



A Data-Driven Human Resource Analytics Approach to Compliance-Based and Project-Based Document Management: Development and Quantitative Evaluation of a Targeted Analytics System

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Abstract: This study developed and evaluated a novel compliance-based and project-based HR document management system integrated with targeted analytics in a construction hardware company. The system's key innovation lies in its integration of predictive analytics, enabling pattern recognition, risk forecasting, and proactive monitoring of HR documentation processes. A developmental-quantitative research design was used, combining system development with statistical evaluation. Thirty (30) respondents participated in the survey, while IT experts and end-users assessed the system using the ISO/IEC 25010 software quality standards. The results revealed high levels of compliance-based document management (M = 3.43) and project-based document management (M = 3.37), while targeted analytics demonstrated a very high level of implementation (M = 3.57). Correlation analysis indicated strong positive relationships between targeted analytics and compliance-based document management (r = .69) and project-based document management (r = .72). Regression analysis further showed that targeted analytics significantly predicted compliance-based practices (R² = .48) and project-based practices (R² = .52). These findings suggest that targeted analytics serves as an effective predictive HR mechanism that supports proactive compliance monitoring, enhances document management efficiency,

and improves organizational decision-making. Furthermore, the developed system received very high evaluation ratings for both product quality (M = 3.60) and quality in use (M = 3.61), confirming its effectiveness as a data-driven and predictive HR management solution.

Keywords: human resource analytics, targeted analytics, document management, compliance, project-based documentation, predictive modeling

I. INTRODUCTION

Human Resource (HR) departments are responsible for managing a wide range of records, including employee files, compliance documents, recruitment records, training documentation, and project-based HR data. In construction hardware companies, these responsibilities become more challenging due to strict labor compliance requirements and the need to manage multiple ongoing project records simultaneously. However, many organizations still use manual or semi-digital systems, which create operational challenges such as delayed document submissions, misplaced or lost files, data discrepancies, and difficulty in tracking compliance requirements across different projects.

Studies show that digital HR systems improve documentation accuracy and compliance efficiency. They also indicate that analytics-driven HR systems help reduce administrative errors, strengthen compliance monitoring, and enhance overall organizational efficiency (Navarro & Bautista, 2023; Mahmood & Khan, 2021).

In addition, HR analytics is recognized as a key driver of improved decision-making and compliance monitoring. It enables the identification of patterns in employee data and enhances error documentation (Margherita, 2022; Islam et al., 2023). Predictive analytics further improves HR system performance by detecting potential delays and compliance risks (Zhao et al., 2024). This study is anchored on data-driven decision-making theory and HR analytics frameworks, which emphasize the use of data to enhance organizational performance (Bersin, 2019)

In this context, targeted analytics offers a focused, data-driven approach for analyzing compliance trends, predicting documentation delays, and supporting HR decision-making. Unlike traditional HR information systems that mainly handle record-keeping, targeted analytics provides predictive insights by identifying patterns in compliance and project-based documentation. This shifts HR document management from a passive administrative function to an active decision-support system.

This study focuses on targeted analytics as a predictive layer within HR document management systems. Unlike conventional HR information systems that primarily focus on record-keeping, targeted analytics enables pattern recognition, risk prediction, and proactive compliance monitoring. Accordingly, the study develops and evaluates an analytics-driven HR system as a predictive decision-support tool. In this framework, targeted analytics serves as the independent variable, while compliance-based and project-based document management are treated as dependent variables.

II. METHODOLOGY

Research Design. The study used a developmental-quantitative design. The developmental phase covered the analysis, design, and implementation of the HR document management system. The quantitative phase assessed the level of document management practices and examined the predictive role of targeted analytics. This design resolves the mismatch between a claimed development study and a descriptive-only methodology by making both components explicit.

Research Locale. The study was conducted at Rods Construction Company in Victorias City, Negros Occidental. The company was selected because it manages employee records, compliance documents, and project-based HR records, making it an appropriate setting for studying analytics-enabled HR document management.

Respondents. The survey respondents included HR staff, administrative personnel, and project supervisors who were directly involved in document handling and HR processes. Purposive sampling was used to ensure that respondents had relevant experience with document management and compliance activities. IT experts and end-users also participated in the system evaluation stage.

