Application of Information System and Computer Science in Various Fields of Education

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ABSTRACT— The performance of the Civil Servantsinformation system in the Indramayu Regency Government is the work done by the employees along with the work system applied. The role of employees as information system personnel is needed to provide the best performance to superiors and customers. Competence is the knowledge and skills needed to support business processes. They represent the basis for creating value in an organization. This study has observed and measured competency factors. Competencies are used to measure the success of organizations and individuals in the field of information technology, namely technical knowledge, work coordination, problem solving and prevention, communication, and service, and accountability. This study aims to determine how strong the influence of education, mastery, position and information technology competencies on the performance of information system actors in Indramayu District Government. Descriptive research method with survey technique, hypothesis testing is done by using path analysis. The result is, simultaneous hypothesis testing with the level of education, mastery and level of position, and information technology competencies affect the effectiveness and efficiency, discipline and work initiatives of information system actors. In the partial examination of formal education does not significantly influence the effectiveness and efficiency of information system factors.

Keywords— Education, Position, Information Technology, Competency of Information System, Performance of Information Technology

I. INTRODUCTION

The process of corporate performance is determined by the quality of human resources that process and manage it. Thus, the recruitment process is done selectively, using only skilled, qualified and high-performing workers who work to be employees in Indramayu District Government especially Bappeda, Dephubkominfo and Education Department. With quality human resources, the Government of Indramayu Regency of West Java is expected to serve the community.

One of human behavior is the main concern, namely errors that occur in information systems that cause information systems to be ineffective. Factors needed to improve a person's performance are individuals who have an appropriate formal and non-formal education level of elementary, undergraduate, (S3) education when the results are accurate. The rapid development of information systems and information technology becomes a competitive weapon (competitive weapon) required by the company in winning the competition. Implementation of information systems and information technology can be said successful if it can improve employee performance, which in turn can improve company performance. With the implementation of information systems and information technology required Preparation of Human Resources (HR). This is stated also from previous research, which uses information systems and information in the context of tasks that can be used from various information and information technology sources [1]

Competence with "skills, behaviors, and abilities that allow employees to perform certain functions" [2]. Although the training has identified in other contexts such as leadership competence [3], the context of this study is the information system used by individuals who are not only able to efficiently and efficiently routine tasks but also complete tasks new using information system. Information system competencies used on the use of system information, which are different from others such as competence, anywhere such as flexibility and usability for others. Competence of information system actors is not understood or not well researched [4]. Learning specific competencies in the context of information systems is interesting because of its uniqueness in human-computer interaction, compared to the type of competence. In this study, the focus is on learning the competence characteristics of information system actors who utilize information systems within organizational boundaries to achieve certain tasks in order to identify factors relevant to the competence of information system actors.
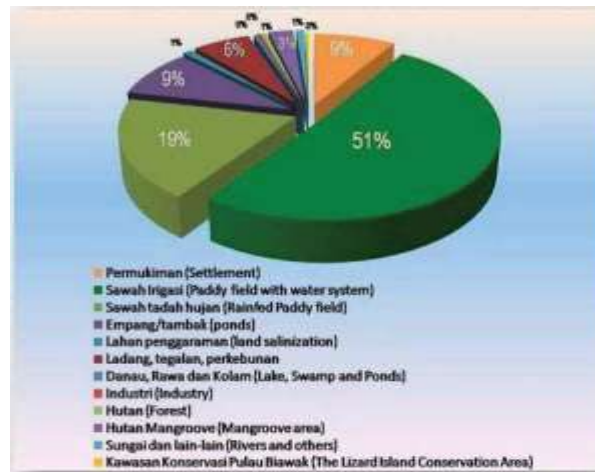
Figure 1. Land Use in Indramayu District

From Figure 1 it is clear that most of the land is used for rice fields, fields and settlements, only a small part of which is 6% of land used for industry and offices of Indramayu Regency Government, due to scarcity of Industry and offices, the authors are interested to examine how the mastery of technology and performance of Information System Actors in Indramayu District.

