



POLISH-JAPANESE ACADEMY
OF INFORMATION TECHNOLOGY

Content Management Systems (CMS)

Lecture 05: Content Management Systems - presentation of popular solutions (2)

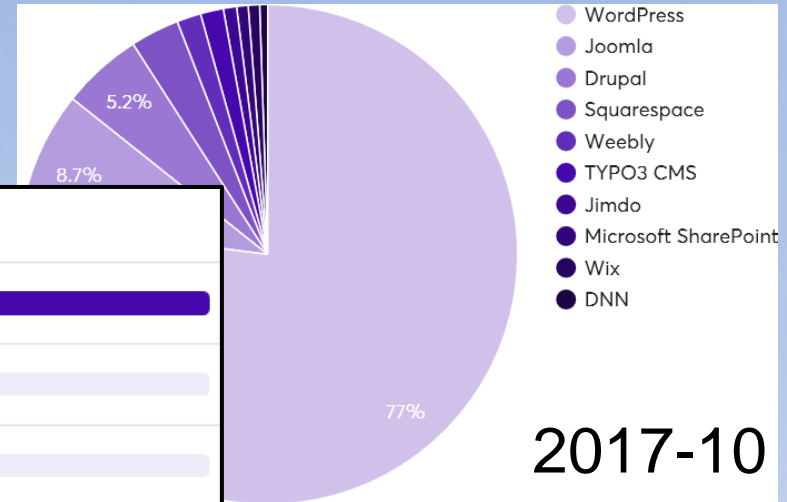
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Agenda

Continued from the previous lecture

CMS popularity according to Wappalyzer (plugin for browsers)



Technology	Market share
WordPress	83%
Drupal	4%
Joomla	4%
Wix	2%
Squarespace	2%
1C-Bitrix	2%
Microsoft SharePoint	1%
TYPO3 CMS	1%
Weebly	0.6%
Tilda	0.6%

2021-09

<https://www.wappalyzer.com/categories/cms>

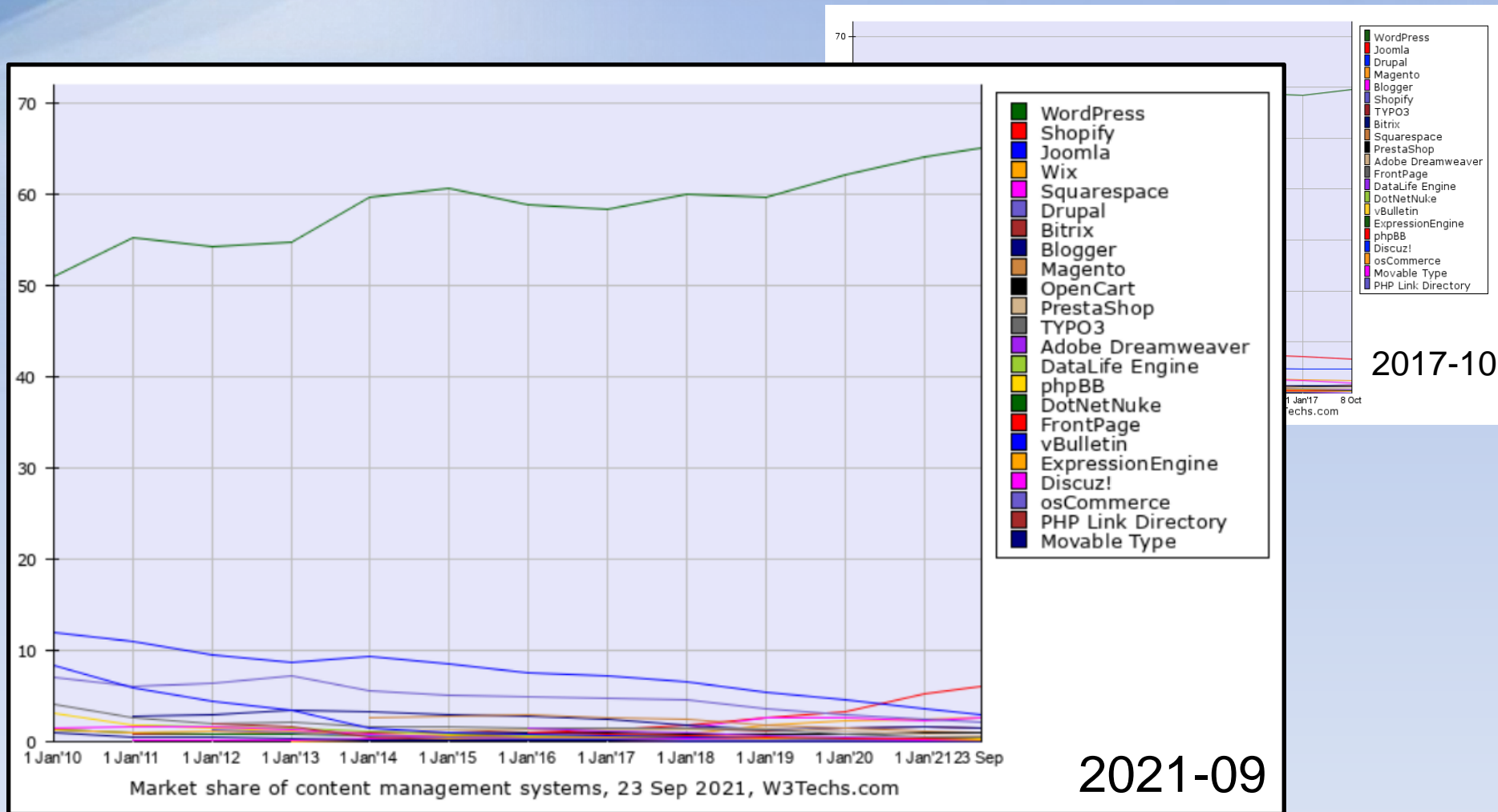
The systems used by the most popular websites by W3Techs

- W3Techs analyzes 10,000,000 of most popular online sites according to Alexa service.
- Approximately:
 - 34.7% in 2021-09,
 - 39.4% in 2020-10,
 - 52% in 2017-10,
 - 71% in 2013-01sites use a custom/unknown solution.

source:

