

Desk Aid Website

By Victoria Shelton and Tim Hunt

1. Introduction

The project proposed by Cameron Hardy is an interactive web application. Its purpose is to be a guide for district office staff when a constituent approaches requiring help with any number of issues. Essentially, it will be an interactive online desk aid adapted from an existing printed guide that uses problem-solving flowcharts. The website will give staff options based on these flowcharts, and staff will select the option that best describes the constituent's issue. Once the end is reached, the website will return a solution in the form of a description, link, or contact information of a relevant department.

The client, Cameron Hardy, would like this project done to increase efficiency in assisting constituents and educating office staff on common issues these constituents may have. He was originally planning to implement the printed guide as an interactive/clickable PDF, but was considering the option to use a web version for greater ease of use. Additionally, implementing this data in the form of a website would allow for opportunities to make it easily modifiable, so that entries can be added and removed as time passes. This project would align well with those goals and simplify the guide.

2. Requirements

User Stories

The website's requirements were gathered directly from meetings with the client. These requirements were then formatted as user stories, shown in the table below. Three technical tasks were added in order to set aside time for building the website's framework: the backend, the database, and the user interface. Some additional user stories were suggested by the professor to make this project an appropriate difficulty level for the course.

ID	Story Title	Points	I want [functionality]	So that [value]
User Stories				
S1	View guide categories	2	to view categories	I can find the guide I need
S2	Search for guides	3	to search for specific guides	I can find a specific guide
S3	Use guide	3	to navigate through the guide	I can reach the answer to the

				constituent's question
S4	View resources	2	to view resources	I can find info quickly
S5	Add resource	1	to add additional resources	I can add additional resources
S6	Edit resource	3	to edit resources	I can edit resources
S7	Delete resource	2	to delete resources	I can delete resources
S8	Create guide info	2	to begin making a guide	I can add another guide
S9	View guide as flowchart	13	to view the guide as a flowchart (or a tree)	I can visualize and click on steps
S10	Export guide as flowchart	5	to export the guide as a flowchart (or a tree)	I can export the guide as an image
S11	Delete guide	1	to delete a guide	I can remove it from the database
S12	Assign category to guide	3	to categorize my guide	It is easier to find
S13	Create category	2	to create a category for my guide	It can be more customized
S14	Delete category	3	to delete a category	It can have categories removed
S15	Add guide step	5	to add a step to my guide	I can add steps to my guide
S16	Edit guide step	3	edit a step of the guide	I can update my guide
S17	Delete end step	1	to remove parts of my guide	I can remove parts of my guides
S18	Delete Intermediary Step	3	to delete Intermediary Steps	I can safely remove Intermediary Steps
S19	Accounts	2	to have accounts for access to certain functions	I can create accounts with customized access
S20	History	2	to see who makes editations	I can trace who edits what
S21	Backup	1	to save data in case of accidental deletion	I will not lose important data
Technical Tasks				
T1	Setup the backend	5	a functioning website	I have a useful application

T2	Setup the Database	2	a functioning database	I have a useful database
T3	Setup the UI	3	to access the application	I can utilize the application
Total points		72		

Non-Functional Requirements

The client specified a few non-functional requirements. The website should be easy to use and navigate and should contain relevant logos and branding provided by the PA House of Representatives. If possible, the website should interface with existing web pages hosted on SharePoint, through links or otherwise.

