

Thoughts On Web Development

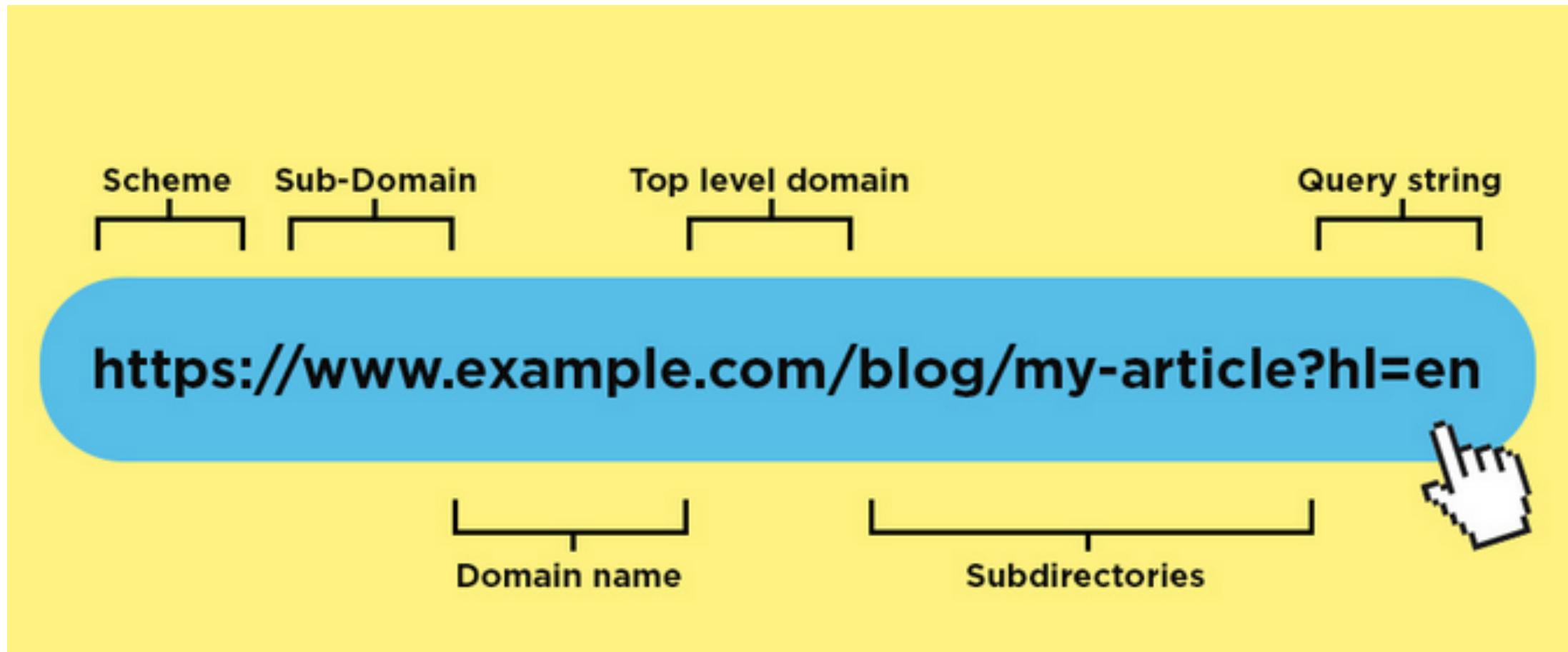
Archit Chandra, Greythink Labs

Disclaimers

Class Rules

Back to Basics

What is a URL?

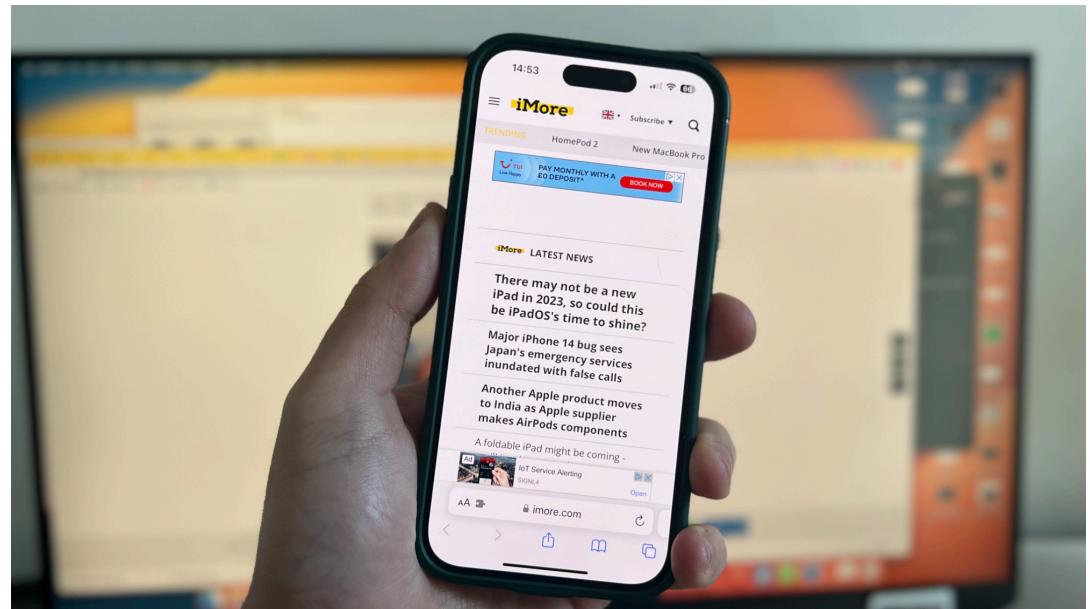
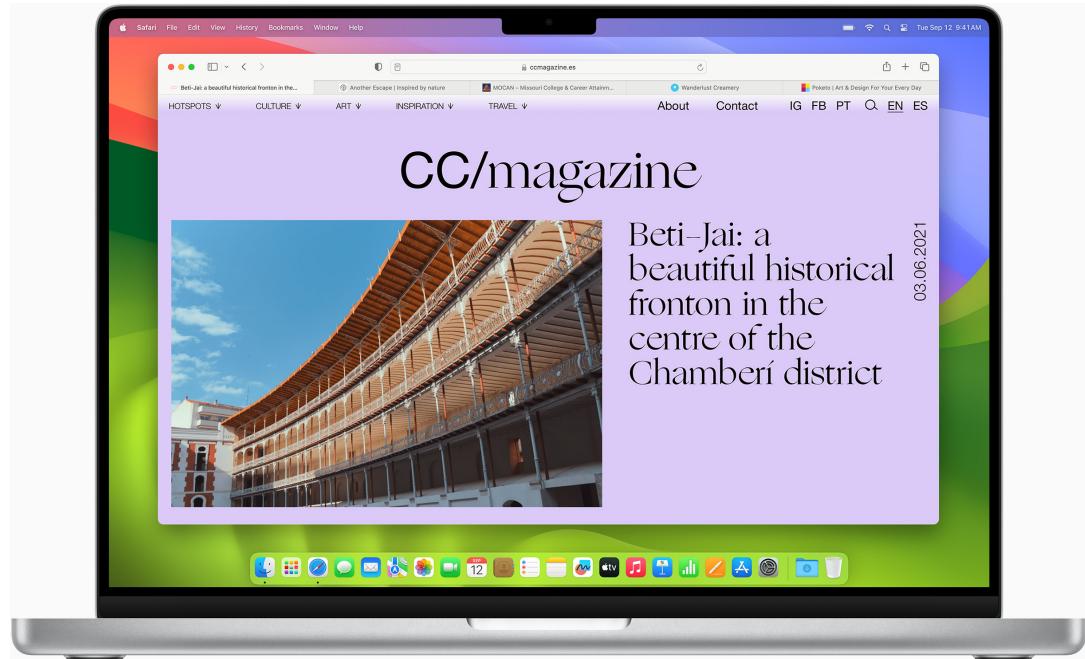


What is a domain? What is hosting? What is DNS?

- Domain (eg. architchandra.com) points to DNS
- DNS points to hosting IP (eg. 142.250.194.110)
- Hosting is where the website code is available for a browser
 - Traditional server (full or shared) - code is run that generates HTML
 - CDN/edge - pre-generated code is stored for quick access

What is a browser?

- Tool that parses, handles basic errors and presents HTML, CSS and JS
- Communicates with other devices to get the data
- HTTP *client, user agent*



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Main Page

From Wikipedia, the free encyclopedia

Jump to: [navigation](#), [search](#)

Welcome to [Wikipedia](#), the free encyclopedia that [anyone can edit](#).