A person's ability does not come suddenly, but education and experience are required. According to Nawawi [5] states that the past experience will be very useful in supporting the knowledge possessed when a person faces new problems. It is not uncommon to find some people who have not done their job well, psychologically they are not mature in performing new tasks, and they need a certain time even long enough to understand the work and the ins and outs of the organization. Surachmad [6] asserted that experience is a lesson that will result in a change toward the maturity of behavior, an increase in understanding and teaching information. The results of research conducted by TIM Researcher Depdikbud also concluded that the teaching experience for teachers has an effect on the establishment of a teacher's behavior.

When talking about the period of work, of course there is an association with work experience owned by someone in doing his work in an agency or company. Experience of a job is an event that someone has experienced during work. According to As'ad (1995: 8) states that one's experience related to his behavior, namely 1). What is the accomplished and which is not accomplished by an act constitutes an experience; 2). The bitter experience of failure has a tendency to be avoided, while the fun tends to be maintained; and 3). Failure and success will form the pattern of deeds that serve as a basis for defending for the next action. Observing As'ad's opinion on the first point, in line with the opinion of Sastrohadiwiryo [7], which states that the longer the employee works the more experience he has, viceversa, the shorter the employee works the less experience he gets. From the two opinions above, it appears that one's work experience will provide value added knowledge and skills of work both qualitatively and quantitatively.

Simply put, thinking about employee performance is an interaction function of ability and motivation, which can be formulated performance = f (A x M). If both are not sufficient, performance will be negatively affected. In this case intelligence and skill (combined into capability or ability) should be considered in motivation if you want to explain and predict employee performance appropriately. It should also be considered an opportunity to perform into the above equation, so that performance = f (A x M x O). The purpose of the opportunity to perform is that the high performance level is partly a function of the absence of constraints that hinder employees in performing such performance. Here it is implied that even if a person is willing and able to do so, there may be obstacles that impede his performance. This can be seen in the following picture.2

So, the aim this research are (1) To know whether simultaneously the level of education, tenure and level of office affect the effectiveness and efficiency, discipline and work initiatives of information system actors, (2) To determine whether (3) To know whether the correct working period affect the effectiveness, work efficiency, work discipline, as well as work initiatives of information system actors, (4) To determine whether or not the formal education has an effect on the effectiveness, work discipline, (5) To know whether the true competence of information technology actors affect the discipline and work initiatives of information system actors

II. RELATED WORK

A well-implemented and accepted user information system is a very important condition for companies to reap the financial and non-financial benefits of nature. A system that helps people perform better is expected to be positively related to net profits [8]. A system that is well designed from a technical standpoint has a positive impact on organizational efficiency as found by Bradley et al. [9] in research involving corporate entrepreneurship and positive impact on organizations in general as found by Gorla, Somers and Wong [10]. In addition, systems that improve business processes due to software integration such as ERP and SCM are expected to lead to increased profitability, [11] and can help the company's competitive advantage [12]. Poor data and reporting quality will adversely affect customers, decision-making processes and strategic objectives will be difficult to archive [13]. In addition, the information that should have usability attributes to users [14] as the success of Information System is based on the current and future needs of users [15].

Research in the field of information technology is limited to the effectiveness of information systems at the organizational level. Some researchers have found a significant impact of information technology on performance [16][17]. Other researchers discussing the progress in technology is not comparable to the progress of productivity and profitability in many companies in various sectors [18][19]. Other studies have found no relationship between IT investment and organizational performance [20][21][22].

According to Weill [23] IT investments categorize management into strategic, informational and transactional objectives and tested against the following four performance measures: two measures of labour productivity, sales growth and asset profits. The results are different for each goal because IT transactional investment is found to be significantly associated with strong corporate performance whereas, the strategic use of IT is found to have no relationship in the long run and is associated only with relatively poorly performing firms in the short run. Kivijärvi and Saarinen [24] found that IT investment is not always associated with superior financial performance, especially in the short term, and benefits can be reaping in the long run. This is known as the productivity paradox [25] which means that IT does not really offer the promised benefits.

