Propelling the Innovation Speed for Malaysian Biotechnology Products

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Abstract: The aim of this paper is to examine the effect of professional expertise, managerial, markets related knowledge and experience on innovation speed of new product performance related to biotechnology companies. Innovation speed is considered as a core element in performance of new product. Many researchers have stated a positive and effective interaction between success of new product performance and speed to market. Another point is that innovation speed provides a firm and sustainable competitive advantage. And at last, innovation speed for each biotechnology company is valuable resource and tries to have close relationship between customers and their requirements. The innovation speed cannot be developed easily just by project managers, technological developments and competitors in all around the world; in many results of researches it can be seen that innovation speed has been absent in marketing strategies, especially in biotechnology companies. Bringing innovation speed in biotechnology companies to increase profit of the company is big challenge in marketplace.
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1. Introduction

Recently, the focus on relationship between innovation speed and new product performance is dramatically increasing. Many researchers show that this issue has positive and great impact on new product performance. However, researchers attempt to determine how innovations speed, commercialization and new product performance are big challenge for each organization and what strategic advantages are required (Coussement & Buckinx, 2011). Besides that, there are several examples of companies which are followed these strategies and predominant economic events happened to them. For example, Google Company started by two Ph.D students, Standford University, as a research Project. Another one is two famous universities, MIT and Cambridge University had great influence to develop high-tech around the world especially in UK.

Biotechnology companies are not exception. There are many researches are in progress to solve different problems specifically marketing and commercializing new product in competitive world regarding to these companies (Gounaris et al., 2010). Best result and best performance are the priority for customers and it cannot be neglected. Another major driver is innovation speed and it increases both productivity and financial supports for biotechnology companies and these firms attempt to have rapid adoption of new product performance. But which company will be successful? Strong position and revenue are reward of activities related to creative and innovative R&D. It can be seen that bringing new product into the biotechnology industry is a big challenge. Strong marketing campaign to introduce, convince and adopt customers with new product performance is another business issue (Liu & Forsythe, 2010).

It should be mentioned that commercial application is fundamental in creating of each new technology and product that can help to support the positive growth in competitive marketplace. The innovation speed is implemented between activities of nascent entrepreneurial and making the first profit (Juga et al., 2010). Independent variables to develop innovation speed in this paper refers to professional expertise, managerial skill, market related knowledge, experience, skill and dependent variable is innovation speed of new product performance.

The definition of innovation speed in a firm is the space of progress that represents new product commercializing and innovating. It is a capability of a company that refers to activities to accelerate the process of new product development. Outcomes of new product are a result of profitability, market share and sale; it can be considered as new product performance (Hume & Mort, 2010).

The most important and tangible problem of biotechnology providers, researchers and companies

in biotechnology industry is that many young companies do not know how to introduce, commercialize, and distribute a new product in marketplace (Liu & Forsythe, 2010). Therefore, the present situation impacts on these companies to design and formulate their business model which follows marketing and commercialization strategies beside innovation speed to make revenue. It is possible to do that; having good and effective relationship with other professional companies and find proper strategies in various location around the world is useful (Ponsignon et al., 2011).

Also creating value is a significant factor to introduce a new product to the customer. Innovation speed would create value for each customer; speed of commercialization and adoption noticeably impact the success and financial of companies (Hume & Mort, 2010). It has been an important issue in both information product and biotechnology industries because of possibility of risk and rate of time. The influence of creating value is on expectation of market and managerial and commercialization. Customer acceptance is a significant issue in biotech industry and if the company will be successful to introduce new product to marketplace the productivity and revenue will be dramatically go up both for suppliers and retailers (Anh & Matsui, 2011).

