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Carsharing Vehicle Fleet Selection from the Frequent User's Point of View

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Abstract: Short-term car rental services, i.e., carsharing, is a solution that has been developing better and better in urban transport systems in recent years. Along with intensive expansion, service providers have to face an increasing number of challenges to compete with each other. One of them is meeting the expectations of customers about the fleet of vehicles offered in the system. While this aspect is noticed in the literature review mainly in terms of fleet optimization and management, there is a research gap regarding the appropriate selection of vehicle models. In response, the article was dedicated to identifying the vehicles that were best suited to carsharing systems from the point of view of frequent customers. The selection of appropriate vehicles was treated as a multi-criteria decision issue, therefore the study used one of the multi-criteria decision support methods—ELECTRE III. The work focuses on researching the opinions of users (experts) who often use carsharing services in Poland. The study included a list of the most popular vehicles in Europe in 2021, including classic, electric, and hybrid cars, and a list of 11 evaluation criteria. The research results indicate for frequent users the advantage of conventional drive vehicles over electric and hydrogen vehicles. Moreover, they indicate that the best vehicles are relatively large cars (European car segments C and D) with the greatest possible length, boot capacity, engine power, number of safety systems, and quality. On the other hand, the least important issues are the number of seats in the vehicle and the number of doors. Interestingly, the vehicles selected by frequent users questioned the concept of small city cars, which occupied a small public space on which carsharing was supposed to focus. The results obtained support the operators of carsharing services in making fleet decisions.

Keywords: carsharing; shared mobility; vehicle selection; mobility management; transportation engineering; multi-criteria decision analysis; ELECTRE III; MCDM; electromobility

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1. Introduction

Carsharing services systems, i.e., short-term automated car rentals, are solutions that are gaining popularity in the world. The solutions owe their intensive development, among others, to their high convenience and self-commission of use [1]. What is more, the systems also benefit from the fact that users do not have to bear the costs associated with vehicle maintenance, relatively low usage prices, and the possibility of free parking in urban areas or the use of dedicated parking spaces. The advantages of using the systems also translate into favorable market development statistics. The size of the carsharing market in 2020 exceeded USD 2 billion [2]. On the contrary, it is expected to increase by the end of 2022 with a Compound Annual Growth Rate (CAGR) of 17.4% [3]. Along with the intensification of carsharing services in global markets, many improvements have been made in terms of management and operation. These improvements were related, among others, to the issues of appropriate adjustment of services to the public space and the conditions of a given city, optimization of the functioning of systems, or adaptation of systems to changing regulations or conditions, for example, during the COVID-19 pandemic [4–8]. Although many issues have been improved, there are aspects that carsharing users classified as problematic. Among the many different complaints, there are issues regarding the carsharing fleet [9].

While in the literature review one can find a wide range of issues related to the modeling and optimization of systems [8], the issue of the vehicle fleet used in carsharing systems is usually considered similarly.

The first fleet trend that researchers are focusing on is the carsharing fleet size. For example, the research of Xu et al. addressed the tactical electric vehicle fleet size problem faced by carsharing service providers, while considering the operational vehicle assignment, vehicle relocation, and vehicle charging strategies in pursuit of profit maximization [10]. Huang et al. presented a method for determining the deployment of one-way electric carsharing services within a designated region that maximized the total profit of the operator [11]. In turn, Nourinejad and Roorda focused on a dynamic carsharing decision support system, pointing out that fleet size in carsharing services is dependent on the pattern of user requests [12].

The second trend identified in the literature related to the fleet of carsharing is related to the location and relocation of vehicles. For example, Martin and Minner focused on a feature-based selection of carsharing relocation modes, identifying the best modes for car movement in the city [13]. Barrios and Godier in their study focused on free-floating carsharing and explored the trade-offs between fleet size and hired vehicle redistributors, intending to maximize the demand level that could be satisfactorily served [14]. In turn, Carlier et al. proposed a mathematical programming-oriented approach and introduced a simple linear model based on integer flow variables [15]. Their solution was based on three optimization criteria: maximizing satisfied carsharing demands, while minimizing the fleet of vehicles and the relocation operations [15].

The third trend is research on the environmental impact of the carsharing fleet in cities and the surrounding area. For example, Firnkorn and Müller looked at the environmental impact of the electrification of the carsharing fleet [16]. Doka and Ziegler analyzed the life cycle of the carsharing fleet [17]. Chang et al. analyzed the CO_2 emissions of the vehicle fleet [18]. While Migliore et al. estimated the environmental benefits related to carsharing [19]. Their research has shown that there are benefits deriving from the use of carsharing in terms of reducing emissions of pollutants: there is a reduction of 25% for PM10 and 38% for CO_2 [19].

