Jurnal Pengabdian Masyarakat Bestari (JPMB)
Vol. 3, No. 9, September 2024: 527-540

Automated and Measured Managerial Systems in the Management of Independent Tourism Villages: A Case Study of Parsingguran II Village, Polung Subdistrict, Humbang Hasundutan Regency

Samerdanta Sinulingga[1*], Vivi Adryani Nasution[2] , Amalia Meutia[3], Sinar Indra Kesuma[4] , Flansius Tampubolon[5] , Jonathan Liviera Marpaung[6]
[1]Tourism Department, Universitas Sumatera Utara
[2]Chinese Literature Department, Universitas Sumatera Utara
[3]Psychological Department, Universitas Sumatera Utara
[4]Agribusiness Department, Universitas Sumatera Utara
[5]Bataknese Literature Department, Universitas Sumatera Utara
[6]Mathematics Department, Universitas Sumatera Utara
Corresponding Author: Samerdanta Sinulingga danta@usu.ac.id

A R T I C L E I N F O

Keywords: Automated Managerial System, Tourism Village Management, Qualitative Experimental Research, Rural Business Development, Stakeholder Engagement

Received : 25, July
Revised : 12, August
Accepted: 16, September

©2024 Sinulingga, Nasution, Meutia, Kesuma, Tampubolon, Marpaung: This is an open-access article distributed under the terms of the Creative Commons Atribusi 4.0 Internasional.

A B S T R A C T

The development of tourism villages is a key strategy for boosting rural economies in Indonesia, but managing these ventures often faces challenges, particularly in establishing systematized and measurable practices. This study investigates the implementation of an automated managerial system in the Parsingguran II Tourism Village, using a qualitative experimental approach. The research explores how the system influences business operations and stakeholder engagement, focusing on contextual impacts rather than quantitative measures. Through intervention-based experimentation and case studies, the findings indicate that the automated system improves managerial efficiency and fosters a more cohesive stakeholder environment. Recommendations are made for scaling this approach to other rural tourism areas, enhancing sustainability and operational effectiveness.

DOI Prefiks: https://doi.org/10.55927/jpmb.v3i9.11334
ISSN-E: **2964-7150**
https://journal.formosapublisher.org/index.php/jpmb

INTRODUCTION

The increasing focus on rural development has led to the rise of tourism villages in Indonesia, providing a promising avenue for boosting local economies and fostering sustainable growth. Parsingguran II, a village located in the Polung Subdistrict of Humbang Hasundutan Regency, is one such example where tourism has become an essential driver of economic activity(Beta et al., 2021; Stoler & Stoler, 2010). However, the challenge lies in managing these ventures effectively, given the often informal and unstructured nature of rural business operations(Sofiyah et al., 2024; Tulus et al., 2024). As the need for more structured, automated, and measured managerial systems becomes apparent, the integration of such systems could offer a more sustainable approach to managing tourism-based rural enterprises. This research seeks to investigate the implementation of an automated managerial system within this specific context, aiming to enhance the overall efficiency of tourism village management(Erwin et al., 2024; Tulus et al., 2020). By exploring how such a system influences operational effectiveness and stakeholder engagement, this study contributes to the broader discourse on tourism village management and rural business development(Manurung et al., 2024; Sembiring et al., 2020). The study takes an innovative approach by utilizing a qualitative experimental research design to evaluate the effects of managerial automation in a setting where traditional quantitative experimental research might not be applicable(Hanum, 2013; Hartanto, 2016; Mutia, 2022). While quantitative experiments often rely on strict variable manipulation and controlled environments, the qualitative experimental approach allows for a more flexible exploration of real-world dynamics and human experiences. By using intervention-based experimentation, case studies, and participatory action research, this study examines the deeper impact that automated systems can have on managerial practices, stakeholder perceptions, and business outcomes in rural tourism settings. Through the qualitative lens, this research not only assesses the efficiency gains from systematizing business operations but also seeks to understand the socio-cultural implications that arise from such a transition. The tourism village management in Parsingguran II faces several challenges that stem from a lack of structured processes and effective communication among stakeholders. These issues often lead to inefficiencies in resource allocation, poor decision-making, and misalignment of goals between the community members and business operators. An automated managerial system, by providing a framework for standardized procedures, real-time data monitoring, and performance measurement, has the potential to address these challenges by offering a more cohesive and transparent mode of operation. In turn, this system aims to foster a more informed and engaged stakeholder environment, enabling better decision-making and aligning the efforts of various actors involved in the tourism business. The experimental aspect of this research is central to understanding how these automated systems interact with the existing social and economic fabric of the village. Rather than focusing solely on quantitative outcomes such as profit margins or visitor numbers, this study places emphasis on qualitative indicators such as stakeholder satisfaction, engagement levels, and the perceived impact of automation on daily operations.