https://w3techs.com/technologies/overview/content_management/all

Market shares according to w3techs.com

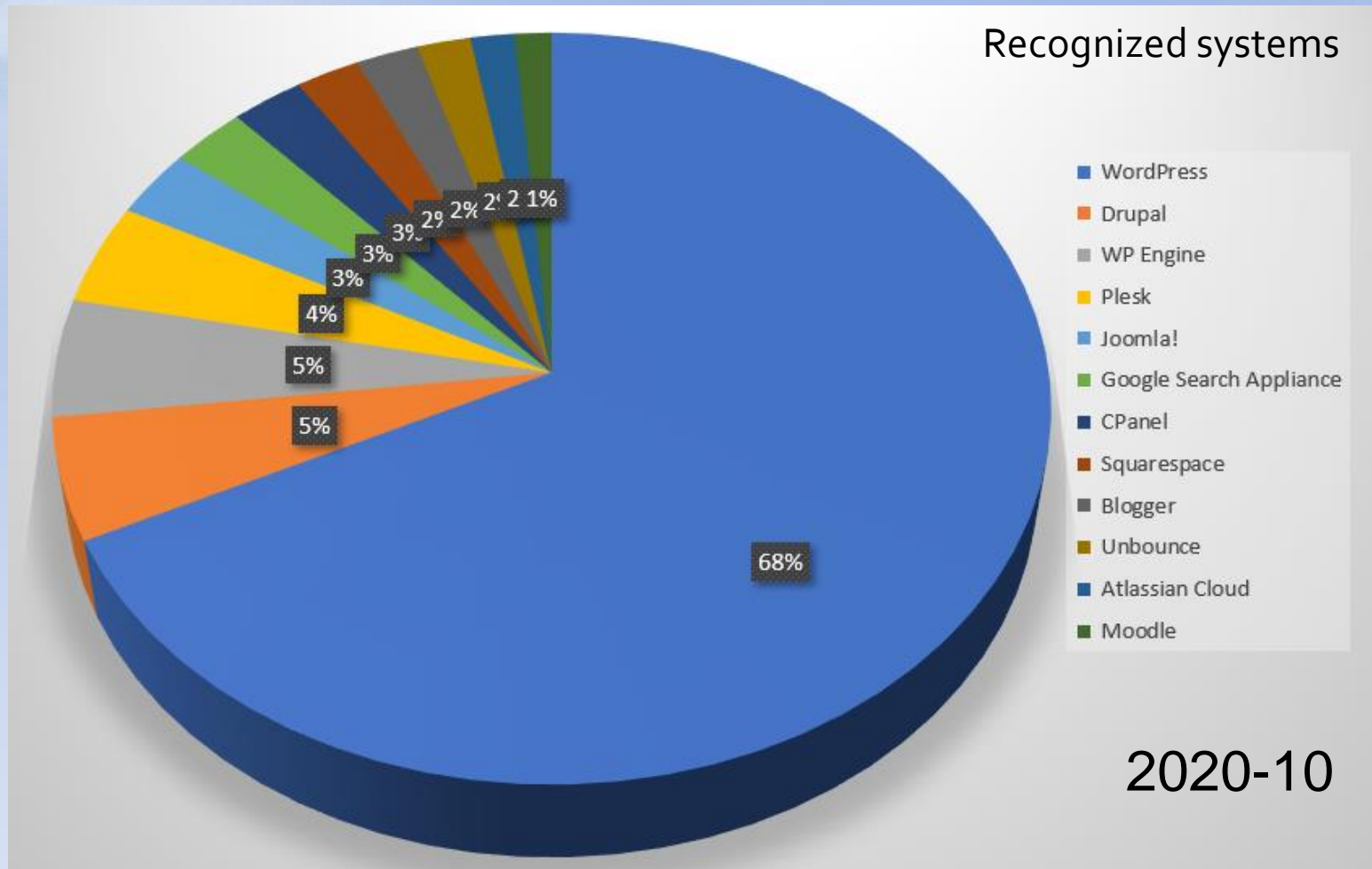


http://w3techs.com/technologies/history_overview/content_management/ms/y

The systems used by the most popular websites by BuiltWith

- BuiltWith is another service that explores the popularity of web technologies.
- The most popular websites (1 million, 100k and 10k) were analyzed on the Internet by Quantcast.
- Custom systems:
 - top 1 000 000 sites: 49%,
 - top 100 000 sites: 61%,
 - top 10 000 sites: 65%.

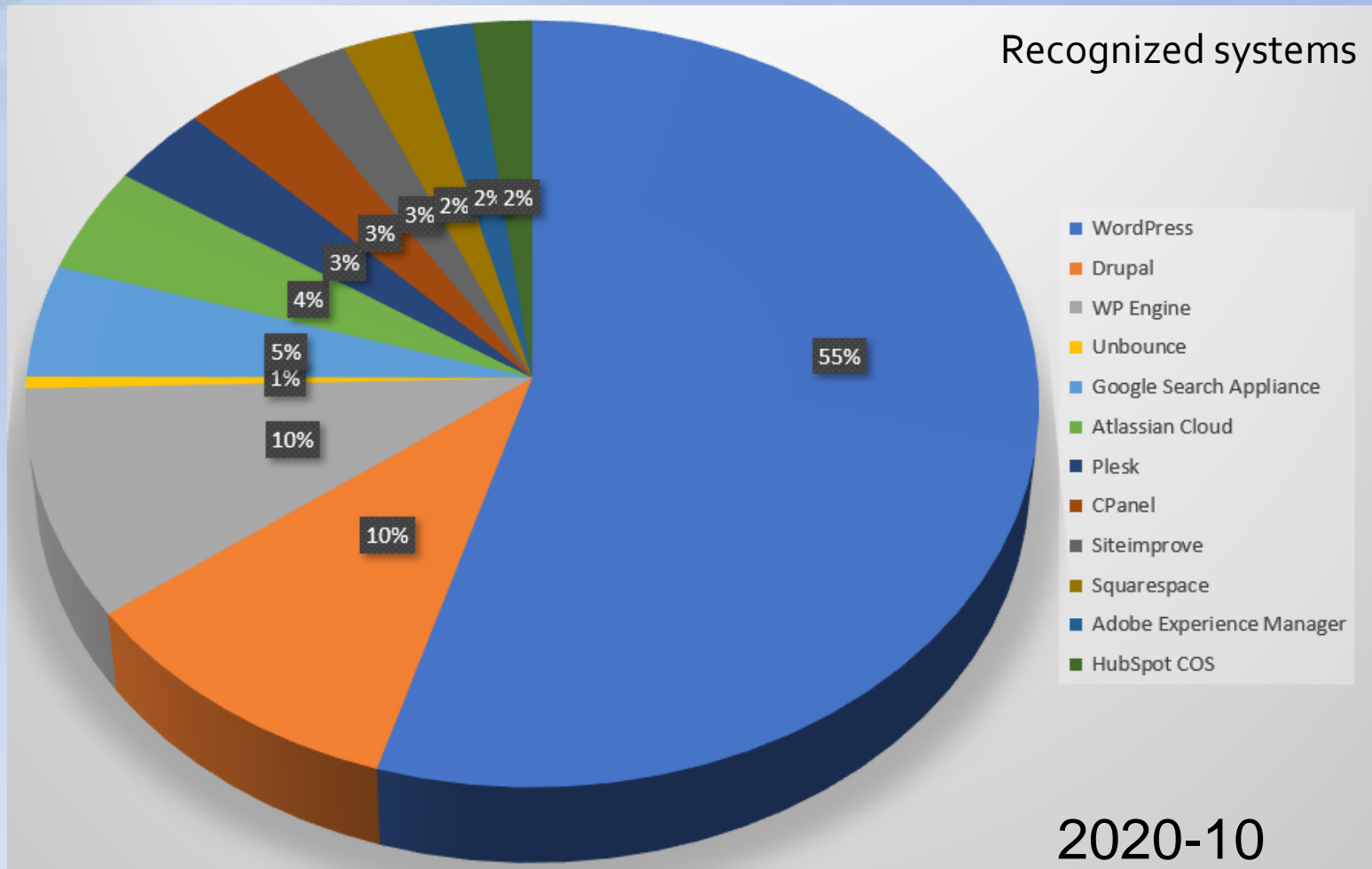
Market shares for 1 000 000 websites



Unknown systems: 49%

<http://trends.builtwith.com/cms>

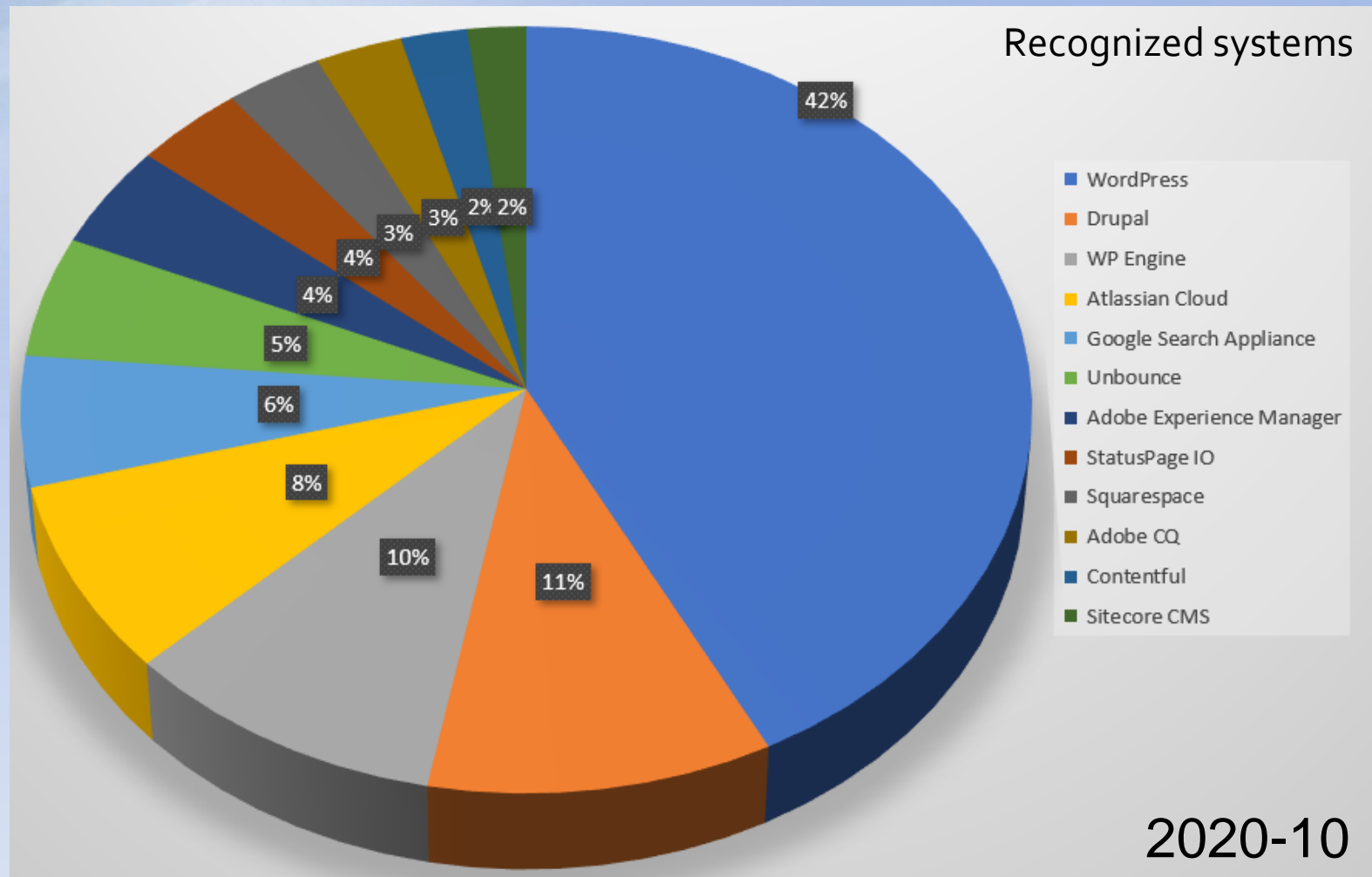
Market shares for 100 000 websites



Unknown systems: 61%

<http://trends.builtwith.com/cms>

Market shares for 10 000 websites



Unknown systems: 65%

<http://trends.builtwith.com/cms>

Service offer for individual CMS

CMS	Guru.com
WordPress	110 296
Joomla!	28 039
Drupal	16 560
Squarespace	1 647
Moodle	1 384
DotNetNuke	1 233
Umbraco	521
MODx	500
Liferay	352
TYPO3	246
Concrete5	205
Alfresco	201
Unbounce Landing Pages	187
Plone	119
Xoops	75
Movable Type	37