The findings in the study sparked a need for researchers to reconsider the operationalization of enterprise performance variables [26]. Several empirical studies used measures of intermediate performance and found again consistent findings. Mukhopadhyay, Rajivand and Srinivasan (1997) focused on the process of efficiency and quality and impact of IT. Thatcher and Oliver (2001) examine IT''s contribution to productivity and find that IT investments that can reduce fixed company overhead costs, while not affecting a company's quality products, do not increase profits and increase productivityFirst, confirm that you have the correct template for your paper size. This template has been tailored for output on the A4 paper size. If you are using US letter-sized paper, please close this file and download the Microsoft Word, Letter file.

III. METHOD

This research was conducted using explanatory method by using qualitative quantitative data. Quantitative data of this study were obtained from survey results using questionnaires given to Bappeda staff, Education Office, then analyzed the problems found, in order to adjust the steps of further solution described qualitatively.

Type of research design explanatory (explanatory research), namely research that involves testing the research hypothesis in the description also contains a description and the focus lies in the analysis of the relationship between research variables by describing real reality in the field at that time systematically and accurately about the facts of the object of research and observation of the consequences and finding factors that may be the cause through certain data (Miller, 1994: 9). Based on this we set the framework of this study as shown in Figure.2
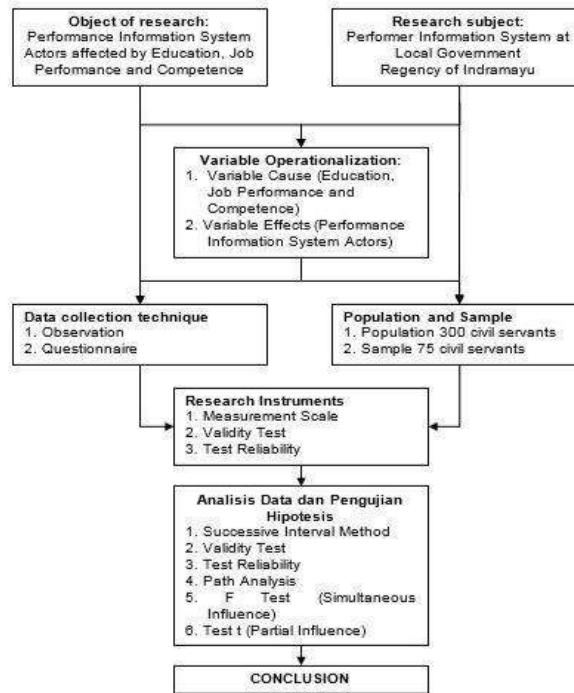
Figure. 2 Research Framework

IV. RESULT

Influence of Education, Working Period, Position and Competence of Information Technology Performer of Information System to Performer Performance of Government Information System of Indramayu Regency.

The results of data collection by using a Likert scale questionnaire to produce data with ordinal measurement scale. In order to be processed by using path analysis that requires minimal data to have the scale of interval measurement, then the data obtained in the form of ordinal measurement scale, first transformed into the form of interval scale measurement using Successive Interval Method. The result of data transformation can be seen in the attachment, which then used the sum of item value of interval scale for each research variable. In the analysis of this path can be seen the relationship between variables with the term cause and effect between the variables characteristics and competence of information technology, which includes; education (X1), work period (X2), position (X3) and competence (X4) as the causal variable to the performance variable of information system actors (Y1) as the resultant variables, including effective and efficient (Y1), discipline (Y2) and initiative (Y3) where inter-variables cause there is a reciprocal relationship (mutually correlated).

