**Chi-Square Goodness of Fit Test on Customer Preference For Payment Method**

#### ****Introduction****

The purpose of this report is to analyze whether customers' preferences for different payment methods align with an expected distribution. The company's hypothesis was that customers would equally prefer the six available colors (Bank Transfer,Cash, Credit Card, Debit Card, PayPal and Venmo transformed into 1, 2, 3, 4, 5 and 6). To test this, a survey was conducted, and the observed customer preferences were compared with the expected equal distribution using a Chi-Square Goodness of Fit test.

#### ****Data Collection****

A sample of 3900 customers was surveyed, and each customer was asked to select their favorite payment method. The observed counts of customer preferences for each payment were recorded as follows:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **TransformedPaymentMethod** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | 1 | 648 | 16.6 | 16.6 | 16.6 |
| 2 | 632 | 16.2 | 16.2 | 32.8 |
| 3 | 696 | 17.8 | 17.8 | 50.7 |
| 4 | 633 | 16.2 | 16.2 | 66.9 |
| 5 | 638 | 16.4 | 16.4 | 83.3 |
| 6 | 653 | 16.7 | 16.7 | 100.0 |
| Total | 3900 | 100.0 | 100.0 |  |

The company hypothesized that customer preferences would be evenly distributed across the six payment methods.

#### ****Hypotheses****

To test whether the observed customer preferences deviate significantly from the expected even distribution, the following hypotheses were formulated:

* **Null Hypothesis (**H0H\_0H0​**)**: Customer preferences for paymentMethodare evenly distributed (i.e., the observed frequencies match the expected frequencies)
* **Alternative Hypothesis (**HAH\_AHA​**)**: Customer preferences for paymentmethod are not evenly distributed (i.e., the observed frequencies differ from the expected frequencies).

#### ****Chi-Square Goodness of Fit Test****

The Chi-Square Goodness of Fit test compares the observed frequencies of the categories to the expected frequencies

|  |  |  |  |
| --- | --- | --- | --- |
| **TransformedPaymentMethod** | | | |
|  | Observed N | Expected N | Residual |
| 1 | 648 | 650.0 | -2.0 |
| 2 | 632 | 650.0 | -18.0 |
| 3 | 696 | 650.0 | 46.0 |
| 4 | 633 | 650.0 | -17.0 |
| 5 | 638 | 650.0 | -12.0 |
| 6 | 653 | 650.0 | 3.0 |
| Total | 3900 |  |  |

|  |  |
| --- | --- |
| **Test Statistics** | |
|  | TransformedPaymentMethod |
| Chi-Square | 4.440a |
| df | 5 |
| Asymp. Sig. | .488 |
| a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 650.0. | |

#### Interpretation

The degree of freedom=(5), the Chi-square = (4.440) and the p-value of 0.488 indicate that there is no significant difference between the observed and the expected outcomes.

So, I will reject the alternative hypothesis and accept the null hypothesis.

**Conclusion**

The Ch-Square test for goodness of fit shows that customers preference for ayment method is evenly distributed.

There is a significant evidence to proof that the observed distribution of preferences compared to the expected preferences is statistically significant.

**Recommendations**

Based on the result;

1. The company should maintain their payment methods
2. Conduct another survey to know the reason(s) for customer preferences