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Data-Driven Assessment of Selection Criteria for Commercial Electric Scooters

*** Vimala Saravanan, Soniya Sriram, M. Ramachandran, Chitra Periyasamy**
REST Labs, Kaveripattinam, Krishnagiri, Tamil Nadu, India.
*Corresponding Author Email: vimalarsri@gmail.com

Abstract: *With the growing concern for environmental sustainability and the rising demand for efficient urban mobility, electric scooters have emerged as a popular alternative to traditional gasoline-powered vehicles. This abstract presents a comprehensive overview of the process involved in selecting commercially available electric scooters. The selection of an electric scooter involves considering various factors such as performance, range, charging infrastructure, pricing, and reliability. These abstract highlights the key aspects that should be evaluated during the selection process to ensure a well-informed decision. Firstly, the performance characteristics of electric scooters, including motor power, top speed, and acceleration, are crucial considerations. Another important factor to consider is the availability and accessibility of charging infrastructure. Cost considerations, including the initial purchase price and ongoing maintenance expenses, are essential for both individual buyers and commercial fleet operators. The abstract emphasizes the need to assess the total cost of ownership, factoring in maintenance, insurance, and battery replacement costs, to determine the long-term affordability and economic viability of electric scooters. Lastly, the reliability and durability of electric scooters are critical aspects to ensure a satisfactory ownership experience. By considering these factors, potential buyers and fleet managers can make informed decisions when selecting from the range of commercially available electric scooters. In recent years, the landscape of urban transportation has undergone a significant transformation with the emergence of electric scooters. Electric scooters, also known as e-scooters, are two-wheeled vehicles powered by electric motors that offer a clean and efficient alternative to traditional gasoline-powered scooters or cars. These compact and lightweight vehicles have gained immense popularity among commuters, delivery services, and individuals seeking convenient and environmentally friendly transportation options. The appeal of electric scooters lies in their numerous advantages over conventional vehicles. Firstly, electric scooters produce zero emissions during operation, contributing to reduced air pollution and improved air quality in urban areas. This eco-friendly characteristic has positioned them as an attractive solution in the fight against climate change and the pursuit of sustainable transportation. Secondly, electric scooters are cost-effective to operate. Moreover, electric scooters are known for their ease of use and maneuverability. They are designed to be user-friendly, making them accessible to a wide range of riders, including those who are new to motorized vehicles. The compact size and agility of electric scooters allow riders to navigate through congested city streets, access narrow pathways, and park conveniently, saving time and reducing traffic congestion. The availability of electric scooters for shared mobility services has further increased their prominence. Rental services provided by companies allow users to conveniently rent and ride electric scooters for short distances, providing a flexible and on-demand transportation option for many urban dwellers Research plays a crucial role in advancing the technology of electric scooters. It helps in improving battery efficiency, motor performance, charging infrastructure, and safety features. By conducting research, scientists and engineers can explore innovative solutions and address technical challenges to enhance the overall functionality and performance of electric scooters. Research enables the optimization of electric scooter performance parameters such as range, speed, acceleration, and handling. By studying the interactions between various components and systems, researchers can identify ways to improve efficiency, increase range, and enhance overall user experience. This optimization ensures that electric scooters meet the evolving needs and expectations of riders. Research is* *crucial for electric scooters to drive technological advancements, optimize performance, promote sustainability, enhance safety, support infrastructure development, inform policies and regulations, and empower consumers. By conducting research in this field, we can unlock the full potential of electric scooters as a sustainable and efficient mode of transportation. The Weighted Aggregated Sum Product Assessment (WASPAS) method is a multi-criteria decision-making technique used to evaluate and rank alternatives based on multiple criteria. It is commonly applied in fields such as management, engineering, and economics to aid in decision-making processes. The WASPAS method provides a systematic approach for decision-makers to assess alternatives based on multiple criteria and arrive at a well-informed decision. It allows for the incorporation of subjective preferences and enables a comprehensive evaluation of the alternatives, considering both the relative importance of criteria and the performance of each alternative against those criteria. The method is flexible and can be adjusted to suit different decision contexts and problem domains. However, it should be noted that the results of the WASPAS method heavily depend on the accuracy of criteria weighting and the reliability of the rating assessments, both of which require careful consideration and input from decision-makers or experts. Overall, the WASPAS method is a valuable tool for multi-criteria decision-making, aiding decision-makers in selecting the most suitable alternative based on their preferences and the specific criteria involved in the decision TVS NTORQ 125, Honda Activa 6G, Suzuki Access 125, Yamaha Aerox 155, Hero Pleasure Plus, Aprilia SR 160,Vespa VXL 125,Keeway Vieste 300 Fuel Capacity L), Mileage (kmpl), Top Speed (kmph), Kerb Weight (kg), price (in 1000 rupees) The result of the selection of commercially available electric scooters using the WASPAS method would depend on the specific criteria, weights assigned to those criteria, and the ratings given to each alternative. As the WASPAS method allows for subjective assessments, the result can vary based on the decision-maker's preferences and the specific context of the decision. The specific result would provide a ranked list of commercially available electric scooters based on the selected criteria, their assigned weights, and the ratings given to each alternative. This result would assist decision-makers in making an informed decision about which electric scooter to choose based on their specific preferences and requirements. In conclusion, the selection of commercially available electric scooters is a crucial decision for individuals, businesses, and urban transportation planners aiming to embrace sustainable mobility. The process of selecting the most suitable electric scooter involves careful consideration of various factors, including performance, range, charging infrastructure, cost, reliability, and durability.*

