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# Investigating the Effective Components on Customer Lifetime Value of Dairy Products in Tehran

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## Abstract

In contemporary marketing, maintaining and enhancing customer loyalty toward a company's products or services has become a primary focus. Among the factors influencing customer loyalty is ethical marketing, a field of applied ethics related to the principles governing behavior, advertising, and regulation in marketing. Over the past two decades, ethical consumerism has grown in importance due to increasing social and environmental concerns. This study examines the impact of ethical components on Customer Lifetime Value (CLV) for dairy product consumers in Tehran in 2023. A total of 710 questionnaires were completed, and the GWRFM method was employed to extract the necessary information for calculating CLV. The results revealed a high frequency of clusters with low lifetime value. In the subsequent phase, multinomial logit regression was utilized to analyze the effect of ethical components on CLV, highlighting the significant positive impact of adherence to industry regulations and acceptance of social responsibility. Therefore, it is recommended that stakeholders in the dairy industry assure customers of their compliance with regulations and social responsibility to elevate them to higher-value clusters and foster loyalty. By respecting ethical norms, a substantial portion of consumers of cheese, yogurt, and ayran products may transition toward becoming valuable customers in this sector.

**Keywords:** Customer lifetime value, Ethical marketing, Ethical consumerism, GWRFM



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## Introduction

Customer loyalty is defined as a preference for a brand over others, accompanied by a psychological commitment. In today's hyper-competitive environment, organization cannot succeed without addressing customer needs and desires and ensuring their satisfaction. Research indicates that perceived customer value significantly influences customer satisfaction, loyalty, and the successful sale of goods or services, often more than the characteristics of the goods themselves (Zehir, & Narcıkara, 2016). Customer loyalty has gained special importance, particularly in the service sector, due to competitive pressures. Scholars define customer loyalty as favorable attitudes toward services/products and a commitment to their purchase or use (Shiri *et al*., 2017). Increased loyalty can stabilize revenue streams and enhance profitability over time. Without customer loyalty, even the best business models falter. Organizations strive to continuously meet customer expectations and cultivate long-term relationships. Loyalty reflects a favorable attitude toward a business, leading to repeat purchases (Niazian, 2018). Ethical marketing is known as a factor that can enhance customer loyalty, which pertains to the ethical principles governing behavior, advertising, and regulation in marketing. To sustainably attract buyers, companies must instill confidence in the honesty and correctness of their product advertisements. This concept has been widely discussed in management and marketing literature (Jandaghi *et al*., 2017).

Research on ethical judgment indicates that moral feelings significantly drive cognitive reasoning processes before conscious ethical reasoning occurs (Haidt, 2007; Greene & Haidt, 2002). Neuroimaging studies confirm that specific brain areas related to emotional feelings activate in response to ethical dilemmas (Moll *et al*., 2005; Moll *et al*., 2002). Ethical consumerism has become increasingly significant over the last two decades due to social and environmental issues (Adams, 2002). More consumers are integrating ethical considerations into their purchasing decisions, such as opting for environmentally labeled products or avoiding ethically questionable items. Various studies demonstrate that responsible corporate behavior positively affects brand reputation, employer image, investor access, and competitive positioning (Chang, 2011). Many retailers are now offering ethical products under private labels (Willer, & Lernoud, 2016). Pecoraro *et al*. (2014) describe ethical consumption as a behavioral pattern prompting consumers to reconsider their everyday choices from an ethical standpoint. Crane & Matten (2010) define ethical consumption as the deliberate choice to engage in certain consumption practices based on personal ethical beliefs and values. Shaw *et al*. (2016) view ethical consumption as embodying care, responsibility, and commitment, including consumers' willingness to pay extra for sustainable products (Tsarenko *et al*., 2013).

In the context of consumers and retailing, terms like ethical, conscious, environmentally friendly, green consumption, and slow consumption are often used interchangeably. Green consumption relates consumerism to its environmental effects (Glim *et al*., 2013). Organic food consumption, often associated with health awareness, is another ethical consumption pattern (Rana & Paul, 2017).

Among the methods for measuring and profiling customer loyalty, the Customer Lifetime Value (CLV) method is noteworthy for identifying the most valuable customers and calculating customer value (Kumar *et al*., 2009; Fader, 2012). CLV plays a vital role in customer retention and long-term relationships, key goals of CRM (Haenlein, 2017). Each customer is an asset with unique preferences, and companies compete for their attention. Customers vary in needs, expectations, and behaviors, necessitating tailored management approaches (Monalisa, 2018). Marketing's customer-centered focus drives organizations to understand the real value of customers. Some researchers argue that CLV is the most effective variable for measuring customer value. However, CLV's meaning varies across industries and is influenced by the types of

services and products offered. The CLV method connects the value provided by the company to the customer and the value the customer contributes to the company over their relationship (Buttle & Maklan, 2016). Most studies in the literature have utilized CLV for segmentation (Yoseph *et al.*, 2019; Akhondzadeh *et al.*, 2014), resulting in segments reflecting only customer value (e.g., high profit, low profit) without detailing specific industry characteristics (Mosaddegh *et al.*, 2021). The primary goal and application of CLV is customer segmentation (Abens & Parcheta, 2016).

This study focuses on calculating the customer lifetime value as a representation of customer loyalty to dairy products and the relationship between CLV and ethical components. To calculate CLV and segment dairy product consumers, the K-means clustering method and WRFM method were employed, and multinomial logit regression used to measure the impact of ethical components on clustering.

## Methodology

The CLV-based segmentation model allows a company to identify the most profitable customer groups, understand their common characteristics, and focus more on them. This process is based on current value, potential value, and loyalty while also considering generated profit share and potential profit. However, these factors can only be calculated if the customer has a long-term relationship with the business entity (Abens & Parcheta, 2016).