Planning

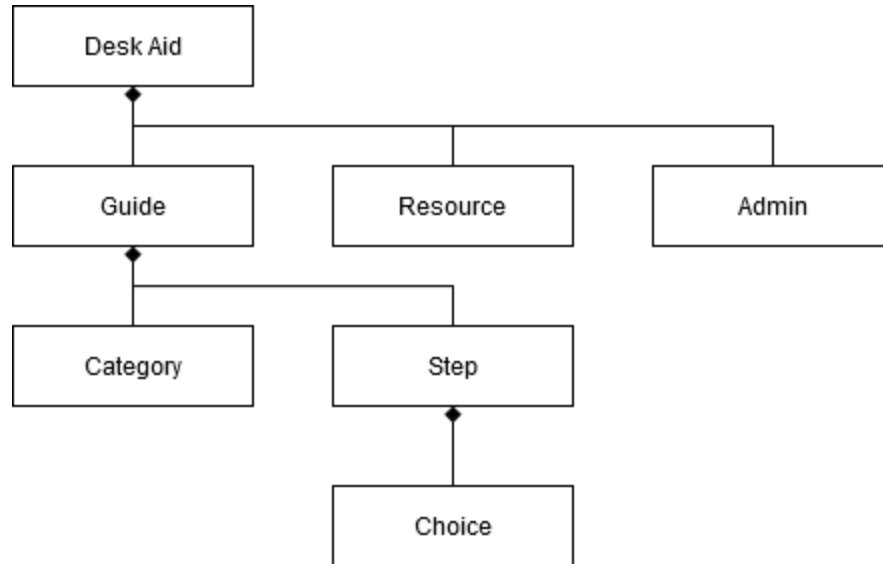
The project will take place over 5 iterations, or sprints, during the course of the spring semester. Below is a table detailing the planned schedule of story completion. This is liable to change depending on whether or not the difficulty of each story was estimated correctly.

Iteration	End Date	Stories	Total Story Points
1	2/12/2025	T1, T2, T3	10
2	2/26/2025	S1,S2,S3,S4,S8	12
3	3/19/2025	S11,S12,S13,S14,S15,S16	18
4	4/2/2025	S5,S6,S7,S18,S19,S20,S21	14
5	4/16/2025	S9,S10	18

3. Design

Architecture

Our project will be using layered architecture and will be organized as a full-stack web application. Its layers will include a front-end, a back-end/server, and a database. A simple class diagram can be seen below.

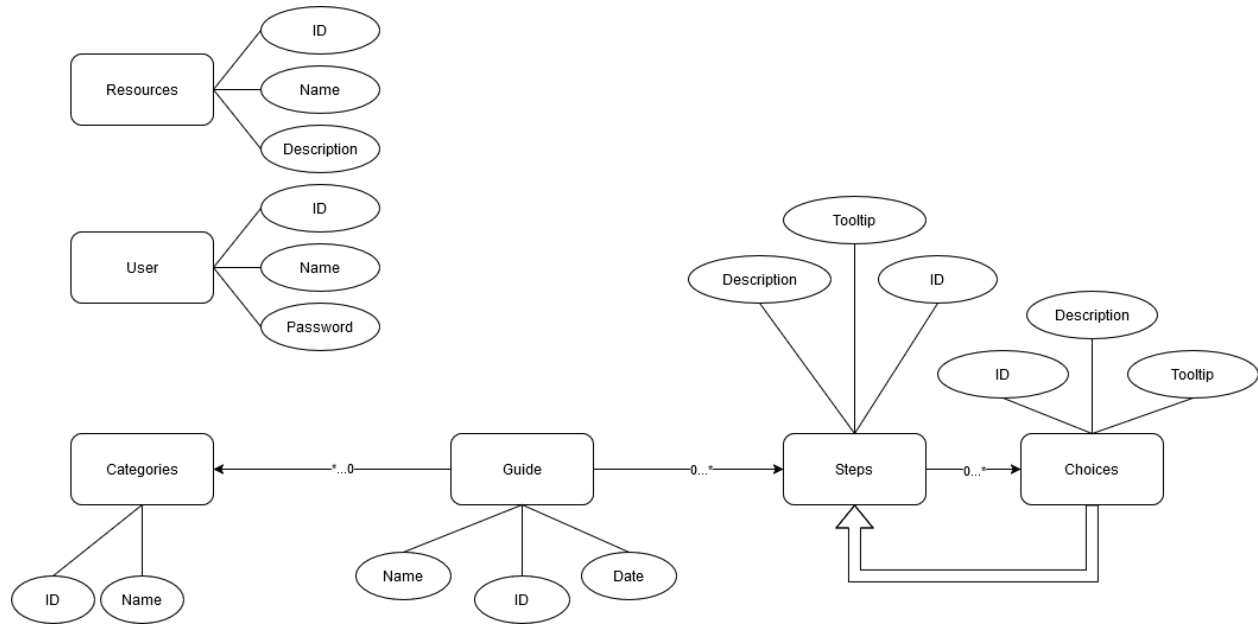


Technology

The main programming language for this project will be Javascript because of its flexibility and tools for creating web apps. This project will benefit from additional technology for the front-end, back-end, and database. To construct the front-end, we will use Next.js, React.js, and Tailwind CSS. React is a javascript framework that will aid in creating the dynamic, user-friendly interface. For the server/back-end, we will use Node.js and Express.js. Express.js is a web framework for Node.js that will make connecting the front and back end easier. For the database, we will use SQLite.