The stakeholder engagement aspect is particularly critical, as successful tourism village management relies heavily on the participation and collaboration of various groups, including local residents, business owners, and external investors or partners(Purba et al., 2018). Therefore, this research investigates how the introduction of an automated managerial system influences these relationships and whether it can help harmonize the different interests at play.

Additionally, this study addresses the broader implications of rural business development through the lens of tourism. As tourism becomes a more viable economic activity in rural areas, there is a growing need for systems that can manage the complexities of these ventures. Automated managerial systems, when properly implemented, can serve as a vital tool for ensuring that these businesses remain competitive and sustainable over time(Amalia, 2023; Dalimunthe et al., 2022). The research findings from this case study could provide insights into how similar systems could be adapted and scaled in other rural areas, particularly those with burgeoning tourism industries. The broader goal is to develop a model for rural business development that leverages technology and automation to improve operational efficiency while preserving the unique cultural and social dynamics that define these communities. In summary, this research seeks to fill a gap in the existing literature by examining the application of automated managerial systems in the context of rural tourism village management. By adopting a qualitative experimental research approach, this study moves beyond the traditional quantitative methods and offers a more nuanced understanding of how automation can affect not only business operations but also the broader stakeholder environment in which these businesses operate. The findings from this research are expected to contribute to the ongoing discussions on sustainable rural development, tourism management, and the role of automation in enhancing business performance in non-urban settings.

IMPLEMENTATION AND METHODS

This study employs a qualitative experimental research design to investigate the implementation and impact of an automated managerial system within the context of a rural tourism village in Parsingguran II, Polung Subdistrict, Humbang Hasundutan Regency. The research is divided into several key stages, including the design and deployment of the automated system, the collection of qualitative data from stakeholders, and the analysis of the effects of the system on village management and stakeholder engagement.

Research Design

The research utilizes an experimental approach adapted to qualitative inquiry, focusing on the real-world application of the automated managerial system. This design allows for the flexibility necessary to explore the system's impact on the complex social and business dynamics present in a rural tourism setting. Unlike traditional quantitative experimental designs, which involve controlled variables and statistical measurements, this qualitative approach

emphasizes understanding the subjective experiences of stakeholders and the broader social effects of the system's implementation.

Study Context and Participants

The study was conducted in Parsingguran II, a rural village that has been identified as a developing tourism destination within Humbang Hasundutan Regency. This village was selected due to its growing tourism sector and the existing challenges in managing tourism-related businesses effectively. The village's key stakeholders include local business owners, village leaders, community members involved in tourism activities, and external partners such as investors or tourism agencies. A purposive sampling method was used to select participants who were directly involved in the tourism business or held influential roles in the management and operation of village activities. A total of 25 participants were selected, including 10 local business operators, 5 village officials, 5 community representatives, and 5 external stakeholders. This diverse sample ensured that a broad range of perspectives was included in the data collection process.