According to Gupta *et al.*, 2006; Estrella-Ramón *et al.*, 2013; Jasek *et al.*, 2018 and Jasek *et al.*, 2019, there are two approaches for analyzing CLV components: the deterministic approach and the stochastic approach (a combination of six different modeling methods). The deterministic approach uses equations in which all criteria are directly incorporated into the simplified CLV calculation. One of the representatives of this approach is the RFM model (Recency, Frequency, Monetary). The RFM analysis model, which is one of the most powerful and simplest CLV models for customer loyalty, was proposed by Hughes (1994). Customer loyalty is an appropriate feature for customer segmentation. Customers' past purchasing behavior can indicate their level of loyalty (Chang & Tsai, 2011). The RFM model measures when, how often, and how much a customer has purchased (Winer, 2001). This model, using three features-recency (the time since the last purchase), frequency (the number of purchases in a given time period), and monetary value (the amount spent in the last period)—distinguishes important customers from a dataset (Monalisa *et al.*, 2019). RFM analysis is used to calculate a score for each customer (Yeh *et al.*, 2009). In more complex scenarios, weights are used to assign more or less importance to the RFM variables (Kasperova, 2020).

In this study, RFM variables are used as inputs for other models. Given that segmentation based on products is one of the objectives of this study, the model used to calculate customer lifetime value is the Group WRFM model. This model extracts the values of the three variables R, F, and M for each of the products that customers have purchased so far. To do this, products must first be grouped, and then customer transactions must be considered separately for each group of products to calculate WRFM values for each purchased product category. Using this model, a precise sales strategy can be developed to better meet market needs. Therefore, customer segmentation is based on purchased products. After extracting the model variables, they were scaled to calculate each customer's score. Since the range of variables differs based on their nature and to prevent larger values from dominating the analysis, a normalization process must be conducted. This ensures that the data are comparable on a uniform scale. In this stage, the min-max approach is used.

Next, the weight of each parameter must be determined for ranking and clustering customers. In this study, the Analytic Hierarchy Process (AHP) and expert opinions are employed for weighting the indicators, while the Expert Choice software is used to determine

parameter weights. In the following stage, customers are ranked based on their Customer Lifetime Value (CLV) using the following relationships (Kasperova, 2020).

$$CLVci = (NR\text{Milk}ci \times WR) + (NF\text{Milk}ci \times WF) + (NM\text{Milk}ci \times WM) \quad (1)$$

$$CLVci = (NF\text{Cheese}ci \times WF) + (NR\text{Cheese}ci \times WR) + (NM\text{Cheese}ci \times WM) \quad (2)$$

$$CLVci = (NF\text{Yogurt}ci \times WF) + (NR\text{Yogurt}ci \times WR) + (NM\text{Yogurt}ci \times WM) \quad (3)$$

$$CLVci = (NF\text{Ayran}ci \times WF) + (NR\text{Ayran}ci \times WR) + (NM\ \text{Ayran}ci \times WM) \quad (4)$$

In the relationship described above, NRMilk denotes the normalized value of RNMilk within cluster ci, while WR represents the weight of parameter R. Other parameters are defined in a similar manner.

Since loyalty is a multi-level variable based on the categorization of customer lifetime value, the multinomial logit model can be used to evaluate the impact of each ethical factor on loyalty. This approach relies on the assumption that the levels are independent and that excluding one level when selecting individuals for the chosen loyalty categories does not lead to any changes (Long, 1997). For the purposes of this study, the multinomial logit model was applied to examine the effect of ethical factors on customer lifetime value, which was categorized into five levels: very high, high, medium, low, and very low. In the multinomial logit model, one category of the dependent variable is selected as the reference class. In other words, the probability of selecting one category of the dependent variable relative to the reference class is evaluated (Ben-Akiva & Lerman, 1985). The general structure of the multinomial logit model is expressed by the following equation:

$$\text{, M=0,1,2,} \quad (5)$$

The observed dependent variable consists of four loyalty groups for consumer iii. wiw_iwi represents the vector of explanatory variables, and αm\alpha_mαm is a vector of model coefficients. mmm denotes each consumer group. The first step in estimating multinomial logit models is to designate one group from the dependent variable categories as the reference group, so that the probability of selecting the other groups relative to it can be measured. Given that logit models are discrete choice models, the estimation process utilizes the logarithm of the likelihood function:

(6)

n the model estimated in this study, the dependent variable consists of customer value clusters, calculated using equations 1 to 4 (divided into five categories: very high-value customers, high-value customers, medium-value customers, low-value customers, and very low-value customers). The explanatory variables include the three ethical components previously mentioned. In this model, the coefficients are not directly interpreted because the change in probability resulting from an increase in an independent variable depends not only on its own value but also on the values of other variables. Since this probability change is not constant, the coefficients themselves are not directly meaningful. Instead, only the sign of the coefficient is interpreted, as it indicates the direction of the probability change. After estimating the model, the Relative Risk Ratio (RRR) criterion is calculated to determine the impact of each explanatory variable on the dependent variable groups (willingness to purchase more). This criterion measures how the probability of selecting the comparison group, relative to the probability of selecting the reference group, changes with a change in the explanatory variable (Long, 1997).

To assess the goodness-of-fit of the multinomial logit model, several tests and criteria are used, including pseudo-R2R^2R2 statistics. These statistics do not have an interpretation equivalent to the regular R2R^2R2, and it can only be stated that the value increases with the power of model fit (Greene, 2011). In the multinomial logit model, to examine the effect of independent variables on the dependent variable, two tests-Likelihood

Ratio (LR) and Wald-are used for each of the independent variables in the model (Isengildina & Hudson, 2001).

To test the Independence of Irrelevant Alternatives (IIA) assumption, the Hausman test is recommended. To test the assumption of independence of irrelevant alternatives, the Hausman test is recommended (Hausman & McFadden, 1984).

The population under study in this research consists of consumers of dairy products (milk, cheese, yogurt, and ayran) in Tehran, Iran. A sample size of 620 questionnaires was initially determined. An electronic version of the questionnaire was created, and the link was distributed to residents of Tehran. In addition to the online completion of the questionnaire, in-person interviews were also conducted. Ultimately, to ensure the reliability of the data and minimize errors, 710 valid questionnaires were included for analysis after excluding incomplete responses. To gather insights from both consumers and experts (specialists in the private dairy industry), a combination of accessible random sampling and snowball sampling methods was employed.

## Results and Discussion

The demographic characteristics of the studied individuals are illustrated in Fig. 1 and 2. As shown in the charts, 55.9% of consumers are women, while 44.1% are men. The respondents have an average age of 35, ranging from 18 to 60 years. The highest percentage belongs to individuals with a bachelor's degree (approximately 46.9%), whereas the lowest percentage corresponds to those with a doctoral degree or higher. Regarding employment status, about 41% of consumers are employed, while the unemployed group has the lowest representation at 4.2%.

