

Psychographic Segmentation of Generation Z Coffee Shop Customers: An Activities, Interests, and Opinions (AIO) Approach

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ABSTRACT

Coffee shops increasingly function as social and experiential spaces, making demographic profiles alone insufficient for understanding Generation Z customers.

This study aims to identify psychographic segments among urban Generation Z segments among urban Generation Z (2026). Psychographic segmentation of coffee shop consumers in Indonesia using Generation Z coffee shop customers: An the Activities, Interests, and Opinions activities, interests, and opinions (AIO) (AIO) framework. This quantitative study approach. *International Journal of Applied Business & International Management*, 11(2), 1056-1078. employed survey data from 285 respondents, primarily from Bandung and Jakarta, and analyzed them using K-means clustering based on four context-specific psychographic dimensions. The optimal three-cluster solution (silhouette coefficient = 0.575) identified Community Adventurers (33.33%), Aesthetic Socializers (33.68%), and Community-Oriented Selective Explorers (32.98%). One-way analysis of variance and Tukey tests indicated balanced psychographic profiles in the first two clusters, whereas trend consciousness was significantly lower in the third cluster ($p < 0.001$). Age, occupation, monthly income, and expenditure per visit were associated with segment membership, whereas gender and visit frequency were not. These findings demonstrate that context-specific psychographic segmentation provides actionable insights for developing targeted marketing strategies for urban coffee shop businesses.

Keywords: Coffee Shop; Consumer Behavior; Customer Segmentation; Generation Z; Psychographic Segmentation

JEL Classification: M31, M39, L83

INTRODUCTION

Coffee shops have evolved from beverage outlets into experiential and social settings where customers work, study, interact, and express their identities. Consequently, customer value is increasingly derived not only from product quality but also from the atmosphere, social interaction, and memorable experiences created during a visit (Bitner, 1992; Pine & Gilmore, 2011; Schmitt, 2014). This transformation is particularly evident among Generation Z consumers, whose purchasing decisions are closely associated with digital lifestyles, social media engagement, and rapidly evolving consumption trends (Djafarova & Bowes, 2021; Feriyawati et al., 2026). Recent studies also indicate that Generation Z consumers exhibit distinctive shopping lifestyles and behavioral patterns that substantially influence their purchasing decisions, highlighting the growing importance of understanding lifestyle-related consumer characteristics in contemporary marketing (Khatimah et al., 2024).

The rapid expansion of Indonesia's coffee shop industry has intensified competition among businesses offering increasingly similar products and services. As a result, sustaining competitive advantage requires a deeper understanding of customer characteristics beyond traditional demographic variables (Bilal & Achmad, 2023; Sin et al., 2024; Statista, 2025). While demographic segmentation describes who customers are, variables such as age, gender, occupation, and income often fail to explain why consumers with similar demographic profiles exhibit different motivations, preferences, and purchasing behaviors (Wedel & Kamakura, 2000). From a managerial perspective, understanding heterogeneous customer characteristics has become increasingly important for developing more effective and customer-oriented marketing strategies, particularly in highly competitive markets (Rifani et al., 2025).

Psychographic segmentation provides a more comprehensive understanding of customer heterogeneity by grouping consumers according to their lifestyles, motivations, interests, attitudes, and opinions. Among various psychographic approaches, the Activities, Interests, and Opinions (AIO) framework has been widely recognized as an effective approach for explaining lifestyle-related consumption behavior (Plummer, 1974). Existing studies have successfully applied AIO across various industries, demonstrating that psychographic dimensions generate more meaningful customer segments when they are adapted to a specific behavioral context rather than applied as generic lifestyle constructs (Ameyibor & Saini, 2024; Nabilah & Sari, 2023). This context dependency is particularly relevant for coffee shops because customer visits may simultaneously reflect functional needs, social interaction, aesthetic appreciation, trend participation, and exploratory behavior.

Despite growing interest in psychographic segmentation, several research gaps remain. Existing coffee shop studies have predominantly focused on customer satisfaction, service quality, customer engagement, purchase intention, revisit intention, and customer loyalty (Hanaysha, 2022; Karo et al., 2025; Rather & Hollebeek, 2021). Likewise, studies involving Generation Z have mainly examined purchasing behavior, shopping lifestyle, or impulsive buying in digital commerce rather than identifying distinct psychographic customer segments (Khatimah et al., 2024). Consequently, limited evidence exists regarding how context-specific psychographic characteristics explain heterogeneity among Generation Z coffee shop customers and support differentiated marketing strategies.

To address these gaps, this study operationalizes the AIO framework into four coffee shop-specific psychographic dimensions: Trend Conscious, Community Oriented, Aesthetic Oriented, and Adventurer. These dimensions were developed through an

extensive review of consumer behavior and coffee shop literature to better represent the lifestyle characteristics of Generation Z coffee shop consumers. The K-means clustering algorithm was employed to identify naturally occurring customer segments, while the elbow criterion and silhouette coefficient were used to evaluate alternative clustering solutions. Subsequently, one-way analysis of variance (ANOVA), Tukey's post hoc comparisons, chi-square tests, and cross-tabulation analyses were conducted to statistically profile the identified segments rather than independently validate the clustering solution.

Accordingly, this study aims to identify and profile psychographic segments among urban Generation Z coffee shop customers in Indonesia using context-specific AIO dimensions. The novelty of this study lies in translating the broad AIO framework into four psychographic constructs specifically tailored to coffee shop consumption behavior and integrating them with a transparent data-driven clustering approach. The study contributes theoretically by extending psychographic segmentation literature through context-specific AIO operationalization, while practically providing coffee shop managers with actionable customer profiles that support differentiated community, ambience, innovation, and value-oriented marketing strategies. Given the sample's concentration in Bandung and Jakarta, the findings primarily reflect urban Generation Z coffee shop consumers in Indonesia.

LITERATURE REVIEW

Psychographic Market Segmentation

Market segmentation divides a heterogeneous market into relatively homogeneous groups whose members share characteristics relevant to marketing strategy and decision-making. Traditional segmentation approaches, such as demographic or behavioral segmentation, remain useful for describing customer characteristics; however, they often fail to explain why consumers with similar observable characteristics exhibit different motivations, preferences, and purchasing behaviors (Wedel & Kamakura, 2000). Psychographic segmentation addresses this limitation by focusing on consumers' lifestyles, attitudes, interests, opinions, and behavioral tendencies, thereby providing a deeper understanding of customer heterogeneity. Compared with demographic segmentation, psychographic segmentation offers richer managerial insights because it explains the underlying motivations that shape consumer decisions rather than merely describing observable characteristics (Dolnicar et al., 2018).

