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Enhancement One

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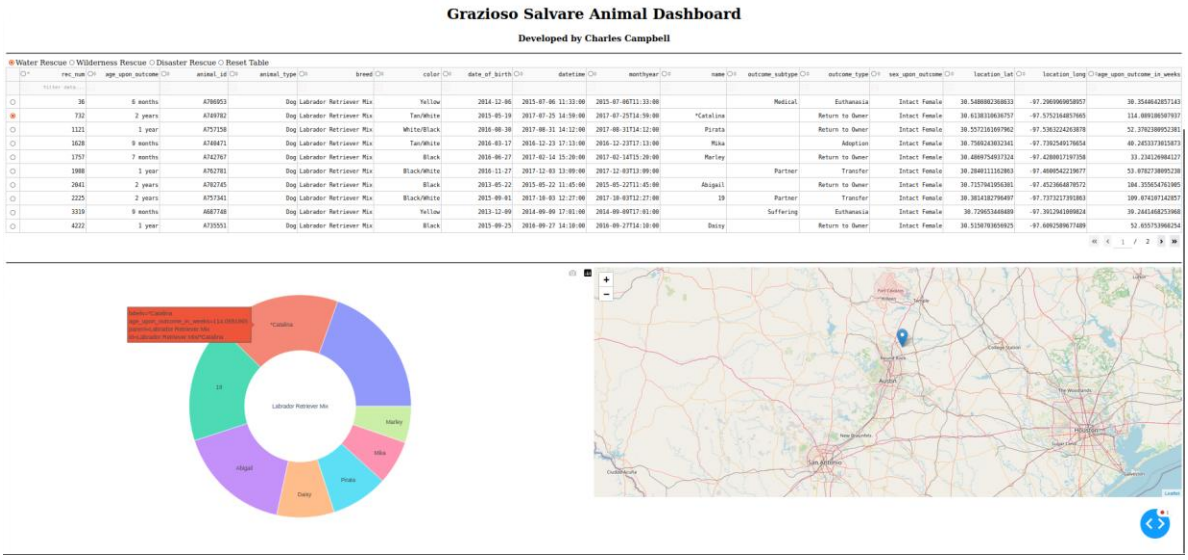
Software Design and Engineering Narrative

The original artifact was a Python & MongoDB client/server web application I developed from February – April of 2025. It featured a dashboard table that would display data elements that were held in the MongoDB; and displayed them in a list format, and the table's results would then create a graph and dropped pin on a geo-map. The dashboard could be filtered through 3 specific buttons, along with a reset button. Below is a screenshot of the original output a user would see on the browser window.

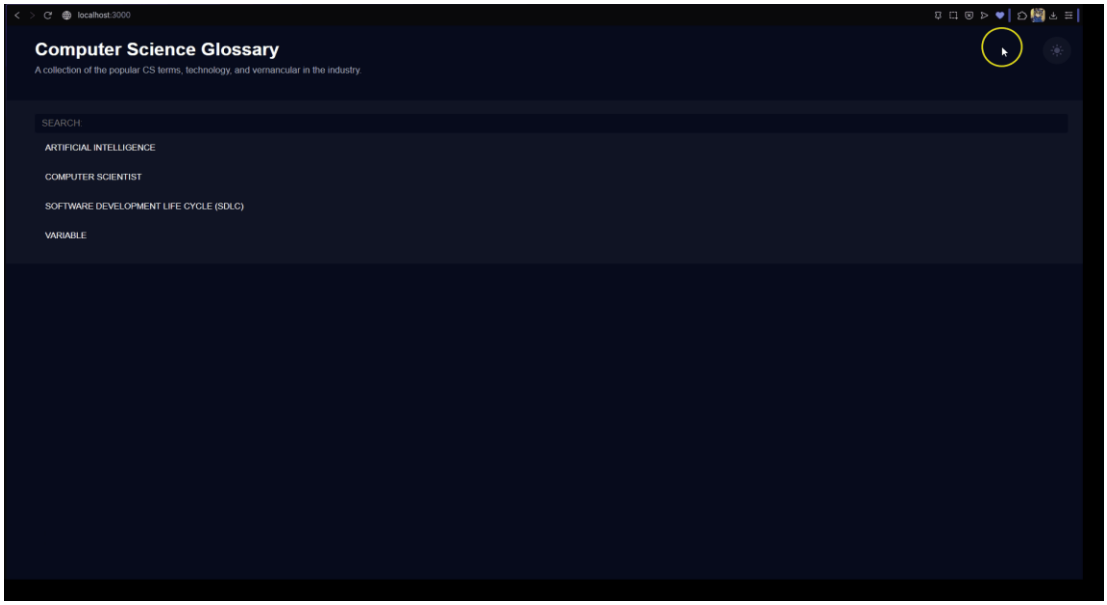


I wanted to improve upon this web application, mostly due to my desire to pursue a career as a full stack developer, but additionally because the tools I utilized in this client/server web application don't match what is being prominently used in the industry at the current time. From personal research, the MEAN stack (MongoDB, Express, Angular, Node.js) is becoming the industry standard tools that many modern projects are designed with. As Prytulents explains,

“JavaScript is a pivotal programming language that breathes interactivity into web pages” (2025). While Python is a strong language that can cover many requirements, JavaScript’s strength for web development outweighs Python.

