

MALAYSIA BLOOD DONOR EXPLORATORY DASHBOARD

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ABSTRACT - With each passing second, there exists an individual in dire need of a blood transfusion to sustain their life. Despite numerous attempts made to encourage blood donation, Malaysia continues to face persistent blood shortage. This issue is caused by the escalating population, relentless medical needs, and a significant reliance on repeated donors rather than new contributors (Mohamad Yunus et al., 2019). This motivated this study to develop a website and interactive dashboard that comprises information regarding blood donor and blood donation in Malaysia. The objective of this study is to analyze the data on blood donation across the various states in Malaysia. This study also aims to visualize the data using Microsoft Power BI dashboard and evaluate the prototype using Technology Acceptance Model (TAM). Agile method has been implemented as the baseline to conduct this study. It is divided into six cycles which are requirements collection, analysis, design, development, testing, and maintenance. Since the study ends at the testing phase, the maintenance phase was dismissed. This project has received positive feedback in terms of its ease of use and perceived usefulness.

Keywords: blood donor, blood donation, dashboard

1. INTRODUCTION

The demand for blood donation would never cease to exist due to the obligation of providing blood supply to treat hospital patients that need blood transfusions, and it is undeniable that maintaining an adequate stock for blood donation is a continuous journey for the medical sector. According to the World Health Organization (2016), the blood donation rates are 33.1, 11.7, and 4.6 donations per 1000 for high-income, middle-income, and lower-income countries, translating to only 22.5 blood donations per population (Ling et al., 2018). This had motivated this study to develop an interactive dashboard that comprises of important details regarding blood donation in every state in Malaysia. Therefore, utilizing data visualization in exploring the information for blood donor and blood donation in Malaysia could be one of the methods that contributes to this long-standing effort. The objectives of this study are to analyze the requirement of data analysis regarding the blood donor and blood donation in Malaysia, develop an exploratory dashboard to visually represent data related to blood donors and blood donation in Malaysia, and to evaluate the functionality of the dashboard using technology Acceptance Model (TAM).

2. METHODOLOGY

The methodology utilized in this study is agile model which is one of Software Development Life Cycle (SDLC) models. This model is divided into five cycles which are requirements collection, analysis, design, development, testing and maintenance. Since the study ends at the testing phase, the maintenance phase was dismissed. The project requirements were collected in the early stages of the project by obtaining crucial datasets for blood donation and the population from various rightful sources, such as Ministry of Health Malaysia's GitHub account and Department of Statistics Malaysia's website. The design process of the project includes designing the data model and sketching wireframe for the project. The development phases were done with developing the website using HTML and CSS, developing the dashboard using Microsoft Power BI and utilizing Hive as a data warehouse. Finally, the testing phase was done using the Technology Acceptance Model (TAM) questionnaire using the Google Form platform.

3. RESULTS AND DISCUSSION

The evaluation of the website and dashboard were done using the Technology Acceptance Model (TAM). The testing phase was held after the completion of the development process. An online questionnaire that evaluates based on the TAM method was distributed to the respondents via Google Forms. The questionnaire was divided into three parts: Demographic Information, Perceived Ease of Use (PEU), and Perceived Usefulness (PU). The system has a total of 52 respondents. Based on the results that were obtained from the testing, most of the respondents found the website

and dashboard to be easy to utilize and agree that it is user friendly. They also agree that the system is useful in providing knowledge and raising awareness regarding blood donation and blood donors to the users.

4. NOVELTY OF RESEARCH / PRODUCT

This study aims to develop an exploratory dashboard that combines all of the information regarding blood donors and blood donation, providing real-time updates and insights on this subject for informed decision-making process. There are various research studies that have utilized the requirements and development of dashboard visualization that focuses on the technique, healthcare field and the big data field. Firstly, Sopan et al. (2012) has produced an interactive dashboard that utilizes geospatial multivariate datasets on an interactive map, allowing comparison between variables using data visualization and showing the geographic distribution of the selected variable at the same time. Next, Bahel et al. (2017) utilized machine learning to predict blood donation in the future to counter the issue for blood donation demands due to blood transfusion procedures and make data-driven decisions. Lastly, Concannon et al. (2019) developed a framework for population health surveillance, and it was implemented at a demographic surveillance platform at the Africa Health Research Institute, in KwaZulu-Natal, South Africa.

5. CONCLUSION

The study has successfully completed its objectives, which are to analyze the requirements of data analysis regarding the blood donor and blood donation exploratory dashboard in Malaysian states and developing an exploratory dashboard using Microsoft power BI. The study has managed to display the visualizations and forecasts for blood donor and blood donation information in Malaysia and raising the public's knowledge regarding the subject.

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