Keywords: *electric scooters, cost effective, transportation, WASPAS.*

1. INTRODUCTION

Two-wheeled vehicles like mopeds, motorbikes and scooters are regarded as common and dominating modes of transportation throughout the world, particularly in Asia (Hsu et al., 2003; Haworth, N., 2012). Although this mode of transportation has some common drawbacks, including exposure to weather extremes, machine instability, a small capacity for carrying goods, a short range, lack of security against thieves, and susceptibility to accidents (Rose et al., 2012), it still offers many people in developing countries an affordable means of personal transportation that uses fewer resources (fuel, materials, and space). Only 15–20% of the area needed by a car for each person is used by a motorbike. In addition, it emits less $CO2$ and uses less energy during production and operation (Hsu et al., 2003; Rose et al., 2012). Urban sprawl can be curbed by requiring less space for parking and reducing the need for new highways. In addition, scooters are less expensive to buy than cars, which cost almost ten times as much. Scooters are a more cost-effective form of mobility as a result. The Indian vehicle industry has experienced rapid expansion in recent years, particularly in the two-wheeler market. India is the world's second-largest two-wheeler producer. India's younger generation is fascinated by two-wheelers and favours them over four-wheelers. The scooter is a significant segment in the two-wheeler category, with the newest models, new designs, new features, and cutting-edge technology. Due to rising purchasing power in both rural and urban areas, the two-wheeler market in India has been expanding quickly. According to market analysts, there is a growing demand for scooters in several rural and smaller communities. Low maintenance costs, top speed, low kerb weight, and simplicity of riding (automated scooters) are becoming more popular in rural markets while aspects like fuel efficiency still rule in smaller towns. Hero, TVS, Yamaha, and Honda, among other two-wheelers on the Indian market, are introducing low-weight, gearless scooters. Using information and communication technologies (ICT) in the transport infrastructure is the foundation of the smart city concept (Lopez-Carreiro and Monzon, 2018; Akande et al., 2019, Kang et al., 2020). E-scooters unquestionably fit within the Smart City model due to their dependency on cellphones and GPS technologies. Smart Cities should not, however, have ICT innovation as their main objective (Marsal-Llacuna and Segal, 2016). According to Bifulco et al. (2016), Ahvenniemiet al. (2017), and 2020, smart cities are meant to improve sustainable urban development from the city's social, environmental, and economic perspectives. Although it is unclear whether electric scooters will primarily be used as a replacement for active transportation or as a supplement, various studies have shown that they can replace private vehicles on short trips. In research conducted in Portland, Oregon, 34% of locals and 48% of tourists choose to use an e-scooter instead of a personal automobile or a ride-hailing service. E-scooters can also play a part in mobility-as-a-service (MaaS) when they are incorporated into the transportation network. The idea behind MaaS is to offer a transport service that uses Internet-based technology to combine many modes into a multimodal journey, including public transport (MaaS Alliance, 2017; Crozet et al., 2019). According to recent studies (Zarif et al., 2019; DuPuis et al., 2019), E-scooters in particular can meet the demand for first-mile-last-mile (FMLM) transit options to improve accessibility. In China, dockless bike-sharing trips make up half of multimodal journeys that also involve public transit (Yin and Tan, 2017). According to Mobike (2018), dockless bike-sharing significantly improved access to jobs, healthcare, and educational opportunities. Younger people used micromobility at higher rates than older people, according to several research (Brown et al., 2020; Nickkar et al., 2019; Nikiforiadis et al., 2019; Shaheen et al., 2020). As the current younger population ages, Chang et al. (2019) predicted a higher market penetration rate in the future Furthermore, a Clewlow (2019) study discovered that 70% of the sampled community had a favourable opinion and that low-income populations had a greater adoption rate. This result is consistent with the examination of aggregated E-scooter model activity data, which showed a considerable increase in micromobility riding in urban areas (Clewlow, 2019). Researchers were compelled to investigate the new micromobility mode from a variety of perspectives in light of the considerable expansion of e-scooters, including public acceptance rates, distribution, and safety (Yang et al., 2020). To fully grasp the potential of E-scooters as a micromobility mode in sustainable Journal Pre-proof 5 developments, there is a dearth of research that examines the relationship between E-scooter excursions and the sustainable aspects of urban development. By finding a connection between the sustainable aspects of urban development and the new mode of transport, our endeavour will close the research gap.

