



The Impact of Customer Interaction Data from Call Centers and Digital Channels on Improving CRM Processes Integrated with ERP Systems (Case Study: Irancell)

Ali Tasharofi¹, Elham Fazeli Veisari^{2*}

¹ Department of Management, SR.C., Islamic Azad University, Tehran, Iran

² Department of Management and accounting, To.c., Islamic Azad University, Tonekabon, Iran

* Corresponding author email address: elhamfv@iau.ac.ir

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Abstract

In the era of digital transformation, service organizations are confronted with a vast volume of data generated through customer interactions in call centers and digital channels. The effective utilization of these data requires the integration of Customer Relationship Management (CRM) systems with Enterprise Resource Planning (ERP) systems. The present study was conducted with the aim of examining the impact of customer interaction data on the improvement of CRM processes integrated with ERP systems in Irancell Company. In terms of purpose, this study is applied research, and in terms of methodology, it is a descriptive-survey study with a quantitative approach. The statistical population consisted of Irancell employees, among whom 330 participants were selected through convenience sampling. Data were collected using a standardized 33-item questionnaire based on a five-point Likert scale. Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed for data analysis. The findings indicated that various CRM features in the dimensions of marketing, sales, and service/support have a significant effect on CRM capabilities, and these capabilities directly enhance organizational performance. Furthermore, CRM-ERP integration plays a reinforcing role in these relationships. The findings suggest that the analytical use of customer interaction data, when supported by system integration, can lead to improved organizational performance and the creation of sustainable competitive advantage in the telecommunications industry.

Keywords: *Customer Relationship Management (CRM), Enterprise Resource Planning (ERP), Customer Interaction Data, Systems Integration, Organizational Performance, Competitive Advantage, Irancell.*

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1. Introduction

In the contemporary era of digital transformation, organizations are increasingly confronted with unprecedented volumes of customer-generated data originating from diverse communication channels, including contact centers, social media platforms, mobile applications, websites, and digital self-service systems. The growing expansion of digital ecosystems has fundamentally transformed the nature of customer interactions and shifted organizational focus from traditional transaction-oriented communication toward intelligent, data-driven relationship management. In this context, Customer Relationship Management (CRM) systems have emerged as strategic

infrastructures for managing customer information, improving customer experiences, and strengthening organizational responsiveness. Simultaneously, Enterprise Resource Planning (ERP) systems have become central mechanisms for integrating organizational processes, operational coordination, and enterprise-wide information management. The integration of CRM and ERP systems therefore represents a strategic necessity for organizations seeking to achieve sustainable competitiveness, operational efficiency, and customer-centric innovation in highly dynamic markets [1, 2]. The rapid growth of customer interaction data has created both opportunities and challenges for organizations, particularly in service industries where customer satisfaction and loyalty constitute



essential determinants of organizational success. As organizations increasingly rely on digital channels for communication with customers, the ability to collect, analyze, and integrate interaction data into operational decision-making processes has become a major source of strategic value creation.

Customer interaction data generated through contact centers and digital channels possess considerable analytical value because they provide detailed insights into customer expectations, emotional responses, behavioral patterns, purchasing intentions, and service experiences. Unlike conventional customer data, interaction data reflect real-time behavioral dynamics and reveal customer sentiments during actual communication processes. Organizations that can effectively analyze these interactions are better positioned to personalize services, anticipate customer needs, optimize marketing strategies, and improve customer retention rates. Recent developments in artificial intelligence, machine learning, and predictive analytics have significantly enhanced organizations' capacities to process customer interaction data and convert them into actionable managerial knowledge [3, 4]. In modern digital business environments, the integration of intelligent analytical tools with CRM systems allows firms to automate customer segmentation, sentiment analysis, recommendation systems, and behavioral forecasting. These developments are particularly relevant in industries such as telecommunications, where organizations continuously interact with millions of customers across multiple digital and physical touchpoints. As a result, firms increasingly recognize that the strategic utilization of customer interaction data is no longer limited to operational customer service activities but extends to broader organizational functions, including strategic planning, innovation management, and competitive positioning.

The evolution of CRM systems has also transformed the conceptual understanding of customer relationships from static transactional exchanges into dynamic relational ecosystems. Modern CRM systems are no longer confined to databases for storing customer records; instead, they function as integrated platforms for managing customer journeys, facilitating multichannel communication, and coordinating organizational responses to customer needs. Studies have shown that CRM capabilities significantly contribute to customer retention, customer satisfaction, and relationship marketing effectiveness by enabling organizations to establish long-term interactive relationships with customers [5, 6]. Furthermore, the emergence of

artificial intelligence-based CRM technologies has accelerated the transformation of customer relationship management into an intelligent and predictive organizational capability. AI-powered CRM systems can identify hidden customer patterns, automate communication processes, and improve decision-making accuracy through data-driven insights. In highly competitive markets, these capabilities provide organizations with substantial advantages in understanding customer behavior and delivering personalized services. At the same time, relationship marketing theories emphasize that organizations capable of maintaining meaningful and responsive customer interactions are more likely to establish trust, emotional attachment, and customer loyalty. Consequently, CRM systems integrated with analytical technologies and customer interaction data have become essential strategic tools for strengthening organizational competitiveness.

