

# Mobile application: Development of Fuel Station Search

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## Abstract

This research can greatly help most motorists find the cheapest fuel station within an area. It was developed so that users can view the price of the fuel station in the area along with the fuel station's details, such as the station's name, location on the map, and the distance from the site. Using geographical referencing, the app helps save cash, fuel economy, and time in looking for the nearest fuel refilling station. This application requires internet access, and thus there is a disadvantage of internet failure. The main aim of developing this application is to reduce the time to a great extent that is consumed in searching for the nearest and cheapest fuel station. This study used a descriptive design. Data were gathered through interviews and standard questionnaires using purposive sampling. McCall's Software Evaluation was used for the expert's evaluation, and ISO/IEC25010 Software Characteristics for the respondents. Rapid Application Development was used in Software Development Life Cycle. As a result, both experts and respondents agreed that system was operational, always available, accessible, and responsive anytime by giving the grand mean both equal to 4.77 and 4.77. Various software development tools, such as the Javascript framework, Angular 7 CLI, and Firebase real-time database, were used. The final software product was given to motorists and travelers in Negros Occidental.

**Keywords:** *Fuel prices, Fuel Geo-referencing, Motorist, Negros Occidental*

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## Introduction

Fuel is one of the most used earth products because in the world, fuel energy is used to make a lot of essential things such as vehicles gas, cells, etc. Due to the region fuel demand, many businesses minded people engage in franchising fuel station. The prices of domestic fuels differ by region and provinces. But they are not much far off from each other after considering transport costs from Manila, wherein it is the basis point for the transportation of the domestic fuel. This proposed Mobile application can help in finding nearest fuel station using map. It can view all the fuel stations with fuel prices and the distance from the motorist's location.

The main objective of this study was to develop a mobile Mobile application for instant viewing and locating a fuel station nearby and its prices. Specifically, it aims to achieve the following:

- a. Design and develop an app with following features: geographical referencing to locate the fuel station; and filtering and sorting capabilities to sort and show a list of the fuel stations, prices and other services.
- b. Evaluate the system by the experts using McCall's Software Quality Model.
- c. Evaluate the system regarding functionality, efficiency compatibility, usability, reliability, security, maintainability, and portability.

## Methodology

The study used the descriptive methods in developmental design. It is a model in the design and development of the system. The (RAD) approach was applied to come up with the proposed app. The development stage of RAD includes requirements planning, user design, construction, and testing. Moreover, a descriptive research methodology was used because the system will be evaluated by the selected motorist in different locations of Negros Occidental which is based on ISO/IEC 25010 software characteristics.

The respondents of study were 43 participants. The respondents were breakdown into (3) IT experts, (2) staff, and (25) web users. The total number of respondents selected was (30) participants. The study's sample size was determined by utilizing the purposive sampling technique. Purposive sampling is a non-probability sampling most operational when one needs to study a specific cultural domain with experts within or according to the researcher's purpose.

The researcher used McCall's Software Evaluation Criteria and ISO/IEC 25010 Software Quality Model Characteristics. The McCall's Software Quality Model was used by the researcher

to assess the relationships between external factors and product quality criteria. The ISO/IEC 25010 software characteristics is an International Organizations for Standardization/ International Electro-Technical Commission criteria based assessment that is consists of eight characteristics.

The researcher observed and interviewed respondents for the flow and functionality of the system to obtain the relevant data and information for the research study. The end-user completed a ISO/IEC 25010 Software Quality Model Characteristics and rated the given criteria. The data collected from the respondents guarantees quick retrieval and identifies problems that require more explanation. And for the evaluation, IT experts used McCall's, in which the proponents provided an idea for the improvement of what kind of system can be fitted to the administration and convenience of the potential user. The study's objective was also conveyed to the respondents, who were urged to provide unbiased responses.

For the survey, the researcher employed a statistical technique to provide valuable results. It was crucial to choose an analytical test to address the researcher's research questions and field. Descriptive statistics were used in this study to analyze the data collected. Data are summarized in the mean form using descriptive statistics, which also explain the connection between variables in a sample or population.

The weighted Mean was used as a statistical tool to determine whether the proposed system meets the quality evaluation criteria. After the participants completed the questionnaire, the researcher derived four ratings from their answers in terms of Compatibility, Usability, Reliability, Security, Maintainability and Portability.

