Asian Journal of Information Technology 15 (15): 2559-2563, 2016
ISSN: 1682-3915
© Medwell Journals, 2016

Regression and Correlation Analysis for Strategic Management of Information Technology Private University of XYZ

Suyatmi and Ferry Wahyu Wibowo
Department of Informatics Engineering, STMIK AMIKOM Yogyakarta,
55283 Yogyakarta, Indonesia

Abstract: A statistical technique is a good way to assess and investigate the relationships of variables. The technique that has been described in this study is used to investigate the relationships among some variables. In this study has used regression and correlation analysis to define the relationship in the different ways because analysis of both regression and correlation has different roles in the implementation. These methods have been implemented to assess the effects of the internal environment, the external environment, the competitive advantage, and the organization performance. Based on concluding, the IT private university of XYZ is embracing the resource based view approach and the external environment doesn't affect the competitive advantage. Meanwhile the effect of competitive advantage to the organization's performance can be achieved with some conditions.

Key words: Analysis, correlation, management, method, regression

INTRODUCTION

This study is an enhancement of the research instrument testing for strategic management of Information Technology (IT) private university of XYZ. The method that has been used to collect data is using a census method. The samples of population or respondents used in this paper are 22 respondents. These respondents were taken from all stakeholders of the IT private university of XYZ. From the data results, the variable measurements shown that all questions in the questionnaire items have been checked and valid. For the reliability test, the results were also reliable. But for the analysis for that case hasn't been done yet. So, in this paper is analyzing for each items those have been obtained from the previous data. The analysis used in this study is the analysis of regression and correlation.

The regression analysis is a statistical technique to assess the relationship between an outcome variable and some risk variables. The outcome variable is known as the response or dependent variable and the risk variables are known as independent variables. Meanwhile the correlation analysis is a statistical technique to assess the linear relationship between two variables. So the regression and correlation analysis are due to the relationship among variables. The analysis of both is used to assess the data in the effects of the internal environment, the external environment, the competitive advantage and the organization performance variable measurements. So these assessments could be used as a reference and recommendation for the stakeholders of the IT private university of XYZ to manage its organization in the future (Williams *et al*., 2013).

REGRESSION ANALYSIS

Some hypothesis that would be tested the validity has been provided. Hypothesis testing was done using calculation result based on SPSS application tool version 15 consisting of summary model, Anova model and regression coefficient. The summary model was used to find the effect among all variables, especially value of R square (R^2). Meanwhile ANOVA table was used to know its regression model, thus for knowing the effects partially could be seen the calculation results on the coefficient Table 1. A structural equation for analysis of sub structural I is shown as Eq. 1:

$$\gamma_1 = \rho\gamma_1\chi_1 + \rho\gamma_1\chi_2 + \xi_2 \quad (1)$$

In this study the analysis is divided into two ways, i.e., the analysis at the combined effect and analysis at the effect partially. The effect of the internal environment,

Table 1: Combined influence of the competitive advantage

Model	R	R^2	Adjusted R^2	SE
1	0.839(a)	0.704	0.672	2.804

A predictors: (Constant), external, internal

Corresponding Author: Suyatmi, Department of Informatics Engineering, STMIK AMIKOM Yogyakarta, 55283 Yogyakarta, Indonesia

Table 2: The feasibility regression model ANOVA ([b])

Model 1	Sum of squares	df	Mean square	F-value	Sig.
Regression	354.644	2	177.322	22.558	0.000 (a)
Residual	149.356	19	7.86100		
Total	504.000	21			

[a]Predictors: (Constant), external, internal; [b]Dependent variable: Advantage

external environment and competitive advantage to the organization's performance in aggregate can be seen from the calculation with the output named summary model, especially the number of R^2 as shown in Table 2.

The magnitude of the numbers of R^2 is 0.704. This number is used to view the influence of the internal and the external environments to a competitive advantage. To determine the feasibility regression model depicted from the ANOVA table is shown in Table 2.

The hypothesis states that Ho defined as there is no linear relationship between the internal environment and the external environment with a competitive advantage, while H1 defined as there is a linear relationship between the internal environment and the external environment with a competitive advantage. The testing can be done in two ways. The first way is by comparing the magnitude F of research with F table and the second way is by comparing the level of significance (Sig.) results with significance level of 0.05 or 5%.