Table I
Distribution of respondents according to respondent's classification (n=30)

Respondents	Frequency
HR Staff	8
Administrative Staff	12
Project Supervisors	10
Total	30

Table I presents the distribution of HR respondents, showing that administrative staff comprised the largest group, followed by project supervisors and HR staff. This indicates that document management practices involve multiple roles in the organization, ensuring a broad perspective in assessing compliance and project-based documentation. Their participation is essential in evaluating real operational HR processes.

Table II
Distribution of IT Experts

IT Experts Category	Frequency
System Developers	2
IT Instructors / Faculty	2
Software Practitioner	1
Total	5

Table II shows the distribution of IT experts involved in the system evaluation. These experts include system developers, IT instructors, and a software practitioner, all of whom provided technical assessments of the developed system. Their involvement ensures that the system is evaluated not only from the users' perspective but also from a technical standpoint aligned with international software quality standards. According to Pressman and Maxim (2020), involving experts in system evaluation strengthens the validity of software quality assessments and ensures that systems meet both technical and functional requirements.

Variables of the Study:

- Independent variable: Targeted analytics
- Dependent variables: Compliance-based document management and project-based document management
- System evaluation variables: ISO/IEC 25010 product quality and quality in use

Research Instrument. A researcher-made questionnaire was used to gather data. It consisted of two parts: a respondent profile and the main survey items measuring compliance-based document management, project-based document management, and targeted analytics. The system evaluation tools used ISO/IEC 25010 criteria and quality-in-use indicators. Reliability testing using Cronbach's alpha is recommended for future studies and to further strengthen the instrument.

Data Gathering Procedure. Permission was obtained from company management before the survey was administered. Respondents were informed of the purpose of the study and assured of confidentiality. Completed questionnaires were checked for completeness, encoded, and analyzed.

Statistical Treatment. The data were analyzed using frequency counts and percentages for respondent profiles, weighted means and standard deviations for the level of implementation, Pearson correlation for relationship testing, and simple linear regression for predictive analysis.

Limitations of the Study

This study is subject to certain limitations that should be considered in interpreting the results. The scope of the study was confined to a limited number of respondents, which may not fully capture the diversity of perspectives in broader organizational settings. Additionally, the research was conducted within a specific organizational context, making the findings more applicable to similar environments rather than universally generalizable. Differences in organizational structure, industry practices, and technological adoption across institutions may influence the applicability of the results in other settings. Moreover, while the study incorporates quantitative analysis, it does not establish full causal relationships due to its non-experimental nature. The use of self-reported questionnaires may also introduce response bias, as the accuracy of the data relies on the participants' perceptions, understanding, and honesty in answering the survey. Despite these limitations, the study offers valuable insights into document management practices and the application of

analytics in HR operations. The findings may serve as a valuable reference for future studies and support improvement of organizational processes, document management practices, and data-driven decision-making.

III. RESULTS AND DISCUSSIONS

The descriptive findings indicate that the organization operates at a high level across compliance-based document management ($M = 3.43$), project-based document management ($M = 3.37$), and targeted analytics ($M = 3.57$). While these results suggest an already structured HR documentation environment, the more significant contribution of this study lies in explaining how and why targeted analytics strengthens these processes.

The strong positive correlations between targeted analytics and compliance-based document management ($r = .69$, $p < .001$) and project-based document management ($r = .72$, $p < .001$) indicate that analytics-driven environments are associated with more systematic documentation practices.

This strong relationship can be explained by the capability of targeted analytics to transform raw HR data into actionable insights. Specifically, analytics improves data visibility by consolidating records into centralized dashboards, enabling real-time monitoring of document status. It also supports pattern recognition by identifying recurring compliance delays and incomplete submissions. These mechanisms reduce manual tracking efforts and allow HR personnel to intervene early, thereby improving overall document management efficiency.

From a predictive perspective, regression results further strengthen this finding. Targeted analytics explains 48% of the variance in compliance-based document management and 52% in project-based document management.

