

Contributive Use of Information Systems in Improving Performance and Work Satisfaction in the Technology Literacy Era

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Abstract---Information and telecommunications technology devices' progression have slowly changed people's working and communicating. It can be seen in the 4.0 industrial revolution by New literacy, including Technological literacy. Improved employee performance that has an influence on job satisfaction is obtained through literacy technology. This study aims to analyze the information system usage of Unnes Engineering Faculty on employee performance and satisfaction, expectedly supports the authority department to decide in increasing of acceleration and work targets. 65 lecturers of Unnes Engineering Faculty were treated as the sample. The terms of multivariate data analysis assumption require initial testing (validity and reliability, normality, multicollinearity or singularity). Structural Equation Modelling (SEM) is used as analytical method. And Confirmatory Factor Analysis (CFA) used as the measurement model in this study. The AMOS on Information System usage shows positive effect on lecturer's job satisfaction. Job satisfaction significantly affects the positivity on lecturer's performance and management equivalently.

Keywords: *information systems, performance, satisfaction*

I. INTRODUCTION

An institution will run very well if all services that will be balanced by individuals receive balanced attention and rewards. Louis A.Allen said that "no matter how perfect the organization's plans and controls are, if they do not carry out their duties with interest and happiness then a company will not achieve as much results as it can" [1]. The expression perceives that humans and job satisfaction play a role in achieving the expected accomplishments. Low levels of satisfaction with employees can lead to the ineffectiveness of the company's operations and production processes caused by high levels of delay (intentional or ill), acts of sabotage and intentional slowing down. Conversely people who get self motivation to act achieve greater achievement than people who are not satisfied.

In general, employees will be enthusiastic and passionate about work when aspects of their work such as position, working environment conditions, leadership attitude to subordinates, social security and safety guarantees work in accordance with

employee expectations. Things in work that are in line with employee expectations. Things in work that are in line with the expectations of employees will lead to a condition where job satisfaction will be created. Job satisfaction reflects a person's feelings for his work, this appears in positive attitude of employees towards their work, this appears in the positive attitude of employees towards work and everything that is faced in the work environment.

Job satisfaction is one of the important factors that influence life fulfillment because most human time is spent in the workplace [2]. The study of job satisfaction and organizational commitment is an interesting topic and can be considered by employees. According to [3], job satisfaction is an early sign of organizational commitment in an employee turnover.

In relation to job satisfaction in the 21st century, it is felt how information technology changes lives in organization. One indication that is coloring is the presence of technology that allows someone to work anywhere. Another characteristic is the emergence of a tendency to split large corporations into small units, each of which becomes an independent unit capable of generating profits.

The technology currently available is known as Literacy Technology where one is able to understand the workings of machines, technology applications (Coding, Artificial Intelligence & Engineering Principles) and Data Literacy where one has the ability to read, analyze and use information (Big Data) in the digital world.

Utilization of Information Technology not only in business sector organizations, but also in the public sector. One of the public sector department that utilize information system technology is college institutions. For institutions of higher education, information system technology has become a necessity to support the education process. The use of information technology is needed to improve efficiency and productivity for the management of education in higher education.

Information technology of an organization is used to improve the performance of individuals as members of the organization that are expected to upgrade organizational performance. [4] states that the importance of using information systems as a

performance chain and the results are widely recognized at the level of analysis [5], groups [6] and organizations [7]. Therefore, organization that implements information technology need to pay attention to the extent to which the success of the system has a positive impact on improving the performance of both individuals and organizations as a whole.

In this study, researcher will retest part of the performance-technology chain to predict the impact of the use of Information System in improving performance caused by information system technology and job satisfactio

II. INFORMATION SYSTEM AT UNNES

This research will be conducted at the Faculty of Engineering, Semarang State University (Unnes) with a sample of individuals working at the Faculty of Engineering Unnes. This research was conducted at Semarang State University with several consideration. The first consideration, that information technology has been widely used in the public sector, especially at Semarang State University. The second consideration is that there is an information system development at Unnes, so that it is necessary to know the impact of information system on performance. The third consideration, research on the effect of the use of integrated academic information system (Sikadu) on individual performance and job satisfaction has not been done in the public sector. The fourth consideration, because there are still some differences in previous research, in several studies revealed that the use of technology will improve performance [8] on the other [9]; Szajna, et al (1993) found that the use of technology will reduce performance, even there is research that reveals that technology has no effect on performance [10].

In this study using empirical studies at the Faculty of Engineering, Universitas Negeri Semarang. This is because in the Engineering Faculty there are Information and Communication Technology Education study programs related to Information System Technology. Samples in the study were individuals who worked at the Faculty of Engineering UNNES consisting of faculty of Engineering Unnes's lecturers, with the consideration that the lecturers had more experience and knowledge about the Information System compared to other faculties in Unnes.

