

Emerald U. Henry – Statement of Purpose

One major factor contributing to the inefficient planning and allocation of resources for the operations of the Nigerian Oil and Gas Industry is the lack of accurate and up-to-date data about crude oil production and petroleum product consumption. I believe that technology transfer of data management solutions, as well as using Artificial Intelligence to develop engaging content for building the capacity of major decision-makers in the industry, can help facilitate data-driven decision-making. These factors have led me to pursue an MSC in Advanced Computer Science.

From my earliest memories, the sight of endless queues during festive periods, signifying "Fuel Scarcity," sparked a curiosity I couldn't ignore. As I got older, my fascination evolved into a quest to understand the reasons behind these cyclical shortages. It was a complex amalgamation of economic, political, and technical challenges that affected petroleum production throughout the year. With efficient data systems and effective capacity-building campaigns, the industry could better plan for various economic challenges, equip national and political leaders with precise and updated information for effective decision-making, and foster synergetic integration between the units that make up the oil and gas industry.

This awareness guided my choice to pursue Mechanical Engineering at the bachelor's level, specializing in the Optimization of Energy Systems under Professor Ohunakin Olayinka's mentorship. Our research explored the use of Data Science and Artificial Intelligence methods to improve the energy production efficiency of wind turbines by enhancing energy forecasting accuracy, developing new methods to aid in detecting turbine faults long before they occur, and increasing the overall reliability of wind energy systems. Our research, including "A Neural Network-Based Wind Turbine Power Curve Models Using Several Wind Farms' Influencing Parameters and Topography" and "Conditional Monitoring and Fault Detection of Wind Turbines based on Kolmogorov-Smirnov's nonparametric test and Machine Learning," among others, has been published in prestigious journals around the world. Additionally, discussions with a brother of mine who works in the Nigerian National Petroleum Corporation led me to understand that a software solution enabling the daily reporting of operational data in the Oil and Gas Sector is inadequate without developing a sustainable method for building capacities across all levels in the industry.

Moreover, the gap between research and real-world application remains apparent. This realization fuels my aspiration to pursue advanced studies through a potential PTDF OSS Masters. I aim to integrate successful data reporting and capacity-building strategies established in developed nations with the chance to contribute learned expertise to Nigeria's Oil and Gas industry upon my return. Securing this scholarship signifies more than a personal achievement; it serves as a resolution of local challenges via global knowledge. This degree will be an opportunity to strengthen our national efforts towards a sustainable future for the Oil and Gas Industry while maintaining a secured energy path for Nigeria's economy.