Psychographic segmentation is particularly relevant for experiential service industries because customer value is closely associated with identity, social interaction, and personal experiences. Recent studies demonstrate that context-specific psychographic dimensions generate more meaningful customer segments than generic lifestyle measures because they better reflect the behavioral characteristics of a particular consumption context (Ameyibor & Saini, 2024; Nabilah & Sari, 2023). Coffee shops provide an appropriate setting for psychographic segmentation since customers may purchase similar products while pursuing substantially different goals, such as social interaction, productivity, aesthetic experiences, trend participation, or leisure.

Activities, Interests, and Opinions (AIO)

Among psychographic segmentation approaches, the AIO framework remains one of the most widely adopted methods for representing consumer lifestyles. Originally introduced by Plummer (1974), AIO explains consumer behavior through three interrelated components. Activities describe how consumers spend their time and engage in daily behavior, Interests represent the objects, experiences, or issues they consider important, and Opinions reflect their evaluations of products, services, and the surrounding

environment. Collectively, these components shift attention from static demographic characteristics toward patterns of lifestyle that influence consumption decisions.

The flexibility of AIO is one of its principal strengths because its indicators can be adapted to reflect the behavioral characteristics of different industries and target markets. Rather than applying generic lifestyle inventories, recent studies recommend operationalizing AIO according to the specific consumption context so that the resulting psychographic dimensions better capture customer heterogeneity and provide more meaningful inputs for market segmentation (Ameyibor & Saini, 2024; Nabilah & Sari, 2023). Accordingly, this study develops coffee-shop-specific AIO indicators to represent the lifestyle characteristics of Generation Z consumers before performing customer segmentation.

AIO Dimensions

The four dimensions were selected because they represent distinct mechanisms through which Generation Z customers engage with coffee shops and because each mechanism can plausibly differentiate cluster membership. Trend Conscious captures marketplace and social-media responsiveness, Community Oriented captures the social function of the venue, Aesthetic Oriented captures the influence of servicescape and visual presentation, and Adventurer captures variety seeking and exploration. Used jointly, the dimensions distinguish whether customers prioritize social belonging, visual experience, novelty, or trend participation, while also allowing segments to exhibit mixed profiles rather than forcing mutually exclusive lifestyle types.

Trend Conscious

Generation Z consumers are frequently exposed to rapidly changing consumption trends through social media, digital communities, influencers, and peer-generated content. Such exposure influences preferences toward popular coffee shops, seasonal beverages, limited products, and visually attractive experiences (Djafarova & Bowes, 2021; Hanaysha, 2022; Khatimah et al., 2024). Trend Conscious therefore measures the extent to which popularity, virality, and emerging coffee shop trends influence consumers' venue and product choices. This dimension is particularly relevant for clustering because customers differ substantially in the extent to which trend-related information shapes their purchasing decisions, allowing the analysis to distinguish highly trend-responsive consumers from more selective individuals.

Community Oriented

Coffee shops increasingly function as social environments where customers interact, collaborate, study, work, and participate in informal communities rather than merely consume beverages. Customer engagement research suggests that service value is created not only through products but also through social interaction and relationship formation (Rather & Hollebeek, 2021). Similarly, studies of food-service consumption indicate that interpersonal experiences significantly influence perceived value (Nair et al., 2021). Community Oriented therefore captures the extent to which social interaction, togetherness, and community engagement influence customers' coffee shop preferences. Consequently, this dimension enables the clustering process to distinguish consumers who primarily seek social experiences from those whose coffee shop choices are driven by other experiential attributes.

Aesthetic Oriented

Physical environments strongly influence customers' perceptions and experiences within service settings (Bitner, 1992), while experiential marketing emphasizes the importance of sensory and emotional value in shaping consumer behavior (Schmitt, 2014). These effects become increasingly prominent as Generation Z consumers frequently document and share visually appealing experiences through social media (Djafarova & Bowes, 2021; Karo et al., 2025). Accordingly, Aesthetic Oriented measures consumers' sensitivity toward interior design, ambience, visual attractiveness, and overall servicescape quality. Variation in this dimension enables clustering to distinguish visually oriented consumers from customers whose preferences rely more heavily on functional or social considerations.

Adventurer

Novelty seeking represents another important characteristic of experience-oriented consumers. Rather than repeatedly visiting familiar places, adventurous consumers actively seek new coffee shops, unique beverages, and different consumption experiences. Previous psychographic studies indicate that exploratory tendencies meaningfully differentiate consumer groups and influence responses to innovation (Ameyibor & Saini, 2024). Furthermore, Generation Z consumers may pursue exploration independently of trend-following behavior because curiosity and variety seeking do not necessarily imply adopting every popular product or venue (Ibrahim et al., 2025; Khatimah et al., 2024). Adventurer therefore measures consumers' willingness to explore new coffee shop experiences. This dimension complements rather than duplicates Trend Conscious by distinguishing exploratory behavior from responsiveness to marketplace popularity.

K-Means Clustering

K-means clustering is an unsupervised partitioning algorithm that assigns observations to the nearest cluster centroid and iteratively updates cluster centers until within-cluster variation is minimized. Owing to its computational efficiency and interpretability, K-means has become one of the most widely applied clustering techniques in customer segmentation studies (Tabianan et al., 2022; Yuliasih et al., 2024). Because all four psychographic dimensions in this study were measured using the same six-point Likert scale, the resulting dimension scores could be entered directly into the clustering procedure without requiring additional standardization.

In this study, K-means clustering groups respondents according to their combined psychographic profiles across the four AIO dimensions. The elbow method is used to examine diminishing reductions in within-cluster sum of squares, while the silhouette coefficient evaluates cluster cohesion and separation (Abdulnassar & Nair, 2021). Together, these diagnostics provide the principal basis for selecting the most appropriate cluster solution before subsequent profiling analyses are conducted.

Validation of Customer Segmentation

A meaningful segmentation solution should demonstrate both statistical structure and managerial interpretability. Internal validation measures, such as the silhouette coefficient, assess whether observations are more similar to members of their own cluster than to those of competing clusters (Dolnicar et al., 2018). Consequently, this study considers the elbow method and silhouette coefficient as the primary evidence for selecting the optimal clustering solution.

