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# EXTENDED ABSTRACT HEADLINE

(TIMES NEW ROMAN, 14, BOLD)

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## Abstract (max 250 words)

Summary of your project.

***Keywords**: Topsis, MCDM, vehicle breakdown, TAM **(3-6 keywords)***

## 1. Introduction (Objectives and Scope) (100 - 150 words)

Vehicle breakdowns present significant challenges for drivers, particularly in finding suitable service providers efficiently and safely. The absence of an integrated solution often leads to stress and delays during roadside emergencies. This study introduces FIXEL, a mobile application leveraging the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) to enhance decision-making for both drivers and Vehicle Repair Service Providers (VRSPs) (Parida, 2019). By integrating criteria such as price, distance, service ratings, and availability, the application seeks to optimize the customer experience and resource utilization while reducing costs and uncertainties during emergencies.

## 2. Methodology (Methods, Procedures, Process) (100-250 words)

This research employs the TOPSIS multi-criteria decision-making (MCDM) (Tscheikner-Gratl et al, 2017) approach to determine the most suitable VRSPs. The TOPSIS process includes establishing criteria, normalizing decision matrices, applying weights, and identifying ideal and non-ideal solutions. The study focused on four core criteria: distance, time, price, and ratings—to rank VRSPs effectively. A graphical user interface was developed to facilitate seamless interaction among drivers, VRSPs, and administrators. Five VRSPs were evaluated using sample decision matrices to test the application's functionality (Wu and Abdul-Nour, 2020). A Perceived Ease of Use (PEOU) test involving 30 participants further validated FIXEL's usability. Respondents rated the application highly for its simplicity and ease of understanding.

## 3. Results / Findings (100-200 words)

The implementation of FIXEL demonstrated its capability to prioritize VRSPs effectively based on user preferences and the TOPSIS algorithm. The results identified Speed Master as the most optimal VRSP, followed by PRD Auto Service, WL Tyre, Fixmotion, and KD Tyre. The PEOU (Baharudin, 2016) analysis confirmed that most users found the application easy to use and comprehend, with key functionalities such as location-based VRSP suggestions, service requests, and integrated ratings enhancing the decision-making process. The results underline FIXEL's potential to improve roadside assistance by bridging gaps in service efficiency and user satisfaction.

## 4. Novelty of Research / Product / Project (100-200 words)

FIXEL represents a novel integration of MCDM techniques, specifically TOPSIS, in a mobile application designed for real-time roadside assistance. Unlike traditional service models that rely on manual selection or static recommendations, FIXEL dynamically adapts to user criteria, offering personalized and efficient solutions. The adoption of progressive web application (PWA) technology ensures compatibility across multiple platforms, making the solution accessible and scalable. Additionally, FIXEL's ability to equitably balance criteria like cost and service quality introduces a significant advancement in decision-making applications for emergency services.)

## 5. Conclusion or Future Work (50 words)

FIXEL successfully enhances decision-making for roadside assistance by integrating MCDM principles. Future enhancements will include additional sorting options for VRSP recommendations, push notifications for updates, and scalability improvements through cloud infrastructure. This will further optimize user experience and system efficiency.

## REFERENCE LIST

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