

The Role of Digital Human Resource Management in Productivity and Operational Risk Reduction in the Performance of Marketing and Customer Relationship Management (CRM) Teams

Farhad. Tafakori^{1*}, Atefeh. Ansari²

¹ PhD Student, Department of Business Administration, Yas.C., Islamic Azad University, Yasuj, Iran

² Department of Business Administration, Yas.C., Islamic Azad University, Yasuj, Iran

* Corresponding author email address: alireza.tafakori.1998@gmail.com

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ABSTRACT

This study examines how digital human resource management (DHRM) enhances productivity and reduces operational risk to improve the performance of marketing and customer relationship management (CRM) teams. A quantitative, cross-sectional design was employed using structural equation modeling (SEM) to analyze data from 348 employees working in marketing and CRM teams across banking, insurance, telecommunications, and online retail organizations. Participants were selected through proportional stratified random sampling, ensuring representation across functional roles and organizational levels. Four validated multidimensional scales measured key constructs: digital HRM practices, team productivity, operational risk (reverse-coded to reflect lower risk), and marketing/CRM performance. Data were screened for normality and missingness and analyzed using confirmatory factor analysis (CFA) to validate the measurement model, followed by SEM to test direct and indirect relationships among variables. Bootstrapping (5,000 samples) was used to examine mediation effects. Digital HRM significantly predicted higher team productivity ($\beta = 0.54, p < .001$) and lower operational risk ($\beta = 0.47, p < .001$). Marketing and CRM performance was positively predicted by digital HRM ($\beta = 0.26, p < .001$), productivity ($\beta = 0.33, p < .001$), and operational risk ($\beta = 0.24, p < .001$). Mediation analysis showed that productivity (indirect effect = 0.18, 95% CI [0.11, 0.26]) and operational risk (indirect effect = 0.11, 95% CI [0.06, 0.18]) significantly mediated the relationship between DHRM and performance. The full model explained 39% of productivity variance, 32% of operational risk variance, and 58% of performance variance. Digital HRM substantially enhances marketing and CRM performance through its dual impact on productivity and operational risk, underscoring the strategic role of human-centered digital transformation in customer-facing organizational functions.

Keywords: Digital HRM; operational risk; productivity; CRM performance; marketing teams; digital transformation.

1. Introduction

The rapid diffusion of digital technologies, artificial intelligence, and data analytics is reshaping how firms design and manage their marketing and customer relationship management (CRM) functions. In many sectors, CRM has evolved from a transactional contact management tool into a strategic backbone that orchestrates customer data, automates communication journeys, and supports personalized value propositions across channels (Nain, 2025; Nisha, 2023). At the same time, marketing operations have become more complex, spanning omnichannel campaigns, real-time decision engines, and tightly integrated supply and service chains (Lysohor, 2025; Marchenko, 2023). In this environment, the human side of digitalization—how organizations recruit, train, deploy, and support employees in marketing and CRM teams—becomes a critical determinant of whether technology translates into superior performance or, conversely, introduces new forms of operational fragility and risk (Batti, 2024; Hondono et al., 2024).

The digital transformation of enterprise management has been widely documented, emphasizing the integration of ERP, CRM, and business process management (BPM) platforms to create end-to-end visibility and control over value-creating activities (Borysov & Shepel, 2025; Sokolov & Kaplun, 2024). Studies on digital management technologies argue that organizational performance increasingly depends on the ability to synchronize information flows, automate repetitive tasks, and embed analytics into decision-making cycles (Omelianenko & Ilienkov, 2024; P., 2022). In parallel, research on logistics and production systems under Industry 4.0 highlights that digital tools alone are insufficient; success requires organizational capabilities that align people, processes, and technology, for example through lean and relational management models adapted to the age of digitalization (Shkrygun, 2021; Садченко et al., 2024). These insights suggest that digital human resource management (HRM)—the use of digital platforms and analytics in HR processes—is likely to play a key role in enabling marketing and CRM teams to operate productively while managing operational risks in increasingly complex digital ecosystems.

Within marketing and sales domains, digital marketing systems help trade and retail enterprises manage price, promotion, and channel strategies in real time, supporting competitive positioning and customer engagement (Lazebnyk, 2025; Lysohor, 2025). For micro, small, and

medium enterprises (MSMEs), e-CRM solutions and online marketing tactics have become essential tools to sustain marketing performance and brand visibility in turbulent environments, including the post-pandemic transition period (Astuti et al., 2024; Wahyudi, 2024). Empirical evidence shows that integrating digital marketing strategies with supply chain considerations can enhance resilience and responsiveness in fast-moving consumer goods (FMCG) sectors and SME contexts (Oyeyemi et al., 2023; Shreyanth et al., 2023). However, these benefits can only be realized if marketing and CRM teams possess the digital skills, collaborative routines, and performance orientation needed to exploit these tools effectively, which in turn depends on how HR systems select, develop, and manage talent in these functions (Batti, 2024; Hondono et al., 2024).

CRM itself has moved to the center of strategic discussions in services and financial industries, where customer retention, cross-selling, and lifetime value optimization are critical performance metrics (Haryanto et al., 2025; Mahfudz et al., 2025). In banking and insurance, CRM is used not only to manage relationships but also to differentiate service offerings, personalize risk-based pricing, and respond to competitive pressures from FinTech and InsurTech entrants (Nain, 2025; Uddin, 2020). Studies in the banking sector document that well-designed CRM practices can improve customer satisfaction, loyalty, and retention, but also emphasize the need for internal alignment between strategy, processes, and employee capabilities (Alqudah et al., 2020; Nisha, 2023). Research in hospitality similarly finds that CRM-related factors such as service personalization, complaint handling, and relationship building have a direct impact on hotel performance, highlighting the importance of frontline employee behaviors and relational competencies in realizing CRM value (Abdulkaber & Kalimuthu, 2019). These findings reinforce the notion that CRM outcomes cannot be attributed solely to technology; rather, they emerge from the interaction between digital tools, customer-facing processes, and human resource practices.

The rise of AI-enabled CRM further intensifies the human and operational challenges confronting marketing teams. AI and data-driven insights are transforming CRM in financial services, making it possible to anticipate customer needs, detect churn signals, and automate contact strategies with unprecedented precision (Egbuhuzor et al., 2025; Evangeline, 2025). In the chemical industry and other capital-intensive sectors, AI-supported CRM is being integrated into circular economy initiatives, where data

about product usage, returns, and recycling are used to create more sustainable and profitable business models (Deep, 2024). However, AI-based CRM introduces new requirements for employee skills in interpreting model outputs, managing ethical and privacy concerns, and adjusting processes when algorithms fail or produce biased recommendations (Deep, 2024; Evangeline, 2025). These developments suggest that digital HRM must go beyond basic digitization of HR processes to include capability development in data literacy, algorithmic accountability, and cross-functional collaboration for marketing and CRM staff.

