Research Article

Analysis of the Role of Organizational Culture and Innovation on Adaptability of the West Sumatra Provincial Education Office

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Abstract: Rapid changes in the environment of public organizations demand a work culture that is able to encourage innovation and increase adaptability. In the context of the education bureaucracy, the ability to innovate and adapt is the key to successful institutional reform. This study aims to analyze the effect of organizational culture on employee innovation and adaptability in the Education Office of West Sumatra Province. This research uses a quantitative approach with Partial Least Squares-Structural Equation Modeling (PLS-SEM) analysis technique processed using SmartPLS software. Data were obtained from 100 respondents through a five-point Likert scale questionnaire, with indicators developed based on relevant theories. The instrument was tested through validity and reliability tests using the loading factor value, AVE, composite reliability, and Cronbach's alpha. The results showed that organizational culture has a significant effect on adaptability, while innovation also has a significant effect but with a smaller coefficient. A strong, participatory, and adaptive organizational culture is proven to encourage organizational readiness in the face of change. This finding confirms the importance of integration between organizational culture and innovation in shaping adaptive public organizations. One form of Digital Adaptation is also shown by the use of Artificial Intelligence which is applied in various forms of tasks and obligations that need to be completed.

Keywords: Organizational culture, innovation, adaptability, public organization, PLS-SEM, Innovation-Artificial Intelligence

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1. Introduction

In an era of highly dynamic change, organizations are required to continue to develop and adapt to an ever-changing environment. One important factor that influences an organization's ability to innovate and adapt is organizational culture. Organizational culture reflects the values, norms, and practices embedded in the organization, which shape the behavior of organizational members in carrying out their duties. A strong, adaptive, and learning-supportive culture will encourage the formation of an innovative and change-responsive work environment (Lase et al., 2025).

In public organizations, such as the West Sumatra Provincial Education Office, the role of organizational culture is becoming increasingly crucial. In the face of demands for bureaucratic reform, digitalization of public services, and the dynamics of national education policy, government agencies must be able to develop service innovations and increase organizational adaptability (Sendika & Frinaldi, 2025). However, in practice, challenges are often encountered in the form of resistance to change, limitations in developing new ideas, and low flexibility in responding to the dynamics of the strategic environment.

Empirical phenomena that occur in the West Sumatra Provincial Education Office show that although the organizational structure has been arranged and internal regulations have been adjusted, the level of organizational innovation and adaptability to change is still not optimal. Some work units still show rigid work patterns, are less open to new proposals, and are slow in responding to external challenges. This raises the question of whether the existing organizational culture is sufficient to support the birth of innovation and adaptability within the education bureaucracy because this is one of the main pillars in supporting the smooth and successful development in various sectors, including education (A Sahri, 2025).

Innovation and adaptability in public organizations are important indicators for the success of bureaucratic reform. Innovation allows organizations to present new solutions that are more efficient and effective in public services (Rasadi et al., 2024). Meanwhile, adaptability describes the organization's ability to anticipate and respond to environmental changes quickly and appropriately (Lesnussa et al., 2023). In the context of strategic management, these two elements are closely related to competitive advantage and sustainability of organizational performance. Based on this background, this study aims to analyze the role of organizational culture on innovation and adaptability in the Education Office of West Sumatra Province. This research seeks to answer the following questions: (1) To what extent does organizational culture affect innovation in the Education Office of West Sumatra Province? and (2) How does organizational culture affect organizational adaptability within the department?

This research is expected to provide academic and practical benefits. Academically, the results of this study can contribute to the development of theoretical studies in strategic management, especially related to the role of organizational culture in improving the performance of public organizations. While practically, this research can be an evaluation material and strategic input for the West Sumatra Provincial Education Office in building a more innovative and adaptive organizational culture to answer future challenges.

Innovation development using Artificial Intelligence and the approach to Adaptability of the West Sumatra Provincial Education Office, is needed as a real comparison in performance in improving the quality of maximum service to the community. This research provides another view of innovation, especially in terms of the approach to the use of Artificial Intelligence which is also able to be analyzed comprehensively. Kim, J, et.al. (2024), Chen, X., et.al.(2024), Vishnumolakala, S. K, et.al.(2024), Zhao, J., & Ding, R. (2024), Schimanke, F. (2024), Dewan, U, et.al. (2025), Contreras, M. R., & Jaimes, J. O. P. (2024).