Hypothesis testing in this study using path analysis (path analysis) with the structure of the path shown in the form of structural causal diagram drawings between variables research as follows figure 3:
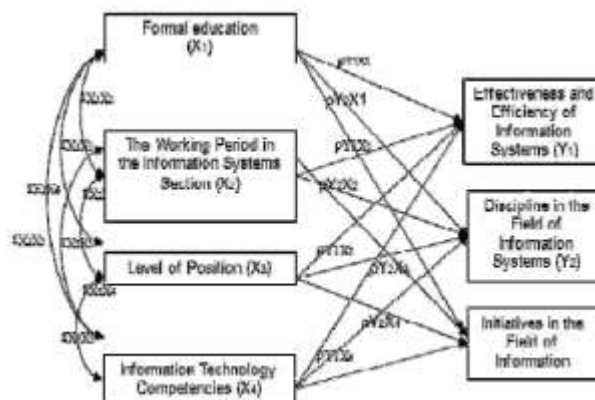

Figure 3. Structural Relationships between Variable Causes (X1, X2, X3 and X4) and Variable Effects (Y1, Y2 and Y3)

Based on hypothesis testing of joint effect of X1, X2, X3 and X4 on every aspect of performance by using F test can be known to have significant influence so that it can be concluded X1, X2, X3 and X4 have significant effect on performance. Therefore, for the next step X1, X2, X3 and X4 are tested partially by using t test.

4.1. Effect of Variable Causes on Effective Variables and Efficiency
Relationships stated that the path diagram consists of 1 (one) sub-structure which is the complete structure. This structure shows the effect of four causal variables (X1, X2, X3 and X4) against a variable due to (Y1). The structure can be displayed in the form of equation of structural function is as follows:

Y1YXX1YX   X 2YX   X3YX $X4_X(1)$
1   2   3   4

Using data of result of transformation using successive interval method, and data processing of path analysis done

by software tool of SPSS Ver 22.0 obtained result of path coefficient that is influence of causal variable that is X1, X2,

X3 and X4, to variable of Y1 as follows as follows:

YX1= 0.030

YX2=0.076

YX3= 0.220

YX4= 0.636

The path coefficients obtained have overall positive values, indicating that the increase in the causal variables will affect the increase in the resulting variables. For example = positive 0.030; which shows that the increase of 1 (one) educational unit variable (X1), will influence to the increase of performance variable (Y) as positive as 0,030 unit.

Path coefficients can also be used to compare which cause variables are most influential to the result variable. So the results of this calculation shows that based on the path coefficient obtained from the calculation shows that the coefficient path YX4= 0.636 is the largest coefficient of the path. This indicates that the variable causes of information technology competence (X4) is the most decisive variable to the variables due to the performance of information system actors about effective and efficient (Y1) , then the variable cause of the position (X3) with the path coefficient obtained for 0.220 is a variable that determines after the competence of information technology (X4). While the correlation coefficient between the variables can be shown in the form of Table.1 and the summary model in table. 2 as follows:

Table.1 Interconnect Variables Causes

	X1	X2	X3	X4
X1	1,000	,182	,333	,055
X2	,182	1,000	,379	,264
X3	,333	,379	1,000	-,116
X4	,055	,264	-,116	1,000

Table. 2 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,688[a]	,473	,443	1,22538

a. Predictors: (Constant), X4, X1, X2, X3

Coefficient of determination obtained from the value of correlation coefficient together R = 0.688

obtained value $R^2YX1X2X3 = 0.473$. While the influence of other variables outside the variables used is obtained by using the formula as follows:

$$\overline{\qquad} \tag{2}$$
$$1R$$
$$Y \quad YX_1........X_k$$

$$Y \sqrt{1\ 0.\ 473}\ \ 0{,}726 \tag{3}$$

There is another influence with path coefficient of 0.726; shows that the variables due to the performance of information system actors are not only influenced by the causal variables. Other influences besides causal variables that affect the performance of information system actors are the variables that are not included in the model of structural equation.