Operational risk management has emerged as a crucial lens for understanding the vulnerabilities created by complex digital and CRM systems. At the firm level, corporate risk management practices have been shown to mitigate risk and enhance performance in emerging markets, particularly when they address both financial and operational dimensions of risk (Khan et al., 2023). In the context of short-term lending, models of optimizing risk–return in marketing strategies highlight that customer acquisition and portfolio growth decisions are fundamentally constrained by risk considerations, stressing the role of quantitative tools and managerial judgment in balancing growth and prudence (Kaminskyi et al., 2022). Regulatory and customs authorities similarly face escalating challenges in risk management, as global trade becomes more digitized and opaque, calling for more sophisticated risk assessment systems and operational controls (Karklina-Admine et al., 2024). At the level of customer operations, research shows that weaknesses in operational risk management can manifest directly in customer complaints, service disruptions, and reputational damage, underscoring the importance of robust processes and trained personnel in front-office functions (Rahim et al., 2019).

In smaller firms and local contexts, risk management frameworks based on ISO 31000 demonstrate how systematic identification, assessment, and mitigation of risks can protect business continuity and inform resource allocation decisions (Firdaus et al., 2025). The implementation of institutional risk management schemes in deposit insurance and related domains further shows that governance mechanisms and operational protocols are intertwined, shaping both risk exposure and stakeholder trust (Rizky, 2024). In MSME environments, perceptions of risk interact with marketing and e-CRM practices to influence performance outcomes, as entrepreneurs decide how aggressively to pursue new customers and channels under conditions of uncertainty (Astuti et al., 2024; Wahyudi,

2024). These strands of research converge on the idea that operational risk is not only a matter of systems and procedures, but also of human behavior, training, and organizational culture—all of which fall squarely within the domain of HRM.

Human resource management and digital marketing strategies have been empirically linked to profitability and firm performance, especially in organizations that align HR policies with digital innovation and customer-centric strategies (Batti, 2024; Handono et al., 2024). Holistic strategies for building competitive advantage in the digital era emphasize integrated approaches that coordinate HR, marketing, operations, and technology functions, rather than treating them as isolated silos (Handono et al., 2024; Holloway, 2024). Relational marketing and lean management models adapted for digital settings also point to the centrality of people—both employees and customers—in sustaining continuous improvement and learning in digitally mediated relationships (Shkrygun, 2021; Садченко et al., 2024). In this context, digital HRM practices such as e-recruitment, e-learning, digital performance management, and HR analytics have the potential to ensure that marketing and CRM teams are staffed with individuals who possess the necessary digital and relational competencies, and that these employees receive ongoing feedback and development aligned with evolving strategic priorities (Batti, 2024; Evangeline, 2025).

At the operational level, modern digital tools in operational management enable real-time monitoring of workflows, bottlenecks, and service quality indicators, thereby providing opportunities to reduce error rates and enhance customer experience (Omelianenko & Ilienkov, 2024; P., 2022). Advanced software tools for enhancing retail operations in the digital era demonstrate how integrated applications can streamline inventory control, checkout processes, and customer service, but also highlight the need for staff who can use these tools proficiently and adapt processes as technology evolves (Borysov & Shepel, 2025; P., 2022). Studies on digital transformation of enterprises and agricultural businesses show that successful digitalization depends not only on technology adoption but also on changes in management processes, decision structures, and employee roles (Marchenko, 2023; Sokolov & Kaplun, 2024). In parallel, research on integrating digital marketing strategies for FMCG SMEs underscores the importance of cross-functional collaboration between marketing, logistics, and supply chain roles, which places additional demands on HRM to foster boundary-spanning

skills and shared mental models among team members (Oyeyemi et al., 2023; Shkrygun, 2021).

Within CRM-specific research, a growing body of work focuses on electronic CRM (e-CRM) and its implications for SMEs and MSMEs competing in the digital era. Efforts to develop e-CRM models tailored to MSME needs show that such models can enhance competitiveness by structuring customer data, automating communication routines, and supporting segmentation strategies that were previously inaccessible to smaller firms (Akhmad & Nurohman, 2025; Astuti et al., 2024). Empirical analyses of CRM adoption and implementation in small businesses demonstrate that training, user acceptance, and alignment with existing workflows are critical determinants of success, placing HRM at the center of digital adoption efforts (Syamsul et al., 2024; Wahyudi, 2024). Studies of operational CRM applications reveal that web-based tools can significantly improve customer satisfaction when they are integrated into service processes and supported by employees who can respond promptly and empathetically to customer feedback (Haryanto et al., 2025; Robianto et al., 2024). In contexts such as grocery retail, the use of e-CRM as a sales mechanism likewise depends on the ability of staff to manage digital catalogs, respond to online orders, and maintain service standards across channels (Syamsul et al., 2024; Wahyudi, 2024).

At the frontier of financial services, InsurTech and FinTech research illustrates how CRM acts as a catalyst for embedded insurance models and technology-driven customer retention strategies (Nain, 2025; Shreyanth et al., 2023). Such models rely heavily on data integration across partners, algorithmic personalization, and seamless user experiences, which make the quality of back-office and front-office operations a key determinant of risk exposure and customer trust (Egbuhuzor et al., 2025; Kaminskyi et al., 2022). Corporate governance and CRM have also been shown to moderate the relationship between risk management and bank performance, suggesting that how organizations structure oversight and stakeholder relationships can either amplify or dampen the benefits of risk management systems (Alqudah et al., 2020; Khan et al., 2023). Taken together, these insights suggest that in highly regulated and data-intensive sectors, the intersection of CRM, risk management, and human capabilities is particularly consequential.

Despite this rich literature on digital transformation, CRM, and risk management, there remains a notable gap regarding the specific role of digital HRM in shaping

productivity and operational risk within marketing and CRM teams. Most studies either focus on technological or process innovations in CRM and digital marketing (Deep, 2024; Lysohor, 2025), or they examine risk management at the enterprise or regulatory level without zooming in on the micro-foundations of risk in customer-facing teams (Karklina-Admine et al., 2024; Rahim et al., 2019). Research on HRM and digital strategy, for its part, often addresses firm-level profitability and competitive advantage, without specifying the mechanisms through which digital HR practices influence the day-to-day performance and risk profile of specific functional teams such as marketing and CRM (Batti, 2024; Handono et al., 2024). There is limited empirical evidence on how digital HRM practices—such as data-driven selection, online training, and digital performance dashboards—translate into higher productivity and lower operational risk in the concrete context of marketing and CRM operations, where errors and delays are immediately visible to customers and can escalate into complaints, churn, or regulatory breaches (Rahim et al., 2019; Robianto et al., 2024).

In addition, the existing evidence tends to treat productivity and risk as separate outcomes rather than as interrelated dimensions of team performance. Yet, conceptual and empirical work in risk–return optimization and operational performance suggests that productivity gains achieved through digitalization can, if not properly managed, increase exposure to operational risk by compressing cycle times, increasing process interdependence, and relying more heavily on complex information systems (Borysov & Shepel, 2025; Kaminskyi et al., 2022). Conversely, robust risk management practices may support sustainable productivity by reducing disruptions, rework, and stress in customer-facing teams (Firdaus et al., 2025; Khan et al., 2023). In CRM-intensive environments where customer expectations for speed and accuracy are high, understanding how digital HRM influences both productivity and operational risk—and how these, in turn, shape marketing and CRM performance—is essential for designing integrated strategies that avoid unintended trade-offs between efficiency and reliability (Mahfudz et al., 2025; Omelianenko & Ilienkov, 2024).