2. Literature Review

2.1 Organizational Culture Theory

Organizational culture is a system of shared values, beliefs, and norms that shape behavior and interaction patterns within the organization. Edgar Schein classifies organizational culture into three levels: artifacts (what is visible), espoused values (explicit beliefs), and basic assumptions (unconscious beliefs that shape thinking patterns). A strong organizational culture will create consistency in action and be able to direct the organization in a collectively desired direction (Selfiana et al., 2025). Cameron and Quinn (2006) through the Competing Values Framework identified four types of organizational culture: clan, adhocracy, market, and hierarchy. Clan culture focuses on collaboration and engagement, adhocracy culture emphasizes creativity and innovation, market culture emphasizes results and competition, while hierarchy culture emphasizes stability and control.

Furthermore, in this study, organizational culture (X1) is measured by indicators adapted from four aspects based on Robbin's theory (in Sofyan & Arifudin, 2020), namely innovation and risk-taking, attention to detail, people orientation and results orientation.

- X1.1: innovation and risk taking
- X1.2: attention to detail
- X1.3: people orientation
- X1.4: result orientation

2.2 The Concept of Innovation in Public Organizations

Innovation in public organizations is defined as the application of new ideas, processes, products, or procedures that aim to improve the effectiveness of public services and organizational efficiency. Sumarto (2025) emphasizes that public sector innovation requires sensitivity to community needs, the ability to collaborate across sectors, and a commitment to continuous improvement.

Characteristics of innovation in the public sector include open communication, courage to take risks, encouragement of creativity, and the application of new ideas in policy and operations. In this study, innovation (Y1) is measured using indicators that refer to West and Farr's theory, as follows (Sarensia & Susilo, 2021):

- X2.1: Opportunity exploration
- X2.2: Idea generation
- X2.3: Championing
- X2.4: Application

2.3 Concept of Organizational Adaptability

Organizational adaptability refers to an organization's ability to adjust to external changes effectively. Adaptive organizations can recognize environmental changes, adjust their internal structures and processes, and develop appropriate strategies to survive and thrive.

According to Ambarwati (2021), adaptability is one of the important dimensions of organizational effectiveness, and is closely related to organizational learning and flexibility in decision making. In this study, adaptability (Y2) is measured based on indicators from Denison & Mishra, as follows (Wulandary et al., 2017):

- Y1.1: Organizational ability to respond to changes in the external environment
- Y1.2: Flexibility in the implementation of tasks and procedures
- Y1.3: Organizational speed in making strategic decisions
- Y1.4: The organization's ability to develop new competencies

2.4 Relationship between Variables

Innovation → The adaptability of innovation to support learning will encourage innovation in the organization. Values such as respect for new ideas, openness to change, and encouragement to be creative become the foundation for the creation of innovation. Previous research shows that organizational culture has a positive relationship with innovation intention and realization (Prayudhayanti, 2014).

2.4.1 Organizational Culture → Adaptability

A flexible and responsive culture will allow the organization to adjust to the changing environment. Values such as continuous learning, employee empowerment, and openness to external input create a more adaptive organization. Research by Denison and Mishra (1995) supports the finding that culture has a significant effect on adaptability (Kusnadi, Suparman, & Mariene, 2020).

2.4.2 Hypothesis Formulation

Based on the theoretical study and the relationship between variables, the hypotheses proposed are:

- H1: Organizational culture has a positive effect on adaptability.
- H2: Innovation has a positive effect on adaptability.

3. Method

3.1 Conceptual Framework

The conceptual model in this study describes the relationship between organizational culture, innovation, and adaptability to innovation as following Figure 1.

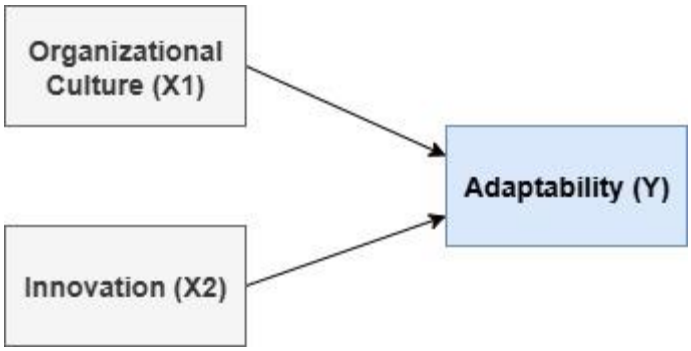

Figure 1. Initial framework

This research uses a quantitative approach with a causal type, which aims to analyze the relationship between organizational culture, innovation, and adaptability at the West Sumatra Provincial Education Office. This approach allows statistical hypothesis testing through a Partial Least Squares-based Structural Equation Modeling (PLS-SEM) model with the help of SmartPLS software (Santosa, 2018).