2. MATERIALS AND METHOD

The Weighted Aggregated Sum Product Assessment (WASPAS) is a multi-criteria decision-making method used to evaluate alternatives based on multiple criteria. It helps decision-makers in selecting the most suitable alternative by considering the relative importance of criteria and the performance of alternatives against those criteria.

The WASPAS method involves the following steps:

- Criteria Identification: Identify the criteria relevant to the decision-making problem. These criteria represent the factors that will be used to evaluate the alternatives.
- Weight Assignment: Assign weights to each criterion to indicate their relative importance. The weights can be determined subjectively based on the decision-maker's preferences or through objective methods like the Analytic Hierarchy Process (AHP).
- Rating and Normalization: Assess the performance of each alternative with respect to each criterion and assign ratings or scores. The ratings can be numerical or linguistic, depending on the nature of the criteria. If necessary, normalize the ratings to ensure they are on the same scale.
- Aggregation: Multiply each rating by its corresponding weight and calculate the weighted score for each criterion. Then, aggregate the weighted scores for all criteria to obtain an aggregated score for each alternative.
- Rank Calculation: Rank the alternatives based on their aggregated scores. The alternative with the highest aggregated score is considered the most preferred or the best solution according to the set of criteria and their assigned weights.

The WASPAS method allows decision-makers to take into account both quantitative and qualitative criteria and incorporates their preferences through the assignment of weights. It provides a systematic approach for evaluating alternatives in complex decision-making scenarios.

By applying the WASPAS method, decision-makers can make more informed decisions, considering multiple criteria simultaneously. This method helps in objectively comparing alternatives, considering their performance against different criteria and the relative importance of those criteria. The result of the WASPAS method provides a ranking of alternatives based on their overall suitability, aiding decision-makers in selecting the most appropriate solution.

Overall, the WASPAS method is a valuable tool for multi-criteria decision-making, providing a structured and systematic approach to evaluating alternatives and supporting decision-making processes in various domains.