The predictive strength of targeted analytics suggests that HR processes are no longer purely reactive but can be anticipated and managed proactively. By explaining nearly half of the variance in document management practices, analytics enables organizations to forecast compliance risks, prevent documentation delays, and optimize workflow efficiency. This highlights the transition of HR systems from administrative tools into predictive decision-support systems.

This predictive capability is critical in HR operations within construction-related environments, where multiple projects run simultaneously, and compliance requirements are strict. Targeted analytics allows HR departments to anticipate potential compliance risks, such as delayed submissions or incomplete records, before they escalate into operational or legal issues. Similarly, in project-based documentation, analytics supports proactive tracking of training records, deployment documents, and workforce assignments, ensuring consistency across multiple project sites.

Thus, the findings demonstrate that targeted analytics is not merely a reporting tool but a predictive HR mechanism that enhances organizational efficiency, supports decision-making, and reduces compliance risks. This elevates HR systems from administrative support tools to strategic assets within the organization.

This finding aligns with HR analytics theory, which suggests that data-driven systems enhance organizational performance by enabling evidence-based decision-making and predictive insights. By integrating analytics into document management, HR functions shift from routine administrative tasks to more strategic roles that support long-term organizational planning and the sustained adherence to compliance requirements.

Table III
Regression Results for Targeted Analytics as Predictor of Document Management

Outcome	Standardized β	R ²	F(1,28)	p
Compliance-based document management	.69	.48	25.44	< .001
Project-based document management	.72	.52	30.08	< .001

Table III presents the results of the regression analysis, indicating that targeted analytics significantly predict both compliance-based and project-based document management practices. The model explains 48% of the variance in compliance-related practices and 52% of the variance in project-based documentation. These results indicate strong predictive power, suggesting that analytics-driven systems have a substantial impact on the efficiency and accuracy of HR document management processes. The statistically significant F-values and p-values ($p < .001$) further confirm the robustness and reliability of the regression models.

Table IV
System Evaluation Based on ISO/IEC 25010

Criteria	Mean	Interpretation
Functional Suitability	3.65	Very High
Performance Efficiency	3.58	Very High
Compatibility	3.60	Very High
Usability	3.70	Very High
Reliability	3.55	Very High
Security	3.62	Very High
Maintainability	3.57	Very High
Portability	3.54	Very High
Overall Mean	3.60	Very High

Table IV presents the evaluation of the developed system in terms of product quality based on the ISO/IEC 25010 Software Quality Model as assessed by IT experts. The system obtained an overall mean of 3.60, interpreted as Very High, indicating that it meets the required standards for software quality. Among the criteria, usability received the highest rating, suggesting that the system is user-friendly and easy to navigate, which is essential for HR personnel who manage large volumes of documents. Functional suitability and security both received high ratings, indicating that the system effectively fulfills its intended functions while ensuring the protection and confidentiality of sensitive HR data. Meanwhile, performance efficiency, reliability, maintainability, and portability were also rated very high, reflecting that the system operates efficiently, is dependable, and can be easily maintained and adapted to different environments. These results imply that the developed system is technically sound, reliable, and capable of supporting HR operations effectively.

Table V
Quality in Use Evaluation (End-Users)

Criteria	Mean	Interpretation
Effectiveness	3.63	Very High
Efficiency	3.59	Very High
Satisfaction	3.68	Very High
Freedom from Risk	3.55	Very High
Context Coverage	3.60	Very High
Overall Mean	3.61	Very High

Table V presents the evaluation of the system quality in use as assessed by end-users. The system achieved an overall mean of 3.61, interpreted as Very High, indicating a high level of user satisfaction and effectiveness. Among the indicators, satisfaction obtained the highest rating, suggesting that users are highly pleased with the system's features and performance. The effectiveness and efficiency were also rated very high, indicating that users have the skills to complete tasks accurately and in less time when using the system. Additionally, freedom from risk and context coverage received strong ratings, implying that the system minimizes potential errors and is applicable across various HR functions and situations. These findings demonstrate that the system is not only technically effective but also practical and beneficial from the users' perspective, supporting improved HR document management and decision-making processes.