2. Theoretical Framework

Influenced aspects and factors on speed of biotechnology innovations help literature to be rich. In this study, independent variables referred to factors and aspects which are taken from different but related sources. Variables have been selected based on their relevance to the innovation speed in biotechnology companies and related application .These factors are divided into 5 categories which are including:

2.1 Professional Expertise

Expertise is a characteristic of a person who has knowledge to solve the specific problems efficiently and effectively. Expertise is a valuable knowledge and in fact is essential asset for each company and biotechnology companies need these professionals as a based structure of the company (Maditinos & Theodoridis, 2010). The knowledge of these people can develop some aspects of the company for example; can aid to decide about standardized knowledge and access knowledge of other competitor which is called structural expertise. The responsibility of management in the biotechnology companies to have better output in future is formulating strategies, collecting and coordinating both staff and clients (human expertise) and supporting them to apply the expertise and performing functions (Gounaris et al., 2010).

2.2 Management

One key element to fulfill a purpose is management. The definition of management is responsibility to design effective planning and regulation to gain a goal and do an operation. In fact, it has various aspects and consists of dynamic process and activities; these aspects are common in different operative functions such as finance, marketing, purchase etc without considering managers' status (Liu & Forsythe, 2010). There are four basic and fundamental keys of management; 1- Planning, 2- Organizing, 3- Staffing, and 4-Controlling. Other aspects that have influence but not the main ones are supervision, motivation, leadership and communications. The purpose of management is managing and controlling everything which is occurred and he/she would confirm them with standards; it is an efficient way to control and manage a system or organization to have high and best performance (Herna´ndez et al., 2011).

2.3 Market Related Knowledge

One of the most critical, dynamic and helping factors that can face the challenge of markets is market related knowledge which manages companies' changes and provide customer preferences. To improve the process of every single business to gain superior market related performance this knowledge is the priority. To attain the best performance analytical capabilities, direct human interaction and knowledge- intensity are the most noticeable features that cannot be neglected (Brandon-Jones & Silverstro, 2010). Physical products, services and the process of commercialization of the companies are the nature of market related knowledge and performance that without them being successful is impossible. These factors can help to retain positive customers' relationship with companies. This is the right way to nurture, develop and process market related knowledge and performance which is a useful measurement (Williams & Naumann, 2011).

2.4 Experience

A firm's development and growth have close relationship with ability to introduce and offer new products. Having especial knowledge and combine it with key elements such as facilitating manufacturing, promotion and sales, and distribution of the product makes a business is successful (Lin & Lin, 2011). Experience has a great and critical role in product-market domain. Experience can be defined differently in different businesses but its value is constant this value can enhance and help to present a new product to a competitive marketplace. Possessing specific stock of technological and product market experience can assist to have more successful new product presentation and customer acceptance and it can lead

to more initial sales level (Maditinos & Theodoridis, 2010).

2.5 Skill

Manager has three different fundamental skills but these skills have different applications; it can be defined ad Technical, Human and Conceptual. Technical skill refers to be proficient in specific tasks and it tries to persuade people to do dome specific actions. Human skill can be explained as how to work with different people inside and outside the organization. And Conceptual skill is a skill that manager considers organization as whole (Anh & Matsui, 2011). In fact, it is a skill to have an effective and efficient interaction with other people and organization. The most significant management skills are as follow: Ethical standards, People skills, Visionary, Self-management, Team player, Making decision to solve complex problems, Flexibility and Strategic thinking (Gounaris et al., 2010).

Innovation Speed of New Product Performance

A final challenge in each business is new product introduction and performance but it requires innovation speed strategies to do this; nowadays, there are so many competitors in all around the world and if a company had delay to do the right action such as effective commercialization or sufficient R&D expenditures or financial budget to market a new product, the company will be failed very soon. Knowing about innovation speed strategies, considering ability of competitors and evaluating market and competitors' actions are essential assessment to have the best strategy and offering the best model to be number one and having better future (Lin & Lin, 2011).

Figure 1. Research Framework

Two Real Examples of Biotechnology Products

In this paper two real examples of biotechnology products are presented: Triomic which is made in Malaysia and Qiagen from German. These products are related to biotechnology industry and are used to DNA extraction. The powerful and competitive product all around the world especially in Malaysia is Qiagen. Research centers universities and laboratories are big users in Malaysia. But there is an unanswered question; Why Triomic cannot compete with this Germany product while Triomic is made in Malaysia and to some extent is cheaper?