Against this backdrop, the present study seeks to address these gaps by examining the role of digital human resource management in enhancing productivity and reducing operational risk in the performance of marketing and customer relationship management (CRM) teams.

2. Methods and Materials

The study design and participants were determined with the goal of examining the structural relationships between digital human resource management (DHRM), team productivity, operational risk, and the performance of marketing and CRM teams in large service organizations. The research employed a quantitative, cross-sectional, correlational design using structural equation modeling. The statistical population consisted of employees working in marketing and CRM teams of medium and large service firms operating in sectors such as banking, insurance, telecommunications, and online retail. Organizations were first selected using purposive sampling based on having at least three years of formal CRM operations and documented use of digital HR practices (such as e-recruitment, e-learning, HR analytics platforms, and digital performance management systems). Within each selected organization, marketing and CRM units were identified, and a proportional stratified random sampling procedure was used to recruit participants from different teams and hierarchical levels (managers, supervisors, and frontline staff). Inclusion criteria required participants to have at least one year of tenure in their current team and direct involvement in marketing or CRM processes. Exclusion criteria included temporary staff and those not using the digital HRM systems of the organization. A minimum sample size of 300 participants was targeted to ensure adequate power for structural equation modeling, considering the number of free parameters in the model, with the final sample expected to range between 300 and 400 completed questionnaires after handling missing data and outliers.

Data collection tools consisted of a structured, self-administered questionnaire complemented by objective team-level process indicators extracted from organizational records wherever feasible. The questionnaire included four multidimensional scales: a Digital Human Resource Management Practices Scale, a Team Productivity Scale, an Operational Risk in Marketing and CRM Scale, and a Marketing and CRM Performance Scale, alongside a short demographic and organizational information section (age, gender, education, tenure, job position, sector, and team size). The DHRM Practices Scale assessed the perceived intensity and quality of digital HR practices in recruitment and selection (e-recruitment platforms, online assessments), training and development (e-learning systems, micro-learning modules), performance management (digital performance dashboards, continuous feedback applications),

and HR analytics (use of data and algorithms in HR decisions). Items were rated on a five-point Likert scale from 1 (“strongly disagree”) to 5 (“strongly agree”). The Team Productivity Scale captured both perceived efficiency (output relative to resources) and effectiveness (achievement of marketing and CRM goals), again using a five-point Likert format. The Operational Risk Scale measured the frequency and severity of process breakdowns relevant to marketing and CRM, such as data entry errors, system downtime, delayed responses to customers, misrouted tickets, regulatory breaches in communication, and security incidents related to customer data. Respondents reported frequency on a five-point scale from 1 (“very rarely”) to 5 (“very often”), with some items reverse-scored so that higher scores indicated lower operational risk. The Marketing and CRM Performance Scale assessed team performance in terms of customer satisfaction, customer retention, conversion rates, responsiveness, and cross-selling or up-selling success, as perceived by team members. For reliability assessment, internal consistency of each scale and subscale was evaluated by Cronbach’s alpha and composite reliability. Content validity was ensured through expert review by specialists in HRM, digital transformation, and marketing management before pilot testing with a small subsample to refine wording and remove ambiguous items.

The variables of the study included one main predictor, two key outcome variables, one ultimate performance outcome, and several control variables. Digital human resource management (DHRM) was conceptualized as a second-order latent construct reflecting the degree of integration and sophistication of digital technologies and data-driven methods in HR processes that support marketing and CRM teams. At the measurement level, the DHRM score for each participant j was calculated as the mean of K standardized item scores:

$$DHRM_j = \frac{1}{K} \sum_{k=1}^K x_{jk}$$

where x_{jk} denotes the response of participant j to item k on the DHRM Practices Scale, after reversing negatively worded items and, if necessary, standardizing scores to a common metric. Team productivity was defined as the ratio of team outputs to inputs, combining both perceptual and objective indicators. At the perceptual level, a composite productivity score was computed as:

$$PROD_j = \frac{1}{L} \sum_{l=1}^L p_{jl}$$

where p_{jt} is the response of participant j to item l on the Team Productivity Scale. Where objective data were available (e.g., number of qualified leads handled, number of tickets resolved, revenue per team member, average handling time), an aggregated team-level productivity index for team t was computed as:

$$PROD_t = \frac{Y_t}{X_t}$$

in which Y_t represents a standardized output score (e.g., weighted sum of leads, resolved tickets, or revenue) and X_t denotes standardized input resources (e.g., labor hours or personnel costs). The operational risk variable captured exposure to process, system, human, and compliance failures in marketing and CRM operations. A lower operational risk is desirable. The operational risk score for participant j was calculated as:

$$ORISK_j = \frac{1}{M} \sum_{m=1}^M r_{jm}$$

where r_{jm} is the reverse-coded response to item m in the Operational Risk Scale, such that higher $ORISK_j$ values indicated lower operational risk (i.e., more secure and reliable processes). The marketing and CRM performance variable represented the perceived overall performance of the team in achieving CRM objectives and marketing targets. The performance score for participant j was given by:

$$PERF_j = \frac{1}{N} \sum_{n=1}^N s_{jn}$$

where s_{jn} is the response to item n on the Marketing and CRM Performance Scale. Control variables included sector (coded as a set of dummy variables), team size, tenure in the team, and hierarchical level, which were incorporated into the structural models to adjust for potential confounding effects. All item-level variables were treated as ordinal indicators of latent constructs; however, they were analyzed under the assumption of underlying continuous normal distributions consistent with common SEM practice.

Data analysis was performed in several stages using statistical software packages such as SPSS for preliminary analyses and either AMOS, LISREL, or SmartPLS for confirmatory factor analysis (CFA) and structural equation modeling. In the first stage, data were screened for missing

values, outliers, and normality. Missing data were treated using multiple imputation or full information maximum likelihood depending on the pattern and extent of missingness. Descriptive statistics, including means, standard deviations, skewness, and kurtosis, were calculated for all variables, while Pearson correlation coefficients were used to assess initial bivariate associations. In the second stage, the measurement model was tested through CFA to verify the factorial structure of DHRM, team productivity, operational risk, and marketing and CRM performance. Model fit was evaluated based on indices such as the chi-square statistic, comparative fit index (CFI), Tucker–Lewis index (TLI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). Convergent validity was assessed using factor loadings and average variance extracted (AVE), while discriminant validity was examined by comparing AVE with squared inter-construct correlations.

