Grosse Point Associates

A deeper analysis of the microvans success potential

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Problem background

We will start this report by outlining the current situation. As we all know, the U.S. automotive industry is always on the lookout for the next big trend in vehicle design, but developing a new model is a massive project that involves significant time and financial investment. Because of these challenges, accurately predicting consumer preferences and market trends is essential for an automotive companies success. This is where we step in. In recent years, our biannual consumer panel surveys have revealed an interesting trend among affluent families with one to three children. Unlike the traditional minivan user, being the middle- to upper-middle-class families with multiple young children, this new demographic is showing increased interest in purchasing a minivan. However, their preferences diverge significantly from the traditional model.

Our data seems to point to the emergence of a luxury-oriented niche market among smaller families. These consumers still value the "kids and their friends" functionality of a minivan but are dissatisfied with the bulkiness of traditional models. Many respondents in this demographic have described existing minivans as "tanks" or "boats", indicating their interest for a more compact alternative. This observation also seems to align with government census data, indicating an increase in smaller, educated, and relatively affluent families. While the trend is clear, we cannot yet be sure about its underlying motivations. Some consumers may simply want a personalized version of the minivan, similar to the evolution of compact SUVs. In addition, the environmental movement might also play a vital role.

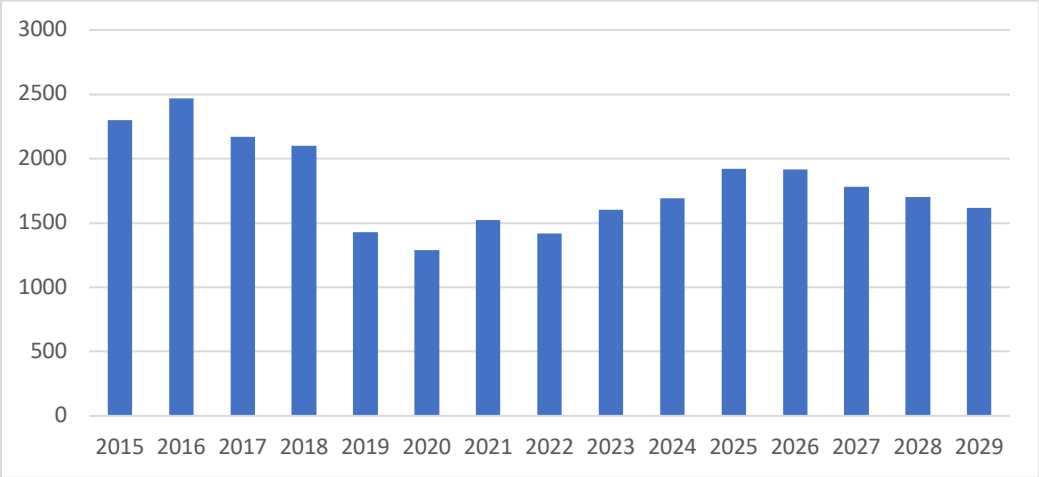
With these insights in mind, we turned to the concept of microvans. Inspired by Japanese Kei cars which are known to be lightweight vehicles bought for their practicality and compact size, we began exploring whether a similar model could find success in the U.S. market. To test the viability of the microvan concept, we conducted focus groups with a range of potential buyers, including affluent small families, city dwellers with limited parking, and small business owners seeking economical delivery vehicles. The results were encouraging. Many participants viewed microvans as innovative vehicles with desirable attributes like compact size and practicality. Additionally, a significant portion of respondents expressed a willingness to pay a premium for such a product, positioning microvans as a potential competitor to smaller pickups, SUVs, and especially traditional minivans. However, participants also raised some concerns. Based on

these findings, we decided to expand our research. Using our existing in-house panel, we tested the microvan concept to gather more insights. This analysis will allow us to better understand the preferences and concerns of potential customers while helping us assess the market potential of microvans in the U.S. automotive industry.