The population of this study were all employees and staff of the West Sumatra Provincial Education Office. The sample was taken purposively, with the criteria of at least two years of service and involvement in organizational activities. Based on the number of research indicators and the minimum SEM-PLS requirements, a sample size of 100 respondents was determined. Primary data was collected through a closed questionnaire using a Likert scale of 1-5. The instrument was developed based on relevant theories, with indicators: four for organizational culture (innovation and risk taking, attention to detail, people orientation, results orientation), four for innovation (Opportunity exploration, Idea generation, Championing, Application), and four for adaptability (response to change, flexibility, speed of decision making, and competency development).

Validity tests were carried out through outer loading and AVE, while reliability was tested using Composite Reliability and Cronbach's Alpha. All tests were carried out through outer model analysis. Furthermore, inner model analysis is carried out to test the relationship between latent variables through R-square, path coefficient, and significance testing using bootstrapping. The model is also tested through the f-square and Q-square values to determine its effect and predictive power. The use of SmartPLS was chosen because of its ability to handle non-normal data and models with reflective indicators. Through this method, the research is expected to produce accurate findings on the influence of organizational culture on innovation and adaptability in the context of local government bureaucracy.

4. Result and Analyzes

4.1 Data Analysis

Analysis of Test Results of the Role of Organizational Culture on Innovation and Adaptability of the West Sumatra Provincial Education Office using SMART PLS with indicators of Organizational Culture variables (X1), Innovation (Y1), and Adaptability (Y2). This research uses a quantitative approach with the Partial Least Squares - Structural Equation Modeling (PLS-SEM) method through SmartPLS software. The model used is reflective, with indicators developed from relevant theories. Testing was carried out in two main stages: measurement model evaluation (outer model) and structural model evaluation (inner model), and then proceed with hypothesis testing.

4.2 Measurement Model (Outer Model)

Outer model testing aims to assess construct validity and reliability. The loading factor results show that all indicators have values above 0.70, which means they meet the requirements of convergent validity. Thus, the indicators used in this study are statistically able to represent the measured constructs.

Table 1. Loading Factor (Validity Test)

Indicators	Adaptability (Y)	Organizational Culture (X1)	Innovation (X2)
X1.1		0,806	
X1.10		0,844	
X1.2		0,836	
X1.3		0,830	
X1.4		0,865	
X1.5		0,841	
X1.6		0,820	
X1.7		0,837	
X1.8		0,869	
X1.9		0,881	
X2.1			0,799
X2.2			0,826
X2.3			0,866
X2.4			0,860
X2.5			0,782
X2.6			0,886
X2.7			0,869
X2.8			0,851
Y.5	0,892		
Y1.1	0,702		
Y1.10	0,832		
Y1.2	0,859		
Y1.3	0,815		

Indicators	Adaptability (Y)	Organizational Culture (X1)	Innovation (X2)
Y1.4	0,845		
Y1.6	0,851		
Y1.7	0,856		
Y1.8	0,800		
Y1.9	0,740		

Furthermore, the reliability test results also support the validity of the instrument. All three variables - organizational culture, innovation, and adaptability - showed Composite Reliability values above 0.95 and Average Variance Extracted (AVE) values above 0.70, which means that all constructs have high internal consistency and reliability.

Table 2. Outer Model Reliability Test

Parameter Y, X1, X2	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Adaptability (Y)	0,946	0,967	0,954	0,674
Organizational Culture (X1)	0,955	0,958	0,961	0,711
Innovation (X2)	0,942	0,959	0,952	0,711

4.3 Structural Model (Inner Model)

The structural model is used to test the influence between latent variables in the research model. Based on the results of the analysis, the effect of organizational culture on adaptability shows the original sample value of 0.301, t-statistic of 1.978, and p-value of 0.000, which shows a significant effect. This means that the stronger the organizational culture applied, the higher the level of organizational adaptability. A work culture that prioritizes participation, mission clarity, and readiness to face change can strengthen organizational responsiveness to environmental dynamics.