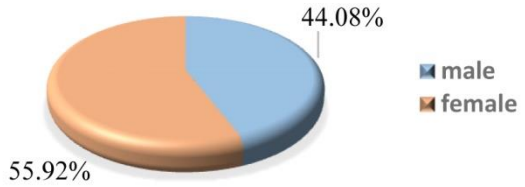


**Figure 1- The percentage of Gender frequency**

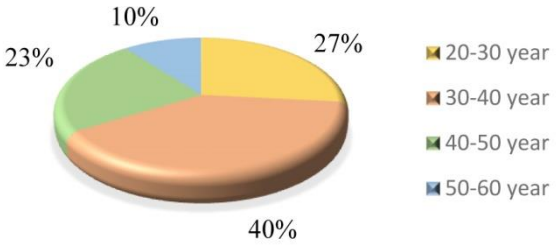


**Figure 2- The percentage of age frequency**

In the initial step of calculating Customer Lifetime Value (CLV), the RFM model parameters, derived from 710 completed questionnaires, were normalized and subsequently categorized into five clusters using the K-Means clustering method. The optimal number of clusters was determined using the Dunn index, based on the clustering results analyzed with SPSS Statistics 25. The average values of the R, F, and M parameters for each dairy product within each cluster are presented in Table 1.

**Table 1- Member clustering results based on RFM parameters for each product**

| (Cluster) | Milk | | | Cheese | | | Yogurt | | | Ayran | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | R | F | M | R | F | M | R | F | M | R | F | M |
| 1 | 1 | 0.206 | 0.931 | 1 | 0 | 0 | 0.165 | 0.31 | 0.945 | 0.853 | 0.043 | 0.210 |
| 2 | 0.158 | 0.052 | 0.781 | 0.19 | 0 | 0 | 0.733 | 0.107 | 0.878 | 0.881 | 0.035 | 0.815 |
| 3 | 0.317 | 1 | 1 | 0.239 | 0.102 | 0.857 | 0.092 | 0.053 | 0.79 | 0.306 | 0.002 | 0.174 |
| 4 | 0.092 | 1 | 0.985 | 0.147 | 1 | 1 | 0.375 | 0.077 | 0.869 | 0.981 | 1 | 0.16 |
| 5 | 0.173 | 0.287 | 0.949 | 1 | 0.103 | 0.869 | 0.119 | 0.099 | 0.951 | 0.530 | 4 | 0.206 |

Source: Researcher's Calculations

To determine the weight of each parameter, a similar approach was used by consulting ten experts from the private dairy industry. The weights were calculated using the AHP method and analyzed with Expert Choice software, with the results presented in Table 2. The total sum of the weights equals one, and the AHP consistency index was found to be 0.02.

Next, Equations 1 to 4 were applied to calculate the CLV score for each cluster using the WRFM method. The CLV values and the corresponding rankings for each cluster are presented in Table 3.

**Table 2- RFM model parameter weights**

| R | F | M | Parameter |
|---|---|---|---|
| 0.11 | 0.245 | 0.645 | Weight |

Source: Researcher's Calculations

**Table 3- CLV calculation results and cluster ranking for each product**

| Cluster | Milk | | | Cheese | | | Yogurt | | | Ayran | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CLV | Rank | Status of indicators | CLV | Rank | Status of indicators | CLV | Rank | Status of indicators | CLV | Rank | Status of indicators |
| 1 | 0.761 | 3 | ↓↓↑ | 0.11 | 4 | ↑↓↓ | 0.704 | 1 | ↑↑↑ | 0.584 | 4 | ↑↑↓ |
| 2 | 0.537 | 5 | ↓↓↓ | 0.02 | 5 | ↓↓↓ | 0.673 | 2 | ↑↑↓ | 0.666 | 3 | ↑↓↑ |
| 3 | 0.924 | 1 | ↑↑↑ | 0.604 | 3 | ↓↓↑ | 0.532 | 5 | ↓↓↓ | 0.216 | 5 | ↓↓↓ |
| 4 | 0.89 | 2 | ↑↓↑ | 0.906 | 1 | ↑↑↑ | 0.62 | 4 | ↑↓↓ | 0.895 | 2 | ↑↑↓ |
| 5 | 0.702 | 4 | ↑↓↓ | 0.693 | 2 | ↑↑↓ | 0.651 | 3 | ↑↓↑ | 1.344 | 1 | ↑↑↑ |

Source: Researcher's Calculations

In analyzing the indicator status, the average value of each RFM model parameter for each product within each cluster was compared to the overall average across the dataset. This comparison highlights how each cluster's parameter values deviate from the general trend. If a parameter's average value in a cluster exceeds the overall average, it is marked with an upward arrow (↑) to indicate a favorable status, whereas a lower-than-average value is denoted by a downward arrow (↓) to reflect an unfavorable status.

The frequency and distribution of customers across Customer Lifetime Value (CLV) categories are presented in Fig. 3 for milk, Fig. 4 for cheese, Fig. 5 for yogurt, and Fig. 6 for Ayran. The results indicate that the proportion of customers with very high and high loyalty is relatively low. For milk, yogurt, and Ayran, the highest frequency percentages correspond to very low and low loyalty levels, respectively. In contrast, for cheese, the majority of customers are classified within the medium loyalty cluster.

To examine the impact of ethical consumption factors on customer loyalty and their distribution across customer lifetime value clusters, a multinomial logit model was employed. The ethical consumption factors were selected based on prior research in ethics, marketing, and consumer behavior, as these

aspects are expected to influence customer placement within different lifetime value clusters. These factors include the brand's compliance with industry regulations, adherence to ethical norms, and customer preference for brands that demonstrate social responsibility. Each of these components was measured on a five-point Likert scale, where a score of 5 represents "strongly agree" and 1 signifies "strongly disagree."

Fig. 7, 8, and 9 show the frequency distribution of responses for each ethical factor, respectively, indicating that customers place significant importance on ethical considerations. However, the extent to which these factors influence purchasing decisions, as well as their impact on loyalty and customer lifetime value, remains an open question that will be further explored through multinomial logit analysis. The first step in estimating the multinomial logit model is to designate one of the groups as the base group, enabling the calculation of the probability of selecting other groups relative to this reference category. Typically, the group with the highest frequency is chosen as the base group. The results of the multinomial logit model for each product are presented separately below.