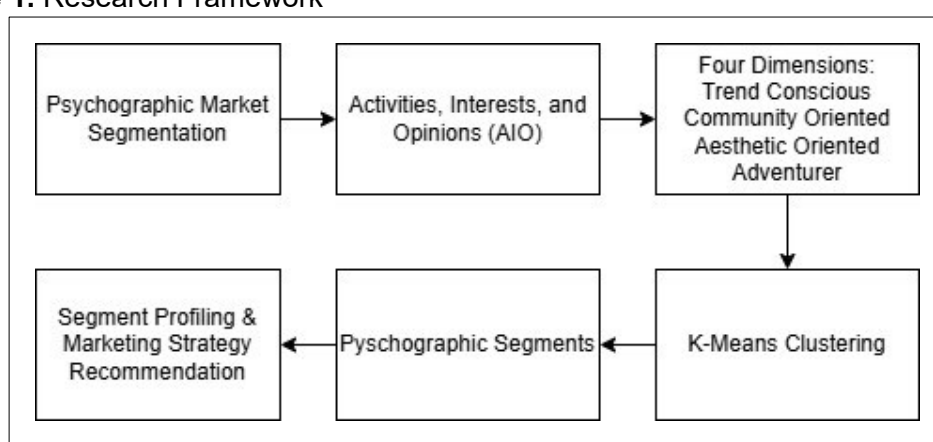
Subsequently, ANOVA and Tukey's honestly significant difference tests are employed as descriptive-inferential tools to examine the relative prominence of the four psychographic dimensions within each identified cluster (Naqvi et al., 2026). Pearson

chi-square tests and cross-tabulation analyses are then conducted to identify demographic and behavioral characteristics associated with each customer segment (Dewi, 2025). These analyses are intended to profile and interpret the identified customer segments rather than independently validate the clustering solution.

Conceptual Framework

Based on the preceding literature, the conceptual framework links psychographic market segmentation to the AIO framework, operationalizes AIO through four coffee-shop-specific dimensions, and uses those dimensions as inputs to K-means clustering. The selected solution is assessed through elbow and silhouette diagnostics, after which the segments are statistically and descriptively profiled. The resulting profiles provide the basis for segment naming and targeted marketing recommendations, as illustrated in Figure 1.

Figure 1. Research Framework



RESEARCH METHOD

Research Design

This study employed a quantitative research approach with a cross-sectional design to identify psychographic segments among Generation Z coffee shop customers in Indonesia using the AIO framework integrated with the K-means clustering algorithm. The research procedure consisted of four main stages: sampling, data collection, measurement validation, and data analysis. The methodological framework was designed to ensure that the identified customer segments were statistically valid and practically meaningful for marketing strategy development.

Sampling

The target population comprised Generation Z customers aged 17-29 years who had previously visited a coffee shop. Purposive sampling was used because respondents had to satisfy both criteria. Data were collected online through SurveyMonkey from 6 to 25 April 2026. After screening for eligibility and completeness, 285 valid responses were retained. The sample is urban and geographically concentrated: 83.51% of respondents resided in Bandung or Jakarta. The results should therefore be interpreted as evidence about the surveyed urban customer base rather than as nationally representative estimates for all Indonesian Generation Z consumers.

Data Collection and Measures

Primary data were collected using a structured online questionnaire distributed through SurveyMonkey between 6-25 April 2026. The questionnaire consisted of three sections. The first section collected respondents' demographic information, while the second

section measured coffee shop consumption behavior using the Recency, Frequency, and Monetary (RFM) framework. The final section measured respondents' psychographic characteristics based on the AIO framework. Drawing upon an extensive review of previous studies on psychographic segmentation and coffee shop consumer behavior, the AIO framework was operationalized into four context-specific dimensions: Trend Conscious, Community Oriented, Aesthetic Oriented, and Adventurer. The operational definitions, measurement indicators, and questionnaire items used to measure each psychographic dimension are presented in Table 1.

Table 1. Operationalization of the Psychographic Dimensions

Dimension	Operational Definition	Indicator	Questionnaire Item
Trend Conscious (TC)	Consumers' tendency to actively follow emerging coffee shop trends and show a strong interest in trying popular products and experiences.	Trend adoption	I keep up with coffee consumption trends.
		Popularity preference	I visit coffee shops that are currently popular.
		Viral motivation	I choose coffee beverages that are currently viral.
Community Oriented (CO)	Consumers' tendency to prioritize social interaction and feel comfortable engaging in activities with friends or communities within coffee shop environments.	Preference for togetherness	I enjoy spending my leisure time with other people.
		Community engagement	I like gathering or having discussions with my community or friends.
		Social interaction	I enjoy interacting socially with other people.
Aesthetic Oriented (AE)	Consumers' tendency to consider visual appeal and coffee shop ambience as important factors when deciding where to visit.	Interior design preference	The interior design of a coffee shop influences my decision to visit.
		Visual appeal priority	The visual attractiveness of a coffee shop is more important than its size.
		Photo-worthy environment	I am interested in visiting coffee shops that are aesthetically pleasing for taking photos.
Adventurer (AV)	Consumers' tendency to seek novel experiences by exploring different coffee shops, beverages, and coffee shop concepts.	Interest in newly opened coffee shops	I am interested in visiting newly opened coffee shops.
		Willingness to try new beverages	I enjoy trying coffee beverages that I have never tasted before.
		Preference for unique concepts	I am interested in visiting coffee shops with unique concepts.

As shown in Table 1, each dimension was represented by three items, producing 12 psychographic indicators. Responses were recorded on a six-point Likert scale from 1 (strongly disagree) to 6 (strongly agree). The absence of a neutral midpoint encouraged directional responses, although forced-choice formats can also increase response burden and should be interpreted cautiously (Combrinck, 2024; Pearson et al., 2024). Item scores were aggregated within their intended dimensions, and the resulting four-dimension scores were used as the clustering variables.

Instrument Evaluation

Before conducting the clustering analysis, the quality of the measurement instrument was evaluated through construct validity and reliability testing. Construct validity was assessed using the factor loading values to determine whether each questionnaire item adequately represented its corresponding psychographic construct. Following the recommendation of [Purwanto and Sudargini \(2021\)](#), factor loading values greater than 0.70 indicate that an indicator has satisfactory convergent validity and can be retained for further analysis. The results of the construct validity assessment are presented in [Table 2](#).