Testing the effect of innovation on adaptability shows the original sample value of 0.080, t-statistic of 3.465, and p-value of 0.000. This result is also significant, although the coefficient value is small. This means that the presence of innovation in the organization still plays an important role in encouraging adaptability. Innovation encourages organizations to find efficient and creative solutions in responding to changes, such as implementing digital systems, developing new work methods, or improving public services.

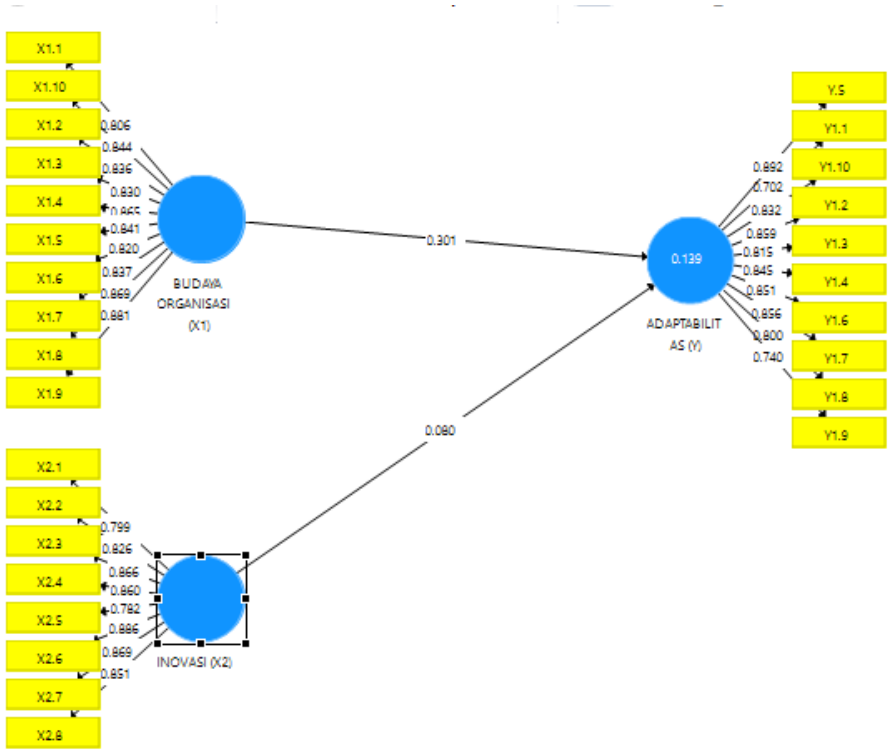

Figure 2. Structural Model

Table 3. Inner Model Test

X1 & X2 -> (Y)	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Organizational Culture (X1) -> Adaptability (Y)	0,301	0,314	0,185	1.978	**0,000**
Innovation (X2)-> Adaptability (Y)	0,080	0,100	0,186	3,465	**0,000**

4.4 Hypothesis Testing and Interpretation of Results

Based on the test results, it can be concluded that the first hypothesis (H1), namely the effect of organizational culture on adaptability, proved to be significant, with a positive coefficient. This reinforces the assumption that strong and purposeful organizational values have a real impact on the organization's ability to adapt to external changes. The second hypothesis (H2), the effect of innovation on adaptability, also proved significant, albeit with a smaller effect. This indicates that although innovation is not the only key determinant, it still contributes to the organization's ability to adapt responsively to new challenges.

Table 4. Path Coefficients in Hypothesis Model Testing

Variables	Original Sample	T-Statistik	P-Value	Conclusion
Organizational Culture → Adaptability	0,301	1,978	0,000	Significant
Innovation → Adaptability	0,080	3,465	0,000	Significant

However, it should be noted that these results do not include a direct path from organizational culture to innovation. For this reason, further studies can be conducted by developing models that test the indirect or mediating effect of innovation on the relationship.

5. Discussion

This finding is in line with the thoughts of Khairan, Khoerunnisa and Setiawati (2025), who emphasize that an organizational culture that is participatory and integrated with the organization's vision will encourage organizational flexibility and speed in responding to the environment. In the context of the West Sumatra Provincial Education Office, a clear work culture, plus encouragement to think creatively, allows the organization to not only carry out administrative functions, but also position itself as an agent of change in the field of education public services.