The Weighted Aggregated Sum Product Assessment (WASPAS) method is important for decision-making in various fields due to its several key benefits:

- Multi-Criteria Evaluation: The WASPAS method allows decision-makers to evaluate alternatives based on multiple criteria simultaneously. This is particularly valuable when decision-making involves complex problems with numerous factors to consider. By considering multiple criteria, the method provides a comprehensive and holistic assessment of alternatives.
- Subjectivity Incorporation: The WASPAS method allows decision-makers to incorporate their subjective preferences and priorities into the decision-making process. By assigning weights to criteria, decision-makers can reflect the relative importance they attribute to each criterion. This feature enables decision outcomes that align with the decision-maker's preferences, enhancing the overall satisfaction with the chosen alternative.
- Transparency and Consistency: The WASPAS method provides a transparent framework for decision-making. By explicitly defining and weighting criteria, decision-makers can clearly communicate the rationale behind their decisions to stakeholders. Additionally, the method promotes consistency by ensuring that all alternatives are evaluated using the same set of criteria and weightings, thereby reducing potential biases.
- Trade-off Analysis: The WASPAS method allows decision-makers to explicitly analyze trade-offs between criteria. By assigning weights to criteria, decision-makers can reflect the trade-offs they are willing to make between different factors. This enables a more balanced evaluation of alternatives, taking into account both strengths and weaknesses across various criteria.
- Flexibility and Adaptability: The WASPAS method is flexible and adaptable to different decision contexts. Decision-makers can customize the set of criteria, assign different weights, and adjust the rating scales to suit the specific decision problem at hand. This adaptability makes the method applicable to a wide range of decision-making scenarios across various industries and domains.
- Decision Support: The WASPAS method serves as a decision support tool, providing a systematic and structured approach to decision-making. It helps decision-makers organize and analyze information, facilitating a more informed and rational decision-making process. By considering multiple criteria and their respective weights, the method assists decision-makers in identifying the most favorable alternative.
- Efficient and Time-saving: The WASPAS method offers a streamlined approach to decision-making by consolidating multiple criteria into a single aggregated score for each alternative. This efficiency allows decision-makers to quickly compare and rank alternatives, enabling more timely decision-making and reducing the effort required for evaluating complex decision problems.

In summary, the WASPAS method is important for decision-making as it enables multi-criteria evaluation, incorporates subjective preferences, promotes transparency and consistency, facilitates trade-off analysis, offers flexibility and adaptability, provides decision support, and enhances efficiency. By leveraging the benefits of the WASPAS method, decision-makers can make more robust and well-informed decisions that align with their objectives and priorities.

In conclusion, the Weighted Aggregated Sum Product Assessment (WASPAS) method is a valuable tool for decision-making in various domains. Its importance lies in its ability to facilitate multi-criteria evaluation, incorporate subjective preferences, promote transparency and consistency, enable trade-off analysis, offer flexibility and adaptability, provide decision support, and enhance efficiency.

The given list includes several popular models of scooters from different manufacturers. Here is a brief overview of each model:

- TVS NTORQ 125: TVS NTORQ 125 is a sporty scooter known for its performance and features. It comes with a powerful engine, Bluetooth connectivity, digital instrument cluster, and sporty design elements.
- Honda Activa 6G: Honda Activa 6G is a well-established scooter known for its reliability and practicality. It offers a refined engine, comfortable ride, and a wide service network.
- Suzuki Access 125: Suzuki Access 125 is a popular scooter known for its performance and fuel efficiency. It features a powerful engine, comfortable seating, and ample storage space.
- Yamaha Aerox 155: Yamaha Aerox 155 is a premium scooter known for its sporty design and performance. It comes with a powerful 155cc engine, advanced features, and aggressive styling.
- Hero Pleasure Plus: Hero Pleasure Plus is a lightweight and compact scooter designed for easy maneuverability. It offers good fuel efficiency, comfortable ride quality, and a value-for-money proposition.
- Aprilia SR 160: Aprilia SR 160 is a sporty scooter known for its performance-oriented characteristics. It features a powerful engine, sporty design cues, and advanced features like disc brakes and digital instrument cluster.

- Vespa VXL 125: Vespa VXL 125 is a retro-styled scooter known for its iconic design and premium build quality. It offers a smooth and refined ride, classic aesthetics, and a unique riding experience.
- Keeway Vieste 300: Keeway Vieste 300 is a larger displacement scooter suitable for long-distance touring. It features a powerful 300cc engine, spacious seating, and ample storage capacity.
- Each of these scooters has its own unique features, design elements, and target audience. The selection among these models would depend on individual preferences, requirements, and budget constraints. It is recommended to research and test ride these scooters to determine which one best fits your needs and riding style.