Automotive market analysis

As seen in figure 1, the U.S. minivan market is currently experiencing stagnation and is projected to shrink in the coming years. This trend highlights the struggles the traditional minivans market experiences at the moment, as they are not successful in maintaining their relevance within a changing automotive landscape. As consumer preferences always evolve, we can assume that the lack of momentum in the market might mean that the market has become saturated. This clearly shows the urgent need for innovation to drive new demand. If we wanted to draw a drastic picture for our clients we might even say that without meaningful updates or advancements, traditional minivans risk losing their position in the market entirely.

Figure 1: Minivan Unit Sales (in 10m$) in the US from 2015-2029



Source: https://www.statista.com/outlook/mmo/passenger-cars/minivans/united-states#unit-sales

The microvan concept might present a unique opportunity to break out of the stagnation in the minivan market. This would primarily be accomplished by targeting new customer segments, for which it is essential to develop a deep understanding of consumer preferences and to identify the key factors driving purchasing decisions. Every crisis also brings great possibilities with it. We can bring our company into a great position by being able to provide our automotive clients with exactly these insights and a path to new successes.

Research objective

As our survey is comprised of a very large dataset, our primary objective of this research is to achieve significant data reduction while preserving the essential insights captured in the survey results. Thereby we aim to make our findings more comprehensible and easier to communicate. The findings should provide clear and actionable insights for everybody interested in the topic, enabling them to make informed decisions based on a robust analysis of the results. We will accomplish this by conducting a dimensionality reduction of the survey variables which will be followed by a clustering of the data. Following this, we will closely look at all the clusters and derive customer segments from them. These two steps will help us in understanding the demand for a microvan as well as its potential customer segments. In addition, we also consider the importance of different demographic factors. The report ultimately aims to communicate these findings to internal stakeholders, giving them the ability to decide on whether or not we should pursue in presenting the microvan concept to our automotive clients.

Data quality

To ensure reliable findings we need to be able to rely on our data. Luckily, the data collection process was carefully structured to ensure representativeness and minimize biases. Data was drawn from a pre-existing panel, which included a broad demographic representation of the U.S. adult population. Key demographic variables like age, income, education, and family size were already included in our panel as well. Moreover, including the microvan survey within a larger biannual questionnaire minimized the risk of so called “yea-saying”, which is a common bias where respondents overstate their interest in a specific concept when directly asked. The survey design also benefited from a pre-test phase, during which the question wording was refined to increase clarity.

The sampling strategy ensured that the data collected was both relevant to the target market and representative of potential consumers. Respondents were carefully chosen, focusing on those with a non-zero likelihood of purchasing a new car within the next year. This approach helped reduce selection bias and ensured alignment with the study's goals. The final sample included 400 participants, which was sufficient for the analysis. The survey questions were based on validated psychographic attributes identified during focus groups and were

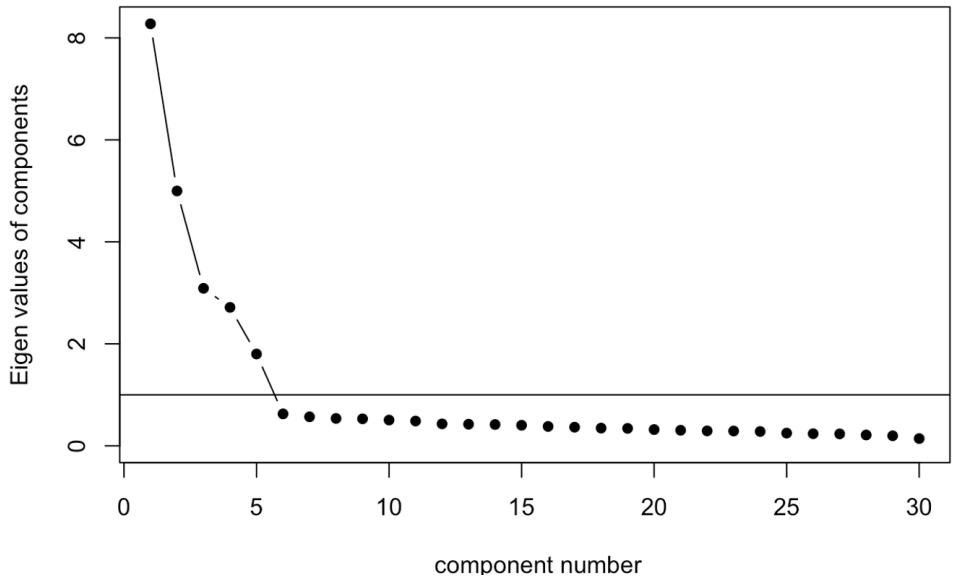
measured using a 1-9 Likert scale. This method allowed for effective comparative and factor analyses. To avoid potential biases, the survey did not ask directly about “purchase likelihood,” as responses to such questions could be influenced by external factors like financial constraints. Instead, a general question about product attractiveness was included, which provided a more neutral measure of interest.

