

Product Quality Growth Analysis using Canonical Correlation in Small Business

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Abstract: This paper is a concept of small business resistance in the point of product quality growth in facing the progress of transformation era with case study : village-owned small enterprises in Deli Serdang. Through this research, it is expected that they have good resistance by making the best product quality. The method used is descriptive and canonical correlation analysis method. The result shows that willingness to pay more, loyalty as the dependent variable and responsiveness as the independent one give the strong factor. The rest weakness factor must be improved to get the small medium enterprises (SMEs) product quality growth

1 INTRODUCTION

Deli Serdang Regency is an area close to Medan City and greatly affect the economy of North Sumatra. Fluctuating economic growth from the year of 2013 amounted to 9.22%, tend to decrease by 7.5% and 2015 by 5.24%. This decline is related to national economic conditions and 2016 began to show an increase of 5.32% based on <https://deliserdangkab.bps.go.id/>, 2018. The improvements made in the direction of small business development with village-owned enterprises (VOE) in industry revolution 4.0.

The VOE officially endorsed by Regent Ashari Tambunan in Galang District of Deli Serdang Regency. Head of Deli Serdang Communication and Information Office said that the inauguration of VOE conducted in Galang District to meet the demand from the community will be a in Subur Village. The Regent hoped that it can be a business for residents in Galang District based on the information (<http://beritasumut.com>, 2017). The Progress of VOE will be the responsibility to select and rank the quality and the failures so that it can make the high result for economic growth.

Firbank (2013) informed that Elderly users had difficulty evaluating services because standards or benchmarks they could use as a basis for comparison were missing. Over half the elderly respondents had

considerable difficulty or were unable to select and rank three quality failures they considered to be most important.

The quality of VOE must be started from the quality management universally. The real fact is needed the practitioners to make it successfully. As the competitive condition, it needs the good brand quality in consumer point of view.

Sharma, *et al* (2012) said that It is worth mentioning here that, in the present competitive world, the dynamics of market does not allow any deviation in quality of end product. Therefore, the importance of quality management is universally espoused by the researchers and practicing managers working in this area.

The VOE needs the ecocentric approach thought improving it. The empathy can transformation towards a society. The one can touched with its innovation. The result can be the better for the environment movement.

Lithoxoidou, *et al* (2017) explained that Coping with environmental crisis cannot but presuppose a change in the values adopted by modern man. Both eco centric values associated with creating a caring relationship with nature, and the development of empathy, can become vehicles of transformation towards a society based on ecological principles.

Peterson & Leonhardt (2015) informed that For instance, individual firms may vary in the degree to

which nonverbal communication and empathy are incorporated as components of their training programs, depending upon their needs and available resources.

Based on the phenomenon described, the main problems of the research focused are how to solve problems of product quality growth using canonical approach with the case study in the VOE Of Deli Serdang Regency.

Plank & Reid (2010) informed that Given the strong role of empathy in this model, more work needs to be done in the context of buyer-seller relations on the actual process of empathetic communication. As has been noted in the literature review of this paper, process models of empathy do exist, but not in buyer-seller contexts.

Sarwar, *et al* (2012) said that Generally, It has been seen that quality of services, transparent policies, delivering what is promised and representing the things honestly ultimately generates the customer trust. Customer trust is the pivotal characteristic of each and every relationship.

Jahanshahi, *et al* (2011) said that One may pursue the common point of these studies in undiscovered customer needs. In a setting where companies do not depend on others to serve customers, the customer is aware to whom his/her perception is dedicated, and the direct link between perceived quality, customer satisfaction and loyalty is naturally expected.

Abidin, *et al* (2016) told that Based on a sample size of 712 non-financial companies, the results suggest board independence as one of the determinant factors of auditor switch. Other significant determinants include the provision of non-audit service, changes in management, size.

Lokkerbol, *et al* (2012) informed that Financial service organizations are coping with increasing international competition. Organizations willing to gain or to secure a competitive advantage are required to continuously improve. One strategy to improve results is to eliminate operational inefficiencies.