Table 2. Construct Validity Results

Construct Variable	Indicator	Factor Loading	Remarks
Trend Conscious	TC1	0.896	Valid
	TC2	0.913	Valid
	TC3	0.888	Valid
Community Oriented	CO1	0.890	Valid
	CO2	0.848	Valid
	CO3	0.892	Valid
Aesthetic Oriented	AE1	0.862	Valid
	AE2	0.801	Valid
	AE3	0.872	Valid
Adventurer	AV1	0.869	Valid
	AV2	0.871	Valid
	AV3	0.845	Valid

As shown in [Table 2](#), all 12 indicators exceeded the 0.70 criterion, with loadings ranging from 0.801 to 0.913. The items therefore showed satisfactory correspondence with their specified dimensions and were retained for dimension scoring and clustering.

Internal consistency was then evaluated using Cronbach's alpha. Values of 0.70 or higher were interpreted as acceptable for multi-item scales in applied research ([Hair et al., 2021](#)). [Table 3](#) presents the reliability coefficients for the four psychographic dimensions.

Table 3. Reliability Test Results

Construct Variable	Cronbach's Alpha	Remarks
Trend Conscious	0.881	Reliable
Community Oriented	0.849	Reliable
Aesthetic Oriented	0.795	Reliable
Adventurer	0.826	Reliable

[Table 3](#) demonstrates that all psychographic dimensions achieved Cronbach's Alpha values exceeding the recommended threshold of 0.70, ranging from 0.795 to 0.881. These results indicate that the measurement instrument possesses satisfactory internal consistency and reliability. Therefore, all psychographic dimensions were considered reliable and suitable for the subsequent customer segmentation analysis.

Data Analysis

Data analysis was performed using IBM SPSS Statistics 27, Minitab, and Google Colaboratory (Google Colab). IBM SPSS Statistics 27 was used for descriptive statistics, data screening, construct validity, reliability, and cross-tabulation analysis. Google Colab was utilized for data preprocessing, including outlier detection, K-means clustering, and the determination of the optimal number of clusters using the Elbow Method and the Silhouette Coefficient. Minitab was employed to perform one-way ANOVA, Tukey's post

hoc test, and to generate grouping information based on Tukey's multiple comparison results. The Kaiser-Meyer-Olkin statistic and Bartlett's test were reported as factorability checks for the 12-item psychographic scale; they were not treated as prerequisites for K-means clustering.

RESULTS

This section presents the empirical findings obtained from the data analysis. The results are organized into five stages, including respondent characteristics, data quality assessment, psychographic customer segmentation, statistical analysis of the identified clusters, and customer profile analysis. The findings presented in this section are intended to objectively report the outcomes of each analytical procedure, while their theoretical and managerial implications are discussed in the subsequent section.

Respondent Characteristics

Respondent characteristics included gender, domicile, age, occupation, monthly income, and coffee shop consumption behavior based on the RFM approach. A summary of the respondent profile is presented in Table 4.

Table 4. Respondent Characteristics and Coffee Shop Consumption Behavior

Characteristics	Category	Frequency (n)	Percentage (%)
Gender	Male	104	36.49
	Female	181	63.51
Domicile	Bandung	122	42.81
	Jakarta	116	40.7
	Bogor	22	7.72
	Depok	7	2.46
	Bekasi	6	2.11
	Others	12	4.21
Age	17-20	48	16.84
	21-24	147	51.58
	25-29	90	31.58
Occupation	Student	104	36.49
	Employee	119	41.75
	Entrepreneur	35	12.28
	Part-time Worker	21	7.37
	Unemployed	3	1.05
	Others	3	1.05
Monthly Income	< Rp1,000,000	56	19.65
	Rp1,000,000-Rp2,000,000	53	18.6
	Rp2,000,000-Rp3,000,000	54	18.95
	Rp3,000,000-Rp5,000,000	74	25.96
	> Rp5,000,000	48	16.84
Last Visit	Within the last week	139	48.77
	1-2 weeks ago	89	31.23
	3-4 weeks ago	47	16.49
	More than 1 month ago	10	3.51
Visit Frequency per Month	0 visit	1	0.35
	1-2 visits	105	36.84
	3-4 visits	105	36.84
	5-6 visits	44	15.44
	More than 6 visits	30	10.53
	Less than IDR 25,000	28	9.82

Average Expense per Visit	IDR 25,000-IDR 50,000	129	45.26
	IDR 50,000-IDR 75,000	87	30.53
	More than IDR 75,000	41	14.39

Table 4 presents the demographic characteristics and coffee shop consumption behavior of the respondents. The 285 respondents were predominantly female (63.51%). Most lived in Bandung (42.81%) or Jakarta (40.7%), and 51.58% were aged 21-24. Employees (41.75%) and students (36.49%) formed the largest occupational groups. Monthly income was distributed across categories, with IDR 3,000,000-5,000,000 the most common (25.96%). These figures confirm the urban concentration and mixed student–employee composition of the sample.

Coffee shop behavior indicates an active customer base: 48.77% had visited within the previous week, 73.68% reported one to four visits per month, and 45.26% spent IDR 25,000-50,000 per visit. The profile provides context for the segmentation results but should not be interpreted as an estimate of national Generation Z consumption, as the sample was purposive and geographically concentrated.

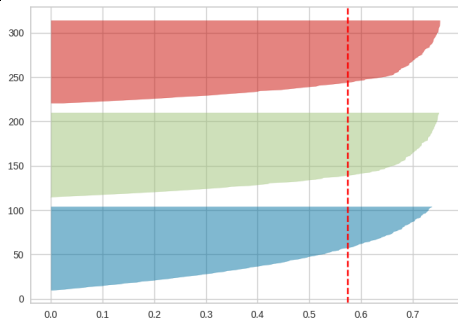
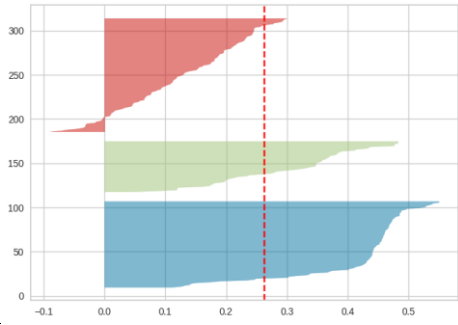
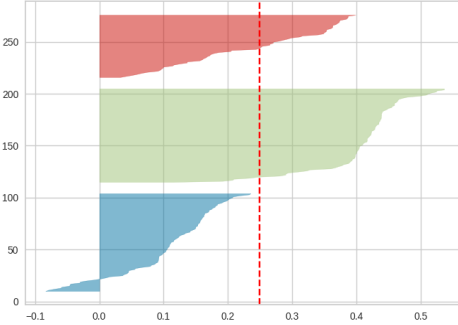
Data Quality Assessment

Before clustering, the dataset and psychographic scale were examined for extreme observations, excessive redundancy among the four-dimension scores, and item-level factorability. These diagnostics were used to understand the data structure and measurement quality. The elbow method and silhouette coefficient, presented subsequently, provide the direct basis for selecting the number of clusters.

