HOUSEHOLD UTILITIES MONITORING SYSTEM USING GEOFENCE TECHNOLOGY WITH DATA ANALYTICS

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CAPSTONE PROJECT SUBMITTED TO THE FACULTY OF THE INSTITUTE OF COMPUTING, ENGINEERING AND TECHNOLOGY (ICET), DAVAO DEL SUR STATE COLLEGE, MATTI, DIGOS CITY, DAVAO DEL SUR, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY

JUNE 2024

ABSTRACT

SUIZO, CLYDE ANDRIE G. Davao del Sur State College (DSSC), Institute of Computing, Engineering, and Technology (ICET), Matti Digos City. June 2024 **HOUSEHOLD UTILITIES MONITORING SYSTEM USING GEOFENCE TECHNOLOGY WITH DATA ANALYTICS** Undergraduate Capstone Project Manuscript.

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This study was conducted to determine that combining geofence technology into household monitoring systems was an approach to improving utility management and monitoring more efficiently and effectively. While the previously mentioned changes had already been integrated into systems used to monitor household utilities, it was clear that there was a lack of monitoring systems that utilized geofence technology. Such methods were more useful among locals in Don Lorenzo Homes Subdivision, Tres de Mayo, Digos City. As a solution, the monitoring system created in this study achieved the following functions; (1) used a motion sensor as the geofence to cover the entrances and exits of the household with an effective range of 250cm and an effective angle between 60 and 120 degrees, (2) used light and gas sensors integrated into household utilities to gather real-time information with an effective range of 60cm and

20cm respectively, (3) visualized data with the help of bar and line graphs using graphical analytics techniques to display the collected data. Through pilot testing and evaluation, the system gained a 4.2 weighted mean with a remark of GOOD, which demonstrated that employing geofencing techniques increases the efficiency of the homeowner's household utility management. The capstone project stood to make significant contributions to the research field by combining geofencing technology and sensors to enhance household utility management. The anticipated benefits in terms of energy efficiency, cost savings, and household utilities management highlighted the project's potential to influence both academic research and practical applications in the smart home domain. The research outcomes could serve as a foundation for further studies, leading to the development of more sophisticated systems and inspiring new approaches to energy efficiency, sustainability, and management.

Keywords: *Desktop application, Household utilities, Geofence, Data analytics, Motion sensor, Light Sensor, Gas Sensor, Arduino*