master
      - Blog Landing Page
      - Blog Post
      - Login Page
      - Search Results Page
      - Sitemap Page
      - Standard Page (level 1)
      - Standard Page (level 2)

SEO

pageTitle — Textstring

Web page header title

Use this field to override the default page title of your webpage. The default page title will be a combination of the current page node name

metaDescription — Textarea

Meta description

Use this field to enter a description for your webpage. This is the information that is displayed by search engines when your website appears in a search listing. Try and keep

openGraphTitle — Textstring

Open Graph title

Use this field to override the default Open Graph title of your webpage. The default

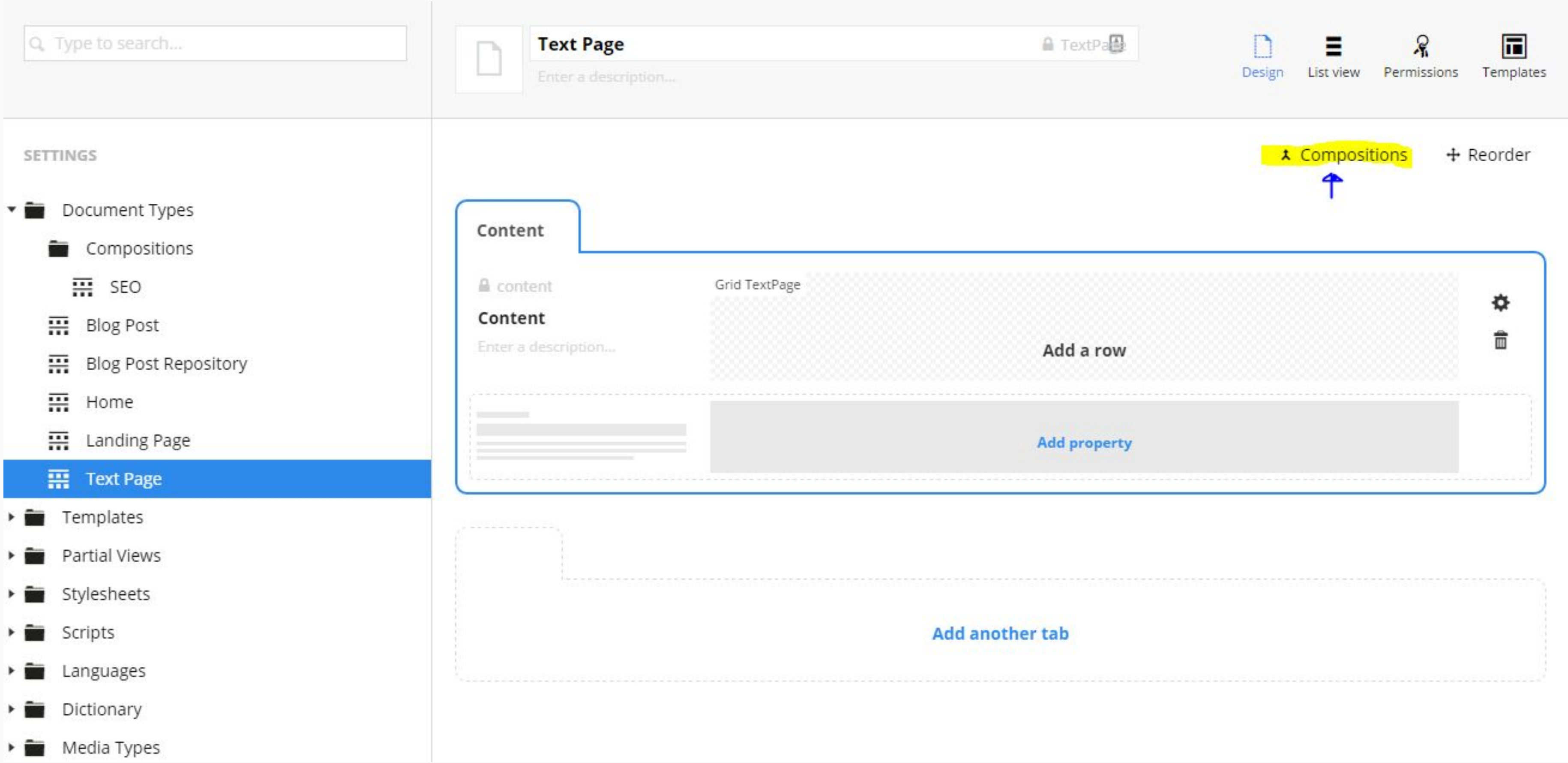
Solutions / Considerations

Favor object composition over class inheritance.

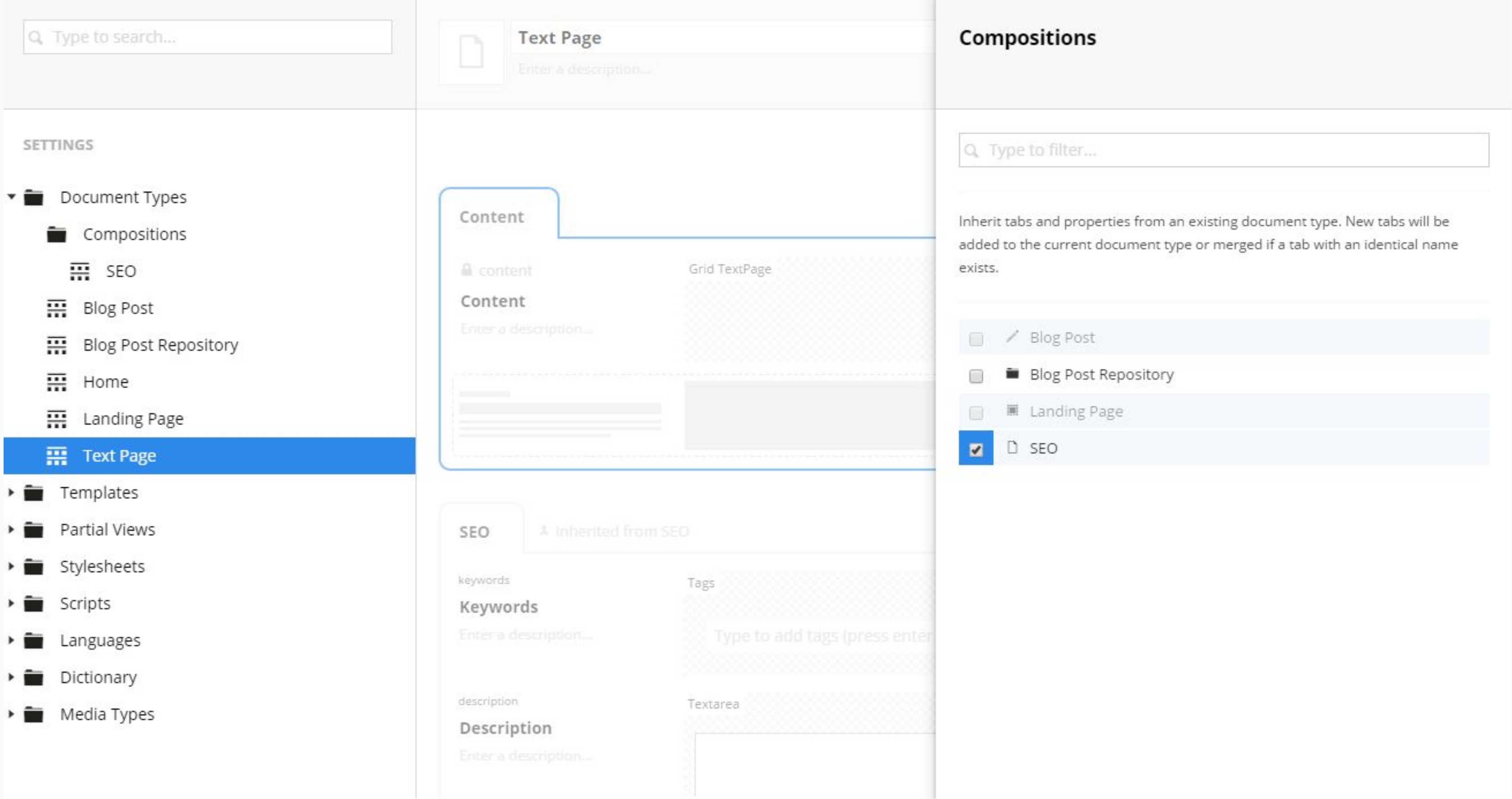
-- Design Patterns: Elements of Reusable Object-Oriented Software