Innovation in public organizations is often hampered by bureaucratic procedures. However, the findings of this study show that innovation still has an important contribution to make, especially if it is supported by a culture that opens up space for the exploration of new ideas. Therefore, strengthening organizational culture and creating innovative ecosystems need to be a strategic agenda in the future governance of the education bureaucracy.

Furthermore, an approach that can be done in addition to adding novelty to research, especially is the existing Artificial Intelligence Ciampi, M. M., (2025), Huang, G., & Liang, X. (2024).Guillén-Yparrea, N., & Hernández-Rodríguez, F. (2024). Lo, C. K., et al. (2024). Dey, A. K., et.al (2024), Xu, X. (2024) which is currently also a parameter in civilizing the adaptation process in public services. While the results of the Smart-PLS analysis in Figure 2, the analysis results are shown in Tables 5 and 6.

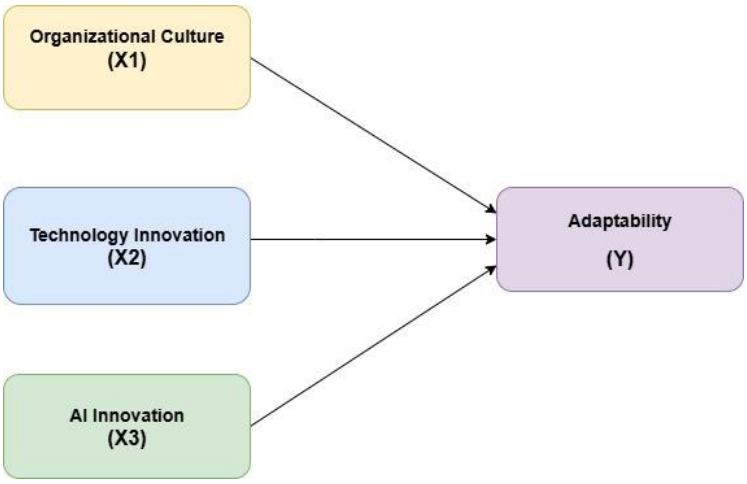

Figure 3. Approach by adding initial Framework AI Innovation (X3)

Table 5. Simulation analysis results with n=200

	BO1	BO2	BO3	BO4	IT1	IT2	IT3	IT4
Count	200.000	200.000	200.000	200.000	200.000	200.000	200.000	200.000
Mean	2.932	3.070	2.728	3.039	3.062	3.012	3.128	3.193
Std	0.697	0.719	0.670	0.675	0.772	0.795	0.801	0.725
Min	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
25%	2.434	2.609	2.160	2.540	2.529	2.460	2.625	2.686
50%	2.959	3.127	2.715	3.018	3.064	2.981	3.097	3.171
75%	3.338	3.507	3.187	3.512	3.539	3.536	3.614	3.717
max	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000

Table 6. Simulation analysis results with n=200 Continue

	AT1	AT2	AT3	AT4	AD1	AD2	AD3	AD4
Count	200.000	200.000	200.000	200.000	200.000	200.000	200.000	200.000
Mean	2.911	3.178	2.943	2.782	3.170	3.022	2.802	3.197
Std	0.645	0.660	0.696	0.699	0.693	0.766	0.700	0.780
Min	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
25%	2.510	2.730	2.457	2.312	2.733	2.544	2.349	2.670
50%	2.883	3.172	2.971	2.727	3.103	3.022	2.751	3.113
75%	3.356	3.631	3.382	3.320	3.593	3.535	3.265	3.765
max	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000

Furthermore, from the addition of Artificial Intelligence (AI) parameters as one of the sources of innovation, it will be able to provide additional analysis that is comprehensively elaborated from various parameters, including managerial implications. Some of the analysis results include: The model has good predictive power (R^2 = 0.417). AI innovation has the greatest influence on adaptability, All independent variables contribute positively to adaptability, and Moderation and synergy effects show an increase in the predictive power of the model.

Next are the Managerial Implications, including: The Education Office needs to prioritize investment in AI technology, Adaptive organizational culture needs to be strengthened to support innovation, Integration between technological innovation and AI will provide optimal results, and Need a holistic strategy that combines all three factors. So that a recommendation is needed from the use of AI, namely Implementation of a structured AI roadmap, Development of an organizational culture that supports digital transformation, HR training to improve technology and AI literacy, and Continuous evaluation of the effectiveness of innovation implementation. The results of the analysis using Smart-PLS Analysis Result with the addition of Artificial Intelligence parameters, including Actual vs Predicted [Figure 6], Residual Plot [Figure 7], Variable importance [Figure 8], and Model Comparison (R2) [Figure 9].

