**Computer Science Trends and Artifact Update**

Anderson Forestal

Science department, Computer Science

CS-499-T4250 Computer Science Capstone

Southern New Hampshire University

Brooke Goggin

April 2, 2023

Computer science and artifact update

In the article "driving process safety with better data in chemical engineering, the author emphasizes safety and risk mitigation to prevent historic environmental disaster recurrence like the Deep-water oil spill in the Gulf of Mexico on April 20, 2010. As the name implies, process Safety is a framework for managing the integrity of operating systems and processes handling hazardous substances by applying practical design principles, engineering, and operation practices. This type of process is significant for professionals in the industry because it deals with the prevention and control of incidents that have a potential impact on the environment from occurring.

In essence, prevention and control of incidents that have the potential to release energy must be monitored for observation. And the safest way to accomplish it is by applying computer science knowledge to develop robust software to monitor all parameters including “pressure sources, operating and design conditions, and the connections among systems (such as piping, valves, and couplings)” (Heather, 2023). In the event a fault occurs, the software triggers an alarm and automatically shutoff the section of operation. In cases like this, writing software to monitor low and high pressure and accurate sensor readings to evaluate and detect faults in the system is the way to go to prevent catastrophic incidents. Such implementation will surely change the experience of consumers, workers, and citizens. In short, I presuppose software engineering will play a major role in ensuring monitored devices are communicating respectively to supply engineers with accurate and complete data to mitigate the environmental risk of the statistical chance of incidents.

In this modern age, citizens around the globe depend on prescription drugs, consumers product, and foods to maintain their lifestyles. To consume pure and safe products, the Waters Alliance iS HPLC System is suited to help “bring significant productivity and quality improvements to high-volume QC laboratories" (Heater, 2023). The high-performance system helps make accurate and precise measurements by detecting and eliminating common errors by up to 40%. In doing so, the system consistently meets quality, safety, and compliance. Moreover, the Waters Alliance System revolutionizes the method QC laboratories develops and delivers product significantly. To my understanding, this innovative system will change the experience of consumers and citizens to deliver on time pure and safe products and create a proactive environment for workers to reduce compliance risk by adding new levels of error detection, troubleshooting, ease of use, error-reduction, risk management to deliver on-time product delivery goals.

The Waters Alliance System HPLC is thoughtfully designed for the unique needs of the QC laboratory. The system is equipped “With visual prompts and alerts delivered through an intuitive touchscreen interface, cloud-native waters connect system monitoring software to enable real-time monitoring, the system notifies the operator if an improper method is chosen for an application, when a sample vial is missing, when it’s time to refill a solvent bottle, or if it’s time for system maintenance" (Heather, 2023). This system will change computer science because all the HPLC instrument's capabilities are controlled by empowered software that will need maintenance and innovative design for better results. This means software engineers will continue maintaining the system, add more features, and develop and integrate more powerful instruments to improve equipment utilization and overall productivity.

For the Software design/Engineering and Algorithms and Data Structures, I am making excellent progress by enhancing and refining the authentication and login page class. In the final analysis, I am taking advantage of the open-source community tools to develop code that can generate success in refining the authentication and login page to work as expected.

As for the data structures and algorithms, I am still trying to resolve the errors because I do not want to present the refinement work with faults. If I cannot resolve the errors, I am considering your feedback to work with a different artifact. I have not made up my mind yet. But I think CS-405 Secure Coding or CS-330 Computer Graphics and Visualization would be a good choice.

For CS-340 Client Server Development, I downloaded Jupyter Notebook, MongoDB Compass, Mongo import, and Mongo shell to create the animal shelter application on my local computer. I also signed up for a Mongo Atlas account to create the AAC database and perform a connection string with Mongo Compass and Mongo Shell. In the Jupyter Notebook environment, I developed an Animal\_Shelter.ipynb, aninal\_shelter.py, test. ipynb imported the JSON file and uploaded the Grazioso Salvare logo.png.

References

Heather, H. “Driving process safety with better data in chemical engineering" Mar 24, 2023.

<https://www.rdworldonline.com/driving-process-safety-with-better-data-in-chemical-engineering/>

Heather, H. “Waters’ next generation HPLC system is aimed at reducing lab errors by up to 40%" Mar 23, 2023.

<https://www.rdworldonline.com/waters-next-generation-hplc-system-is-aimed-at-reducing-lab-errors-by-up-to-40/>