Intervention: Automated Managerial System Implementation

The intervention in this study involved the design and deployment of an automated managerial system tailored to the needs of the tourism village. The system was developed to address key management challenges identified during the preliminary phase of the study, such as inefficient resource allocation, lack of communication among stakeholders, and uncoordinated business operations. The system included features such as real-time data tracking for financial performance, visitor management, scheduling of tourism activities, and task delegation among stakeholders. Additionally, it offered performance metrics to monitor the effectiveness of different tourism initiatives, providing a structured framework for decision-making and resource management. Once the system was developed, it was introduced to the stakeholders over a period of three months. During this time, stakeholders were trained on how to use the system, and the system was integrated into daily operations. The implementation phase also involved continuous monitoring and technical support to ensure the system's smooth functioning and to address any challenges that arose during its use.

Data Collection

Data was collected using multiple qualitative methods to gain a comprehensive understanding of the system's impact on the village's tourism management. These methods included:

1. In-depth Interviews: Semi-structured interviews were conducted with all 25 participants at three points during the study: prior to the implementation of the system, during the system's use, and after the three-month implementation period. These interviews explored participants' perceptions of the automated system, its effectiveness in addressing managerial challenges, and its

broader impact on their engagement with tourism management activities.

2. Focus Group Discussions: Focus group discussions were held with smaller subsets of participants to facilitate more dynamic conversations about the system's impact. These discussions provided insights into the collective experiences and interactions between stakeholders as they adapted to the new managerial processes.
3. Participant Observations: Observations were conducted to assess how stakeholders used the automated system in their day-to-day operations. These observations allowed for a more nuanced understanding of the system's practical effects on business operations, stakeholder collaboration, and decision-making processes.
4. Document Analysis: Relevant documents, including reports generated by the automated system, meeting minutes, and business records, were analyzed to track the performance metrics and evaluate changes in management efficiency before and after the system's implementation.

Data Analysis

The qualitative data collected through interviews, focus groups, observations, and document analysis was transcribed and coded using thematic analysis. This approach allowed the identification of recurring themes and patterns in the data related to the system's impact on managerial practices, stakeholder engagement, and business performance. Coding was conducted both inductively and deductively, with predefined codes related to the research objectives and emergent codes reflecting new insights from the data. The analysis focused on understanding how the automated system influenced key areas of village management, including decision-making processes, resource allocation, communication among stakeholders, and overall business outcomes. Additionally, the data was analyzed to identify any socio-cultural effects of automation, such as changes in stakeholder relationships, power dynamics, or the village's approach to tourism development.

Validity and Reliability

To ensure the validity and reliability of the research, triangulation was employed through the use of multiple data sources and methods. By collecting data from different stakeholder groups, using various qualitative techniques, and analyzing both subjective and objective data points (e.g., system-generated reports), the research was able to provide a comprehensive and credible understanding of the system's impact. Member checking was also used to validate the findings. After the initial analysis, the findings were presented to participants in a feedback session, where they could confirm or clarify the results.

This process helped to enhance the credibility and trustworthiness of the study by ensuring that the participants' perspectives were accurately represented.

RESULTS

The implementation of the automated managerial system in the Parsingguran II tourism village yielded several notable outcomes. The results are categorized based on the key areas of interest: managerial efficiency, stakeholder engagement, and overall business performance.

Managerial Efficiency

One of the key metrics for assessing the impact of the automated system was the improvement in managerial efficiency. This was measured by evaluating changes in resource allocation, task management, and the ability to monitor performance in real-time. The automated system provided data on several performance indicators, allowing for a more structured decision-making process.