Dimensionality reduction

Before we start with the factor analysis, we need to take two important preparatory steps. First, we need to select our important variables for reduction and then assess whether the data set is suitable for this type of analysis. Since we are primarily concerned with the preferences of potential customers, only the survey variables are included in the reduction. The next step is to test the suitability of the data set for factor analysis. This means that we want to determine whether the data is sufficiently correlated to provide meaningful results. To assess this suitability, we rely on three key criteria. First, we examined the correlation matrix, where higher correlations between variables increase the likelihood of obtaining reliable factor analysis results. Second, we performed Bartlett's sphericity test, which tests the null hypothesis that the correlation matrix is an identity matrix. A significant result, for us a p-value below 0.05, indicates that the data set is suitable for factor analysis. Third, we calculate the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, which assesses whether the sample size and correlations are suitable for factor extraction. The results are promising. The correlation matrix shows many strongly correlated variables, suggesting strong relationships between them. The Bartlett's test gives a p-value below 0.05, which is further confirmation that the data set is appropriate. The overall KMO value is 0.92, which is classified as “marvelous” and indicates that the data set is well suited for factor analysis.

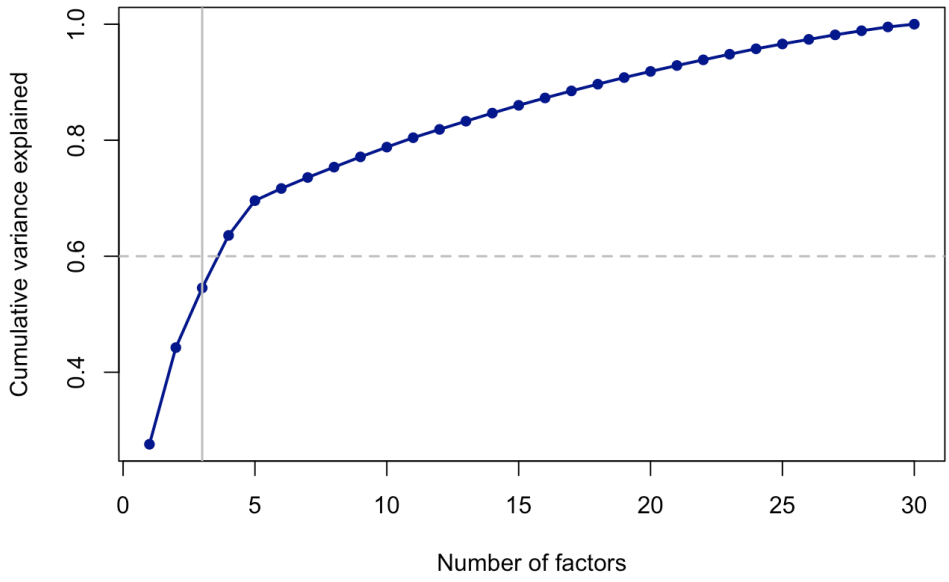
After the preliminary analysis, the next step is to find the initial eigenvalues and explain their individual and cumulative variance percentages. This helps us to decide how many dimensions to keep as relevant. To better understand the result of the eigenvalues, we can look at the generated scree plot and cumulative variance to visualize the changes in eigenvalues as an increase in the number of components and the percentage of cumulative variance explained as an increasing number of factors.

