

How Information Technology Affects Decision Making

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ABSTRACT

One of the most important contribution of information technologies on the leaders was to enhance the performance level with the help of alternatives provided by the information technology. Information technology provided support to decision making process. The main important point in the decision making was giving the most appropriate and best decisions. This research was conducted to analyze the effect of Information technology in Junior High school principals in Tomohon City. The study was conducted with quantitative approach using simple regression technique. The result show that there were significant impact of Information technology on principal decision making. Therefore, suggested that education institution leaders to enhance the maximization of Information Technology.

Keywords: decision making, information technology, school

INTRODUCTION

As an educational institution, Schools has various activities related to the provision of education. There are various kinds of activities that reflect the implementation of education ranging from those that are management and administrative to those that are technical in nature learning. These activities are divided into specific units where there are roles from stakeholders in the school. These activities continuously build the school into an organization that can realize its vision and mission well.

One key activity to achieve school success is how the decision was made. Decisions are made at all levels of school organization (Lunenburg, 2010). The supervisor decisions concerned a school region's goals and strategies. Then principals make tactical decisions concerning those goals and strategies to accomplish them in relation to their own buildings. Department heads and team leaders then make curricular and operational decisions to carry out the day-to-day activities of a department or unit. And, finally, classroom teachers make decisions in their classrooms. The principal make

decision. In schools, principal's decisions were crucial. Decision making allows each principal to know what steps should be taken in the future regarding the achievement of school goals. The principal will take part to what decisions he takes so that there will be good management effectiveness on the implications of decision-making theory. Decision making allowed the school continued to be dynamic amid obstacles and threats that arise both from internal and external schools.

School's Principal needed information. Information helped to solve problems effectively and efficiently. Well-managed information technology could be an asset to schools that implement it. Principals can utilize information technology in the decision-making process. Information processed in education was in the form of an information system. There were still many school principals who did not take advantage of information technology. As a result, the improvement in school quality had become slower and less than other schools. There was a long-standing trend in which the parameter used for competitive advantage was the management of physical resources. But now the paradigm had changed along with the development of science that information can be an advantage in competing. Information technology has a high value for the sustainability of an organization including schools. The information generated by a well-managed system will provide such great benefits. Decision making by the principal supported by management information technology helped the school to achieve educational goals. This information came from various units or sections in the school such as curriculum, facilities and infrastructure, student affairs, staffing, finance, and so on. Each of these sections applied an information system in carrying out its tasks. The data generated from each part was then collected and processed into information that could describe the conditions and circumstances that occur. Thus, the principal could find out what position the school was in a state that had the opportunity to progress or is experiencing setbacks. The headmaster determined what steps should be taken to give the school direction to develop.

Tomohon City was one of the young cities in eastern Indonesia. However, awareness of the use of information technology had been high by most of the community. However, it is a big question whether the decision makers in schools, in this case principals, have really made use of the information technology available. This study explores the use of information technology by school principals in Tomohon city, totaling 24 people, in their decision making.

Decision Making

Decision making is the determination of choice between two or more alternatives (Robbins, 2007), while Terry argues that "decision making is the selection of certain alternative behaviors (behaviors) from two or more existing alternatives." In line with that, Siagian stated that decision making is a systematic approach to the nature of the alternatives faced and taking action that according to calculations is the fastest action. Furthermore, Robbins and Coulter (2012) define decision making as "1). identifying a problem 2). Identifying decision criteria 3). allocating weights to the criteria 4). developing alternatives 5). analyzing alternatives 6). selecting an alternative 7). implementing the alternative 8). evaluating decision effectiveness".

Decision making was a dynamic process. This dynamic process had behavioral and strategic implications for the organization. Recent empirical research indicated that decision processes that include making strategic choices result in good decisions in organizations. The same opinion was

conveyed by Robert Kreitner (2011) "Decision making entails indentifying and choosing solutions that lead to a desired end result". Decision making is the process of identifying and selecting problem solving (solutions) to achieve the desired or expected end result. The quality of the decisions managers make is the measure of their effectiveness. Sometimes, one or two good or bad decisions can greatly affect an individual's career success or even organizational success.

