ABSTRACT

One important component that has a direct impact on human health is air quality. Besides containing oxygen, air carries many other substances, such as carbon dioxide, dust and other pollutants, whose concentrations vary and affect air quality. According to AQLI, air pollution in Bandung reached the highest level in Indonesia with an AQI of 158, which is an unhealthy pollution category, this also impacts indoor air quality, which can pose serious health risks such as respiratory problems, cancer, and other diseases. Various efforts have been made to help address the problem of poor indoor air quality, but the problem still persists. A tool is needed that can help people to detect and clean indoor pollution. The product to be designed must be in accordance with user needs and can monitor and purify indoor pollution.

This research aims to design an Internet of Things (IoT)-based air quality monitoring and purifying tool using the Quality Function Deployment (QFD) method to design products that meet customer needs. This tool is designed to be able to monitor indoor air quality and perform air filtration. User needs are obtained from residents in the dayeuhkolot sub-district, because the dayeuhkolot sub-district is a sub-district with a high population density level in the Bandung area.

The design process begins with collecting primary data through interviews and distributing questionnaires to identify consumer needs. Then data processing is carried out using the QFD method, which includes making a planning matrix, determining technical responses, making relationships between consumer needs and technical responses, and prioritizing technical responses. Furthermore, concept design, concept selection, and IoT system design are carried out. The design results show that the IoT-based air quality monitoring and purifying device has features such as air quality monitoring, air filtration, notification, remote control, and integration with smartphone applications.

To solve the problem of poor air quality indoors, products designed to monitor and clean air quality have proven successful. The product was able to fulfill most user expectations, such as control via smartphone, air quality detection, air filtering capability, and real-time data display. Customers remain satisfied that the product

is easy to carry and affordable, despite its relatively high weight. These results show that user-centered design approaches, such as the implementation of quality features, are successful in increasing user satisfaction.

Keywords:
Internet of Things (IoT), Quality Function Deployment, Air Quality, Monitoring Air Quality.