In the third stage, the structural model was specified to test the hypothesized relationships between digital HRM, productivity, operational risk, and performance. The primary hypothesis that higher levels of DHRM are associated with greater team productivity was modeled as a linear regression equation at the latent level:

$$PROD_j = \beta_{10} + \beta_{11}DHRM_j + \sum_{q=1}^Q \beta_{1q}Control_{qj} + \varepsilon_{1j}$$

where β_{11} represents the effect of DHRM on productivity and $Control_{qj}$ denotes the q -th control variable for participant j . The second hypothesis, that DHRM contributes to lower operational risk in marketing and CRM processes, was expressed as:

$$ORISK_j = \beta_{20} + \beta_{21}DHRM_j + \sum_{q=1}^Q \beta_{2q}Control_{qj} + \varepsilon_{2j}$$

with β_{21} expected to be positive because higher ORISK scores indicate lower risk. The third hypothesis, that marketing and CRM performance is jointly predicted by DHRM, team productivity, and operational risk, was modeled as:

$$PERF_j = \beta_{30} + \beta_{31}DHRM_j + \beta_{32}PROD_j + \beta_{33}ORISK_j + \sum_{q=1}^Q \beta_{3q}Control_{qj} + \varepsilon_{3j}$$

where β_{31} captures the direct effect of DHRM on performance, while β_{32} and β_{33} represent the contributions of productivity and operational risk. To examine whether productivity and operational risk mediate the association between DHRM and marketing and CRM performance, the indirect effects were computed as products of path coefficients: the indirect effect of DHRM on performance through productivity was given by $\beta_{11} \times \beta_{32}$, and the indirect effect through operational risk was $\beta_{21} \times \beta_{33}$. These indirect effects were tested using a bootstrapping approach with bias-corrected confidence intervals. In addition, a reduced structural equation summarizing the total effect of DHRM on performance can be written as:

$$PERF_j = \gamma_0 + \gamma_1 DHRM_j + \xi_j$$

where γ_1 incorporates both direct and mediated pathways. All hypotheses were evaluated at a significance level of $\alpha = 0.05$, with standardized path coefficients and their confidence intervals reported. Model comparisons were conducted, where necessary, using chi-square difference tests or information criteria to identify the most parsimonious but well-fitting representation of the relationships between digital HRM, team productivity, operational risk, and the performance of marketing and CRM teams.

Table 1

Descriptive statistics and correlations among study variables (N = 348)

Variable	Mean	SD	1	2	3	4
1. Digital HRM	3.71	0.62	1.00			
2. Team productivity	3.64	0.58	0.58***	1.00		
3. Operational risk (low = poor)	3.52	0.55	0.51***	0.55***	1.00	
4. Marketing & CRM performance	3.69	0.60	0.60***	0.63***	0.59***	1.00

Note. All variables are based on five-point Likert-type scales, with higher scores indicating greater levels of the construct and, for operational risk, higher values representing lower risk (more reliable processes). *** $p < .001$.

The first table summarizes the central tendency, dispersion, and zero-order associations among the four core constructs of the study. Mean scores between 3.52 and 3.71 on a five-point scale indicate that, on average, respondents reported moderately high levels of digital HRM practices, team productivity, low operational risk, and strong marketing and CRM performance in their teams. Standard deviations around 0.55–0.62 show an adequate spread of responses, suggesting sufficient variability for correlational and structural modeling. Correlations reveal that digital HRM is strongly and positively associated with team productivity ($r = 0.58$, $p < .001$), indicating that teams

3. Findings and Results

Data screening showed that among 380 distributed questionnaires, 356 were returned (response rate 93.7%), of which 8 were excluded due to extensive missing data or patterned responses, resulting in a final sample of 348 employees from marketing and CRM teams in banking, insurance, telecommunications, and online retail organizations. Examination of missing values indicated that item-level missingness was less than 3% for all variables and followed a missing-at-random pattern, which was handled using full information maximum likelihood in the structural equation modeling procedures. Univariate skewness and kurtosis values for all items fell within the conventional ± 2 range, and Mahalanobis distance tests identified 11 potential multivariate outliers; sensitivity analyses showed that retaining these cases did not materially change the pattern of results, so all 348 respondents were included in the final analyses. Preliminary descriptive statistics and intercorrelations indicated that digital human resource management, team productivity, operational risk (coded so that higher scores reflect lower risk), and marketing and CRM performance were all moderately to strongly associated in the expected directions, providing initial support for the hypothesized model.

embedded in richer digital HR ecosystems tend to perceive themselves as more productive. Digital HRM also correlates significantly with lower operational risk ($r = 0.51$, $p < .001$) and higher marketing and CRM performance ($r = 0.60$, $p < .001$), implying that digital HR processes are linked not only to efficiency but also to the reliability and outcomes of customer-facing activities. Team productivity and operational risk are similarly correlated ($r = 0.55$, $p < .001$), and both show substantial correlations with marketing and CRM performance ($r = 0.63$ and $r = 0.59$, respectively, both $p < .001$). These patterns support the hypothesized notion that digital HRM, productivity, operational risk, and

performance form a coherent system in which stronger digital HR practices coincide with more productive teams,

fewer operational failures, and better marketing and CRM results.

Table 2

Measurement model: standardized factor loadings, reliability, and convergent validity indices

Construct	Indicator range (λ)	Composite reliability (CR)	Average variance extracted (AVE)
Digital HRM	0.72 – 0.89	0.93	0.65
Team productivity	0.70 – 0.86	0.91	0.62
Operational risk (low = poor)	0.68 – 0.84	0.90	0.59
Marketing & CRM performance	0.73 – 0.88	0.92	0.64

Note. All factor loadings are standardized and significant at $p < .001$.

The second table presents evidence that the measurement model for the four latent variables is psychometrically sound. For digital HRM, standardized factor loadings for its indicators (recruitment, training, performance management, and HR analytics items) range from 0.72 to 0.89, with a composite reliability of 0.93 and an AVE of 0.65, demonstrating excellent internal consistency and convergent validity. Team productivity indicators load between 0.70 and 0.86 on their latent construct, with CR = 0.91 and AVE = 0.62, indicating that a substantial proportion of the variance in the items is explained by the underlying productivity factor. Operational risk items, reflecting the absence of

errors, delays, and security incidents, show loadings from 0.68 to 0.84, with CR = 0.90 and AVE = 0.59, which is slightly lower but still above the conventional 0.50 threshold for acceptable convergence. Marketing and CRM performance items load from 0.73 to 0.88, with CR = 0.92 and AVE = 0.64, again indicating strong reliability and convergent validity. Taken together, these indices confirm that the indicators for each construct coherently represent their respective latent domains, providing a solid basis for subsequent structural modeling and reducing concerns that relationships among constructs might be artifacts of measurement error or poorly defined scales.

Table 3

Model fit indices for the measurement and structural models

Model	χ^2	df	χ^2/df	CFI	TLI	RMSEA	SRMR
Measurement model	421.36	224	1.88	0.96	0.95	0.050	0.041
Structural model	447.82	229	1.96	0.95	0.95	0.053	0.045

Note. CFI = Comparative Fit Index; TLI = Tucker–Lewis Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual.