- Use Document Type Composition
- Consider Inheritance only in specific targeted scenarios
- Vary page types in anticipation of change
  - Avoid “Everything is a Content Page”
- Don’t overuse templates on a single document type

Compositions



Compositions



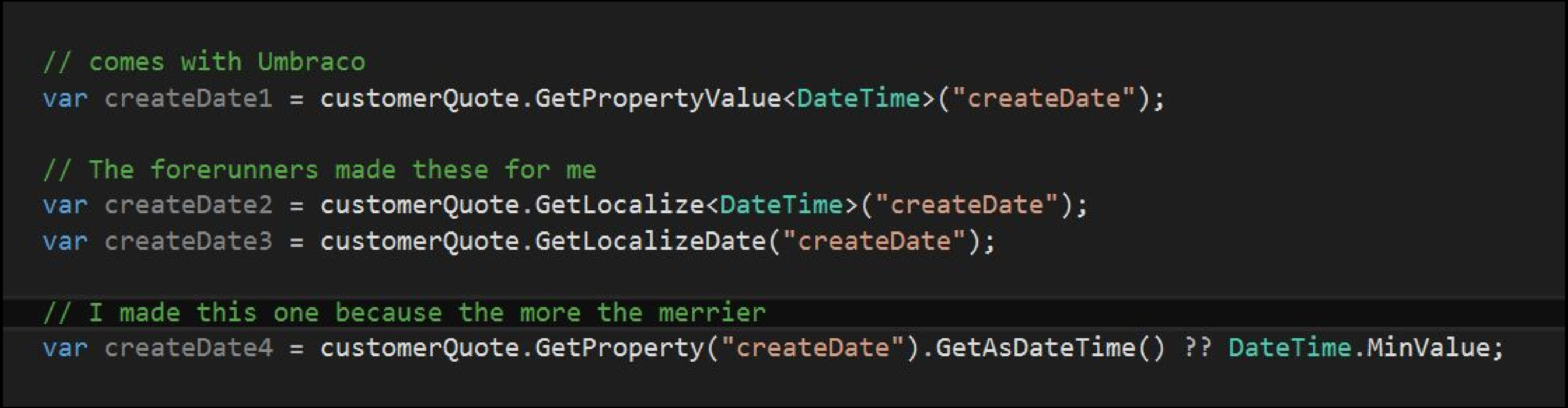
Inherit tabs and properties from an existing document type. New tabs will be added to the current document type or merged if a tab with an identical name exists.

- □ Blog Post
- □ Blog Post Repository
- □ Landing Page
- ☑ SEO

Tower Of Voodoo

Flickr: Lee Coursey

Inconsistency



```
// comes with Umbraco
var createDate1 = customerQuote.GetPropertyValue<DateTime>("createDate");

// The forerunners made these for me
var createDate2 = customerQuote.GetLocalize<DateTime>("createDate");
var createDate3 = customerQuote.GetLocalizeDate("createDate");

// I made this one because the more the merrier
var createDate4 = customerQuote.GetProperty("createDate").GetAsDateTime() ?? DateTime.MinValue;
```

Problem: Need to query Umbraco

So many options

- ContentService
- NodeFactory
- UmbracoHelper
- Examine

Problem: Need to query Umbraco

The old way:

- Use NodeFactory
- Use UmbracoHelper with Dynamics

The wrong way:

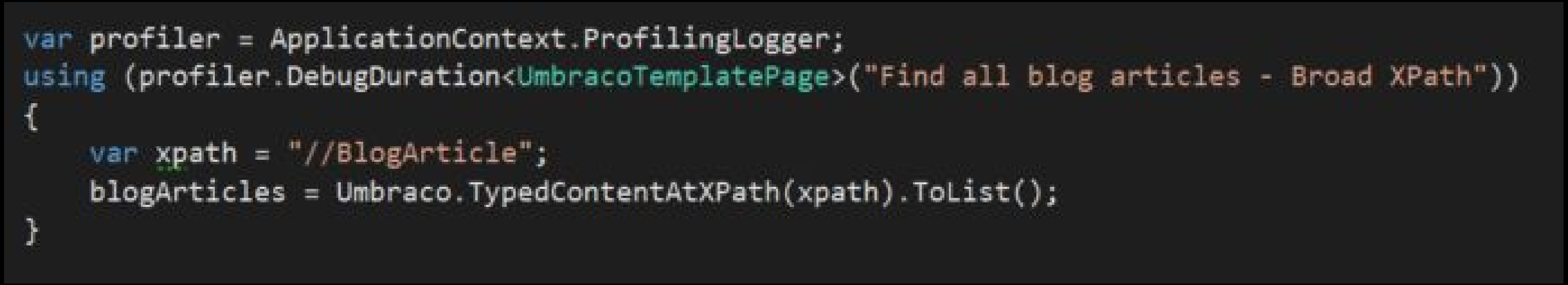
- Using Descendants a lot
- Umbraco management services (probably)