In this English version, started in 2001, we are currently working on [1,024,885](#) articles.

[Overview](#) - [Questions](#) - [Categories](#) - [A-Z](#) - [Portals](#) - [Site news](#) - [Donations](#)
[Arts](#) | [Biography](#) | [Geography](#) | [History](#) | [Mathematics](#) | [Science](#) | [Society](#) | [Technology](#)

Today's featured article



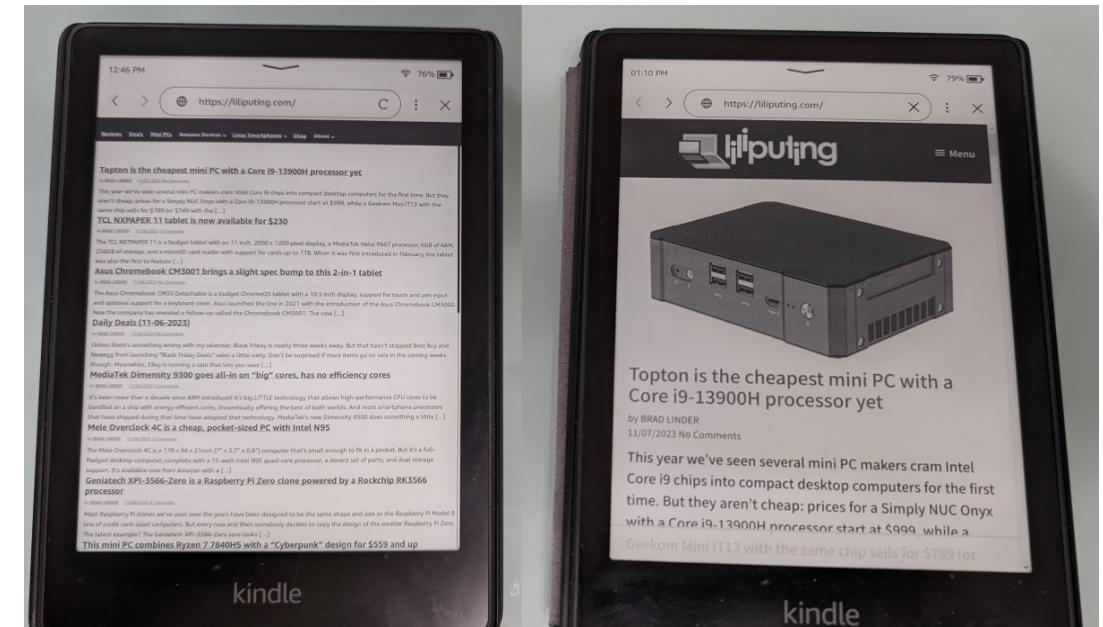
The [Palazzo Pitti](#) is a vast, mainly Renaissance palace in [Florence](#), Italy. It is situated on the south side of the [River Arno](#), a short distance from the [Ponte Vecchio](#). The core of the present palazzo dates from 1458 and was originally the town residence of [Luca Pitti](#), an ambitious Florentine banker. It was later bought by the [Medici](#) family in 1549; as the official residence of the ruling families of the Grand Duchy of Tuscany, it was enlarged and enriched almost continually over the following three centuries. In the 19th century, the palazzo, by then a great treasure house, was used as a power base by [Napoleon I](#), and later served for a brief

In the news

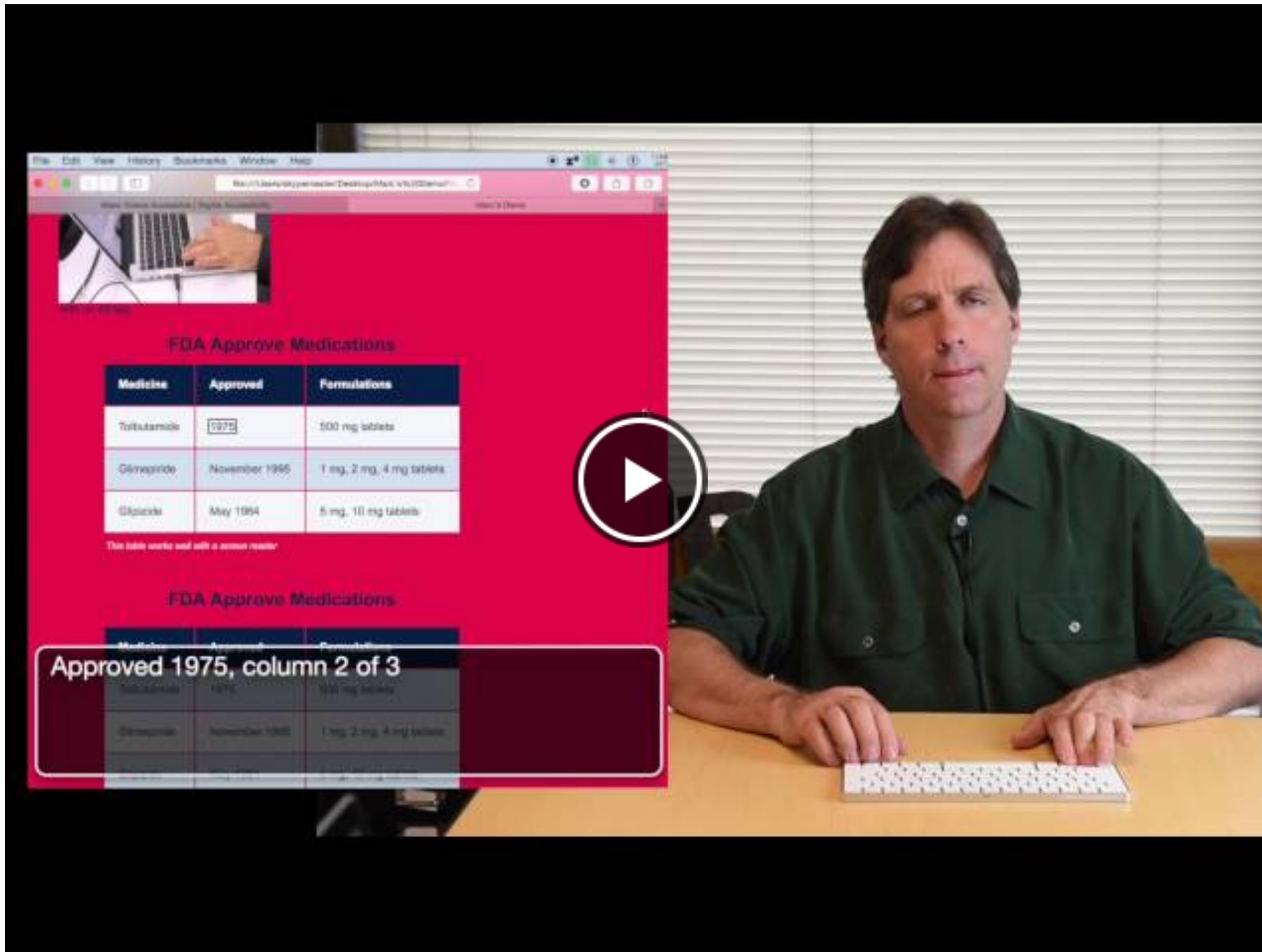


Lennart Meri

- * Former President of Estonia [Lennart Meri](#) (pictured) dies.
- * Venezuela adopts a [new flag](#).
- * Former Yugoslav leader Slobodan Milošević dies in his prison cell in The Hague, Netherlands.
- * NASA's Mars Reconnaissance Orbiter enters Martian orbit.
- * The Laotian rock rat is identified as part of a group previously thought to have disappeared 11 million years



Screen Readers



Which languages are needed in web dev?