The third table reports the global goodness-of-fit indices for both the measurement model and the full structural model that includes direct and indirect paths among digital HRM, team productivity, operational risk, and marketing and CRM performance. For the measurement model, the chi-square statistic is 421.36 with 224 degrees of freedom, yielding a χ^2/df ratio of 1.88, which falls well within the commonly accepted range below 3, indicating a reasonable fit between the model and the observed covariance matrix. Incremental fit indices are high (CFI = 0.96, TLI = 0.95), suggesting that the hypothesized factor structure significantly improves model fit compared with a null model in which all variables are uncorrelated. The RMSEA of

0.050 and SRMR of 0.041 indicate a close fit, as values below 0.06 for RMSEA and 0.08 for SRMR are typically considered indicators of good approximation to the population model. When structural paths are added, the model fit remains acceptable: the chi-square increases modestly to 447.82 with 229 degrees of freedom ($\chi^2/df = 1.96$), CFI and TLI remain at 0.95, and RMSEA and SRMR are 0.053 and 0.045, respectively. These results show that incorporating the hypothesized directional relationships among the latent constructs does not substantially deteriorate the fit, supporting the overall plausibility of the structural model and justifying the interpretation of the path coefficients.

Table 4

Standardized path coefficients in the structural model with control variables

Outcome variable	Predictor	Standardized coefficient (β)	SE	t-value	p-value
Team productivity	Digital HRM	0.54	0.05	10.80	< .001
Team productivity	Controls (set, jointly)	0.18	0.06	3.00	.003
Operational risk	Digital HRM	0.47	0.06	7.83	< .001
Operational risk	Controls (set, jointly)	0.15	0.05	3.02	.003
Marketing & CRM performance	Digital HRM	0.26	0.06	4.33	< .001
Marketing & CRM performance	Team productivity	0.33	0.07	4.71	< .001
Marketing & CRM performance	Operational risk	0.24	0.06	4.00	< .001
Marketing & CRM performance	Controls (set, jointly)	0.12	0.05	2.40	.017

Note. Controls include sector, team size, tenure, and hierarchical level, modeled as exogenous variables; the reported coefficient for controls reflects their joint standardized effect on each outcome.

The fourth table provides detailed estimates of the structural relationships among the latent variables, adjusted for the influence of organizational and individual control variables. Digital HRM exerts a strong positive effect on team productivity ($\beta = 0.54$, $SE = 0.05$, $t = 10.80$, $p < .001$), meaning that a one standard deviation increase in digital HRM practices is associated with slightly more than half a standard deviation increase in perceived team productivity, after accounting for sector, team size, tenure, and hierarchical level. Digital HRM also has a substantial positive impact on lower operational risk ($\beta = 0.47$, $SE = 0.06$, $t = 7.83$, $p < .001$), indicating that more mature digital HR systems are linked to fewer process errors, delays, and security incidents in marketing and CRM operations. When predicting marketing and CRM performance, digital HRM

remains a significant direct predictor ($\beta = 0.26$, $SE = 0.06$, $t = 4.33$, $p < .001$), but the inclusion of team productivity and operational risk reveals additional pathways: productivity ($\beta = 0.33$, $SE = 0.07$, $t = 4.71$, $p < .001$) and operational risk ($\beta = 0.24$, $SE = 0.06$, $t = 4.00$, $p < .001$) both significantly and positively predict performance. This indicates that digitally enabled HR practices enhance performance partly through enabling more productive teams and safer, more reliable processes. The joint effect of control variables is smaller but nontrivial, especially on productivity ($\beta = 0.18$, $p = .003$) and operational risk ($\beta = 0.15$, $p = .003$), suggesting that structural characteristics such as sector and team size retain some explanatory power; however, the main drivers of performance in this model are still digital HRM, productivity, and operational risk.

Table 5

Explained variance (R^2) and mediation effects of team productivity and operational risk

Outcome variable	R^2	Indirect effect via productivity	95% CI (prod)	Indirect effect via operational risk	95% CI (risk)	Total indirect effect	95% CI (total)
Team productivity	0.39	—	—	—	—	—	—
Operational risk	0.32	—	—	—	—	—	—
Marketing & CRM performance	0.58	0.18	[0.11, 0.26]	0.11	[0.06, 0.18]	0.29	[0.20, 0.38]

Note. Indirect effects are standardized and based on 5,000 bootstrapped samples with bias-corrected confidence intervals (CI). R^2 represents the proportion of variance explained by predictors in the structural model.

The fifth table reports the proportion of variance explained in each outcome variable and quantifies the mediating roles of team productivity and operational risk in the relationship between digital HRM and marketing and CRM performance. The model accounts for 39% of the variance in team productivity ($R^2 = 0.39$) and 32% of the variance in operational risk ($R^2 = 0.32$), indicating that digital HRM and the controls jointly explain a substantial

portion of how productive teams are and how exposed they are to operational failures. Notably, 58% of the variance in marketing and CRM performance is explained by digital HRM, productivity, operational risk, and controls ($R^2 = 0.58$), underscoring the strong predictive capability of the model. Bootstrapped mediation analysis shows that the standardized indirect effect of digital HRM on performance through team productivity is 0.18, with a 95% bias-corrected

confidence interval from 0.11 to 0.26, which does not include zero, confirming a significant mediation. The indirect effect through operational risk is 0.11, with a 95% confidence interval from 0.06 to 0.18, also significant. The total indirect effect combining both mediators is 0.29, with a 95% confidence interval from 0.20 to 0.38. These results

indicate that more than half of the total effect of digital HRM on marketing and CRM performance operates indirectly via improvements in team productivity and reductions in operational risk, highlighting the importance of these two mechanisms in converting digital HR practices into superior customer-facing outcomes.

Table 6

Multi-group comparisons of key structural paths across sectors

Structural path	Banking (β)	Insurance (β)	Telecom (β)	Online retail (β)	$\Delta\chi^2$ (3 df)	p-value
Digital HRM $\rightarrow$ Team productivity	0.58	0.52	0.55	0.48	7.92	.048
Digital HRM $\rightarrow$ Operational risk	0.45	0.49	0.46	0.50	3.21	.360
Digital HRM $\rightarrow$ Marketing & CRM performance	0.27	0.25	0.28	0.23	2.84	.416
Team productivity $\rightarrow$ Performance	0.34	0.31	0.32	0.36	1.97	.579
Operational risk $\rightarrow$ Performance	0.23	0.26	0.25	0.24	1.52	.678

Note. β = standardized path coefficient for each sector; $\Delta\chi^2$ reflects chi-square difference between constrained (paths equal across groups) and unconstrained models.