Problem: Need to query Umbraco

Some right ways

- UmbracoHelper
- Examine
- Use XPath

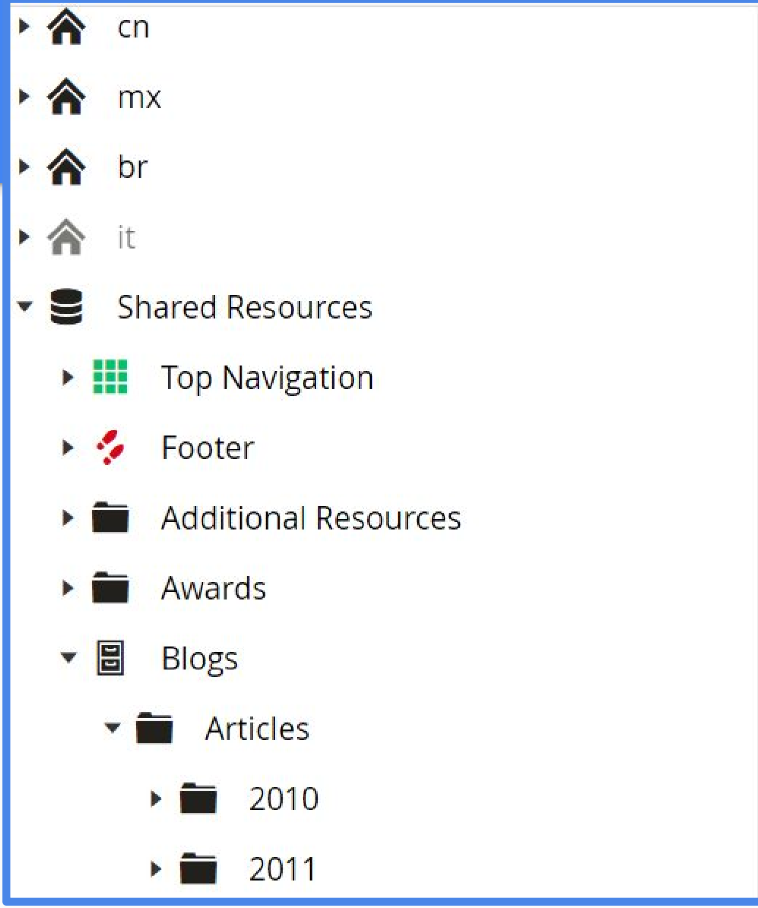
How do I know which queries are slow?



```
var profiler = ApplicationContext.ProfilingLogger;
using (profiler.DebugDuration<UmbracoTemplatePage>("Find all blog articles - Broad XPath"))
{
    var xpath = "//BlogArticle";
    blogArticles = Umbraco.TypedContentAtXPath(xpath).ToList();
}
```

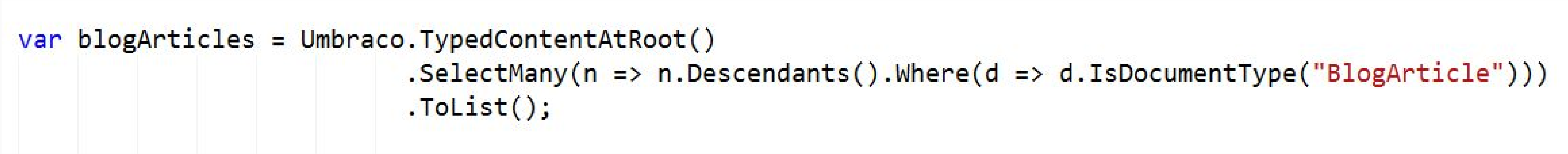
Slowest Query Countdown

- Example site
  - ~13,000 total published nodes
  - 415 published BlogArticle nodes
  - All the BlogArticles live in “Shared Resources”



- cn
- mx
- br
- it
- Shared Resources
  - Top Navigation
  - Footer
  - Additional Resources
  - Awards
  - Blogs
    - Articles
      - 2010
      - 2011

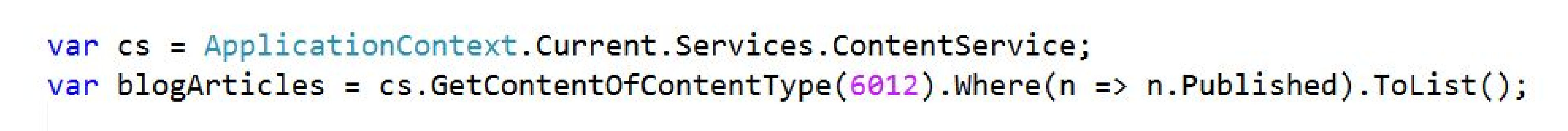
Querying with Linq using Descendants()



```
var blogArticles = Umbraco.TypedContentAtRoot()
                          .SelectMany(n => n.Descendants().Where(d => d.IsDocumentType("BlogArticle")))
                          .ToList();
```

5697ms

Querying with the ContentService

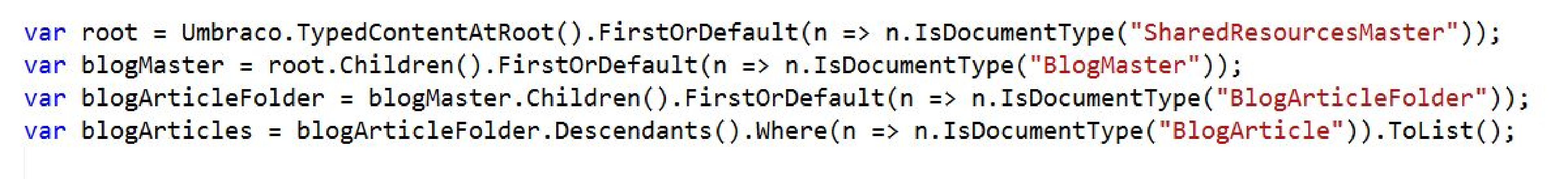


```
var cs = ApplicationContext.Current.Services.ContentService;
var blogArticles = cs.GetContentOfContentType(6012).Where(n => n.Published).ToList();
```

1331ms

Querying with Linq and lots of sub queries

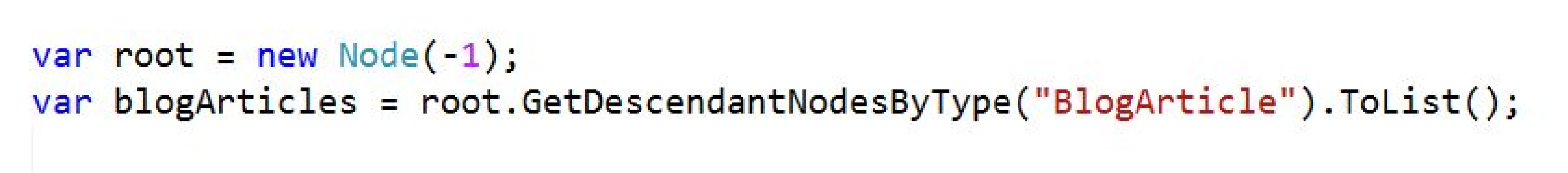
We know the blog articles are under **SharedResources->Blogs->Articles**



```
var root = Umbraco.TypedContentAtRoot().FirstOrDefault(n => n.IsDocumentType("SharedResourcesMaster"));
var blogMaster = root.Children().FirstOrDefault(n => n.IsDocumentType("BlogMaster"));
var blogArticleFolder = blogMaster.Children().FirstOrDefault(n => n.IsDocumentType("BlogArticleFolder"));
var blogArticles = blogArticleFolder.Descendants().Where(n => n.IsDocumentType("BlogArticle")).ToList();
```