Here are the meanings of the terms related to scooter specifications:

- Fuel Capacity: It refers to the maximum amount of fuel that can be stored in the scooter's fuel tank. It is typically measured in liters or gallons. A larger fuel capacity allows for longer rides without the need for refueling.
- Mileage: Mileage, also known as fuel efficiency or fuel economy, represents the distance a scooter can travel on a given amount of fuel. It is usually measured in kilometers per liter (km/l) or miles per gallon (mpg). Higher mileage means the scooter can cover more distance with less fuel consumption, resulting in cost savings and reduced environmental impact.
- Top Speed: Top speed indicates the maximum speed that a scooter can achieve under optimal conditions. It is usually measured in kilometers per hour (km/h) or miles per hour (mph). The top speed may vary based on factors such as engine power, aerodynamics, weight, and road conditions.
- Kerb Weight: Kerb weight refers to the weight of the scooter without any additional load or passengers. It includes the weight of the vehicle's components, fluids, and a full fuel tank. Kerb weight affects the scooter's handling, stability, and fuel efficiency. Lighter scooters tend to be more agile, while heavier scooters may offer better stability.
- Price: Price denotes the cost of purchasing the scooter. It can vary based on factors such as brand, model, features, specifications, and geographic location. The price may also differ for different variants or trims of the same model. Generally, scooters with more advanced features and higher engine capacities tend to have higher prices.
- Understanding these specifications can help you assess the performance, efficiency, and value for money of a scooter based on your specific requirements and preferences.

3. RESULTS AND DISCUSSION

TABLE 1. Data set of the scooter

Scooter Name	Fuel Capacity L)	Mileage (kmpl)	Top Speed (kmph)	Kerb Weight (kg)	price (in 1000 rupees)
TVS NTORQ 125	5.8000	54.3300	90.0000	110.0000	84.3860
Honda Activa 6G	5.3000	50.0000	85.0000	105.0000	75.3470
Suzuki Access 125	5.6000	64.0000	92.0000	101.0000	79.4000
Yamaha Aerox 155	5.5000	48.6200	120.0000	126.0000	143.0000
Hero Pleasure Plus	4.8000	50.0000	78.0000	106.0000	77.3180
Aprilia SR 160	6.0000	44.0000	90.0000	118.0000	132.0000
Vespa VXL 125	7.4000	55.0000	90.0000	115.0000	131.0000
Keeway Vieste 300	12.0000	21.5600	85.0000	147.0000	299.0000

The above table represents the data set of the Electric scooter’s names Honda Activa 6G, Suzuki Access 125, Yamaha Aerox 155, Hero Pleasure Plus, Aprilia SR 160, Vespa VXL 125 and Keeway Vieste 300 as Alternative Parameters. Fuel, Mileage, Top speed, Kerb weight and price which are the evaluate parameters. The evaluate parameters are the factors that are dependent on the other parameters. The relation between the two parameters is been studied here.

