DiAGRAM: An accessible R application for The National Archives

The Challenge

Having previously worked with The National Archives to create a prototype, web-based application in Shiny, allowing users to build and compare storage policies to help manage risk to digital collections, we were tasked with taking that application to a public-facing production build.

Being a public sector organisation, compliance with Web Content Accessibility Guidelines (WCAG) was a requirement for the final application. Specifically, WCAG 2.1 level AA. The prototype built with Shiny had a number of accessibility issues to contend with. These needed to be resolved and, in addition, there was a requirement to make a more user-friendly interface for the "Advanced" section of the application.

Initial scoping led to the decision to rebuild the application, replacing Shiny with a front-end built using standard web technologies and a serverless, scalable back-end hosted in AWS Lambda.

WCAG 2.1
level AA

Hosted by
AWS Lambda

HTML, CSS,
JavaScript

DiAGRAM: An accessible R application for The National Archives

The Project

Over a few months we completely rebuilt the entire application. The R back-end was migrated to AWS Lambda, providing a scalable way to interact with the underlying Bayesian network model, build charts and reports, and validate user data via REST API.

The application's underlying infrastructure was implemented with Terraform, providing a repeatable and declarative model of the solution architecture. Terraform workspaces were used to provision development, staging and production environments, with deployment and application life-cycle automated with GitHub Actions.

The front-end user interface for the application was reconstructed using HTML, CSS and JavaScript. This was a significant body of work that involved building out replacements for each of the widgets that we wanted to retain from the prototype shiny application *and* making them accessible. For example, every widget needed to be operable with a keyboard as well as by a mouse and touch input.

The "Advanced" section was also updated, with an interactive SVG displaying a graphical representation of the network. The user is now able to choose a node they want to edit by clicking on it, with a dropdown-menu providing a keyboard-and-screen-reader-friendly alternative. The subsequent model-editing process — following selection of a node — was also made more intuitive, based on feedback from usability tests of the original Shiny application.

Our Results

The WCAG 2.1 compliant application is now live and free-to-use at https://diagram.nationalarchives.gov.uk/.

All code associated with this project is publicly available on the National Archive GitHub pages (front-end code, back-end code, infrastructure as code).

WCAG 2.1
level AA

Hosted by
AWS Lambda

HTML, CSS,
JavaScript