827ms

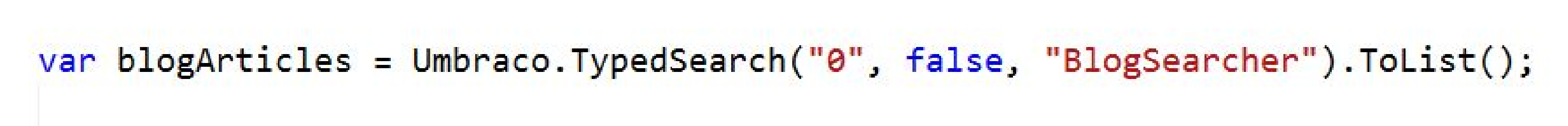
Querying with NodeFactory



```
var root = new Node(-1);
var blogArticles = root.GetDescendantNodesByType("BlogArticle").ToList();
```

491ms

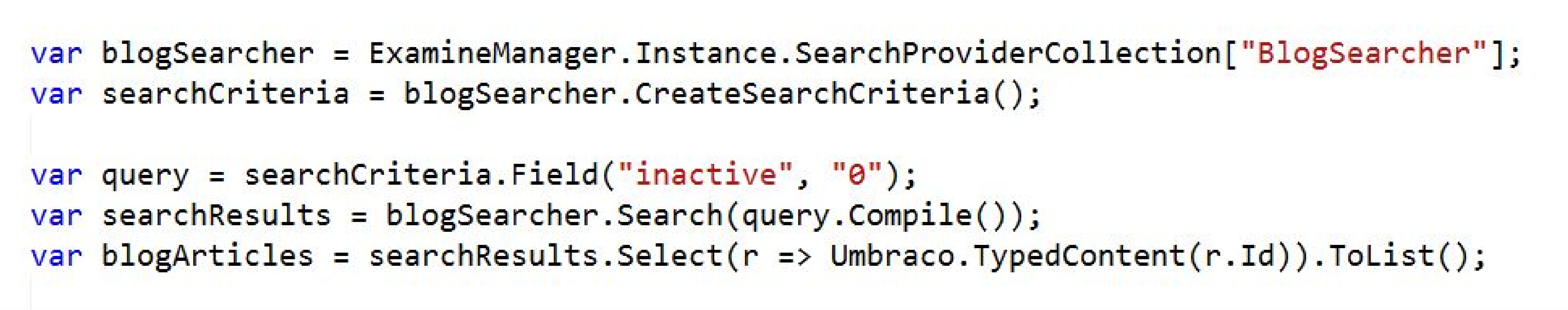
Querying with Examine via TypedSearch



```
var blogArticles = Umbraco.TypedSearch("0", false, "BlogSearcher").ToList();
```

190ms

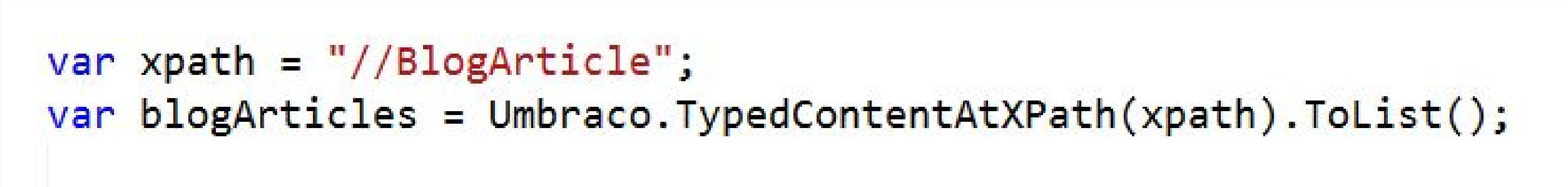
Querying with Custom Examine Indexer



```
var blogSearcher = ExamineManager.Instance.SearchProviderCollection["BlogSearcher"];
var searchCriteria = blogSearcher.CreateSearchCriteria();

var query = searchCriteria.Field("inactive", "0");
var searchResults = blogSearcher.Search(query.Compile());
var blogArticles = searchResults.Select(r => Umbraco.TypedContent(r.Id)).ToList();
```

167ms

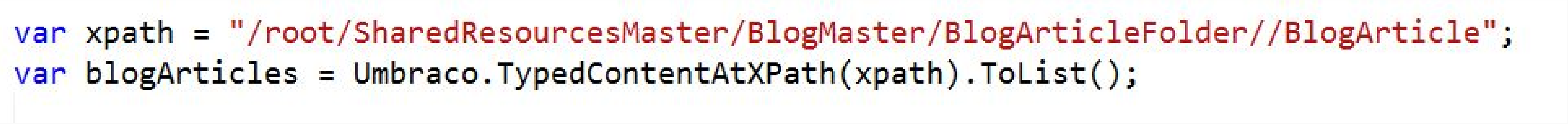
Querying with broad XPath



```
var xpath = "//BlogArticle";
var blogArticles = Umbraco.TypedContentAtXPath(xpath).ToList();
```

14ms

Querying with targeted XPath



```
var xpath = "/root/SharedResourcesMaster/BlogMaster/BlogArticleFolder//BlogArticle";
var blogArticles = Umbraco.TypedContentAtXPath(xpath).ToList();
```

4ms

Yet Another Cache Will Solve It

Custom Caching

There are two hard things in computer science: cache invalidation and naming things.

-- Phil Karlton

Problem: You go live and the site is SLOW...