Unnes as the one of the state universities has used information technology. Information technology is used as a device for efficiency and efficacy in the Unnes's authority. The application of Unnes's information technology has undergone development. Before 2004, Unnes's information technology usage was limited to using computers applying Microsoft Office programs (Microsoft Word, Microsoft Excel,

Power Point and others). Since 2004, Unnes has made and integrated academic information system.

The Integrated Academic Information System of Semarang State University (Unnes) or better known as sikadu is a web-based information system that was built with the aim of organizing academic online data at Semarang State University. the organization data in question includes: management of student registration system, lecture scheduling system, management of Study Plan Cards (KRS) students, monitoring lectures, organizing student grade, and handling graduation registration. Sikadu can be accessed online via the internet network with the address: <http://akademik.unnes.ac.id>

Sikadu Unnes began to be trialed in the Even Semester of 2005/2006 which was adopted by the Sikadu Faculty of Mathematics And Natural Sciences (FMIPA) which was built by a special team from the Physics Department since 2004. At first, Sikadu was only used to facilitate academic administration in the form of managing student and yudisium grades online, then the graduation registration facility began to be used since the second period of graduation registration in 2006. But along with its development, starting in the Even Semester 2006/2007, sikadu began to be developed for an integrated scheduling system and administrative registration services already exist, namely the new student registration information system (<http://spm.unnes.ac.id>), and information system staffing (Simpeg).

Some of the facilities provided by Sikadu include: registration information, student's personal identity information, class schedules, information on the progress of student learning outcomes, recapitulation of academic grades, lecturer teaching assignments, and other data statistics. In addition, Sikadu also provides print facilities for academic administration purposes that can be used by all operators from the university level to the study program. Some information is also provided for official members who can be used as control of various academic processes in the current semester, as well as decision-making materials or strategic policies needed [11]. With the existence of Sikadu, it is expected that the academic administration process that was served with a stand alone system and through a limited computer network can be replaced with an internet-based information system, so that access to information for users, lecturers, employees, officials and other interested parties can be served quickly, precisely and accurately.

III. RESEARCH METHODOLOGY

The definition of operational

- 1) Integrated Information system (sikadu) (x) is a web-based information system built with the aim of online organizing academic data at Semarang State University. the organization of data in question includes: management of student registration systems, lecture scheduling system, management of Study Plan Cards (KRS), monitoring lectures, organizing student grades, and handling graduation registration. Sikadu can be accessed online via the internet network with the address: <http://akademik.unnes.ac.id>. Assessment using indicators:
 - a. System Flexibility (X1)
 - b. System Services (X2)
 - c. Cost savings (X3)
 - d. Data Literacy (X4)
 - e. Technology utilization (X5)
 - f. System Accessibility (X6)
- 2) Lecturer Performance (Y) is the work done by users in one period. Performance assessment observed from:
 - a. Service (Y1)
 - b. Quality (Y2)
- c. Work Productivity (Y3)
 - 3) User job satisfaction (Z) is the satisfaction received by the user for the work and the award they receive. Job satisfaction assessment using indicators:
 - a. Type of Work done (Z1)
 - b. Salary received (Z2)
 - c. Working condition (Z3)
 - d. Coworker (Z4)

Sample Determination

According to [12] one of the guidelines for sample size is depending on the number of parameters estimated. The guidelines are 5-10 times the number of parameters estimated. The number of parameters used in this study are 13 parameters. Therefore, the minimum number of samples used was 65 FT Unnes lecturers.

Technique of Analysis and Test of Research Instrument

The analysis technique used is the Structural Equation Modeling (SEM). There are at least 2 (two) reasons why using SEM, first there is a latent variable / factor (Unobserved served Variable), and the second aims to confirm the model. Data collected from respondent is still quantitative.

Reliability is measured by Cronbach's alpha coefficient. Validity test of item whether each question item has actually been valid/accurate. Some other tests in Structural Equation Modeling include: a. Univariate Outlier Test, b. Multivariate Outlier Test, c. Unidimensional Test, d. Causality Test.

Model Evaluation

Hair et al, 1998 Explained that the "confirmatory" pattern shows a procedure designed

to evaluate the utility of hypotheses by fit testing between theoretical model and empirical data. When the theoretical model describes "good fit" with data, then the model is considered as reinforced. Contrarily, a theoretical model is not reinforced if the theory has a "poor fit" with data. Amos can test whether the model is "good fit" or "poor fit", so the "good fit" model tested is very important in the use of structural equation modeling.

Assessing of model developed various criteria of goodness of fit, namely Chi-square, Probability, RMSEA, GFI, TLI, CFI, AGFI, CMIN/DF. If the initial model is not good fit with the data, the model is developed with a two step approach to SEM.

IV. RESULTS AND DISCUSSION

Outlier Test

Detection of multivariate outliers was carried out using the Mahalanobis Distance criteria at a level of $p < 0.001$. The Mahalanobis Distance is evaluated using x^2 at the free degree of number of variables used in the study. If the case that has Mahalanobis distance is greater than the chi-square value at a significance level of 0.001, multivariate outliers occur. The value of x^2 , (0.001, 13) was 34,528, the results of the Mahalanobis analysis resulted in a maximum value of 29, 103, thus there were no multivariate outliers, because the distance of the nominees was a maximum of $29,108 < 34,528$.