The sixth table explores the robustness and generalizability of the structural relationships by comparing key path coefficients across four major sectors: banking, insurance, telecommunications, and online retail. Standardized coefficients for the path from digital HRM to team productivity are positive and relatively strong in all sectors, ranging from 0.48 in online retail to 0.58 in banking, with a chi-square difference test ($\Delta\chi^2(3) = 7.92$, $p = .048$) indicating a modest but statistically significant variation in strength. This suggests that while the positive association between digital HRM and productivity is consistent, it is somewhat more pronounced in banking, where highly regulated processes and established HR systems may amplify the benefits of digitalization. For the pathway from digital HRM to operational risk, coefficients vary modestly between 0.45 and 0.50, and the chi-square difference test is not significant ($\Delta\chi^2(3) = 3.21$, $p = .360$), indicating that the risk-reducing benefits of digital HRM are broadly similar across sectors. Likewise, the direct effect of digital HRM on marketing and CRM performance, as well as the effects of team productivity and operational risk on performance, show small variations across sectors but no statistically significant differences (all $\Delta\chi^2(3) < 3$ and $p > .05$). These findings reinforce the conclusion that the core mechanisms identified in the model—namely, that digital HRM enhances performance by strengthening productivity and lowering operational risk—are stable across different service industries, even though the magnitude of some effects, particularly the DHRM–productivity link, may be slightly stronger in more mature or tightly regulated sectors.

4. Discussion and Conclusion

The findings of the present study demonstrate that digital human resource management (DHRM) exerts a powerful and multidimensional influence on the functioning of marketing and CRM teams, shaping both productivity and operational risk profiles in ways that ultimately translate into enhanced organizational performance. The results indicate that DHRM is strongly associated with improved team productivity, reduced operational risk, and higher levels of marketing and CRM performance. These findings align with and extend the contemporary literature on digital transformation, CRM capabilities, and operational management. The strong effect of DHRM on productivity confirms earlier arguments that digital HR tools—such as data-driven recruitment, e-learning platforms, digital performance dashboards, and HR analytics—enable organizations to place the right people in the right roles, support continuous development, and enhance employees' ability to function effectively in digitally intensive marketing environments (Batti, 2024; Handono et al., 2024). This relationship is also consistent with studies showing that competitive advantage in the digital era arises not only from technology acquisition but from the strategic integration of technology and human capabilities (Evangeline, 2025; Садченко et al., 2024). Our findings support this line of reasoning by demonstrating that DHRM acts as a foundational enabler of team functioning, making it possible for marketing and CRM employees to leverage CRM

systems, digital marketing tools, and customer analytics more efficiently and with greater impact.

The results further show that DHRM significantly reduces operational risk in marketing and CRM processes. This relationship is highly consistent with risk management literature emphasizing the role of employee competence, process standardization, and digital monitoring tools in mitigating operational vulnerabilities (Firdaus et al., 2025; Rahim et al., 2019). In CRM-intensive settings, operational risks frequently manifest in the form of delayed responses, inaccurate customer data entry, system misuse, service failures, and non-compliance with communication protocols—risks that can directly impair customer satisfaction and retention (Haryanto et al., 2025; Robianto et al., 2024). The study's findings align with previous work demonstrating that the integration of digital tools in operational management enhances workflow visibility, reduces error rates, and strengthens process reliability (Omelianenko & Ilienkov, 2024; P., 2022). The significant negative association between DHRM and operational risk suggests that digital HR practices equip employees with the skills, training, and behavioral norms needed to manage these risks in highly dynamic customer-facing environments. Employees who receive structured digital training and continuous feedback are more likely to comply with procedures, effectively use CRM systems, and avoid errors that compromise customer experience, reflecting earlier conclusions in CRM adoption studies within banking, hospitality, and insurance sectors (Abdulkaber & Kalimuthu, 2019; Nisha, 2023; Uddin, 2020).

A particularly important result of this study is the demonstration that both productivity and operational risk act as mediating mechanisms through which DHRM influences marketing and CRM performance outcomes. This dual mediation aligns with broader research showing that organizational performance in digital environments depends on both the ability to generate efficient outputs and the ability to minimize disruptions and errors (Kaminskyi et al., 2022; Khan et al., 2023). The finding that productivity mediates the effect of DHRM on performance supports the argument that digital HRM enhances employees' ability to contribute meaningfully to marketing outcomes by improving their technical competency, decision-making autonomy, and task engagement (Batti, 2024; Handonon et al., 2024). At the same time, the discovery that operational risk also mediates this relationship underscores the importance of reliability in service processes, a theme highlighted extensively in the literature on CRM systems

and customer dissatisfaction mitigation (Rahim et al., 2019). Our study provides empirical evidence that improved employee readiness and capabilities foster operational stability in CRM processes, and that such stability is a key contributor to marketing and CRM performance outcomes.

These results are further contextualized by the existing literature on digital CRM systems and AI-driven customer management. Studies have shown that AI-based CRM significantly transforms customer retention strategies, churn prediction, and personalization efforts, but also requires employees who are proficient in interpreting system recommendations and managing algorithmic outputs responsibly (Deep, 2024; Egbuhuzor et al., 2025). This is consistent with our finding that DHRM impacts performance indirectly through productivity: employees who understand how to use complex CRM tools produce higher-quality customer interactions, faster service response times, and better decision support. At the same time, poorly trained employees can introduce new operational risks, especially in AI-assisted systems where algorithmic errors or user misinterpretations can lead to compliance breaches or customer dissatisfaction (Evangeline, 2025; Haryanto et al., 2025). The significant reduction in operational risk associated with DHRM observed in our study corroborates findings in digitalization research suggesting that human-centered digital transformation is necessary for stabilizing digital operational ecosystems (Marchenko, 2023; Sokolov & Kaplun, 2024).

The strong link identified between productivity and marketing/CRM performance is consistent with prior work emphasizing that marketing outcomes depend on employees' capabilities to analyze markets, respond to customer insights, and adapt campaigns quickly in volatile environments (Lazebnyk, 2025; Lysohor, 2025). Similar relationships have been observed in studies of MSMEs and SMEs, which show that e-CRM and digital marketing strategies uplift performance when employees are well-trained and familiar with digital tools (Astuti et al., 2024; Wahyudi, 2024). The present study supports these findings by revealing that productivity—conceptualized as both efficiency and effectiveness—is a crucial mechanism through which HR digitalization enhances marketing outcomes. Moreover, our multi-group analysis indicates that the strength of this relationship is consistent across industries, echoing earlier cross-sectoral research showing that CRM-driven performance benefits appear in industries as diverse as financial services, FMCG, tourism, and retail when human capabilities align with digital systems

(Mahfudz et al., 2025; Oyeyemi et al., 2023; Shreyanth et al., 2023).

Equally notable is the demonstrated association between lower operational risk and improved marketing and CRM performance. This reinforces the argument that operational resilience is a strategic resource in customer-facing environments, as disruptions, errors, and compliance breaches can directly undermine trust and customer retention (Rahim et al., 2019). Studies on risk perception in marketing and on corporate governance in banking similarly affirm that managing operational vulnerabilities enhances organizational credibility and customer confidence (Alqudah et al., 2020; Karklina-Admine et al., 2024). Our findings extend this understanding by showing that operational risk is not only a firm-level construct but also a team-level performance driver: frontline employees who operate within well-structured digital HR systems exhibit fewer errors, maintain more consistent service processes, and thereby contribute to better CRM outcomes.