To fix it you may:

- Create your own cache
- You make cache expirations really long (24 hours)
- Now your caching is blocking app startup (really slow)
- May have memory problems on the server
- Stovepiped cache
    - Integrated so tightly that it’s a critical part of the implementation

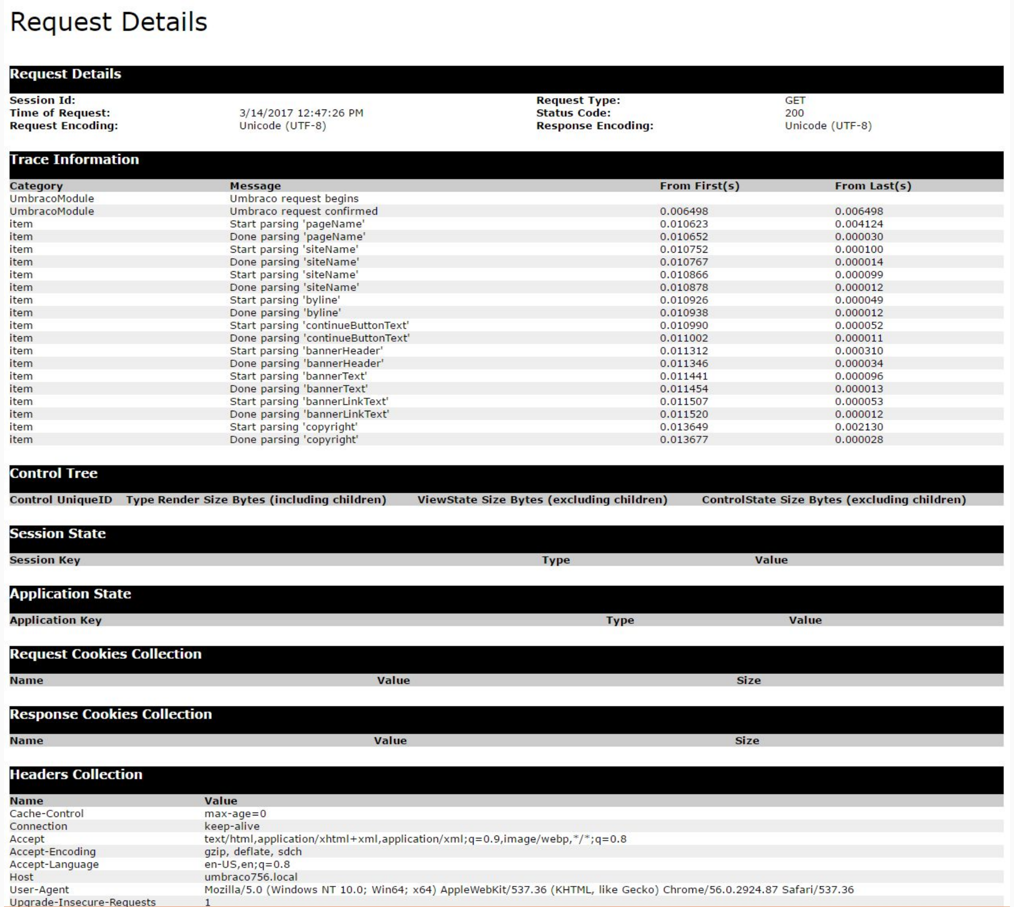
Solutions

- Lazy loading key settings or crucial content
  - Don’t load them entirely on startup
- Try the Umbraco Cached Partials/Macros
  - Try caching for 15 minutes - something short initially
- Try MvcDonutCaching
- SiteSettings / AppSettings for key content locations
- Use tracing / performance logger to find the real source of the problem

Trace.axd

```
<configuration>
    <system.web>
        <trace enabled="true"/>
    </system.web>
</configuration>
```

http://mysite.local/trace.axd as URL



Request Details

Request Details

Session Id:		**Request Type:**	GET
Time of Request:	3/14/2017 12:47:26 PM	**Status Code:**	200
Request Encoding:	Unicode (UTF-8)	**Response Encoding:**	Unicode (UTF-8)

Trace Information

Category	Message	From First(s)	From Last(s)
UmbracoModule	Umbraco request begins		
UmbracoModule	Umbraco request confirmed	0.006498	0.006498
item	Start parsing 'pageName'	0.010623	0.004124
item	Done parsing 'pageName'	0.010652	0.000030
item	Start parsing 'siteName'	0.010752	0.000100
item	Done parsing 'siteName'	0.010767	0.000014
item	Start parsing 'siteName'	0.010866	0.000099
item	Done parsing 'siteName'	0.010878	0.000012
item	Start parsing 'byline'	0.010926	0.000049
item	Done parsing 'byline'	0.010938	0.000012
item	Start parsing 'continueButtonText'	0.010990	0.000052
item	Done parsing 'continueButtonText'	0.011002	0.000011
item	Start parsing 'bannerHeader'	0.011312	0.000310
item	Done parsing 'bannerHeader'	0.011346	0.000034
item	Start parsing 'bannerText'	0.011441	0.000096
item	Done parsing 'bannerText'	0.011454	0.000013
item	Start parsing 'bannerLinkText'	0.011507	0.000053
item	Done parsing 'bannerLinkText'	0.011520	0.000012
item	Start parsing 'copyright'	0.013649	0.002130
item	Done parsing 'copyright'	0.013677	0.000028

Control Tree

Control UniqueID	Type	Render Size Bytes (including children)	ViewState Size Bytes (excluding children)	ControlState Size Bytes (excluding children)

Session State

Session Key	Type	Value

Application State

Application Key	Type	Value

Request Cookies Collection

Name	Value	Size

Response Cookies Collection

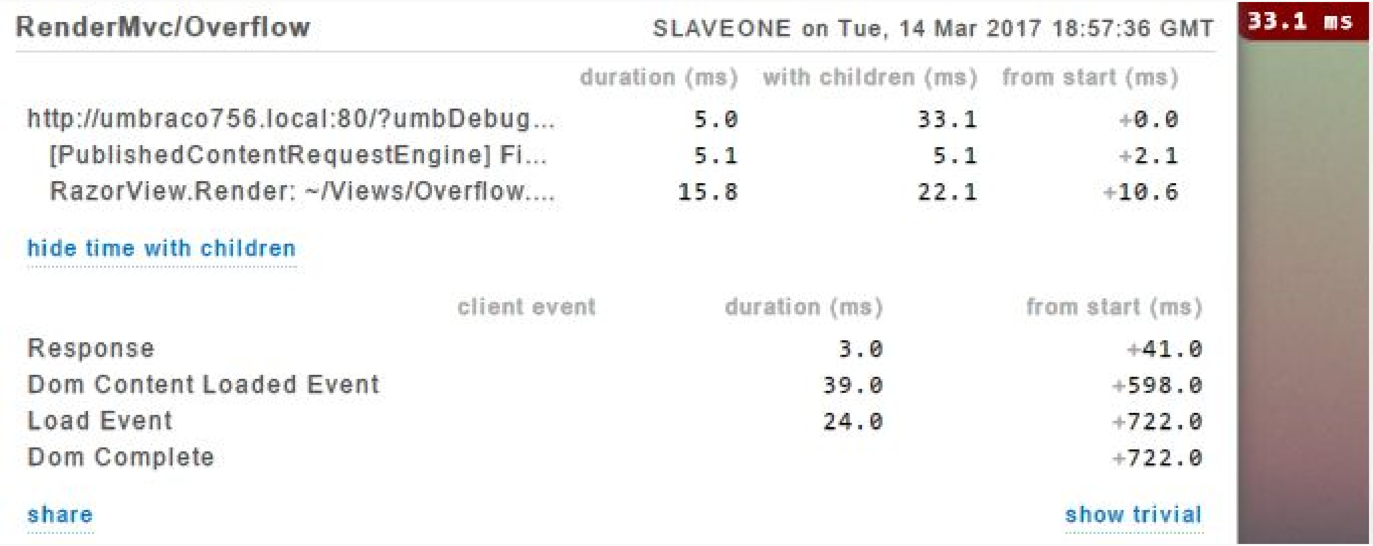
Name	Value	Size

Headers Collection

Name	Value
Cache-Control	max-age=0
Connection	keep-alive
Accept	text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8
Accept-Encoding	gzip, deflate, sdch
Accept-Language	en-US,en;q=0.8
Host	umbraco756.local
User-Agent	Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/56.0.2924.87 Safari/537.36
Upgrade-Insecure-Requests	1