Comments

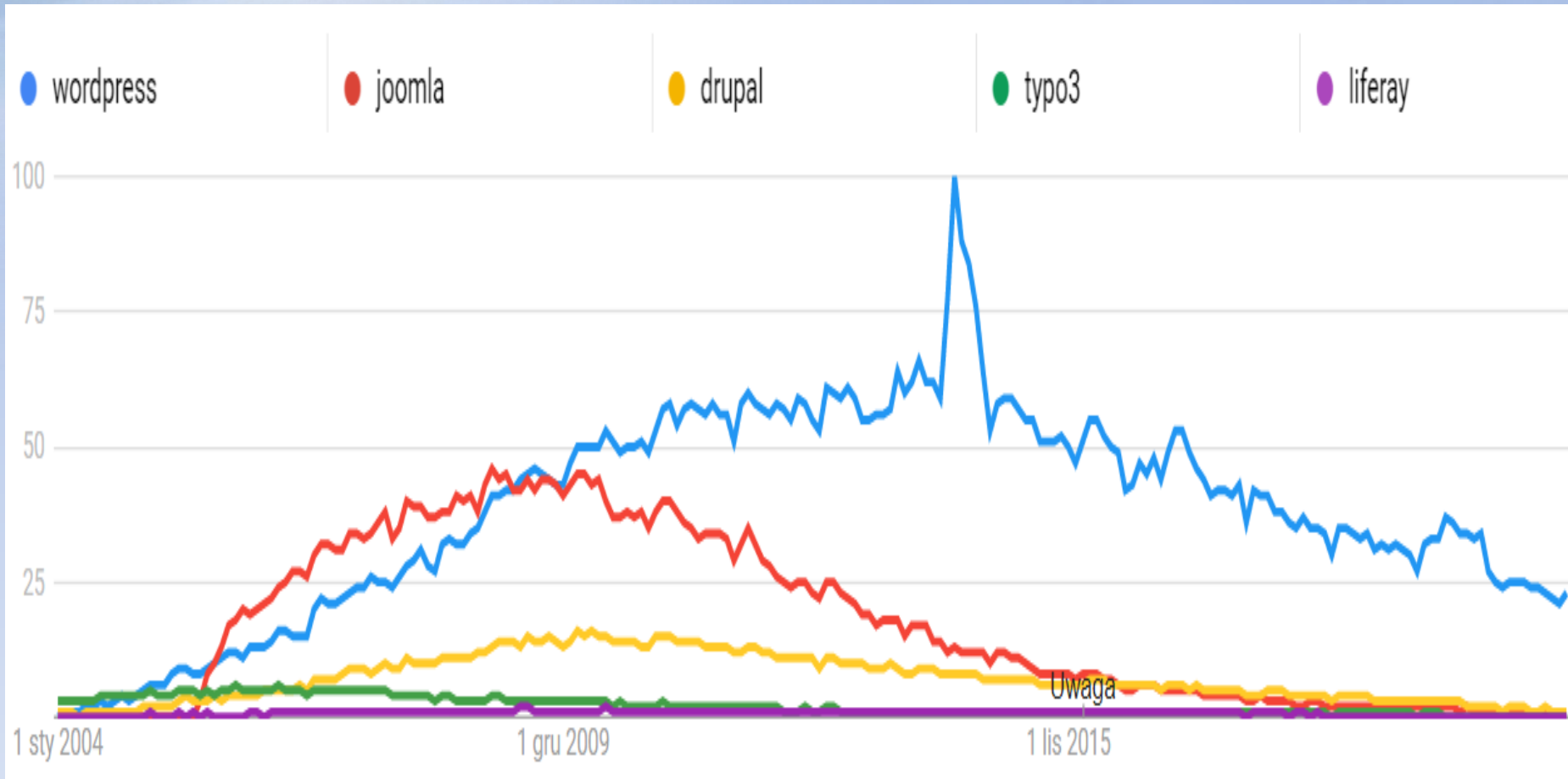
Guru (over 100,000 contractors) is a site that associates principals with contractors (usually freelancers).

Source: own study 2020-10

Popularity by search engines (Google, Yahoo!, Bing)

- Results for individual keywords:
 - *content management system*
 - *open source content management system*
 - *open source cms*
 - *cms*
 - *web cms*
 - *web content management system*
- Currently, this method is not very reliable because:
 - the results of articles on this subject are often returned (rather than particular CMSs),
 - search history affects results.

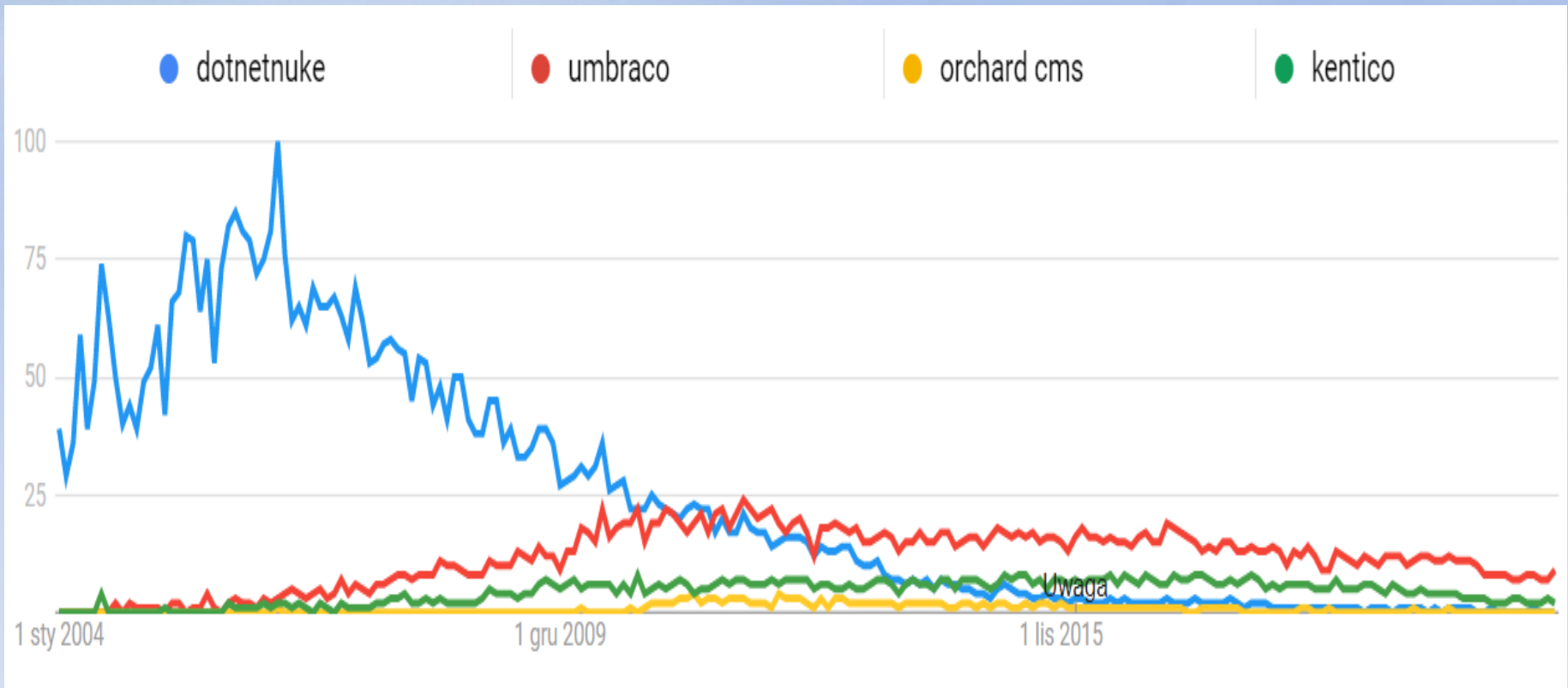
Popularity by Google Trends



Popularity [by Google Trends: 2004 - 2021](#)