Figure 2: Scree Plot



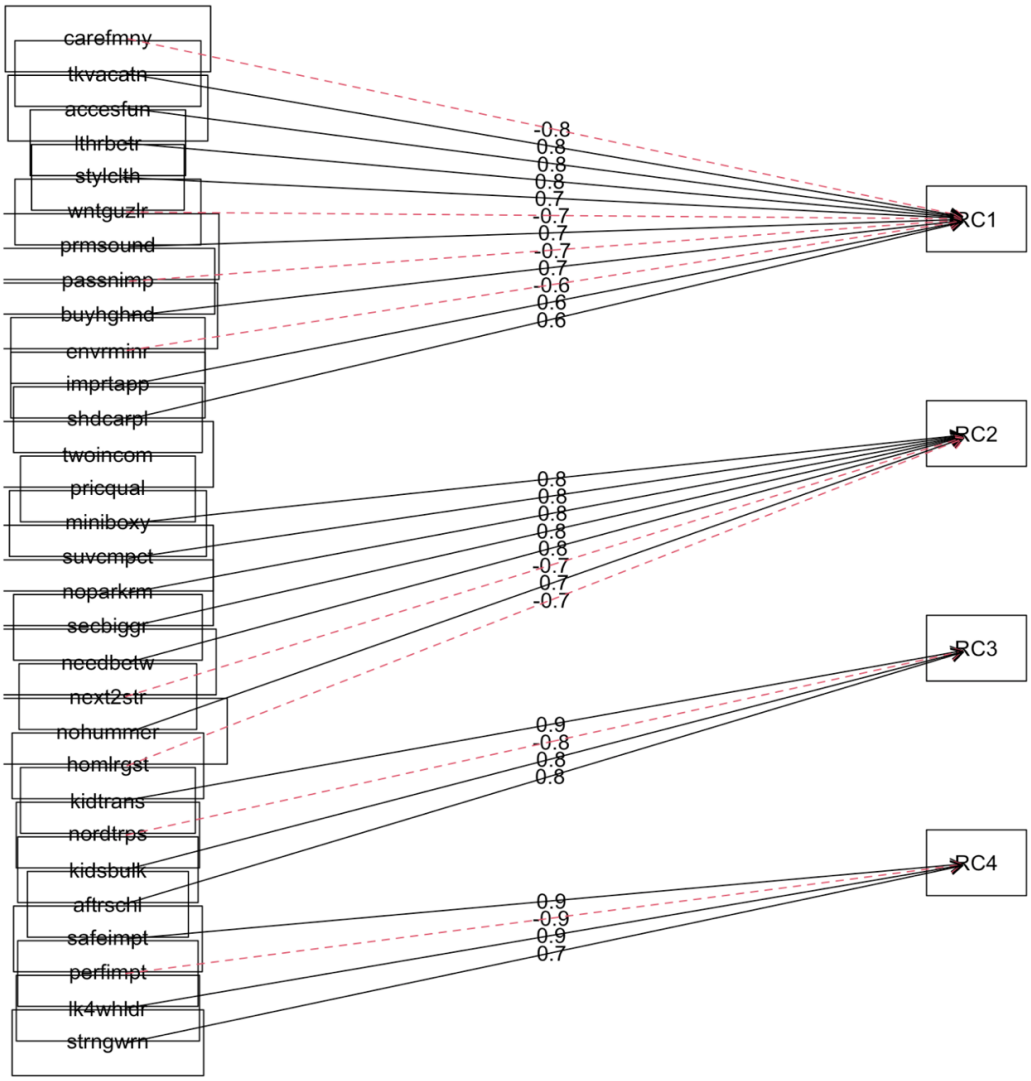
The scree plot shows a clear elbow structure after five components, which is consistent with the number of eigenvalues greater than one. However, when considering the cumulative variance explained, we decided to proceed with only four factors. In general, it is recommended to select enough factors to achieve at least 60% of the explained variance, which in this case occurs after four factors. Adding a fifth factor would only add 6% to the explained variance, while increasing the number of factors by 25%. This trade-off does not seem justified, so we decided to keep four factors. Together, these four factors account for 63.6% of the total variance in the dataset.