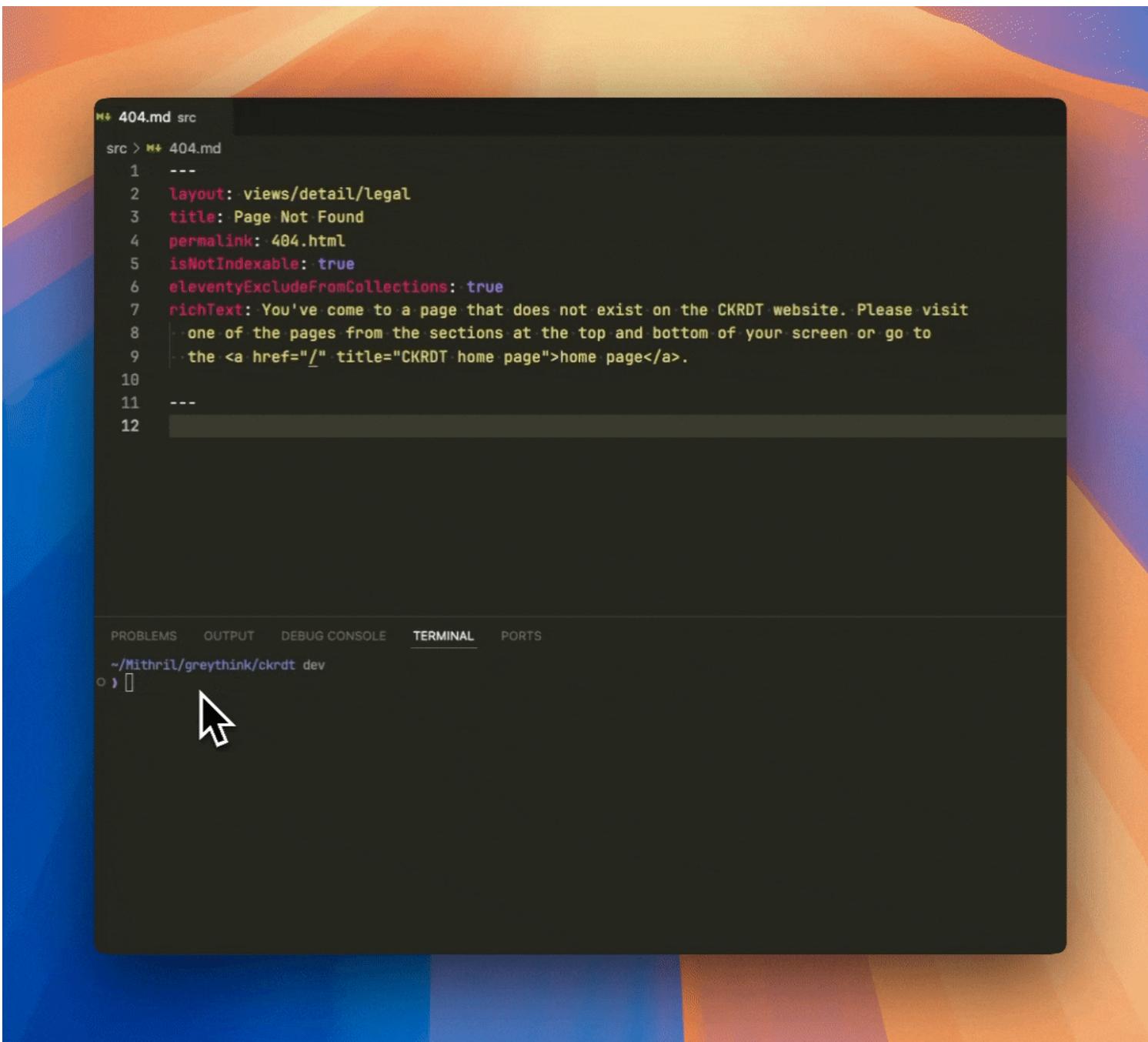
- **HTML** - structure
- **CSS** - styling
- **JS** - modify HTML/CSS
- **Server-side**/scripting - any backend language, but PHP was built for the web server
- **Database** - data storage

Some Terminologies

Routing

- The operation to parse a request and serve the data that the requesting entity has asked for
- In simpler terms, going to where you want to be based on the URL or an action that you took

Build time

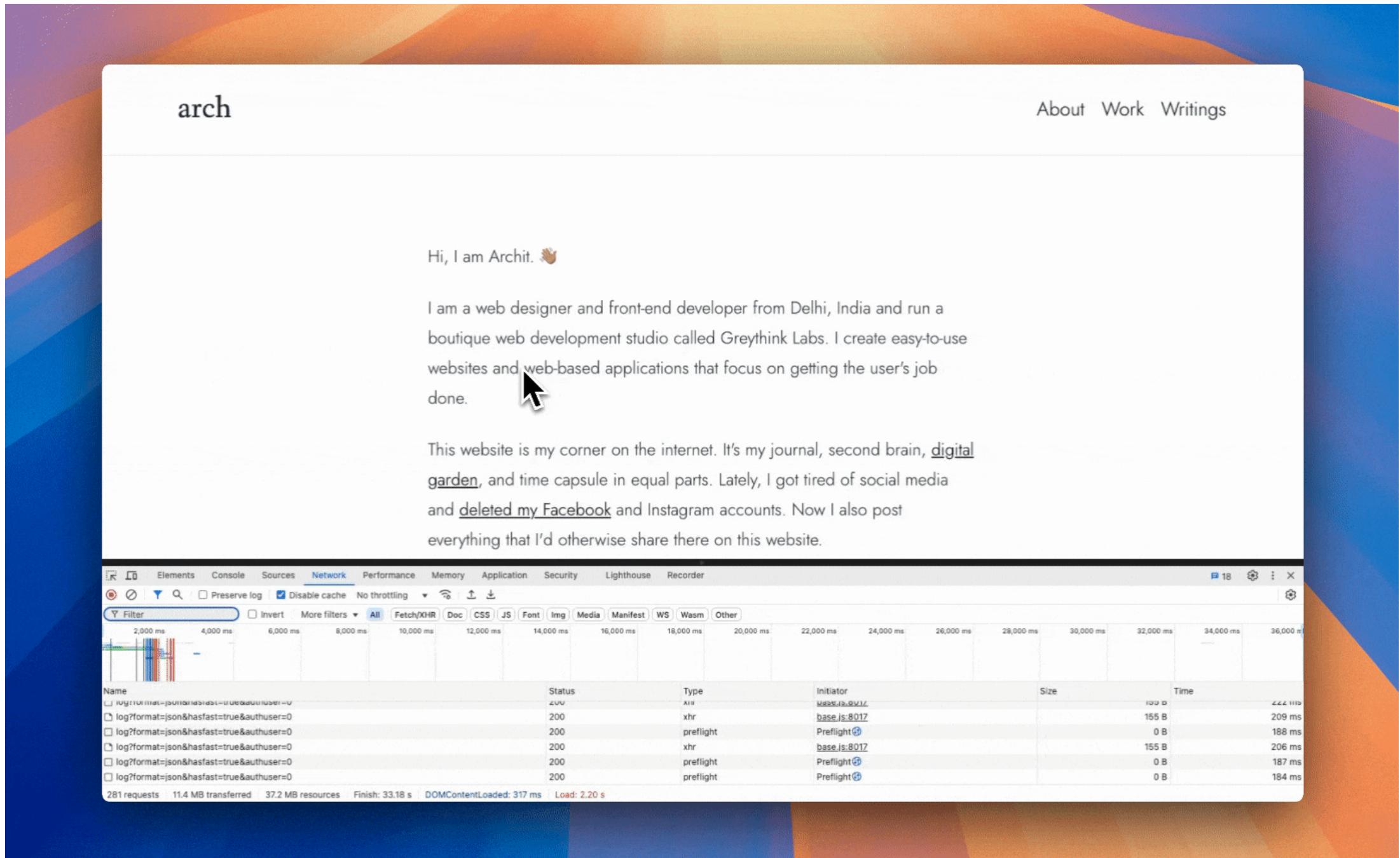


A screenshot of a terminal window within a dark-themed code editor interface. The terminal window has a black background and displays the following content:

```
404.md src
src > 404.md
1 ---  
2 layout: views/detail/legal  
3 title: Page Not Found  
4 permalink: 404.html  
5 isNotIndexable: true  
6 eleventyExcludeFromCollections: true  
7 richText: You've come to a page that does not exist on the CKRDT website. Please visit  
8 one of the pages from the sections at the top and bottom of your screen or go to  
9 the <a href="/" title="CKRDT home page">home page</a>.  
10 ---  
11 ---  
12
```

The terminal window is part of a larger interface with tabs for PROBLEMS, OUTPUT, DEBUG CONSOLE, TERMINAL (which is currently selected), and PORTS. A cursor arrow is visible at the bottom left of the terminal window.