MiniProfiler

Add ?umbDebug=true to the end of the URL:



RenderMvc/Overflow SLAVEONE on Tue, 14 Mar 2017 18:57:36 GMT

33.1 ms

	duration (ms)	with children (ms)	from start (ms)
http://umbraco756.local:80/?umbDebug...	5.0	33.1	+0.0
[PublishedContentRequestEngine] Fi...	5.1	5.1	+2.1
RazorView.Render: ~/Views/Overflow....	15.8	22.1	+10.6

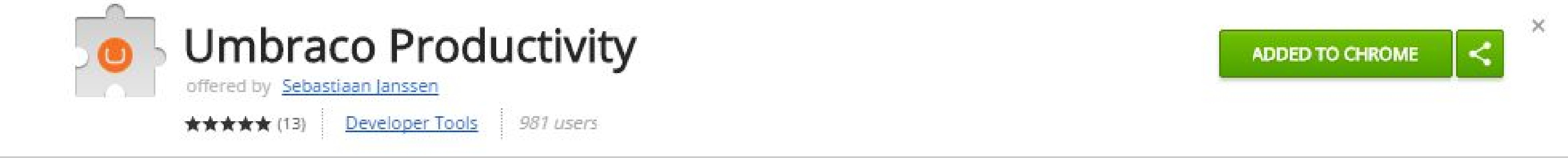
hide time with children

client event	duration (ms)	from start (ms)
Response	3.0	+41.0
Dom Content Loaded Event	39.0	+598.0
Load Event	24.0	+722.0
Dom Complete		+722.0

share

show trivial

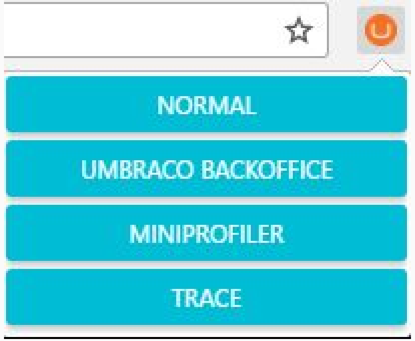
Umbraco Productivity Chrome Extension



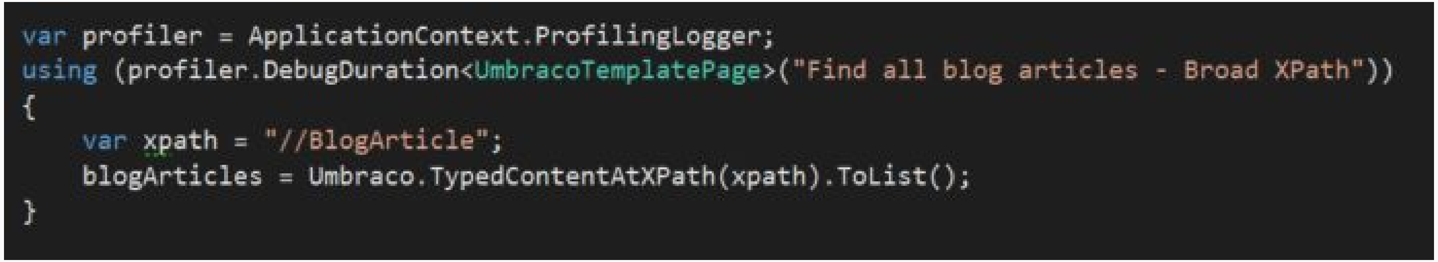
Umbraco Productivity

offered by Sebastiaan Janssen

★★★★★ (13) | Developer Tools | 981 users

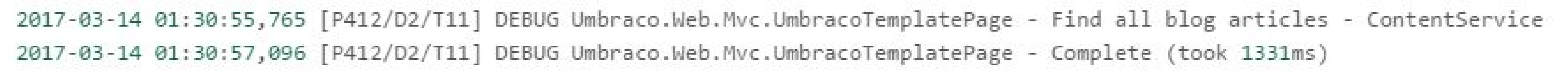


Profiling in Umbraco Log



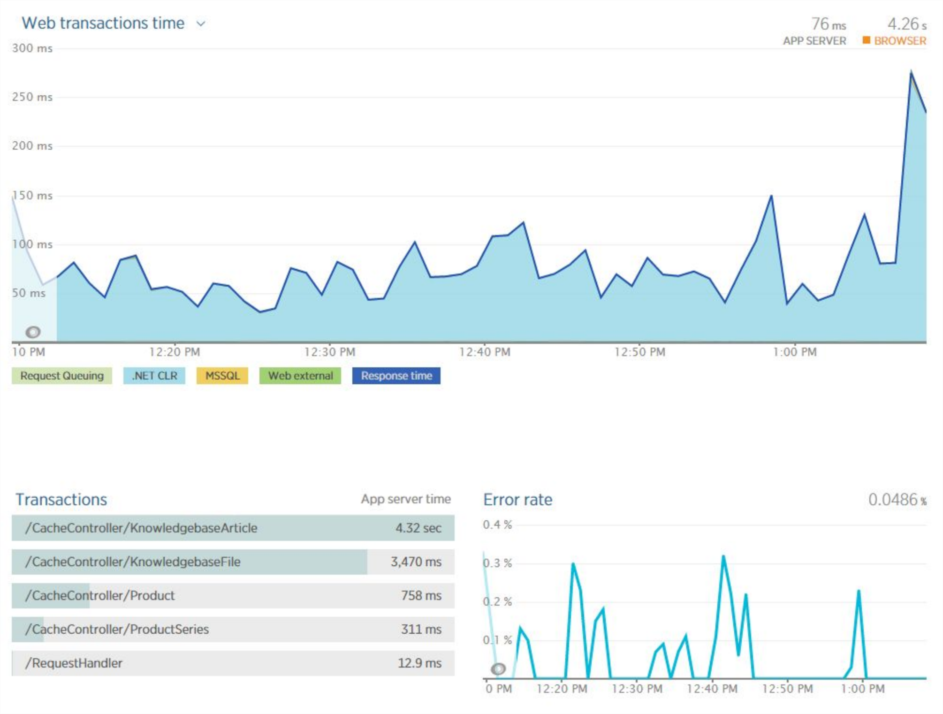
```
var profiler = ApplicationContext.ProfilingLogger;
using (profiler.DebugDuration<UmbracoTemplatePage>("Find all blog articles - Broad XPath"))
{
    var xpath = "//BlogArticle";
    blogArticles = Umbraco.TypedContentAtXPath(xpath).ToList();
}
```