Sampaio, *et al* (2012) said that Given the economic and social relevance of the ISO 9000 phenomenon, as well as the increasing availability of data related to it, we feel that more and more fact-based and statistically oriented studies should be conducted in this area.

Butler & Surace (2015) said that The newly emerging businesses are very fragile and represent an interest for managers and scholars alike to identify success strategies in emergent business sectors. According to the Australian Bureau of Statistics, more than 50% of all established

businesses fail in the first four years, for example, out of all existing new businesses established in 2007, just 48.6% were in business in July 2011.

Sukati, *et al* (2012) said that In today's competitive business, most of the firms increased focus on delivering value to the customer. The focus on attention of businesses is providing products and services that are more valuable compared to its competitors.

Roopchund & Boojhawon (2014) explained that Service quality has become a key marketing tool for achieving competitive differentiation and fostering customer satisfaction and loyalty. Across industries and sectors, firms seek to distinguish themselves and retain customers by excellence in service performance.

Pongpearchan & Ussahawanitchakit (2011) said that When an environment does not reached its carrying capacity, it may not guarantee survival of SMEs but only shows that this environment is easier to survive in than in other environments. Our study is only limited in the isolated population.

Al Khattab & Aldehayyat (2011) said that With regard to improvement of the tangibles dimension, hotel managers should focus on specific items (improvement areas) related to this dimension. These areas include equipment and physical facilities, appearance of employees, materials associated with the service, and operating hours in the hotels.

Goyanes (2015) said that As with age, gender has been found to be a fundamental factor in the analysis of intent to pay for online news in previous studies, although the findings have never established a significant association with general information; hence, men and women tend to behave similarly in this respect.

Makkonen, *et al* (2011) informed that A preferable path of future research would be to replicate our study also in other countries and cultures by using a more precise categorisation of age and income as well as a more varied set of methods for measuring willingness to pay.

Demirgüneş (2015) said that The analysis results reveal that perceived value dimensions have differential effects on customer satisfaction with the product and behavioral intentions. Implication of the current findings proposed the importance of perceived value in creating satisfaction and then WTP more.

Malawat & Putra (2018) said that Human capital which is the main point in improving the quality of MSMEs is required an entrepreneurship education support to be able to increase innovation

so as to be able to improve the performance of the company. The SMEs needed the capability in combining the income, capital, selling price, the amount of manpower from the community who can solve all problems to reach the market share globally.

Dilham & Aisyah (2017) informed that The community empowerment, transportation linked to environmental conditions that can be directed to produce results from the creation of society to be more quickly achieved in the target market. In the case of empowerment, the power of the development community actors who cooperatively create synergy and responsive to the problems that occur for the common welfare.

2 METHOD AND MATERIAL

This research took place in Deli Serdang Regency by taking the population from customers who are loyal to conduct transactions in SBD with VOE with samples taken by purposive sampling of 50 samples conducted from January to April 2018 based on the activity made. For data analysis techniques requires understanding of the couple linear combinations are called canonical variables because the dependent variables are more than one and require understanding the correlation value is called a canonical correlation.

The assumptions in Canonical Correlation, such as :

- There is a linear relationship and correlation between the dependent variable to the independent variables.
- The need for multivariate normality to test the significance of every canonical function.
- There is no multicollinearity between the members of the dependent variable group against the independent variables.

The variables taken are

- Independent variables represents service quality developments: Reliability is the ability of the service provider to provide what is promised to the recipient of the service (customer) accurately. Assurance relates to the knowledge, modesty, and ability of the worker (the service provider) to generate a sense of trust and confidence from the recipient (customer) for the services received. Tangibles relates to the physical facilities, equipment, and appearance of the service personnel. Empathy is concerned with the concern and care of the service provider to the

customer (recipient) and Responsiveness desires to provide excellent services and to assist the recipient (customer) in case of problems related to the services provided by the service provider.