Database

The database will be created using SQLite. Below is a diagram that displays the structure of the entries in the database.



UI

The client specified that the website should be easy to use and navigate. Additionally, it should contain relevant logos and branding provided by the PA House of Representatives. To implement these requests, we designed the UI to have a similar color scheme and layout as existing PA House of Representatives websites. The UI does not contain an overwhelming amount of information, and all options are easy to locate from the home page. Extra effort was taken to make sure the user can find the guide they need and reach the answer of the constituent's query as fast as possible. Mocks of the web pages can be seen below.



4. Iterations

Sprint 1

Stories Attempted

ID	Story Title	Points	Sprint Done	Total Points per Sprint
T1	Setup the backend	5	1	
T2	Setup the Database	2	1	Total Points
T3	Setup the UI	3	1	10

Member	Stories	Hours Worked	Total Points
Victoria	T1 T3	12	8
Tim	T2	6	2

Testing

```

PASS ./test.js
  Home page
    ✓ Renders (21 ms)
    ✓ Displays title (8 ms)
    ✓ Renders search bar (2 ms)
    ✓ Calls search function (32 ms)

  › 2 snapshots obsolete.
    • Home page renders correctly 1
    • renders correctly 1

-----|-----|-----|-----|-----|-----
File    | % Stmts | % Branch | % Funcs | % Lines | Uncovered Line #s
-----|-----|-----|-----|-----|-----
All files |    100   |    100   |    100   |    100   |
page.js  |    100   |    100   |    100   |    100   |
-----|-----|-----|-----|-----|-----

```

For the testing framework, we used Jest. Since we did not have too much code to test at the beginning of the project, we only wrote tests for the home page's components. The coverage report can be found at [desk_aid\coverage\cov-report\index.html](#), as well as the image above.

Retrospective

This sprint was a bit difficult as the website setup did not completely cooperate. Building the UI with next.js and tailwind was reasonably painless, but integrating the database into the UI proved to be difficult. More work will have to be done next sprint on integrating the database into the UI.

Next Iteration Planning

For the next iteration, we will aim to complete the stories S1, S2, S3, S4, and S8. These stories will integrate the database into the UI and flesh out the website. Additionally, we will work on meeting more often and working as a team.

Sprint 2

Stories Attempted

ID	Story Title	Points	Sprint Done	Total Points per Sprint
S1	View guide categories	2	2	
S2	Search for guides	3	2	
S4	View resources	2	2	
S8	Create guide info	2	2	
S11	Delete guide	1	2	
S14	Delete category	3	2	Total Points
S19	Accounts	2	2	15

Member	Stories	Hours Worked	Total Points
Victoria	S1, S4, S14, S19	15	9
Tim	S2, S8, S11	12	6

Testing

For our testing we utilized Jest to help effectively test our front end. The generated coverage report is shown below, and can be accessed at [desk_aid\coverage\index.html](#).

All files

94.44% Statements 187/198 88.88% Branches 36/38 100% Functions 18/18 94.44% Lines 187/198

Press *n* or *j* to go to the next uncovered block, *b*, *p* or *k* for the previous block.

Filter:

File	Statements	Branches	Functions	Lines
pages	<div><div></div></div> 96.29% 52/54	<div><div></div></div> 100% 5/5	<div><div></div></div> 100% 3/3	<div><div></div></div> 96.29% 52/54
pages/EditSelectPage	<div><div></div></div> 100% 29/29	<div><div></div></div> 100% 1/1	<div><div></div></div> 100% 1/1	<div><div></div></div> 100% 29/29
pages/HelpPage	<div><div></div></div> 100% 16/16	<div><div></div></div> 100% 1/1	<div><div></div></div> 100% 1/1	<div><div></div></div> 100% 16/16
pages/ResourcesPage	<div><div></div></div> 88.23% 30/34	<div><div></div></div> 80% 4/5	<div><div></div></div> 100% 1/1	<div><div></div></div> 88.23% 30/34
pages/SignInPage	<div><div></div></div> 92.3% 60/65	<div><div></div></div> 83.33% 5/6	<div><div></div></div> 100% 4/4	<div><div></div></div> 92.3% 60/65