Supranto (1998) stated that decision making was to choose one of the best alternatives among many alternatives. Furthermore, Stoner emphasized the process element of problem solving. He argues that the process aspect was an integral part of decision making. In that process a decision maker identified problems, gathered information and established decision alternatives. Decision making is the process used to choose a course of action as a way of solving problems. Decision making according to Stoner contains three meanings, (1) there is a choice based on logic or consideration, (2) there are several alternatives that must be chosen one of the best, and (3) there is a goal to be achieved and the decision is getting closer to that goal. Gullies (1996) explains that decision making is an unhurried cognitive process and consists of a series of stages that can be analyzed, refined, and combined to produce greater accuracy and accuracy in solving problems and initiating actions.

Kreitner & Kinicki (2010) provide an explanation of decision making as follows: "the rational model proposes that managers use a rational, four step sequence when making decisions; (1) identifying the problem, (2) generating alternative, (3) selecting a solution, and (4) implementing and evaluating the solution". According to this model, managers in decision making were completely objective and mastered all the information needed. After the solution was selected, the next step was to apply it, then evaluated the effectiveness of the solution. The above statement is supported by Luthans (2011: 259) "decision making is universally defined as choosing between alternatives". This related to traditional management functions. When managers plan, manage, and control, they made decisions. An individual who has good decision making will try to work as much as possible to smooth the wheels of the organization. A person with good decision making towards the organization will have identification with his organization and involve himself seriously, and loyally, have a positive affection for the organization.

A simpler definition was stated by Handoko (1997), where "decision making is an activity that describes the process through a series of activities chosen as solving a particular problem. Based on the above understanding, it can be concluded that the principal's decision making is a process of selecting the best alternative from several alternatives systematically to be followed up (used) as a way of solving school problems. And the indicators of the principal's decision-making are choosing the best alternatives, setting actions, and solving school problems.

Luthans (2006) emphasized the aspect of alternative selection in the decision-making process. Decision making was essentially a choice of several alternatives. Luthans (2004) "decision making is the process of developing and analyzing alternatives and making a choice" From the explanations above, it can be synthesized decision making is the action taken by someone to choose the best solution from a number of alternative solutions available in order to solve a problem in the organization.

Information Technology

Reffering to Maryono and Istiana (2007) "Information Technology is a procedure or system used by humans to convey messages or information". Meanwhile, according to Ishak (2008) "Information

technology is the result of human engineering on the process of delivering information from sender to receiver so that the delivery of information will be faster, wider in distribution, and longer in storage". Information Technology was a procedure or system used to help process information, store, and then communicate or convey the information in multimedia forms that were accommodated through computer assistance.

Referring to Suyanto (2005), Information Technology could be measured by information technology components which are

- 1) Computer Hardware (Hardware): Hardware for an information system consists of input and flexibility in storing files and so on, equipment, data preparation, input and output terminals.
- 2) Computer Software (Software): Such as software systems developed to support the distribution of data and information such as operating systems. Also developed several methods and applications and computer-based systems to meet user needs. For example: e-commerce, DSS (Decision Support System), e-banking, SAP.
- 3) Network and Communication: Network and communication were system that was able to connect and combine several communication points into a single unit and interact each other. Various ways were used to obtain and maintain the quality of information through the internet. The development of tools that support the ability of networks to connect with each other has proceeded rapidly.
- 4) Database: containers or files containing programs and data evidenced by the presence of physical storage media from the process of using the system.
- 5) Information Technology Personnel: The existence of computer operators, system analysts, program makers, data preparation personnel, information system leaders

Thompson (1991; 1994) in Rahmawati (2008) stated that the analysis of factors affecting the use of information technology defined the use of technology as the benefits expected by users of information systems where the measurement is based on:

- Utilization intensity
The level of quality is based on the extent of the depth of information that can be understood by information technology users in utilizing information technology to help meet their needs
- Utilization frequency
How often do information technology users utilize information technology facilities to help meet their needs?
- Number of apps or software used
The number and variety of applications used to be able to help information technology users, such as groups of internet-based applications embedded in computers or smartphones in the form of social media, namely Instagram, Twitter, Facebook, and others