The detail of Qiagen product information about values, management, commitment and sales are indicated. This company has innovative technology leader and market which is providing wide samples to these research centers. The mission of the company is achieving success of life science, molecular diagnostic and their commitment is customer service. Its strategy is to gain excellence of all centers of activity and concentrate on core competencies and try to enhance value to its customers (Yao, 2011). The most noticeable characteristic of this product that Triomic cannot do it until now is invent, develop the solution standardization and guarantees the result; so reliability is key success. Standardization and simplification provide this opportunity for non-experts to benefit the molecular biology methods.

Management is brave to change to product whenever it is needed to have better and better performance and also has commitment to its responsibility; he/she strives to have effective communication with the company's customers all around the world and is compatible to their environment. Trust-building is composed in all different activity areas (Coussement & Buckinx, 2011). Malaysian product, Triomic, has to fulfill all these existing gaps in this industry to be potential competitors. Here there are bar charts of sales and earnings of Qiagen during 2007 to 2011 (Figure 2) according to Qiagen Website (www.qiagen.com).

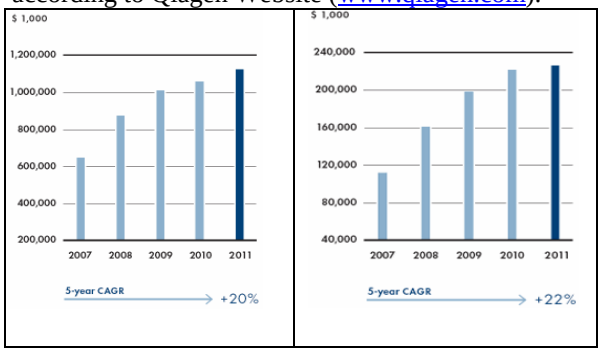

Figure 2. Net Sales & Diluted Earnings Per Share; Adjusted (2007-2011)

3. Materials and Methods

To conduct the data in this research a quantitative questionnaire was designed. The validity of the questionnaire was guaranteed by the researcher, a pilot test and a board of specialists. Cronbach's alpha consistency was applied to do the measurement of the questionnaire reliability (Levy and Lemeshow, 2008; Ary et al., 2006). 20 Malaysian biotechnology companies were supposed to answer the questionnaire to conduct the reliability of pilot test. These respondents were not included in the target population of the research. The questionnaire which was adapted were considered administered on

company managers. The Cronbach's alpha was utilized for each single item of the questionnaire. The reliability coefficients of the questionnaire which is distributed to R&D managers' and manager director of biotechnology companies in various constructs and sections that are called Professional Expertise, Management, Market related the knowledge, Experience, Skill and Innovation speed of new product was calculated that were equal to 0.87, 0.90, 0.89, 0.88, 0.86 and 0.91 respectively.

All the coefficients indicated the answers corresponding related to stable and consistent items do not change in different constructs. It should be mentioned that all coefficients were more than 0.75. The result of reliability coefficient for this research is 0.90. Managing directors and R&D managers who are academic members in biotechnology companies replied distributed questionnaires. 110 validated and reliable questionnaires have been distributed to biotechnology companies. 71% (N=79) was the feedback rate for biotechnology companies.

The descriptive statistics show that the age of respondents was 30 to 60 years old while 70.9% of them were males and 29.1% were females. 30-35 years = 21.5%, 36-40 years = 24.1%, 41-45 years = 24.1%, 46-50 years = 20.2%, 51-55 years = 3.8% and more than 55 years = 6.3%. Age factor mean was 42 years. The percentage of R&D managers was 65.8% and managing directors' participation was 34.2%.

The degree of company respondents is divided into 3 categories which is presented percentage, i.e. 2.5% are with bachelors' degree, and 68.4% have a master's degree, while 29.1% hold Ph.D.'s. The range of experiences is from 2 years to 21 years. Collected responses can be classified as follows: 20.3% were in the range of 1-5 years, 60.7% between 6-10 years, 16.5% were in the range of 11-15 years, while 2.5% had more than 15 years experience.

