Smart Directory Map Locator with Navigation using A* Algorithm for the National Museums in Manila

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by

ERMAC, ANDREA JANE L.
JULIO, NATALIE KATE L.
LIM, RANDALL EIRA C.
TACORDA, MARK CEDRICK B.

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INTRODUCTION

The study will focus on developing a Smart Directory Map Locator with Navigation to help with navigation and guide users to their target destination with the correct route. The system will use the A* algorithm and 2D mapping as the primary features to provide more accurate searched places. The study has the following specific objectives: Design a smart navigation system with the following features for the users: User Log-in System, Shortest Path, Average Distance and ETA, Filter for every floor, View Gallery. The proposed project would use the A* algorithm in finding dissatisfactionthe optimal path from one point to another. It would integrate a searching feature that would let the users find the specific art/sculpture/artifact or gallery they wanted to find. The system is expected to be used as an alternative means of locating the museum's hall galleries, and offices. The application should provide an admin tool to maintain the artworks and gallery per museum. The National Museum Complex spans a wide area, making it difficult for visitors, tourists, and staff members to navigate.

METHOD

The mobile application lets the user select the museum of their choice, the artist and artworks of their choosing, and view the progress of their visited galleries. The users can also access the gallery tab to identify the artworks they want to view and visit, giving them options to search the destination of a certain artwork, sculpture, artifact, gallery, and artist. The system will be tested using the testing procedure described in Appendix A, which involves creating a list of test cases that detailed the actions that needed to be executed for each system function. The system is accessible on any Android mobile devices and an internet connection is needed to load the mobile application. The application comprises a Homepage, Profile Info, and tabs for the two museums in Manila. The logical sequence and flow of the system is visually represented through flowchart symbols. Users may continue their journey anytime and track the galleries they already visited so they can visit other places in the museum next time. Admins may save information and update the system. The system is available for download from the Google Play store.

RESULTS

The mobile application displays the shortest path, ETA, and distance from one place to another. The system can only be used as a navigation tool in the national museums in Manila, specifically in Anthropology and Fine Arts. The results for the user profile module were similar to the expected results. The test results were similar for the Destination Selection and Inventory modules. The mobile application can only navigate and display a specific part of the system that the user has chosen to use. The limitations of the app include the inability to view users and their visitation progress. The researchers developed a smart navigation mobile application for the National Museums of Manila. It provides a quick and easy way to navigate around large structures around the museums. A total of 70 respondents have evaluated the system, consisting of 10 IT/CS professionals, 40 IT/ CS students, and 20 museum visitors which takes up to 14.29%, 57.14% and 28.57% of the population sample. The results for the user registration module are similar to the expected results. The smart navigation mobile application presents various interfaces for different modules such as Sign-in/Sign-up, Gallery, Visitation Progress, and Shortest Path. The system has been consistently rated as highly acceptable across all categories. The app is intended to be beneficial to students, researchers, National Museum staff, and tourists around the world. It was developed using Godot, which develops desktop, mobile, and the web systems. It has been rated highly acceptable in terms of its suitability, efficiency, usability, reliability, and maintainability.

DISCUSSION

The Smart Directory Map Locator with Navigation using A* Algorithm for the National Museums in Manila was developed by researchers from the University of the Philippines. The map provided the necessary information, including labels and legends per floor, brief information about the place, and the established QR code for download link access of the application. The system received favorable feedback from the CS/IT students and professionals as well as the museum visitors, although there is still room for improvement in terms of performance efficiency. The researchers recommend adding other museums. The application may also become integrated with an interactive game that allows the users to take pictures at the museums.