Table 1. Managerial Efficiency

Metric	**Before Implementation**	**After Implementation**
Time to Allocate Resources (hrs)	10	4
Number of Missed Deadlines	7	2
Frequency of Stakeholder Meetings	1/month	2/month
Decision-Making Time (days)	5	2
Task Completion Rate (%)	70%	90%

As shown in Table 1, there was a significant reduction in the time required for resource allocation and decision-making. Additionally, the task completion rate improved from 70% to 90%, and missed deadlines were reduced from seven instances to two during the intervention period. The automated system's ability to track performance indicators in real-time contributed to the observed improvements in resource allocation and decision-making. These findings align with previous research, which suggests that automated systems can reduce administrative burden and improve organizational efficiency in rural business settings. The significant reduction in missed deadlines further indicates that the system fostered a more structured and accountable approach to task management. The increase in task completion rates can be attributed to the system's task delegation and monitoring features, which provided stakeholders with clear responsibilities and deadlines. This is consistent with studies showing that automation can enhance productivity by reducing ambiguity in roles and expectations.

Stakeholder Engagement

Stakeholder engagement was assessed based on participation in meetings, level of satisfaction with the automated system, and communication among stakeholders. The results indicate that the system improved stakeholder involvement and communication efficiency.

1. Meeting Participation: Meeting frequency increased from one meeting per month to two meetings per month, with average attendance rising from 60% to 85%.
2. Satisfaction Surveys: Post-implementation surveys revealed that 75% of stakeholders reported an increase in satisfaction with the overall management process, primarily due to the system's transparency and ease of access to real-time data.
3. Communication Effectiveness: Stakeholders reported improved communication facilitated by the system's automated notifications and task assignment features, which led to a more coordinated effort in managing tourism-related activities.

Stakeholder engagement was a critical factor in the success of the tourism village, and the automated system played a key role in enhancing communication and participation among the various actors involved. The increase in meeting frequency and attendance, as well as higher satisfaction levels, suggests that stakeholders valued the transparency and accountability facilitated by the system. This is particularly important in rural tourism management, where effective collaboration between different community members is essential for the success of tourism initiatives. The qualitative feedback also revealed that the system helped reduce communication barriers, as stakeholders were able to access important information and updates more easily. This finding underscores the importance of automation in bridging communication gaps in rural settings, where traditional methods of communication may be inefficient or unreliable.

Business Performance

Business performance was evaluated through financial metrics and qualitative feedback from stakeholders. The financial data showed a 15% increase in revenue during the three-month implementation period, attributed to improved resource management and operational efficiency.

Table 2. Business Performance

Performance Indicator	**Before Implementation**	**After Implementation**
Average Monthly Revenue (IDR)	100 million	115 million

Average Visitor Satisfaction Rating	4.0/5	4.4/5

Figure 1 below provides a visual representation of the revenue growth and stakeholder satisfaction improvements during the study. The increase in revenue and visitor satisfaction during the implementation period indicates that the automated system contributed to improved business performance. The enhanced operational efficiency likely allowed for better management of tourism activities, resulting in higher visitor satisfaction and repeat business. These results are consistent with existing literature that highlights the role of managerial automation in improving business outcomes, particularly in resource-constrained environments. While the financial gains were modest, they suggest that over time, the benefits of the system could become more pronounced as stakeholders continue to adapt to the automated processes. The improvement in visitor satisfaction is also noteworthy, as it indicates that the managerial changes had a positive impact on the customer experience, which is a key factor in the success of tourism ventures.

Comparison of Mean Value

The resource allocation time was relatively high, indicating inefficiencies in managing resources. This could have been due to manual processes, unclear responsibilities, or a lack of centralized control over the resources needed for tourism activities. After Implementation the time to allocate resources has significantly decreased after the system was put in place. This suggests that the system introduced automation, better scheduling, or more effective resource tracking, allowing stakeholders to allocate resources more quickly and efficiently. This improvement is essential for maintaining smoother operations, particularly in time-sensitive environments like tourism.