Retrospective

Looking back at this sprint and the way we planned out our stories, we realized that some of them depended on having other stories done, forcing us to reconsider how we needed

to reorganize our future sprints alongside this. Alongside this we had also run into issues in combining the front and backend with react due to neither of us having much experience with databases. Part of this issue as stated earlier with our stories tackled for this sprint has to do with how many points we decided to tackle as opposed to what we had originally planned. We ended up with 15 points worth of stories where we had only originally intended 12 points total.

Next Iteration Planning

For our next iteration we plan to tackle several key user stories surrounding the UI and generally syncing up the frontend and backend, with a more test heavy focus for what we are going to emphasize after the interface with react and HTML pseudo code is reorganized. Primarily we intend to focus on S3, S12, S13, S15, and S16 for our stories while optimizing the code we already have, while tackling the estimated 16 story points.

Sprint 3

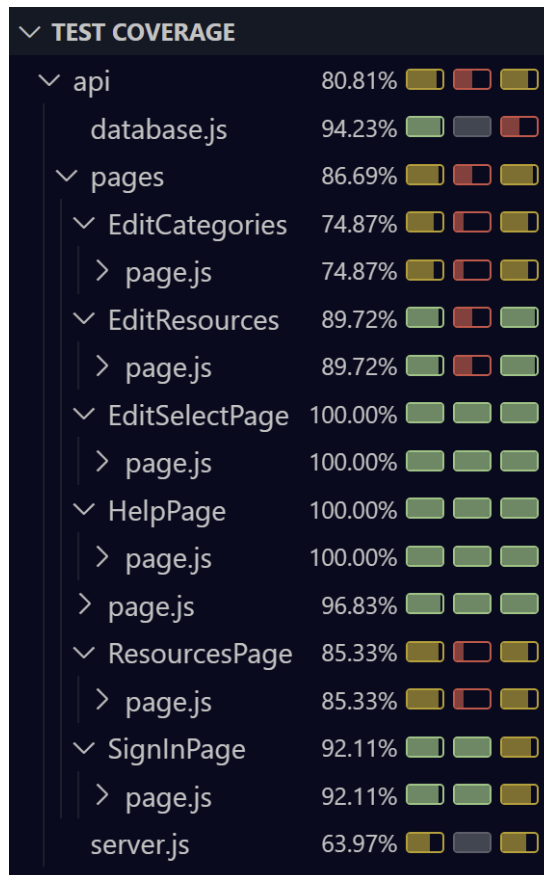
Stories Attempted

ID	Story Title	Points	Sprint Done	Total Points per Sprint
S5	Add resource	1	3	
S6	Edit resource	3	3	
S7	Delete resource	2	3	
S11	Delete guide	1	3	
S12	Assign category to guide	3	3	Total Points
S13	Create category	2	3	12

Member	Stories	Hours Worked	Total Points
Victoria	S13, S5, S6, S7, S12	30	11
Tim	S11	12	1

Testing

api	<div><div></div></div>	68.94%	202/293	67.74%	21/31	100%	0/0	68.94%	202/293
api/pages	<div><div></div></div>	96.36%	53/55	100%	5/5	100%	3/3	96.36%	53/55
api/pages/EditCategories	<div><div></div></div>	78.44%	131/167	75%	6/8	25%	3/12	78.44%	131/167
api/pages/EditResources	<div><div></div></div>	91.66%	165/180	95.23%	20/21	53.84%	7/13	91.66%	165/180
api/pages/EditSelectPage	<div><div></div></div>	100%	26/26	100%	1/1	100%	1/1	100%	26/26
api/pages/HelpPage	<div><div></div></div>	100%	16/16	100%	1/1	100%	1/1	100%	16/16
api/pages/ResourcesPage	<div><div></div></div>	89.39%	59/66	80%	4/5	25%	1/4	89.39%	59/66
api/pages/SignInPage	<div><div></div></div>	92.42%	61/66	83.33%	5/6	100%	4/4	92.42%	61/66



During this sprint, we worked on testing the majority of the front end and the server. We managed to get around 80-90% of the front end tested and 60-70% of the back end tested. We will need to separate the server file into more files to better track each page's functions and components.