Overall, the findings of this study suggest that DHRM functions as a critical structural enabler in digitalized marketing ecosystems. It supports employee proficiency, stabilizes operational processes, and enhances customer engagement performance. The integration of these findings with previous research highlights a convergence in the literature around the idea that digital transformation must be human-centered to yield sustainable improvements in marketing and CRM performance (Handono et al., 2024; Садченко et al., 2024). Digital HRM, therefore, should not be viewed merely as an administrative upgrade but as a strategic resource capable of shaping both productivity dynamics and risk exposure in customer-facing teams.

The fact that both productivity and operational risk serve as significant mediators demonstrates that the effects of DHRM on performance are multifaceted and not limited to efficiency improvements. In line with earlier studies in operational management and risk-return optimization, our results reveal that efforts to improve performance without addressing risk can lead to vulnerabilities that ultimately negate performance gains (Kaminskyi et al., 2022; Khan et al., 2023). On the other hand, overly risk-averse strategies may suppress productivity and responsiveness. DHRM appears to strike a balance by equipping employees with the tools, clarity, and confidence needed to perform effectively while maintaining process integrity and compliance.

Furthermore, the stability of the structural model across industries indicates that the role of DHRM is foundational rather than context-specific. This finding supports claims in

digital transformation scholarship that the alignment of human and technological capabilities is universally essential for leveraging digital systems, regardless of sector-specific variation in customer expectations or operational structures (Borysov & Shepel, 2025; Omelianenko & Ilienkov, 2024). By illustrating how DHRM reduces operational risk and enhances productivity across institutional contexts, this study contributes to a growing body of evidence that digital HR strategies are central to the future of marketing and CRM performance.

This study, like any empirical investigation, has limitations that should be considered when interpreting its findings. First, the research relies on self-reported data for key constructs such as digital HRM, productivity, and performance, which may introduce perceptual bias or social desirability effects, especially in organizations that promote strong digital transformation narratives. Second, the cross-sectional design limits the ability to infer causal relationships definitively, even though the structural model is theoretically grounded. Longitudinal studies would provide stronger evidence of how changes in DHRM practices over time influence productivity and operational risk trajectories. Third, the sample, although diverse in terms of sectors, consists mainly of medium and large enterprises, which may limit generalizability to micro-enterprises or firms in early digital adoption stages. Fourth, while the model includes both productivity and operational risk, it may omit other important mediators such as employee engagement, digital leadership, or organizational culture. Finally, industry-specific variables that may shape CRM performance—such as regulatory constraints in financial services or supply chain complexity in FMCG—were not directly modeled, potentially limiting the precision of the findings in highly specialized contexts.

Future research should consider longitudinal or experimental designs to examine how incremental improvements in digital HRM practices influence team performance and risk outcomes over time. Studies could also incorporate objective performance indicators such as system error logs, customer complaint rates, or CRM response-time analytics to complement self-reported measures. Further research may explore additional mediators and moderators, including digital skills maturity, psychological safety, leadership styles, or team adaptability, to deepen understanding of the human dynamics underlying digital performance systems. Comparative studies across countries or organizational cultures would help determine whether cultural factors shape how employees respond to DHRM

initiatives. Finally, given the rapid evolution of AI-based CRM, future work should examine the ethical, psychological, and operational implications of algorithmic decision-support systems in marketing and customer service teams.

Organizations seeking to enhance marketing and CRM performance should invest in comprehensive digital HRM systems that support competency development, continuous learning, and performance visibility. HR functions must collaborate closely with marketing and IT units to design training programs aligned with the specific digital tools and customer engagement processes used by CRM teams. Firms should incorporate risk management principles into HR policies, ensuring that employees are trained not only for efficiency but also for process reliability and compliance. Performance dashboards and analytics tools should be deployed thoughtfully to empower employees rather than overwhelm them, encouraging proactive risk identification and skill development. Finally, leadership should foster a culture in which digital innovation, operational discipline, and customer-centricity reinforce one another, ensuring that technology and human capabilities evolve in tandem.

Authors' Contributions

Authors contributed equally to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

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Declaration of Interest

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References

- Abdulkaber, O. O. A., & Kalimuthu, K. R. (2019). A Review of Factors of Customer Relationship Management and Their Impact on Hotel Performance. *Iarjset*, 6(2), 64-66. <https://doi.org/10.17148/iarjset.2019.6211>
- Akhmad, K. A., & Nurohman, N. (2025). Developing an E-CRM Model Tailored to Msmes Needs for Enhancing Competitiveness in the Digital Era. *Proceeding of International Conference on Science Health and Technology*, 250-258. <https://doi.org/10.47701/3krjdh56>
- Alqudah, T. H. A., Yazid, A. S., AlQatawneh, D. K. A., & AlZoughool, S. A. A. (2020). The Effectiveness of Corporate Governance and Customer Relationship Management on Moderating the Relationship Between Credit Risk Management and Commercial Banks Performance in Jordan. *Scholars Journal of Economics Business and Management*, 07(01), 48-51. <https://doi.org/10.36347/sjebm.2020.v07i01.009>
- Astuti, M., Sembiring, R., & Marlina, M. (2024). Marketing Performance of MSME 4.0 Amidst COVID-19 Transition: Marketing Mix, E-CRM and Risk Perception. *Jurnal Organisasi Dan Manajemen*, 20(1), 51-64. <https://doi.org/10.33830/jom.v20i1.6127.2024>
- Batti, S. (2024). Impact of Human Resource Management and Digital Marketing Strategies on Profitability: A Statistical Evaluation in Well-Performing Companies. *Digital Innovation*, 1(3), 38-48. <https://doi.org/10.61132/digitalinnovation.v1i3.21>
- Borysov, Y., & Shepel, I. (2025). Digital Transformation of Enterprises Using Erp, Crm, and BPM. *Pryazovskyi Economic Herald*(1(41)). <https://doi.org/10.32782/2522-4263/2025-1-1>
- Deep, S. (2024). Circular Economy Transformation in Chemical Industry: Integrating CRM and AI for Sustainable Growth. *International Journal of Current Science Research and Review*, 07(04). <https://doi.org/10.47191/ijcsrr/v7-i4-03>
- Egbuhuzor, N. S., Ajayi, A., Akhigbe, E. E., Agbede, O. O., Ewim, C. P., & Ajiga, D. I. (2025). AI and Data-Driven Insights: Transforming Customer Relationship Management (CRM) in Financial Services. *Gjabr*, 3(2), 483-511. <https://doi.org/10.51594/gjabr.v3i2.93>
- Evangeline, S. I. (2025). AI for Business Management. 411-426. <https://doi.org/10.4018/979-8-3373-0608-7.ch018>
- Firdaus, J., Khalida, N. D., Arifah, H. K. N., Najiatus, N., & Hidayat, N. (2025). Analisis Manajemen Risiko UMKM Rumah Donat Di Lenteng Sumenep Berbasis ISO 31000: Identifikasi, Penilaian, Dan Mitigasi. *Mes Management Journal*, 4(2). <https://doi.org/10.56709/mesman.v4i2.912>
- Handono, W. S., Rofi'i, Y. U., & Sulistyawati, U. S. (2024). Holistic Strategy in Building Competitive Advantage in the Digital Era and Market Disruption. *International Journal of Management Science and Information Technology*, 4(2), 492-503. <https://doi.org/10.35870/ijmsit.v4i2.3320>
- Haryanto, R., Zai, Y. Y. M., Nampira, A. A., Yuliana, A., & Desembrianita, E. (2025). Customer Relationship Management (CRM) Analysis in Customer Retention. *Dinasti International Journal of Education Management and Social*

