



Ohio's State Boards and Commissions See the Silver Lining of Cloud Technology

How a 'Low Code' Site Builder and Enterprise Thinking Has Transformed Ohio's Smallest Sites with Industry-Leading Cybersecurity and User-Centered Design

Category: Enterprise IT Management Initiatives

State: Ohio

Agencies: Ohio Department of Administrative Services and Ohio Boards and Commissions

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**Design and development of InnovateOhio Platform Core Template and initial proof of concept with four state websites*

Executive Summary

In March of 2020, as the global pandemic spread around the country and across Ohio, the InnovateOhio Platform (IOP) was working on a proof of concept – that it could store website content in Amazon Web Services (AWS) CloudFront, its content delivery network (CDN), for faster and more reliable delivery.

Why Cache Your Content?

Content delivery networks provide a globally distributed network of proxy servers that cache images, videos, and web page content locally to consumers, improving the speed to load pages and download content. Caching content in this way reduces the number of incoming web requests, like mouse clicks, page views, or downloads, that have to directly hit local site infrastructure. As a result, sites can handle exponentially more traffic - and in the event of service degradation or a brief outage, the cached portions of your site remain available for a period of time, buying engineers invaluable lead time to resolve the issue and restore service before users notice an impact.

The global pandemic shifted many of our daily activities online. As federal, state, and county governments went digital, their vulnerability to cyberattacks vastly increased. The ability of the state to scale infrastructure and respond to cyber threats - both proactively and reactively - had never been more important. With the proof of concept complete, IOP accelerated its project timeline. By April 2020, 85 percent of all web content hosted on IOP was cached on Amazon CloudFront. At that time, that was about 50 websites, including the state's coronavirus response website, coronavirus.ohio.gov. Throughout 2020 and 2021, the state's COVID site was routinely hit with massive and unpredictable surges in traffic, at times, more than 18 times the typical volume.

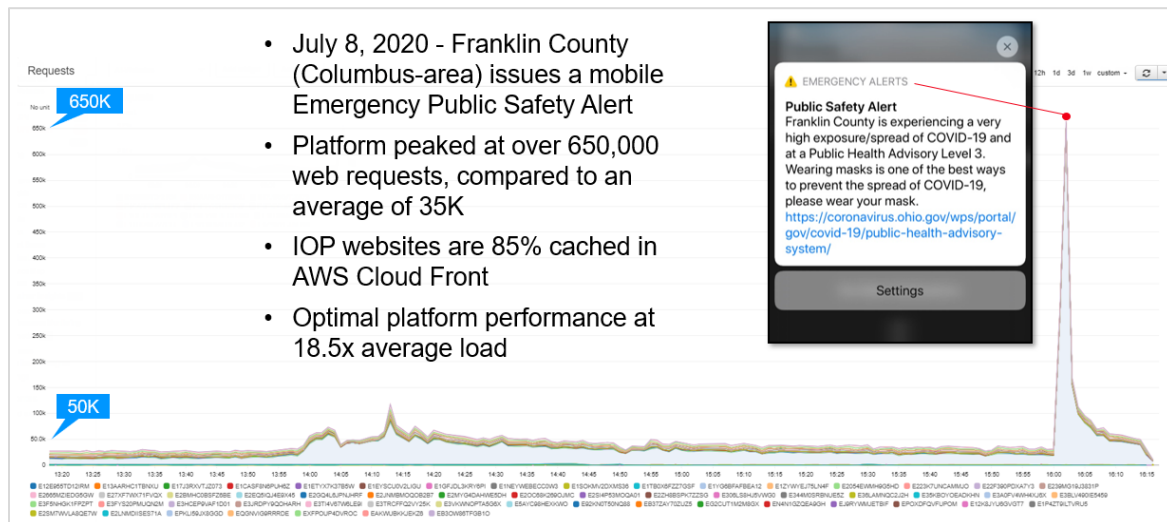


Figure 1: Platform elasticity in action

In addition to fast and reliable content delivery, IOP websites cached on AWS CloudFront are also automatically protected by: AWS Web Application Firewall (WAF); AWS Shield Advanced; and AWS Certificate Manager. These services provide a coordinated response to cyberthreats that is present on both macro and micro levels, much like customs and border patrol coordinate to secure a nation's borders. Following this metaphor, AWS Shield Advanced works from the air, analyzing traffic at scale to identify unexpected patterns. AWS Certificate Manager is