Reliability Test

The elimination process is treated on item to total correlation on indicators with a value of < 0.5 (Purwanto, 2003). No elimination occurs because the item to total correlation indicator value is ≥ 0.5 . the eliminated indicators are not included in the cronbach's alpha calculation. Cronbach's alpha calculation are carried out after the elimination process. The internal consistency reliability test results for each construct above show quite good results where the Cronbach's Alpha coefficient obtained has not all fulfilled the rules of thumb required, namely ≥ 0.7 (0.786; 0.739; 0.818) (Hair et al, 1998).

V. STRUCTURAL EQUATION MODELING

Model Evaluation of One-Step Approach-Base Model

The estimation result and fit of the one-step approach model to SEM using AMOS program are shown in the figure and the Goodness of Fit table below.

MEASUREMENT MODEL & STRUCTURAL

Use of information systems, Performance and Satisfaction

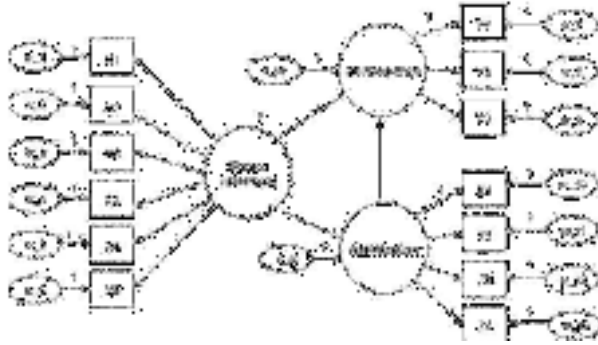


Figure 1 Model Specification: One Step Approach-Base Model

Table 1. Evaluation of Goodness of Fit Criteria Indices Model One-Step Approach

Criterion	Results	Criterion Value	Model Evaluation
Cmin/DF	1.468	≤2,00	good
Probability	0.010	≥0,05	poor
RMSEA	0.086	≥0,08	poor
GFI	0.836	≥0,90	poor
AGFI	0.762	≥0,90	poor
TLI	0.891	≥0,95	poor
CFI	0.914	≥0,94	poor

The evaluation result of one step approach base model turned out that all the goodness of fit were used, not all of them showed good evaluation result, meaning the model was not in accordance with the data. That is, the conceptual model developed and based on theory has not been fully supported by facts. Thus the model still needs to be modified as stated below.

MEASUREMENT MODEL & STRUCTURAL

Use of information systems, Performance and Satisfaction.

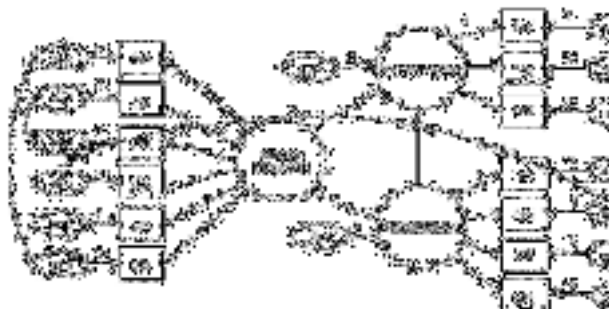


Figure 2. Model Specification: One Step Approach-Base Model

The evaluation result of one step approach modification model, it turns out that all the goodness of fit criterion used, all of which show the good results of model evaluation, meaning that the model is in accordance with the data.

Table 2. Evaluation of Goodness of Fit Indices Criteria (Modified)

Criterion	Results	Criteria Values	Model Evaluation
Cmin/DF	1.468	≤2,00	good
Probability	0.010	≥0,05	poor
RMSEA	0.086	≥0,08	poor
GFI	0.836	≥0,90	Poor
AGFI	0.762	≥0,90	Poor
TLI	0.891	≥0,95	poor
CFI	0.914	≥0,94	poor

Based on the result of multicollinearity and singularity test, it was concluded that multicollinearity or singularity did not occur. Thus the magnitude of the regression coefficient of each factor can be trusted as seen in the causality test below.

Table 3. Regression Weights

Factor	Factor	Ustd Estimate	Std. Estimate	Prop.
Satisfaction	Use of information systems	0.467	0.836	0.000
Performance	Satisfaction	0.732	0.609	0.028
Performance	Use of information systems	0.159	0.237	0.331
Limit of Significance				≤0,10

VI. FINDING

By the result of research methods and research result above, conclusion as follows: Use of Information Systems has a significance and positive effect on lecturer job satisfaction. The findings in this study indicate that respondents consider the utilization of Information systems various factors that shape it. Job satisfaction has a significant and positive effect on lecturer’s performance, and the use of Information Systems has a significant and positive effect on the performance of lecturers. Job satisfaction is not based solely on changes in work factors, but takes into account the overall factors that affect job satisfaction.

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