Figure 3: Cumulative variance explained



There are two main methods for extracting factors: principal component analysis (PCA) and exploratory factor analysis (EFA). Both aim to identify patterns in the data by grouping related variables, but differ in focus. PCA emphasizes dimension reduction by transforming variables into uncorrelated components that capture the most variance. EFA, on the other hand, aims to uncover latent constructs and is often used for theory development. For our analysis, we chose PCA because the variables are measured with minimal error and our main goal is to reduce dimensionality. This method effectively summarizes the data set while retaining the most important information. The results identify four factors, each representing a specific dimension within the data. The diagram below shows how the variables are grouped under each component, providing a clear structure for further interpretation.

Figure 4: Component analysis



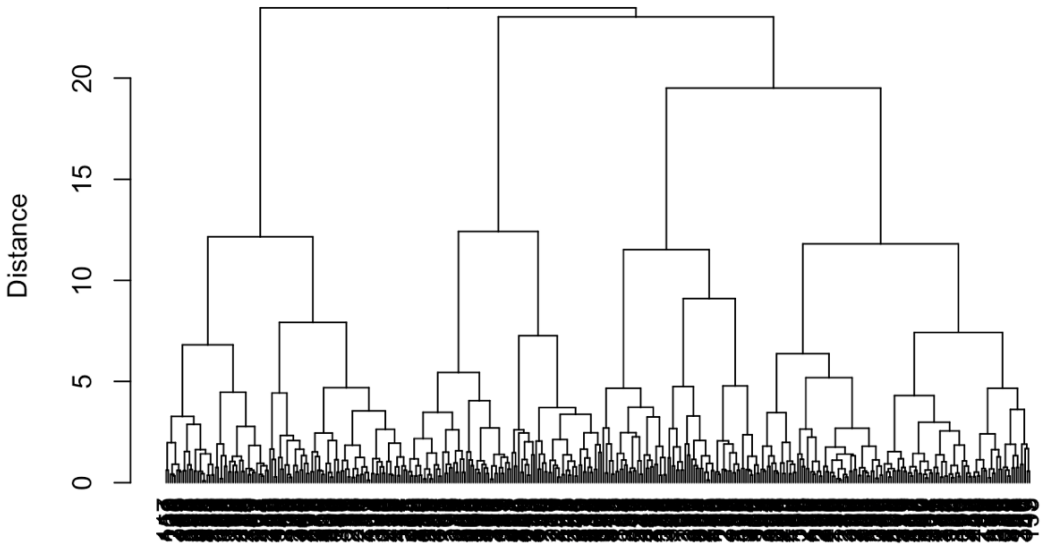
The first factor consists of 12 variables that can be summarized under the topics of quality, willingness to spend and environmental protection. These variables mainly reflect preferences for high-quality vehicles, taking environmental aspects into account. The second factor comprises eight variables that primarily capture consumers' expectations regarding the introduction of new products on the automotive market. The third factor comprises only four variables, all of which relate to family needs, particularly children. Finally, the fourth factor also contains only four variables and represents safety considerations, as the importance of safety features and warranty in new vehicles is consistently emphasized.

Cluster analysis

In order to perform customer segmentation, we wanted to identify different subgroups within the given data set. These subgroups or clusters are characterized by internal similarities in behaviors and preferences, but are distinctly different from other clusters. This segmentation allows for a more individualized understanding of customer needs and enables the development of targeted marketing strategies. The first step in this process is to determine the appropriate number of clusters. The clustering model begins by treating each customer as a single segment. Customers are then grouped iteratively, starting with those whose aggregation results in the least loss of information. This process continues until further merging would lead to an unacceptable loss of information.

