

## **APPLIED DISCRIMINANT ANALYSIS IN MARKET RESEARCH**

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### **Abstract**

Discriminant Analysis is statistical technique which is used on the dependence relationship. Discriminant analysis uses dependent variable with form category data and independent variable with form kuantitatif data.

Discriminant analysis is aimed to classify particular person or observation in group with independent each other and thorough based on a number of independent variable.

Asumtions used in the discriminant analysis:

1. As  $p$  independent variable must be normally distributed
2. Varians-covarians matrices of independent variable has ordo  $p \times p$  on both group must be equal.

Key word: Diskriminant analysis, dependence relationship, dependent variable, independent variable, category data and kuantitatif data.

## **1 INTRODUCTION**

### **1.1 Background**

This now business increase, so company is taken decision, preference, behaviour and the customer satisfaction the first problem for company if company will survival and the best in competitive. So company has to continue the product quality and customer smugness. The company has to make the program repair product quality and customer smugness with expected elimination the product cost, customer smugness and increase the market area and repair under bound line relation with the company profit. The quality produk un able enough. Quality is not the customer price on will output return in form repair sales, profit and market area. Which has to do :

1. The product quality is given fit the market objective
2. The add quality is has to impact positif to profitabilitas.

Marketing is the planning process, execute concepts, the price, promotion, the goods distribution and honours for the making change satisfaction destination person and organization. According to (Kotler, 1997, 8) the marketing is the social process and management this in person and the group which they requirement and expected with construcs, supply, and the product change which price with other people.

Discriminant analysis is one the statistics technique is used to dependence relation (relation among variable where different respon variable and independent variable). For special more, discriminant analysis is used in case where respon variable form data qualitative and independent variable form data quantitative. Discriminant is objective classification for individual to in group mutually exclusive and exhaustive according to

number the independent variables.

There are two assumption compliance the discriminant analysis :

1. The number  $p$  independent variable is normal distribution.
2. Variances –covariances matrixes independent variable size  $p \times p$  the two group has to same.

If similar with a linear regression , so discriminant analysis is inverse. A Linear regression , response variable has to normal distribution and homoskedastic, where independent variable is assumed fixed, artinya mean the independent variable not certain distribution. For discriminant analysis , independent variable has to normal distribution and homoscedastic , while response variable is fixed.

### 1.2 Research Problem

According background above emerge the problem research following:

1. What is the different customer which often, enough and rarely is come to shop?
2. What is the impact of the goods position arrangement on shop, the completeness of goods on shop , the goods price competitive, the music facility on shop , the ac facility on shop, lighting on shop , customer service from employee on shop, customer service from cashier, promotion from shop and the shop image of customer .

### 1.3 Research objective

1. For know the customer often , enough, rarely come to the shop different .
2. For know the impact of the goods position arrangement on shop, the completeness of goods on shop, the goods price competitive, the music facility on shop, the ac facility on shop, lighting on shop, customer service from employee on shop, customer service from cashier, promotion from shop and the shop image of customer.

## 2 THEORETICAL BACKGROUND

### 2.1 Customer satisfactions

2.1 The product using or honours by customer become smugness and not smugness . The customer smugness is the level smugness customer after real is compared with expected (Kotler,2000:50). The customer smugness a main factor impact to the company survival. Company has to allocate the customer smugness is the first priority has to calculate in work planning.

Factor-factor impact the customer smugness is product quality, service quality , emotional quality , prize and cost, and easy product (Handi,2003,22-23).

### 2.2 Discriminant Analysis

Discriminant analysis is technique data analysis , if the dependent variable is category variable while independent variable is numeric. If dependent variable grouped become more 2 group (category ) by name multiple discriminant analysis .

Discriminant analysis is the statistics methods for group a number objek to several group according several variable, so every object become elemen for one group.