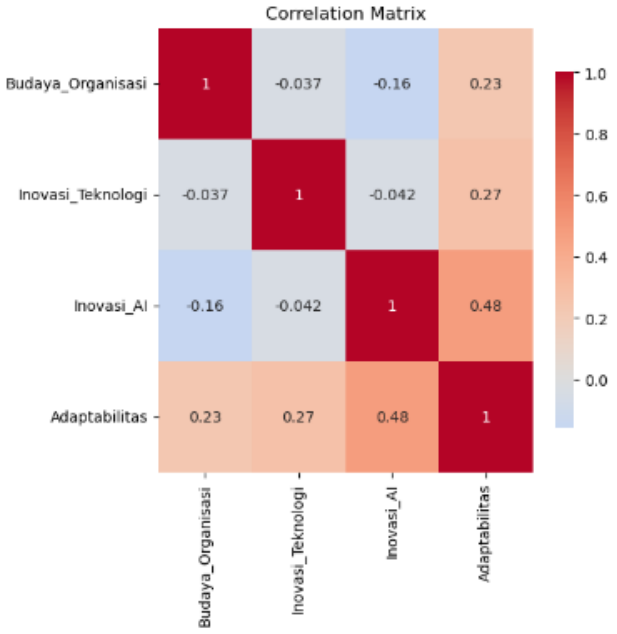

Figure 4. Smart-PLS Analysis Result, i.e. Correlation Matrix

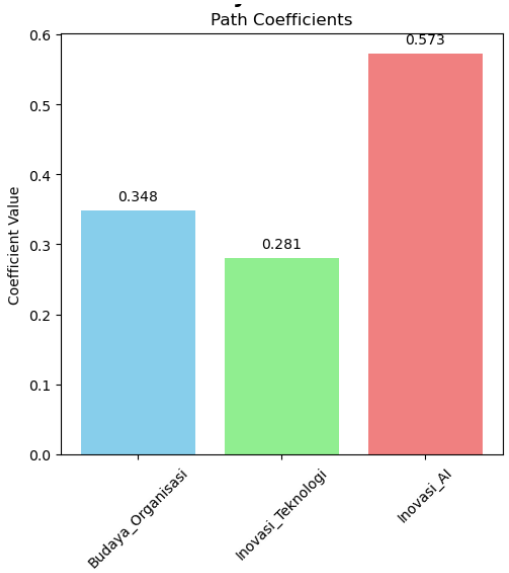

Figure 5. Smart-PLS Analysis Result, i.e. Path Coefficients

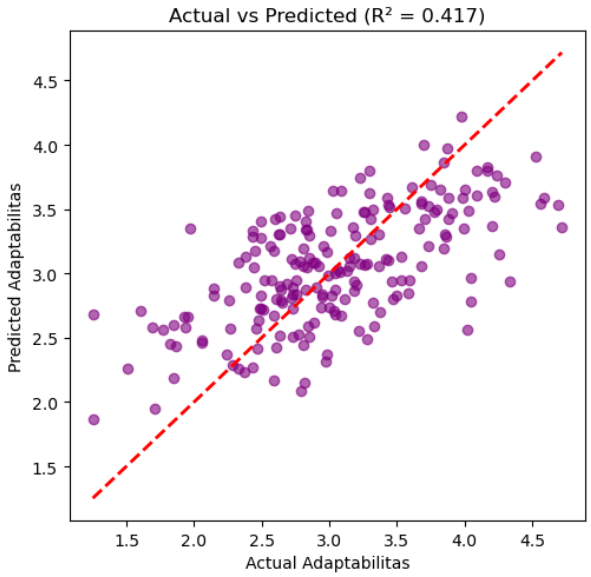

Figure 6. Smart-PLS Analysis Result, i.e. Actual vs Predicted (R^2=0.417)