While many studies were conducted on the implementation of electric or hybrid vehicle fleets into carsharing [20–22], little research has focused on determining the factors for selecting vehicles for the car fleet. The last trend, therefore, concerns operational and technical issues as well as factors influencing the selection of the vehicle fleet. In this regard in previous works, together with the co-authors, we conducted research on the determination of the type of fleet in carsharing vehicles [23], identification of the main operational factors of the operation of systems based on electric cars [24], or determination of the type of vehicle most suitable for carsharing from the operators' point of view [25]. However, the indicated studies refer to service providers. Despite these analyses, there is a lack of research that would directly relate to society's expectations toward carsharing vehicles. Noticing this research gap, the author proposed her own research cycle on the appropriate selection of the carsharing fleet from the point of view of various social groups. The first of the series of articles is aimed at identifying the vehicles that were best suited to carsharing systems from the point of view of the customers who used them most recently (frequent users).

The article is divided into five parts. The second part presents the applied methodology based on one of the methods of multi-criteria decision support. The results of the research are presented in the third part. The fourth chapter presents a discussion of the results. The last part presents a summary and conclusions.

2. Materials and Methods

The decision on what criteria is important for society when choosing cars for the carsharing fleet is a complex decision-making problem. In the case of all complex decision problems, the methods of multi-critical decision-making (MCDM) provide support in making the right choice. MCDM methods are analytical tools used in the case of the desire to determine the best possible choice (solution, decision) or ranking of solutions, considering various types of often contradictory criteria [26]. The methods make it possible to establish a set of criteria, weights of individual criteria, and to indicate stakeholders involved in the decision-making process [27]. The methods are used for decision problems of various types, from strategic to practical and operational [28,29]. MCDM methods are also tools very widely used in making various types of decisions related to transport issues. They were used, among others, when searching for the best project to build the Paris metro [26], finding the best method to evaluate the functioning of transport in Istanbul [30], and determining the best network of air connections in Pittsburgh [31]. Concerning carsharing systems, MCDM methods were used, among others, to define the operating areas of the systems in Shanghai, Beijing, and La Rochelle [32–34]. Due to the wide application of MCDM methods to transport issues, it has been proposed to use them in this article.

The research was conducted for a case study of a free-floating type carsharing company, which operates in the Polish shared mobility market. The company has 2000 vehicles, focusing on one type of segment B cars with classic drive cars. Segments of cars (otherwise known as Car Class) is a conventional European model that includes cars regulated by the European Commission standard, Regulation (EEC) No 4064/89—Merger Procedure, Office for Official Publications of the European Communities, 17 March 1999. These can be passenger cars or vans with specific characteristics or purpose. The classification distinguishes segments A, B, C, D, E, F, S, H, J, and M:

- Segment A—mini cars—cars designed for urban driving; they are characterized by small dimensions and low operating costs. Impractical to move on extra-urban routes. They can be two- or four-seater, five-seaters usually allocate three rear seats for children;
- Segment B—small cars—small cars offering more space for passengers than segment A and a practical trunk. These features allow them to be driven on routes outside the city, but they are more intended for use in the city as "another car" in the family. In addition to the hatchback version, some models are also offered in sedan or station wagon body versions;
- Segment C—compact; lower-medium class—medium-sized cars designed for driving around the city and on routes. They offer space for five adults and a trunk, as well as relatively comfortable travel conditions. Selected as both the first and the next vehicle in the family. A wide range of body versions;
- Segment D—middle class, family cars—large cars—cars providing comfortable conditions for five adults (with luggage) to travel over longer distances. Most often in body versions sedan (or close in size to sedan hatchback) and station wagon. Many of them are available in coupé versions, most often as sporty, exclusive versions of a given model;
- Segment E—upper-middle class—executive cars—large, comfortable and richly equipped cars, the purpose of which is not only to use by families but also as representative limousines for companies. The technology and equipment contained in them allows for long journeys—and the technical data of the leading versions can often compete even with typical sports cars;
- Segment F—luxury cars—limousines with the highest level of equipment and the best (often the largest) engines. Their features allow for a very comfortable journey for both the driver and passengers. Often used as representative limousines for heads of state, companies, etc., these cars are often driven better as a rear seat passenger rather than as a driver;
- Segment S—sport coupes—a class of cars covering a very large group of vehicles. As standard, there are vehicles with a two-door or three-door coupé body,

- Segment H—convertibles—cars with a folding, hard or soft roof, or completely without a roof. They can be open versions of cars included in the G segment, others are available only as convertibles or roadsters;
- Segment J—sport utility cars—cars presenting features enabling off-road driving;
- Segment M—multipurpose cars—a class of spacious cars that can take at least five people with large luggage.

