

The Tyranny of Algorithms: The Failure of Big Data-Based Strategic HRM to Predict Organizational Resilience in the Age of the Black Swan

Mahmud Abdul Ghofur^{1*}, Siti Aimah²

^{1,2}Kh Mukhtar Syafa'at University, Banyuwangi, Indonesia

* Corresponding author:

Email: mahmudabdulghofur@gmail.com

Abstract.

This study aims to critically analyze how the limitations of a big data-based strategic human resource management (HRM) approach affect an organization's ability to build resilience in the era of Black Swan events, through a case study at MTs Roudlotul Muta'allimin Simbar Tampo Cluring, Banyuwangi. This study employs a qualitative approach using a case study design at MTs Roudlotul Muta'allimin Simbar Tampo Cluring Banyuwangi during May 2026. Four informants were selected through purposive sampling, consisting of the school principal, the vice principal for curriculum, the administrative director, and a senior teacher. Data were collected through observation, in-depth interviews, and documentation. Data analysis utilized the interactive model proposed by Miles, Huberman, and Saldaña through data condensation, data presentation, and drawing conclusions, while data validity was tested through source triangulation, methodological triangulation, and member checking. The results of this study indicate that the implementation of data-driven strategic human resource management at MTs Roudlotul Muta'allimin Simbar Tampo Cluring Banyuwangi has not yet been able to optimally build organizational resilience in the face of uncertainty. The main findings identify three limitations: the illusion of predictability, the reproduction of structural bias, and algorithmic fragility, which indicate that reliance on historical data can reduce organizational adaptability. This study contributes to expanding the field of Strategic Human Resource Management by emphasizing that data should be positioned as a decision support tool, not a decision substitute. Consequently, HRM practices need to integrate data analytics with adaptive leadership, sensemaking, and professional judgment. Further research is recommended to test the Human-Centered Data-Driven Human Resource Management model across various organizational contexts.

Keywords: *Big Data; Algorithmic Bias; Algorithmic Fragility; Organizational Resilience and Human-Centered HRM.*

I. INTRODUCTION

Modern organizations' reliance on algorithms is now growing faster than their own ability to understand the complexity of human behavior (Meira et al., 2025). Digital transformation has propelled strategic human resource management (HRM) practices into an era of decision-making based on *big data*, *artificial intelligence*, and *predictive analytics*, which are believed to produce more objective, efficient, and accurate decisions than human judgment (Dominici & Versuti, 2025; Kim, 2025).

Various organizations in the business, government, and digital sectors are increasingly relying on algorithmic systems to support processes ranging from recruitment and performance evaluation to talent identification, *turnover* prediction, and leadership succession planning. This shift indicates that data no longer serves merely as a tool to support decision-making but has become the primary foundation for developing organizational strategies (Kolt, 2023). However, various global crises in recent years have revealed a paradox that is hard to ignore.

Organizations that have invested significant resources in data-driven analytics technologies continue to struggle to maintain stability and adaptability when faced with extreme, unexpected events that fall outside historical patterns, such as the COVID-19 pandemic, global supply chain disruptions, the accelerating disruption caused by generative artificial intelligence, geopolitical conflicts, and global economic uncertainty (Ma & Su, 2025; Prabowo et al., 2025). These conditions indicate that the sophistication of algorithms does not always align with an organization's ability to build resilience. The growing reliance on data-driven predictive systems even has the potential to give rise to a new form of organizational vulnerability—namely, when strategic decisions are determined more by past statistical

patterns than by human capabilities to interpret contextual changes, engage in sensemaking, and respond to rapidly evolving social dynamics (Dominici, 2026; Tessore & Petrella, 2026) .

In such situations, algorithms no longer merely serve as analytical tools but begin to dominate the strategic decision-making process, to the point of supplanting the professional judgment, intuition, experience, and contextual knowledge possessed by decision-makers (O'Regan, 2024) . This phenomenon has come to be known as the “tyranny of algorithms”—a condition in which the dominance of data-driven systems creates an illusion of certainty while simultaneously reducing an organization’s capacity to adapt to the very uncertainty that defines the contemporary business environment.