Popularity by Google Trends (2)

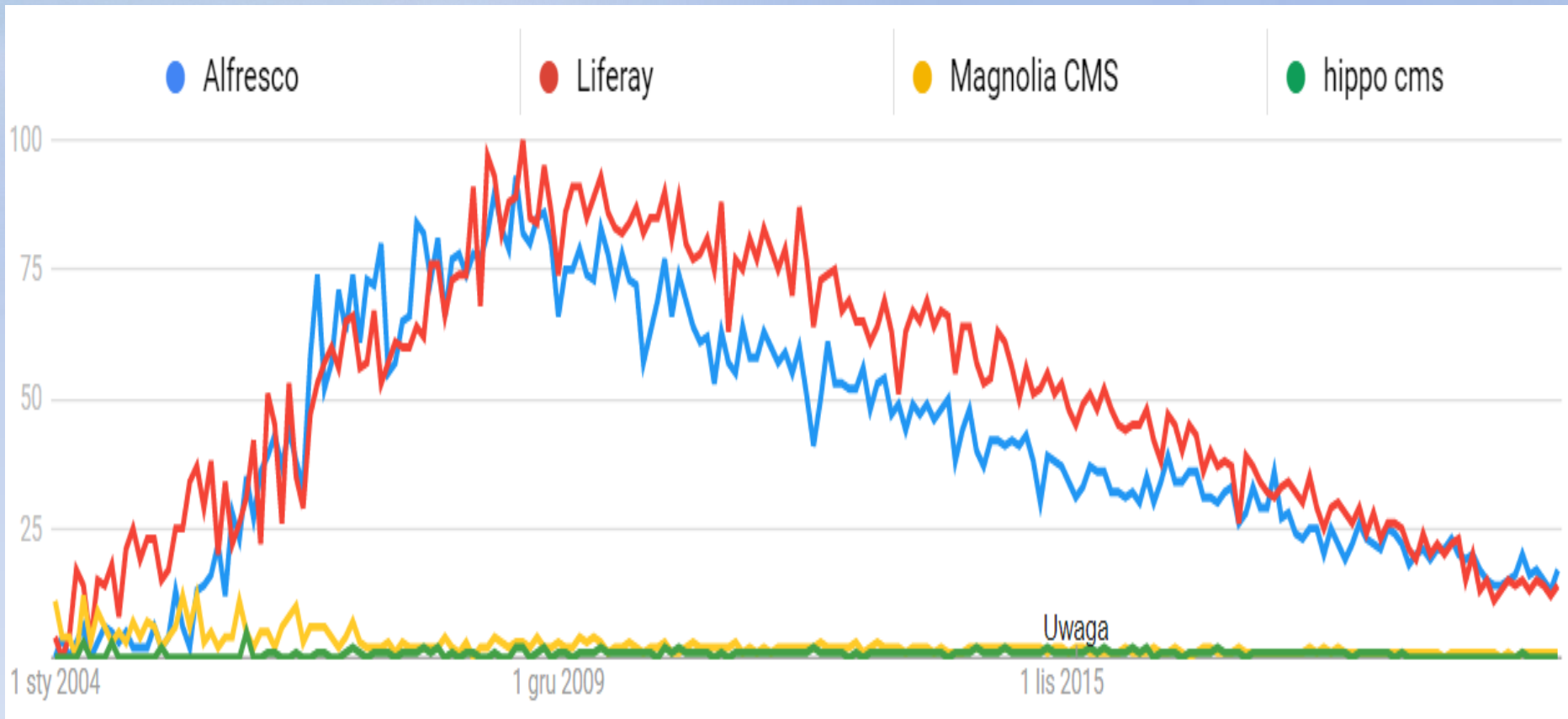
● .NET systems



Popularity by [Google Trends: 2004 - 2021](#)

Popularity by Google Trends (3)

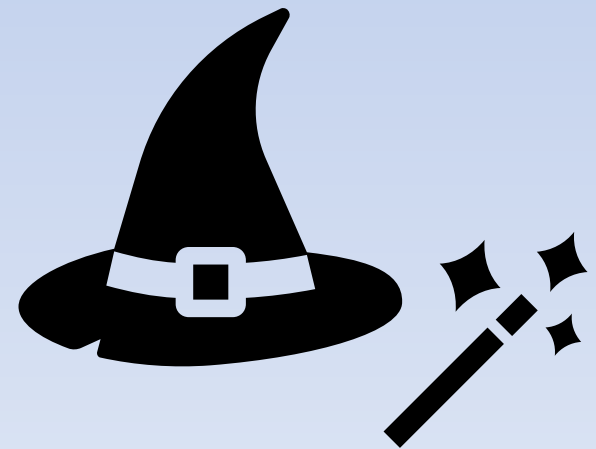
● Java systems



Popularity by [Google Trends: 2004 - 2021](#)

Website creators

- We usually get dedicated hosting;
- Quite limited functionality;
- Very easy to use;
- Most solutions are paid (subscription), but some have a free or trial plan (limited);
- Popular features / functionalities:
 - portfolio ("business card"),
 - simple online store,
 - contact form,
 - easy template changes,
 - integration with your own domain,
 - consultant support.



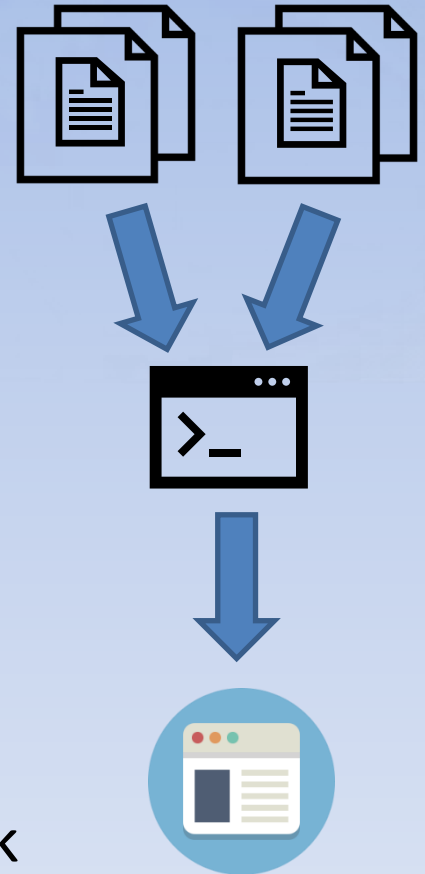
Website creators (2)

● Popular solutions

- [Squarespace](#). Paid but with a trial period;
- [WiX](#). Quite powerful;
- [Weebly](#). Business oriented;
- [Site123](#). Easy-to-use wizard;
- [Strikingly](#). Creator oriented (portfolio) with sales support;
- [Jimdo](#). Dedicated to small businesses;
- [Webnode](#). Dedicated to small businesses;
- [Imcreator](#). Support in the sale of services and goods.
More info: <https://www.websitebuilderexpert.com/website-builders/free/>

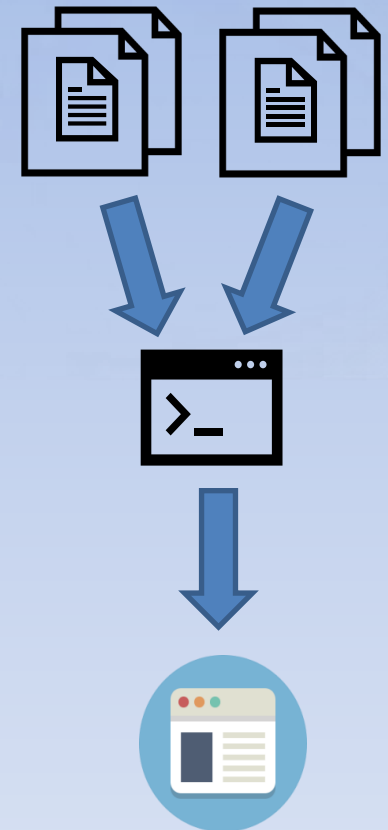
New trends: Flat-file/file-based CMS, static site generators

- All portal content is generated by the administrator into HTML / CSS / JavaScript files;
- Then it is published and available to the audience;
- Possibility of placing on a CDN (Content delivery network), which significantly speeds up access to files;
- Rather intended for advanced users (e.g. developers);
- Sometimes there are GUI tools to make your work easier;
- Often the approach is referred to as JAM Stack (Javascript - APIs - Markup).



New trends: Flat-file CMSs (2)

- During consumption (browsing), it does not require running the code, connecting to the database, etc.;
- Very simple (cheap) hosting. No need to run program code or a database.
- Stability (no programming errors).
- Content versioning could be achieved with file changes (e.g. GitHub).