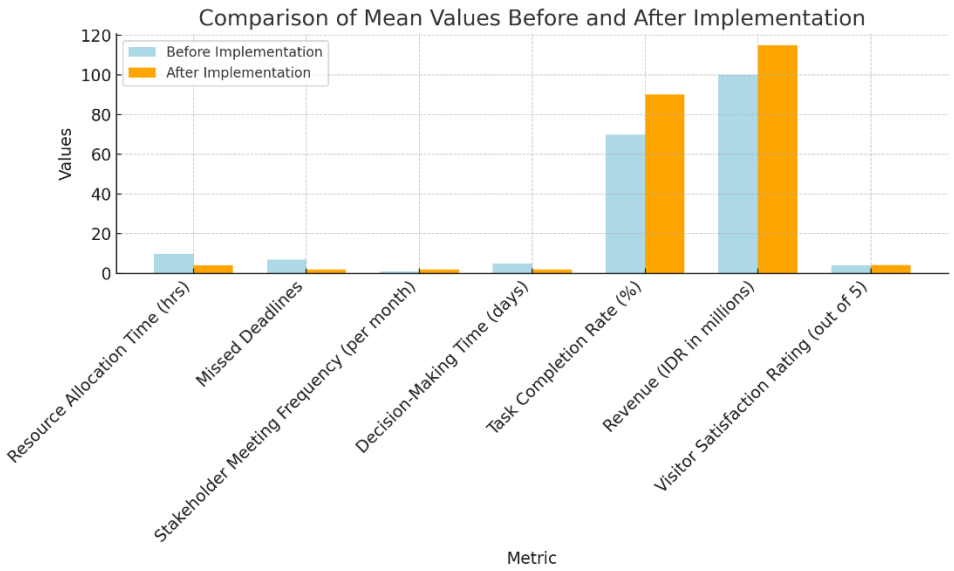

Figure 1. Comparison of Mean Value

The chart clearly demonstrates the positive impact of the implemented system across various operational and financial metrics. The improvements suggest that the system helped streamline processes, reduce inefficiencies, and foster better collaboration among stakeholders, leading to both higher revenues and better customer satisfaction. These changes are essential for the sustainable growth of the tourism business, particularly in competitive and dynamic markets.

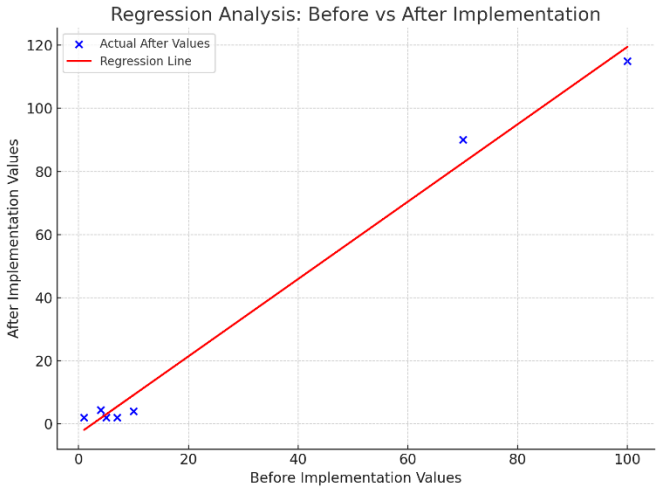

Figure 2. Regression analysis chart

This regression analysis chart illustrates the relationship between the "before" and "after" implementation values. The blue dots represent the actual data points for after-implementation values across various metrics, while the red line represents the regression line derived from the linear regression model. The near-perfect alignment of the data points with the regression line indicates a strong correlation between the before and after values, with an R-squared value of 0.991. This high R-squared value suggests that the model effectively explains the variability in the after-implementation outcomes based on the before-implementation metrics. In essence, the model shows a highly predictive relationship, indicating that improvements seen after implementation can be confidently attributed to changes in the before metrics.

DISCUSSION

The presentation of the discussion clearly aligns with the research results, but further detail is needed regarding participant responses. Initially, participants expressed mixed reactions to the automated managerial system. Some were hesitant due to a lack of familiarity with digital tools, while others saw potential for improving efficiency. As the system was integrated into daily operations, participants gradually adapted, with the majority reporting increased confidence in its use. By the end of the intervention, stakeholder engagement improved significantly, and participants noted that the system facilitated better communication and streamlined resource management. Focus group discussions highlighted a general consensus that the automated system reduced decision-making time and enhanced task coordination. These findings underscore the

importance of ongoing support and training to ensure long-term success and adoption of such systems. The factors influencing tourism village management often do not operate in isolation; rather, they interact dynamically and can either amplify or mitigate each other's effects. Understanding these interactions is key to developing more effective management strategies.