focused on the paperwork, ensuring all documentation is valid, while AWS Web Application Firewall scans and inspects all vehicle contents to identify and stop any suspicious packages.

Private sector companies, like Hulu, Netflix, and Reuters, routinely partner with AWS to take advantage of these intertwined security services. However, this level of investment is often out of reach for smaller state government agencies, boards, and commissions. By implementing these services at the enterprise level, instead of an individual level, all websites on IOP, regardless of size, budget or staffing now benefit from AWS security. For that reason, even as traffic surged and interest in State of Ohio government sites ballooned, websites on IOP remained largely stable and secure against cyberattacks, security threats, and performance outages.

To date, 22 state agencies have migrated their websites to IOP. Many of the larger agencies contracted the design and development to a pre-approved vendor. However, state boards and commissions have historically lacked the budget and personnel resources required to engage in large vendor projects. As such, the question became: How can we get smaller websites onboarded to IOP – and protected by AWS – in a budget-friendly way, with no vendor contracts and no dedicated developers?

Idea

IOP's Core Website Solution

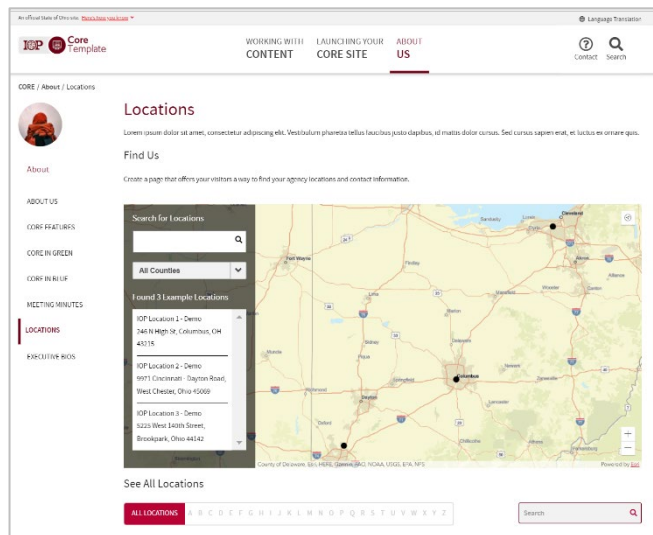
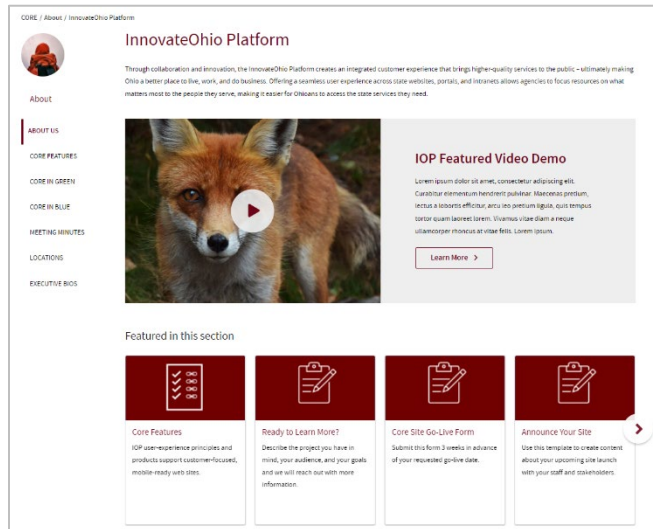
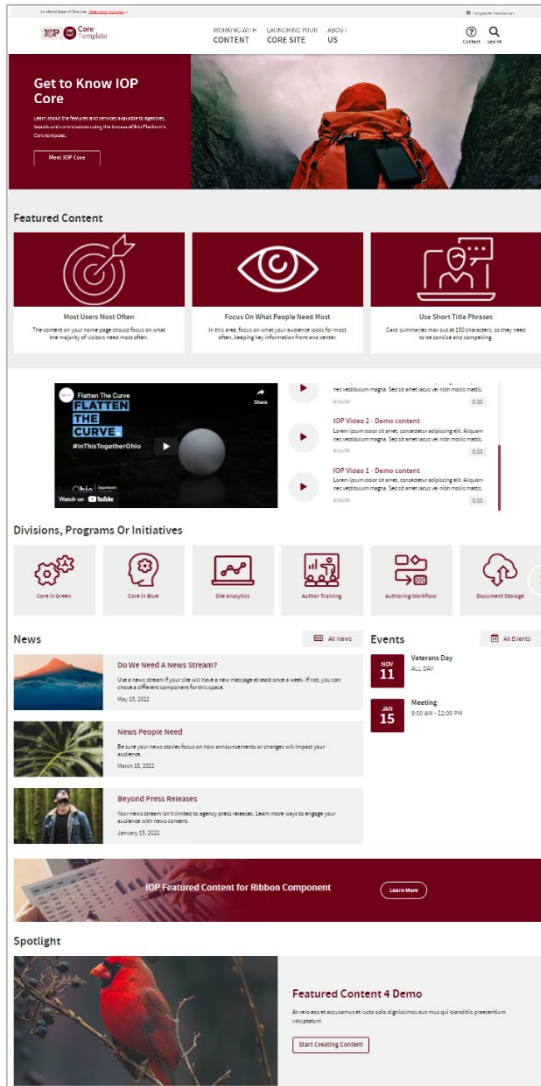
Necessity is the mother of invention, and so too, of innovation. In February 2020, IOP began developing a website template that could help boards and commissions with limited staff and resources onboard their websites to the platform with no added cost, no contracts, and no web-development experience. The template would need to be both easy to use and easy to maintain, with design patterns that are repeatable, yet customizable. And so, the IOP Core Template was born. The Core Template is essentially a catalog of easy-to-edit, expertly designed page and site components developed by IOP using HCL Software. It is available to eligible State of Ohio boards and