Outlier Detection

Outlier detection was performed using the Z-score method to identify observations that substantially deviated from the overall data distribution (Yaro et al., 2023). To determine the most appropriate dataset for clustering, three preprocessing scenarios were compared, namely the original dataset, the winsorized dataset, and the dataset after outlier removal. These scenarios were compared because mechanical treatment of extreme values can either reduce noise or erase substantively meaningful heterogeneity (Ardhani et al., 2025). The clustering performance of each scenario was evaluated using the Silhouette Coefficient. The comparison of the preprocessing scenarios is presented in **Table 5**.

Table 5. Comparison of Data Preprocessing Scenarios

Data Preprocessing Scenario	Silhouette Graph	Silhouette Score	Interpretation
Original Data		0.575	Good
Winsorized Data		0.262	Weak
Outlier Removal		0.249	Weak

As presented in Table 5, the original dataset achieved the highest Silhouette Coefficient (0.575) compared with the winsorized dataset (0.262) and the dataset after outlier removal (0.249). Therefore, the original dataset was selected for the subsequent clustering analysis because it generated the highest-quality cluster solution. Although several observations were statistically identified as outliers, the lower Silhouette Coefficients obtained after winsorization and outlier removal indicate that these observations were not simply noise or data entry errors. Rather, they represent meaningful variations in respondents' psychographic characteristics that contribute to the overall cluster structure. Retaining the original dataset therefore enabled the clustering algorithm to capture the full diversity of Generation Z coffee shop customers more effectively.

Multicollinearity Test

Tolerance and variance inflation factor (VIF) values were inspected to identify excessive redundancy among the four-dimension scores. This diagnostic was not used as a formal assumption test for K-means; rather, it helped determine whether one set of highly overlapping constructs might dominate the distance calculation. The results are presented in Table 6 (Putri et al., 2025).

Table 6. Multicollinearity Test Results

Psychographic Dimension	Tolerance	VIF	Remarks
Trend Conscious	0.426	2.345	No Multicollinearity Occurred
Community Oriented	0.42	2.382	No Multicollinearity Occurred
Aesthetic Oriented	0.421	2.375	No Multicollinearity Occurred
Adventurer	0.363	2.756	No Multicollinearity Occurred

Table 6 indicates that tolerance values ranged from 0.363 to 0.426 and VIF values from 2.345 to 2.756. These values indicate related but non-redundant psychographic dimensions, supporting their simultaneous use in the cluster profile.

Sampling Adequacy Assessment

The Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity were used to assess whether the 12 psychographic items shared sufficient covariance for the reported factor-based measurement check (Lestari et al., 2024). These statistics concern the factorability of the item set and should not be interpreted as requirements for K-means clustering. Table 7 presents the results.

Table 7. KMO and Bartlett's Test Results

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.93	
Bartlett's Test of Sphericity	Approx. Chi-Square	2240.9
	df	66
	Sig.	0.00

The KMO value was 0.930, and Bartlett's test was significant, $\chi^2(66) = 2240.90$, $p < 0.001$. The item correlation matrix was therefore suitable for the measurement assessment used to support the four-dimension scores. Cluster selection itself was evaluated separately through the elbow and silhouette analyses.

Psychographic Customer Segmentation

Customer segmentation was performed using the K-means clustering algorithm. The optimal number of clusters was determined using the Elbow Method and the Silhouette Coefficient before identifying the characteristics of each customer segment.

Determination of the Optimal Number of Clusters

The elbow method evaluated the reduction in within-cluster sum of squares as K increased, while the silhouette coefficient compared within-cluster cohesion with between-cluster separation (Abdulnassar & Nair, 2021). Figure 2 presents the elbow curve and Figure 3 presents the silhouette profile for the selected solution.

Figure 2. Elbow Method

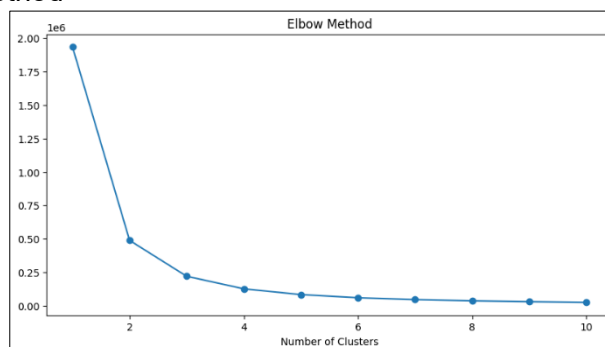
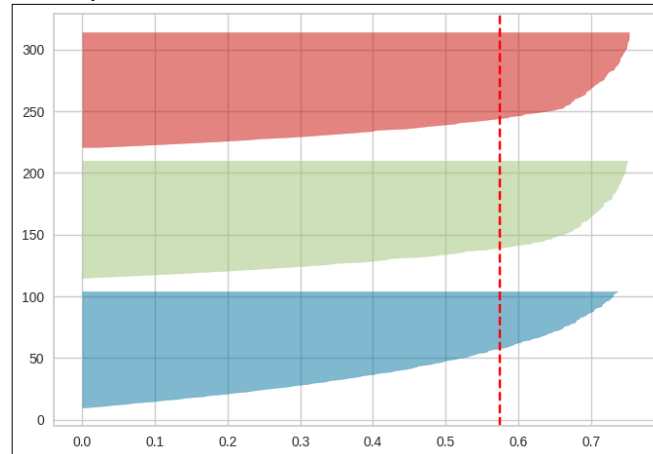


Figure 2 shows a steep decline in within-cluster sum of squares from one to three clusters, followed by progressively smaller gains. The inflection at $k = 3$ indicates that additional clusters would increase complexity without a commensurate improvement in compactness.

Figure 3. Silhouette Graph



As shown in Figure 3, the three-cluster solution also achieved the highest silhouette coefficient (0.575). This value indicates reasonably strong cohesion and separation for behavioral survey data and substantially exceeds the values obtained under the two outlier-adjustment scenarios.