The Rapid Application Development (RAD) technique addressed the need for fast system delivery. The project's scope dictated its size and conditions.

## **Findings**

The system was assessed to end user using the ISO/IEC 25010 software characteristics and expert groups using McCall's Software Quality Model. Upon completing the study, the data were tabulated, and the Weighted Mean was computed for each instrument question. To determine the level of usability of the user, the respondents evaluated the performance of the Mobile application in terms of functionality and reliability of the information provided to a user.

The finding meant that the Gasapp possessed a high level of usability, reliability, security, maintainability, and portability whereby the users were able to smoothly use the due to its simple interface design yet highly working functions. Since the 's interfaces were presented using graphical user interfaces (GUI), it also has a high level of learnability and satisfies the interaction for the user.

## Conclusion

In light of the findings of the study, the app is able to view all fuel station in Negros Occidental by that it is complete, correct and appropriate. It provided the users requests and needs with a high level of functionality. The Mobile application is able to view all fuel station in Negros Occidental by that it is complete, correct and appropriate. It provided the users requests and needs with a high level of functionality. It has a real-time or dynamic response to the user who wants to know the exact distance from his/her location to the fuel station.

Since the Gas App was found to be high-performance, functional, usable and reliable, it is recommended that the GasApp be fully implemented to its actual operational environment. All motorist and tourist in Negros Occidental may choose to adopt this developed software GasApp. It is also recommended to the future researchers who may decide to update and improve the mobile application and add other information in which may help to maximize its potential and by improving the ways of finding fuel station in the nearest area.

## References

- Ahmed, M. (2013). A GIS-Based Analysis of Police Stations Distributions in Kano Metropolis. *IOSR Journal of Computer Engineering*, 8(4), 72-78. doi:10.9790/0661-0847278
- Arc GIS Comes to the Android Platform. (n.d.). Retrieved from <http://www.esri.com/news/releases/11-4qtr/arcgis-comes-to-the-android-platform.html>
- Arokoyu et al. (2015), Retrieved Sept. 2, 2018, Petrol Filling stations' Location and Minimum Environmental Safety Requirements in Obio Akpor LGA, Nigeria. [https://www.researchgate.net/publication/288986564\\_Petrol\\_Filling\\_stations'\\_Location\\_and\\_Minimum\\_Environmental\\_Safety\\_Requirements\\_in\\_Obio\\_Akpor\\_LGA\\_Nigeria](https://www.researchgate.net/publication/288986564_Petrol_Filling_stations'_Location_and_Minimum_Environmental_Safety_Requirements_in_Obio_Akpor_LGA_Nigeria).
- BlockSim. (2016). Retrieved January 23, 2017, from Reliasoft:[http://www.reliasoft.com/BlockSim/maintainability\\_analysis](http://www.reliasoft.com/BlockSim/maintainability_analysis).

- Geographic Information Systems in Water Resources Engineering - CRC Press Book. (n.d.). Retrieved from <https://www.crcpress.com/Geographic-Information-Systems-in-Water-Resources-Engineering/Johnson/p/book/9781420069136>
- Griffin, D. (2016, June 1). Performance Feedback. Retrieved January 23, 2017, from Houston Chronicle: <http://smallbusiness.chron.com/performance-feedback-1882.html>
- Gupta, P., Patodiya, S., Singh, D., Chhabra, J., & Shukla, A. (2016). IoT based smart petrol pump. 2016 Fourth International Conference on Parallel, Distributed and Grid Computing (PDGC). doi:10.1109/pdgc.2016.7913168
- Haucap, J., Heimeshoff, U., & Siekmann, M. (2017). Fuel Prices and Station Heterogeneity on Retail Gasoline Markets. *The Energy Journal*, 38(01). doi:10.5547/01956574.38.6.jhau
- Miguel, J. M. (2014). A Review of Software Quality Models for the Evaluation of Software Products. *International Journal of Software Engineering & Applications (IJSEA)*, Vol. 5.
- Mitre. (2016). Retrieved January 23, 2017, from Systems Engineering Guide: <https://www.mitre.org/publications/systems-engineering-guide/acquisition-systems-engineering/integrated-logistics-support/reliability-availability-and-maintainability>
- Spencer, D. (2004, November 1). What is usability? Retrieved January 23, 2017, from Step Two: [http://www.steptwo.com.au/papers/kmc\\_whatisusability](http://www.steptwo.com.au/papers/kmc_whatisusability)