Timing in Umbraco Log:

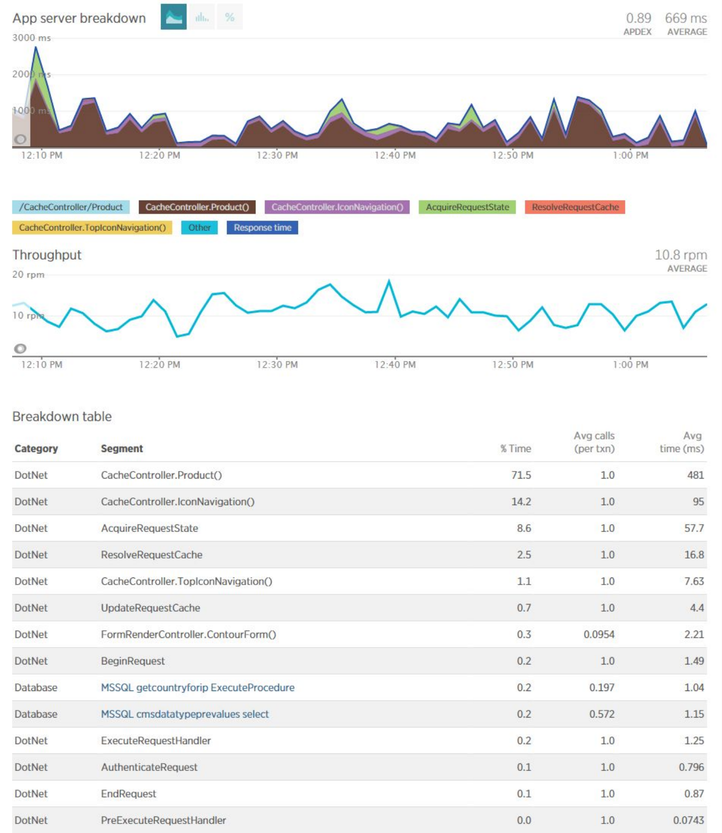


```
2017-03-14 01:30:55,765 [P412/D2/T11] DEBUG Umbraco.Web.Mvc.UmbracoTemplatePage - Find all blog articles - ContentService
2017-03-14 01:30:57,096 [P412/D2/T11] DEBUG Umbraco.Web.Mvc.UmbracoTemplatePage - Complete (took 1331ms)
```

NewRelic



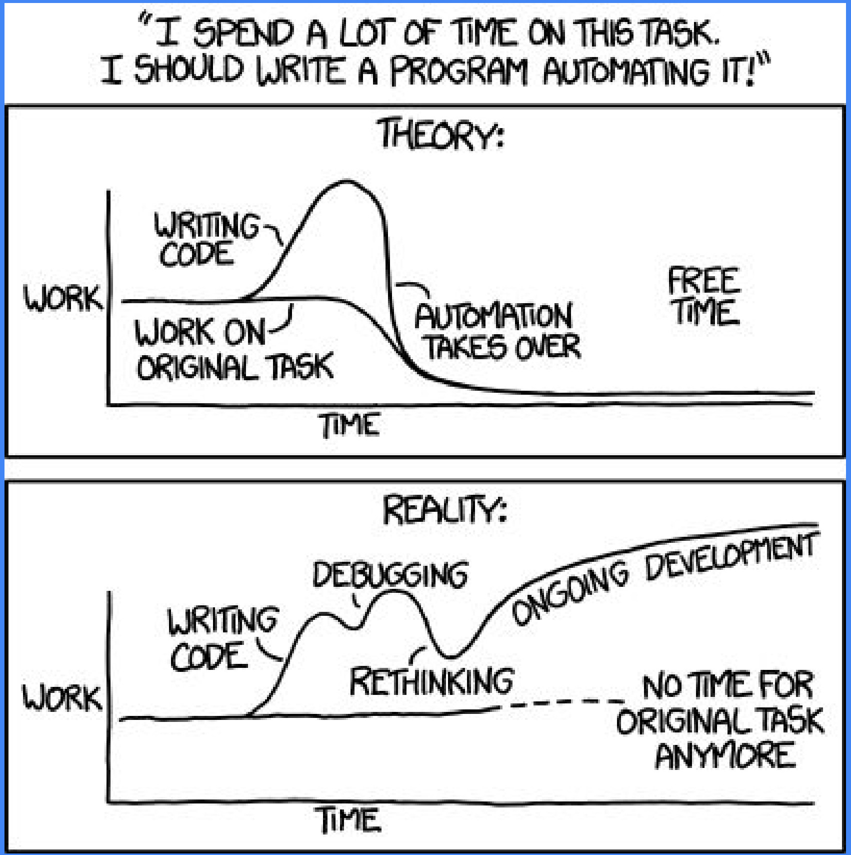
Transactions	App server time
/CacheController/KnowledgebaseArticle	4.32 sec
/CacheController/KnowledgebaseFile	3,470 ms
/CacheController/Product	758 ms
/CacheController/ProductSeries	311 ms
/RequestHandler	12.9 ms



Breakdown table

Category	Segment	% Time	Avg calls (per txn)	Avg time (ms)
DotNet	CacheController.Product()	71.5	1.0	481
DotNet	CacheController.IconNavigation()	14.2	1.0	95
DotNet	AcquireRequestState	8.6	1.0	57.7
DotNet	ResolveRequestCache	2.5	1.0	16.8
DotNet	CacheController.TopIconNavigation()	1.1	1.0	7.63
DotNet	UpdateRequestCache	0.7	1.0	4.4
DotNet	FormRenderController.ContourForm()	0.3	0.0954	2.21
DotNet	BeginRequest	0.2	1.0	1.49
Database	MSSQL getcountryforip ExecuteProcedure	0.2	0.197	1.04
Database	MSSQL cmsdatatypeprevalues select	0.2	0.572	1.15
DotNet	ExecuteRequestHandler	0.2	1.0	1.25
DotNet	AuthenticateRequest	0.1	1.0	0.796
DotNet	EndRequest	0.1	1.0	0.87
DotNet	PreExecuteRequestHandler	0.0	1.0	0.0743

Roll your own API



Custom API

> *People are often aware that wrapping is a good thing as it adds encapsulation, but are not always aware that wrapping comes with a cost: an added level of abstraction.*
>
> *-- http://wiki.c2.com/?TowerOfVoodoo*