Run time



Server

- A computer/virtual machine which is optimised to serve a particular kind of data, web data for our context



@meliss_houghton

Framework

- A platform built on top of a programming language offering tools to make it easier to build for a set of use-cases eg. web frameworks offer routing, database actions, templating syntax, etc.
- Good to know where a language ends and the framework begins
- Django, Flask, Laravel, Symfony, React, RoR, Adonis
- Meta frameworks: Next, Remix, Nuxt (common in JS ecosystem)

CSS Frameworks

Predefined conceptual models and class names help in saving time making code easier to reuse/manage eg. Tailwind, Bootstrap

```
<div class="flex font-sans">
  <div class="flex-none w-48 relative">
    
  </div>
  <form class="flex-auto p-6">
    <div class="flex flex-wrap">
      <h1 class="flex-auto text-lg font-semibold text-slate-900">
        Classic Utility Jacket
      </h1>
      <div class="text-lg font-semibold text-slate-500">
        $110.00
      </div>
      <div class="w-full flex-none text-sm font-medium text-slate-500">
        In stock
      </div>
    </div>
  </form>
</div>
```

CSS Pre-processors

Add some functionality to make writing CSS easier eg. SASS, LESS

```
$base-color: #036;

@for $i from 1 through 3 {
  ul:nth-child(3n + #{$i}) {
    background-color: lighten($base-color, $i * 5%);
  }
}
```

Library/Package

- Piece of self-contained code that adds some functionality or enhancement
- eg. PostCSS, React Router, Guzzle

Package manager

- A tool to install and manage packages
- eg. npm, Composer, pip

Reactivity

Changing application data/state when
user input changes **without server action**

Version control

- A tool to save snapshots of a project that make managing, coordination and working on iterations easier
- eg. Git, SVN, Mercurial

CMS

- A tool used to manage content (text, image, etc.) for a website/webapp
- Often built on top of a framework to leverage its functionality
- eg. WordPress, Craft CMS, Strapi, Ghost, Statamic, Tina CMS, Shopify, etc.
- Headful vs headless CMS
- With database vs flat file CMS

≡ statamic PRO

Search...

Dashboard

CONTENT

- Collections
- Articles
- Events
- Pages
- Navigation
- Taxonomies
- Assets
- Globals

FIELDS

- Blueprints
- Fieldsets

TOOLS

- Forms
- Updates
- Addons
- Utilities
- SEO Pro

< Articles

From Meme to Hero: How Florida Man Saved a Community

... Save & Publish ↵

Main SEO

Title *

From Meme to Hero: How Florida Man Saved a Community

Content

In the quiet town of Elsmore, Florida, nestled between the swamps and the Gulf Coast, Denny Dalton lived a life largely unnoticed by his neighbors. Known more for his quirky antics and eccentric behavior than any heroic deeds, Denny was the embodiment of the infamous "Florida Man" meme. However, when disaster struck, Denny's true character emerged, transforming him from a local punchline into a hero.



Live Preview Visit URL

Published

Date * 2024-07-03

Category Inspiring

Related Articles

The Legacy of Bob Ross ...

Static Site Generators (SSG)

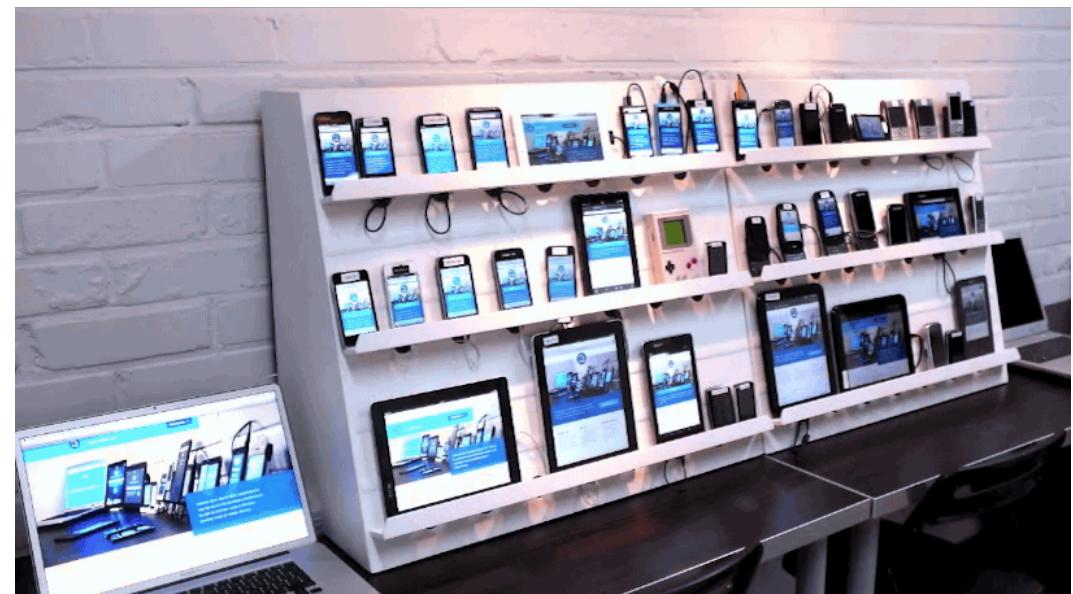
- Static site: webpages stored directly as a compilation of HTML files with associated CSS, JS and assets.
- A tool that compiles a project into a set a static site typically at build time.
- eg. Jekyll, Hugo, Eleventy, Astro

Important Aspects & Good Practices

SO. MANY. DEVICES.



- Phones
- Tablets
- Watches
- Laptops
- Monitors
- Display screens



Multiple browser engines and versions

- Webkit (Chrome, Safari), Gecko (Firefox)
- Style elements and behave different
- Browser quirks and bugs eg. iphone
Safari address bar height changes while
scrolling
- Use a CSS reset (many frameworks
include one)

Check browser support

- MDN
- caniuse.com
- DO NOT USE w3schools

The screenshot shows the MDN Web Docs interface for the `field-sizing` CSS property. The left sidebar has a filter set to "display". The main content area is titled "field-sizing" and includes a "Limited availability" section with browser compatibility icons and a note that it's not baseline because it doesn't work in some browsers. A "Browser compatibility" link in the "In this article" sidebar is highlighted with a red box.

The screenshot shows the MDN Web Docs interface for the `grid` CSS property. The left sidebar has a filter set to "grid-*". The main content area is titled "grid" and includes a "Baseline Widely available" section with browser compatibility icons and a note that it's well-established and works across many devices and browser versions since October 2017. A "Browser compatibility" link in the "In this article" sidebar is highlighted with a red box.