In parallel with CRM development, ERP systems have evolved into comprehensive enterprise integration platforms that facilitate coordination among organizational functions such as finance, operations, supply chain management, marketing, and human resources. ERP systems provide centralized access to organizational information and improve internal communication efficiency by eliminating data fragmentation across departments. However, despite their operational strengths, traditional ERP systems often lacked sufficient customer-oriented functionalities, thereby limiting organizations' abilities to respond rapidly to customer expectations and market changes. This limitation led to the increasing integration of ERP systems with CRM infrastructures in order to create unified organizational information architectures capable of synchronizing customer-related insights with operational processes [2, 7]. The integration of CRM and ERP systems allows organizations to establish seamless information flows between front-office customer interactions and back-office operational activities. As a result, customer service departments can access real-time operational information, while managerial units can utilize customer interaction data for strategic decision-making and resource planning. Such integration significantly enhances organizational agility, responsiveness, and service quality by ensuring that customer information is consistently shared across all organizational units.

The increasing importance of omnichannel customer engagement has further intensified the need for integrated CRM-ERP ecosystems. Customers today interact with organizations through multiple digital and physical

touchpoints, including websites, social networks, online chat systems, mobile applications, and contact centers. These multichannel interactions generate fragmented data streams that require centralized integration and analysis to provide coherent customer experiences. Research indicates that organizations capable of integrating digital touchpoints with CRM and ERP systems can significantly improve customer experience consistency, communication efficiency, and organizational responsiveness [7, 8]. In service-oriented sectors such as telecommunications, where customer expectations for rapid and personalized services are continuously increasing, integrated customer data management has become a crucial determinant of organizational success. Customers increasingly expect organizations to recognize their preferences, communication histories, and service requirements regardless of the communication channel used. Failure to integrate customer interaction data across channels often results in inconsistent service delivery, communication gaps, and reduced customer satisfaction. Consequently, organizations are investing heavily in integrated information systems capable of unifying customer data, improving service coordination, and facilitating personalized customer engagement.

Artificial intelligence and chatbot technologies have also become important components of modern customer interaction management. AI-driven systems are increasingly utilized to automate customer support, improve communication speed, and enhance service availability through intelligent conversational interfaces. Chatbots and virtual assistants can process customer inquiries, provide instant responses, and collect valuable interaction data that can subsequently be analyzed within CRM systems [4, 9]. The integration of AI technologies with CRM and ERP systems therefore contributes not only to operational efficiency but also to strategic knowledge generation. Through advanced sentiment analysis and predictive modeling, organizations can identify customer dissatisfaction, predict service failures, and proactively implement corrective actions before customer relationships deteriorate. Moreover, AI-based CRM systems can enhance customer retention by identifying customers at risk of churn and recommending personalized engagement strategies [3, 5]. These capabilities demonstrate that customer interaction data are increasingly functioning as strategic organizational assets rather than merely operational communication records. In highly competitive industries, organizations that effectively utilize AI-enhanced CRM capabilities are more

likely to strengthen customer loyalty, improve service quality, and establish sustainable competitive advantages.

Digital marketing strategies have similarly become closely interconnected with CRM systems and customer interaction analytics. Strategic digital marketing relies heavily on customer data to design personalized campaigns, optimize customer targeting, and improve communication effectiveness. CRM systems integrated with digital marketing tools enable organizations to monitor customer responses, evaluate campaign performance, and dynamically adapt marketing strategies based on behavioral feedback [10]. The integration of marketing analytics with CRM and ERP infrastructures further strengthens organizational capacities for customer-centric decision-making and strategic resource allocation. In this regard, technology readiness and organizational ICT capabilities play important roles in determining firms' abilities to successfully implement AI-based CRM systems and leverage customer interaction data for strategic advantage [11]. Organizations with stronger technological infrastructures and higher digital maturity are generally more capable of integrating customer data across systems and transforming analytical insights into operational improvements. Additionally, industry dynamism influences the extent to which firms need to continuously adapt their customer relationship strategies in response to evolving market conditions and technological developments. In rapidly changing industries such as telecommunications, the ability to dynamically manage customer interactions and integrate digital technologies has become essential for maintaining organizational competitiveness.

The strategic significance of customer experience management has also attracted increasing scholarly attention in recent years. Research has demonstrated that effective customer experience management contributes significantly to customer loyalty, organizational reputation, and long-term business sustainability [12]. Customer experience is shaped not only by service quality but also by the consistency, personalization, and responsiveness of customer interactions across communication channels. Organizations capable of integrating customer interaction data into CRM and ERP systems can better understand customer expectations and design more coherent customer experiences. Furthermore, advanced analytical integration enables firms to identify service bottlenecks, improve communication efficiency, and optimize customer journeys through evidence-based decision-making [2]. In this context, customer interaction data generated through contact centers

and digital channels become critical sources of strategic intelligence that support organizational innovation and service improvement initiatives. Telecommunications companies such as Irancell operate within highly competitive environments characterized by rapidly changing customer preferences, technological disruptions, and increasing service expectations. Consequently, the effective integration and analysis of customer interaction data can significantly influence organizational performance and competitive positioning.