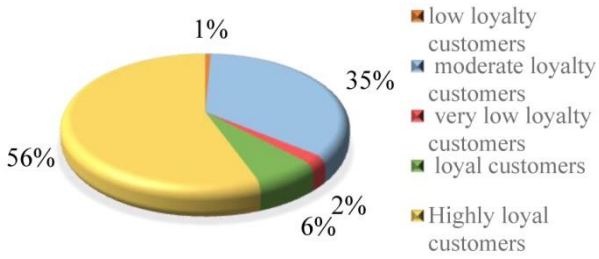


**Figure 3- Percentage frequency of customer lifetime value clusters (Milk)**

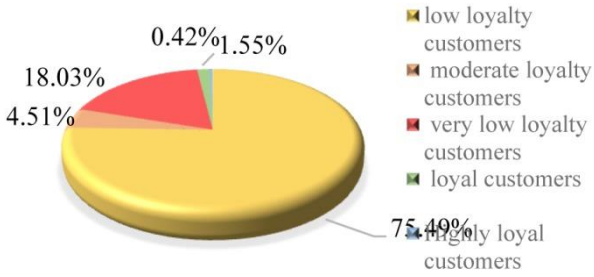


**Figure 4- Percentage frequency of customer lifetime value clusters (cheese)**

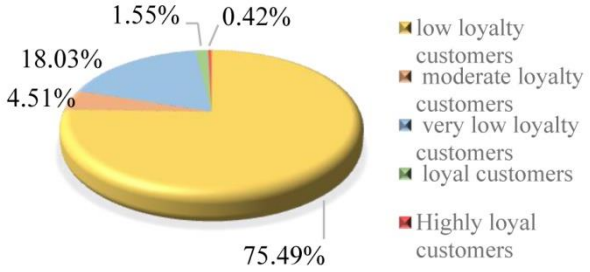


**Figure 5- Percentage frequency of customer lifetime value clusters (ayran)**

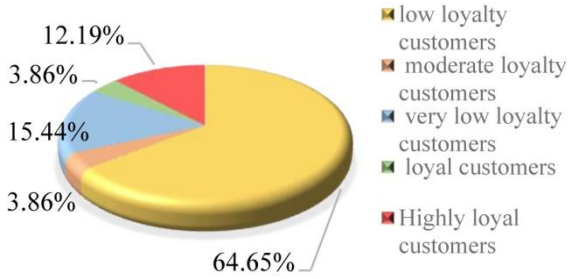


**Figure 6- Percentage frequency of customer lifetime value clusters (yogurt)**

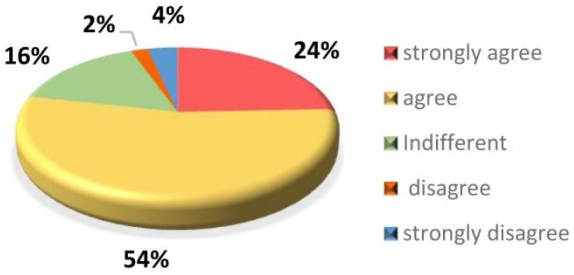


**Figure 7- The frequency percentage of items in the second component**

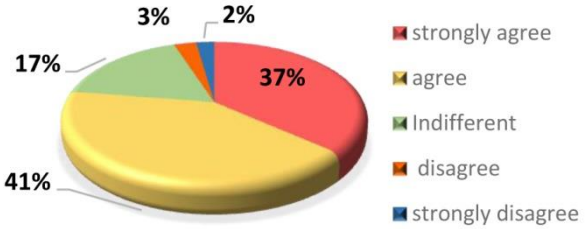


**Figure 8- The frequency percentage of items in the first component**

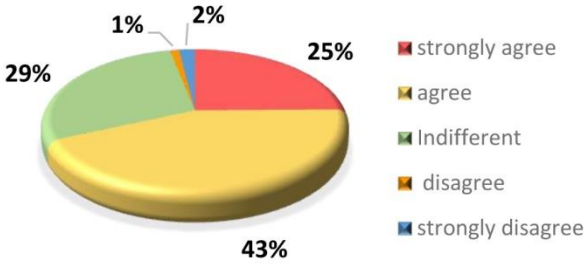


**Figure 9- Frequency percentage of items in the third component**

## Product: Milk

In this study, the fourth cluster, consisting of individuals with low customer lifetime value, was designated as the base group for segmenting customers of the milk product. To ensure the optimal and accurate classification of the dependent variable groups, the Wald test was conducted, with the results presented in Table 4. The statistical analysis of pairwise comparisons between the first and third clusters showed no significant differences, meaning the null hypothesis could not be rejected. Consequently, the first cluster was merged with the second, while the third cluster was combined with the fourth. After repeating the test, all pairwise comparisons yielded significant results, confirming that the three customer lifetime value clusters should remain

distinct and should not be merged into a single group.

**Table 4- Parent test results for combining loyalty levels (milk)**

| Clusters | Wald Test | |
|---|---|---|
| | Stat | Probe |
| Very high & high loyalty people with medium & low loyalty | 27.325 | 0.00 |
| People with very low loyalty to people with medium and low loyalty | 18.291 | 0.00 |
| People with very high and high loyalty with people with very low loyalty | 27.954 | 0.00 |

Researcher's Calculations

The generalized Hausman test was employed to evaluate the independence of irrelevant alternatives within the model, with the results presented in Table 5. According to this Table, the statistical values for all groups are insignificant, indicating that the null hypothesis regarding the independence of irrelevant alternatives cannot be rejected. Therefore, it can be concluded that the groups are independent of one another, and use of the multinomial logit model for this analysis is appropriate and will not pose any issues.

**Table 5- The results of the generalized Hausman test for the assumption of independence of unrelated options (IIA) (milk)**

| clusters | Stat | Probe |
|---|---|---|
| people with Very high & high loyalty | -0.792 | 1.00 |
| people with medium and low loyalty | -6.523 | 1.00 |
| people with very low loyalty | -10.007 | 1.00 |

The goodness of fit for the regression model is presented in Table 6, where the likelihood ratio of the estimated model is reported as 82.805. Given the significance level of 0.00, this result is statistically significant. Therefore, the overall significance of the likelihood ratio test confirms the appropriateness of the regression model.