The research task was to determine which vehicles, in the opinion of frequent users of the services of users, should be included in the system's fleet if the operator wanted to expand it.

The Polish carsharing market was not chosen by chance, as Poland is one of the fastest-growing shared mobility markets [2]. Although carsharing systems appeared in Poland quite late (in 2016) [35] compared to other European countries, the market is considered dynamic and valuable [36]. At the highest stage of system development, 17 service providers offered carsharing services in 250 cities in Poland [29]. From a financial point of view, carsharing services in 2019 generated revenues of more than PLN 50 million and in 2021 over PLN 100 million [37]. Carsharing services in Poland, despite many superlatives, also recorded many failures. These included, in addition to the financial problems of the operators, an inadequately selected fleet of cars, or the type of carsharing services provided in cities [23]. In many cases, changes in vehicle fleets appeared only as a pilot, for example, in the form of the introduction of several electric vehicles [23].

The research process included a four-stage action plan presented in Figure 1.

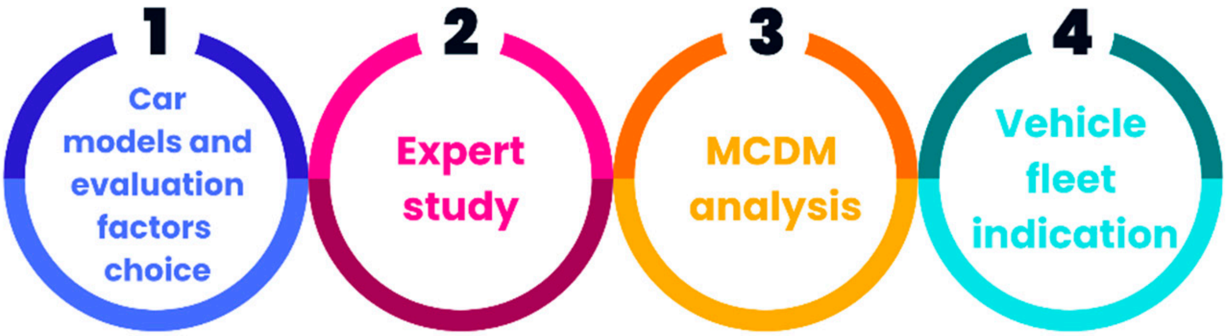

Figure 1. Research process.

The first step was to choose car models that were considered for analysis and the factors against which individual choices will be judged. The most popular, generally accessible vehicles in Europe in 2021 were selected for the analysis [38–40]. A detailed list is presented in the next chapter.

Subsequently, it was necessary to determine which factors will be considered when evaluating the vehicles. To do this, a detailed literature review of global purchase reports was conducted. According to the literature, the factors most often taken into account by individual customers are [41,42]: safety, fuel efficiency, quality, low price, suitability for everyday use, high driving comfort, good warranty, number of doors, customer service, design, spaciousness, good connectivity with smartphone and internet services, brand, environmental friendliness, good driver assistance systems, sportiness, propulsion type, size, engine capacity, color, optional equipment, number of seats, gearbox type, and boot capacity. In turn, the factors that are important when buying fleet cars for companies are [43]: size, engine performance, appearance, safety, and brand. The study focused on technical factors that could be quantified, without favoring any kind of brand. A detailed list is presented in the next chapter.

The second step was to conduct expert research to determine the weights of individual factors. An anonymous, one-time research questionnaire was used in the study. The research was conducted online in June 2022. The questionnaire was addressed to a group of active and frequent users of carsharing systems, i.e., people who use carsharing up to 10 times a month. A total of 150 system users acting as experts participated in the study. These people represented a population of 200,000 system users of an analyzed company. The confidence level was 95% ($\alpha = 0.95$). The fraction size was 0.5. In turn, the maximum error was estimated at 8%. Respondents' characteristics was presented in the Appendix A. The respondents' task was to make pairwise comparisons of the individual criteria. The respondents made comparisons according to Saaty's scale, giving grades from 1 to 9, where [31]:

- 1—same meaning;
- 2—very weak advantage;
- 3—weak advantage;
- 4—more than a weak advantage, less than strong;
- 5—strong advantage;
- 6—more than a strong advantage, less than very strong;
- 7—a very strong advantage;
- 8—more than a very strong advantage, less than an extreme;
- 9—extreme, total advantage.