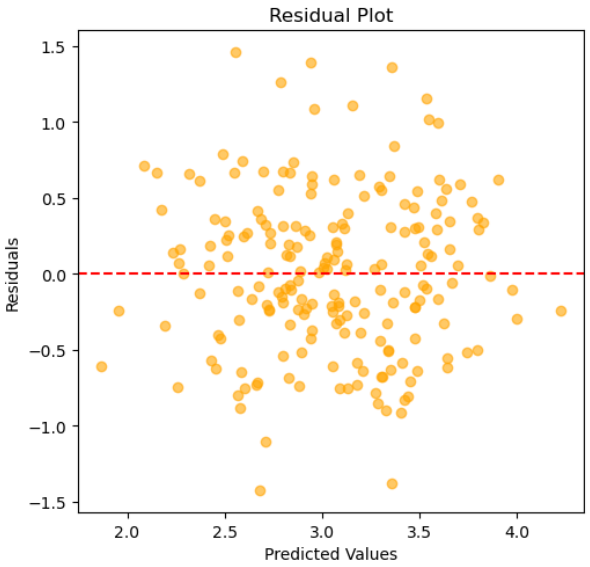

Figure 7. Smart-PLS Analysis Result, i.e. Residual Plot

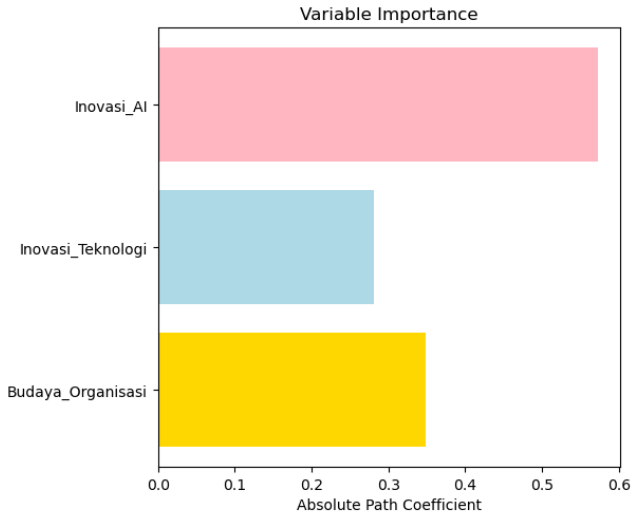

Figure 8. Smart-PLS Analysis Result, i.e. Variable importance

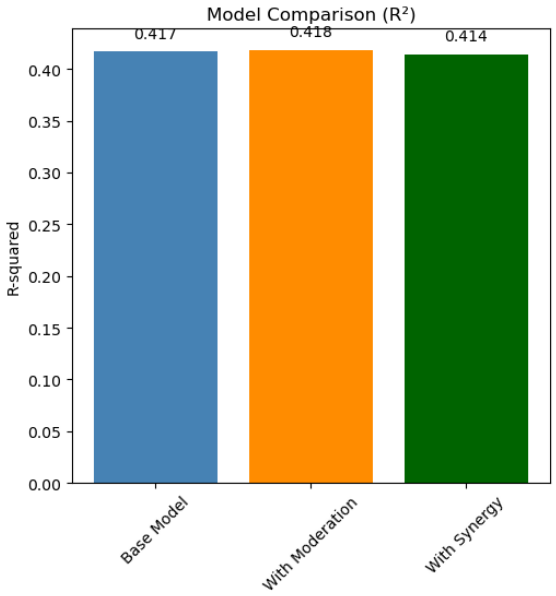

Figure 9. Smart-PLS Analysis Result, i.e. Model Comparison (R^2)

6. Conclusions

Based on the results of research conducted on employees of the West Sumatra Provincial Education Office, it can be concluded that organizational culture has a significant influence on adaptability, which shows that organizational values, participation, and clear strategic direction can encourage the organization's ability to respond to change. In addition, innovation is also proven to have a significant effect on adaptability, although the effect is smaller. This shows that the implementation of new ideas, the use of technology, and leadership support for renewal remain important elements in increasing organizational flexibility and readiness to face the dynamics of the external environment. Thus, strengthening organizational culture

that supports innovation can be an effective strategy for building public organizations that are adaptive and responsive to future challenges. Artificial Intelligence, which is currently developing, will help to have an impact, among others, optimizing the adaptation side that determines the service side. Human resources who are capable of using AI, will tend to provide increased service effectiveness.

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Availability of data and Materials: All data are available from the authors.

Conflicts of Interest: The authors declare no conflict of interest.
Additional Information: No Additional Information from the authors.

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