**Table 6- Good fit criteria of the multinomial logit model (milk)**

| Statistics | Statistics value | Statistics | Statistics value |
|---|---|---|---|
| LR | -657.304 | Pseudo R2 | 0.078 |
| LR-prob | 0 | Cragg & Uhler's R2 | 0.128 |
| LR(6) | 82.805 | AIC | 1354.608 |
| McFadden's Adj R2 | 0.033 | BIC | -4.056 |

Researcher's Calculations

The results of estimating the multinomial logit model using the maximum likelihood method to assess the impact of the specified explanatory variables on customer loyalty for the milk product (measured by the CLV score) are presented in Table 7. It is important to note that the estimated coefficients indicate only the magnitude and direction of their effect on the odds ratio. The relative odds ratio represents the change in the odds of belonging to a specific group compared to the base group in response to variations in the explanatory variables.

The importance individuals place on adhering to ethical norms has a significant negative effect on the likelihood of being classified in the high and very high customer lifetime value clusters compared to the base cluster (very low customer lifetime value), reducing the odds of inclusion in this group by 67.0%. In contrast, the emphasis on social responsibility has a significant positive impact, increasing the likelihood of being categorized in the high and very high customer lifetime value clusters by 396.0% relative to the base cluster. Additionally, individuals who prioritize compliance with industry regulations exhibit a significant negative effect on the likelihood of being classified in the medium customer lifetime value cluster compared to the base cluster, decreasing the odds of inclusion in this group by 62.0%.

**Table 7- Estimation results of multinomial logit model (milk)**

| Category | Variable Name | Coefficient | Standard deviation | P-Value | Relative Risk Ratio |
|---|---|---|---|---|---|
| Cluster1 People with a very high & high level of loyalty | Adherence of the brand to the rules of its field of activity | -0.315 | 0.199 | 0.114 | 0.729 |
| | Respect for ethical norms by the brand | -0.390 | 0.229 | 0.089 | 0.676 |
| | preferably a brand with social responsibility | 1.37 | 1.001 | 0 | 3.96 |
| Clusterv2 People with an average level of loyalty | Adherence of the brand to the rules of its field of activity | -0.473 | 0.119 | 0 | 0.622 |
| | Respect for ethical norms by the brand | 0.217 | 0.142 | 0.127 | 1.242 |
| | preferably a brand with social responsibility | -4.049 | 0.432 | 0.694 | 0.951 |

Researcher's Calculations

## Product: Cheese

For the customer group associated with the cheese product, the third cluster, representing individuals with medium customer lifetime value, was designated as the base group. The Wald test results for pairwise comparisons among all clusters were not statistically significant. Consequently, the first and second clusters were merged, as well as the fourth and fifth clusters. The test was then repeated, with the results presented in Table 8. The findings indicate that the customer lifetime value clusters remain statistically distinct and should not be combined.

**Table 8- Parent test results for combining loyalty levels (cheese)**

| Clusters | Wald Test | |
|---|---|---|
| | Stat | Probe |
| Very high & high loyalty people with medium loyalty people | 47.01 | 0.00 |
| People with very low loyalty & low with people with medium loyalty | 24.974 | 0.00 |
| People with very high & high loyalty versus people with very low & low loyalty | 40.372 | 0.00 |

Researcher's Calculations

The generalized Hausman test was employed to evaluate the independence of irrelevant alternatives within the model, with the results presented in Table 9. The statistical values of the test for each group in the model are not statistically significant. Therefore, it can be concluded that the loyalty levels are independent of one another, confirming the appropriateness of the multinomial logit model for this analysis.

**Table 9- The results of the generalized Hausman test for the assumption of independence of unrelated options (IIA) (cheese)**

| Clusters | Stat | Probe |
|---|---|---|
| Very high & high loyalty people | -6.829 | 1.000 |
| People with medium loyalty | -645.415 | 1.000 |
| people with very low & low loyalty | 0.868 | 0.929 |

Researcher's Calculations

The goodness of fit for the regression model is presented in Table 10, where the likelihood ratio of the estimated model is reported as 121.65. Given a significance level of less than 1%, this result is statistically significant. Therefore, based on the overall likelihood ratio test, the regression model is considered statistically valid and appropriate for analysis.

**Table 10- Good fit criteria of the multinomial logit model (cheese)**

| Statistics | Statistics value | Statistics | Statistics value |
|---|---|---|---|
| LR | -260.283 | Pseudo R2 | 0.189 |

| | | | |
|---|---|---|---|
| LR-prob | 0 | Cragg & Uhler's R2 | 0.265 |
| LR(6) | 121.65 | AIC | 544.566 |
| McFadden's Adj R2 | 0.152 | BIC | -82.275 |

Researcher's Calculations

The results of estimating the multinomial logit model using the maximum likelihood method to assess the impact of the specified explanatory variables on customer loyalty for the cheese product are presented in Table 11. The findings indicate that individuals who prioritize compliance with industry regulations have a significant negative effect on the likelihood of being categorized in the second cluster compared to the base cluster, reducing the probability of inclusion in this group by 0.10%. Furthermore, the importance placed on social responsibility has a significant positive impact on the likelihood of being classified in the high and very high customer lifetime value clusters relative to the base cluster (medium customer lifetime value), increasing the probability of inclusion in this group by 5.49%.

Additionally, adherence to ethical norms has a dual effect: it significantly reduces the likelihood of belonging to the high and very high customer lifetime value clusters while significantly increasing the likelihood of being placed in the very low and low customer lifetime value clusters. Specifically, it decreases the probability of inclusion in the high and very high customer lifetime value clusters by 0.51% and increases the probability of being in the very low and low customer lifetime value clusters by 21.22% compared to the base cluster.