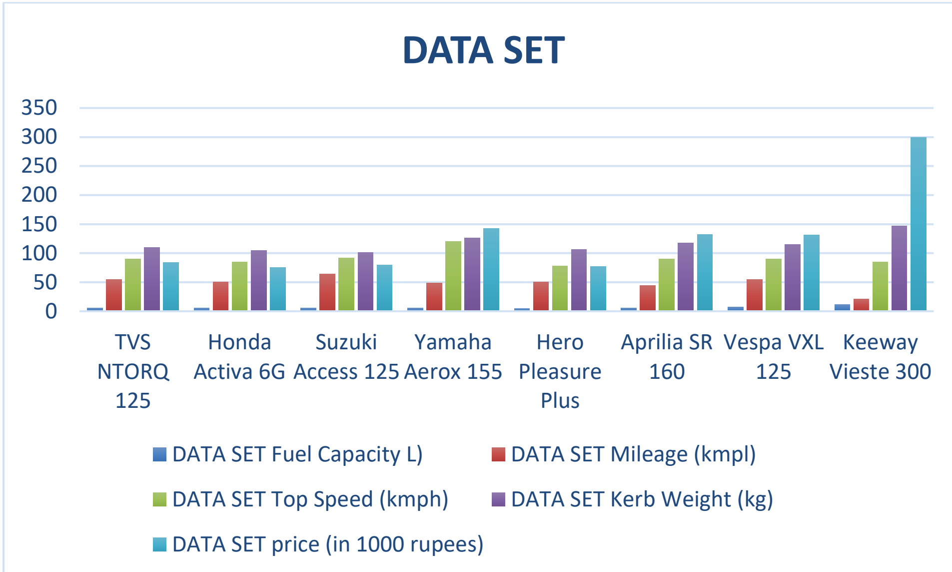

FIGURE 1. Representing the data set of E Electronic scooters

The above figure represents the data set of the Electric scooter's names Honda Activa 6G, Suzuki Access 125, Yamaha Aerox 155, Hero Pleasure Plus, Aprilia SR 160, Vespa VXL 125 and Keeway Vieste 300 as Alternative Parameters. Fuel, Mileage, Top speed, Kerb weight and price which are the evaluate parameters. The evaluate parameters are the factors that are dependent on the other parameters. The relation between the two parameters is been studied here.

TABLE 2. Performance value

Performance value				
0.48333	0.84891	0.75	0.91818	0.89289
0.44167	0.78125	0.70833	0.9619	1
0.46667	1	0.76667	1	0.94895
0.45833	0.75969	1	0.80159	0.5269
0.4	0.78125	0.65	0.95283	0.97451
0.5	0.6875	0.75	0.85593	0.57081
0.61667	0.85938	0.75	0.87826	0.57517
1	0.33688	0.70833	0.68707	0.252

The above table represents the data set of preference score under weighted sum model and for weighted product model the Electric scooters names Honda Activa 6G, Suzuki Access 125, Yamaha Aerox 155, Hero Pleasure Plus, Aprilia SR 160, Vespa VXL 125 and Keeway Vieste 300 as Alternative Parameters. Fuel, Mileage, Top speed, Kerb weight and price which are the evaluate parameters. The evaluate parameters are the factors that are dependent on the other parameters.

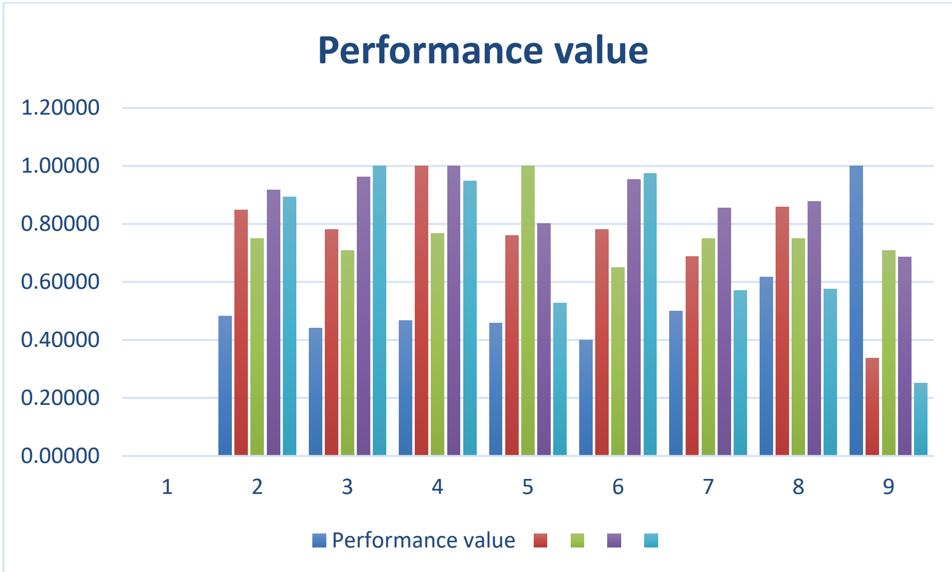

FIGURE 2. Representing the performance value

The above figure represents the data set of preference score under weighted sum model and for weighted product model the Electric scooters names Honda Activa 6G, Suzuki Access 125, Yamaha Aerox 155, Hero Pleasure Plus, Aprilia SR 160, Vespa VXL 125 and Keeway Vieste 300 as Alternative Parameters. Fuel, Mileage, Top speed, Kerb weight and price which are the evaluate parameters. The evaluate parameters are the factors that are dependent on the other parameters.

