

DATA VISUALIZATION ON AIR POLLUTION INDEX (API) IN MALAYSIA USING INTERACTIVE DASHBOARD

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ABSTRACT - Air pollution is a concern in the environment and health, especially in the developing country like Malaysia. Most people are ignorant of the status of Air Pollution Index (API) levels in their areas that can harm their health. Thus, a Data Visualization of Air Pollution is proposed to increase awareness and people to plan their movement around Malaysia. The waterfall model was used in this research, and it consists of five phases, which is preliminary study, analysis, design, development, and testing. Using Power Bi for data visualization, this project intends to assist users in viewing data in a more comprehensible and intuitive manner. The goal of this project is to investigate the Air Pollution Index data analysis requirements and techniques, design and develop an Air Pollution Index data analysis using a data visualization approach. User Acceptance Test (UAT) has been carried out to evaluate the proposed system with the participation of thirty-three individuals. In conclusion, the participants acknowledged the Data Visualization of Air Pollution Index(API) In Malaysia Using Interactive Dashboard as a platform for gaining knowledge about this topic.

Keywords: Air Pollution Index (API), User Acceptance Test (UAT)

1. INTRODUCTION

Air pollution poses significant environmental and health concerns, particularly in developing countries like Malaysia. The public urgently requires timely and credible information about air pollution in order to make everyday decisions (Y. Li & Hou, 2017) Unfortunately, a lack of awareness prevails among the general population regarding the potentially harmful Air Pollution Index (API) levels in their respective areas. This knowledge gap can be attributed to poor information sharing between API monitoring agencies and the public, thereby hindering individuals from making informed decisions. To address this issue and enable people to plan their movements effectively, this research proposes the development of a Data Visualization of Air Pollution. the goal of data visualization is to help people understand the importance of data by presenting it in a visual context (Bai et al., 2019). There are many ways that data can be visualised in a dashboard, for example bar charts, line charts, graph, spatial map and other visual representations that can be used to show performance. (Nur et al., 2021). The study employs the waterfall model, encompassing five key phases: preliminary study, analysis, design, development, and testing. The outcome of this research is an interactive design dashboard, serving as a valuable tool for public users to visualize air pollution information. The project's objectives involve investigating the requirements and techniques for analyzing Air Pollution Index data, designing and developing a data visualization approach for the analysis, and evaluating the effectiveness of the resulting data visualization through user acceptance testing.

2. METHODOLOGY

To facilitate the development of this project, the waterfall research model was adopted, encompassing five distinct phases: preliminary study, analysis, design, development, and testing. During the preliminary study phase, the project's concept was carefully examined, problem statements were identified, and project objectives, scope, and significance were defined. Moving on to the analysis phase, comprehensive datasets obtained from Kaggle were analyzed, accompanied by a thorough assessment of the hardware and software requirements. Transitioning to the development phase, Apache Hive was utilized as a centralized information repository, enabling the creation of effective data visualization solutions. Finally, in the testing phase, the project underwent rigorous evaluation through a User Acceptance Test involving 33 participants, ensuring the system's performance and usability.

3. RESULTS AND DISCUSSION

As a result of the User Acceptance Test, some personal information was collected including gender, age, and employment status. The test successfully gathered a diverse sample of 33 respondents, consisting of both students and older individuals. The questionnaire's scales provide a comprehensive picture of user experience, ranging from strongly disagree labelled 1 to strongly agree labelled 5. All user acceptance criteria including perceived ease of use, perceived usefulness, attitude, and intention to use are measured in the test. Based on the result gained from the test, more than 75.8% of respondent find it is easy to use the dashboard, as well as 45.5% of the respondent agree that the dashboard is useful for planning their movement around Malaysia, more than 60.6% have favourable attitude towards the dashboard.

4. NOVELTY OF RESEARCH / PRODUCT

In this study, the researcher addresses the pressing issue of air pollution in Malaysia, particularly its detrimental effects on the environment and public health. Recognizing that most individuals lack awareness regarding the Air Pollution Index (API) levels in their areas, primarily due to poor information sharing between API monitoring agencies and the public, we propose a novel solution: a Data Visualization of Air Pollution. By utilizing the waterfall model, comprising five distinct phases, namely preliminary study, analysis, design, development, and testing, we aim to develop an interactive design dashboard that empowers the public with real-time air quality information and enables them to make informed decisions about their movements in Malaysia. This project goes beyond mere data analysis; it investigates the specific requirements and techniques necessary for comprehensive Air Pollution Index data analysis and employs a data visualization approach to effectively communicate the findings. The integration of data visualization, user-centric design, and comprehensive analysis distinguishes this study as a significant advancement in addressing the critical issue of air pollution and its impact on public well-being.

5. CONCLUSION

In conclusion, Data Visualization of Air Pollution Index (API) in Malaysia is a dashboard for people planning their movement and increase awareness among the public. The dashboard was created for people to increase their awareness and plan their movement by analyzing the danger zone. Therefore, this dashboard is successfully developed to increase the public awareness about air pollution.

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