**Table 11- Estimation results of multinomial logit model (cheese)**

| Category | Variable Name | Coefficient | Standard deviation | P-Value | Relative Risk Ratio |
|---|---|---|---|---|---|
| Cluster1 People with a very high & high level of loyalty | Adherence of the brand to the rules of its field of activity | -0.179 | 0.188 | 0.341 | 0.835 |
| | Respect for ethical norms by the brand | -0.668 | 0.196 | 0.001 | 0.512 |
| | preferably a brand with social responsibility | 1.704 | 0.25 | 0.00 | 5.498 |
| Cluster 2 people with very low & low loyalty | Adherence of the brand to the rules of its field of activity | -2.240 | 0.438 | 0.00 | 0.106 |
| | Respect for ethical norms by the brand | 3.055 | 1.109 | 0.006 | 21.221 |
| | preferably a brand with social responsibility | -0.745 | 0.728 | 0.306 | 0.474 |

Researcher's Calculations

## Product: Yogurt

In this study, the fifth cluster of the dependent variable, representing individuals with very low customer lifetime value, was designated as the base group for the yogurt product customer segment. To ensure the optimal and accurate classification of the dependent variable groups, the Wald test was employed, and the results are presented in Table 12. The statistical values for the pairwise comparisons among all clusters were found to be significant. As a result, the null hypothesis, which suggested that the groups could be combined, was rejected. Therefore, the model, with the five distinct levels of the dependent variable, is considered to fit the data appropriately.

The generalized Hausman test was conducted to evaluate the independence of irrelevant alternatives within the model, with the results presented in Table 13. The statistical values for each group in the model were found to be insignificant, confirming the suitability of the multinomial logit model for this analysis.

**Table 12- Parent test results for combining loyalty levels (Yogurt)**

| Category | Wald Test | | Category | Wald Test | |
|---|---|---|---|---|---|
| | Stat | Probe | | Sta | Probe |

| | | | | | |
|---|---|---|---|---|---|
| People with very high loyalty with people with high loyalty | 42.227 | 0.00 | High-loyalty people versus low-loyalty people | 27.181 | 0.000 |
| People with very high loyalty versus people with moderate loyalty | 35.274 | 0.00 | People with high loyalty versus people with very low loyalty | 29.439 | 0.000 |
| High-loyalty people versus low-loyalty people | 20.858 | 0.00 | People with moderate loyalty versus people with low loyalty | 41.721 | 0.000 |
| People with very high loyalty versus people with very low loyalty | 40.522 | 0.00 | People with moderate loyalty and people with very low loyalty | 9.991 | 0.019 |
| People with high loyalty versus people with medium loyalty | 32.951 | 0.00 | People with low loyalty versus people with very low loyalty | 27.386 | 0.000 |

Researcher's Calculations

**Table 13- The results of the generalized Hausman test for the assumption of independence of unrelated options (IIA) (Yogurt)**

| Clusters | Stat | Probe |
|---|---|---|
| People with very high loyalty | -0.669 | 1.00 |
| People with high loyalty | -2.949 | 1.00 |
| People with moderate loyalty | 0.978 | 1.00 |
| people with low loyalty | 2.961 | 0.94 |
| people with very low loyalty | 11.785 | 0.16 |

Researcher's Calculations

The goodness of fit for the regression model is presented in Table 14, where the likelihood ratio of the estimated model is 110.03. Given the significance level of less than 1%, this result is statistically significant. Therefore, the regression model is considered significant overall.

**Table 14- Good fit criteria of the multinomial logit model (Yogurt)**

| Statistics | Statistics value | Statistics | Statistics value |
|---|---|---|---|
| LR | -916.406 | Pseudo R2 | 0.056 |
| LR-prob | 0 | Cragg & Uhler's R2 | 0.154 |
| LR(12) | 110.03 | AIC | 1872.778 |
| McFadden's Adj R2 | 0.036 | BIC | -31.25 |

Researcher's Calculations

The results of estimating the multinomial logit model using the maximum likelihood method to assess the impact of the specified explanatory variables on customer loyalty for the yogurt product are presented in Table 15. Individuals who prioritize compliance with industry regulations have a significant positive effect on the likelihood of being classified in the second cluster compared to the base cluster (the very low customer lifetime value cluster), increasing the probability of inclusion in this group by 3.92%.

The importance of accepting social responsibility positively impacts the likelihood of being placed in the clusters of individuals with high, medium, and low customer lifetime value compared to the base cluster. Specifically, the likelihood increases by 1.77% for the first cluster (high customer lifetime value) and by 1.56% for the second cluster (medium customer lifetime value), while it decreases by 0.41% for the fourth cluster (low customer lifetime value). Adherence to ethical norms significantly reduces the likelihood of being placed in the very high and high customer lifetime value clusters relative to the base cluster, while increasing the likelihood of being classified in the low customer lifetime value cluster. Specifically, it reduces the probability of inclusion in the high customer lifetime value cluster by 0.42% compared to the base cluster and increases the likelihood of being in the low customer lifetime value cluster by 2.10% compared to the base cluster.

**Table 15- Estimation results of multinomial logit model (Yogurt)**

| Category | Variable Name | Coefficient | Standard deviation | P-Value | Relative Risk Ratio |
|---|---|---|---|---|---|
| Cluster1 People with a very high level of loyalty | Adherence of the brand to the rules of its field of activity | -0.152 | 0.165 | 0.356 | 0.858 |
| | Respect for ethical norms by the brand | -0.315 | 0.199 | 0.114 | 0.729 |
| | Preferably a brand with social responsibility | 0.321 | 0.187 | 0.001 | 1.77 |
| Cluster 2 People with a high level of loyalty | Adherence of the brand to the rules of its field of activity | 1.367 | 0.305 | 0.00 | 3.925 |
| | Respect for ethical norms by the brand | -0.845 | 0.296 | 0.004 | 0.429 |
| | Preferably a brand with social responsibility | 0.45 | 0.174 | 0.01 | 1.569 |
| Cluster 3 People with an average level of loyalty | Adherence of the brand to the rules of its field of activity | -0.134 | 0.149 | 0.366 | 0.873 |
| | Respect for ethical norms by the brand | -0.008 | 0.174 | 0.961 | 0.991 |
| | Preferably a brand with social responsibility | -0.019 | 0.282 | 0.066 | 0.981 |
| Cluster 4 People with low level of loyalty | Adherence of the brand to the rules of its field of activity | -0.132 | 0.166 | 0.427 | 0.875 |
| | Respect for ethical norms by the brand | 0.742 | 0.221 | 0.001 | 2.102 |
| | Preferably a brand with social responsibility | -0.886 | 0.177 | 0.00 | 0.412 |

