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# Analysis of Innovation and Implementation of the "Silaw Mas" Application on Employee Performance with Job Satisfaction as an Intervening Variable in Pangkalan Susu Sub-District

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**ABSTRACT**

This study aims to analyze the effect of innovation and the implementation of the SILAW MAS application on employee performance with job satisfaction as an intervening variable at Pangkalan Susu Subdistrict Office. This research uses a quantitative approach with a survey method. The population in this study consisted of all employees of the Pangkalan Susu Subdistrict Office totaling 89 people, and the sampling technique used was saturated sampling, so the entire population was used as the research sample. The data analysis technique used was Structural Equation Modeling (SEM) based on Partial Least Squares (PLS) with the assistance of SmartPLS software. The results showed that innovation has a positive and significant effect on job satisfaction and employee performance. Job satisfaction also has a positive and significant effect on employee performance. The implementation of the SILAW MAS application has a positive and significant effect on job satisfaction, but does not have a significant direct effect on employee performance. In addition, job satisfaction is proven to mediate the effect of innovation and the implementation of the SILAW MAS application on employee performance. The conclusion of this study is that increasing innovation and optimizing the implementation of the SILAW MAS application can improve job satisfaction, which in turn has an impact on improving employee performance. Therefore, the institution is expected to strengthen innovation and improve the quality of application system implementation to achieve more optimal employee performance.



## Introduction

The development of information and communication technology in the digital era has brought significant changes to government governance systems. The transformation towards an electronic-based government system (e-government) is an unavoidable demand to improve the effectiveness, efficiency, transparency, and accountability of public services. Both central and regional governments are encouraged to carry out digital-based innovations

to accelerate service processes and improve the performance quality of state civil servants as the main executors of public services. The Sub-district, as a government unit that deals directly with the community, has a strategic role in providing administrative services. The complexity of community needs demands a fast, precise, and integrated service system. To answer this challenge, the Pangkalan Susu Sub-district developed and implemented the SILAW MAS (Sistem Layanan Administrasi Masyarakat / Community Administration Service System) application as a form of digital innovation in public services. This application is designed to simplify the process of managing correspondence, population administration, and various other administrative services to be more systematic and well-documented.

Conceptually, innovation in public organizations is an effort to renew aimed at improving performance through changes in systems, working methods, or technology utilization. The implementation of the SILAW MAS application is expected to accelerate service flow, reduce administrative errors, improve the timeliness of document completion, and create a more orderly and transparent work system. With an integrated system, employees can work more effectively because the processes of recording, data storage, and reporting are done digitally. However, the success of innovation does not only depend on the sophistication of the system used but also on the readiness of human resources as the implementers of the system. Employees are required to have technological competence, the ability to adapt to change, and a positive attitude towards digital transformation. In practice, not all employees have the same level of digital literacy. Some employees can adapt quickly, while others still need time and training to understand the new system. These differences in ability and readiness have the potential to affect the effectiveness of application implementation and overall employee performance.

Besides the ability factor, the psychological aspect of employees is also a significant concern. Implementing a digital system can have a positive impact in the form of ease of work and reduction of manual administrative burdens, which ultimately increases comfort and job satisfaction. However, if the system is considered complex, often experiences technical problems, or is not accompanied by adequate training support, it can lead to work pressure, dissatisfaction, and even resistance to change. Job satisfaction is one of the factors that influence employee performance. Employees who are satisfied with their work tend to show higher commitment, good morale, and optimal productivity. Conversely, job dissatisfaction can result in decreased motivation, low service quality, and suboptimal achievement of organizational targets. Therefore, in the context of implementing digital innovation such as SILAW MAS, job satisfaction can act as an intervening variable that bridges the influence of innovation and application implementation on employee performance.

The phenomenon occurring at Pangkalan Susu Sub-district shows that even though the SILAW MAS application has been implemented to improve services, the effectiveness of employee performance is not yet evenly distributed. There are still variations in the speed

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and accuracy of services among employees. Some employees feel helped by the digital system because work becomes more structured and documented, but others face challenges in the adaptation process. This condition indicates a gap between the goals of innovation and their realization in the field. Furthermore, digital transformation brings significant changes in work culture, from manual systems to application-based systems. This change demands improved competence, adjustments in work patterns, and the mental readiness of employees to accept updates. If innovation and application implementation can be managed well and supported by a high level of job satisfaction, then employee performance is expected to improve significantly. However, if job satisfaction is not achieved, the impact of innovation on performance can be suboptimal. Based on these conditions, it is essential to conduct research that deeply analyzes how innovation and the implementation of the SILAW MAS application affect employee performance and to what extent job satisfaction acts as an intervening variable in this relationship. This research is expected to provide an empirical overview of the effectiveness of digital innovation at the sub-district level and serve as evaluation material for improving the quality of public services in Pangkalan Susu Sub-district.