Convergence between the elbow and silhouette diagnostics supports the three-cluster solution as the most parsimonious representation of the observed psychographic structure. The solution was therefore retained for segment formation and profiling (Tabianan et al., 2022; Yulisasih et al., 2024).

Cluster Characteristics

Following the determination of the optimal number of clusters, respondents were classified into three psychographic customer segments using the K-means clustering algorithm. The distribution of respondents across clusters is presented in Table 8.

Table 8. Distribution of Customer Segments

Cluster	Number of Respondents	Percentage (%)
Cluster 1	95	33.33
Cluster 2	96	33.68
Cluster 3	94	32.98
Total	285	100

Table 8 presents the distribution of respondents across the three identified customer segments. The clustering process classified all respondents into mutually exclusive clusters, which subsequently served as the basis for the statistical analysis and customer profile analysis. To further describe the identified customer segments, the centroid values of each psychographic dimension are presented in Table 9.

Table 9. Cluster Centroids

Dimension	Cluster 1	Cluster 2	Cluster 3
Trend Conscious	4.639	4.253	4.085
Community Oriented	4.891	4.622	4.635
Aesthetic Oriented	4.825	4.538	4.507

Adventurer	4.828	4.417	4.507
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Table 9 reports the four centroid values for each cluster. Cluster 1 records the highest mean on every dimension, with Community Oriented most prominent. Cluster 2 also places Community Oriented first, followed by Aesthetic Oriented. Cluster 3 shows comparable levels of Community Oriented, Adventurer, and Aesthetic Oriented but a visibly lower Trend Conscious centroid. These profiles provide the basis for the post-clustering comparisons and segment labels.

Statistical Analysis of Customer Segments

After the solution was selected, inferential analyses were used to characterize the segments. Within-cluster ANOVA and Tukey comparisons examined whether the four-dimension means were equally prominent inside each group. Pearson chi-square tests and cross-tabulations then assessed associations between segment membership and demographic or behavioral variables. Because the four AIO scores formed the clusters, these analyses are interpreted as profile evidence rather than independent validation of the clustering algorithm.

One-Way Analysis of Variance (ANOVA)

One-way ANOVA was performed separately within each cluster to test whether the four psychographic dimension scores had equal means. This analysis addresses the internal shape of each segment. For example, whether one orientation is clearly weaker or stronger than the others, rather than testing whether the three clusters differ from each other. Table 10 presents the results.

Table 10. One-Way ANOVA Results

Cluster	F-value	p-value	Interpretation
1	1.73	0.161	No significant difference among psychographic dimensions
2	1.99	0.115	No significant difference among psychographic dimensions
3	7.90	<0.001	At least one psychographic dimension differs significantly

As shown in Table 10, Clusters 1 and 2 do not exhibit statistically significant differences among the four psychographic dimensions ($p > 0.05$), indicating that the dimensions have relatively similar mean values within each cluster. Conversely, Cluster 3 demonstrates a statistically significant difference ($F = 7.90$, $p < 0.001$), indicating that at least one psychographic dimension differs significantly from the others. These findings suggest that the psychographic profile of Cluster 3 is more differentiated than those of Clusters 1 and 2.

Tukey's Post Hoc Test

Tukey's honestly significant difference procedure was used to locate the within-cluster difference identified by ANOVA (Naqvi et al., 2026). Dimensions sharing the same grouping letter do not differ significantly; dimensions assigned different letters do. Table 11 reports the standardized numeric format and grouping results.

Table 11. Tukey Test Results

Cluster	Factor	N	Mean	Grouping
1	T_CO	95	14.674	A
	T_AV	95	14.484	A
	T_AE	95	14.474	A
	T_TC	95	13.916	A
2	T_CO	96	13.865	A
	T_AE	96	13.615	A
	T_AV	96	13.250	A

	T TC	96	12.760	A
3	T CO	94	13.904	A
	T AV	94	13.521	A
	T AE	94	13.521	A
	T TC	94	12.255	B

As presented in Table 11, the Tukey's test results are consistent with the ANOVA findings. In Clusters 1 and 2, all four psychographic dimensions belong to the same grouping (Group A), indicating that no statistically significant differences exist among the dimensions within these clusters. In contrast, Cluster 3 exhibits two distinct grouping categories. Community Oriented, Adventurer, and Aesthetic Oriented are classified within Group A, whereas Trend Conscious belongs to Group B. The defining contrast for Cluster 3 is therefore lower trend consciousness, not stronger trend seeking.

Cross-Tabulation Analysis

Pearson chi-square tests examined whether segment membership was associated with age, gender, occupation, monthly income, recency, visit frequency, or expenditure per visit. Exact p-values are reported to show the strength of evidence directly. Variables meeting the $p < 0.05$ criterion were then interpreted through cross-tabulations. The Chi-square test results are presented in Table 12, followed by the cross-tabulation results in Table 13.

Table 12. Pearson's Chi-square

Variable	χ^2	P-Value	Interpretation
Age	10.730	0.030	Significant association between customer segment and age
Gender	5.761	0.056	No significant association between customer segment and gender
Occupation	33.803	< 0.001	Significant association between customer segment and occupation
Monthly Income	23.697	0.003	Significant association between customer segment and monthly income
Last Visit	10.687	0.099	No significant association between customer segment and last visit
Visit Frequency per Month	12.836	0.118	No significant association between customer segment and visit frequency
Average Expense per Visit	20.309	0.002	Significant association between customer segment and average expense per visit

As presented in Table 12, Pearson's Chi-square analysis indicates that age, occupation, monthly income, and average expense per visit are significantly associated with customer segment membership. Conversely, gender, last visit, and visit frequency do not exhibit significant associations with the identified customer segments. These findings suggest that the psychographic segments are primarily differentiated by respondents' demographic and economic characteristics rather than by gender or coffee shop visitation patterns.