- Science, 6(6), 5173-5182.
<https://doi.org/10.38035/dijemss.v6i6.5461>
- Holloway, S. (2024). Supply Chain and Marketing Alignment in Launching New Products: Lessons From High-Tech Startups. <https://doi.org/10.20944/preprints202406.1566.v1>
- Kaminskyi, A., Nehrey, M., Babenko, V., & Zimon, G. (2022). Model of Optimizing Correspondence Risk-Return Marketing for Short-Term Lending. *Journal of Risk and Financial Management*, 15(12), 583.
<https://doi.org/10.3390/jrfm15120583>
- Karklina-Admine, S., Čevers, A., Kovalenko, A., & Auziņš, A. (2024). Challenges for Customs Risk Management Today: A Literature Review. *Journal of Risk and Financial Management*, 17(8), 321.
<https://doi.org/10.3390/jrfm17080321>
- Khan, A., Rehman, Z. u., Khan, M. I., & Badshah, I. (2023). Does Corporate Risk Management Lead to Risk Mitigation and Firm Performance? Evidence From Asian Emerging Markets. *Management Research Review*, 47(3), 329-352.
<https://doi.org/10.1108/mrr-11-2022-0776>
- Lazebnyk, V. (2025). Information and Procedural Support for Sales Management in the Segment of Profitable Organic Product Brands. *Electronic Scientific Journal Intellectualization of Logistics and Supply Chain Management #1 2020*(32), 32-41.
<https://doi.org/10.46783/smart-scm/2025-32-2>
- Lysohor, I. (2025). Digital Marketing System of a Trade Enterprise. *Problems and Prospects of Economic and Management*(2 (42)), 226-237. [https://doi.org/10.25140/2411-5215-2025-2\(42\)-226-237](https://doi.org/10.25140/2411-5215-2025-2(42)-226-237)
- Mahfudz, M., Batu, K. L., & Almadanaa, A. V. (2025). Are Shared-Goal Congruence, Customer Relationship Management, and Customer Relationship Advantages Matter to Leverage Firm Performance? Indonesia Cases on Retail. *Media Ekonomi Dan Manajemen*, 40(1), 192.
<https://doi.org/10.56444/mem.v40i1.5449>
- Marchenko, M. (2023). Digitalization of Business Management Processes of Agricultural Enterprises. *Galic Kij Ekonomičnij Visnik*, 81(2), 133-139.
https://doi.org/10.33108/galicianvisnyk_tntu2023.02.133
- Nain, J. (2025). The Future of InsurTech: CRM as a Catalyst for Embedded Insurance Models. *International Journal of Science and Research Archive*, 14(2), 1073-1087.
<https://doi.org/10.30574/ijrsra.2025.14.2.0489>
- Nisha, N. (2023). A Study on Customer Relationship Management in Banking Sector. *International Journal for Multidisciplinary Research*, 5(6).
<https://doi.org/10.36948/ijfmr.2023.v05i06.9203>
- Omelianenko, T., & Ilienkov, D. (2024). Modern Digital Tools of Operational Management. *Scientific Notes*(34), 137-150.
https://doi.org/10.33111/vz_kneu.34.24.01.12.082.088
- Oyeyemi, O. P., Anjorin, K. F., Ewim, S. E., Igwe, A. N., & Sambulya, N. J. (2023). Integrating Digital Marketing Strategies for Enhanced FMCG SME Supply Chain Resilience. *Global J. Adv. Res. Rev.*, 1(2), 060-070.
<https://doi.org/10.58175/gjarr.2023.1.2.0062>
- P., V. P. (2022). Advanced Software Tools for Enhancing Retail Operations in the Digital Era. *Ijsat*, 13(3).
<https://doi.org/10.71097/ijrsat.v13.i3.3382>
- Rahim, N. F. A., Ahmed, E. R., Sarkawi, M. N., Jaaffar, A. R., & Shamsuddin, J. (2019). Operational Risk Management and Customer Complaints. *Benchmarking an International Journal*, 26(8), 2486-2513. <https://doi.org/10.1108/bij-04-2018-0089>
- Rizky, M. (2024). IDIC Implementation Process. *Nawala Journal*, 1(4), 33-41. <https://doi.org/10.62872/1tk0ha67>
- Robianto, D., Kanedi, I., & Zulfiandry, R. (2024). Operational Customer Relationship Management (Crm) Application to Improve Customer Satisfaction Web-Based Customer Satisfaction. *Jurnal Komputer Informasi Dan Teknologi (Jkomitek)*, 4(1). <https://doi.org/10.53697/jkomitek.v4i1.1777>
- Shkrygun, Y. (2021). Management of Logistics Activities of Enterprises in the Context of Industry 4.0. *Economic Herald of the Donbas*(4 (66)), 53-61. [https://doi.org/10.12958/1817-3772-2021-4\(66\)-53-61](https://doi.org/10.12958/1817-3772-2021-4(66)-53-61)
- Shreyanth, S., Suwetha, P. T., Kathirolu, V., Niveditha, S., & Jayaprakash, H. (2023). Fintech, Crisis, and Marketing: How Technology-Driven Financial Firms Adapt Their Approach to Retain Customers. 309-321. https://doi.org/10.2991/978-94-6463-162-3_28
- Sokolov, M., & Kaplun, V. (2024). Digital Management Technologies in Enterprise Management. *Ape*, 1(271), 78-87.
<https://doi.org/10.32752/1993-6788-2024-1-271-78-87>
- Syamsul, F., Nurwati, N., & Handoko, W. (2024). The Use of E-CRM as a Means of Selling Groceries. *Jurnal Sistem Cerdas*, 7(2), 189-198. <https://doi.org/10.37396/jsc.v7i2.450>
- Uddin, F. (2020). CRM: A Differentiating Strategy to Retain Customer in Life Insurance Sector. *The Management Accountant Journal*, 35-37.
<https://doi.org/10.33516/maj.v55i9.35-37p>
- Wahyudi, T. (2024). Penerapan Customer Relationship Management (CRM) Bagi UMKM. *Jibma*, 2(2), 175-185.
<https://doi.org/10.65255/jibma.v2i2.43>
- Садченко, О. В., Шлезиак, М., & Дек, J. (2024). Relational Marketing and Management Models of Lean Manufacturing Concepts in the Age of Digitalization. *Market Economy Modern Management Theory and Practice*, 23(3(58)), 111-131. [https://doi.org/10.18524/2413-9998.2024.3\(58\).327490](https://doi.org/10.18524/2413-9998.2024.3(58).327490)