Despite the growing importance of integrated CRM–ERP ecosystems and customer interaction analytics, many organizations continue to face substantial challenges in effectively utilizing customer-generated data. Data fragmentation, lack of system interoperability, insufficient analytical capabilities, and organizational resistance to technological change often hinder the successful implementation of integrated customer management systems. Moreover, although numerous studies have investigated CRM systems, ERP integration, digital marketing, and AI-based customer management independently, fewer studies have comprehensively examined the combined impact of customer interaction data from contact centers and digital channels on improving CRM processes integrated with ERP systems, particularly in the telecommunications industry. This research gap is especially evident in developing digital economies where organizations are rapidly adopting digital transformation strategies but still face structural and technological integration challenges. Therefore, examining the role of customer interaction data within integrated CRM–ERP environments can contribute significantly to both theoretical understanding and managerial practice by clarifying how organizations can leverage customer data for enhanced organizational performance and sustainable competitive advantage [1, 13].

Accordingly, the present study aims to investigate the impact of customer interaction data from contact centers and digital channels on improving CRM processes integrated with ERP systems in Irancell Company.

2. Methodology

In terms of approach, the present study is categorized as quantitative research because the required data were collected numerically and the relationships among variables were examined through statistical methods. In terms of purpose, this study is applied research, as its findings can be

directly utilized to improve customer relationship management processes and the integration of information systems within Irancell Company. Regarding the nature and implementation method, the study is descriptive–survey research, meaning that in addition to describing the current status of the variables, it investigates and analyzes the causal relationships among them within the framework of a conceptual model. In this study, the conceptual research model was designed based on a systematic review of the literature and theoretical background. The research variables consisted of four main categories: (1) independent variables including general, marketing, sales, and service/support characteristics in the field of Customer Relationship Management (CRM); (2) mediating variables including CRM capabilities (interaction management, relationship enhancement, and customer recovery) and organizational performance; (3) the dependent variable, namely competitive advantage; and (4) the moderating variable of CRM and ERP integration. In the proposed model, CRM characteristics influence competitive advantage through the enhancement of CRM capabilities and the improvement of organizational performance, while the magnitude of this effect is influenced by the level of CRM–ERP integration.

The statistical population of the study consisted of all employees of Irancell Company, which, according to the latest available statistics, was estimated at approximately 2,300 individuals. Due to time and operational limitations, convenience sampling was employed, and the sample size was determined to be 330 participants using the Morgan Table. This sample size possessed sufficient adequacy for multivariate analyses and structural equation modeling and enabled the generalization of the findings to the statistical population. Data collection was conducted through a combination of library and field methods. In the library section, valid scientific resources were used to explain the theoretical framework, define concepts, and extract indicators. In the field section, the primary data collection instrument was a standardized questionnaire based on a five-point Likert scale. The questionnaire consisted of three sections: introduction and objectives of the study, demographic information, and specialized questions related to the research variables. The items of each construct were adapted from valid prior studies and localized according to the conditions of the organization under study. The questionnaires were distributed in person, and ultimately 330 analyzable questionnaires were collected.

To ensure the quality of the measurement instrument, the validity and reliability of the questionnaire were evaluated.

Content and face validity were confirmed through consultation with academic experts and specialists in management and marketing. Cronbach's alpha method was employed to assess reliability, and the values of all constructs exceeded 0.70, while the overall Cronbach's alpha coefficient of the questionnaire was reported as 0.91, indicating desirable internal consistency of the research instrument. Furthermore, during the measurement model analysis stage, convergent validity (factor loadings and AVE), discriminant validity (Fornell–Larcker criterion and HTMT), and composite reliability were also assessed. In the data analysis section, descriptive statistics (mean, standard deviation, tables, and charts) were initially used through SPSS software to describe the characteristics of the sample and variables. Subsequently, to test the hypotheses and examine the structural relationships among latent variables, Structural Equation Modeling based on Partial Least Squares (PLS-SEM) and SmartPLS software were utilized. Model evaluation was performed at both the measurement and structural levels, and indicators such as R^2 , Q^2 , f^2 , and the bootstrap test (with 5,000 resamples) were applied to assess the significance of path coefficients and the predictive power

of the model. This approach enabled the simultaneous examination of multiple relationships, consideration of measurement error, and analysis of direct, indirect, and moderating effects.

3. Findings and Results

The demographic characteristics of the respondents can play a significant role in data analysis and interpretation of the research findings because the composition of age, education, work experience, and gender of the workforce influences their level of understanding, experience, and familiarity with CRM and ERP systems, as well as their attitudes toward the use of customer interaction data. Since the statistical population of the present study consisted of Irancell employees, a precise examination of these characteristics can demonstrate the extent to which the data obtained from the sample are reliable, valid, and representative of the organization's professional population. The following table presents a comprehensive overview of all demographic indicators.

Table 1. Integrated Demographic Characteristics of the Statistical Sample (N = 330)

Variable	Category	Frequency	Percentage
Age	Under 30 years	84	25.45
Age	30–40 years	98	29.70
Age	40–50 years	83	25.15
Age	Over 50 years	65	19.70
Education	Bachelor's degree	126	38.18
Education	Master's degree	113	34.24
Education	Doctoral degree	91	27.58
Work Experience	Less than 5 years	58	17.58
Work Experience	5–10 years	97	29.39
Work Experience	10–20 years	112	33.94
Work Experience	More than 20 years	63	19.09
Gender	Male	197	59.70
Gender	Female	133	40.30

Overall, the demographic composition of the research sample indicates that Irancell's workforce possesses a balanced, experienced, and specialized structure and appropriately represents employees engaged with CRM and ERP processes. The balanced age distribution among young, middle-aged, and senior employees provides a desirable combination of energy, skills, and operational experience. The high educational level, particularly the substantial proportion of employees with postgraduate degrees, reflects their analytical capability and appropriate understanding of

complex data-driven systems. Furthermore, the predominance of respondents with more than five years of work experience indicates that most participants had deep familiarity with the organization's operational processes and thus provided valid judgments. The relatively balanced gender composition also reflects workforce diversity across different organizational sectors. Collectively, these factors suggest that the collected data possess sufficient validity and adequacy for research analyses.