The weights obtained were included in the analyses using the MCDM method.

The third step was to perform computational analyses. One of the MCDM methods, which is ELECTRE III, was selected for the calculations. The ELECTRE III method is one of the types of ELECTRE group methods whose name is derived from *Elimination Et Choix Traduisant la Realitè*. Among other MCDM methods, methods are based on a partial aggregation of preferences by overrun [44]. Among the various ELECTRE methods, the most popular is the ELECTRE III method [45]. This method is based on performing analyses and obtaining a final ranking [45]. Moreover, it is the solution most often combined with expert research to determine the weight values of given criteria [46]. The method is characterized by a two-level preference for a given criterion, which means that the criteria may be strongly or slightly better than each other. Therefore, using the method, it is possible to determine insignificant or very significant differences between the analyzed variants [45]. The tools to help determine the exceedance relationship are parameters, such as the equivalence threshold Q, the preference threshold p, and the veto threshold V, which relate to the difference in assessments of two variants concerning a given criterion. For the equivalence threshold Q, if the difference in scores does not exceed this threshold, the variants are considered to be equivalent. Preference threshold p—means the minimal difference in the assessment of two variants. The preference threshold is not lower than the equivalence threshold value, its value indicates the boundary between strong and weak preference. If the difference in scores is between p and Q then it is said to have a weak preference. On the other hand, if the difference is greater than p, it is said that there is a strong preference for one variant over the other. The veto threshold V is defined separately for each criterion. It determines the maximum difference in the assessment of variants. It makes it possible to determine the size by which the values of the criteria may differ between the compared variants. The occurrence of the above parameters, the possibility of determining an ordered ranking of variants and the selection of a large number ($\geq$7) of factors speak over the use of the ELECTRE III method over other methods of multi-criteria decision support. The ELECTRE III method is based on a three-stage algorithm presented in Figure 2.

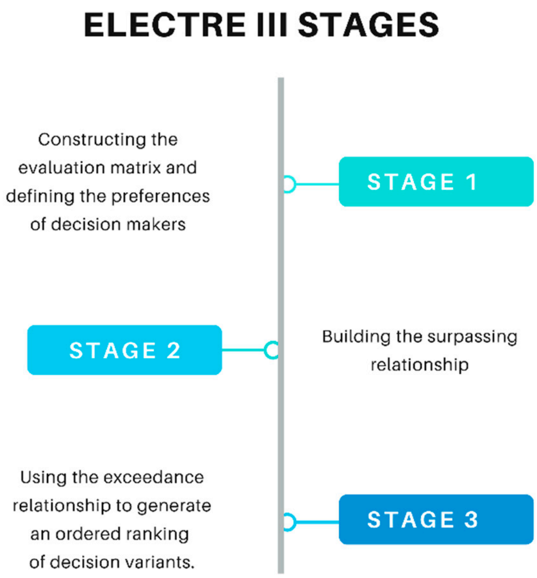

Figure 2. ELECTRE III method process.

In the first stage, it is necessary to identify the decision variants and then define a set of criteria that will be used to evaluate each of the variants [47,48]. For each of the criteria, a weight is determined, which is indicated by experts. Then, by comparing the two decision variants, the exceedance index is calculated [47,48].

In the second stage, using the calculated exceedance index, it is determined whether the first variant is not worse than the second due to the given criterion. Consequently, the compliance rate calculations should be performed to obtain an answer with the level of advantage of one variant over the other in terms of all criteria [47,48]. The compliance rate is the sum of the weights of the criteria for which the evaluation value of one variant is greater than or equal to the evaluation value of the other variant [47,48].

In the third stage, an altitude difference matrix is created. Variants should be arranged sequentially, starting from their initial ordering using classification procedures of ascend distillation and descend distillation [47,48]. Ascend distillation is a scheduling process that begins with selecting the best variant and placing it at the top of the classification [47,48]. The best variant is then selected again from among the remaining scenarios and placed in the next position in the classification. This procedure is repeated until the set of variants is exhausted [47,48]. For descend distillation, the scheduling process begins with the worst-case selection and placement at the end of the ranking. The sequence is the same as in the ascend distillation procedure, with the difference that in subsequent iterations of the remaining variants to be considered, the worst variant is always selected and placed in the next positions "from the bottom" [47,48].