A number of previous studies have shown that the use of *big data* and algorithms in strategic Human Resource Management (HRM) provides significant benefits to the effectiveness of organizational decision-making, but also presents various limitations when dealing with situations fraught with uncertainty. . Shaik’s study“(2026) ,” explains that the application of *analytics* in human resource management can improve decision-making accuracy through the use of quantitative and predictive data. Nevertheless, the study also emphasizes that the effectiveness of analytics is highly dependent on the quality of the historical data used, making it less capable of anticipating dynamic environmental changes that lack prior patterns.

Furthermore, research by(2024) reveals that the dominance of algorithms in modern organizations has the potential to create a new form of digital control that displaces human judgment in the decision-making process. According to him, excessive reliance on data-driven systems can reduce an organization’s sensitivity to social, cultural, and psychological aspects which are, in fact, critical factors in building organizational adaptability. Meanwhile, research by Sienkiewicz,(2021) , on *organizational resilience* explains that an organization’s ability to cope with crises is not solely determined by the sophistication of information technology or predictive models, but rather by the ability of its members to engage in *sensemaking*, improvisation, collective learning, and adaptive decision-making when facing unexpected conditions.

The third finding of the study indicates that although *big data* and algorithms can improve the efficiency of strategic HRM processes, neither is yet fully capable of explaining or predicting organizational resilience when faced with extreme “*Black Swan*” events. Thus, there remains an open academic space to critically examine the relationship between algorithmic dominance, the limitations of data-driven predictive systems, and the importance of the human dimension in building organizational resilience in an era of uncertainty.

The novelty of this study lies in its attempt to reconstruct the paradigm of strategic Human Resource Management, which has thus far tended to position *big data* and algorithms as the primary tools in organizational decision-making. Unlike previous studies, which have largely emphasized the effectiveness of *HR analytics*, *predictive analytics*, and artificial intelligence in improving the efficiency of human resource management, this study critically examines the limitations of these approaches when faced with “Black Swan” events—that is, rare, unpredictable situations that have a massive impact on an organization’s sustainability. This study offers a new perspective: the failure of predictive systems is not solely due to technological limitations or data quality, but also stems from a reduction in human complexity that cannot be fully represented through statistical patterns and historical data.

Therefore, this study develops a conceptual framework that positions human-centered strategic human resource management as both a complement to and a counterbalance for algorithm-based approaches. Within this framework, *sensemaking* capabilities, professional intuition, adaptive leadership, organizational learning, and a collaborative culture are positioned as strategic elements that cannot be replaced by data-driven analytical systems. Thus, this study not only critiques the dominance of algorithms in strategic HRM practices but also offers an integrative approach that combines technological sophistication with human adaptive capacity as the primary foundation for building organizational resilience in an era marked by extreme uncertainty and disruption.

Although various studies have shown that *big data analytics*, *human resource analytics*, and algorithm-based decision-making systems can improve the efficiency of human resource management, most

studies still focus on predictive accuracy, organizational productivity, and performance optimization, while attention to these systems' ability to build organizational resilience under conditions marked by extreme uncertainty remains relatively limited. Previous research has also tended to develop predictive models based on historical data patterns, and thus has not been able to explain how organizations maintain their adaptive capacity when facing Black Swan events—which are unexpected, have a major impact, and fall outside statistical assumptions.

This research gap serves as a key rationale for conducting this study, as to date there have been few studies that integrate a critique of algorithmic dominance in strategic HRM with the dynamics of organizational resilience in the context of Islamic educational institutions. Therefore, this study aims to critically analyze how the limitations of strategic HRM approaches based on *big data* affect an organization's ability to build resilience in the era of *the Black Swan*, through a case study at MTs Roudlotul Muta'allimin Simbar Tampo Cluring Banyuwangi. This study argues that organizational resilience is not only determined by a system's ability to process data and generate predictions but is also shaped by adaptive leadership, contextual decision-making, organizational learning, and *sensemaking* capabilities that develop through human interaction. Thus, the main contribution of this study is to expand the discourse on Strategic Human Resource Management by introducing a human-centered perspective to complement algorithmic approaches, while also offering a conceptual framework that explains that organizational resilience in an era of uncertainty cannot be built solely through technological sophistication, but also through human capacity to respond to complexities that cannot always be predicted by historical data.