Table 13. Cross-tabulation Results

Characteristics	Category	Cluster 1	Cluster 2	Cluster 3
Age	17-20	20 (21.1%)	14 (14.6%)	14 (14.9%)
	21-24	36 (37.9%)	56 (58.3%)	55 (58.5%)
	25-29	39 (41.1%)	26 (27.1%)	25 (26.6%)
Gender	Male	32 (33.7%)	44 (45.8%)	28 (29.8%)
	Female	63 (66.3%)	52 (54.2%)	66 (70.2%)
Occupation	Student	22 (23.20%)	44 (45.80%)	38 (40.40%)
	Employee	47 (49.50%)	32 (33.30%)	40 (42.60%)
	Entrepreneur	16 (16.80%)	17 (17.70%)	2 (2.10%)
	Part-time Worker	9 (9.50%)	3 (3.10%)	9 (9.60%)
	Unemployed	0 (0.00%)	0 (0.00%)	3 (3.20%)
	Others	1 (1.10%)	0 (0.00%)	2 (2.10%)
Monthly Income	< IDR 1,000,000	20 (21.10%)	15 (15.60%)	21 (22.30%)
	IDR 1,000,000-2,000,000	5 (5.30%)	24 (25.00%)	24 (25.50%)
	IDR 2,000,000-3,000,000	20 (21.10%)	22 (22.90%)	12 (12.80%)
	IDR 3,000,000-5,000,000	27 (28.40%)	25 (26.00%)	22 (23.40%)
	> IDR 5,000,000	23 (24.20%)	10 (10.40%)	15 (16.00%)
Last Visit	More than 1 month ago	1 (1.10%)	2 (2.10%)	7 (7.40%)
	3-4 weeks ago	16 (16.80%)	19 (19.80%)	12 (12.80%)
	1-2 weeks ago	36 (37.90%)	28 (29.20%)	25 (26.60%)
	Within the last week	42 (44.20%)	47 (49.00%)	50 (53.20%)
Visit Frequency per Month	0 visit	0 (0.00%)	1 (1.00%)	0 (0.00%)
	1-2 visits	25 (26.30%)	38 (39.60%)	42 (44.70%)
	3-4 visits	43 (45.30%)	32 (33.30%)	30 (31.90%)
	5-6 visits	13 (13.70%)	15 (15.60%)	16 (17.00%)
	> 6 visits	14 (14.70%)	10 (10.40%)	6 (6.40%)
Average Expense per Visit	< IDR 25,000	4 (4.2%)	16 (16.7%)	8 (8.5%)
	IDR 25,000-50,000	38 (40.0%)	36 (37.5%)	55 (58.5%)
	IDR 50,000-75,000	33 (34.7%)	31 (32.3%)	23 (24.5%)
	> IDR 75,000	20 (21.1%)	13 (13.5%)	8 (8.5%)

As presented in Table 13, the cross-tabulation analysis provides a descriptive overview of the demographic and behavioral characteristics of each customer segment. Cluster 1 is primarily characterized by respondents aged 25-29 years, employees, and monthly incomes of IDR 3,000,000-5,000,000. Cluster 2 mainly consists of respondents aged 21-24 years, students, and monthly incomes of IDR 3,000,000-5,000,000, whereas Cluster 3 is dominated by respondents aged 21-24 years, employees, and monthly incomes of IDR 1,000,000-2,000,000. Across all segments, female respondents were the majority, most respondents had visited a coffee shop within the last week, and the average expenditure per visit ranged from IDR 25,000-50,000. These findings complement the psychographic segmentation by providing a descriptive profile of each customer segment.

Customer Segmentation Results

The segment summary integrates centroid patterns, within-cluster comparisons, and cross-tabulated characteristics. Labels were assigned only when they reflected the observed psychographic ordering and did not imply behavior unsupported by the data. Table 14 reports the resulting demographic, behavioral, and AIO profiles.

Table 14. Customer Segments Results

Criteria	Cluster 1	Cluster 2	Cluster 3
Age	25-29 years	21-24 years	21-24 years
Gender	Female	Female	Female
Occupation	Employee	Student	Employee
Monthly Income	IDR 3,000,000-5,000,000	IDR 3,000,000-5,000,000	IDR 1,000,000-2,000,000
Last Visit	Within the last week	Within the last week	Within the last week
Visit Frequency	3-4 visits/month	1-2 visits/month	1-2 visits/month
Average Expense per Visit	IDR 25,000-50,000	IDR 25,000-50,000	IDR 25,000-50,000
Psychographic Characteristics (AIO)	Community Oriented, Adventurer, Aesthetic Oriented, Trend Conscious	Community Oriented, Aesthetic Oriented, Adventurer, Trend Conscious	Community Oriented, Adventurer, Aesthetic Oriented, significantly lower Trend Conscious

The profiles show both shared and differentiating features. Community orientation is high in all three segments, suggesting that social value is a category-wide expectation rather than a niche preference. Cluster 1 combines the highest overall AIO levels with older, employed, and relatively higher-spending customers. Cluster 2 combines social and aesthetic orientation in a younger, student-heavy group. Cluster 3 combines social, exploratory, and aesthetic interests with significantly lower trend consciousness and lower income. These patterns support the labels used in the discussion.

DISCUSSION

The study identified three nearly equal psychographic segments among 285 urban Generation Z coffee shop customers. The three-cluster structure was supported by an elbow at $k = 3$ and the highest silhouette coefficient (0.575). Across the solution, community orientation remained consistently high, but the segments differed in the overall intensity and relative ordering of aesthetic, exploratory, and trend-related preferences. Demographic profiling further showed associations with age, occupation, income, and expenditure. The results therefore support the central argument that a single generational label conceals actionable lifestyle heterogeneity.

Segment 1: Community Adventurers

Cluster 1 is labelled Community Adventurers. It has the highest centroid on every AIO dimension, with Community Oriented (4.891) slightly exceeding Adventurer (4.828), Aesthetic Oriented (4.825), and Trend Conscious (4.639). The ANOVA and Tukey results indicate that these differences are not statistically significant, so the segment is best understood as broadly high-engagement rather than dominated by one isolated motive. Its members are more often aged 25-29, employed, and comparatively higher spending, and they visit three to four times per month more often than the other groups. The label captures the combination of strong social use and openness to varied coffee shop experiences without overstating a single dimension.

This profile is consistent with the experience-economy proposition that customers derive value from memorable, participatory encounters beyond the core product (Pine & Gilmore, 2011). It also aligns with evidence that customer engagement is strengthened by relational and experiential elements of service encounters (Rather & Hollebeek, 2021). For coffee shop operators, Community Adventurers are plausible targets for

recurring events, tasting sessions, member communities, and rotating concepts. Their relatively high spending and broad engagement make retention especially valuable, but the data do not demonstrate loyalty directly; that outcome should be tested rather than assumed.

Segment 2: Aesthetic Socializers

Cluster 2 is labelled Aesthetic Socializers. Community Oriented has the highest centroid (4.622), followed by Aesthetic Oriented (4.538), Adventurer (4.417), and Trend Conscious (4.253). Although the ordering motivates the label, the within-cluster differences are not statistically significant, so aesthetic orientation should be interpreted as a relative emphasis rather than an exclusive defining trait. The segment is dominated by respondents aged 21-24 and contains the highest share of students. Most visit one to two times per month, suggesting that the setting may be selected deliberately for particular social or visual occasions rather than used as frequently as in Cluster 1.