## Method

This study uses a quantitative approach with an associative method. According to Sugiyono (2019), quantitative research is a research method based on the philosophy of positivism, used to study specific populations or samples with the aim of testing predetermined hypotheses. Meanwhile, associative research, according to Sugiyono (2019), aims to determine the relationship or influence between two or more variables. In this study, the associative approach is used to analyze the influence of innovation and the implementation of the SILAW MAS application on employee performance with job satisfaction as an intervening variable.

According to Sugiyono (2019), the population is a generalization area consisting of objects or subjects with specific characteristics determined by the researcher to be studied and then conclusions drawn. The population in this study were all employees working at the Pangkalan Susu Sub-district Office, totaling 89 employees.

According to Sugiyono (2019), a sample is a part of the number and characteristics possessed by the population. The sampling technique in this study used saturated sampling (census sampling). According to Sugiyono (2019), saturated sampling is a sample determination technique when all members of the population are used as samples. Because the total population is only 89 people, the entire population was used as the research sample, so the sample size in this study is 89 employees.

This study uses the Partial Least Squares - Structural Equation Modeling (PLS-SEM) method with the help of SmartPLS software. According to Hair et al. (2019), PLS-SEM is a multivariate analysis technique used to analyze complex relationships between latent variables with a relatively small sample size and does not require strict normal data

distribution. Sarstedt, Ringle, & Hair (2020) explain that PLS-SEM aims to maximize the variance of dependent variables and is suitable for predictive research and theory development.

## Results and Discussion

### Outer Model Analysis

Testing the measurement model, or outer model, can be used to specifically determine the relationship between latent variables and manifest variables. This test has convergent, discriminant, and reliability properties.

### 1. Convergent Validity

A measurement model with convergent validity of reflective indicators is shown by the relationship between item/indicator scores and construct scores. During the research development stage, it is permissible to use indicators with individual correlation values higher than 0.7. Indicator values of 0.5 and 0.6 are still considered appropriate. External loading data shows that these indications are not substantial with loadings below 0.60. The structural model of the research is shown in the following figure:

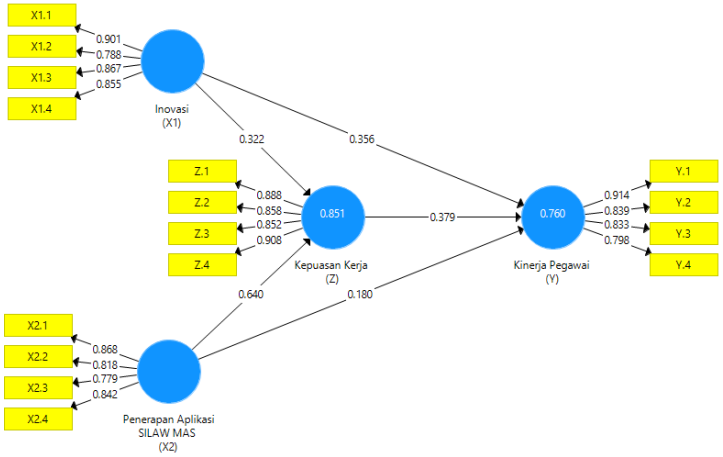


**Figure 1. Outer Model**
Source: Output Smart PLS 3.3.3

**Table 1. Outer Loadings**

| | Innovation_ (X1) | Job Satisfaction_ (Z) | Employee Performance_ (Y) | Implementation of SILAW MAS Application _(X2) |
|---|---|---|---|---|
| X1.1 | 0,901 | | | |
| X1.2 | 0,788 | | | |
| X1.3 | 0,867 | | | |
| X1.4 | 0,855 | | | |
| X2.1 | | | | 0,868 |
| X2.2 | | | | 0,818 |
| X2.3 | | | | 0,779 |
| X2.4 | | | | 0,842 |
| Y.1 | | | 0,914 | |
| Y.2 | | | 0,839 | |

| | | | | |
|---|---|---|---|---|
| **Y.3** | | | **0,833** | |
| **Y.4** | | | **0,798** | |
| **Z.1** | | **0,888** | | |
| **Z.2** | | **0,858** | | |
| **Z.3** | | **0,852** | | |
| **Z.4** | | **0,908** | | |

Source: Output Smart PLS 3.3.3

Based on Table 1 Outer Loadings, all indicators for each variable have loading factor values above 0.70, so they are declared valid. For the Innovation variable (X1), outer loading values range from 0.788--0.901, with the highest indicator on X1.1. The SILAW MAS Application Implementation variable (X2) has values between 0.779--0.868, with the highest value on X2.1. Furthermore, the Employee Performance variable (Y) shows loading values between 0.798--0.914, with indicator Y.1 being the highest. Meanwhile, the Job Satisfaction variable (Z) has values between 0.852--0.908, with indicator Z.4 being the most dominant. Thus, all indicators are declared capable of reflecting the latent variables well.