II. RESEARCH METHODOLOGY

This study employs a qualitative approach using a case study design to gain an in-depth understanding of the limitations of implementing *big data-based* strategic Human Resource Management (HRM) in building organizational resilience in the era of *the Black Swan*. This approach was chosen because the study does not aim to statistically test relationships between variables but rather to interpret the experiences, perceptions, and decision-making practices that emerge within the context of the educational organization (Abdussamad & Sik, 2021). The research was conducted at MTs Roudlotul Muta'allimin Simbar Tampo Cluring Banyuwangi for one month, from May 1 to 30, 2026. During this period, the researcher conducted eight field observations, twice a week, which allowed the researcher to understand the organizational dynamics more comprehensively and to triangulate the data obtained through interviews and documentation (Sari et al., 2022).

The research subjects were selected using purposive sampling, which involves selecting informants considered to have an understanding of the strategic decision-making process within the madrasah setting. The sample consisted of four informants: the madrasah principal, the vice principal for curriculum, the administrative director, and a senior teacher involved in human resource management. These four informants were selected because they possessed characteristics relevant to the research objectives: they had a minimum of five years of service, were involved in organizational planning and decision-making processes, understood policies regarding the management of teaching and non-teaching staff, and had experience dealing with organizational changes and situations requiring adaptability (). These characteristics are expected to provide *information-rich cases* regarding how strategic decisions are formulated, how data is utilized in human resource management, and how organizations maintain their resilience when facing uncertainty (Kusumastuti & Khoiron, 2019).

Data collection was conducted through observation, in-depth *interviews*, and a review of documents. Observation was conducted nonparticipatively, focusing on decision-making processes, communication patterns among organizational actors, problem-solving mechanisms, and the organization's adaptation to environmental changes (Roosinda et al., 2021; Prabowo et al., 2024). The interviews were conducted using a semi-structured approach, allowing the researcher flexibility to explore the informants' responses without straying from the research focus. The interview guidelines were developed based on several key indicators, namely: (1) the informants' understanding of data utilization in HRM decision-making; (2) their experiences

in dealing with crises or unexpected changes; (3) the forms of organizational adaptation to ensure institutional sustainability; (4) the role of intuition, experience, and professional judgment in the decision-making process; and (5) the informants' perceptions of the strengths and limitations of using data or digital technology to support organizational policies. All interviews were recorded with the informants' consent and then transcribed verbatim to ensure data accuracy (Nartin et al., 2024) .

Documentary data was obtained from official madrasah documents, such as organizational charts, work programs, meeting minutes, human resource management policy documents, activity reports, performance evaluation records, and other documents related to the organization's decision-making process (Hasan et al., 2025) . Document analysis was conducted through a process of identifying document content, grouping information based on research themes, and then comparing it with the results of observations and interviews as a form of source triangulation to enhance the credibility of the findings (Sugiyono, 2022) .

Data analysis was conducted using the interactive model developed by Matthew B. Miles, A. Michael Huberman, and Johnny Saldaña, which includes data condensation, data presentation, and the drawing and verification of conclusions. After all the data were transcribed, the researchers conducted a phased coding process consisting of open coding to identify initial concepts from the interview results, axial coding to link categories with conceptual relationships, and selective coding to identify core themes explaining the relationship between algorithmic dominance, HRM decision-making, and organizational resilience (Nasution & Junaidi, 2024) . The resulting themes were then critically interpreted by relating the field findings to the concepts of *Strategic Human Resource Management*, *algorithmic decision-making*, *organizational resilience*, and *Black Swan* theory. To ensure data validity, the study employed methodological triangulation, source triangulation, member checking with key informants, and peer debriefing to ensure that the resulting interpretations truly represent the empirical conditions in the field (Niam et al., 2024) .