Autoprefixer

```
Postcss: v8.4.14, autoprefixer: v10.4.7

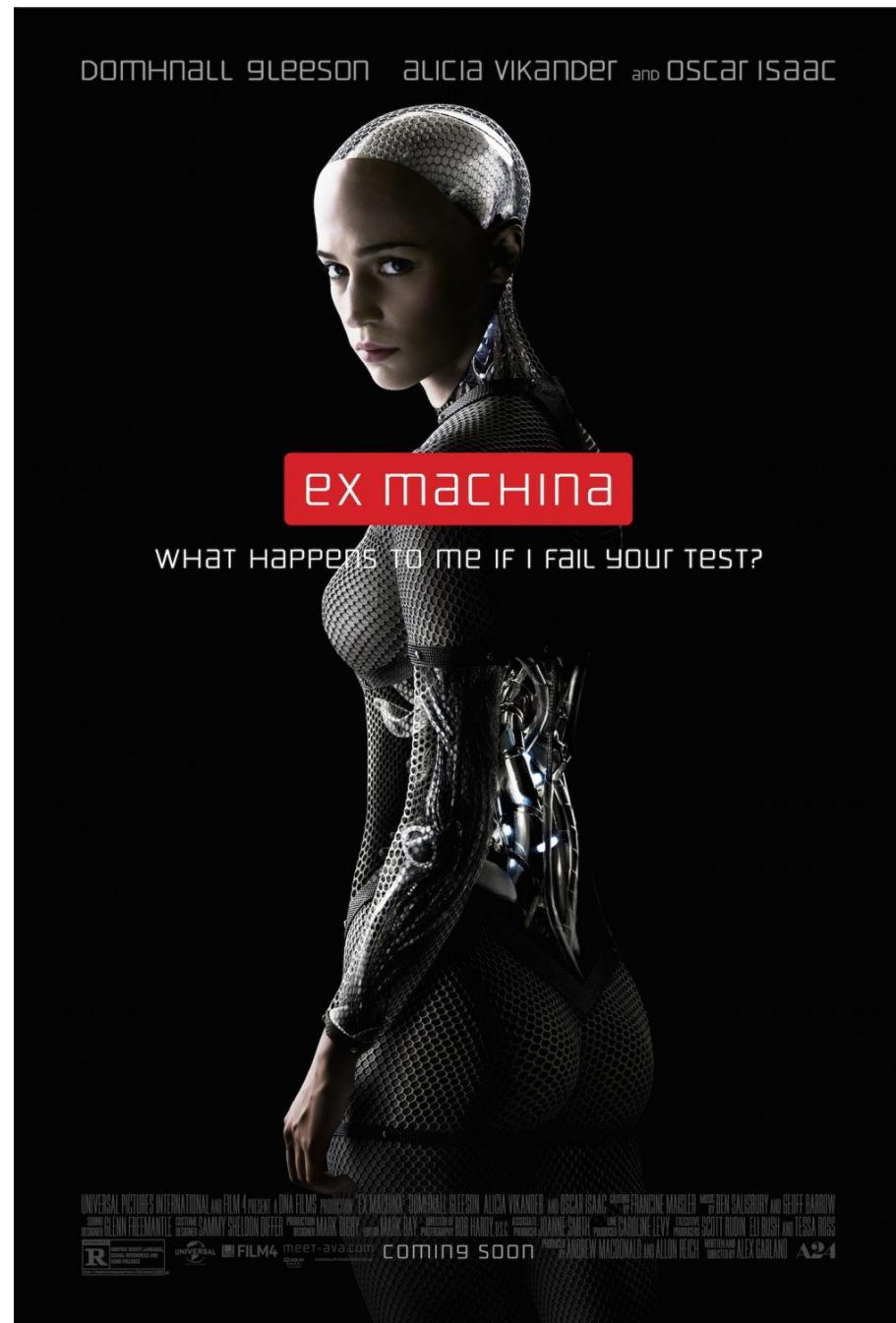
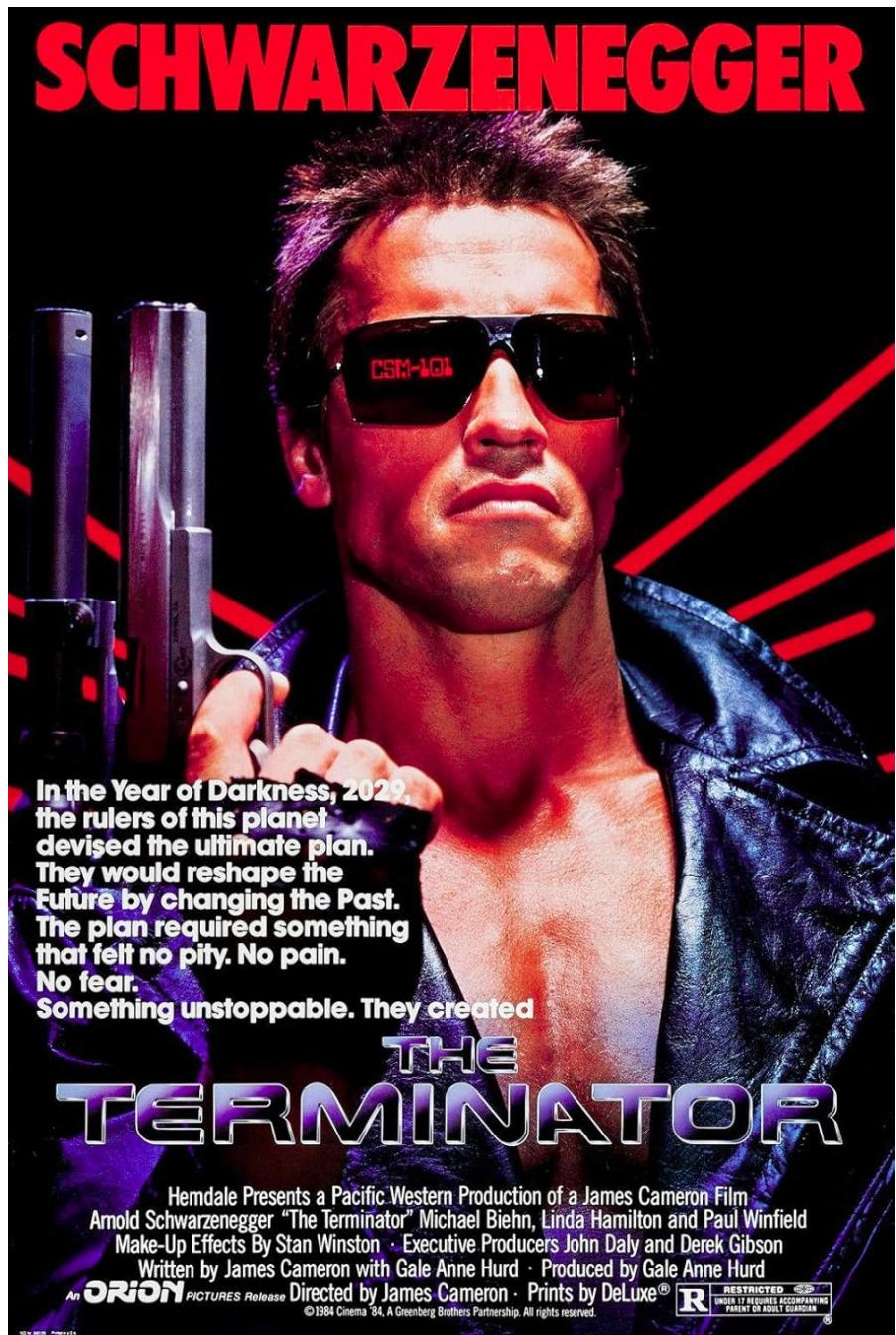
.example {
  display: grid;
  transition: all .5s;
  user-select: none;
  background: linear-gradient(to bottom, white, black);
}

/*
 * Prefixed by https://autoprefixer.github.io
 * PostCSS: v8.4.14,
 * Autoprefixer: v10.4.7
 * Browsers: last 4 version
 */

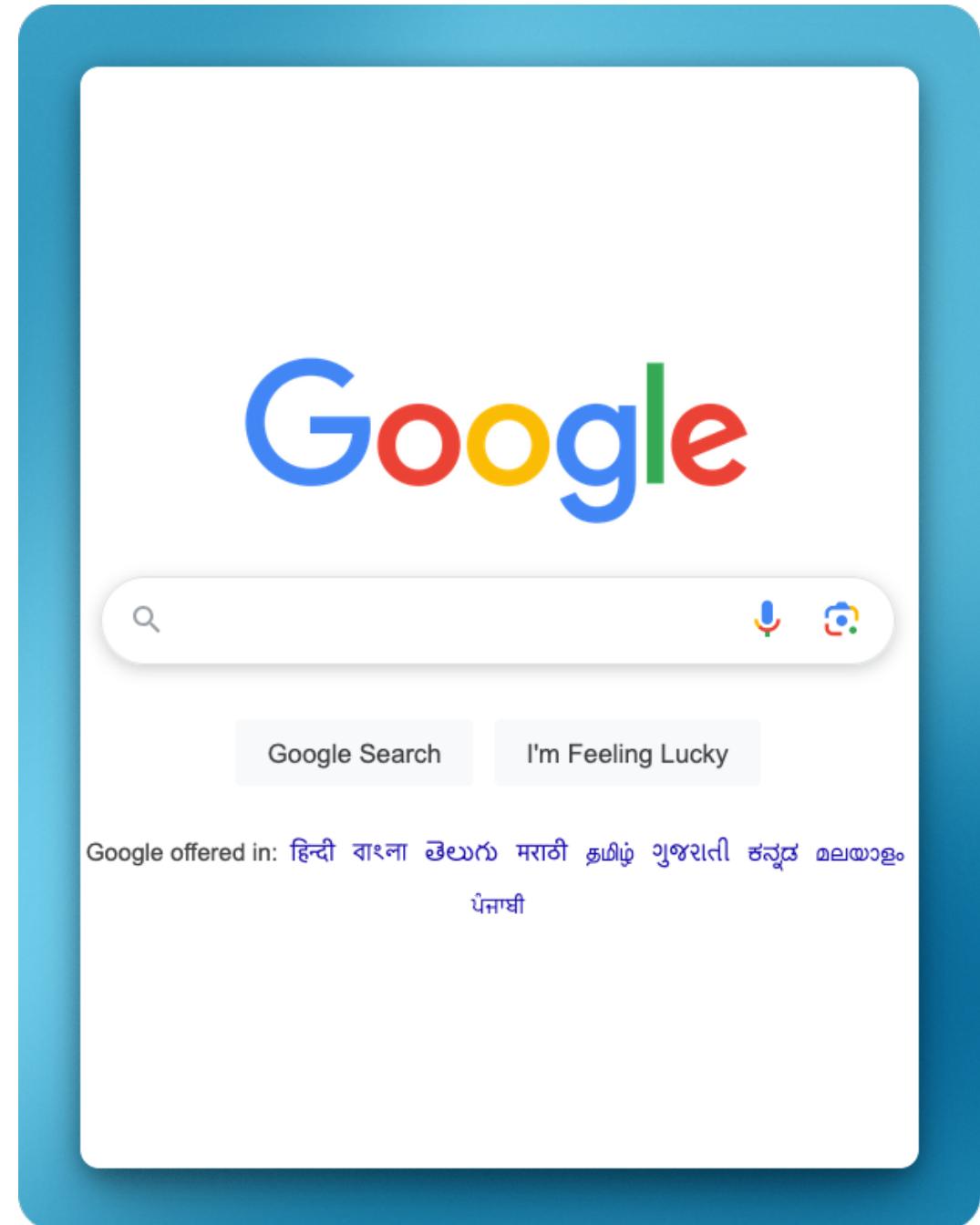
.example {
  display: -ms-grid;
  display: grid;
  -webkit-transition: all .5s;
  -o-transition: all .5s;
  transition: all .5s;
  -webkit-user-select: none;
  -moz-user-select: none;
  -ms-user-select: none;
  user-select: none;
  background: -webkit-gradient(linear, left top, left bottom, from(white),
to(black));
  background: -o-linear-gradient(top, white, black);
  background: linear-gradient(to bottom, white, black);
}
```

Browserslist last 4 version

Machines!