First, comparing the magnitude of the numbers F with F table. F is obtained amounted to 22.558. F table with the provisions of 0.05 was 3.44. The criteria is, if F is bigger than F table then H_0 is rejected and H_1 is accepted and if F is less than F table then H_0 is accepted and H_1 is rejected. In this study, the result of F is 22.558 that is bigger than F table which is of 3.44, then H_0 is rejected and H_1 is accepted. This means that there is a linear relationship between the internal environment and the external environment with a competitive advantage. Thus the above regression model is feasible and correct. The conclusion is the internal environment and the external environment in aggregate affect competitive advantage. The magnitude of the effect was at 0.704. The magnitude of the effect of other variables outside the regression model is calculated using the formula $1-R^2$ or 1-0.704 = 0.296 or 29.6%. Second, comparing the magnitude of the numbers significance level (Sig.) with a significance level of 0.05. The criteria used are: if the Sig. is <0.05, then H_0 is rejected and H_1 is accepted; and if the Sig is bigger than 0.05, then H_0 is rejected and H_1 is accepted. Based on the calculation of significance of 0.000 is <0.05, so that H_0 is rejected and H_1 is accepted. This means that there is a linear relationship between the internal environment and the external environment are combined. To know the effect of variables of the internal

Table 3: Partially effect coefficients ([a])

	Unstandardized coefficients			Standardized coefficients	
Model 1	B	SD	Beta	B	t-Sig.
(Constant)	354.644	2	177.322	22.558	0.000(a)
Internal	149.356	19	7.861		
External	504.000	21			

[a] Predictors: (Constant), external, internal

Table 4: Environment correlation of internal and external

Test	Internal	External
Pearson correlation	1	0.851(**)
Sig. (2-tailed)		
N	22	0.000
Pearson correlation	0.851(**)	22
Sig. (2-tailed)	0.000	1
N	22	22

**Correlation is significant at the 0.01 level (2-tailed)

environment and the external environment to the competitive advantage individually or partially is used test T. Meanwhile, to know the magnitude of the effect is used the Beta number or the standardized coefficient as shown in Table 3 (Chattopadhayay, 2015).

To know if there is a linear relationship between the internal environment with a competitive advantage and between the external environment with a competitive advantage, then could do the steps as follows: first, determine the hypothesis. If H_0, then there is no linear relationship between the internal environment with excellence competitive and if H_1, then there is a linear relationship between the internal environment with excellence competitive; Second, calculate the magnitude of the numbers t; Third, calculate the size of the numbers t table; Fourth, specify the criteria. If the number t is bigger than t table, then H_0 is rejected and H_1 is accepted, and if the number t is less than t table, then H_0 is rejected and H_1 is accepted; Fifth, make decisions.

CORRELATION ANALYSIS

The analysis of the correlation between the internal environment variables and the external environment is obtained as Table 4.

First hypothesis: The first hypothesis is an internal environmental factors positively effects the competitive advantage. Based on the calculations the obtained numbers t (3.337) is bigger than t table (2.086) so that H_0 is refused and H_1 is accepted. This means that there is a linear relationship between both an internal environment and a competitive advantage. The magnitude of the effect of the internal environment of the competitive advantages of 0.794 or 79.4%, the remaining 21.6%, obtained from 100%-79.4%, influenced by other variables outside the model. For example influenced by the vision, mission, goals and strategies. In conclusion the first hypothesis is proven.

The internal environment needs to be analyzed to determine the strengths and weaknesses that exist in the IT private university of XYZ. If the IT private university of XYZ performs in-depth analysis of the internal environment consists of a structure, culture and resources, then the company will have a competitive advantage. It was proven that the competitive advantages possessed by the IT private university of XYZ affected by the internal environment.

A good internal management practices need to be instituted as part of the concept of Total Quality Management (TQM), so that improvement can be done sustainably. Similarly, a benchmarking is an essential to boost the morale and motivation in improving corporate performances. The company's strategy can't be implemented properly without an adequate support system. The support system is not only facilitate the implementation of the strategy to be better but it can also strengthen the organizational capability to increase their competitiveness. In today's business environment, a competitive advantage will be on companies those are able to mobilize information and be able to create a knowledge system effectively (Chattopa).

The competitive advantage and difference in performance of the company have a close relationship with the resources owned by the company and how the company can manage it well. The company's resources are the foundation and pillar of the strategy. Without superior resources, the company will face many problems in facing of the competition in the market. The uniqueness of the resources that aren't owned by a competitor will result in a sustainable competitive advantage. Therefore, the company should be able know and utilize a resources for the management as well as possible in order to create superior value for customers as well as to generate profit for the company.

Second hypothesis: The second hypothesis is an external environmental factors positively affects competitive advantage. Based on the calculations the obtained numbers t (0.220) is less than t table (2.086), so that Ho is accepted and H1 is rejected. This means that there is no linear relationship between both an external environment and a competitive advantage. The magnitude of the influence of the external environment on the competitive advantages of 0.052 or 5.2% is considered insignificant.