I want to showcase that I have the aptitude to design high quality web artifacts utilizing the MEAN stack technology and methods. Enhancing this client/server application by designing it with the MEAN tools will be a great portfolio artifact to showcase that ability. The enhanced item will not exactly reflect the same items listed; I plan to convert the webpage displaying a dashboard list of animals into a dashboard list of computer science glossary items. This will still show my skills of creating a high quality web application that displays data, pulled from the server database using CRUD algorithms, into a user friendly and pleasing modern front-end client design. For the first step, the front-end structure of the software design and engineering has been set up to accomplish this.

I was able to successfully design a clean SPA (single page application) that features a detailed data list that users can interact with, along with a filtering option so that they can quickly access specific information they need. I accomplished this using HTML accordion buttons, and by creating JavaScript modules that link to specific features for the application. In my previously designed artifact, the user could only push buttons to filter the results of the table. Now, in this enhanced project, the user has a search function and can filter the table’s results to specific terms they want to find. What’s more, the overall design of the table has been enhanced. Before the items were in small text and all the details were displayed much like an Excel spreadsheet. Now, the data items are clickable, once a user selects a CS term they find interesting, the website expands the item to a more detailed description. Below is an example of these enhancements.



In my creation and improving of the artifact from Python to the MEAN tools, I was able to not only take advantage of the web design centric tools by improving the original functions like the display of the data within the webpage (the table), or creating a more user centric data search/filtering option, but I was also able to add more features like the dark/light mode button. Thanks to the use of JavaScript, CSS & HTML, I could effectively implement these user specific features that would have likely been much more complicated or unable to achieve with the original Python code base.

Adding the light/dark mode feature to further enhance the project also helps showcase I can develop a product that: meets accessibility requirements, can be developed with modern or professional design elements, and implements a power/energy efficiency principles in the software (for example, consuming less power on mobile devices due to less light emitted for the screen pixels). As Frenkel reports that recent surveys show that 81.9% of users utilize dark mode on their devices, and 64.6% of people expect websites to have a dark mode (2023). Enhancing from Python to the MEAN tools allowed me to improve the original functions, while also adding in new features that increased the artifact's overall value and industry-specific requirements

With these enhancements, I believe I have met my previously desired outcomes I sought to achieve when enhancing the software design & engineering. Through my enhancement of programming language migration of the client/server application from Python to the MEAN stack, I've showcased my ability to employ a strategy to support organizational decision making. Employers will be able to see that I can apply strategies in building collaborative environments in the field of computer science. Additionally, this artifact can be an example that I can design, develop and deliver professional, coherent, and technically sound products for specific audiences & contexts. My artifact can show I keep accessibility and user-experience at the forefront of designing the software's design and architecture. Finally, this project displays my ability to use well-founded techniques, skills, and computing tools (such as the MEAN stack) to accomplish industry-specific goals and high value solutions.

Through the enhancement of this artifact, I've come to learn how powerful the MEAN stack is in comparison to just utilizing Python and older frameworks. While it was challenging at first to transfer the logic of certain functions like the search/filter option from the original Python code base to the JavaScript modules, I became satisfied at how much simpler and more user-friendly the final result became. And while the dark/light mode feature took some additional research and testing than originally planned, I'm excited that I was able to implement it and further enhance the project for a higher-quality artifact in the end.

While the overall architecture and base software design is in place, the artifact still has some major features that need to be enhanced. The inclusion of the MongoDB for the database, and the CRUD algorithms will be necessary to improve the server portion of the SPA. Ensuring users can create their own list, while being able to read, add, delete and update their list will greatly enhance the overall artifact while showcasing my skills and abilities to future employers.

References

Frenkel, S. (2023, August 15). *Should You Consider Dark Mode for Your Next Website?* Big Drop Inc. https://www.bigdropinc.com/blog/considering-dark-mode-for-website

Prytulenets, A. (2025, January 8). *How to Choose the Best Tech Stack for Web App Development in 2025*. 5ly.co. https://5ly.co/blog/best-web-app-tech-stack