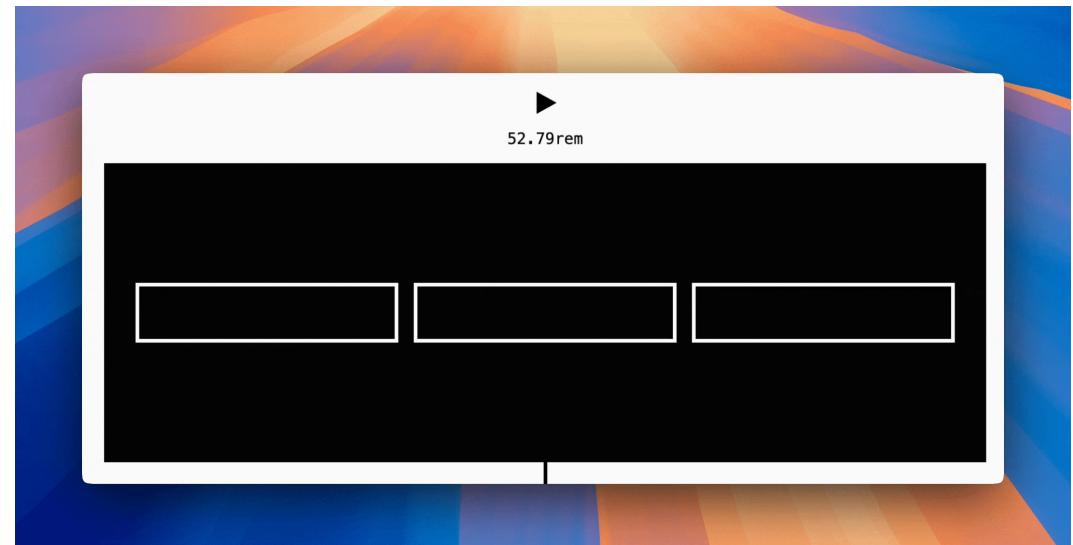


- Article readers
- Screen readers
- Search engines
- Webpage scrapers
- AI?



Responsive web design

- Multiple width and orientation devices to support
- Current standard is adjusting design based on window width



Not The Only One

Another approach is to try to identify the user-agent (client) and serve different webpages for mobile and desktop [outdated].

Think in terms of proportions and constraints

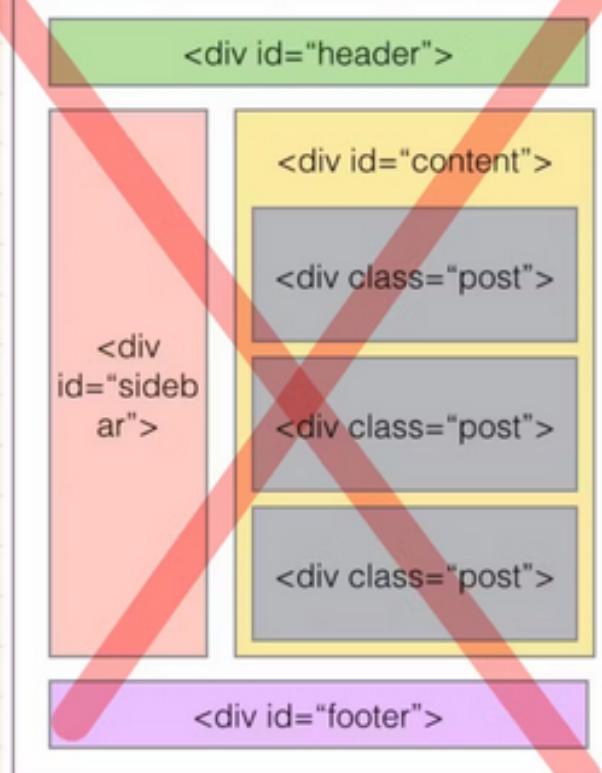
- The web adheres to a fluid canvas—
you cannot design to a fixed space.
- Use `rem`, `percentage` and `ch` units
instead of px.

Semantic HTML

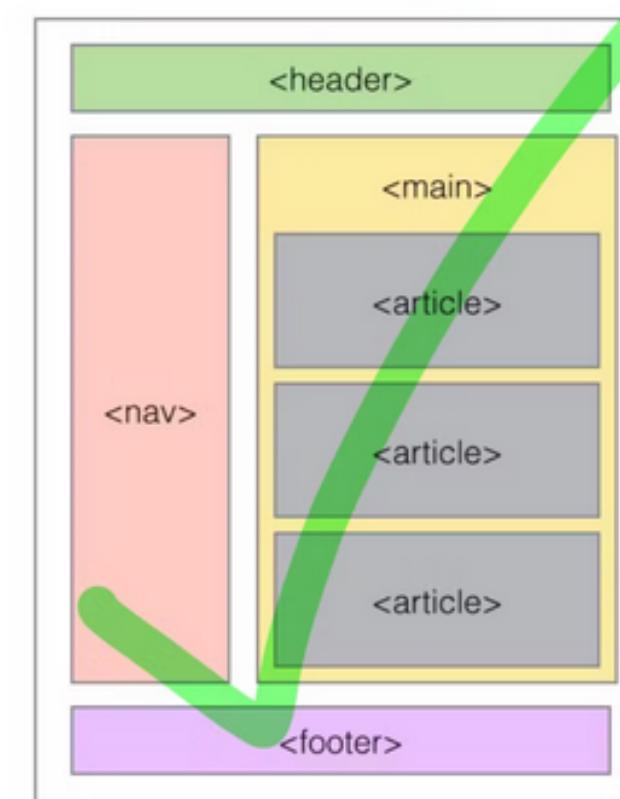
- The meaning of the elements should be clear to the client so that they can take appropriate action
- Browsers should be able to display content correctly
- Special browser/device functionality, eg. link pointer, forms on iOS
- Search engines rely on semantic HTML to index websites

HTML Layout

HTML4: Lots of Classes/IDs



HTML5: Semantic Tags/Sections



Accessibility

- Visually impaired: screen readers, alt text, captions. Search engines are also blind.
- Colour blindness: using patterns in addition to colours, adding feedback in addition to colours eg. links
- Hearing impaired: show some feedback when audio plays, add captions and transcripts

Progressive enhancement

- Do not assume JS
- Chrome disables JS in low-network situations
- Screen readers don't parse JS very effectively
- Google's crawlers tries to conserve resources by not processing JS eg. frameworks
- Avoid any critical info/element being generated using client-side JS
- Example: a carousel/slider should work to some degree without JS else should have only supplementary content

Performance

- People want websites to load fast, else they might move to something else and site's goals will not be fulfilled
- Performance is a ranking factor for search engines
- Content might not load in low-network situations if performance is not good

Perf: Caching

- Server-level caching
- Network-level caching (CDN)
- Browser-level caching
- Tradeoff: complexity
- Remember to bust the cache during dev and after changes

Perf: Images

- Use `sizes` and `srcset` attributes to avoid serving larger files than needed
- Use next-gen formats like `webp` and `avif` to reduce file size (often configured on server-side)
- Lazy load images (native and JS-based)
- Tradeoff: complexity, server or build-time load

Perf: CSS

- Keep CSS size small—prefer reusing classes (easier when using a framework)
- Fewer network requests—compile styles to a single CSS file or rely on JS-framework's style scoping
- Critical CSS

Perf: JS

- Separate JS between critical and normal priority
- Bundle all the JS code into these two files
- Avoid loading any JS that is not required (keep JS to a minimum)
- Try to keep everything async/deferred