III. RESULTS AND DISCUSSION

Research Results

The Illusion of Predictability in Big Data-Based HRM Systems

The research findings indicate that one limitation in the implementation of data-driven strategic Human Resource Management (HRM) at MTs Roudlotul Muta'allimin Simbar Tampo Cluring Banyuwangi is the emergence of an illusion of predictability—that is, the organization's tendency to believe that administrative data and past performance records are sufficient to represent future human resource conditions. Although the madrasah has not yet fully implemented a *big data analytics* system as modern business organizations have, decision-making practices have utilized various forms of digital data—such as attendance records, teacher performance evaluation results, instructional supervision reports, and annual evaluation documents—as the basis for formulating human resource management policies. Research findings indicate that the use of this data provides benefits in supporting administrative and evaluation processes, but it has not yet been able to fully capture the adaptability of teachers and educational staff when facing rapid changes.

In some situations, decisions based on administrative indicators tend to overlook contextual factors, such as psychological readiness, the ability to adapt to changes in education policy, the dynamics of communication among employees, and the emergence of challenges that have never before been recorded in organizational data. This situation indicates that historical data has limitations in predicting organizational resilience because it represents only past conditions, not the various possibilities that may arise in situations marked by uncertainty (*Black Swan events*). Thus, these findings suggest that the use of data as a basis for decision-making must be balanced with professional judgment, leadership experience, and organizational dialogue so that the resulting decisions are not only administratively accurate but also adaptable to changes in the environment.

These findings were reinforced by an interview with the principal of MTs Roudlotul Muta'allimin Simbar Tampo Cluring in Banyuwangi, who explained that administrative data is indeed one of the bases for

evaluating the performance of educators and educational staff, but it cannot be used as the sole reference when madrasahs face rapidly changing situations. He stated:

"Administrative data does help us track teachers' performance over time. However, when there are policy changes or unforeseen circumstances, decisions cannot be based solely on numbers or reports. We still need to discuss matters directly with the teachers, assess the situation on the ground, and take their experiences into account so that the decisions we make truly meet the needs of the madrasah."

This statement is consistent with the findings of interviews with other informants—namely, the Deputy Principal for Curriculum, the Administrative Director, and senior teachers—who generally stated that administrative documents and evaluation data serve only as tools, not as the primary determinants in strategic decision-making. All informants emphasized that various important decisions—particularly those related to policy adjustments, teacher assignments, and responses to changes in the educational environment—are largely determined through deliberation, consideration of experience, and an understanding of actual conditions on the ground. These findings indicate that organizational resilience cannot be predicted solely through historical data but is built through the organization's ability to combine administrative information with contextual assessment, collective communication, and adaptive leadership. Thus, this study confirms that the illusion of predictability is a major limitation of data-driven HRM approaches when faced with dynamic conditions that cannot be fully projected through past patterns, thereby reinforcing the argument that a human-centered strategic human resource management approach is more relevant for building organizational resilience in the era of *Black Swans*.

To clarify the research findings regarding the emergence of the illusion of predictability in the implementation of data-driven HRM, these findings are summarized into several key indicators that illustrate the relationship between the use of historical data, the decision-making process, and their impact on organizational resilience. These indicators were developed based on observations, interviews, and documentation, enabling them to systematically represent the flow of research findings as presented in Figure 1.

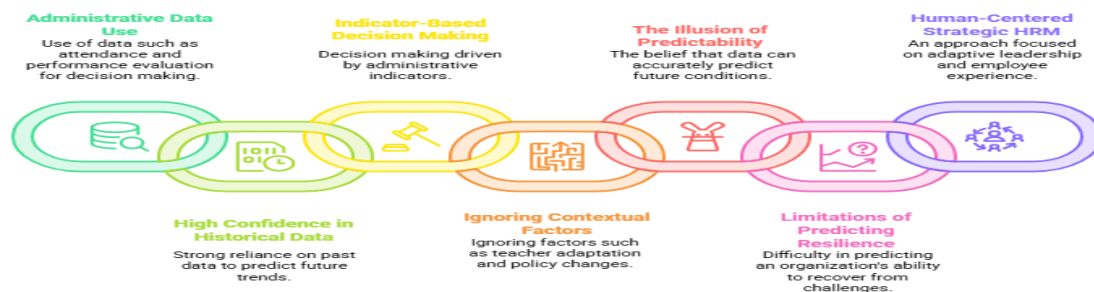


Fig. 1. Indicators of Findings on the Illusion of Predictability in Big Data-Based HRM Systems