## 2. Discriminat Validity

Next, a discriminant validity test was conducted. The purpose of this test is to determine whether the reflection indicators are a good measurement for a particular construct based on the hypothesis that an indicator has a strong relationship with that construct. The results of the cross-loading discriminant validity test are presented in the following table.

**Table 2. Discriminant Validity**

| | Innovation_ (X1) | Job Satisfaction_ (Z) | Employee Performance_ (Y) | Implementation of SILAW MAS Application_ (X2) |
|---|---|---|---|---|
| **X1.1** | 0,901 | 0,822 | 0,765 | 0,794 |
| **X1.2** | 0,788 | 0,654 | 0,755 | 0,632 |
| **X1.3** | 0,867 | 0,682 | 0,669 | 0,673 |
| **X1.4** | 0,855 | 0,718 | 0,613 | 0,683 |
| **X2.1** | 0,702 | 0,753 | 0,686 | 0,868 |
| **X2.2** | 0,656 | 0,669 | 0,635 | 0,818 |
| **X2.3** | 0,602 | 0,696 | 0,675 | 0,779 |
| **X2.4** | 0,740 | 0,857 | 0,694 | 0,842 |
| **Y.1** | 0,769 | 0,742 | 0,914 | 0,707 |
| **Y.2** | 0,695 | 0,698 | 0,839 | 0,632 |
| **Y.3** | 0,686 | 0,776 | 0,833 | 0,751 |
| **Y.4** | 0,638 | 0,633 | 0,798 | 0,664 |
| **Z.1** | 0,744 | 0,888 | 0,717 | 0,815 |
| **Z.2** | 0,793 | 0,858 | 0,706 | 0,800 |
| **Z.3** | 0,674 | 0,852 | 0,735 | 0,806 |
| **Z.4** | 0,756 | 0,908 | 0,797 | 0,750 |

Source: Output Smart PLS 3.3.3

Based on Table 2 Discriminant Validity, it appears that all indicators have the highest loading values on their respective construct variables compared to other variables. This

shows that each indicator can well distinguish the construct being measured. Thus, it can be concluded that the model has met the discriminant validity criteria, so each variable such as Innovation (X1), Job Satisfaction (Z), Employee Performance (Y), and SILAW MAS Application Implementation (X2) is declared valid and there is no discriminant problem between constructs.

**3. Composite reliability**

To determine the reliability value in subsequent tests, a block of indicators evaluating the dependency of the composite construct is used. A construct value is considered reliable if the composite reliability value is more than 0.60. The construct value of the variable from the indicator block measuring the construct can be used to calculate the reliability value using Cronbach's alpha in addition to testing the composite reliability value. An item is considered credible if its Cronbach's alpha value is greater than 0.7. The following table displays the construct loading values of the research variables obtained through the use of the Smart PLS program:

**Table 3. Construct Reliability and Validity**

| | Cronbach's Alpha | Composite Reliability | Average Variance Extracted (AVE) |
|---|---|---|---|
| **Innovation_(X1)** | **0,875** | **0,915** | **0,729** |
| **Job Satisfaction_(Z)** | **0,899** | **0,930** | **0,769** |
| **Employee Performance_(Y)** | **0,868** | **0,910** | **0,718** |
| **Implementation of SILAW MAS Application_(X2)** | **0,846** | **0,897** | **0,685** |

Source: Output Smart PLS 3.3.3

Based on Table 3 Construct Reliability and Validity, all variables show Cronbach's Alpha and Composite Reliability values above 0.70, which means all constructs are declared reliable. Additionally, the Average Variance Extracted (AVE) values for each variable are also above 0.50, thus meeting the convergent validity criteria. Therefore, the variables Innovation (X1), Job Satisfaction (Z), Employee Performance (Y), and SILAW MAS Application Implementation (X2) are declared to have good reliability and validity levels.

**Inner Model Analysis**

The structural model, also known as the inner model, is assessed to ensure its accuracy and reliability. Several indicators such as the following can be used to visualize the stages of the structural model evaluation analysis:

**1. Coefficient of Determination (R2)**

Based on the data processing performed using the SmartPLS 3.0 program, the R Square values obtained are as follows:

**Table 4. R Square Results**

| | R Square | Adjusted R Square |
|---|---|---|
| **Job Satisfaction _(Z)** | 0,851 | 0,848 |
| **Employee Performance _(Y)** | 0,760 | 0,751 |