TABLE 3. weight

Weight				
0.25	0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25	0.25

The table 3 shows the weight of the parameters, the Electric scooters names Honda Activa 6G, Suzuki Access 125, Yamaha Aerox 155, Hero Pleasure Plus, Aprilia SR 160, Vespa VXL 125 and Keeway Vieste 300 as Alternative Parameters. Fuel, Mileage, Top speed, Kerb weight and price which are the evaluate parameters.

TABLE 4. weighted normalized decision matrix

Weighted normalized decision matrix (WSM)				
0.12083	0.21223	0.1875	0.22955	0.22322
0.11042	0.19531	0.17708	0.24048	0.25
0.11667	0.25	0.19167	0.25	0.23724
0.11458	0.18992	0.25	0.2004	0.13173
0.1	0.19531	0.1625	0.23821	0.24363
0.125	0.17188	0.1875	0.21398	0.1427
0.15417	0.21484	0.1875	0.21957	0.14379
0.25	0.08422	0.17708	0.17177	0.063

The above table represents the data set of weighted normalized decision matrix the Electric scooters names Honda Activa 6G, Suzuki Access 125, Yamaha Aerox 155, Hero Pleasure Plus, Aprilia SR 160, Vespa VXL 125 and Keeway Vieste 300 as Alternative Parameters. Fuel, Mileage, Top speed, Kerb weight and price which are the evaluate parameters. The evaluate parameters are the factors that are dependent on the other parameters.

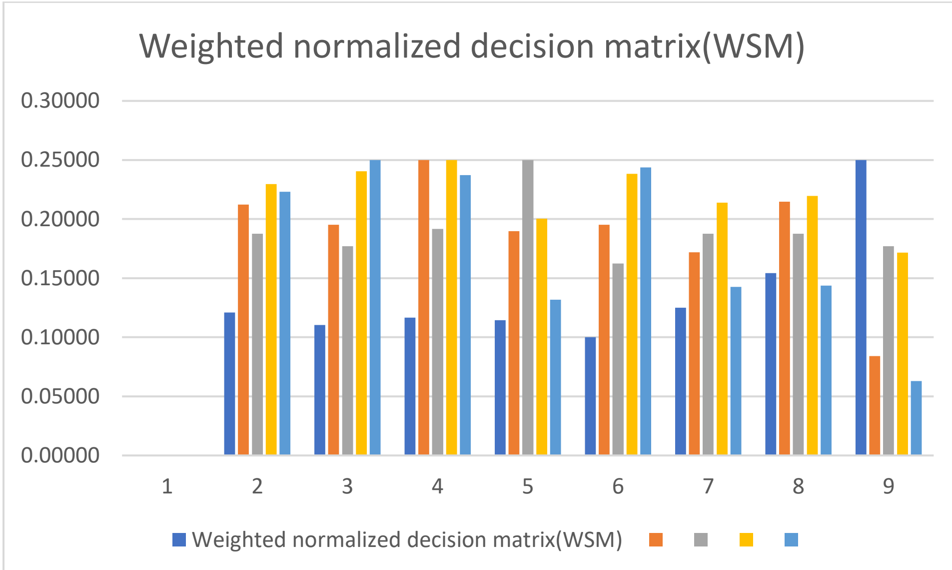

FIGURE 4. weighted normalized decision matrix

The above figure 4 represents the data set of weighted normalized decision matrix the Electric scooters names Honda Activa 6G, Suzuki Access 125, Yamaha Aerox 155, Hero Pleasure Plus, Aprilia SR 160, Vespa VXL 125 and Keeway Vieste 300 as Alternative Parameters. Fuel, Mileage, Top speed, Kerb weight and price which are the evaluate parameters. The evaluate parameters are the factors that are dependent on the other parameter.