Then, create the final ranking based on the descending and the ascending ordering, according to the following rules [47,48]:

- Variant *a* is considered better than variant *b*, if in at least one order *a* is placed before *b*, and in the other *a* is at least as well classified as *b*;
- Variant *a* is assessed equally to *b*, if both variants belong to the same class in each of the two rankings;
- Variants *a* and *b* are incomparable if, in one of the two order lines, variant *a* is in a better position than *b*, and variant *b* is in a better position than *a* in the second order. The results are presented in the next chapter.

3. Results

Based on the developed research process, in the first step, the vehicle variants that were considered in the analysis were determined. The most popular vehicle models in 2021 representing segments A, B, C, and D, classic, hybrid, and electric drive were cars considered in the analysis. A detailed list of vehicles is presented in Table 1.

Table 1. Cars (variants) included in the analysis.

ID of Alternative	Segment	Engine Type	Vehicle Model
a1	C	Classic	Volkswagen Golf
a2	B	Classic	Peugeot 208
a3	B	Hybrid	Toyota Yaris
a4	D	Hybrid	BMW Series 3
a5	B	Classic	Renault Clio
a6	C	Hybrid	Toyota Corolla
a7	C	Classic	Skoda Octavia
a8	A	Electric	Dacia Spring
a9	D	Hybrid	Hyundai IONIQ
a10	A	Electric	Fiat 500
a11	D	Electric	Škoda Enyaq
a12	D	Electric	Volkswagen ID.4

The next step was to indicate the set of factors that were accessed by the expert's group. The study focused mainly on the technical factors that could be quantified, without favoring any kind of car manufacturers. The selected factors are presented in Table 2.

Table 2. Factors considered in the analysis of selecting carsharing fleets.

Factor #	Factor Definition
f_1	Vehicle price—average between the highest and lowest equipment [€]
f_2	Engine power [kW]
f_3	Energy consumption/fuel consumption [kWh/100 km]
f_4	Battery charging time/time of refueling [min]
f_5	Boot capacity [l]
f_6	Number of seats in the vehicle [-]
f_7	Number of doors in the vehicle [-]
f_8	Vehicle length [m]
f_{09}	Euro NCAP rating [-]
f_{10}	Safety equipment [-]
f_{11}	Warranty period in years [-]

where: #—number, [-]—dimensionless value.

The next stage was the determination of the weights by experts. Sequentially based on the set of variants (vehicles models) presented in Table 1, the criteria for their evaluation indicated in Table 2, detailed specifications of the individual vehicles were determined and presented in Table 3.

Table 3. Detailed values of individual criteria for each variant.

ID	Vehicle Price	Engine Power	Energy/ Fuel Consumption	Charging Time/ Refueling Time	Boot Capacity	Number of Seats	Number of Doors	Vehicle Length	Euro NCAP Rating	Safety Equipment	Warranty Period in Years
	[€]	[kW]	[kWh/ 100 km]	[min]	[l]	[-]	[-]	[m]	[-]	[-]	[-]
a1	23,173	81	38.5	2	380	5	5	4.28	5	10	2
a2	14,762	74	37.8	2	311	5	5	4.05	4	9	2
a3	18,180	74	28.7	1.5	286	5	3	3.94	5	8	3
a4	39,597	215	13.3	2	480	5	4	4.70	5	11	2
a5	15,050	48	29.4	1.5	391	5	5	4.05	5	10	2
a6	21,354	90	29.4	2.5	361	5	4	4.37	5	10	3
a7	23,196	110	37.8	2.5	600	5	5	4.68	5	10	3
a8	16,870	33	13.9	90	300	5	5	3.73	1	6	2
a9	33,170	104	23.8	2	443	5	5	4.47	5	8	5
a10	25,620	70	11	240	363	5	3	3.63	4	8	2
a11	48,888	109	14.4	360	585	5	5	4.49	5	8	2
a12	43,818	128	17	450	543	5	5	4.58	5	8	3

where: [-]—dimensionless value.

Sequentially, according to the ELECTRE III methodology, the equivalence, preference, and veto thresholds were determined for each of the analyzed factors. Detailed data are presented in Table 4.

Table 4. The values of equivalence, preference, and veto thresholds.

Factor #	Maximum Difference of Criteria Values	Equivalence Threshold	Preference Threshold	Veto Threshold
	$\Delta = \max - \min$	$Q = 0.25 \times \Delta$	$p = 0.5 \times \Delta$	$V = \Delta$
f_1	34,126.61	8531.65	17,063.30	34,126.61
f_2	182	45.5	91	182
f_3	27.5	6.875	13.75	27.5
f_4	448.5	112.125	224.25	448.5
f_5	1289	322.25	644.5	1289
f_6	0	0	0	0
f_7	2	0.5	1	2
f_8	1.07	0.2675	0.535	1.07
f_9	4	1	2	4
f_{10}	5	1.25	2.5	5
f_{11}	3	0.75	1.5	3

where: #—number.