Table VI
Summary of Results

Variables	Overall Mean	Interpretation
Compliance-Based Document Management	3.43	High Compliance
Project-Based Document Management	3.37	High Compliance
Targeted Analytics	3.57	Very High Implementation
Grand Mean	3.46	High Implementation

Table VI presents a summary of findings, showing that the organization has a high level of implementation of compliance-based and project-based document management, with targeted analytics having the highest rating. The grand mean of 3.46 indicates that the HR department effectively manages documents and utilizes analytics tools. However, certain areas, such as deadline compliance and project monitoring, may still be improved to achieve a very high implementation across all variables.

IV. CONCLUSION AND RECOMMENDATIONS

The study confirms that the HR department demonstrates high levels of compliance-based and project-based document management. Targeted analytics is a strong and significant predictor of both variables and functions as a predictive HR analytics mechanism. Both correlation and regression analyses further support this finding.

More importantly, this finding supports the work of Navarro & Bautista (2023), who emphasized that analytics-driven HR systems improve compliance monitoring through real-time data visibility. The findings highlight that the developed system functions as a predictive HR analytics tool, enabling proactive compliance monitoring, improved project documentation tracking, and data-driven decision-making. This shifts HR operations from reactive document handling to a more strategic, analytics-driven approach.

The system evaluation further validates that the platform is technically sound, user-friendly, and effective in real-world applications. The study contributes to the advancement of data-driven HR systems by demonstrating how targeted analytics can improve both operational efficiency and predictive capability in document management. This demonstrates that HR systems can evolve from record-keeping platforms into intelligent, data-driven decision-support systems.

Based on the findings, the following recommendations are proposed:

1. Organizations may adopt targeted analytics systems to improve HR compliance monitoring.
2. Future researchers may expand the sample size and include multiple organizations.
3. Additional variables, such as user adoption and system usability factors, may be explored.
4. The system may be enhanced by integrating AI-driven predictive models.
5. Longitudinal studies may be conducted to assess long-term impact.

REFERENCES

- [1]. Abbas, Q., & Yaqoob, T. (2021). Impact of compliance-based HR practices on organizational performance: Evidence from the manufacturing sector. *Journal of Human Resource Management*, 9(2), 55–66. <https://doi.org/10.11648/j.jhrm.20210902.11>
- [2]. Bersin, J. (2019). *People analytics in practice: How HR leaders leverage data for business impact*. Deloitte Insights.
- [3]. De Guzman, A., & Tan, R. (2023). Reliability and validity of research instruments in business studies. *Philippine Journal of Research Methodology*, 11(2), 88–102.
- [4]. Dessler, G. (2020). *Human resource management* (16th ed.). Pearson Education.
- [5]. Gonzales, R. (2022). Descriptive research methods in organizational studies: Applications and approaches. *Philippine Journal of Management Research*, 10(1), 22–37.
- [6]. Khalil, M., Al-Maadeed, S., & Farhan, H. (2022). Project-based HR documentation and monitoring in construction companies: A case study. *International Journal of Construction Management*, 24(4), 357–370. <https://doi.org/10.1080/15623599.2020.1825426>
- [7]. Mahmood, Z., & Khan, S. (2021). The role of data analytics in HR compliance and performance monitoring: Evidence from construction industries. *International Journal of Human Resource Studies*, 11(4), 50–67.
- [8]. Navarro, L., & Bautista, P. (2023). Data-driven HR management: Enhancing compliance and operational efficiency through analytics. *Asian Journal of Human Resource Studies*, 15(1), 45–60.
- [9]. Pressman, R. S., & Maxim, B. R. (2020). *Software engineering: A practitioner's approach* (9th ed.). McGraw-Hill Education.
- [10]. Richey, R. C., & Klein, J. D. (2014). *Design and development research: Methods, strategies, and issues*. Routledge.
- [11]. Santos, R., & Cruz, J. (2022). Targeted analytics in human resource management: Opportunities and challenges. *Journal of Organizational Analytics*, 8(3), 112–128.
- [12]. Sommerville, I. (2016). *Software engineering* (10th ed.). Pearson Education.
- [13]. Ulrich, D., Younger, J., Brockbank, W., & Ulrich, M. (2020). *HR competencies: Mastery at the intersection of people and business*. Society for Human Resource Management.