The information about trained personnel in biotechnology companies indicated that 5.1% of the companies had less than 10 trained personnel, 30.46% had between10-15 trained personnel, 34.1% with 16-20 trained workers, 16.5% with 21-25 trained workers, 7.6% with 26-30 trained workers and 6.24% were large companies with more than 30 trained personnel.

Now the logit regression model is utilized to check the possibility of happening and occurring an event between existing factors of Professional Expertise, Management, Market related knowledge, Experience, Skill as the independent variables and Innovation speed of new product performance act as dependent variable.

3.1 Logistic Regression

In a variety of regression applications in social sciences fields, the response variable of interest has only two possible quantitative outcomes, and therefore can be represented by a binary indicator variable taking on values 0 and 1 (Nemes et al., 2009; Agresti, 2007; Peduzzi et al., 1996). In this study, the basis of the questionnaire was a Likert scale of five values. The positive values of innovation speed (somewhat agree, agree and strongly agree) are recoded as 'agree' and indicated by the value 1, and the negative values (strongly disagree and disagree) are recoded as 'disagree' indicated by the value 0, so the variables are turned into binary variables. We recoded the innovation speed because in social sciences fields, the most noticeable discussion is logistic regression and the main feature of this level of importance is marketing applications to analyze and predict customers' tendency to start or stop buying a product or service. Thus, a logistic regression model is utilized to get the optimum innovation speed of the company.

Let us consider the logistic regression model:

$$E(Y_i) = \pi_i = \frac{e^{\beta_0+\beta_1 X_{1i}+\beta_2 X_{2i}+...+\beta_m X_{mi}}}{1+e^{\beta_0+\beta_1 X_{1i}+\beta_2 X_{2i}+...+\beta_m X_{mi}}} \quad (1)$$

The logit transformation leads to the logit response, or linear predictor as follows:

$$L_i = \ln\left(\frac{\pi_i}{1-\pi_i}\right) = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + ... + \beta_m X_{mi} \quad (2)$$

We maximize the parameters $\beta_0, \beta_1, \beta_2, ..., \beta_m$ by maximum likelihood estimator. Then we substitute these estimated parameters into the response function in (1). We shall use $\hat{\pi}_i$ to denote the fitted values for the *i*-th cases as follows:

$$\hat{\pi}_i = \frac{e^{\hat{\beta}_0+\hat{\beta}_1 X_{1i}+\hat{\beta}_2 X_{2i}+...+\hat{\beta}_m X_{mi}}}{1+e^{\hat{\beta}_0+\hat{\beta}_1 X_{1i}+\hat{\beta}_2 X_{2i}+...+\hat{\beta}_m X_{mi}}} \quad (3)$$

Now the fitted logistic response function is the probability logit of unknown binominal which is indicated as a linear function of X_i and expressed as

$$L_i = \ln\left(\frac{\hat{\pi}_i}{1-\hat{\pi}_i}\right) = \hat{\beta}_0 + \hat{\beta}_1 X_{1i} + \hat{\beta}_2 X_{2i} + ... + \hat{\beta}_m X_{mi} \quad (4)$$

Here $\left(\frac{\hat{\pi}_i}{1-\hat{\pi}_i}\right)$ is called odds ratio. This estimated logit model in (4) can predict the probability of the innovation speed of products regarding to biotechnology companies which is expressed by adoption rate.

$$Adoption\ Rate = \hat{\pi}_i = \left(\frac{e^{-L_i}}{1+e^{-L_i}}\right) = \left(\frac{1}{1+e^{-L_i}}\right) \quad (5)$$

4. Results and Discussions

To do the analysis of the possibility of innovation speed of new products rate in biotechnology products, the above formulas have

been considered; it also helps to predict chances and probability for the innovation which is adopted.

There is no missing value in the collected questionnaires (N=79) from biotechnology companies are encompassed in the analysis which is shown by case processing summary in Table 1.