The external environment is the environment that are outside of organization and needs to be analyzed to determine the opportunity and threats faced by the company. The external environment is composed of macro and industrial environment. The people wishes on the quality of higher education and technological development related to the management of the organization is the opportunity for IT private university of XYZ, whereas a political stability is a threat to the IT private university of XYZ.

Based on the results could be seen that the external environment doesn't affect the competitive advantage, because the IT private university of XYZ is using blue ocean strategy which is a strategy that the other universities haven't been carried out as its competitors by creating somethings those are different and unique, so it is difficult to be imitated by the competitors. It is seen by the culture of innovation that is emphasized to the entire academic community of the IT private university of XYZ.

In the last two decades there has been born many perspectives on strategic management and its processes. The approach used is mainly based on three perspectives: the perspective of the industrial organization, resource-based view and stakeholder approach (Teece *et al.*, 1997). Based on these results, the external environment doesn't affect the competitive advantage.

Third hypothesis: The third hypothesis is an internal environment and an external environment together affect the competitive advantage. The magnitude of the effect is of 0.704 or 70.4%. The magnitude of the effect of other variables outside the regression model is calculated using the equation of $1-r^2$ or 1-0.704 = 0.296 or 29.6%.

Based on the obtained results, the competitive advantage of the IT private university of XYZ is affected by the internal environment but it isn't affected by the external environment. But together, the internal environment and the external environment affect the competitive advantage of the IT private university of XYZ. However an organization must relate to the external environment.

Understanding an internal and external environments is very essential for the IT private university of XYZ to see current conditions and predictions of the future. By understanding the external environment, the IT private university of XYZ can strengthen the internal resources to enable the strategic fit that gives the opportunity to continue growing up. The external environment associated with the IT private university of XYZ consists of economic ability, cooperation with external parties, government regulations related to universities, the education industry competition and prospective students.

The strategy is a dynamic concept, where the successful is largely determined by the fit and match between resources and internal capabilities with external dynamics of the IT private university of XYZ. Therefore the IT private university of XYZ besides having the resources, capabilities and competencies that should be

done empowerement all the time, it also needs to have the flexibility to respond the dynamics of environmental change very quickly (Healy *et al*., 2015). In the era of globalization and the free market, the environment changes very quickly. The IT private university of XYZ can't isolate itself from the dynamics of the environment, it should be able to provide an appropriate response and take advantage of the change as an opportunity to develop the IT private university of XYZ in the future. In this context, it needs the capability to analyze internal and external, so that the future will always be a strategic fit between the capabilities and resources of the company with the external environment.

Fourth hypothesis: The fourth hypothesis is an internal environmental factors positively affects the performance of the IT private university of XYZ. Based on the calculations the obtained numbers t (2.024) is less than t table (2.086), so that H_0 is accepted and H_1 is rejected. This means that there is no linear relationship between the internal environment and the organizational performance. The magnitude of the influence of the internal environment on the organizational performance of 0.565 or 56.5%.

The performance is a decisive means in a process to achieve organizational goals. While the internal environment is the structure, culture and resources. When an organization has the resources but aren't optimized then predetermined organizational objectives won't be achieved so that the organization becomes less good performance.

Based on the obtained results, the internal environment doesn't affect the performance of the organization, it is because the performance of the organization is determined by the implementation of the strategy. In the context of the implementation of the strategy, the most important is the lack of compatibility between the strategy and the organizational capability, between the strategy and the organizational structure, between the strategy and the internal support systems, between strategy and organizational culture.

A managerial duties in the implementation of the strategy and execution of the strategy is to seek how the organization has the capability to be able to implement these strategies so that the organizational goals can be achieved within a predetermined time. An important task of top management is to evaluate the performance and progress of the organization. The leaders of companies must have systems and instruments to evaluate the development and progress of internal and external developments related monitoring and impact on the company. If progress isn't as planned internal and external environment is less favorable impact on the company, it needs correction and adjustment to the long-term direction of the company, objectives, business model or strategy.

If one or more aspects of the execution of the strategy isn't going well, then there is a possibility of the need to revise the budget, policy changes, reorganization, build new competence and capability as well as the revitalization of the corporate culture. In this context it should be stressed that the strategy is a dynamic concept, where success is largely determined by the fit and match between resources and internal capabilities with external dynamics of the organization. Therefore the organization in addition to having the resources, capabilities and competencies that should be done empowerement all the time, it also needs to have flexibility in responding to the rapidly environment changing dynamics.