Information Technology and Decision making relationship

"Decision making and communication process are the most important processes that awaken the organizations and lead the operations. Decision making forms the both organizational and managerial processes, while communication shapes out the organization's all sub-systems." (Dastan et al, 2011). One of the most important effects of the information technologies on the principals was the raising of

the accomplishment level with the help of facilities provided by the information systems. information technology provided support to decision making process. The main important point in the decision making was giving the most appropriate and accurate decisions. Prior to choose the right decisions, the principal must first identify the problems, gather the necessary information, and then determine the alternatives. In this process, quality Information would enhance the decision making ability of the principals.

METHOD

This research was conducted using a quantitative approach. This approach used numerical numbers in the process of analyzing findings in the field and then drawing general conclusions that were representative of the existing population. Data were obtained through filling out questionnaires. The questionnaires were distributed to all principals of the Junior High School in Tomohon City, totaling 24 schools. The selection of the principal population was based on the government's stipulation that Senior high schools were the responsibility of the provincial government while kindergarten, elementary schools, and junior high schools were the responsibility of the city government.

The Term decision making in this study was interpreted as the decision making of the principal of a junior high school in Tomohon City which described the process through a series of activities chosen as solving school's problem. Indicators of decision making are: selection of the best alternatives, determination of action, and quality of solving school problems. The term information technology in this study was defined as procedures or systems used by the Principal of Junior High School in Tomohon to get the information needed. The indicators of this variability are: Intensity of utilization, Frequency of utilization and utilization of applications or software.

The questionnaires were designed based on the Likert scale by giving weight to each respondent's question/statement. The data were then processed using statistical software. The analysis technique used was a simple regression technique to find the influence of independent variables on dependent variables. Simple Linear Regression was a Statistical Method that test the extent of the causal relationship between the independen Variable (X) to dependent Variable. The independent was generally denoted by X or also called the Predictor while the independent Variable was denoted by Y or also called the Response. Simple Linear Regression or often abbreviated as SLR (Simple Linear Regression) was also one of the Statistical Methods used in production to forecast or predict quality and quantity characteristics.

The results of statistical calculations were then processed for analysis. The Simple Linear Regression Equation model wasv as follows:

$$Y = a + bX$$

Y = Response Variable or Consequence Variable (Dependent))

X = Predictor Variable or Causative Factor Variable (Independent)

a = constant

b = regression coefficient (slope); Amount of Response generated by the Predictor

The values of a and b could be calculated using the formula below:

$$a = \frac{(\sum y)(\sum x^2) - (\sum x)(\sum xy)}{n(\sum x^2) - (\sum x)^2} \quad (1)$$

$$b = \frac{n(\sum xy) - (\sum x)(\sum y)}{n(\sum x^2) - (\sum x)^2} \quad (2)$$

The hypothesis to be tested was that whether there was impact of the use of information technology on the decision making of the principal of Junior High schools in Tomohon City.

RESULTS AND DISCUSSION

After the questionnaires were filled out and collected from the respondents, the data were then tabulated and ready to be processed. The respondents were described. Before processing data with regression techniques, the instrument must be tested for validation and reliability. The following are the results of the validity test and reliability test of the Instrument. See table 1.

Table 1. Validity test on Information Technology result

	Total
Item_1	.829"
Item_2	.718"
Item_3	.716"
Item_4	.492'
Item_5	.893"
Item_6	.891"
Item_7	.829"
Item_8	.718"
Item_9	.893"

SPSS provided calculation and generated conclusions for the validity test. On each item it provided star to indicate that the item was valid. Based on the validity test results above, we could say that the information technology instruments were all valid and can be used in further tests. See table 2.

Tabel 2. Validity test on Decision Making result

	Correlations
	Total
Item_1	.773"

Item_2	.789"
Item_3	.811"
Item_4	.724"
Item_5	.799"
Item_6	.870"
Item_7	.753"
Item_8	.742"
Item_9	.783"

Based on the validity test results above, we could say that the Decision-making instruments were all valid and can be used in further tests. See table 3.