These indicators suggest that the illusion of predictability arises when historical data is treated as the primary basis for HRM decision-making without considering the contextual factors evolving within the organizational environment. As a result, the organization's ability to build resilience is limited because various dynamic changes cannot be fully projected through administrative data. Therefore, strategic decision-making requires the integration of data analytics with adaptive leadership, organizational communication, professional experience, and *sensemaking* so that the organization can respond to uncertainty in a more flexible and sustainable manner.

Reproduction of Structural Bias Through Algorithms

The research findings indicate that the use of data in Human Resource Management (HRM) at MTs Roudlotul Muta'allimin Simbar Tampo Cluring, Banyuwangi, has the potential to perpetuate structural biases if historical data is used as the sole basis for decision-making. Although the madrasah has not yet fully implemented *artificial intelligence-based* algorithms, the use of administrative data, performance records, length of service, and teacher evaluation results often serves as the primary reference in determining various internal policies, such as task allocation, the appointment of activity coordinators, and the assignment of additional responsibilities. Research findings indicate that while the use of such data streamlines administrative processes, it also risks perpetuating decision-making patterns that have persisted for years

without evaluating changes in the organization's needs. Consequently, teachers or educational staff with new skills and innovative potential may not receive equal opportunities if they lack a strong track record in administrative records. This situation demonstrates that historical data can shape decision-making patterns that tend to repeat past practices, thereby limiting the space for new perspectives and competencies to emerge. Therefore, the use of data in human resource management must be accompanied by contextual considerations so that decisions are not solely oriented toward past experiences but also take into account the potential for future human resource development.

This finding was reinforced by an interview with the Madrasah's Deputy Head for Curriculum, who explained that teacher evaluation data is indeed one of the bases for decision-making, but does not always reflect the full range of abilities possessed by each individual. He stated:

"Assessment documents and performance records do help us in determining task assignments, but we also recognize that teachers' abilities are constantly evolving. If we only look at old data, we might overlook teachers who actually have new potential. Therefore, we always discuss every decision together so that we do not rely solely on administrative documents."

This statement is supported by the results of interviews with the Madrasah Principal, the Administrative Director, and senior teachers, who generally stated that the decision-making process at the madrasah is not based solely on administrative data but also involves deliberation and consideration of each teacher's actual circumstances. The informants believed that this approach is necessary to avoid routine decisions and to provide fairer opportunities for all educators to develop their competencies. These findings indicate that historical data serves as a useful initial source of information but should not be the sole basis for strategic decision-making. Thus, this study underscores that human resource management oriented toward organizational resilience requires a balance between data utilization and professional judgment so that the resulting decisions are more adaptive, inclusive, and aligned with the organization's evolving dynamics.

The Emergence of Algorithmic Fragility as a New Source of Vulnerability

The research findings indicate that one form of vulnerability in Human Resource Management (HRM) at MTs Roudlotul Muta'allimin Simbar Tampo Cluring Banyuwangi is the emergence of *algorithmic fragility*—a condition in which the decision-making process becomes less adaptive due to overreliance on administrative data and pre-established procedures. Although the madrasah has not yet implemented complex *artificial intelligence-based* algorithms, many human resource management decisions have been largely based on administrative reports, routine evaluation results, and performance documents as the primary considerations. The research findings indicate that this approach is quite helpful in maintaining administrative order, but it has limitations when the madrasah is faced with changes in education policy, urgent organizational needs, or situations that cannot be predicted in advance. Under such conditions, historical data often fails to provide insight into the most appropriate course of action, so the organization must be able to make quick decisions based on experience, communication, and situational considerations. This situation indicates that overreliance on administrative data can reduce an organization's flexibility in responding to change if it is not balanced by adaptive leadership and the ability to assess real-world conditions on the ground.

