ABSTRACT

Indonesia faces various major challenges in the transportation sector, particularly the high rate of traffic accidents. Most of these traffic accidents are caused by human factors, such as driver fatigue or lack of concentration. This situation highlights the importance of implementing innovative solutions to reduce the risk of accidents caused by human error.

Driver assistance technology offers a solution with a key feature of drowsiness detection using eye, head, and mouth movement sensors. This technology is designed to minimize driver errors, which are often the main cause of accidents. With the ability to accurately detect signs of drowsiness, this technology is expected to enhance driving safety.

This research aims to analyze the economic feasibility of mass-producing driver assistance technology by reviewing three main aspects: technical, market, and economic. The methods used include a Bill Of Materials to calculate production costs (COGS), Market Sizing to estimate market potential (TAM, SAM, SOM), and Capital Budgeting to evaluate financial feasibility using parameters such as NPV, IRR, and Payback Period. Sensitivity analysis was also conducted using a Tornado Diagram to identify the key variables most influencing investment outcomes.

The analysis results indicate that this project is feasible for further development. A positive NPV of Rp1,049,282,742, an IRR of 41%, and an investment payback period in the fourth year demonstrate competitive profit potential. Additionally, market analysis shows realistic demand potential for this safety-technology-based tool.

Thus, the results of this study are expected to serve as a reference for developers, investors, and policymakers in considering the implementation of driver assistance technology in Indonesia. In addition to supporting digital transformation in the transportation sector, this project also contributes to achieving Sustainable Development Goals (SDGs) number 3 (good health and well-being) and number 11 (sustainable cities and communities), particularly in improving driving safety and building a safer and more inclusive transportation system.

Keywords: economic feasibility analysis, drowsiness detection, driver assistance, accidents