The equation of structural functions for the path diagram based on the calculation of path coefficients is obtained:

$$Y0.030$$
$$X \qquad 0.076\ X\ 0.220\ X \quad 0{,}636\ X \quad (4)$$
$$1 \qquad 1 \qquad 2 \qquad 3 \qquad 4$$

Based on the equation of path analysis then the depiction of the structure of causal relationship between the causal variable and the effect variable can be seen below that is:
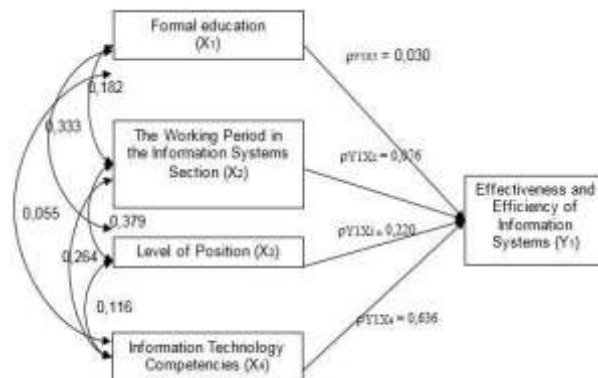

Figure. 5 Structural Relationships between Variable Causes (X1, X2, X3 and X4) and Variable Result of Y1

4.2. Influence of Variable Cause to Variable Discipline Relationships stated that the path diagram consists of 1

(one) sub-structure which is the complete structure. This structure shows the effect of four causal variables (X1, X2, X3 and X4) against a variable due to (Y2). The structure can be displayed in the form of equation of structural function is as follows:

$$(5)$$
$$Y\ 2\ \ YX1X1\ \ YX2X2\ \ \ YX3X3\ \ \ YX4X4\ \ \ X$$

Path coefficient obtained has a positive value that is the working period and competence of information technology, which indicates that the increase of causal variables will affect the increase in the variables as a result. For example x2 = positive 0.446; which shows that the increase of 1 (one) unit of working period (X2), will affect the increase of performance variable on discipline (Y2) as positive as 0.446 units.

Path coefficient obtained has a positive value of information technology competence, which indicates that the increase of causal variables will affect the increase in variable consequences. For example x4 = positive 0.355; which shows that the increase of 1 (one) variable unit of information technology competence (X4), will influence to the increase of performance variable on discipline (Y2) as positive as 0,355 unit.

Path coefficients can also be used to compare which cause variables are most influential to the result variable. So the results of this calculation shows that based on the path coefficient obtained from the calculation shows that the coefficient path x2= 0.446 is the largest coefficient of the path. This shows that the variable of cause of work (X2) is the most decisive variable to the variables due to the performance of information system actors in the discipline (Y2), then the variable that causes the competence of information technology (X4) with the path coefficient obtained for 0.355 is the decisive variable after the working period (X2) is displayed in the form of Table 4 and Model summary in table 4 as follows:

Table. 3 Interconnect Variables Causes

	X1	X2	X3	X4
X1	1,000	,182	,333	,055
X2	,182	1,000	,379	,264
X3	,333	,379	1,000	-,116
X4	,055	,264	-,116	1,000

Table. 4 Interconnect Variables Causes

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,636ª	,404	,370	1,88715

a. Predictors: (Constant), X4, X1, X2, X3

Coefficient of determination obtained from the value of correlation coefficient together R = 0.636 obtained value

$R^2YX1X2X3 = 0.404$. While the influence of other variables outside the variables used is obtained by using the formula as follows:

$$1R^2 \qquad (6)$$
$$YX1........X k$$

$$Y \quad 1 0. \ 4040,772 \qquad (7)$$

X3 and X4) against a variable due to (Y3). The structure can be displayed in the form of equation of structural function is

as follows: Y3   X   X   X   X   (9)
YX1   1   YX22   YX33   YX44   X

Path coefficient indicating that the increase of causal variables will influence the increase of the result variable. For example x4= 0.289 indicating that the increase of 1 (one) unit of working period (X4), will affect the increase of performance variable at initiative (Y3) as positive as 0.289 units.

Table.5 Interconnect Variables Causes

	X1	X2	X3	X4
X1	1,000	,182	,333	,055
X2	,182	1,000	,379	,264
X3	,333	,379	1,000	-,116
X4	,055	,264	-,116	1,000

Table. 6 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,354 a	,126	,076	2,67340

a. Predictors: (Constant), X4, X1, X2, X3

There is another influence with path coefficient of 0.772; shows that the variables due to the performance of information system actors are not only influenced by the causal variables. Other influences besides causal variables that affect the performance of information system actors are the variables that are not included in the model of structural equation.