Tabel 3. Reliability test on Information Technology

Reliability Statistics	
Cronbach's Alpha	N of Items
.921	9

Based on reliability tests, Cronchbach's alpha coefficient was 0.921. This value was greater than 0.60 which was the minimum number for data to be reliable. So, the Information Technology data were reliable.

Based on reliability tests, Cronchbach's alpha number was 0.777. greater than 0.60 which was the minimum number for data to be declared reliable. So the Decision making data were reliable. See table 4.

Tabel 4. Reliability test on Decision Making

Reliability Statistics	
Cronbach's Alpha	N of Items
.777	9

Normality Test

A normality test was performed to test whether the data were normally distributed. Normally distributed data were data that tended to distributed around median, in this case there were no outlier data or data that could cause test results to be biased. See table 5.

Table 5. Normality Test result

Tests of Normality				
		Kolmogorov-Smirnov ^c		
X		Statistic	df	Sig.
Y	25.00	.250	4	
	34.00	.270	5	.200 [*]
	37.00	.183	6	.200 [*]
	40.00	.260	4	

Based on the results of the normality test above, the significance value of KS is $0.200 > 0.05$. When the value of Kolmogrov-Smirnov coefficient greater than 0.05 the data were normally distributed. So, we could conclude that the data used in this study had been normally distributed

Regression Result

The regression result could be analyzed by the output provided by SPSS. After inputting and processing the data on SPSS we get the output as follow.

Table 6. Regression output result

Coefficients ^a					
Model		Unstandardized Coefficients		Standardized Coefficients	Sig.
		B	Std. Error	Beta	
1	(Constant)	20.127	3.879		.000
	X	.409	.113	.498	.001

a. Dependent Variable: Y

Based on the table above, the alpha value was 20.127 and the X coefficient value is 0.409. The value of X was positive so that it could be stated that the influence of Information technology on decision making direction was positive. Thus, the regression equation that can be formed as follows

$$Y = 20.127 + 0.409X$$

The b coefficient was interpreted as the average increase in Decision making variable for each one unit increase in Information variable. in this model every 1 unit increase in information technology would result in 0.409 unit in Decision making.

The intercept was interpreted as the expected average decision making for zero value in Information Technology. In this case, if we omitted the value of information technology, the value of decision making was 20.127.

The determinant coefficient R²

To see how good the model in predicting independent variable we used goodness of Fit test. Goodness of fit test indicated by R² value. The bigger the value, the bigger the model ability in predicting independent variable.

Tabel 7. nilai koefisien determinan

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.498 ^a	.248	.047	4.67941

a. Predictors: (Constant), X

Based on above output, the R square value was 0.248 or 24.8%. Value indicated that the model was able to explain 24.8% of Decision-making variable. The other 75.2% were explained by other factors or Variable.

Hypothesis Test result.

To determine the Hypothesis was accepted or not we could the significance value of t. Based on the regression output table it can be seen that the t value is 1.463 with a significance of $0.001 < 0.05$. thus H_0 is rejected, information technology has a significant effect on decision making.

The results of this study were in line with Sumyati (2018) who found that the use of information technology in education affects decision making. This was aligned with Dastan et al (2011) who study The Effects of Information Technology Supported Education On Strategic Decision Making in attaturk students. The found that Information technology has affirmative effect on decision making. Information technology affected not only the business life but also schools policy.

In order to adopt and adapt these technological changes schools need competent principals who have ability to take advantage from these technological changes. Thus, the schools will get the competitive advantage. In addition, the maximization of Information Technology source will positively affect the decision making ability of the principals. Principals communicated and shared the information in the both vertical and horizontal hierarchy easily with the effect of information technology.

CONCLUSION

Based on statistical testing carried out, we concluded that the use of information technology can improve the decision making of the principals in Tomohon city Junior High Schools. Proper utilization of information technology in all available platforms can improve principals' ability in decision making.

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