commissions at no cost, and with no coding or design experience required. Instead, board or commission staff browse a catalog of interchangeable, user-centered, and state-branded page templates. With assistance from the IOP User Experience team, they will determine their site's navigation and select the components that best fit their content and goals.

Core sites are built to be modern and responsive, ensuring a website looks as good on a smartphone as it does on a laptop. Using Core also automates compliance with the Americans with Disabilities Act (ADA) and Web Content Accessibility Guidelines 2.0 to deliver a quality user experience for everyone. Optionally, these sites can be integrated with OH|ID, a secure state login created for Ohioans and businesses to access a variety of state government programs, services, and applications, all from one account. Most importantly, all onboarded websites receive comprehensive cybersecurity coverage and fast, reliable content delivery.

Additional Core Components

- [Red](#), [green](#), or [blue](#) theme color options that comply with state branding
- Up to five top navigation links (header with custom branding)
- A choice of home page components (e.g., news and events, featured content, featured video, quick actions, and more)
- A variety of authoring templates including one for complex tables
- Ability to support complex site structures via Subsection Hubs

- [Resource catalogs](#) with filtering tools
- A locations directory with [locations mapping](#)
- An Executive Bios [Directory](#)
- Standard headers and footers
- Optional “share to social media” icons



Figures 2, 3 & 4: Stills from Core.Ohio.Gov

Implementation

A Core site can be created exceptionally quickly - fewer than eight hours of IOP developer time is required to prepare a site for agency handoff so they can begin loading their content. However, due to the sheer volume of board and commission websites that needed to migrate to IOP - 89 websites were initially identified - as well as pandemic-related staffing and resource limitations, the Core Template has so far been made available by invitation only.