The next step according to the ELECTRE III methodology was to develop the concordance matrix. The matrix is presented in the form of Table 5.

Table 5. Concordance matrix values.

Concordance Matrix:	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	a11	a12
a1	-	1	0.9977	0.7777	1	0.9977	0.9288	1	0.9885	0.8775	0.8515	0.6889
a2	1	-	0.9977	0.6518	1	0.9704	0.8587	1	0.8878	0.8704	0.7619	0.5512
a3	0.788	0.8966	-	0.527	0.8538	0.7694	0.6934	0.918	0.7549	0.8775	0.6305	0.4688
a4	0.852	0.852	0.9317	-	0.852	0.9317	0.8497	0.918	0.8762	0.8775	0.7932	0.6537
a5	0.9786	0.9854	0.9977	0.716	-	0.9704	0.8009	1	0.8603	0.8713	0.7213	0.483
a6	0.8966	0.9034	1	0.8225	0.918	-	0.8813	0.918	0.901	0.8775	0.7695	0.63
a7	1	1	1	0.857	1	1	-	1	0.9886	0.8775	0.8515	0.712
a8	0.5735	0.6917	0.7595	0.501	0.6917	0.5476	0.4953	-	0.5624	0.7858	0.4605	0.2795
a9	0.8698	0.934	1	0.774	0.9358	0.9358	0.8698	1	-	0.8775	0.8556	0.7316
a10	0.6488	0.7728	0.9096	0.5364	0.7086	0.6465	0.6465	0.918	0.7151	-	0.7444	0.4715
a11	0.8698	0.934	0.9317	0.774	0.8698	0.8675	0.8675	1	0.9688	1	-	0.8582
a12	0.8698	0.934	0.9537	0.7845	0.8828	0.8828	0.8698	1	0.993	1	1	-

The next stage in the ELECTRE III method was to perform the ascend and descend distillation and to create a dominance matrix. The values of the matrix are presented in Table 6.

Table 6. Dominance matrix values.

Dominance Matrix	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	a11	a12
a1	-	I	P+	R	P+	P+	P−	P+	P−	P+	I	P−
a2	I	-	P+	R	P+	P+	P−	P+	P−	P+	I	P−
a3	P−	P−	-	P-	P−	P−	P−	P+	P−	P−	P−	P−
a4	R	R	P+	-	R	R	P−	P+	P−	P+	R	P−
a5	P−	P−	P+	R	-	P−	P−	P+	P−	R	P−	P−
a6	P−	P−	P+	R	P+	-	P−	P+	P−	P+	P−	P−
a7	P+	P+	P+	P+	P+	P+	-	P+	P+	P+	P+	P+
a8	P−	P−	P−	P−	P−	P−	P−	-	P−	P−	P−	P−
a9	P+	P+	P+	P+	P+	P+	P−	P+	-	P+	P+	P−
a10	P−	P−	P+	P−	R	P−	P−	P+	P−	-	P−	P−
a11	I	I	P+	R	P+	P+	P−	P+	P−	P+	-	P−
a12	P+	P+	P+	P+	P+	P+	P−	P+	P+	P+	P+	-

where: (I)—a pair of variants are equivalent, (P+)—the first variant is better than the second variant, (P−)—the first variant is worse than the second variant.

The last step was to prepare the final ranking presenting the ranking of variants in terms of the preferences of experts and the adopted factors. The final ranking is presented in Table 7.

Table 7. Final ranking.

Dominance Matrix	Ascend Distillation	Descend Distillation	Average
a1	2	3	2.5
a2	2	3	2.5
a3	4	5	4.5
a4	1	5	3
a5	4	4	4
a6	2	4	3
a7	1	1	1
a8	5	5	5
a9	1	3	2
a10	3	5	4
a11	2	3	2.5
a12	1	2	1.5

The graphical arrangement of the variants is shown in Figure 3.

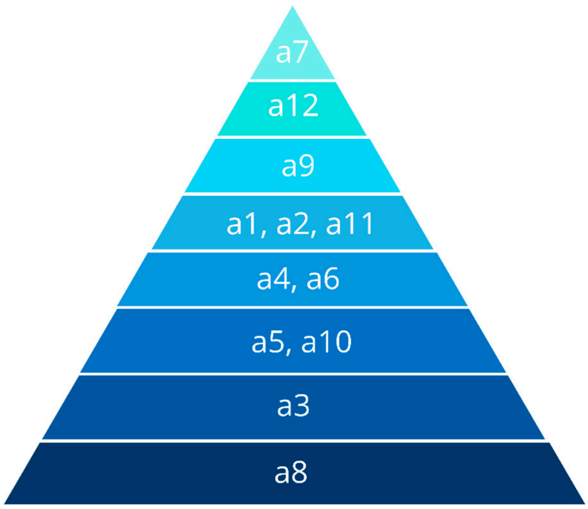

Figure 3. Final ranking—graphic visualization.