Retrospective

For this sprint, we did not get as many points done as originally intended, getting 12 out of the 18 points done. This was mainly due to competing responsibilities outside of this project, underestimating the point value of the stories, and difficulties actually completing those stories. However, we did manage to flesh out a lot of the crud operations and complete a lot of the website. All in all, we are still keeping up with the workload and will finish the website on time.

Next Iteration Planning

For the next iteration, we will work on the most important and most difficult feature of the website: navigating and managing the guides. This will be the part that will require the most time and knowledge to execute.

Sprint 4

Stories Attempted

ID	Story Title	Points	Sprint Done	Total Points per Sprint
S3	Use guide	3	4	
S12	Assign category to guide	3	4	
S15	Add guide step	5	4	
S16	Edit guide step	3	4	Total Points
S17	Delete end step	1	4	15

Member	Stories	Hours Worked	Total Points
Victoria	S3 S16 S17 S15	24	12
Tim	S12	20	3

Testing

No new testing data is available for this sprint.

Retrospective

This sprint was pretty productive in getting the core functionality of the website to work, such as navigating through a guide and editing the steps of a guide. However, the stories completed lacked polish, and will need their ui updated and the bugs ironed out. Additionally, we

did not write tests for the code due to lack of time, so we will have to go over all of the code and write tests to cover missing lines.

Next Iteration Planning

For the final sprint, we will focus on polishing up the website to present to the client. This will include debugging some unstable functionality, including comprehensive tests for the code, and cleaning up the website UI to look more presentable. Additionally, we will meet with the client to get their feedback and implement the changes they suggest.

Sprint 5

Stories Attempted

ID	Story Title	Points	Sprint Done	Total Points per Sprint
S2	Search for guides	3	5	
S9	View guide as flowchart**	13	5	
T4	Polish UI*	8	5	
T6	Refactor Tests	3	5	Total Points
S22	Add Logos	1	5	28

Member	Stories	Hours Worked	Total Points
Victoria	S9** S22 T4* T6	20	24
Tim	S2 T4*	15	7

* Point Value split in half due to it being completed by two people

** Most of this was completed last sprint

Testing

For this sprint, we focused on upping the coverage for the backend functions. We reached around 75% coverage on the server. No new tests were written for the web pages, at

least so far. The server side tests are shown below in app/api.

app	<div><div></div></div>	82.72%	91/110	77.77%	7/9	75%	3/4	82.72%	91/110
app/EditCategories	<div><div></div></div>	79.31%	138/174	75%	6/8	25%	3/12	79.31%	138/174
app/EditResources	<div><div></div></div>	92.06%	174/189	94.73%	18/19	53.84%	7/13	92.06%	174/189
app/EditSelectPage	<div><div></div></div>	100%	26/26	100%	1/1	100%	1/1	100%	26/26
app/HelpPage	<div><div></div></div>	100%	25/25	100%	1/1	100%	1/1	100%	25/25
app/ResourcesPage	<div><div></div></div>	89.39%	59/66	80%	4/5	25%	1/4	89.39%	59/66
app/SignInPage	<div><div></div></div>	92.18%	59/64	83.33%	5/6	100%	4/4	92.18%	59/64
app/api	<div><div></div></div>	77.91%	381/489	68%	51/75	0%	0/1	77.91%	381/489

Retrospective

ID	Story Title	Points
User Stories		
S22	Add Logos	1
S23	Better Text Editing	3
Technical Tasks		
T4	Polish UI	8
T5	Sign in Security	3
T6	Refactor Tests	3

This sprint was mainly focused on polishing the website, finishing a bit of left over functionality, and writing tests. We added a few more user stories/technical tasks to highlight undocumented work that was taking a lot of time, but didn't necessarily fit under any category. These can be seen in the chart above. We also met briefly with the client and his supervisor to show the work so far and see if they had any requests. We will continue working on polishing the website until it is due and we feel that it is complete.

5. Conclusions