Table 1. Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	79	100.0
	Missing Cases	0	.0
	Total	79	100.0
Unselected Cases		0	.0
Total		79	100.0

a. If weight is in effect, see classification table for the total number of cases.

Table 2 shows the classification of the innovation speed. From this table we can see that there were 22 disagree and 57 agree values due to dependent variable of innovation speed of new biotechnology product performance. 72.2 is the correct classification rate. To specify the predictability of the calculation this percentage is applied.

Table 2. Classification Table[a,b]

Observed			Predicted		
			Innovation Speed		Percentage Correct
			Disagree	Agree	
Step 0	Innovation Speed	Disagree	0	22	.0
		Agree	0	57	100.0
	Overall Percentage				72.2

a. Constant is included in the model.
b. The cut value is .500

The coefficients are equal to 0 for all the independent variables and the primary test of the model is shown in Table 3. The log odds (logits) are the beta coefficients of equation of the regression. From one unit of change in X, the change in the average value of Y can be explained and described by the slope.

Table 3. Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.952	.251	14.386	1	.000	2.591

The null hypothesis has been tested using the chi-square goodness-of-fit test and this mentioned test does specify the step justification. The step is shown in Table 4 from the constant-only model to the all-independents model. If the significance of the step is equal to less than .05, the step was to add one or more variables then the inclusion is justified. If the significance of the change was large (ex., over .10), variables had been dropped from the equation then it is possible to justify the exclusion. Chi-square model in this case has a value of 27.983 and a probability of $p < 0.000$ with 5 degrees of freedom that can be seen in Table 4. So, all indications show that the model has a significant whole fits.

Table 4. Omnibus Tests of Model Coefficients

		Chi-square	Df	Sig.
Step 1	Step	27.983	5	.000
	Block	27.983	5	.000
	Model	27.983	5	.000

There is 1 step in Table 4 since to provide only one model to do comparison with the constant model both variables should be entered simultaneously.

Table 5. Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	65.477[a]	.298	.430

a. Estimation terminated at iteration number 6 because parameter estimates changed by less than .001.

In Table 5 to make a logistic R^2 which is based on "likelihood" and the *Cox and Snell's R-Square* and *Nagelkerke R-Square* are involved to do that. Adaption of the *Cox-Snell* measure has been done by the Nagelkerke measure so that it changes from 0 to 1. The *Cox-Snell* measure in this logistic model has indicated the variation in the DV and it is equal to 29.8%. One of the most reliable relationship measurements which ranges from 0 to 1 is the *Nagelkerke* modification. Normally, the *Cox and Snell* measure will be lower than *Nagelkerke's R-Square.* Here the relationship between the prediction and the predictors is moderate and it is 43%; in this case the *Nagelkerke's R-Square* is equal to 0.430.

Table 6. Classification Table[a]

Observed			Predicted		
			Innovation Speed		Percentage Correct
			Disagree	Agree	
Step 1	Innovation Speed	Disagree	13	9	59.1
		Agree	5	52	91.2
	Overall Percentage				82.3

a. The cut value is .500

In Table 6 the classification which has been done is a 2 x 2 table that represent the incorrect and correct estimation for the full model with the constant and independents are shown. Two observed (actual) values of the dependent can be seen in rows while

two predicted values of the dependent are represented in the columns. In all cases, in perfect model the overall percent correct will be equal to 100% and all cases will be on the diagonal. For both rows the result of percent correct will be approximately the same if the logistic model has homoscedasticity (not a logistic regression assumption). It would be mentioned that the overall percent is 82.3% that it is predicted correctly and is a good result. As illustrated in Table 2 the rate of observed correct classification is 72.2 while the rate of fitted correct classification is 82.3; this rate is much larger than the base line of the cut point 0.5, so the conclusion is acceptance of model performance.

