VR Websites: Design, Development, & Optimization (Part 1 – Ecosystem & Resources)

IVRPA Webinar
May 18th, 2024

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Topics

- Architecture Considerations with VR Content: inodes, iframes, & compression
- Choosing a Platform for VR Content
  - Hosting Providers, 360° “Libraries”, & Social Media
- Website Design/Development Workflows
  - “Drag & Drop” Builders: Wix, Squarespace, Shopify, GoDaddy, Elementor, ...
  - Content Management Systems (CMS): WordPress, Joomla, Drupal, ...
  - Front-end Frameworks: Bootstrap, Angular, Vue.js, ...
  - AI-assisted: 10Web, Jimdo, Wix, Gemini 1.5
- Website Analysis & Performance Tools
- *Q&A*

Architecture Considerations with VR: “inodes”

Data Storage on Linux

- Linux file systems use data blocks & inodes

Definition of an inode

- System placeholder storing file metadata
  - Owner, group, permissions, access/creation times, & size

Why inodes matter with VR

- Tiled, high-res tours use tens of thousands of inodes

Architecture Considerations with VR: iframes

VR media often added as an iframe (inline frame)

Benefits

- Integrate external content (videos, maps, forms)

Considerations:

- Performance (extra requests, external dependence)
- Security (source trust, use sandbox attribute)

Control Options:

- Source (src attribute)
- Appearance (width, height, scrolling, border)
- Functionality (sandbox attribute)

Architecture Considerations with VR: compression

DEMO: Comparison of compression methods

Choosing a Platform: Hosting Providers

Hosting Provider	inode limits / storage	Cost* ($/m)
Hostinger, hostinger.com	400K – 2M / 100G– 200G	3 - 10
Hostgator, hostgator.com	< 200K / 10G – 40G	4 - 7
GoDaddy, godaddy.com	< 250K - ∞ / 25G – 100G	6 - 18
Hostwinds, hostwinds.com	250K - ∞ / ∞	6 - 22
DreamHost, dreamhost.com	∞ / 50G - ∞	3 - 165
BlueHost, bluehost.com	50K - ∞ / 10G – 2T	3 - 142
InMotion, inmotionhosting.com	50K - ∞ / ∞	3 - 230
Elementor Hosting, elementor.com	?	33 - 53
Amazon Web Services, aws.amazon.com	∞	0 – "∞"

- Most hosting providers use "introductory pricing" that dramatically increases after a year (or 3).
- Check with hosting provider on any bandwidth, file size, ftp file limits, & especially inode restrictions.
- Limits, storage, & cost are provided for shared - dedicated servers.
- Read Terms of Service (TOS) carefully as most accounts can be cancelled at any time for performance 'drag'.

Choosing a Platform: 360° Libraries & Social Media

360° Libraries ***(i.e., portfolio)***	**videos**	**Cost ($/m)**
360Cities, 360Cities.net, sample	tutorial	0 - 33
Cloudpano, cloudpano.com, sample	tutorial	17 - 33
Gnome Cloud	tutorial	10 – 217
Kuula, Kuula.com, sample	tutorial	0 - 36
GoThru, gothru.co	tutorial	10 - 54

Social Media	**Notes**
Google Maps, sample	Easy to embed as iframe.
Facebook, sample	Can't directly embed or link image.
YouTube, sample	Need to create 360° video out of image.
Instagram, sample	Rough approximation with 4 cubic faces

Workflows: Content Management Systems (CMS)

CMS	Pro / Cons
WordPress	beginner-friendly, highly customizable, cost-effective, SEO-friendly, vast resources / security concerns, limited out-of-the-box, scalability, plugin reliance
Joomla	flexibility, security, scalability, SEO capabilities, user management / learning curve, complexity, extension reliance, limited free templates, smaller community
Drupal	flexibility and scalability, security, content management, multilingual support, active community / steep learning curve, limited out-of-the-box, development costs, performance optimization

Choosing the right CMS depends on your individual needs and resources.