In early 2021, in coordination with the Office of the Governor, the Department of Administrative Services and Governor-identified state boards and commissions, the IOP project management office held a large-scale meeting to announce the scope, methodology, and timeline of this project to board and commission website stakeholders. An initial group of volunteers was identified and became the first to migrate to IOP with the Core Template following a hybrid Waterfall/Agile methodology. Remaining boards and commissions were split into waves and assigned to subsequent releases on a monthly cadence. Once all existing board and commission websites have safely onboarded to IOP, the Core Template will be available for state agency use, as well.

This limited initial release has allowed the IOP team to work individually with each board and commission to review their site and offer guidance on information architecture, content strategy, and training on IOP's content management tool. With this support, board and commission staff members can begin to migrate their web content within days. Once finished, they simply request a go-live date and within three weeks, their new site is live to the public. This guided process provides a solid foundation for boards and commissions, while allowing them to work at their own pace.

The Core Process, from Start to Finish

- ✓ Project kick-off
- ✓ Information Architecture and Content Strategy
- ✓ Site Build (under 8 hours of developer time)
- ✓ Training Session
- ✓ Content Migration
- ✓ Launch

[*Launching Your Core Site \(ohio.gov\)](#)

Cybersecurity is Only Part of the Package

In addition to industry-leading cybersecurity, by onboarding to IOP through the IOP Core Template, boards and commissions are also consuming user-centered design principles to support a customer-focused, compliant, and inclusive web experience. Because these principles are baked into the template, there is no need for their staff to understand web design or keep up with latest best practices – IOP has that covered along with several other support features:

Customer Support for Core Websites

- Updates and improvements to features are automatically deployed to all Core sites, meaning patching older versions is a thing of the past.
- 24/7 access to a guided “just-in-time” training repository that is seamlessly integrated into IOP's content management tool
- Virtual, drop-in style “office hours” each week for web content authors to ask questions and get real-time advice and assistance.
- An online community of authors helping authors

Impact

By leveraging AWS offerings, such as CloudFront and Shield Advanced, alongside the IOP Core Template, the State of Ohio is delivering cutting-edge cybersecurity and user-centered, mobile-ready design, to all state sites, regardless of their staffing, skill, or ability to pay. As of May 2022, 22 state board/commission websites have used Core to migrate to IOP, with six more sites set to go live by July 2022.

Before & After: The State's Digital Landscape

Before the IOP Core Template, state boards and commissions had websites that were completely different in branding, design, and navigation, creating a disjointed experience for Ohioans. The boards and commissions also embraced different tools and user experience philosophies. On top of that, many sites were not mobile-friendly or fully compliant with web accessibility standards, making it harder for users with disabilities to access state government content. State board and commission websites also varied greatly in cybersecurity. Insufficient IT security expenditures on new software and equipment and a lack of training made it very difficult for boards and commissions to keep up with the pace of digital evolution. This, in turn, made it difficult to keep mission-critical information and services up-to-date and safe from online attack.

Today, IOP has constructed a cost-effective engagement and delivery process to make it easier for state websites - large and small - to meet the needs of their users and better serve the public. Core websites support State of Ohio branding and create predictable patterns of interaction and navigation for visitors across state websites. The IOP Core Template also prioritizes a mobile-friendly user experience and offers built in ADA-compliance, ensuring public content is readily available to everyone. There are currently 92 websites (and counting) on IOP, largely maintained by nearly 1,200 self-sufficient content authors.

What is Next?

Once all of the existing board and commission websites are safely on IOP, the Core Template will be available for state agency use. Currently, 33 sites have gone live and 18 more are in progress.