Table 7. Analysis of Maximum Likelihood Estimates

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Professional Expertise	2.340	.463	.9475	1	.047	18.007
	Management	-14.756	7.382	3.179	1	.062	1.292E4
	Market related Knowledge	5.136	.411	6.325	1	.035	126.365
	Experience	1.194	.851	8.732	1	.024	49.391
	Skill	3.218	.912	12.443	1	.000	24.977
	Constant	-46.983	23.169	6.906	1	.009	.003

a. Variable(s) entered on step 1: Avr.B, Avr.C, Avr.D, Avr.E, Avr.F

The most applicable and significant results are represented in Table 7. To test the significance of independents and each single of the covariate both the corresponding significance level and the Wald statistic are utilized. The Wald statistic is equal to the ratio of the logistic coefficient B to its standard error S.E., squared. The model can have a significant parameter if the Wald statistic is significant (Sig. less than 0.05).

The priority is the coefficients exponentiation and describing them as odds-ratios "Exp (b)". The odds ratio of dependent and independent row has been shown by the "Exp (b)" column. In corresponding independent variable a unit has been increased and the predicted change in odds is obvious in this unit. Odds ratios more than 1 correspond to enhance and odds ratios less than 1 correspond to plummet in odds. There is no effect on the dependent variable by unit changes in that independent variable while odds ratios close to 1.0. If *p*-value of independent variables (Professional Expertise (Avr.B), Management (Avr.C), Market related knowledge (Avr.D), Experience (Avr.E) and Skill (Avr.F) is 0.05 or less the null hypothesis, that there is no difference between the coefficients (B) of independent variables can be rejected.

It is indicated in Table 7 that only Avr.C (Management) is not statistically significant with *p*-values of 0.000, while Avr.B (Professional Expertise), Avr.D (Market related knowledge), Avr.E (Experience) and Avr.F (Skill) are. As an example, when one unit enhancing has been occurred in Avr.F, the log odds of biotechnology innovation speed rate made by biotechnology companies (Avr.G) goes up by 3.218. To do logical interpretation Exp (B) (Odds ratio) is applied. For example, a factor of changing the Exp(B) of biotechnology innovation speed rate which equals to 24.977 is seen while one unit change is happened in Avr.F.

From perspective of biotechnology companies' managers, the model of estimation which is designed by Malaysian biotechnology companies is applied to predict the probability of speed of biotechnology innovations adoption:

$$L_i = \ln\left(\frac{\pi_i}{1-\pi_i}\right) = -46.983 + 2.30Avr.B + 5.136Avr.D + 1.194Avr.E + 3.218Avr.F \quad (6)$$

For predictors in this paper 2 units are supposed, so the level of acceptance and probability of adoption of Biotechnology Company and its calculation has been presented below:

$$L_i = \ln\left(\frac{\pi_i}{1-\pi_i}\right) = -46.983 + 2.30Avr.B + 5.136Avr.D + 1.194Avr.E + 3.218Avr.F = -46.983 + 2.30\times 2 + 5.136\times 2 + 1.194\times 2 + 3.218\times 2 = -23.207 \quad (7)$$

Thus

$$Adoption\ Rate = \left(\frac{1}{1+e^{-L_i}}\right) = \left(\frac{1}{1+e^{-(-23.207)}}\right) \to 0 \quad (8)$$

i.e., zero percent is the calculated amount. It can be seen that the percentage of chance is zero that a company would adopt a biotechnology innovation; all factors have no change and they are constant.

The possibile estimation of biotechnology innovation adoption of a company can be occurred while 5 units are given to predictors:

$$L_i = \ln\left(\frac{\pi_i}{1-\pi_i}\right) = -46.983 + 2.30Avr.B + 5.136Avr.D + 1.194Avr.E + 3.218Avr.F = -46.983 + 2.30\times 5 + 5.136\times 5 + 1.194\times 5 + 3.218\times 5 = 12.457 \quad (9)$$

$$Adoption\ Rate = \left(\frac{1}{1+e^{-L_i}}\right) = \left(\frac{1}{1+e^{-(12.457)}}\right) \to 1 \quad (10)$$

i.e., the result of estimation is approximately 100 percent. There is absolutely a connection between increasing and enhancing Professional Expertise, Market related Knowledge, Experience and Skill are absolutely connected with increasing of adoption rate of biotechnology innovation speed chances in this model. In each single step logit model can prepare each unit change of predictors and estimation of adoption rate of biotechnology innovation speed. In above table it is shown that the impact of each independent variable can be recognized by dependent variable and for dependent variable the average of responds are used.