4. Discussion

Research carried out using the ELECTRE III method allowed for the determination of vehicles best suited to carsharing services from the point of view of the needs of people who frequently use the systems. The Skoda Octavia turned out to be the best, optimal solution that met the expectations of users among the considered factors. The second in the final raking was the Volkswagen ID.4 and the third was the Hyundai IONIQ.

When analyzing the results in detail, it should be emphasized that the leading places are occupied by the C-segment vehicles, that is, the lower, and middle-class passenger cars, which are characterized by a compact design ensuring relative driving comfort for four adults and a moderately large space for luggage (segment of compact cars), and segment D, that is, the middle class of passenger cars, including relatively large and comfortable family and sports cars. The D class includes classic passenger cars with dimensions larger than compact cars, ensuring a relatively comfortable ride for five people on longer journeys. It should be noted that the lowest places in the ranking were class A vehicles, i.e., small cars, and segment B, i.e., a class of passenger cars that include small-size and city cars but offer more space than segment A cars.

It is worth noting that the second place is occupied by electric and the third position by a hybrid vehicle. This is related to the high importance of the engine power factor. Classifying a vehicle with a conventional drive over an electric vehicle is mainly related to the lower cost of its purchase and the still large disproportion cost of an electric vehicle over a vehicle with a conventional drive.

Based on the obtained results, it can be concluded that factors such as the size of the vehicle expressed in the form of its length, boot size, engine power, and the presence of the largest possible number of systems supporting the safety of the vehicle and passengers were the most important for frequent users. It is also worth highlighting that vehicle warranty turned out to be an important criterion. The warranty criterion was used purposefully because it is related to the quality of the vehicle. It is interesting that even though the guarantee issues should be relevant only for operators, they were also relevant for users. The results show that the preferences of users are directed towards relatively large, fast, comfortable, and safe vehicles with good quality. These factors coincide with the aspects that individual drivers pay attention to during selecting their own private cars for long journeys [49,50]. On this basis, it can be concluded that users who frequently use carsharing treat carsharing vehicles on an equal footing with individual vehicles selected for long distances. On the one hand, this is a very interesting conclusion because it indicates that carsharing fulfills the basic task of replacing an individual vehicle with a rented one. On the other hand, it is worth highlighting that the idea of carsharing was to ensure high availability of small, city cars that do not take up a lot of public space [51–53]. The research shows that the vehicles selected in the case of frequent carsharing users are the opposite. However, business practice shows that many systems equipped with fleets of small cars have closed. Although many different problems related to insufficient charging infrastructure or the number of vehicles is pointed out, it is not emphasized that these systems are connected by the issue of using small, urban cars in them—e.g., Bolloré Bluecar in Autolib' or Smart Fortwo EQ, BMW i3, Skoda CityGo! [54–56]. Interestingly, carsharing systems equipped with a fleet of large vehicles remain on the market.

It is also worth emphasizing that the ecological aspect is debatable because the issues of energy consumption or vehicle charging time are not as important to the respondents as the issues of the size of the vehicle or its engine power. This is visible when comparing models, such as the Volkswagen ID.4 and the Dacia Spring. Although Dacia achieves much better parameters in terms of battery charging speed and fuel consumption, the size, engine power, safety aspects, and quality of the Volkswagen place it in a winning position. Furthermore, respondents did not pay particular attention to the issue of energy/fuel consumption per 100 km, nor to the aspects of vehicle battery charging time or fuel refinement. Thus, electric and hybrid vehicles took high places in the ranking not because of their ecological aspect but because of additional attributes comparable to conventional vehicles, such as the winner—the Skoda Octavia. That results may indicate inadequate education in the field of electric vehicles and the approach to ecology in transport. Referring also to the Polish market and the constantly insufficient number of charging stations for electric vehicles, the results confirm the reality. Therefore, it should be emphasized that the frequent-user car sharing fleet should be diversified and include electric and hybrid vehicles. This action is needed to subtly lean toward the implementation of sustainable transport assumptions. However, to a large extent, to meet the current expectations of frequent customers, the current fleets should be based on vehicles with conventional drive. Moreover, it is worth noting that the respondents paid little attention to the number of seats and the number of doors in the vehicle. This may show that cars are not used by a larger number of people. What is more, it is an important indication that with subsequent analyses these factors may be replaced by others.