Fifth hypothesis: The fifth hypothesis is an external environmental factors positively affects the performance of the IT private university of XYZ. Based on the calculations the obtained numbers t (-1.103) is less than t table (2.086) so Ho is accepted and H1 is rejected. This means that there is no linear relationship between the external environment and the performance of the IT private university of XYZ. The magnitude of the influence of the external environment on the organizational performance of-0.245 or -24.5% is considered insignificant.

Due to the external environment and the organization can be described by theories such as the population ecology theory, contingency theory and the resource dependence theory. The population ecology theory approach explains that the survival and success of the company is determined by the characteristics of the company is located. This approach implies that the external environment has a direct effect on company performance regardless of strategy options that run the company. While the contingency theory states that the alignment of the strategy and the external business environment determine the viability and performance of the company. The contingency theory also means that how strategy planning is able to meet the demands of the environment in which unless it created alignment between the strategic planning and the external business environment can result in reducing the performance so that it will emerge the organization crisis. When linked to the results can be said that there is no influence of the external environment and the performance of the organization with that theory, in the other word the theory doesn't apply in the IT private university of XYZ. The industrial organization model explains the dominant influence of the external environment on the

implementation of a corporate strategy. The company's performance is influenced by the range of industrial properties including economic scale, barriers to market entry, diversification, product differentiation and the level of companies concentration in the industry. The consequences of the industrial organization is the company must find the most attractive industries.

Sixth hypothesis: The sixth hypothesis is a competitive advantage on the performance of the IT private university of XYZ. Based on the obtained numbers t (2.531) is bigger than t table (2.086) so that H_0 is rejected and H_1 is accepted. This means that there is a linear relationship between the competitive advantage and the performance of the organization, or in other words the influence of the internal environment, external environment and competitive advantages simultaneously affect the performance of the IT private university of XYZ. The magnitude of the influence of the competitive advantage on the organizational performance of 0.541 or 54.1% is considered significant.

The competitive advantage is a competitive strategy to something that is designed to be exploited by an organization. Due to the competitive advantage is eroding due to the actions of competitors, it is necessary to understand the competitive environment as the search arena of competitive advantage. The aim of competitive strategy is the achievement of a sustainable competitive advantage by improving the company's performance. The competitive advantage can be achieved from implementing a value strategy creation not simultaneously but through the condition of the potential competitors.

The competitive advantage possessed by the IT private university of XYZ includes the courses offered, the curriculum of each study program, the management of the organization and excellence in the services provided to students and stakeholders. The courses offered by the IT private university of XYZ include diplom of Department of Information Management and Informatics Engineering, bachelor program of department of Information Systems and Informatics Engineering and master program of Informatics Engineering.

A sustainable excellence is achieved when these advantages can withstand the erosion or the behavior of competitors, in other words the skills and resources of underlying the business competitive advantage should be able to survive from duplicating another institution. There are four essential requirements of the resources and skills those can be regarded as the resources of competitive advantage i.e. it must be valuable, rare or unique, difficult to imitate, and irreplaceable. The performance of the IT private university of XYZ can be seen from the acquisition of the number of new students each year that is always increasing and accreditation of study programs is B, except the department of Information Management that got an accreditation of A.

CONCLUSION

It can be concluded that the IT private university of XYZ is embracing the resource based view approach. The resource base view approach assumes that each organization is a unique set of resources and capabilities that become the basis of the strategy and the main source of return companies. According to the perspective of Resource Base View (RBV), the difference in a corporate performance caused mainly by a resources unique factors and capabilities of the company, not caused by the structural characteristics of the industry. In the context of RBV, the resources are an inputs of the production process. The resources in the single form handedly wont result a competitive advantage. In general, the competitive advantage gained through the combination and integration of a set of available resources. Based on the results, the external environment doesn't affect the competitive advantage.

In relation between the effect of competitive advantage to the organization's performance can be achieved when the management capabilities, the creation and implementation of a strategy is able to resist the advantage that is being many impersonations and able to create resistance factor in the long term.

ACKNOWLEDGEMENT

Thank you for STMIK AMIKOM Yogyakarta which has given us chance to present our research.

REFERENCES

Chattopadhayay, C., 2015. Business environment: A note. Int. Res. J. Eng. Technol., 2: 261-264.

Healy, W., E. Knaus, W. Matthews, R. Mir and S. Betts, 2015. Strategy in an era of economic uncertainy: Integrating external and internal antecedents of firm performance. Acad. Strategic Manage. J., 14: 92-108.

Teece, D.J., G. Pisano and A. Shuen, 1997. Dynamic capabilities and strategic management. Strategic Manage. J., 18: 509-533.

Williams, M.N., C.A.G. Grajales and D. Kurkiewicz, 2013. Assumptions of multiple regression: Correcting two misconceptions. Practical Assess. Res. Evaluation, Vol. 18.