As a result each single independent variable impacts on dependent variable; the reason for this effect is in above calculation average of dependent variable response. In Table 8 outcomes are obvious and they are understandable and comparable; all results related to the responses of biotechnology company managers which are collected by questionnaire that can be seen in Table 8.

Table 8. Final Results

Test	Results
Logistic Regression:	- Professional Expertise (Avr.B) - Market related knowledge (Avr.D) - Experience (Avr.E) - Skill (Avr.F)

The most effective variables on biotechnology innovation speed are Professional Expertise, Market related knowledge, Experience and Skill. It is the perspective of biotechnology company managers.

Logistic regression and its main factors help us to measure the adoption rate and the probability rate of biotechnology innovation speed. In current discussion company related-data will be explained. One of the main advantages of logistic regression is the power of predicting probability of innovation adoption by companies. Logistic regression model can anticipate possibility of each single unit and it is just done for predictors. The aim of designing of adoption possibility graph is assigning each single unit to predictors while percentage representation change in biotechnology adoption chances is so obvious and understandable through Figure 3. Note that MATLAB 7.0 software is applied to compute the Figure 3. The chances of various allocated units are shown in Table 9 and Figure 3.

The probability of acceptance of new biotechnology innovations is indicated in graph so clearly. X axis and Y axis possibility in Figure 3 represent the unit values for predictors in biotechnology innovation speed rate while all other factors are constant.

Table 9. Chance Percent for Accelerating the Biotechnology New Product

Biotechnology Companies:						
X	0	1	2	3	4	5
Logit (π_i)	-46.983	-35.095	-23.207	-11.319	0.569	12.457
π_i	0.00	0.00	0.00	0.00	0.64	1

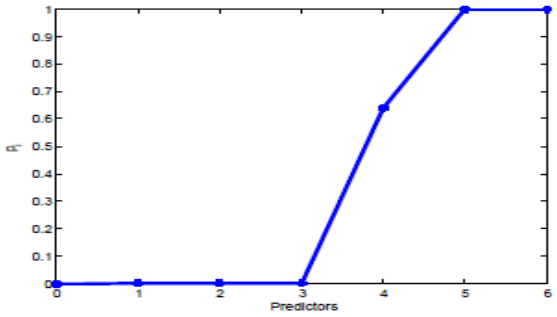

Figure 3. Rate of Biotechnology Innovation Speed Based on Biotechnology Companies' Data

The interpretation is going up the rate of biotechnology innovation speed in monotonous way. It can be seen in Figure 3 that if 5 would be the result of allocated units the possibility of acceptance by companies is 100%; and if the result of allocated units would be less than 3 the probability of acceptance will be 0%. The adoption chance can goes up from 0 to 100 percent while the consequence of two units is in interval (3, 5]; it would be considered that this result is the most impressive and effective one.

5. Conclusions

As a result, designing and delivering the new product or service is the first aim of all biotechnology managers and companies since they need to survive in this competitive marketplace (Lin & Lin, 2011). Based on many researches, the power of support and cooperation with colleagues to have the best innovation speed which has noticeable effect in profit of biotechnology companies cannot be denied and it is the duty of market managers. The ability to accept the importance of innovation speed in biotechnology companies and how to take them into market have been proved in many market research methods; it has major effect on failure or success of launching a new product in these kinds of companies (Liu & Forsythe, 2010).

It should be considered that because of the short product life cycle in biotechnology products and high

customer expectations the need of ability to innovate and deliver the speed are essential for business performance and its lasting. The combination of innovation and speed in biotechnology companies and the impact of non-traditional competition reveal the new challenges for all business owners all around the world and biotechnology companies are of no exception. Managing risk and experimentation is a matrix structure for biotechnology companies to enhance the capacity to deliver innovation with speed (Coussement & Buckinx, 2011).

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