Due to the lack of scientific research on the selection of carsharing fleets from the point of view of the needs of specific user groups, the discussion did not refer directly to the results of other authors' research.

5. Conclusions

In conclusion, by conducting research, it was possible to achieve the goal of the work, which was to identify the vehicles best suited to carsharing systems from the point of view of the customers who used them most recently. The research showed that the best solution from the point of view of frequent users turned out to be the Skoda Octavia car. The results showed that the vehicles should be selected in terms of size, boot capacity, engine power, quality, and safety.

Based on the research results, the following recommendations were developed for operators who want to make the appropriate selection of a fleet of vehicles for people who frequently use systems:

- When completing the fleet of vehicles for regular users, it is worth considering relatively large cars in the vehicle fleet representing the C or D segment;
- Focus on vehicles with the best engine performance and with the largest possible boot;
- Vehicles of good quality and high safety standards should be selected, incorporating as many safety systems as possible;
- Although the carsharing fleet should be diverse, the first choice of vehicles with the largest number of vehicles in the fleet should be directed towards conventional cars, electric and hybrid cars at the moment should constitute an additional supplement to the fleet;
- Although at the moment Polish carsharing fleets should focus on conventional vehicles (which is also confirmed by, among others, the insufficient number of vehicle charging stations), electric and hybrid vehicles should be included in vehicle fleets to properly prepare users for the transition to greener forms of transport;
- The criteria for the number of seats in the vehicle and the number of doors should not be crucial when it comes to good vehicles for frequent customers.

The article, like any other research work, has its limitations. The main limitation is the research was conducted specifically on the Polish market. The second limitation is the study focused on a group of frequent users. Due to this, in the next works, the author plans to expand the group of analyzed users to obtain the full range of the fleet tailored to the needs of each of them. In addition, the author also plans to carry out this type of research in other countries to show differences in the approach to the vehicle fleet, especially in countries with a highly developed approach to ecology.

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Institutional Review Board Statement: According to our University Ethical Statement, following, the following shall be regarded as research requiring a favorable opinion from the Ethic Commission in the case of human research (based on document in polish: https://prawo.polsl.pl/Lists/Monitor/Attachments/7291/M.2021.501.Z.107.pdf (accessed on 13 June 2022): research in which persons with limited capacity to give informed or research on persons whose capacity to give informed or free consent to participate in research and who have a limited ability to refuse research before or during their implementation, in particular: children and adolescents under 12 years of age, persons with intellectual disabilities persons whose consent to participate in the research may not be fully voluntary prisoners, soldiers, police officers, employees of companies (when the survey is conducted at their workplace), persons who agree to participate in the research on the basis of false information about the purpose and course of the re-search (masking instruction, i.e., deception) or do not know at all that they are subjects (in so-called natural experiments); research in which persons particularly susceptible to psychological trauma and mental health disorders are to participate mental health, in particular: mentally ill persons, victims of disasters, war trauma, etc., patients receiving treatment for psychotic disorders, family members of terminally or chronically ill patients; research involving active interference with human behavior aimed at changing it research involving active intervention in human behavior aimed at changing that behavior without direct intervention in the functioning of the brain, e.g., cognitive training, psy-chotherapy psychocorrection, etc. (this also applies if the intended intervention is intended to benefit (this also applies when the intended intervention is o benefit the subject (e.g., to improve his/her memory); research concerning controversial issues (e.g., abortion, in vitro fertilization, death penalty) or requiring particular delicacy and caution (e.g., concerning religious beliefs or attitudes towards minority groups) minority groups); research that is prolonged, tiring, physically or mentally ex-hausting. Our research is not done on people meeting the mentioned condition. Any of the researched people: any of them had limited capacity to be informed, any of them had been susceptible to psy-chological trauma and mental health disorders, the research did not concern the mentioned-above controversial issues, the research was not prolonged, tiring, physically or mentally exhausting.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this study are available on request from the author.

Conflicts of Interest: The author declares no conflict of interest.

Appendix A

Table A1. Sample characteristics.

Demographic Variable	Gender	Quantity	Percent of Respondents
Gender	Male	113	82%
	Female	27	18%
Age	18–30	114	76%
	31–40	24	16%
	41–50	6	4%
	51–60	4	3%
	61–80	2	1%
Education	Secondary education	109	73%
	Higher education	41	27%

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