Usability and UX

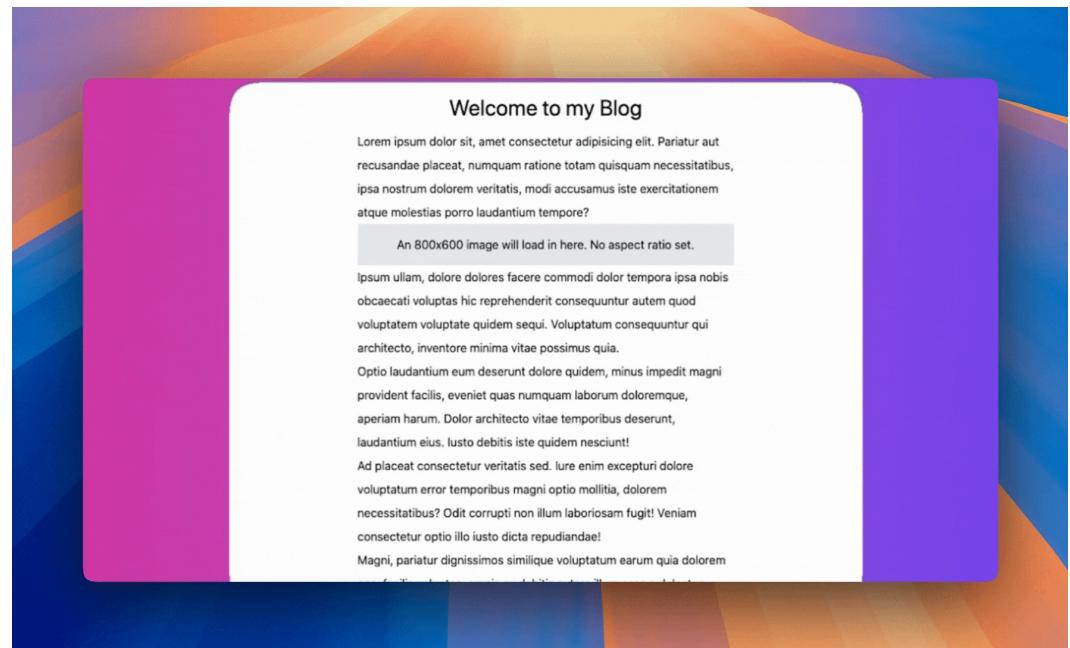
- People won't use if the experience is not good
- Font size should be big enough to read
- Have enough spacing between clickable elements
- Minimise Layout shifts
- Text should be clearly legible—use colours with high contrast

Don't mess with fundamental browser functionality

- Don't hijack back and forward buttons
(breaks on force opening link in new tab)
- Don't add items to browser history to inflate numbers (many news sites do this)
- Don't prevent copy-pasting (govt. sites do this)
- Don't disable selecting text

Layout Shifts

- JS-based addition or modification of elements can result in page layout shifting after it has loaded
- Really bad for UX—can interrupt reading flow, scroll position, ad closing trick, etc.



SEO

- All Google wants is for you to build websites and add content properly
- Semantic HTML
- Easy access to page content (tricky in JS frameworks)
- Heading levels in order
- Once one `<h1>` on a page
- Alt text for images
- Tools: Google Pagespeed Insights, Performance tab in Devtools, Google search console

Prominent Paradigms

There are many approaches to build a web application. Currently, the two prominent ones are:

- Traditional (multi-page)
- "Modern" JS-based (single-page)
- Special mention: State sent by server
(Hotwire, Inertia)

Traditional

- Structured on the basis of pages
- Server parses browser request and offers HTML for the requested URL
- Browsers get pages that exist on different URLs
- Pages are hand-coded or generated using some server-side tool

The screenshot shows the Statamic Control Panel interface. The left sidebar contains navigation links for Content, Fields, Tools, and Settings. The main area displays a list of collections: Articles, Blog, Pages, and Shared Items. A cursor is hovering over the 'Articles' row.

Collections

Title ^	Entries
Articles	6
Blog	17
Pages	7
Shared Items	34

Create Collection

Learn more about [Collections](#)

CONTENT

- Collections
 - Articles
 - Blog
 - Pages
 - Shared Items
- Navigation
- Taxonomies
- Assets
- Globals

FIELDS

- Blueprints
- Fieldsets

TOOLS

- Forms
- Updates 1
- Addons
- Utilities

SETTINGS

- Site
- Preferences

Traditional: Common Characteristics

- Separation of concerns
- JS is added to complement the HTML and CSS
- Often leads to reloading the entire page on taking an action
- Builds on top of browser features eg. DOM tree

SPA

- Origin: Codebase management and perf issues for large-scale projects in big companies (Google, FB)
- Structured on the basis of self-contained components that contain HTML, styling and logic
- Single entry point for the app
- URL is processed on the front-end and the requested view is loaded at runtime
- Everything happens through JS - even the rendering of the HTML and application of styles
- Use the virtual DOM and recreate some browser features, not building on top of them.

Rough Pros & Cons

- SPAs became popular because it became easier to add reactivity *declaratively* and maintain cross-browser uniformity
- Traditional apps are easier to manage. SPAs have a lot of complexity to just run on the browser eg. additional build process
- SPAs have first-load performance overhead and working against the browser in some cases eg. routing.
- By default, SPAs are bad for SEO

Everything is Converging

- Easily attainable reactivity and app-like experience has moved the industry forward
- Traditional approaches have tools and techniques to add selective reactivity eg. Alpine JS, HTMX
- SPAs working on techniques to alleviate performance issues eg. SSR, server components, pre-rendering etc.
- SPAs simplifying build process eg. Vite
- Hybrid approaches: static page but components of reactivity (island architecture)

Information Overload 😴

What to Use When?

- Everything is converging
- Use what you want to use but follow good practices
- Try out multiple approaches and tools
- Suggestions for certain use-cases

Plan Based on What You Want to Do

- Who is your audience?
- Will it be a content-driven website?
- Will it be a public facing tool?
- Will it be an internal tool?
- How much interactivity/reactivity?
- What is the convention set by other similar apps?
- How important is SEO?

Content-driven: Fixed Content

- SSG or no-code tool
- eg. your portfolio website, small marketing site
- Pro tip: try Astro, Eleventy or Alpine if you want some cool interactions

Content-driven: Authors Change Content

- CMS will be required
- Smaller site: flat-file CMS (no DB)
 - eg. business site, project docs/guides, your blog
- Large site: full-fledged CMS with DB
 - eg. university site, job board, ecommerce site

JS: Limited interactivity

- Some buttons, toggles, animations, page loads, etc.
- Vanilla JS, Alpine, HTMX, etc.

JS: Everything is interactive

- Data is fetched using JS
- Use a full-fledged JS framework
- If internal tool, can use framework directly, else use a meta-framework

Application Backend: Small to Medium Scale

- Create from scratch rather than using a framework?
- Can avoid using a database
- Can use a backend as a service (BaaS) instead of a database and a full-fledged backend
 - Firebase
 - Supabase

Application Backend: Large scale

- Use a framework
- Leverage a meta-framework or tool that helps for your use-case
- Use databases

Going from Idea to Product

Figure Out Who Your Audience Is

- What kind of functionality do they need?
- How tech-savvy are they?
- What kind of devices and apps might they use?
- What kind of design choices are they likely to prefer?
- Talk to a few people who are in your audience group.
- Decide on your tech stack based on audience and use-cases

Start With Content

- Create / get content samples that are as close to real content as possible
- Break down content into well-defined structures (content model)

Wanted: A Senior Web Developer

Title

We are looking for a senior level web developer (with around 5–7 years of experience) to help us continue making great websites. This is a remote position. You may be located anywhere in India or the rest of the world (with at least a 4-hour time overlap with the Indian timezone).

Description

- This is a full-time position **Type**
- We work remotely **Location**
- Experience required: 5-7 years **Experience**
- Typical compensation is Rs. 15L per annum **Compensation**

Create Data Model

- Break down content model into objects
- Define properties and types of the objects
- Map object relationships

```
1 let data_model = {
2   datePublished: {
3     type: 'date-time',
4     content: '2025-01-19T12:33:19',
5   },
6   title: {
7     type: 'plain-text',
8     content: 'Wanted: A Senior Web Developer',
9   },
10  description: {
11    type: 'rich-text',
12    content: 'We are looking for a senior level web developer (with around 5-7 years of experience) to help us continue making great websites. This is a remote position. You may be located anywhere in India or the rest of the world (with at least a 4-hour time overlap with the Indian timezone).',
13  },
14  jobType: {
15    type: 'enum',
16    content: 'Full-Time',
17  },
18  location: {
19    type: 'enum',
20    content: 'Remote',
21  },
22  minExperience: {
23    type: 'number',
24    content: 5,
25  },
26  maxExperience: {
27    type: 'number',
28    content: 7,
29  },
30  compensation: {
31    type: 'number',
32    content: '15,00,000',
33  },
34  applyLink: {
35    type: 'link',
36    content: {
37      url: 'example.com/apply',
38      label: 'Apply Now',
39    }
40  }
41 }
```

Create Low-fidelity Wireframes

- Pen and paper sketches
- Excalidraw (preferred)
- Balsamiq
- Figma

Wanted: A Senior Web Developer

We are looking for a senior level web developer (with around 5–7 years of experience) to help us continue making great websites.