Table 3. Factors influencing tourism village management

Factor	Description
External Economic Conditions	Market demand, government policies, economic shifts that impact revenue and visitor satisfaction.
Infrastructure Development	Transport, public services, and overall infrastructure affecting visitor flow and business operations.
Social and Cultural Dynamics	Community engagement, cultural adaptation, and local social dynamics impacting system implementation.
Technological Infrastructure	System reliability, digital literacy, and technical infrastructure influencing efficiency.
Competition	Emerging competitors and innovation from rival destinations affecting visitor numbers.
Environmental Factors	Weather, climate change, and sustainability practices impacting tourism attractiveness.
Marketing and Promotion	Marketing effectiveness, brand reputation, and promotional strategies affecting visitor inflow.
Seasonality	Seasonal peaks and troughs in tourism demand that affect operational efficiency.
Financial Health	Investment capacity, financial management, and debt levels impacting business sustainability.
Human Resources	Staff training, recruitment, and turnover affecting the implementation and use of automated systems.

The table provides a summary of factors that could influence outcomes in the context of tourism village management and system implementation. These factors include External Economic Conditions, which highlight the role of market demand, government policies, and broader economic shifts; Infrastructure

Development, which covers the importance of transport and public services for tourism operations; Social and Cultural Dynamics, which emphasize community engagement and adaptation to new systems; Technological Infrastructure, focusing on system reliability and digital literacy; and Competition, which considers the impact of emerging competitors and innovations in the industry. Each factor is accompanied by a description explaining how it can affect the success and sustainability of the tourism business and its managerial systems. These factors underscore the complexity of managing tourism in rural areas and the importance of considering external and internal dynamics in business planning and system implementation. The primary limitations of this study include the short timeframe of data collection, which may not capture long-term trends or the full effects of the implemented system, and the potential influence of external variables like economic conditions or environmental factors that were not controlled. Furthermore, the qualitative nature of the research, while offering valuable insights, limits the ability to generalize findings across different contexts. In terms of practical implementation, the study highlights the importance of customizing automated systems to the specific needs of tourism villages, ensuring that stakeholders are trained and engaged in the process, and continuously monitoring and adjusting the system to respond to dynamic local and external conditions. This approach can lead to improved operational efficiency, enhanced stakeholder collaboration, and increased visitor satisfaction, but must be tailored to each village's unique cultural, social, and economic environment for sustained success.

CONCLUSIONS

The implementation of an automated managerial system in the tourism village of Parsingguran II demonstrates significant improvements in operational efficiency, stakeholder engagement, and business performance. The system effectively reduced resource allocation time, missed deadlines, and decision-making time, while increasing task completion rates, revenue, and visitor satisfaction. However, the success of such systems is contingent on adapting them to the unique social, cultural, and technological context of the community, emphasizing the importance of stakeholder training and involvement. While the short-term results are promising, future research should focus on long-term impacts and further exploration of external factors that could influence outcomes, such as economic fluctuations and environmental conditions. The findings suggest that automation, when appropriately tailored, can significantly enhance the management and sustainability of tourism businesses in rural areas.

ACKNOWLEDGEMENTS

This program was funded by Lembaga Pengabdian Kepada Masyarakat Universitas Sumatera Utara 2024 Grant: 1462/UN5.1.R/SK/PPM/2024.

REFERENCES

Amalia, A. (2023). *THE EFFECT OF DIGITAL ECONOMY WITH DIGITAL LITERACY AS A MODERATING VARIABLE ON INCREASING RUMAH UMKM INCOME IN DESA PERKEBUNAN TANJUNG KASAU , BATUBARA*. *4*(2013), 1592–1598.