These findings are supported by an interview with the Administrative Head of MTs Roudlotul Muta'allimin Simbar Tampo Cluring in Banyuwangi, who explained that while various administrative reports do serve as guidelines to support the decision-making process, they are not always able to address the organization's needs when faced with rapidly changing conditions. He stated:

"Administrative documents are very helpful to us in carrying out our daily work, but when new policies or unplanned situations arise, we cannot rely solely on existing reports. We must immediately coordinate with the madrasah principal and the teachers so that the decisions we make are appropriate for the circumstances we are facing."

This statement is supported by the results of interviews with the Madrasah Principal, the Vice Principal for Curriculum, and senior teachers, who generally stated that experience, communication, and consultation are more decisive factors than administrative data when the madrasah faces unexpected

changes. The informants assessed that documents and data serve only as initial sources of information, whereas the organization's success in maintaining the continuity of educational activities is largely determined by the ability of the entire madrasah community to collaborate, adapt, and make quick decisions in response to evolving situations. These findings indicate that organizational resilience is built not only through the orderliness of data and administration but also through people's capacity to respond flexibly to uncertainty. Thus, this study confirms that a human-centered strategic human resource management approach is a critical factor in strengthening organizational resilience, as it compensates for the limitations of historical data when the organization faces situations that fall outside previously planned patterns.

IV. RESEARCH DISCUSSION

The Illusion of Predictability in Big Data-Based HRM Systems

Findings regarding the illusion of predictability indicate that the use of data in strategic Human Resource Management (HRM) cannot be viewed as a tool capable of fully predicting an organization's ability to cope with uncertainty. An interpretation of these research findings reveals that administrative data and performance records play a crucial role as a basis for policy formulation, but they cannot fully represent the social dynamics that influence organizational resilience (Jaser & Tourish, 2024). This finding reinforces the perspective of (2023) through the *Black Swan* theory, which explains that extreme events are unpredictable and cannot be explained solely through historical patterns. In the context of this study, data on teacher evaluations, attendance, and supervision reports only describe past conditions and are therefore limited when used to estimate an organization's ability to respond to changes in education policy or rapidly evolving environmental dynamics.

These findings are also consistent with the "perspective (2022) regarding *sensemaking* theory, which asserts that an organization's success in dealing with complex situations is determined more by the ability of individuals and the organization to construct shared meaning, interpret change, and make adaptive decisions than by simply following the information available within formal systems. On the other hand, the research results also support the concept of *human-centered strategic human resource management*, which positions people as the primary actors in strategic decision-making (Cheng, 2024). This perspective emphasizes that the effectiveness of strategic human resource management depends not only on data quality but also on adaptive leadership, organizational communication, professional experience, and deliberative processes that enable more context-specific decisions. Thus, the findings of this study expand our understanding that organizational resilience in the *Black Swan* era is not built solely through faith in the predictive power of data, but rather through the integration of administrative information with human capacity to interpret change, collaborate, and make flexible decisions in accordance with the demands of the situation.

Reproduction of Structural Bias Through Algorithms

Findings regarding the reproduction of structural bias indicate that the use of historical data in HRM decision-making is not entirely objective, as such data is essentially a representation of decisions made in the past. An interpretation of these research findings reveals that when administrative data, length of service, and performance records are used as the primary reference without contextual evaluation, organizations risk perpetuating the same decision-making patterns over time (Castilla, 2025). As a result, individuals with new competencies, adaptability, and innovative potential may not necessarily receive equal opportunities if these characteristics are not documented in the administrative system.

This finding aligns with the theory of algorithmic bias proposed by Bodie, (2021), which explains that data-driven systems tend to reproduce biases embedded in historical data, resulting in decisions that appear objective but are, in fact, still influenced by past patterns. Although MTs Roudlotul Muta'allimin has not yet adopted artificial intelligence-based algorithms, the dominant pattern of administrative data utilization reveals a similar mechanism namely, a tendency to perpetuate old practices by relying on historical information as the primary basis for decision-making.