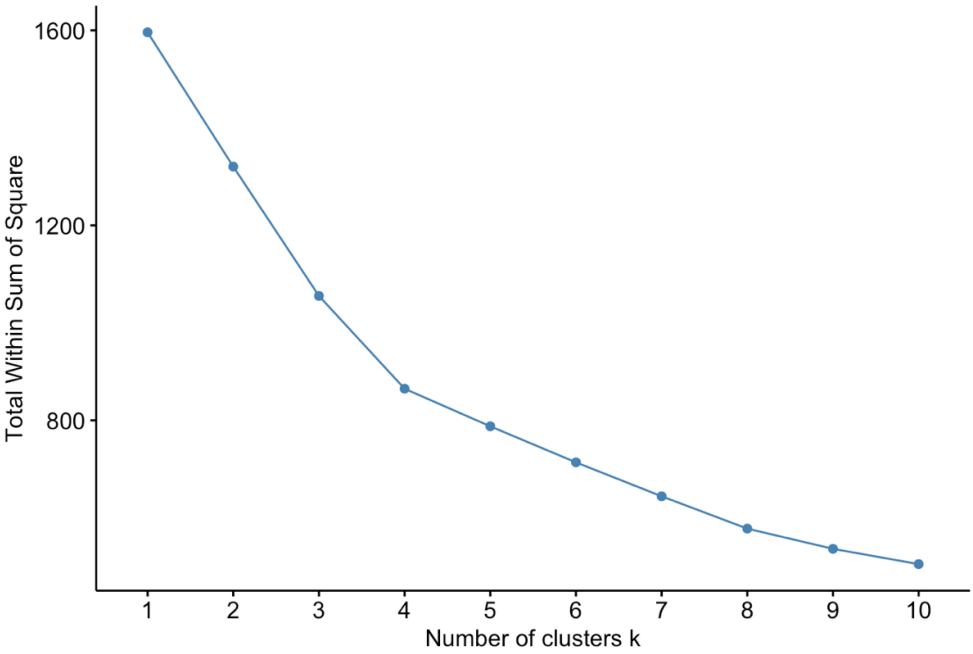
To determine the optimal number of clusters, we analyze a dendrogram created using the clustering method. In our analysis, we used hierarchical clustering with the Ward method, which minimizes the total variance within the clusters. This method was applied to a Euclidean distance matrix that measures the similarity between customers. The dendrogram provides a visual representation of the merging process and helps to identify the point at which the formation of additional clusters no longer provides meaningful distinctions. Through this systematic approach, we ensured that the clusters reflect real and actionable differences in customer preferences and provide a solid foundation for further analysis and strategic planning.

Figure 5: Dendrogram



The dendrogram shows that choosing between four and eight clusters would be a sensible approach to segmentation. This range strikes a balance between maintaining meaningful distinctions between clusters and avoiding unnecessary complexity. To refine this decision, we applied the “elbow method”, a k-means clustering technique commonly used to determine the optimal number of clusters. The elbow method evaluates the trade-off between the number of clusters and the explained variance and identifies the point at which adding more clusters leads to diminishing returns.

Figure 6: Optimal number of clusters



In the four-cluster solution, the cluster sizes range from 73 respondents, representing 18.25% of the sample, to 125 respondents, representing 31.25% of the sample. This distribution illustrates the variability of group sizes and ensures that each cluster captures a significant portion of the data set while maintaining meaningful differentiation between customer segments. In the following we will take a closer look at the characteristics of each of these clusters and try to understand them.

Regression analysis

To better understand the factors that influence consumer interest in the microvan concept, we conducted a logistic regression analysis. The aim was to find out which variables significantly influence the likelihood of a consumer expressing a positive opinion about the product. This analysis not only sheds light on the key drivers of consumer preference, but also allows us to predict how changes in these factors might affect overall interest in the microvan. The results provide valuable insights into how we can adapt our marketing and product development strategies to better meet the needs of potential customers.

The regression results revealed several key drivers of consumer interest. The most significant factor was innovation, represented by RC2. This factor had the strongest positive effect on product liking, with a highly significant p-value. Consumers who value the introduction of new and innovative products in the automotive market were much more likely to express interest in the microvan concept. Another significant factor was safety, captured by RC4. Interestingly, safety considerations had a negative impact on product liking. Respondents who prioritize features like warranties and overall safety were less likely to favor the microvan concept.