In this study, a two-stage Partial Least Squares Structural Equation Modeling (PLS-SEM) approach was employed for inferential analysis. This method is highly appropriate for testing the conceptual model of the study due to its flexibility regarding the assumption of data normality and its capability to analyze complex models with moderating variables. Various methods are available for assessing normality, including formal statistical tests (such as Kolmogorov–

Smirnov and Shapiro–Wilk tests), graphical methods (such as histograms and Q–Q plots), and descriptive distribution indices. However, it should be noted that formal statistical tests in large sample sizes (such as the present study) exhibit excessive sensitivity and may report even the smallest deviations from normal distribution as statistically significant, although such deviations may be practically negligible.

Table 2. Skewness and Kurtosis Values of the Questionnaire Items

Items	Sample Size	Mean	Standard Deviation	Skewness	Kurtosis
Q1	330	3.38	1.66	-0.398	-1.536
Q2	330	3.18	1.64	-0.215	-1.560
Q3	330	3.34	1.66	-0.373	-1.544
Q4	330	3.35	1.67	-0.369	-1.566
Q5	330	3.29	1.67	-0.279	-1.615
Q6	330	3.26	1.68	-0.265	-1.615
Q7	330	3.38	1.65	-0.391	-1.526
Q8	330	3.18	1.63	-0.209	-1.544
Q9	330	3.20	1.68	-0.211	-1.648
Q10	330	3.34	1.63	-0.337	-1.523
Q11	330	3.34	1.67	-0.356	-1.561
Q12	330	3.27	1.62	-0.271	-1.534
Q13	330	3.30	1.70	-0.326	-1.602
Q14	330	3.25	1.65	-0.297	-1.548
Q15	330	3.22	1.69	-0.246	-1.641
Q16	330	3.28	1.68	-0.309	-1.610
Q17	330	3.36	1.67	-0.380	-1.538
Q18	330	3.29	1.63	-0.293	-1.539
Q19	330	3.39	1.66	-0.406	-1.523
Q20	330	3.33	1.64	-0.312	-1.551
Q21	330	3.28	1.60	-0.265	-1.493
Q22	330	3.28	1.68	-0.309	-1.610
Q23	330	3.34	1.60	-0.333	-1.472
Q24	330	3.43	1.61	-0.453	-1.395
Q25	330	3.26	1.67	-0.265	-1.604
Q26	330	3.31	1.69	-0.338	-1.582
Q27	330	3.28	1.68	-0.309	-1.605
Q28	330	3.28	1.67	-0.269	-1.617
Q29	330	3.29	1.60	-0.290	-1.463
Q30	330	3.22	1.59	-0.221	-1.489
Q31	330	3.38	1.66	-0.397	-1.526
Q32	330	3.28	1.59	-0.268	-1.488
Q33	330	3.38	1.63	-0.395	-1.479

As shown in the table above, all obtained skewness and kurtosis statistics for the research items fall within the range of ± 2 . Therefore, it can be concluded that all questionnaire items exhibit a normal distribution.

In this section, the results of the first-order confirmatory factor analysis for all research constructs, including “general characteristics,” “marketing characteristics,” “sales

characteristics,” “service/support characteristics,” “customer interaction management capability,” “customer relationship enhancement capability,” and “customer recovery capability,” are presented. The purpose of conducting CFA was to evaluate construct validity, measurement model fit, and the reliability of the research instrument. Accordingly, indicators such as standardized

factor loadings, t-values, Average Variance Extracted (AVE), Composite Reliability (CR), and Cronbach's alpha were examined.

The following table presents a summary of the most important factor analysis indicators for all constructs of the research model.

Table 3. Summary of CFA Indicators for the Research Model Constructs

Construct	Factor Loading Range	t-Value Range	AVE	CR	α
General Characteristics	0.792–0.849	34.537–46.920	0.684	0.866	0.768
Marketing Characteristics	0.824–0.882	38.592–69.193	0.727	0.889	0.812
Sales Characteristics	0.726–0.959	22.480–429.637	0.780	0.913	0.852
Service/Support Characteristics	0.807–0.864	30.469–54.432	0.694	0.872	0.779
Customer Interaction Management Capability	0.750–0.856	23.840–53.693	0.635	0.839	0.710
Customer Relationship Enhancement Capability	0.794–0.871	30.647–55.631	0.697	0.873	0.782
Customer Recovery Capability	0.840–0.846	43.272–47.720	0.711	0.881	0.797