Flat-file CMSs

- Not so new, because the very beginning of the web was static HTML pages.
- Dynamic page problems:
 - Greater vulnerability to hacking (code execution);
 - Scalability requires, among others, changes to the web and / or database server;
 - The cache is not always the perfect solution (and it is still much slower than a "flat" HTML file);

Source: [Why Static Site Generators Are The Next Big Thing](#)

Flat-file CMSs (2)

- Problems of dynamic pages - *cont.*
 - Performance: A simple experiment showed that "statically generated" Smashing Magazine portal, stored on the CDN improved performance by 600%;
 - Reliability / constancy of urls: the system, generating a response, may return different content;
 - More demanding hosting that allows you to run code (PHP / Java / C #) on the server side.

Wykorzystano: [Why Static Site Generators Are The Next Big Thing](#)

Flat-file CMSs (3)

- Disadvantages of file CMSs:
 - only for advanced users who like working with the command console;
 - functionality problems that require running code; sometimes this can be solved by using external services and / or by running code (JavaScript) on the client, e.g. sorting content by date or filling a contact form;

Flat-file CMSs (4)

- Disadvantages of file CMSs – *cont.*:
 - problems with searching of the portal by users (no code and DB running);
 - difficult content editing; sometimes you can use an on-line editor in the repository of content files (e.g. GitHub);
 - the generation process can be quite long (problem with a small "quick" change), e.g. when you need to update links throughout the portal;

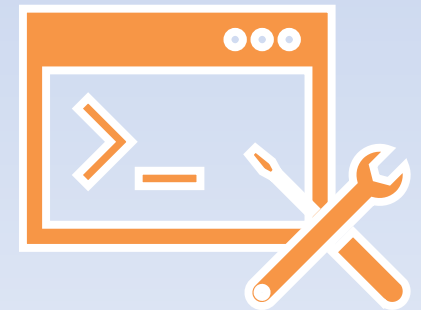
Flat-file CMSs - structure

- Template engine enabling the development of a coherent portal structure; sometimes they also have support for programming languages;
- Quite extensive hierarchy of files / directories;
- Popular use of the *Markdown* syntax (e.g. utilized on the GitHub platform);
- Specific metadata definition, e.g. at the beginning of the document as plain text;

Flat-file CMSs – structure (2)

● Extensive toolkit (console):

- resources compilation;
- transpiling (e.g. TypeScript → JavaScript);
- minification;
- bundling;
- popular packages for processing / generating files are often used, e.g. *Grunt*, *Gulp*, *Broccoli*.



Popular flat-file/file-based CMS, static site generators

- [Droplets](#) (free),
- [Grav](#) (free),
- [Hugo](#) (free),
- [Jekyll](#) (free),
- [Kirby](#) (paid),
- [Middleman](#) (free),
- [Monstra](#) (free),
- [Pico](#) (free),
- [Publii](#) (free),
- [Roots](#) (free),
- [Statamic](#) (free).

The screenshot displays the Grav Admin Dashboard. The top navigation bar includes 'GRAV ADMIN', 'Dashboard', 'Clear Cache', and 'Check for Updates'. The user profile for 'Johnny Appleseed, Site Administrator' is visible. The left sidebar lists navigation options: Dashboard, Configuration, Pages (12), Plugins (15), Themes (1), and Logout. The main content area features a 'Maintenance' section with a '100% updated' status and a '13 days' 'Last Backup' timer, along with a 'Backup' button. A 'Statistics' section shows a bar chart with values for 'Today' (1), 'Week' (3), and 'Month' (3). A red warning banner states: 'This is a Beta release! Use this in production at your own risk...'. Below this is a 'Latest Page Updates' table with a 'Manage Pages' button. The table lists several pages, all updated '3 weeks ago':

Page Title	URL	Update Time
London Industry at Night	/blog/london-industry	3 weeks ago
Random Thoughts	/blog/random-thoughts	3 weeks ago
Sunshine in the Hills	/blog/sunshine-in-the-hills	3 weeks ago
The Urban Jungle	/blog/the-urban-jungle	3 weeks ago
Just Some Text Today	/blog/just-some-text-today	3 weeks ago
DaringFireball Style Link	/blog/df-link	3 weeks ago
Home	/blog	3 weeks ago

At the bottom, a footer note reads: 'Found an issue? Please report it on GitHub.' and 'Grav version 0.9.38 was made with ❤️ by RocketTheme.'

Popular flat-file CMSs - overview

	Language	Framework Used	Focus	Templating
Hugo	Go	None	General	Hugo Specific
11ty	JavaScript	None	General	Multiple
Jekyll	Ruby	None	General	Liquid
Jigsaw	PHP	Laravel (Partial)	General	Laravel Blade
Middleman	Ruby	Rails (Partial)	General	Multiple
Scully	JavaScript	Angular	Application	Angular Based
Gatsby.js	JavaScript	React.js	CMS	JSX (React)
Gridsome	JavaScript	Vue.js	CMS	Vue.js
Next.js	JavaScript	React.js	Application	JSX (React)
Nuxt.js	JavaScript	Vue.js	Application	Vue.js Based
VuePress	JavaScript	Vue.js	Documentation	Markdown/Vue.js Based
Docusarus	JavaScript	React.js	Documentation	JSX (React)
Docsify	JavaScript	Vue.js	Documentation	Markdown/Vue.js Based
Gitbook	SaaS	N/A	Documentation	N/A
Sitesauce	SaaS	N/A	General	N/A
Statamic v3	PHP	Laravel	CMS	Antlers/Laravel Blade

Source: <https://www.ample.co/blog/questions-to-ask-before-choosing-a-static-site-generator>

Popular flat-file CMSs - overview (2)

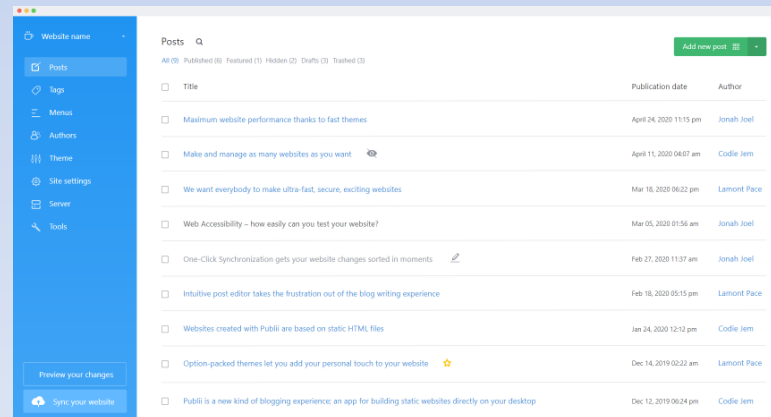
	Hybrid (Sever Side Rendering+SSG)	Data Layer	Default Markdown Flavor	Image Optimization/Transformation
Hugo	⊗	Any	Commonmark	✓
11ty	⊗	Any	Bring Your Own	⊗
Jekyll	⊗	Any	Kramdown	⊗
Jigsaw	⊗	Any	Unspecified	⊗
Middleman	⊗	Any	Unspecified	✓
Scully	⊗	Any	Bring Your Own	⊗
Gatsby.js	✓	GraphQL	Unspecified	✓
Gridsome	⊗	GraphQL	Unspecified	✓
Next.js	✓	Any	Bring Your Own	⊗
Nuxt.js	⊗	Any	Bring Your Own	⊗
VuePress	⊗	Any	Unspecified	⊗
Docusarus	⊗	Any	GitHub Flavored Markdown	⊗
Docsify	⊗	Any	Unspecified	⊗
Gitbook	⊗	Any	Unspecified	⊗
Sitesauce	⊗	Any	N/A	⊗
Statamic v3	✓	Any	Unspecified	✓

Source: <https://www.ample.co/blog/questions-to-ask-before-choosing-a-static-site-generator>

Popular static-site generator: Publii

<https://getpublii.com/>

- Dedicated desktop application (MacOS, Windows, Linux) for convenient editing and management;
- Uses [Handlebars](#) as a template language;
- Local content storage in SQLite database;
- Easy synchronization/publication of generated pages (HTML5/CSS3/JS);
- Optional AMP (Accelerated Mobile Pages) generation.
- Good documentation;
- Project in development phase, currently no plugins available.



Popular flat-file CMS: Gatsby

<https://www.gatsbyjs.com/>

- Uses Node.js and React.js;
- Getting data from various sources using GraphQL;
- Progressive Web Applications (PWAs) are generated.
- A large number of plugins (2000+) and an extensive community;
- Good documentation;
- Getting started with learning can be difficult;
- Not very fast page generation.

Source: [Static Site Generators Overview](#)

Popular flat-file CMS: Hugo

<https://gohugo.io/>

- Written in the Go language;
- Fast page generation;
- Uses templates from the Go language;
- Very easy setup;
- Lots of built-in functionality;
- Good documentation;
- No XML support; uses YAML, JSON and CSV.