Researcher's Calculations

## Product: Ayran (Yogurt Drink)

In this study, the fourth cluster of the dependent variable, representing individuals with low customer lifetime value, was designated as the base group for the ayran product customer segment. To ensure the optimal and accurate classification of the dependent variable groups, the Wald test was conducted, and the results are presented in Table 16. The statistical values for the pairwise comparisons among the clusters were not all found to be significant. As a result, the first cluster was merged with the second cluster, and upon re-testing, all statistical values became significant. Consequently, the null hypothesis of combining the groups was rejected, confirming that the model, with the four distinct levels of the dependent variable, is appropriate**.**

**Table 16- Parent test results for combining loyalty levels (Ayran)**

| Cluster | Wald Test | |
|---|---|---|
| | Stat | Probe |
| Very high and high loyalty people with medium loyalty people | 16.687 | 0.001 |
| People with very high loyalty and high loyalty with people with low loyalty | 10.969 | 0.012 |
| People with very high and high loyalty with people with very low loyalty | 9.498 | 0.023 |
| People with moderate loyalty versus people with low loyalty | 20.405 | 0.00 |
| People with moderate loyalty and people with very low loyalty | 54.573 | 0.00 |
| People with low loyalty versus people with very low loyalty | 54.274 | 0.00 |

Researcher's Calculations

The results of the Hausman test are presented in Table 17. According to the table, the statistical values for all groups are found to be statistically insignificant, meaning the null hypothesis of the independence of irrelevant alternatives is not rejected. Therefore, it can be concluded that the groups are independent, and the use of the multinomial logit model for this analysis is appropriate and will not present any issues.

**Table 17- The results of the generalized Hausman test for the assumption of independence of unrelated options (IIA)(Ayran)**

| Cluster | Stat | Probe |
|---|---|---|
| People with very high and high loyalty | -5.406 | 1.00 |
| People with average loyalty | -2.213 | 1.00 |
| People with low loyalty | 2.061 | 0.865 |
| People with very low loyalty | 1.788 | 0.987 |

Researcher's Calculations

The goodness of fit for the regression model is reported in Table 18, where the likelihood ratio of the estimated model is 113.83. Given the significance level of less than 1%, this result is statistically significant. Therefore, the regression model is considered significant overall.

**Table 18- Good fit criteria of the multinomial logit model (Ayran)**

| Statistics | Statistics value | Statistics | Statistics value |
|---|---|---|---|
| LR | -466.650 | Pseudo R2 | 0.108 |
| LR-prob | 0 | Cragg & Uhler's R2 | 0.192 |
| LR(9) | 113.837 | AIC | 965.3 |
| McFadden's Adj R2 | 0.078 | BIC | -54.776 |

Researcher's Calculations

**Table 19- Estimation results of multinomial logit model (Ayran)**

| Category | Variable Name | Coefficient | Standard deviation | P-Value | Relative Risk Ratio |
|---|---|---|---|---|---|
| Cluster 1 (People with a very high & high level of loyalty) | Adherence of the brand to the rules of its field of activity | -0.422 | 0.561 | 0.452 | 1.525 |
| | Respect for ethical norms by the brand | 0.698 | 0.668 | 0.296 | 2.011 |
| | Preferably a brand with social responsibility | 0.705 | 0.517 | 0.65 | 2.024 |
| Cluster 2 (People with an average level of loyalty) | Adherence of the brand to the rules of its field of activity | 1.297 | 0.303 | 0.00 | 3.661 |
| | Respect for ethical norms by the brand | -0.990 | 0.283 | 0.00 | 0.371 |
| | Preferably a brand with social responsibility | -0.284 | 0.271 | 0.295 | 0.752 |
| Cluster 3 (People with a very low level of loyalty) | Adherence of the brand to the rules of its field of activity | -1.01 | 0.172 | 0.00 | 0.36 |
| | Respect for ethical norms by the brand | 0.489 | 0.193 | 0.012 | 1.63 |
| | Preferably a brand with social responsibility | -0.65 | 0.182 | 0.00 | 0.508 |

Researcher's Calculations

The results of estimating the multinomial logit model using the maximum likelihood method to examine the impact of the specified explanatory variables on customer loyalty for the ayran product are presented in Table 19. The importance of accepting social responsibility has a significant positive impact on the likelihood of being classified in the very low customer lifetime value cluster compared to the base cluster (low customer lifetime value), increasing the probability of inclusion in this group by 2.22%. Additionally, it has a significant negative effect on the likelihood of being placed in the fifth cluster, reducing the probability of inclusion in this cluster by 0.50%.

Adherence to ethical norms negatively impacts the likelihood of being classified in the medium customer lifetime value cluster, while positively influencing the likelihood of being categorized in the very low customer lifetime value cluster compared to the base cluster. Specifically, it decreases the probability of inclusion in the medium customer lifetime value cluster by 0.37% and increases the probability of inclusion in the very low

customer lifetime value cluster by 1.63%.

Individuals who prioritize compliance with industry regulations have a significant positive effect on the likelihood of being placed in the third cluster compared to the base cluster, increasing the likelihood of being in this group by 3.66%. Furthermore, the significance of this factor has a notable negative impact on the likelihood of being classified in the very low customer lifetime value cluster compared to the base cluster, decreasing the probability of inclusion in this group by 0.36%.

## Recommendations

Based on the results obtained from 710 completed questionnaires from dairy product consumers in Tehran, customers were segmented into five clusters after standardizing the RFM model parameters and calculating the Dunn statistic. Using the Analytical Hierarchy Process (AHP) method and expert opinions in the field, the weights of the parameters were determined, revealing that the amount of money spent per purchase holds the highest significance among the parameters. Subsequently, Customer Lifetime Value (CLV) was calculated using customer data and the weights derived from the WRFM model, and clusters were ranked based on the computed CLV scores. The highest frequency percentages were found in clusters with low CLV for milk, very low CLV for yogurt, and medium CLV for cheese.

It is important to note that this survey focused on corporate dairy products and reputable brands in the dairy industry, excluding consumers of traditional dairy products. One possible reason for the frequency of low-CLV clusters could be the exclusion of traditional dairy product purchases from the sample. Respondents indicated that they purchase traditional dairy products for some family members while preferring industrial dairy products for others.