The results of the confirmatory factor analysis indicate that all standardized factor loadings for the items of each construct exceeded 0.70 and were statistically significant with t-values considerably greater than the critical value of 1.96. This finding demonstrates that each item strongly, accurately, and significantly measured its corresponding construct and that the factor structure of the measurement instrument possessed high internal coherence. Furthermore, the Average Variance Extracted (AVE) values for all constructs were greater than 0.50, indicating desirable convergent validity and showing that the items of each construct explained a substantial proportion of the variance of the latent construct. The Composite Reliability (CR) and Cronbach's alpha (α) values for all constructs also exceeded the minimum threshold of 0.70. These findings indicate appropriate internal reliability, measurement stability, and trustworthiness of the instrument. The particularly high CR values for constructs such as "sales characteristics," "customer recovery capability," and "marketing characteristics" suggest that the items had strong internal correlations and that the constructs possessed substantial psychometric robustness. Overall, the CFA findings demonstrate that the measurement model of the study possesses fully acceptable factorial quality, validity, and

reliability. All constructs were properly defined, and the relationships between the items and latent constructs were statistically confirmed at a desirable level. Accordingly, the measurement model could confidently proceed to the next stage of analysis, namely Structural Equation Modeling (SEM), enabling the analysis of causal relationships among constructs with appropriate accuracy and validity.

To evaluate the quality of the measurement model, confirmatory factor analysis was conducted for all research constructs, including CRM characteristics, CRM capabilities, organizational performance, competitive advantage, and CRM–ERP integration. The obtained results demonstrated that all standardized factor loadings were within the acceptable range and were statistically significant. Furthermore, the Average Variance Extracted (AVE) values for all constructs were equal to or greater than 0.50, indicating desirable convergent validity. In addition, the Composite Reliability (CR) and Cronbach's alpha coefficients for all constructs exceeded 0.70, reflecting appropriate internal consistency and reliability of the measurement instrument. Based on these findings, the measurement model possessed adequate quality, and the resulting constructs could be confidently employed in the analysis of the structural model.