- The dependent variable is a value depends on the change in the value of other ones. The indicators are as follows: Loyalty company provides an understanding that all customers can be more loyal with the improvement of existing indicators. Propensity to switch shows the resilience of customers not to switch to other products. Willingness to pay more shows the willingness of the respondent / patient to pay more for services

- The Pattern shows

Loyalty + = Reliability + Assurance +
 Propensity to switch + Tangible + Emphaty +
 Willingness To Pay + Responsiveness
 More

Metric

Metric

3 RESULT AND DISCUSSION

3.1 Result of Canonical Function

The famous VOE in Deli Serdang such as mineral managing water supply, cattle and pavin block. the customers make the assessments with loyalty, propensity to switch and willingness as dependent variable and reliability, assurance, tangible, empathy, responsiveness as the independent variables, namely:

 Eigenvalues and Canonical Correlations

Root No.	Eigenvalue	Pct.	Cum. Pct.	Canon Cor.	Sq. Cor
1	6,02435	99,59905	99,59905	,92609	,85764
2	,01924	,31816	99,91720	,13741	,01888
3	,00501	,08280	100,00000	,07059	,00498

Dimension Reduction Analysis

Roots	Wilks L.	F	Hypoth.	DError	DF	Sig. of F
1 TO 3	,13898	8,09698	15,00	116,4		,000
2 TO 3	,97623	,13009	8,00	86,00		,998

3 TO 3 99502 ,07345 3,00 44,00
,974

Three canonical functions are visible at root no, with canon correlation for function 1: loyalty is 0.92609 and function 2: propensity to switch is 0.13741 while function 3: willingness to pay more is 0.07059. In the sig column. of f which tests the significance of the canonical function, visible for function 1 is 0.000, function 2 is 0.998 and function 3 is 0.974. From these results, it appears that function 1 individually is significant, and can be processed further. For functions 2 and 3, cannot be processed because the numbers are significantly higher than 0.05 then function 2 individually is considered unable to be processed further.

Multivariate Tests of Significance (S = 3, M = 1/2, N = 20)

Test Name	Value	Approx. F	Hypoth. DF	Error DF	Sig. of F
Pillais	,88150	3,66166			15,00
Hotellings	6,04860	16,39843	15,00	122,00	,000
Wilks	,13898	8,09698	15,00	116,34	,000
Roys	,85764				

While tested jointly with test name: Pillais, Hotellings and Wilks for Sig numbers. Of F for all three procedures are below 0.05 ie 0.00. Thus, if combined together, then canonical function 1, canonical function 2 and canonical function 2 are significant and can be processed further.

3.2 Interpretation of Canonical Variates

Canonical variates is a collection of 5 variables that make up a variates. For measurement canonical variates can be done in two ways: Canonical weight and canonical loadings:

3.2.1 Canonical Weights

Standardized canonical coefficients for DEPENDENT variables

Function No.	1	2	3
Variable			
Loyalty	-,00354	,63380	-,83530

Propensi -1,16714 **-3,27464** -2,55693
 Willingn ,17370 **3,20854** 2,90435

Standardized canonical coefficients for COVARIATES CAN. VAR.

COVARIATE	1	2	3
Realibil	-,31135	-2,01593	,27936
Assuranc	,58465	-,75070	1,00145
Tangible	-,17904	-,12592	,83062
Emphaty	-,04855	-,08150	,91619
Responsi	-1,07671	2,71772	-,41674

Considering function 2 (second column number), it is seen for the dependent variable that loyalty variable is in the number 0.63380, the propensity variable is at -3,27464, but it does not meet because under 0.5 and willingness to pay more is in number 3.20854 that meets above 0.5. As for the independent variables (covariates), the correlation numbers above 0.5 are only responsiveness.

3.2.2 Canonical Loadings

Correlations between DEPENDENT and canonical variables

Variable	Function No. 1	2	3
Loyalty	-,28880	,65104	-,70196
Propensi	-,99920	,02980	,02684
Willingn	-,96273	,21347	,16606

Correlations between COVARIATES and canonical variables CAN. VAR.