To assess the impact of ethical components on CLV and customer segmentation, a multinomial logistic regression model was employed. The findings for each component are detailed below:

- Compliance with Industry Regulations: This factor was not statistically significant for any of the examined products (milk, cheese, yogurt, and Ayran) in any cluster. However, significant results indicate that in higher-CLV clusters, compliance with industry regulations has a strong positive impact, increasing the likelihood of placement in these clusters compared to the base cluster. Conversely, in lower-CLV clusters, compliance with industry regulations has a significant negative effect, reducing the probability of placement in these clusters, as shown by the Relative Risk Ratio (RRR) statistic.
- Respect for Ethical Norms: This factor was also not statistically significant for any of the products across the clusters. However, in contrast to compliance with industry regulations, respect for ethical norms had a significant positive impact on placement in low-CLV clusters, increasing the probability of customers falling into these segments. Conversely, for high-CLV clusters, this factor had a negative effect, reducing the likelihood of placement in these clusters compared to the base group. Customers in low-CLV categories value this component, which may ultimately facilitate their transition into higher-CLV categories.
- Social Responsibility of the Brand: Similar to compliance with industry regulations, this factor had a strong positive impact on high-CLV clusters, increasing the probability of customers being categorized in these segments. Conversely, in low-CLV clusters, this factor showed a significant negative effect, reducing the likelihood of placement in these clusters, as indicated by the RRR statistic.

## Product-Specific Findings

Based on the final calculated effects and the estimated logistic regression models, the impact of ethical components on different dairy products is as follows:

- Ayran: Compliance with industry regulations and social responsibility both

increase the likelihood of placement in a higher-CLV cluster, whereas respect for ethical norms is associated with placement in lower-CLV clusters.

- Cheese: The order of influence is as follows: social responsibility, respect for ethical norms, and compliance with industry regulations. Emphasizing ethical norms increases placement in lower-CLV clusters.
- Yogurt: The order of influence is: compliance with industry regulations, respect for ethical norms, and social responsibility. As observed with other products, prioritizing ethical norms results in placement in lower-CLV clusters.
- Milk: The impact of ethical components differs from that of other dairy products. In this case, prioritizing compliance with industry regulations leads to placement in lower-CLV clusters, while social responsibility is associated with placement in higher-CLV clusters.

## Managerial Implications

Dairy industry stakeholders can enhance customer loyalty and facilitate transitions to higher-CLV clusters by demonstrating commitment to industry regulations and social responsibility. If brands take proactive measures to respect ethical norms, some consumers of cheese, yogurt, and Ayran may respond positively and shift towards higher-value customer segments. This is particularly crucial given that a significant proportion of consumers for these products currently belong to low-CLV clusters.

The findings suggest that loyal, high-CLV customers in the dairy industry place considerable importance on social responsibility and compliance with industry regulations as ethical factors. As highlighted at the beginning of this study, in today's competitive market, companies must consider factors that influence consumer decisions, interests, and beliefs to foster brand loyalty. Ethical considerations have emerged as a critical domain, with research and logistic model results confirming that in recent years, ethical concerns have significantly impacted purchasing behaviors and consumer perceptions of products and brands.

Correcting negative brand perceptions through marketing efforts is a time-intensive and costly process. Therefore, it is imperative to address these concerns proactively and implement the necessary measures to align brand strategies with ethical consumer expectations.

## Recommendations for Future Research

It is recommended that dairy brands conduct comprehensive CLV analyses to assess the potential for increasing customer value and subsequently develop targeted marketing strategies for each customer segment based on their CLV.

For future studies, it is suggested that CLV calculations be conducted separately for each brand. Additionally, a second phase of research could focus on identifying the factors influencing CLV growth for each product within each brand. This approach would provide deeper insights into the strategies employed by various brands to enhance customer lifetime value.

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# بررسی مؤلفه‌های اخلاقی مؤثر بر ارزش دوره عمر مشتری محصولات لبنی در شهر تهران

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## چکیده

امروزه نگهداری و تقویت وفاداری مشتری در راستای محصولات یا خدمات یک شرکت، عموماً نکته اصلی و مرکزی فعالیت‌های بازاریابی شده است. ازجمله مواردی که می‌تواند بر بهبود وفاداری مشتریان به برند/ محصول تأثیرگذار باشد، بازاریابی اخلاقی است. بازاریابی اخلاقی حوزه‌ای از اخلاق کاربردی است که با اصول اخلاقی پنهان در رفتار، تبلیغ و تنظیم در بازاریابی ارتباط دارد. مصرف‌گرایی اخلاقی نیز در دو دهه اخیر به دلیل مسائل اجتماعی و زیست‌محیطی اهمیت پیدا کرده است. در این راستا در این مطالعه به هدف بررسی مؤلفه‌های اخلاقی بر ارزش دوره عمر مشتری برای مصرف‌کنندگان محصولات لبنی در تهران در سال ۱۴۰۲ انجام شده است. برای دستیابی به هدف، ۷۱۰ پرسشنامه در شهر تهران تکمیل گردید و با استخراج اطلاعات مورد نیاز برای محاسبه دوره عمر مشتری از روش GWRFM استفاده گردید و نتایج نشان‌دهنده درصد فراوانی بالای خوشه‌های با ارزش دوره عمر پایین بودند. در مرحله دوم با استفاده از لاجیت چندگانه به بررسی تأثیر مؤلفه‌های اخلاقی بر CLV پراخته شد که نتیجه حاکی از اهمیت پایبندی به قوانین حوزه فعالیت و پذیرش مسئولیت اجتماعی بر ارزش دوره عمر مشتری بصورت مثبت و معنی‌دار بود. از این رو پیشنهاد می‌شود فعالان صنعت لبنیات با مطمئن کردن مشتریان از پایبندی به قوانین حوزه فعالیت این صنعت و همچنین پذیرش مسئولیت اجتماعی می‌توانند آنها را به خوشه‌های بالاتر منتقل کرده و جزو مشتریان وفادار خود قرار دهند. اگر در زمینه احترام به هنجارهای اخلاقی نیز اقدامات مثبتی انجام گردد بخش قابل توجهی از مصرف‌کنندگان محصولات پنیر، ماست و دوغ را تحت تأثیر قرار می‌دهد و سبب حرکت آن‌ها به سوی قرارگیری در زمره مشتریان باارزش این صنعت می‌شود.

**واژه‌های کلیدی:** ارزش دوره عمر مشتری، بازاریابی اخلاقی، مصرف‌گرایی اخلاقی، GWRFM

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