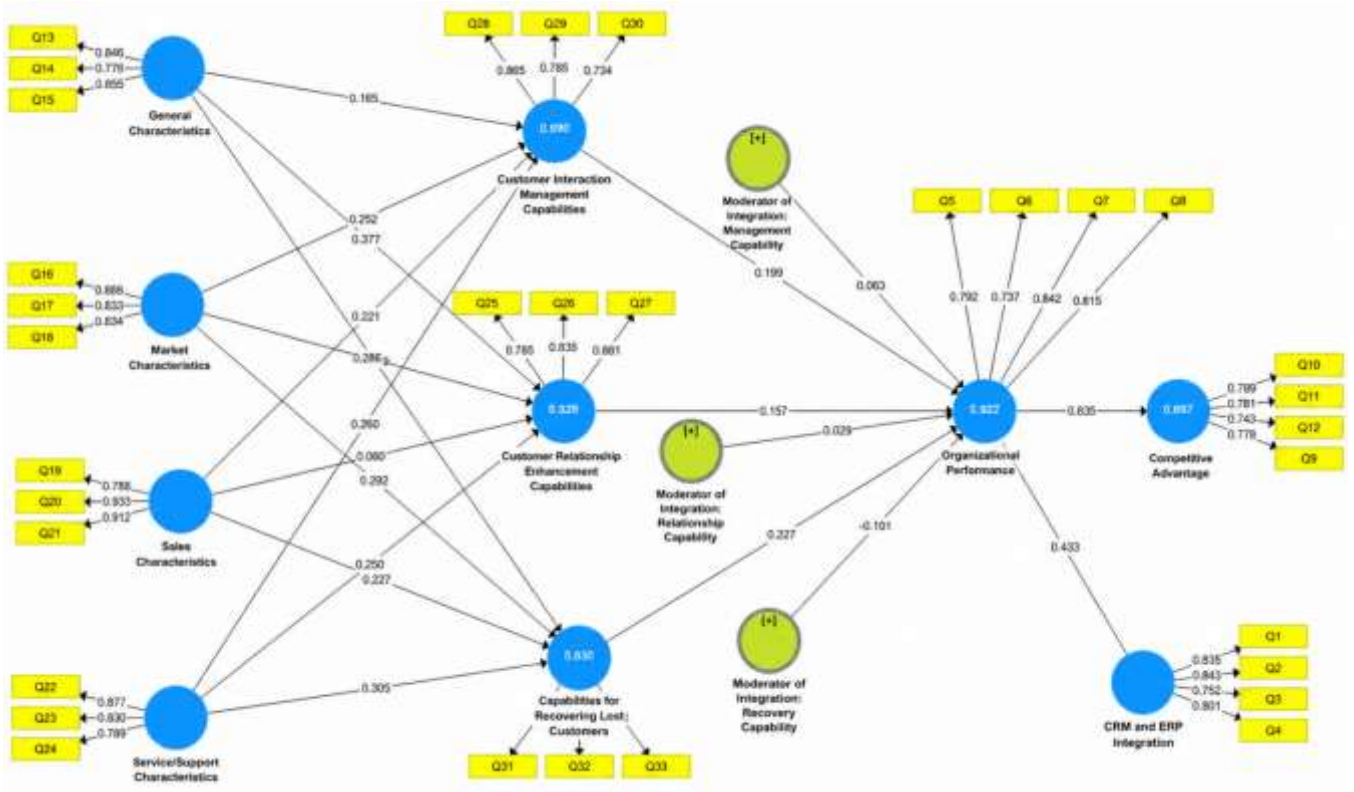


Figure 1. Research Model Testing in the Standardized Path Coefficients State

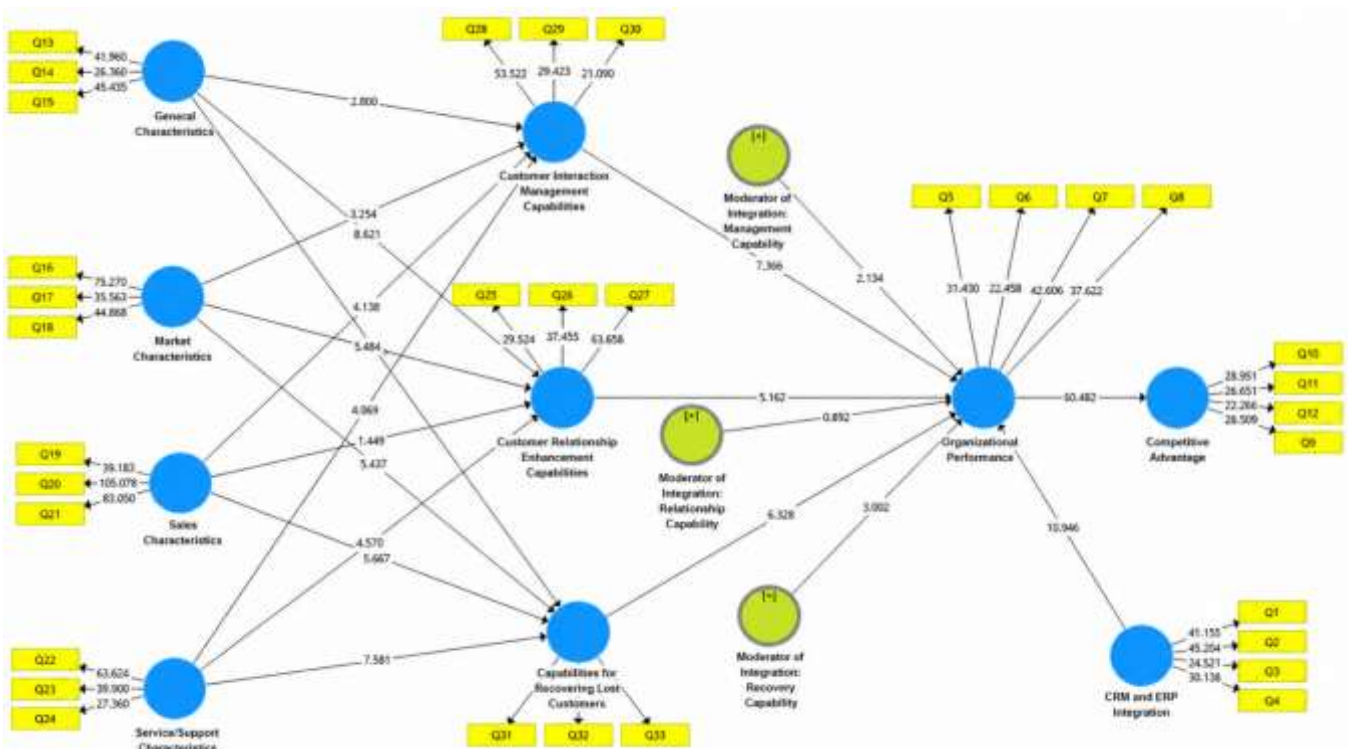


Figure 2. Research Model Testing in the t-Values State

To test the relationships among latent variables, variance-based Structural Equation Modeling (PLS-SEM) was employed. The selection of this approach was entirely appropriate considering the complexity of the research model, the existence of multiple paths among constructs, the potential non-normality of data, and the predictive and

explanatory nature of the research objectives. SmartPLS software was used as the primary analysis tool, enabling the simultaneous estimation of the measurement and structural models, calculation of path coefficients, coefficients of determination (R^2), fit indices, Q^2 values, and estimation of relationship significance.

Table 4. Model Fit Indices

Dependent/Mediating Variable	Coefficient of Determination (R^2)	Predictive Relevance (Q^2)	Goodness-of-Fit (GOF)
Customer Interaction Management Capability	0.686	0.414	0.815
Customer Relationship Enhancement Capability	0.827	0.543	
Customer Recovery Capability	0.828	0.559	
Organizational Performance	0.920	0.551	
Competitive Advantage	0.696	0.392	

To evaluate the structural model fit, the coefficient of determination (R^2), predictive relevance index (Q^2), and overall Goodness-of-Fit (GOF) index were examined. The coefficient of determination represents the proportion of variance in endogenous variables explained by exogenous variables. According to the standards proposed by Wynne W. Chin (1998), values above 0.33 and 0.67 indicate moderate and strong explanatory power, respectively. Moreover, the Q^2 index reflects the predictive capability of the model, and positive values confirm acceptable predictive relevance of the structural model. In addition, the GOF index, which represents a combined measure of measurement and structural model fit, was obtained as 0.815. Based on the standards proposed by Martin Wetzels and colleagues (values above 0.36 indicating strong fit), this result demonstrates a highly desirable overall fit of the research model. These findings indicate that the proposed model possesses high explanatory power, appropriate predictive capability, and reliable overall fit; therefore, the relationships among the constructs can be examined and interpreted with confidence.