Source: [Static Site Generators Overview](#)

Popular flat-file CMS: Jekyll

<https://jekyllrb.com/>

- Written in Ruby;
- Easy and free hosting on GitHub ([GitHub Pages](#));
- Built-in web server facilitating work;
- Uses *Markdown* for content creation, Liquid templates, and a Sass preprocessor (CSS);
- Lots of plugins (generator level) and helpful community;

Source: [Static Site Generators Overview](#)

Popular flat-file CMS: Jekyll (2)

<https://jekyllrb.com/>

- Easy setup;
- Good documentation;
- Good SEO support;
- Pretty slow page generation;
- Additional GUI tools for easy management;
- Sample site for self-experimentation, such as *Justice* ([GitHub](#)).

Wykorzystano: [Static Site Generators Overview](#)

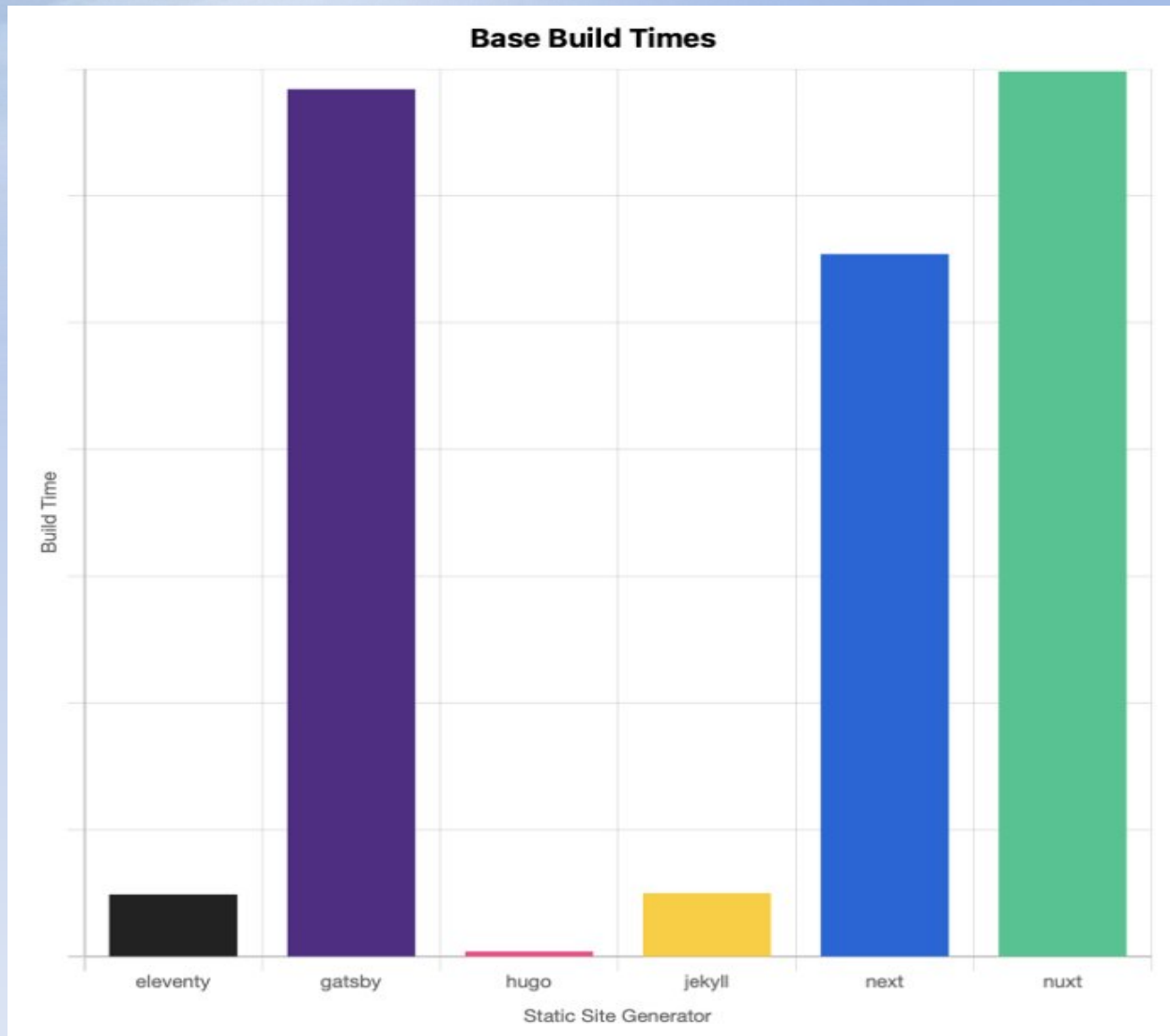
Flat-file CMSs: performance

- Different technologies (e.g. Ruby, Go, JavaScript) affect the performance.
- The test procedure:
 - time of processing / generating ***a single file***;
 - ***a small site*** with 1 - 1024 files; with each generation, the number of files was doubled: 1, 2, 4, 8, 16, 32, ..., 1024;
 - ***large site*** with 1,000 - 64,000 files; with each generation, the number of files was doubled: 1k, 2k, 4k, 8k, 32k, 64k.

Source: <https://css-tricks.com/comparing-static-site-generator-build-times/>

Flat-file CMSs: performance (2)

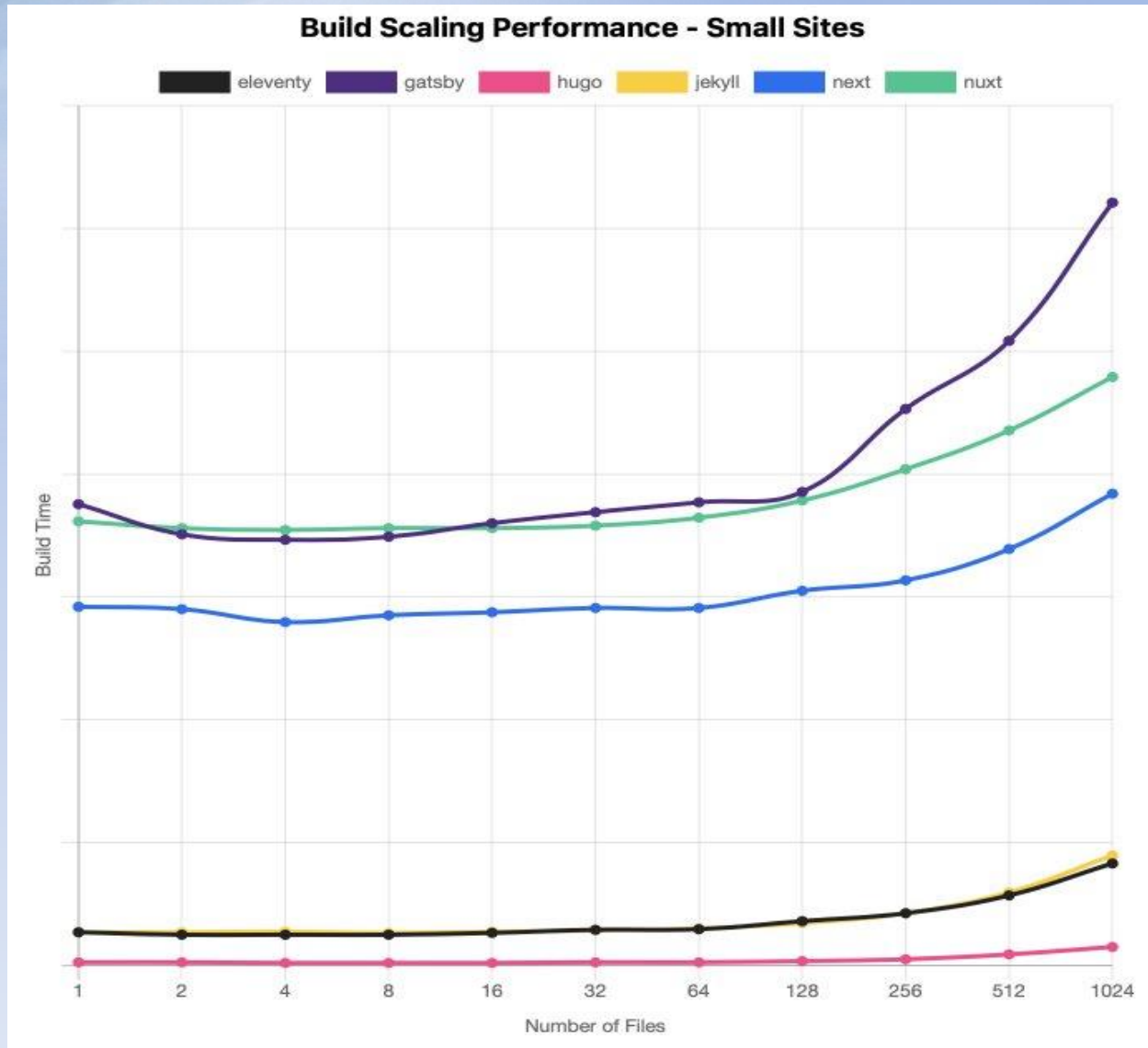
Source: <https://css-tricks.com/comparing-static-site-generator-build-times/>