The equation of structural functions for the path diagram based on the calculation of path coefficients is Coefficient of determination obtained from the value of correlation coefficient together R = 0.354 obtained value

$R^2YX1X2X3 = 0.126$ While the influence of other variables outside the variables used is obtained by using the following this formula:

$$\sqrt{1R^2} \qquad (10)$$

$$Y \quad YX1........Xk$$

$$\sqrt{}$$

$$Y \quad 1\ 0.126\ 0{,}935 \qquad (11)$$

obtained: $Y0.178X1\ 0.446X2\ 0.136X3\ 0{,}355X4$ (8)

Based on the equation of path analysis then the depiction of the structure of causal relationship between the causal variable and the effect variable can be seen below that is:

Another influence with path coefficient of 0.935; shows that the variables due to the performance of information system actors are not only influenced by the causal variables. Other influences besides causal variables that affect the performance of information system actors are the variables that are not included in the model of structural equation.

The equation of structural function for the path diagram based on the calculation of path coefficient is obtained.

$$Y0{,}171X1\ 0.083X\ 2\ 0.142\ X\ 3\ 0{,}289\ X\ 4$$

Based on the equation of path analysis then the depiction of the structure of causal relationship between the causal variable and the effect variable can be seen below that is:
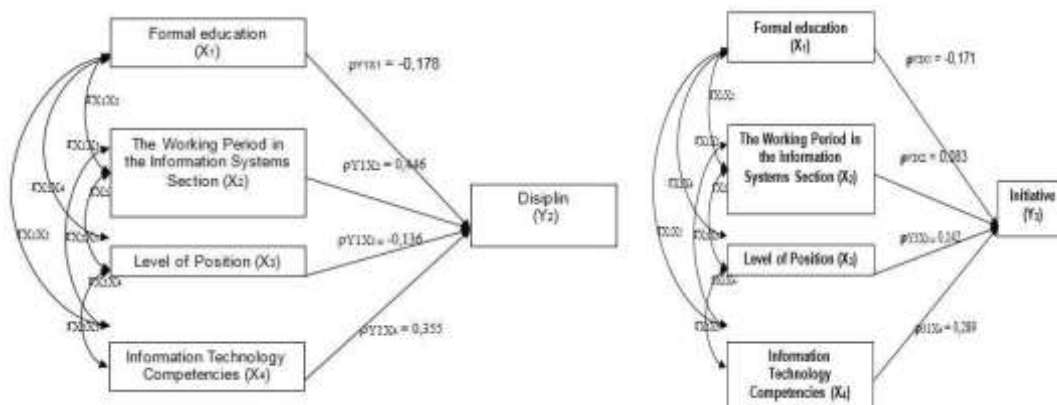

Figure.7 Structural Relationships between Variable Causes (X1, X2, X3 and X4) and Y3 Due Effect

The results of this hypothesis test show that there is a partial influence that significant directly or indirectly through X1, X2, X3 to Y3. While the influence of X1 only indirectly influence through X4, X2, X3 to Y3. X2 only indirectly influence through X1, X4, X3 to Y3. X3 only indirectly influence through X1, X2, X4 to Y3.

V.CONCLUSION

In testing hypotheses simultaneously the level of education, tenure and position level affect the effectiveness and efficiency, discipline and work initiatives of information system actors. In the partial test of the working period and information technology competencies affect the work discipline of information system actors, the position and information technology competencies influence the effectiveness and efficiency of information system actors, information technology competencies affect the work of information system actors.

Based on the conclusions that have been made, in the future some of the following can be done: Information technology competence must be improved so that work discipline, initiative, effectiveness and work efficiency of information system actors increase. Development of science is also recommended for further research to find other influencing factors. The performance of information system actors, given the opportunity to develop careers both through continuing education and the promotion is needed fairly and objectively and transparently to each employee by considering employee discipline to be fostered through exemplary, and courage in making decisions.

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