One interesting use case is Core's potential to help agencies, boards, and commissions quickly build and populate small websites to support new initiatives or governor priorities. Initiative-based sites need to be spun up quickly, in response to media or current events and often there

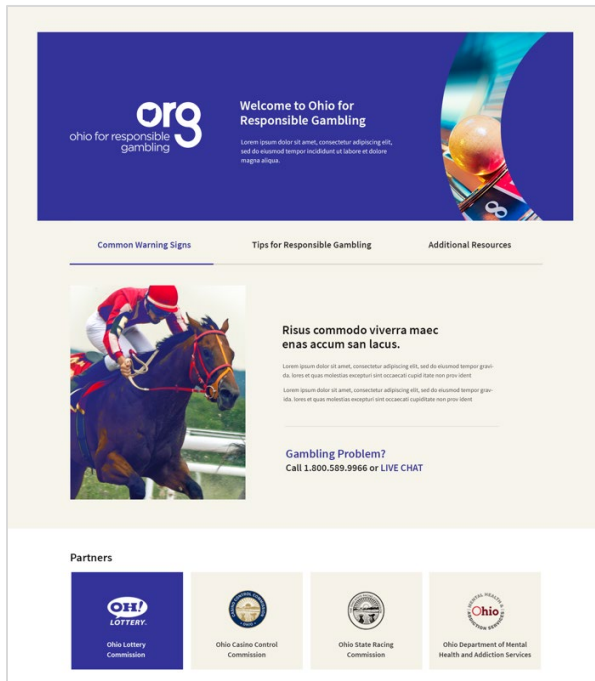


Fig. 5 - An internal mock-up of a Core Template splash page

is not enough content to warrant a full site. With this in mind, IOP wants to expand the IOP Core Template to include a marketing-based splash page that can be easily shared on social media.

In addition, as more people use the IOP Core Template, we expect to see requests for new site components and features. Once built, components with universal appeal would undergo a design review process to be standardized and made available for all IOP Core Template users.

Conclusion

By offering state boards and commissions an easy and cost-effective way to standardize and secure their sites by onboarding to IOP, the State of Ohio continues to exhibit leadership in state government digital presence.

The user testimony below illustrates how - even with a staff of two and no budget, the Ohio Elections Commission transformed its web presence easily and effectively with the IOP Core Site Template.

The Ohio Elections Commission is among the smaller staffed agencies for the State of Ohio. Currently, we have only two full time employees. Regardless of the staff size, the Commission carries and maintains all of the same duties that many agencies require teams of employees to manage. We like to think of ourselves as a Jack of all trades, as our plates stay full, with very little time to spare.

We were still utilizing an outdated [web] platform introduced to us in 1995. Our website was atrocious. Only half of our website worked at any given time. There were more broken links than working links. Eventually, enough was enough. The thought of having to build a new website, while having a staff of two that still needs to maintain its daily duties on top of this, was daunting. Then, there was the issue of funding this migration to a new website. How would we afford to do this on our agency's budget?

After some traded emails and a short meeting ... the IOP team were introduced to us. We discussed our necessities and our pipedreams for this site. Within no time, we were given a template for our new site along with training and a walkthrough to get us started. From there, we chipped away at it like a puzzle. With each page created, the process became easier, moved quicker and no longer seemed as daunting as it had initially. ... It was an excellent collaboration. In less than two months, our staff had completed the new site and ... we were ready to "Go Live." The IOP team quickly scheduled one more meeting with us to [ensure] everything was complete and that nothing had been overlooked. ... The site went live within two weeks. Since then, we have received numerous compliments from users about how easy the new site is to use.

- Philip Richter, Executive Director of the Ohio Elections Commission

We invite you to see the results for yourself by visiting the Ohio Elections Commission website at elc.ohio.gov, or you can view the full IOP Core Template at Core.Ohio.gov.