Source: Output Smart PLS 3.3.3

Based on Table 4 R Square Results, the R Square value for the Job Satisfaction variable (Z) is 0.851 (Adjusted R Square 0.848), which indicates that 85.1% of the variation in Job Satisfaction can be explained by the independent variables in the model, while the remaining 14.9% is influenced by other factors outside the model. Meanwhile, the Employee Performance variable (Y) has an R Square value of 0.760 (Adjusted R Square 0.751), which means 76.0% of the variation in Employee Performance can be explained by the variables in the model, and the remaining 24.0% is influenced by other variables outside the research

## 2. Hypothesis Testing

After assessing the inner model, the next stage is to examine the proposed relationships between latent constructs in this study. This research hypothesis testing technique uses T-Statistics and P-Values. A hypothesis is considered accepted if the T-Statistics value is greater than 1.96 and the P-Value is less than 0.05. The following are the results of the direct effect path coefficients:

**Table 5. Path Coefficients (Direct Effects)**

| | Original Sample (O) | T Statistics (\|O/STDEV\|) | P Values | Results |
|---|---|---|---|---|
| **Innovation_(X1) -> Job Satisfaction _(Z)** | 0,322 | 4,084 | **0,000** | **Accepted** |
| **Innovation_(X1) -> Employee Performance _(Y)** | 0,356 | 3,757 | **0,000** | **Accepted** |
| **Job Satisfaction _(Z) -> Employee Performance _(Y)** | 0,379 | 2,938 | **0,002** | **Accepted** |
| **Implementation of SILAW MAS Application _(X2) -> Job Satisfaction _(Z)** | 0,640 | 8,710 | **0,000** | **Accepted** |
| **Implementation of SILAW MAS Application _(X2) -> Employee Performance _(Y)** | 0,180 | 1,435 | **0,076** | **Accepted** |

Source: Output Smart PLS 3.3.3

1. Innovation has a positive and significant effect on Job Satisfaction, with a coefficient of 0.322, t-statistic 4.084, and p-value 0.000. Hypothesis accepted.
2. Innovation has a positive and significant effect on Employee Performance, with a coefficient of 0.356, t-statistic 3.757, and p-value 0.000. Hypothesis accepted.
3. Job Satisfaction has a positive and significant effect on Employee Performance, with a coefficient of 0.379, t-statistic 2.938, and p-value 0.002. Hypothesis accepted.
4. Implementation of SILAW MAS Application has a positive and significant effect on Job Satisfaction, with a coefficient of 0.640, t-statistic 8.710, and p-value 0.000. Hypothesis accepted.
5. SILAW MAS Implementation has a positive but not significant effect on Employee Performance, with a coefficient of 0.180, t-statistic 1.435, and p-value 0.076. Hypothesis rejected.

**Table 6. Path Coefficients (Indirect Effects)**

| | Original Sample (O) | T Statistics (\|O/STDEV\|) | P Values | Results |
|---|---|---|---|---|
| **Innovation_(X1) -> Job Satisfaction _(Z) -> Employee Performance _(Y)** | 0,122 | 2,210 | **0,014** | **Accepted** |
| **Implementation of SILAW MAS Application _(X2) -> Job Satisfaction _(Z) -> Employee Performance _(Y)** | 0,243 | 2,886 | **0,002** | **Accepted** |

Source: Output Smart PLS 3.3.3

1. Innovation has an indirect positive and significant effect on Employee Performance through Job Satisfaction, with a coefficient of 0.122, t-statistic 2.210, and p-value 0.014. This indicates that Job Satisfaction significantly mediates the effect of Innovation on Employee Performance. Hypothesis accepted.
2. SILAW MAS Implementation has an indirect positive and significant effect on Employee Performance through Job Satisfaction, with a coefficient of 0.243, t-statistic 2.886, and p-value 0.002. This indicates that Job Satisfaction significantly mediates the effect of SILAW MAS Implementation on Employee Performance. Hypothesis accepted.

## Conclusion

1. It is concluded that innovation has a positive and significant effect on increasing employee job satisfaction.
2. It is concluded that innovation plays an important role in directly improving employee performance.
3. It is concluded that job satisfaction has a significant contribution to improving employee performance.
4. It is concluded that the implementation of the SILAW MAS application has a very significant effect on increasing employee job satisfaction.
5. It is concluded that the implementation of the SILAW MAS application does not yet have a significant direct effect on employee performance.
6. It is concluded that job satisfaction is able to significantly mediate the effect of innovation on employee performance.
7. It is concluded that job satisfaction is able to significantly mediate the effect of the SILAW MAS application implementation on employee performance.

## Declarations

**Statement on the Use of Artificial Intelligence**. Declares whether or not AI was used in the article.

**Author contribution statement**. Describes the contribution of each author to the conduct of the research and the preparation of the article, in accordance with the conventions of the specific field of study.

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**Conflict of interest**. Discloses the presence or absence of any conflicts of interest regarding the publication of the article.

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