Age proved to be a significant positive predictor, with older respondents more likely to have a positive opinion of the van. The likelihood of liking the van increased by around 12% with each additional year of age, indicating a stronger response from older demographics. Marketing strategies should consider targeting this group. Conversely, miles driven per year had a negative and significant impact on product liking, with a one-unit increase in miles decreasing the likelihood of liking the minibus by approximately 16%. This indicates concerns about the suitability of the vehicle for long distance travel or frequent use, which could be addressed

through targeted messaging or product improvements. Other factors such as quality, environmental aspects (RC1) and family-related preferences (RC3) were not significant. While attributes such as quality, environmental friendliness and family needs are typically desirable, in this case they do not appear to have a major influence on the general opinion of the van.

These findings have several important implications. First, the strong positive influence of innovation underscores the need to emphasize the unique and innovative features of the microvan in both design and marketing. Second, addressing the safety concerns of consumers who prioritize these features could help increase the appeal of the minivan. Third, the positive correlation with age suggests that for minivans in general the older populations should be a key target audience, with messages tailored to their preferences and lifestyle. Finally, understanding the needs of high-mileage drivers and addressing their potential concerns about the microvan's practicality could further extend its market reach.

Market segmentation

Through the segmentation analysis, we identified four unique clusters of potential customers. Each of these show their own preferences and characteristics and thereby provide insights into the diverse needs and priorities within the minivan market. In the following we will take a closer look at these different priorities of each cluster and try to imagine what each cluster could look like in reality. This will help us to shape marketing strategies and refine the positioning of the microvan concept.

The first cluster, we will call them Young Families, makes up about 18.25% of the market of potential buyers. This group doesn’t prioritize quality or environmental concerns and seems to have a lower willingness to pay for premium features. They are not particularly interested in innovative or new products, but they do show a strong interest in family cars that are practical for their needs. Interestingly, they seem to value performance over financial safety, which suggests they are looking for something fun to drive that still works for their family lifestyle. On average, this group is around 38 years old, has an income of 70,000$, and about 1.75 children per household. They rank second in terms of their overall liking of the concept. Their education and recycling habits are notably lower compared to the other groups. While they are not our key costumers, they might still buy our product if the price and marketing are

right. In marketing to this cluster we should focus on showcasing how the microvan can create joyful family moments and lasting memories. It's also important to frame the vehicle as something cool and trendy and emphasize its performance capabilities to appeal to younger families.

The second cluster can be described as Trendy Parents and accounts for 22.5% of the market. It is arguably the most promising segment for the microvan. These potential buyers place a medium-to-high emphasis on quality and environmental values and are willing to pay more for a product that aligns with these principles. They show a strong interest in innovative, less bulky van designs and a slight but noticeable interest in family-friendly features. They also have some interest in financial safety, which could mean they consider practical aspects of ownership like the vans warranty. Demographically, they are about 45 years old on average, earn 85,000$, and have 1.9 children. This makes them the group with the largest families on average. The Trendy Parents rank the highest in their liking of the microvan concept, as well as in education and recycling habits. Marketing to them should focus on the microvan's high-quality craftsmanship, modern design, and eco-friendly features. To resonate with their family situation, our marketing campaign should show families with teenagers in advertisements, while highlighting the environmental benefits of the vehicle. However, the biggest focus should be on the new modern design of the microvan, as this cluster is most aligned with the microvan concept overall. If the microvan will be a success, it will be because of this group.

The third cluster, our Traditionalists, is the largest group of potential customers covering 28% of the market. These individuals highly value quality and environmental factors. More importantly, they have a strong willingness to pay for these attributes. However, they show no interest in innovative or new models and prefer the larger, more traditional designs they are familiar with. While their interest in family cars is low, they do show some concern for financial safety. Demographically, they are the oldest cluster with an average age of 47 years. Unsurprisingly, this also means that they have the highest income, averaging at 105,000$. They typically have one child per household. Traditionalists rank moderately in their liking of the microvan concept, and their education and recycling habits are also relatively high. Marketing to this group should focus on emphasizing quality and reliability. Messaging that highlights the microvan as a dependable and luxurious option for older couples who enjoy travel and

adventure could resonate with them. We could also consider to position the vehicle as an exclusive and premium product, which would align with their willingness to pay for high-end features.