TABLE 5. WASPAS Coefficient and preference score

Scooter name	WASPAS Coefficient	Preference Score
TVS NTORQ 125	0.84102	0.977333
Honda Activa 6G	0.83481	0.97329
Suzuki Access 125	0.90445	1.04557
Yamaha Aerox 155	0.75294	0.88663
Hero Pleasure Plus	0.79933	0.93965
Aprilia SR 160	0.71840	0.84106
Vespa VXL 125	0.79463	0.91987
Keeway Vieste 300	0.59846	0.74607

The above table represents the data set of WASPAS coefficient and preference score under weighted product model, the Electric scooters names Honda Activa 6G, Suzuki Access 125, Yamaha Aerox 155, Hero Pleasure Plus, Aprilia SR 160, Vespa VXL 125 and Keeway Vieste 300 as Alternative Parameters. Fuel, Mileage, Top speed, Kerb weight and price which are the evaluate parameters. The evaluate parameters are the factors that are dependent on the other parameters.

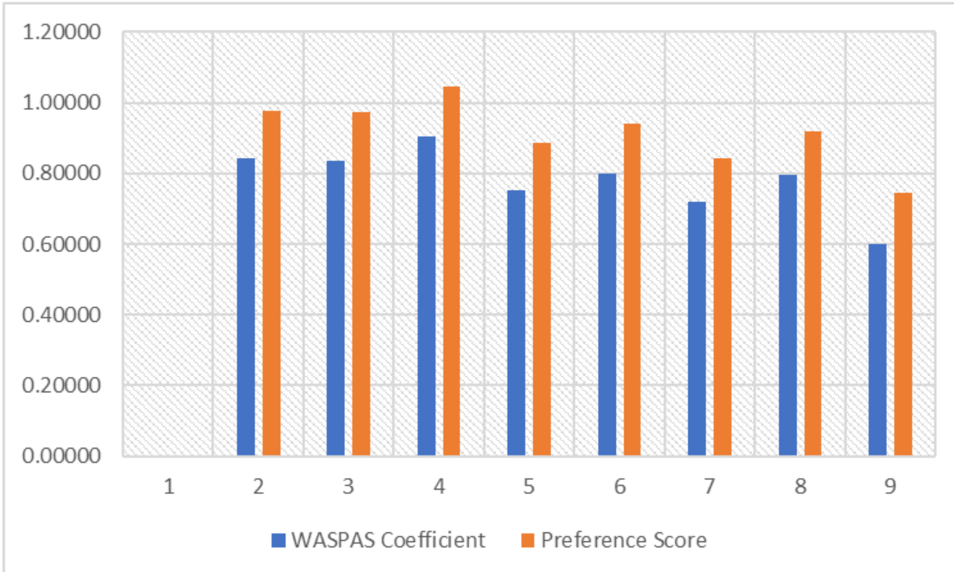

FIGURE 5. WASPAS Coefficient and preference score

The above figure represents the data set of WASPAS coefficient and preference score under weighted product model, the Electric scooters names Honda Activa 6G, Suzuki Access 125, Yamaha Aerox 155, Hero Pleasure Plus, Aprilia SR 160, Vespa VXL 125 and Keeway Vieste 300 as Alternative Parameters. Fuel, Mileage, Top speed, Kerb weight and price which are the evaluate parameters. The evaluate parameters are the factors that are dependent on the other parameters.

TABLE 6. Rank Table

Scooter Name	Rank
TVS NTORQ 125	2
Honda Activa 6G	3
Suzuki Access 125	1
Yamaha Aerox 155	6
Hero Pleasure Plus	4
Aprilia SR 160	7
Vespa VXL 125	5
Keeway Vieste 300	8

The above figure represents the data set of ranks under weighted product model, for the Electric scooter's names Honda Activa 6G, Suzuki Access 125, Yamaha Aerox 155, Hero Pleasure Plus, Aprilia SR 160, Vespa VXL 125 and Keeway Vieste 300 as Alternative Parameters. Fuel, Mileage, Top speed, Kerb weight and price which are the evaluate parameters. The evaluate parameters are the factors that are dependent on the other parameters.

4. CONCLUSION

In conclusion, the selection of commercially available electric scooters is a significant decision for individuals, businesses, and urban transportation planners who seek to promote sustainable mobility. The process of choosing the most suitable electric scooter entails thorough consideration of multiple factors, including performance, range, charging infrastructure, cost, reliability, and durability.

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