4. Discussion and Conclusion

The findings of the present study demonstrated that customer interaction data obtained from contact centers and digital communication channels significantly contribute to the improvement of CRM processes integrated with ERP systems in Irancell Company. The results revealed that general CRM characteristics, marketing characteristics, sales characteristics, and service/support characteristics all exerted significant positive effects on CRM capabilities, including customer interaction management capability, customer relationship enhancement capability, and customer

recovery capability. Furthermore, the findings indicated that CRM capabilities directly enhanced organizational performance and ultimately strengthened competitive advantage. The moderating role of CRM-ERP integration was also confirmed, indicating that higher levels of system integration intensified the positive effects of CRM capabilities on organizational performance. These findings collectively suggest that organizations capable of systematically collecting, analyzing, and integrating customer interaction data across operational systems can achieve superior organizational effectiveness and establish stronger competitive positions in highly dynamic digital markets.

One of the most important findings of the study was the significant effect of marketing, sales, and service/support characteristics on customer interaction management capability. This finding demonstrates that customer-oriented organizational processes can substantially improve firms' capacities to manage customer communications, respond to customer needs, and coordinate customer-related information across different communication channels. In modern digital environments, customer interaction management increasingly depends on the ability of organizations to process large volumes of real-time customer data generated through contact centers, online platforms, and digital applications. The results of the present study are consistent with the findings reported by [9], who emphasized that artificial intelligence and chatbot technologies significantly improve customer interactions by enhancing communication speed and service responsiveness. Similarly, [4] concluded that chatbot systems and customer data analytics positively influence communication efficiency and customer engagement within supply chain systems. The present findings further support the argument that digital

interaction management requires integrated analytical infrastructures capable of transforming fragmented communication data into actionable customer intelligence.

The significant relationship between CRM characteristics and customer relationship enhancement capability also highlights the strategic role of integrated customer data management in strengthening long-term customer relationships. Relationship enhancement capability reflects an organization's ability to personalize communications, improve customer trust, and increase customer satisfaction through consistent and meaningful interactions. The findings suggest that organizations capable of effectively utilizing customer interaction data can better identify customer preferences and tailor their communication strategies accordingly. This result aligns with the findings of [5], who reported that CRM systems positively affect customer interactions and customer retention through market-oriented organizational strategies. Likewise, [6] emphasized the important role of AI-based CRM systems in strengthening relationship marketing by enabling organizations to predict customer behavior and personalize customer engagement processes. In addition, the findings are consistent with the study conducted by [8], which demonstrated that customer trust, social support, and voluntary customer participation are strongly influenced by the quality and continuity of customer interactions within smart digital environments. These findings collectively indicate that organizations that effectively manage customer interactions across digital touchpoints can develop stronger relational bonds with customers and consequently improve organizational performance.

Another important result of the study was the significant impact of CRM characteristics on customer recovery capability. This finding indicates that organizations with stronger CRM infrastructures are more capable of identifying dissatisfied customers, addressing customer complaints, and recovering lost customers through responsive communication and service recovery strategies. In highly competitive service industries such as telecommunications, customer recovery capability is particularly important because customer switching behavior can rapidly reduce organizational profitability and market share. The present findings support the arguments proposed by [12], who emphasized that customer experience management significantly contributes to customer loyalty and long-term business sustainability. Effective customer recovery requires organizations to analyze customer complaints, monitor dissatisfaction signals, and rapidly

implement corrective actions. Similarly, [3] highlighted the importance of automated sentiment analysis in ERP-CRM integrated organizations, arguing that advanced analytical technologies can identify negative customer emotions and facilitate proactive customer relationship management. The findings of the current study therefore reinforce the view that integrated customer interaction analytics can substantially improve organizations' capacities to recover dissatisfied customers and minimize customer churn.

The results further demonstrated that CRM capabilities significantly influence organizational performance. This finding suggests that organizations capable of effectively managing customer interactions, strengthening customer relationships, and recovering dissatisfied customers are more likely to achieve higher levels of operational efficiency, customer satisfaction, and organizational productivity. CRM capabilities allow organizations to align customer-oriented strategies with operational decision-making processes, thereby improving service quality and organizational responsiveness. These findings are strongly consistent with the conclusions of [1], who argued that CRM systems are strategically interconnected with broader information technology infrastructures and organizational performance improvement initiatives. In addition, the results align with the study of [2], which emphasized that analytical integration within ERP-CRM systems significantly improves customer journey management and organizational decision-making processes. The ability to integrate customer interaction data into organizational operations therefore appears to be a critical determinant of organizational performance in digital service industries.

One of the central findings of this study was the positive effect of organizational performance on competitive advantage. This finding indicates that organizations with stronger operational capabilities, more efficient customer management processes, and better service responsiveness are more capable of achieving sustainable market differentiation and superior competitive positioning. In contemporary digital economies, competitive advantage increasingly depends on organizations' abilities to leverage customer data for strategic innovation and customer-centric service development. The findings support the theoretical arguments presented by [13], who identified artificial intelligence as a key driver of competitive advantage in technology-based businesses. AI-enhanced CRM systems provide organizations with advanced predictive capabilities, customer behavior insights, and communication optimization tools that can significantly strengthen

organizational competitiveness. Furthermore, the findings are consistent with [10], who demonstrated that strategic digital marketing management positively affects CRM effectiveness and organizational competitiveness by improving customer targeting and communication quality. These results suggest that customer interaction data should be regarded not merely as operational information but as strategic organizational assets capable of generating sustainable competitive advantages.