These findings are also consistent with Mattfolk & Wikander's perspective "(2025)", which emphasizes that the dominance of data within an organization can undermine sensitivity to the human

dimension if not balanced by critical reflection. From a Strategic Human Resource Management perspective, strategic decisions should not only consider past achievements but also identify individuals' development potential relevant to the organization's future needs (Abraham et al., 2023). Therefore, the results of this study confirm that strengthening organizational resilience requires a human-centered strategic human resource management approach—one that integrates administrative data with professional assessments, deliberation, and an understanding of each individual's potential—so that the resulting decisions are more adaptive, inclusive, and capable of supporting the sustainable development of human resources.

The Emergence of Algorithmic Fragility as a New Source of Vulnerability

Findings regarding the emergence of algorithmic fragility indicate that organizational vulnerability is not solely caused by data limitations, but also by organizations' tendency to rely too heavily on administrative procedures and information in the decision-making process. An interpretation of these research results shows that using data as the basis for HRM can indeed improve administrative orderliness, but it does not always lead to responsive decisions when organizations face rapid and unexpected changes. In the context of MTs Roudlotul Muta'allimin Simbar Tampo Cluring Banyuwangi, the organization's ability to maintain the continuity of educational activities is actually determined more by coordination among stakeholders, adaptive leadership, effective communication, and deliberative processes than by simply referring to available administrative documents.

These findings are consistent with the theory of Organizational Resilience developed by Teo,(2025), which explains that organizational resilience is built through *sensemaking*, collective learning, and improvisation in the face of uncertain conditions. Furthermore, the results of this study also reinforce the Black Swan theory by Jin & Lee,(2025), which asserts that extreme events cannot be predicted solely through historical data because they lie outside the normal patterns upon which predictive systems are based. Therefore, organizations require adaptive capacity that enables rapid decision-making based on an understanding of the current context. These findings also support the Strategic Human Resource Management perspective, which positions human resources as a strategic asset in building organizational excellence (Saengchote & Samphantharak, 2024). From this perspective, technology and data serve as supporting tools, while leadership, collaboration, communication, and experience remain the primary factors in creating organizational resilience (Lee et al., 2026). Thus, this study confirms that algorithmic fragility can be minimized through the implementation of human-centered strategic human resource management—an approach that integrates the use of data with human adaptability—so that organizations are better prepared to face change and uncertainty in the era of *the Black Swan*.

V. CONCLUSION

This study shows that the implementation of data-driven strategic Human Resource Management (HRM) at MTs Roudlotul Muta'allimin Simbar Tampo Cluring Banyuwangi has benefits in improving administrative effectiveness and supporting the decision-making process; however, it has not yet been able to optimally predict or build organizational resilience when faced with dynamic and unpredictable situations. The research findings identify three main limitations: the illusion of predictability, the reproduction of structural biases, and algorithmic fragility. These findings suggest that reliance on historical data has the potential to result in less adaptive decisions, perpetuate old patterns, and reduce the organization's flexibility in responding to change.

Therefore, organizational resilience cannot be built solely through the use of administrative data; rather, it requires the integration of data-driven information with adaptive leadership, organizational communication, deliberation, professional experience, and the ability to make sense of changes in the environment. Theoretically, this study expands the field of Strategic Human Resource Management by integrating the *Black Swan* perspective, *algorithmic bias*, and *organizational resilience* into the context of human resource management in educational institutions. This contribution leads to the understanding that data should be positioned as a decision support tool, not a decision substitute, so that strategic decisions remain oriented toward human judgment.

In this context, this study suggests that madrasahs need to develop a human resource management system that combines data utilization with participatory and reflective evaluation mechanisms to become more responsive to change. Further research is recommended to develop a Human-Centered Data-Driven Human Resource Management model through comparative studies across various levels of educational institutions or organizations with different levels of technology adoption, thereby testing how the balance between data analytics and human capacity influences organizational resilience. Ultimately, amid the acceleration of digital transformation, an organization's competitive advantage will not be determined by the sheer volume of data it possesses, but rather by its people's ability to critically interpret data, make wise “ ” decisions, and build an organization that is adaptive to future uncertainties.

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