The fourth group, we will call them Apathetics, is the largest single segment and makes up 31.25% of the market. Unfortunately, this group is also the least promising for the microvan concept. They do not value quality or environmental factors and have a low willingness to pay for premium features. They show no significant interest in innovative designs or family cars and show only a modest interest in financial safety. From a demographic side this group is the youngest, with an average age of 30 years. They also have the lowest income with an average of 30,000$ and the lowest amount of children, averaging 0.5 per household. They rank last in terms of their liking of the microvan, and their education and recycling habits are similarly low. We should probably consider to ignore this customer segment, as they show basically no interest in our product at all. If we decided to try a marketing approach it should focus on the themes of freedom and independence and clearly differentiate our product from the existing minivans. Ads featuring young couples or individuals exploring the outdoors and engaging in activities like camping might appeal to them. However, given their low interest in the product it would also be reasonable to ignore this customer segment in a potential marketing campaign.

Conclusion

The microvan concept has significant potential for success in the US market as it addresses changing consumer preferences and fills a gap in the stagnating minivan segment. By focusing on compact and innovative features, the microvan can redefine what consumers expect from family-oriented vehicles.

One of the most promising opportunities lies in the Trendy Parents segment, which accounts for 22.5% of the market and is closely linked to the Microvan concept. This group values innovation, modern design, and pro environment features. Also it is willing to pay a premium. To attract this audience, the microvan should feature cutting-edge technology, elegant aesthetics and sustainable materials. Modular interiors, smart connectivity and advanced user interfaces will increase appeal. Marketing campaigns should focus on sustainability and

modernity and portray families with teenagers engaging in outdoor activities. Pricing should reflect premium positioning with tiered options for customization, such as increased security or environmentally friendly technology upgrades.

Another important segment is the traditionalists, who make up 28% of the market. Although they do not value innovation, they do value quality, reliability and exclusivity. The pickup truck should meet their preferences with durable materials, improved safety features, and a comfortable design for long-distance travel. First-class seats, high-quality workmanship and robust guarantees increase the attractiveness. Marketing should position the microvan as a reliable and luxurious choice for older couples seeking adventure or comfort, while emphasizing durability and sophisticated features. High-end models with exclusive features can justify a premium price.

The Young Families segment strives for practicality and affordability over premium features. To appeal to this group, the van should emphasize family-friendly functionality, such as flexible seating, plenty of storage space and easy-to-clean interiors. While pricing should remain competitive, the product still needs to have key differentiators that make it a better choice than alternatives. Marketing campaigns for this group should focus on themes of family enjoyment and show how the microvan supports everyday activities and vacations and creates lasting memories. Although the Apathetics segment is the largest, it is the least promising for the Microvan concept. This group shows little interest in quality, innovation or family-oriented features, making it a challenging target group. Efforts to engage this segment would likely be inefficient.

Addressing consumer concerns is critical to the success of the van. While safety negatively impacted product interest in our analysis, emphasizing advanced technologies such as adaptive cruise control and collision detection could build confidence. Similarly, emphasizing the microvan's fuel efficiency, comfort and durability can maybe counter doubts from high-mileage drivers about its practicality for frequent or long-distance use. To ensure a successful rollout, we need to involve our consultants in the further assessment of features, marketing and pricing strategies. Their expertise will tailor the product to consumer needs. In addition, proactive collaboration with current and potential customers in the automotive sector is

essential. By showcasing our insights and expertise, we can secure key projects and ensure that the microvan concept is effectively developed and positioned for our clients success.

As a next step, we should focus on developing a comprehensive pricing model that includes tiered options to serve different customer segments, as this will help our clients. We also should be able to help our customers prioritize innovative designs, smart technologies and environmentally conscious materials to meet consumer expectations. By taking these steps, the microvan can be established as a desirable and forward-looking product while we position ourselves as a leading consultancy in the automotive industry. All in all, we are therefore firmly convinced that the further development of the microvan concept is the most promising and data-driven approach.