The moderating role of CRM–ERP integration constituted another major contribution of the present study. The results showed that CRM–ERP integration strengthened the effects of customer interaction management capability, relationship enhancement capability, and customer recovery capability on organizational performance. This finding indicates that integrated information systems significantly improve the effectiveness of customer management processes by enabling seamless information exchange between customer-oriented and operational departments. In organizations with integrated CRM and ERP systems, customer information can be rapidly shared across departments, improving communication coordination, service quality, and managerial decision-making. These findings strongly support the conclusions of [7], who emphasized that the integration of digital touchpoints and contact center data within ERP–CRM ecosystems significantly improves customer experience consistency and organizational responsiveness. Similarly, [2] argued that integrated analytics infrastructures facilitate more effective customer journey management by synchronizing customer information across operational systems. The findings of the present study therefore highlight the strategic importance of integrated information architectures in maximizing the value of customer interaction data.

The findings also reinforce the growing importance of artificial intelligence and digital technologies in modern CRM systems. AI-based analytical tools can substantially improve organizations' capacities to process customer interaction data, identify behavioral patterns, and automate customer communication processes. In digital service industries characterized by large customer bases and high communication volumes, manual customer management approaches are increasingly insufficient for maintaining service quality and customer satisfaction. The findings of the present study support the arguments presented by [11], who emphasized that firms' technological readiness and ICT capabilities significantly influence AI-based CRM capacity development. Organizations with stronger technological

infrastructures are more capable of integrating customer interaction data into CRM and ERP systems and utilizing advanced analytical technologies for strategic decision-making. Moreover, the results are consistent with [3], who demonstrated that automated sentiment analysis technologies improve customer interaction management by providing real-time emotional insights into customer communications. Consequently, the integration of AI technologies within CRM–ERP ecosystems appears to represent a critical strategic direction for organizations seeking to improve customer management effectiveness and operational agility.

Another important implication of the findings concerns the role of customer interaction data in supporting customer-centric organizational strategies. The results indicate that customer interaction data generated through digital channels and contact centers can substantially improve organizational understanding of customer expectations, preferences, and experiences. In highly competitive industries such as telecommunications, organizations that can continuously monitor and analyze customer interactions are better positioned to adapt their services to changing customer demands. These findings align with the perspective of [12], who argued that customer experience management constitutes a key mechanism for strengthening customer loyalty and organizational sustainability. Similarly, [8] emphasized that customer trust and social support within smart service environments depend heavily on the quality and consistency of customer interactions. The present study therefore confirms that integrated customer interaction management not only improves operational efficiency but also strengthens the emotional and relational dimensions of customer engagement.

Overall, the findings of the present study indicate that customer interaction data from contact centers and digital channels play a critical role in improving CRM processes integrated with ERP systems. Organizations that effectively integrate customer interaction analytics with CRM and ERP infrastructures can significantly enhance customer interaction management, relationship enhancement, customer recovery processes, organizational performance, and competitive advantage. In digital economies characterized by rapid technological change and increasing customer expectations, integrated CRM–ERP ecosystems supported by AI-driven analytical capabilities are becoming essential strategic infrastructures for organizational sustainability and market competitiveness. The findings contribute to the existing literature by providing empirical

evidence regarding the combined effects of CRM capabilities, customer interaction data, and system integration within the telecommunications industry, while also offering practical insights for organizations seeking to improve customer-centric operational strategies.

One limitation of the present study is that the research was conducted exclusively within Irancell Company, which may limit the generalizability of the findings to other industries or organizational contexts. In addition, the study employed a cross-sectional design, meaning that customer interaction dynamics and organizational changes over time could not be examined longitudinally. Another limitation relates to the use of self-reported questionnaire data, which may have been influenced by respondent bias or subjective perceptions. Furthermore, although the study investigated the moderating role of CRM–ERP integration, other potentially influential organizational variables such as organizational culture, technological maturity, and managerial leadership were not included in the conceptual model.

Future research is recommended to examine the role of customer interaction data and CRM–ERP integration in different industries and organizational environments in order to enhance the external validity of the findings. Longitudinal studies could also provide deeper insights into the long-term effects of integrated CRM systems on organizational performance and customer loyalty. Future studies may additionally investigate the role of emerging technologies such as generative artificial intelligence, predictive analytics, blockchain, and big data infrastructures in enhancing CRM–ERP integration effectiveness. Comparative studies between organizations with different levels of digital maturity may further clarify the conditions under which integrated customer management systems produce the greatest strategic benefits.

From a practical perspective, organizations should invest in integrated CRM–ERP infrastructures capable of consolidating customer interaction data from multiple digital and physical communication channels. Telecommunications companies in particular should prioritize the implementation of AI-enhanced analytical systems that can monitor customer sentiments, predict customer behavior, and automate personalized customer communication processes. Managers should also strengthen organizational ICT capabilities and provide employees with specialized training in data analytics and digital customer relationship management. Furthermore, organizations should adopt customer-centric strategic approaches that emphasize real-

time responsiveness, personalized service delivery, and seamless communication consistency across all customer touchpoints in order to improve organizational performance and sustain competitive advantage.

Authors' Contributions

Authors equally contributed to this article.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

All procedures performed in this study were under the ethical standards.

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