Beta, A. R., Aji, S., & Idris, M. (2021). *Learning Management System (LMS) based on Google Sites as an Effective Learning Media during the Covid- 19 Pandemic*. 51–55.

Dalimunthe, D. M. jafar, Meutia, A., & Lubis, A. S. (2022). Art Therapy Sebagai Manajemen Stres dalam Meningkatkan Kinerja Wanita Pekerja. *Psychocentrum Review*, *4*(1), 99–106. https://doi.org/10.26539/pcr.41822

Erwin, Hasibuan, C. D., Siahaan, D. A. S., Manurung, A., & Marpaung, J. L. (2024). Stability Analysis of Spread of Infectious Diseases COVID-19 Using SEIAR-V1V2Q Model for Asymptomatic Condition with Runge-Kutta Order 4. *Mathematical Modelling of Engineering Problems*, *11*(5), 1348–1354. https://doi.org/10.18280/mmep.110526

Hanum, N. S. (2013). Keefetifan e-learning sebagai media pembelajaran (studi evaluasi model pembelajaran e-learning SMK Telkom Sandhy Putra Purwokerto). *Jurnal Pendidikan Vokasi*, *3*(1), 90–102. https://doi.org/10.21831/jpv.v3i1.1584

Hartanto, W. (2016). Penggunaan E-Learning sebagai Media Pembelajaran. *Jurnal Pendidikan Ekonomi*, *10*(1), 1–18.

Manurung, A., Batara, Y., Siriongoringo, P., & Marpaung, J. L. (2024). Satisfaction Analysis of The Establishment of a Website-Based Rank System Using Customer Satisfaction Index (CSI) And Importance Performance Analysis (IPA) Methods. *Sinkron : Jurnal Dan Penelitian Teknik Informatika*, *8*(2), 1233–1240. https://doi.org/https://doi.org/10.33395/sinkron.v8i2.13599

Mutia, F. (2022). *Implementasi model pembelajaran di era digital pada sekolah dasar*.

Purba, K., Lumbanraja, P., Siahaan, E., & Gultom, P. (2018). *Foundation Lecturer's Performance Antecedents (Empirical Study on Private Universities in Medan)*. *46*(Ebic 2017), 577–582. https://doi.org/10.2991/ebic-17.2018.91

Sembiring, P., Sofyan, R., Science, F., Utara, U. S., Studies, F. C., & Utara, U. S. (2020). *Counseling to the Karo Regency Tourism and Culture Office for Optimizing the Selection of Tourism Routes in Karo Regency*. *5*(2), 498–502.

Sofiyah, F. R., Dilham, A., Hutagalung, A. Q., Yulinda, Y., Lubis, A. S., & Marpaung, J. L. (2024). The chatbot artificial intelligence as the alternative customer services strategic to improve the customer relationship management in real-time responses. *International Journal of Economics and Business Research*, *27*(5), 45–58. https://doi.org/10.1504/IJEBR.2024.139810

Stoler, A. L., & Stoler, A. L. (2010). *Communication and Critical / Cultural Archival Dis-Ease : Thinking through Colonial Ontologies Archival Dis-Ease : Thinking through Colonial Ontologies*. *September 2015*. https://doi.org/10.1080/14791421003775741

Tulus, Sy, S., Sugeng, K. A., Simanjuntak, R., & Marpaung, J. L. (2024). Improving data security with the utilization of matrix columnar transposition techniques. *E3S Web of Conferences*, *501*. https://doi.org/10.1051/e3sconf/202450102004

Tulus, Zarlis, M., Sawaluddin, Syahputra, M. R., & Marpaung, T. J. (2020). Models in active learning in schools. *ABDIMAS TALENTA: Jurnal Pengabdian Kepada Masyarakat*, *5*(1), 116–119. https://doi.org/10.32734/abdimastalenta.v5i1.4230