Less = better

Flat-file CMSs: performance (3)

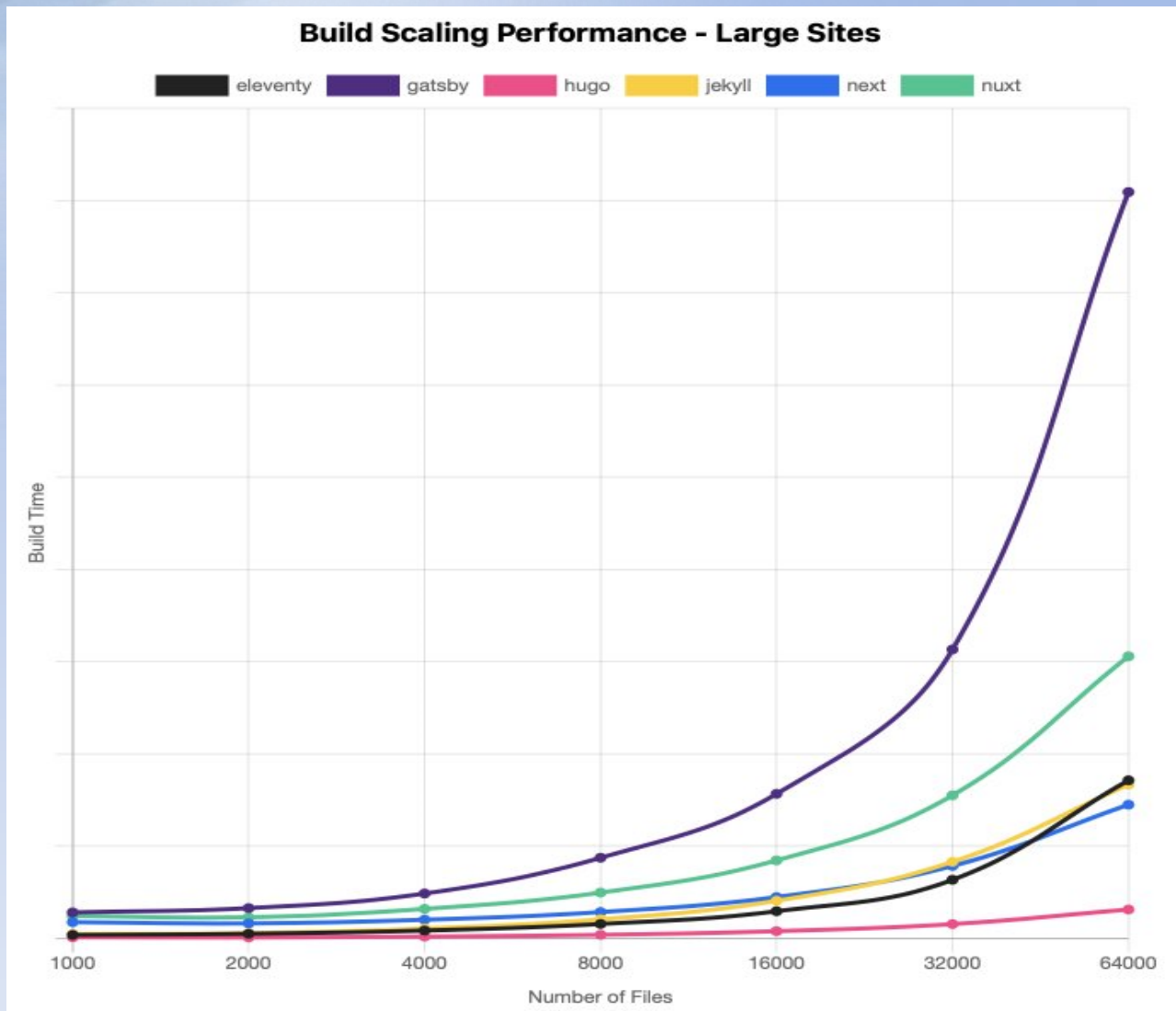
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Less = better

Flat-file CMSs: performance (4)

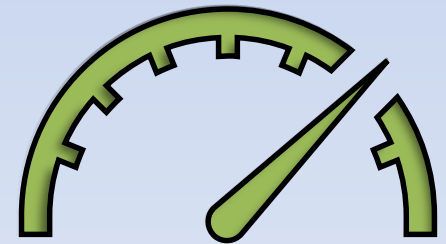
Source: <https://css-tricks.com/comparing-static-site-generator-build-times/>



Less = better

Flat-file CMSs: performance (5)

- Hugo was the fastest, no matter how many files to process;
- None of the tested CMSs scales linearly;
- Slower CMSs have more possibilities, e.g. more plugins.



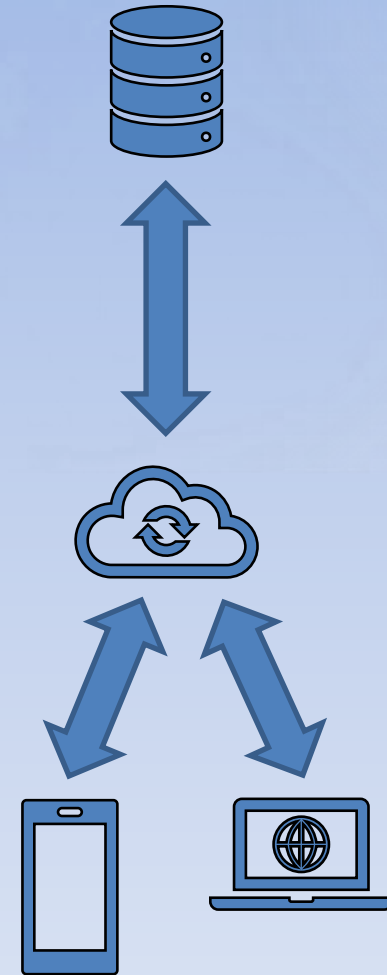
Source: <https://css-tricks.com/comparing-static-site-generator-build-times/>

Flat-file CMSs – more info

- [Mike Neumegen: Jekyll For WordPress Developers](#). Smashing Magazine.
- [Stefan Baumgartner: Using A Static Site Generator At Scale: Lessons Learned](#)
- [Why Static Website Generators Are The Next Big Thing](#)
- [Mathias Biilmann Christensen: Static Website Generators Reviewed: Jekyll, Middleman, Roots, Hugo](#).

New trends: *Headless/decoupled/API first CMS*

- Similar to classic CMS, but we don't have a built-in GUI for the end-user;
- Sometimes there is a GUI for administrators (e.g. CRUD) to manage and create content;
- Ability to perform operations using REST API;
- A client, e.g. a JavaScript application or a native mobile application (e.g. Android), is used to display the content to end-users.



Popular Headless CMSs

- [Built.io \(Contentstack\)](#),
- [ButterCMS](#),
- [Cloud CMS](#),
- [Contentful](#),
- [Directus](#),
- [DNN Evoq 9](#),
- [dotCMS](#),
- [Elemeno](#),
- [GraphCMS](#),
- [NetlifyCMS](#),
- [Prismic](#),
- [Squidex](#),

- [Strapi](#),
- [WordPress REST API](#)

The screenshot displays the Contentful website's landing page. At the top, the Contentful logo is on the left, and navigation links for 'Not a developer', 'Features', 'Pricing', 'Docs & Help', 'About us', 'Contact', and 'Log In' are on the right. A 'Try for free' button is also present. The main headline reads 'Editors get a CMS. Developers don't have to deal with one.' Below this, a sub-headline states 'Contentful is the essential content management infrastructure for projects of any size, with its flexible APIs and global CDN.' The central part of the image shows a workflow: on the left, a CMS editor interface for 'Ernest Hemingway' with a 'Publish my changes' button and a yellow callout box that says 'This is how you edit your content. Change something and publish your changes.'; in the middle, a dark vertical bar containing a JSON snippet:

```
{  "total": 1,  "items": [    {      "fields": {        "title": "Ernest Hemingway",        "description": "Ernest Miller Hemingway (July 21, 1899 - July 2, 1961) was an American novelist, short story writer, and journalist."      }    }  ]}
```

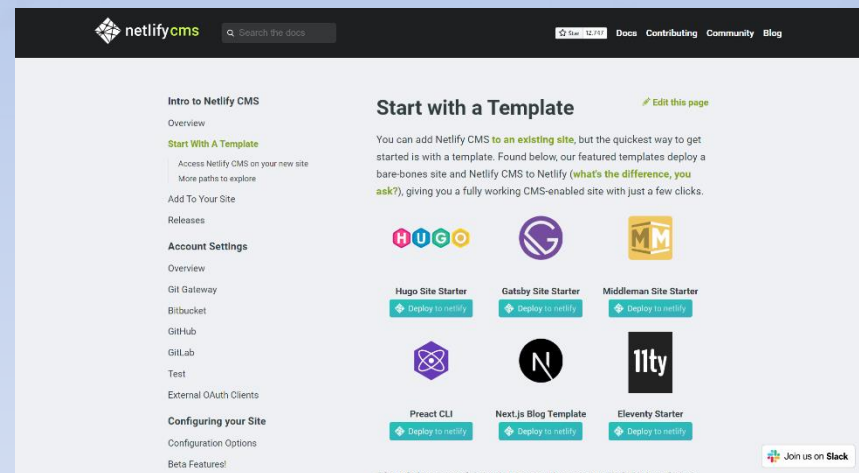
; on the right, a mobile device view showing the rendered content 'Ernest Hemingway' and a light blue callout box at the bottom that says 'Content gets delivered through JSON. You can develop an app for any device to show your content.'