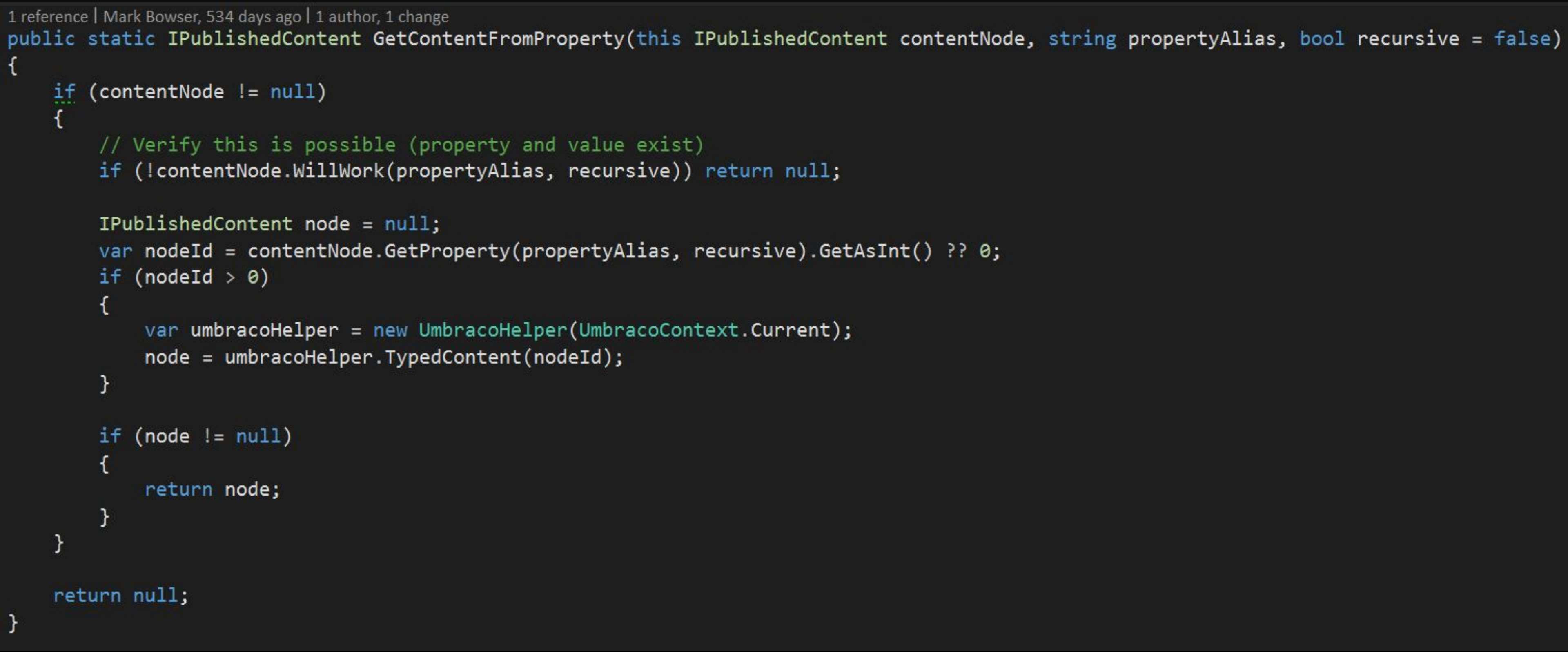
Problem: Duplicate Code / Code in Views

Common solutions:

- Write your own external set of extensions
- Create a “one-size-fits-all” extensions library for all your projects
- Create many “helpers” or “utilities” classes

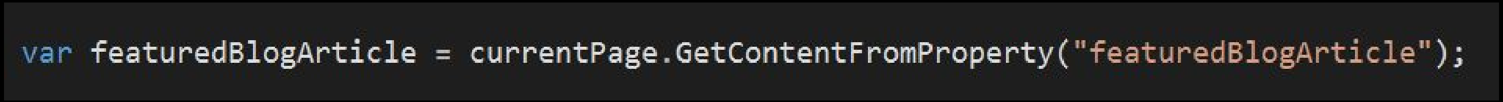
Think about it:

- Other people have to learn this new API.
- Inconsistency
- Documentation?

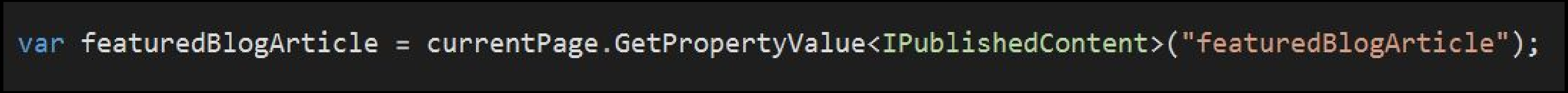


1 reference | Mark Bowser, 534 days ago | 1 author, 1 change

```
public static IPublishedContent GetContentFromProperty(this IPublishedContent contentNode, string propertyAlias, bool recursive = false)
{
    if (contentNode != null)
    {
        // Verify this is possible (property and value exist)
        if (!contentNode.WillWork(propertyAlias, recursive)) return null;

        IPublishedContent node = null;
        var nodeId = contentNode.GetProperty(propertyAlias, recursive).GetAsInt() ?? 0;
        if (nodeId > 0)
        {
            var umbracoHelper = new UmbracoHelper(UmbracoContext.Current);
            node = umbracoHelper.TypedContent(nodeId);
        }

        if (node != null)
        {
            return node;
        }
    }

    return null;
}
```



```
var featuredBlogArticle = currentPage.GetContentFromProperty("featuredBlogArticle");
```



```
var featuredBlogArticle = currentPage.GetPropertyValue<IPublishedContent>("featuredBlogArticle");
```

Example: Custom GetPropertyValue

We found someone’s crazy implementation that:

- In a .dll dependency without source
- Would try to localize content unnecessarily
- Would traverse the whole content tree
- Many layers deep. A box of mystery

Solutions

- Include the source in the repository (actual version used)
- Make sure you are using the Umbraco API as intended.
    - ModelsBuilder
    - PropertyValueConverters

HELLO
MY NAME IS
What Not To Do

Resources

- Umbraco: Common Pitfalls
  - https://our.umbraco.org/documentation/reference/Common-Pitfalls/
- Umbraco.tv
  - http://umbraco.tv/
- Umbraco Training
  - https://umbraco.com/training/
- 24 Days in Umbraco
  - http://24days.in/umbraco-cms/
- Skrift.io
  - http://skrift.io/

Contact Us

PROWORKS

ProWorks Corporation - Umbraco Gold Partner
contact@proworks.com

Jason Prothero
jason@proworks.com

Mark Bowser
mark@proworks.com