### 3. Result and Discussion

With use data on data table1 on appendix1 following output :

**Discriminant Analysis Case Processing Summary**

Unweighted Cases		N	Percent
Valid		105	100,0
Excluded	Missing or out-of-range group codes	0	,0
	At least one missing discriminating variable	0	,0
	Both missing or out-of-range group codes and at least one missing discriminating variable	0	,0
	Total	0	,0
Total		105	100,0

**Group Statistics**

coding from buy		Mean	Std. Deviation	Valid N (listwise)	
				Unweighted	Weighted
,00	the goods position arrangement on shop	3,58222	,804614	45	45,000
	the completeness of goods on shop	3,51778	,707200	45	45,000
	the goods price competitive	2,85111	1,195944	45	45,000
	the music facility on shop	3,58667	,939439	45	45,000
	the air condition facility on shop	3,19556	1,006333	45	45,000
	the lighting on shop	2,89556	1,203396	45	45,000
	the customer service from employ on shop	3,53556	,775229	45	45,000
	the customer service from cashier on shop	3,35778	1,052592	45	45,000
	promotion from shop	2,76222	1,008439	45	45,000
	the shop image of customer	3,46000	1,134260	45	45,000
1,00	the goods position arrangement on shop	3,55238	,899232	21	21,000
	the completeness of goods on shop	3,50476	,767122	21	21,000
	the goods price competitive	3,21905	1,068466	21	21,000
	the music facility on shop	2,80952	,871151	21	21,000
	the air condition facility on shop	2,54286	,992760	21	21,000
	the lighting on shop	2,29048	,667012	21	21,000
	the customer service from employ on shop	3,67619	,867701	21	21,000

2,00	the customer service from cashier on shop	3,36667	,862748	21	21,000
	promotion from shop	3,16190	1,138629	21	21,000
	the shop image of customer	2,90476	1,078182	21	21,000
	the goods position arrangement on shop	3,61795	,781655	39	39,000
	the completeness of goods on shop	3,44359	,509796	39	39,000
	the goods price competitive	2,90513	1,128564	39	39,000
	the music facility on shop	3,30000	1,012813	39	39,000
	the air condition facility on shop	2,93846	1,058205	39	39,000
	the lighting on shop	2,41795	,761533	39	39,000
	the customer service from employ on shop	3,42051	,930246	39	39,000
	the customer service from cashier on shop	3,21026	1,167272	39	39,000
	promotion from shop	3,11795	1,001018	39	39,000
	the shop image of customer	2,65897	,943040	39	39,000
Total	the goods position arrangement on shop	3,58952	,808242	105	105,000
	the completeness of goods on shop	3,48762	,648770	105	105,000
	the goods price competitive	2,94476	1,144383	105	105,000
	the music facility on shop	3,32476	,988762	105	105,000
	the air condition facility on shop	2,96952	1,042291	105	105,000
	the lighting on shop	2,59714	,989800	105	105,000
	the customer service from employ on shop	3,52095	,850870	105	105,000
	the customer service from cashier on shop	3,30476	1,055970	105	105,000
	promotion from shop	2,97429	1,039233	105	105,000
	the shop image of customer	3,05143	1,107762	105	105,000

### Tests of Equality of Group Means

	Wilks' Lambda	F	df1	df2	Sig.
the goods position arrangement on shop	,999	,047	2	102	,954
the completeness of goods on shop	,997	,143	2	102	,867

the goods price competitive	,985	,774	2	102	,464
the music facility on shop	,915	4,764	2	102	,011
the air condition facility on shop	,945	2,941	2	102	,057
the lighting on shop	,929	3,898	2	102	,023
the customer service from employ on shop	,988	,623	2	102	,538
the customer service from cashier on shop	,995	,245	2	102	,783
promotion from shop	,968	1,673	2	102	,193
the shop image of customer	,891	6,269	2	102	,003

### Analysis 1

#### Summary of Canonical Discriminant Functions

##### Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	,385(a)	86,8	86,8	,527
2	,058(a)	13,2	100,0	,235

a First 2 canonical discriminant functions were used in the analysis.

##### Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 2	,682	37,295	20	,011
2	,945	5,539	9	,785

#### Standardized Canonical Discriminant Function Coefficients

	Function	
	1	2
the goods position arrangement on shop	-,077	-,022
the completeness of goods on shop	,027	-,210
the goods price competitive	-,334	-,099

the music facility on shop	,427	,547
the air condition facility on shop	,139	,416
the lighting on shop	,245	-,019
the customer service from employ on shop	-,077	-,200
the customer service from cashier on shop	,191	-,153
promotion from shop	-,396	,375
the shop image of customer	,929	-,456

### Structure Matrix

	Function	
	1	2
the shop image of customer	,530(*)	-,503
the lighting on shop	,445(*)	,077
promotion from shop	-,292(*)	,017
the music facility on shop	,419	,665(*)
the air condition facility on shop	,336	,495(*)
the customer service from employ on shop	,005	-,457(*)
the goods price competitive	-,132	-,380(*)
the customer service from cashier on shop	,061	-,241(*)
the completeness of goods on shop	,059	-,159(*)
the goods position arrangement on shop	-,007	,124(*)

Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions

Variables ordered by absolute size of correlation within function.

\* Largest absolute correlation between each variable and any discriminant function

### Functions at Group Centroids

coding from buy	Function	
	1	2
,00	,702	-,030
1,00	-,646	-,405
2,00	-,462	,252

Unstandardized canonical discriminant functions evaluated at group means

## Classification Statistics

### Prior Probabilities for Groups

coding from buy	Prior	Cases Used in Analysis	
		Unweigh ted	Weighted
,00	,333	45	45,000
1,00	,333	21	21,000
2,00	,333	39	39,000
Total	1,000	105	105,000

### Classification Function Coefficients

	coding from buy		
	,00	1,00	2,00
the goods position arrangement on shop	3,696	3,834	3,800
the completeness of goods on shop	8,966	9,030	8,827
the goods price competitive	1,261	1,686	1,576
the music facility on shop	5,211	4,394	4,853
the air condition facility on shop	1,754	1,419	1,711
the lighting on shop	,530	,195	,229
the customer service from employ on shop	1,107	1,317	1,146
the customer service from cashier on shop	3,342	3,155	3,093
promotion from shop	4,131	4,513	4,681
the shop image of customer	3,565	2,541	2,419
(Constant)	-57,647	-53,203	-53,694

Fisher's linear discriminant functions

3 Data the dependent variable is grouped on discriminant become 3, namely group 0 customer often buy goods on shop, group 1 customer enough buy goods on shop and group 2 customer rarely buy goods on shop. Interpretation from output with methods study coefficients of discriminant function with standardized and correlation structure. Coefficients is standardized biggest 0,929 for the shop image of customer variable on functions 1 and coefficients the big relative for the music facility on shop variable, the air conditions facility on shop, promotion from shop on function 2 (see Table 2). While coefficients functions structur

matrices with larger on the shop image of customer variable and the lighting on shop functions 1 and coefficients with larger the music facility on shop and the air conditions facility on shop functions 2. Equation discriminant functions distandardized:

Functions1:  $D = -0,77 \text{ position} + 0,027 \text{ complete} - 0,334 \text{ price} + 0,427 \text{ music} + 0,139 \text{ ac} + 0,245 \text{ lighting} - 0,077 \text{ serviceemploy} + 0,191 \text{ servicecash} - 0,396 \text{ promotion} + 0,929 \text{ image}$

Functions 2 :  $D = -0,022 \text{ position} - 0,210 \text{ complete} - 0,099 \text{ price} + 0,547 \text{ music} + 0,416 \text{ ac} - 0,019 \text{ lighting} - 0,200 \text{ serviceemploy} - 0,153 \text{ servicecash} + 0,375 \text{ promotion} - 0,456 \text{ image}$ .

The fact after hipotesis –test only variable music, ac, lighting and image signifikan customer frequenci (value p low from 0,05)

So variable impact to the often, enough, rarely different customer buy for goods is the music facility on shop, the air conditions facility on shop, lighting on shop and the shop image for customer

If I see value **Wilks' Lambda=0,682** **chi –square= 37,295** **dan p=0,011 <  $\alpha=0,05$**  means different the customer often, enough and rarely buy of goods on shop significans.

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