Full Time



Remote



5 to 7 years



15L+ per annum

[Apply Now](#)

[Optional] Create High-fidelity Mockups

- Helpful to communicate with stakeholders
- Keeps teams in sync
- Simplifies decision-making during execution
- Figma (preferred), Sketch

Break UI Into Components

- These components will translate to front-end components in code also
- Components to be reusable
- Traditional apps can also be broken into components even if routing is page-level eg. `includes`,
`partials`, etc.

Wanted: A Senior Web Developer

Heading

We are looking for a senior level web developer
(with around 5–7 years of experience)
to help us continue making great websites.

RichText

Button

-  Full Time IconBox
-  Remote
-  5 to 7 years
-  15L+ per annum

Apply Now

Start Application Development

- Work in a way that ensures completion of higher-priority pieces first
- Prefer building core components first rather than the full page view
- For pages, best to start with a specific page rather than generic pages like homepage.
- Don't try to go for perfection in one shot. Make minimum changes to get to next version and then improve iteratively.

Helpful Tools

Use Browser Devtools

- Inspector to check HTML and styling info
- Console to check JS
- Network to check performance and header info
- ...

More Tools: Insomnia

GET ▾ https://architchandra.com

Send ▾

200 OK 573 ms 97.9 KB Just Now ▾

Body ▾ Auth ▾ Query Headers 1 Docs

Preview ▾ Headers 14 Cookies Timeline

* Using Stream ID: 1 (easy handle 0x14518d000)
* TLSv1.2 (OUT), TLS header, Supplemental data (23):

> GET / HTTP/2
> Host: architchandra.com
> user-agent: insomnia/8.2.0
> accept: */*

* TLSv1.2 (IN), TLS header, Supplemental data (23):
* TLSv1.3 (IN), TLS handshake, Newsession Ticket (4):
* TLSv1.2 (IN), TLS header, Supplemental data (23):
* Connection state changed (MAX_CONCURRENT_STREAMS == 250)!
* TLSv1.2 (OUT), TLS header, Supplemental data (23):
* TLSv1.2 (IN), TLS header, Supplemental data (23):
* TLSv1.2 (IN), TLS header, Supplemental data (23):
* TLSv1.2 (IN), TLS header, Supplemental data (23):

< HTTP/2 200
< accept-ranges: bytes
< access-control-allow-origin: *
< age: 144117
< cache-control: public, max-age=0, must-revalidate
< content-disposition: inline
< content-type: text/html; charset=utf-8
< date: Sun, 19 Jan 2025 17:14:58 GMT
< etag: "f74fd92c7715996fb248e8d3e71adcc9"
< last-modified: Sat, 18 Jan 2025 01:13:01 GMT
< server: Vercel
< strict-transport-security: max-age=63072000
< x-vercel-cache: HIT
< x-vercel-id: bom1::9jtb7-1737306898838-c621c13bb003
< content-length: 100264

* TLSv1.2 (IN), TLS header, Supplemental data (23):
* Content-length: 100264 KB

Enter a URL and send to get a response

Select a body type from above to send data in the body of a request

Introduction to Insomnia ↗

More Tools: Xscope

Measure distance on the screen

I am a web designer and front-end developer from Delhi, India and run a boutique web development studio called Greythink Labs. I create easy-to-use websites and web-based applications that focus on getting the user's job done.

1919 x 122 px

This website is my corner on the internet. It's my journal, second brain, [digital garden](#), and time capsule in equal parts. Lately, I got tired of social media and [deleted my Facebook](#) and Instagram accounts. Now I also post everything that I'd otherwise share there on this website.

More Tools: WhatFont

Browser extension to know about fonts used

This website is my corner on the internet. It's my journal, second brain, digital garden, and time capsule in ~~everal parts~~. Lately I got tired of social media and deleted my Facebook and everything that I'd otherwise s

Jost - 400

Family
Jost, ui-sans-serif, system-ui, -apple-system, "system-ui", "Segoe UI", Roboto, "Helvetica Neue", Arial, "Noto Sans", sans-serif, "Apple Color Emoji", "Segoe UI Emoji", "Segoe UI Symbol", "Noto Color Emoji"

Style normal	Weight 400	Color rgb(55, 65, 81)
Size 24px	Line Height 42px	

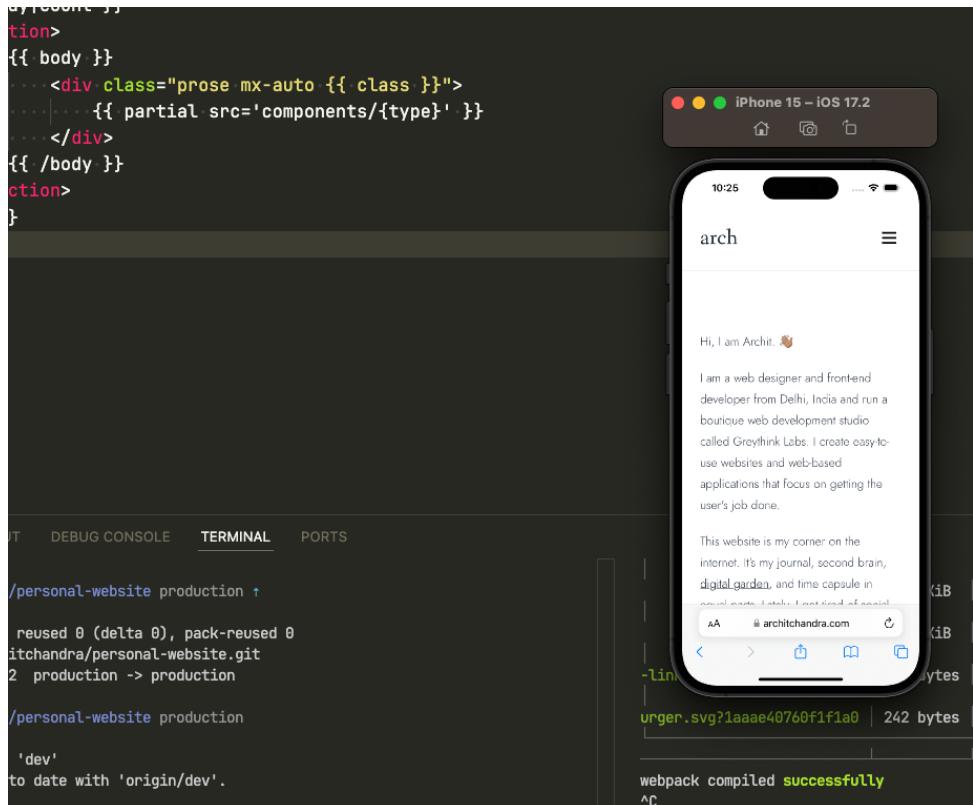
AaBbCcDdEeFfGgHhIiJjKkLlMmNnOoPpQqRrSs

26 Aug 2024 • Article

The Perfectionist's Guide to Deploying a Statamic Website to Vercel

More Tools: Xcode Simulator

Simulate iPhone/iPad on a Mac



Hi, I am Archit. 🙌

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This website is my corner of the internet. It's my journal, second brain, [digital garden](#), and time capsule in equal parts. Lately, I got tired of social media and [deleted my Facebook](#) and Instagram accounts. Now I also post

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Arc Browser has split screen that's helpful in testing

```
<!DOCTYPE html>
<html lang="en"> scroll
  <head> </head>
  <body class="pt-6 border-b border-brand-light-grey"> </body>
</html>
```

```
body {
    font-family: Jost, ui-sans-serif, system-ui, -apple-system, BlinkMacSystemFont, Segoe UI, Roboto, Helvetica Neue, Arial, Noto Sans, sans-serif, Apple Color Emoji, Segoe UI Emoji, Segoe UI Symbol, Noto Color Emoji;
}
```

Keep Tinkering

- Web dev is a huge topic
- You will never know it all (and you won't need to)
- Very low cost of failure, so keep tinkering
- Read, search, ask

**That's All Folks
Best of Luck**