- technical expertise
- budget
- website complexity
- long-term growth plans

Workflows: Front-end Frameworks

Frameworks	What it is	Pro / Con
Bootstrap	Pre-built UI components (buttons, forms, navigation) for responsive websites.	fast development, responsive design, consistency / potential bloat, limited creativity, learning curve
React	Build interactive UIs with reusable components (JavaScript library).	reusable components, virtual DOM, large community & ecosystem / learning curve, overkill for simple UIs, external dependencies
Angular	Comprehensive framework for complex Single Page Applications (JavaScript).	component-based, TypeScript, performance, rich ecosystem / steep learning curve, complexity, SEO limitations
Vue.js	Flexible and easy-to-use framework for UIs (JavaScript).	gradual adoption, easier learning curve, performance, customization, component-based / maturity, enterprise suitability

- Pay attention to size and number of external libraries used by a framework.

Building Websites: AI-assisted Workflows

AI	Cost
Jimdo, jimdo.com, sample, builder	$0-17/m
10Web, 10web.io, sample	$13-28/m
Wix, wix.com, sample, builder	$17-80/m
Gemini 1.5 Pro (AI Studio)	$0 (preview)

DEMO: Gemini 1.5 Pro teaching/building krpano sites

Website Performance & Error Testing

Performance Testing:

- **Tools:** WebPageTest, GTmetrix, Pingdom, Lighthouse, Jmeter
- **Metrics:** Page Load Time, Time to First Byte (TTFB), Waterfall Chart, Network Analysis
- **Methods:** Load Testing, Stress Testing

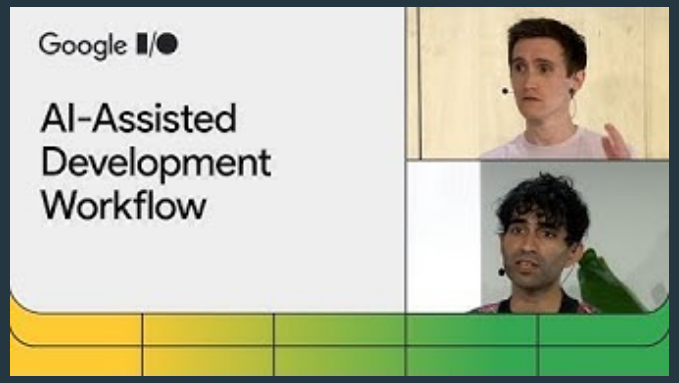
Error Testing:

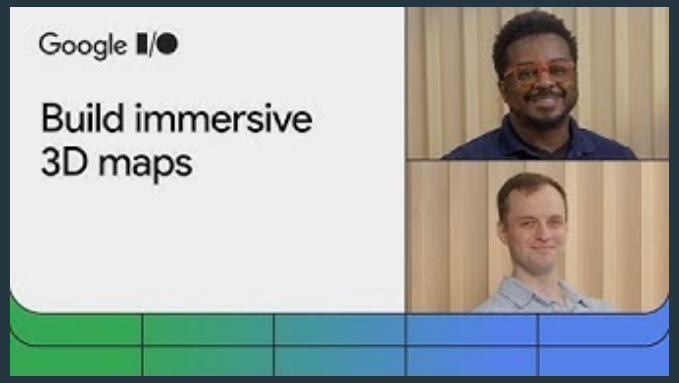
- **Tools:** Browser Developer Tools, Cross-browser Testing Platforms (BrowserStack, Sauce Labs), Google Search Console, W3C Validator
- **Methods:** Testing, Testing, Log Analysis, Accessibility, Security

Tips: Test on different devices & networks, use real-world scenarios, monitor performance over time, & implement optimization strategies.

Everything is About to Change (as usual)

Notable Talks from Google I/O 2024





Open Discussion / Draft Webinar Schedule

6/22 - TBD