Covariate	1	2	3
Realibil	-,91770	-,37317	-,11841
Assuranc	-,88512	-,11717	-,24101
Tangible	-,92564	-,10636	-,01826
Emphaty	-,29282	,10810	,82129
Responsi	-,97689	,05710	-,13062

By paying attention to function 2 (column of the second digit), a row of canonical loadings numbers for dependent variable loyalty above 0.5 is 0.65104. as for the independent variables (covariates), the correlation numbers above 0.5 are none.

3.3 Discussion

From the output of canonical weight or canonical loading, it can be said:

- For significant numbers below 0.05 then function 1: loyalty individually is considered to be processed further, but together have the same significant level.
- For output results canonical weight that meets with a significant level above 0.5 is willingness to pay more dependently and responsiveness independently.
- For the results the canonical loading output is loyalty dependent and no one meets independently if it is above 0.5.
- positive markings on the responsiveness variable indicate that the more customers who favor responsiveness and increase loyalty to increase willingness to pay more by the customer.

Willingness to pay more is the strong factor in VOE in Deli Serdang. As the Elderly users could benchmark for as the importance of quality management is universally espoused by the researchers and practicing managers working in this area with the eco centric values as the nonverbal communication and empathy are incorporated as components of their training programs like the opinion Firbank (2013), Sharma *et al* (2012), Lithoxidou *et al* (2017) and Peterson & Leonhardt (2015). As the strength factor to keep the customers, it must be improved to touch their heart. Benchmarking is the way to know the other company way to get them in the future

Loyalty is the strong factor to get more work needs to be done in the context of buyer-seller relations on the actual process of empathetic communication. Quality of services, transparent policies, delivering what is promised and representing the things honestly ultimately generates the customer trust. the customer is aware to whom his/her perception is dedicated and significant determinants include the provision of non-audit service, changes in management, size like the notion Plank & Reid (2010), Sarwar *et al* (2012), Jahanshahi *et al* (2011) and Abidin *et al* (2016).

Responsiveness as the independent variable gets the strong factor. VOE Organizations willing to gain or to secure a competitive advantage are required to continuously improve based on ISO 9000 phenomenon. The newly emerging businesses are very fragile and represent an interest for managers and scholars alike to identify success strategies in emergent business sectors. In today's competitive business, most of the firms increased focus on delivering value to the customer. Service quality has become a key marketing tool for achieving competitive differentiation and fostering customer satisfaction and loyalty lie the point Lokkerbol *et al* (2012), Sampaio (2012), Butler & Surace (2012), and Roopchund & Boojhawon (2014).

When an environment does not reached its carrying capacity, it may not guarantee survival of SMEs. With regard to improvement of the tangibles dimension, gender has been found to be a fundamental factor in the analysis of intent to pay for online news in previous studies. A preferable path of future research would be to replicate our study also in other countries and cultures by using a more precise. Human capital which is the main point in improving the quality of SMEs is required an entrepreneurship education. The weakness for dependent variables such as propensity to switch and reliability, assurance, tangible, empathy linked to environmental conditions that can be directed to produce results from the creation of society to be more quickly as the idea of Pongpearchan & Ussahawanitchakit (2011), Al Khattab & Aldehayyat (2011), Goyanes (2015), Makkonen *et al* (2011), Sukati (2012), Demirgüneş (2015), Malawat & Putra (2018) and Dilham & Aisyah (2017).

4 CONCLUSIONS

- Product quality growth in the VOE in Deli Serdang gets the loyalty variables individually for significant level and other dependent ones result the significant as group in industry revolution 4.0.
- The strong factor such as willingness to pay more and loyalty dependently and responsiveness independently make the quality of the VOE growth must be improved to get the real result.
- Human capital which is the main point in improving the quality of SMEs is required an entrepreneurship education. The weakness for dependent variables such as propensity to switch and reliability, assurance, tangible, empathy must be educated through the academic and practitioners approach.
- Comparative study among the SMEs in Deli Serdang to other success area can be directed to produce results from the creation of society to be more quickly.

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