More info:
[34 Headless CMSs to Put on Your Radar](#)

Popular headless CMS: NetlifyCMS

- Open source,
- Optional Netlify.com cloud hosting,
- JavaScript technology with React,
- Possibility of cooperation with static generators, incl. Hugo, Middleman and Gatsby,
- Support for treating

GitHub as a content repository,

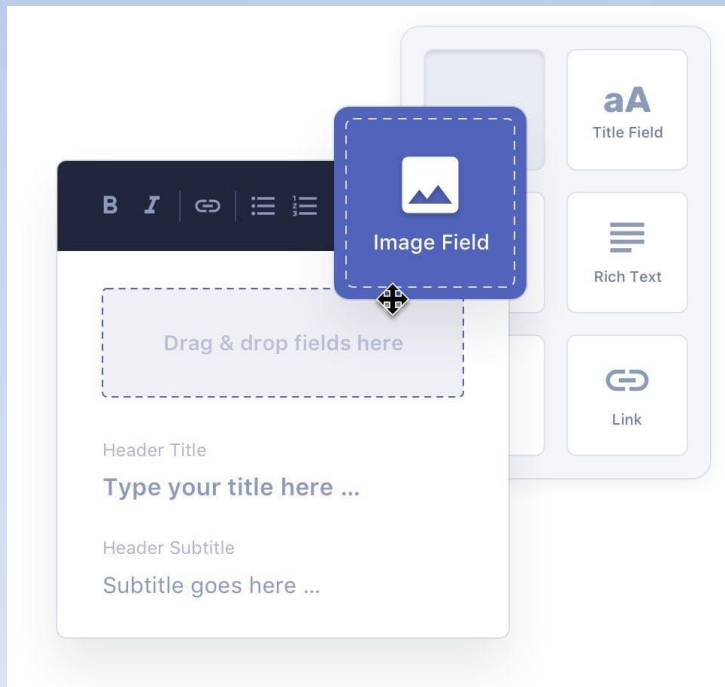


Popular headless CMS: NetlifyCMS (2)

- NetlifyCMS can be treated as a tool that allows you to edit the content (including *Markdown* syntax) and save it to the repository;
- Sample workflow:
 - content editing (e.g. an article) in a simple GUI provided by NetlifyCMS (backend),
 - saving the above-mentioned content in the GitHub repository,
 - automatic rebuilding and publishing of the site by e.g. Gatsby (as static HTML + CSS + JavaScript files).

Popular headless CMS: Prismic

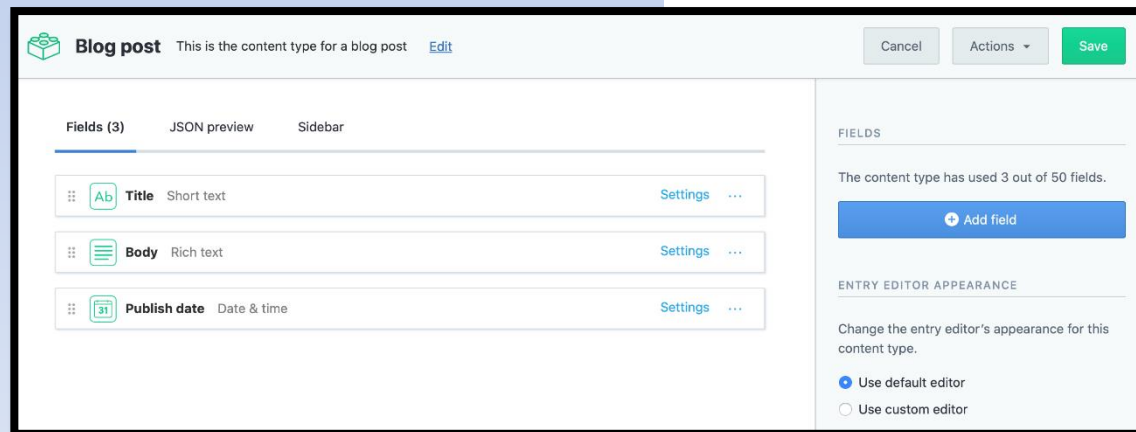
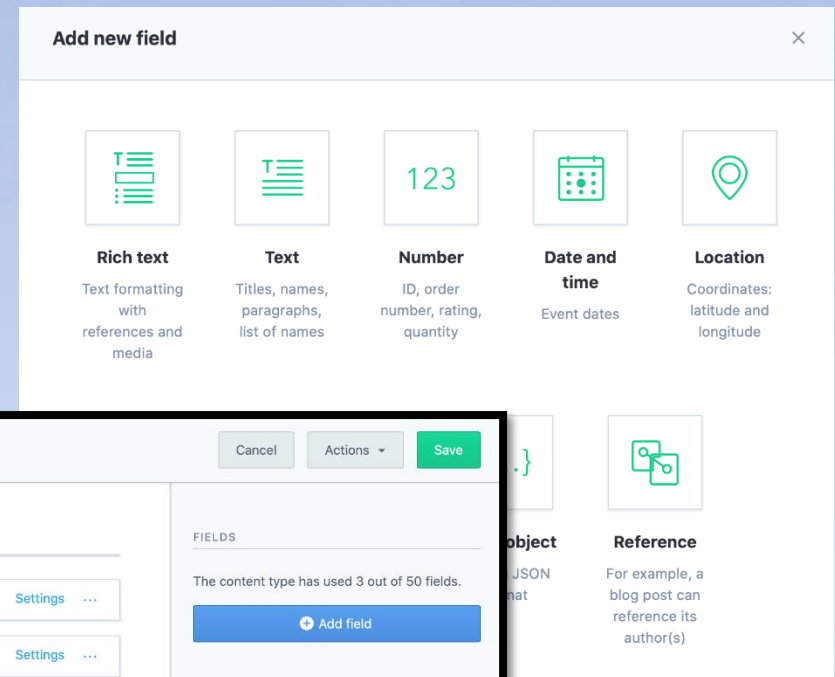
- Modeling your own content types with the possibility of reusing them,



- Support for many libraries/systems, incl. Gatsby, React, Next, Vue,
- Communication using the standard REST API and GraphQL,
- Optional hosting with global CDN servers,
- Dedicated optimization for images ([Imgix](#)).

Popular headless CMS: Contentful

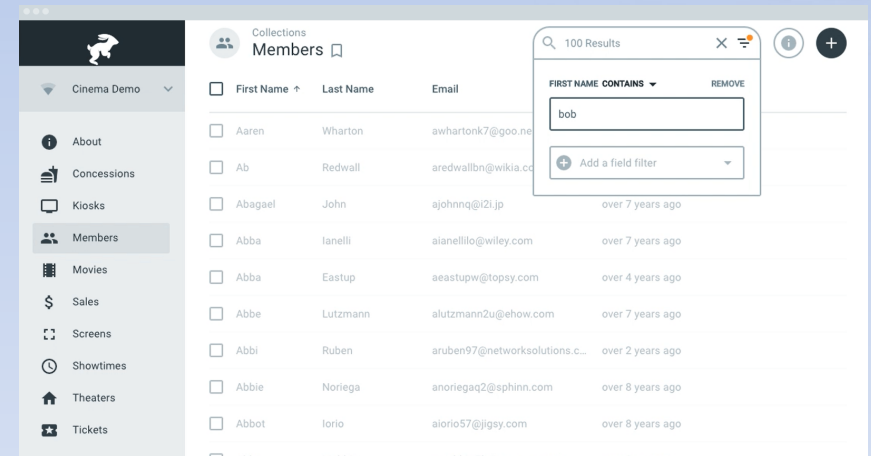
- Free version;
- Technology: Node.js
- Conveniently create custom types of content;
- Support for Google Docs;
- Plugins (HTML + CSS + JS)



Source: <https://www.contentful.com/help/contentful-101/>

Popular headless CMS: Directus

- Free
- PHP technology and backbone.js;
- Convenient CRUD editor;
- Modular and expandable;
- File storage;
- Easy commenting on content;
- Tracking and canceling changes;
- Support for multiple content languages.



Source: [10 Most Popular Headless CMS](#), [11 Headless CMS to Consider](#)

Summary

- Huge selection of different CMS.
- Usually you can find a system that meets most expectations.
- The ability to make changes thanks to the open source code.
- New / alternative approaches are also worth considering.