The profile reflects the established role of servicescape in shaping customer responses (Bitner, 1992) and the importance of sensory and symbolic cues in experiential marketing (Schmitt, 2014). Social-media research further indicates that visual presentation, perceived authenticity, and brand image can influence perceived value and consumer decisions (Djafarova & Bowes, 2021; Karo et al., 2025; Kothari et al., 2025). The evidence supports investment in coherent interiors, photogenic product presentation, and user-generated content opportunities, but it does not imply that aesthetics can compensate for weak product or price value. Those fundamentals remain important in beverage markets (Ibrahim et al., 2025).

Segment 3: Community-Oriented Selective Explorers

The third customer segment was identified as Community-Oriented Selective Explorers because statistically Community Oriented is highest (4.635), while Adventurer and Aesthetic Oriented are equal (4.507); Trend Conscious is lowest (4.085). Tukey's test places the first three dimensions in Group A and Trend Conscious alone in Group B, demonstrating that lower trend consciousness is the segment's clearest internal distinction. The group is concentrated among 21-24 year-old employees, has the largest share of respondents earning IDR 1,000,000-2,000,000, and most commonly spends IDR 25,000-50,000 per visit.

This pattern suggests selective exploration rather than trend-driven consumption. Members appear interested in social, novel, and visually appealing experiences but are less inclined to follow popularity or virality as an end in itself. The lower-income profile makes value sensitivity a plausible interpretation, yet the study did not directly measure price consciousness and therefore cannot establish it as a causal motive. The segment should be approached with accessible opportunities to discover distinctive products, such as affordable tasting bundles, locally themed menus, or low-cost community events without framing every offer around viral status. This interpretation is consistent with evidence that lifestyle orientation and practical purchase considerations can coexist among young consumers (Ibrahim et al., 2025; Khatimah et al., 2024).

Managerial Implications

The segmentation results indicate that a uniform Generation Z campaign would obscure meaningful differences in experience priorities. Segment-specific action should nevertheless be anchored in the common finding that community orientation is high across all groups. Community Adventurers warrant retention-oriented programs and recurring experiential events; Aesthetic Socializers warrant strong visual design and shareable storytelling; Community-Oriented Selective Explorers warrant accessible novelty and clear value. Digital execution should emphasize authenticity and audience

relevance rather than undifferentiated trend chasing (Hanaysha, 2022; Putri et al., 2025). Table 15 summarizes these recommendations.

Table 15. Managerial Implications

Segment	Key Characteristics	Customer Orientation	Recommended Marketing Strategy
Community Adventurers	Community-oriented, experience-seeking, frequent visitors	Experience-oriented and socially engaged	Organize community events, coffee workshops, loyalty programs, seasonal menus, and exclusive member experiences to strengthen customer engagement and encourage repeat visits.
Aesthetic Socializers	Community-oriented, aesthetic-conscious, visually driven	Social and aesthetic experience	Invest in visually appealing interiors, Instagrammable spaces, user-generated content campaigns, and social media storytelling to enhance customer experience and online engagement.
Community-Oriented Selective Explorers	Community-oriented, exploratory, aesthetic-aware, less trend-conscious	Selective exploration with value constraints	Offer affordable discovery bundles, locally distinctive menus, accessible community events, and clear value communication rather than relying primarily on viral positioning.

The recommendations translate observed profiles into testable marketing propositions rather than deterministic prescriptions. Operators should pilot segment-specific offers, monitor response and profitability, and update profiles as customer preferences change. Psychographic targeting can be combined with opt-in customer relationship data, but businesses should avoid stereotyping individuals solely from age or income. Used iteratively, the three profiles provide a practical basis for community programming, servicescape investment, menu innovation, and value communication (Dewi, 2025).

CONCLUSION

This study used four coffee-shop-specific AIO dimensions and K-means clustering to identify three psychographic segments among 285 urban Generation Z customers. The selected solution achieved a silhouette coefficient of 0.575 and produced Community Adventurers (n = 95), Aesthetic Socializers (n = 96), and Community-Oriented Selective Explorers (n = 94). Community orientation was high across all groups, while the segments differed in overall engagement, aesthetic emphasis, exploratory orientation, and trend consciousness. Age, occupation, income, and expenditure were associated with segment membership; gender, recency, and visit frequency were not.

The theoretical contribution is twofold. First, the study demonstrates that AIO becomes more informative when translated into dimensions tied directly to decisions in a focal service context. Second, it shows that Generation Z should not be treated as a homogeneous lifestyle market: even within a narrow age cohort, customers combine social, aesthetic, exploratory, and trend-related motives differently. Methodologically, the study distinguishes cluster-selection diagnostics from post-clustering profile tests, improving the interpretation of segmentation evidence.

Managerially, the findings support differentiated but evidence-bounded strategies. Community Adventurers may respond to recurring events and membership experiences,

Aesthetic Socializers to coherent servicescapes and shareable visual content, and Community-Oriented Selective Explorers to accessible novelty and explicit value. Because these implications are inferred from cross-sectional profiles rather than experiments, businesses should test offers before scaling them. The broader conclusion is that context-specific psychographic data can guide more precise customer engagement than demographic categories alone.

LIMITATION

Several limitations qualify the findings. First, the sample is urban and heavily concentrated in Bandung and Jakarta, so it is not nationally representative of Indonesian Generation Z consumers or of rural and smaller-city coffee markets. Second, purposive online sampling may overrepresent digitally active customers. Third, the cross-sectional design captures preferences at one point in time and cannot establish how segment membership changes. Fourth, all measures are self-reported, and the four AIO dimensions do not include direct measures of price sensitivity, brand loyalty, or social-media behavior. Finally, K-means requires a prespecified cluster count and can be sensitive to initialization and variable construction.

Future research should replicate the solution with probability-based or multi-city samples, test temporal stability through longitudinal designs, and compare K-means with hierarchical, model-based, or density-based clustering. Holdout samples and repeated initialization should be used to assess reproducibility. Researchers could also incorporate observed transaction data, social-media engagement, price sensitivity, and loyalty outcomes to test whether the segments predict behavior beyond self-reported lifestyle scores. Cross-cultural comparison would clarify which dimensions are specific to Indonesian urban coffee culture and which generalize across markets.

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