

Impact of CRM Technology Adoption and Customer-Centric Organizational Culture on Business Performance Mediated by Customer Knowledge Management

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Abstract

This research aims to investigate the CRM technology adoption, customer focused culture, customer knowledge management and organizational performance in software industry of Pakistan. Based on positivism research philosophy, 350 respondents across various cities were employed and data analyzed through Partial Least Squares Structural Equation Modeling (PLS-SEM). The results of the study show that CRM technology adoption and customer-centric culture have direct positive impact on business performance. Furthermore, customer knowledge management was identified as a moderator that significantly moderated the relationship between CRM technology adoption and business performance and the relationship between customer-centric culture and business performance. These results underscore the need for managing customer knowledge as the key to leveraging CRM technologies and cultivating customer-oriented organizational cultures for business value generation. The research is beneficial for theory and practice purposes as it aims to establish the relationship between these organizational factors and the overall organizational performance in the context of the software industry.

Keywords: CRM Technology Adoption, Customer-Centric Organizational Culture, Business Performance, Customer Knowledge Management

Introduction

As for the contemporary business context, organizations gradually but continuously adopt the possibilities of using technology and culture to enhance the organization's performance. This is especially the case with CRM technologies the established players dominated the market and only Groupe Bull and ICL have been able to penetrate this market successfully (Al-Shammari 2023). Today, CRM technology can be regarded as a set of tools and methods concerning the identification and management of channels, means, approaches, and necessary data connected with customer relations and has been established as a vital component of numerous enterprises' functioning. It cannot be overemphasized that its role in enhancing business performance through improving customer satisfaction as well as the loyalty and retention levels is significant. Concurrently the diffusion and application of CRM technology is significantly connected with organizational culture especially customer-oriented culture with reference to customers' needs and their worth within the organization (Al Karim, Alam et al. 2024).

CCOC is defined as an organizational culture that is wholly committed to the delivery of value to customers. It entails integrating the business's objectives, activities, and plans with those of the customers. This culture not only enhances the effectiveness of CRM technologies but also adds value to them. If an organisation embraces the culture of customer relationship management, then the adoption and application of CRM tools will be more efficient. It is therefore important to explore further the link between CRM technology and customer culture as a key driver of business performance (Anwar et al., 2020; Hamedani, Bawazir et al. 2023). Even though CRM technology and customer-centric culture have been identified as having many advantages, the literature lacks research on how these factors affect business performance. Previous research has mainly examined these variables in isolation, examining either the technological side of CRM or the cultural side within firms. Nevertheless, there is scant research that simultaneously incorporates these two sets of factors to explain their overall impact on business performance. This theoretical gap is also coupled with a practical gap where many organisations are unable to seamlessly implant CRM technology into their customer-focused strategies to achieve real changes in performance (Sami et al., 2016; Gazi, Al Mamun et al. 2024).

The research problem, therefore, lies in the identification of the relationship between CRM technology adoption, customer-centric organisational culture, and business performance. It is therefore important for organisations that seek to improve their performance through the adoption of technology and cultural change to fully understand this relationship. This research aims at filling this gap by examining the role that CRM technology adoption plays in business performance outcomes, moderated by a customer-oriented culture (Razzaq et al., 2020; Rafiki, Nasution et al. 2023).

There are several research objectives for this study. Firstly, it seeks to assess the effect of CRM technology adoption on business performance. Secondly, it aims at examining the mediating effect of customer-centric organisational culture on CRM technology adoption and business performance. Last, the study seeks to establish a proactive and a practical prescription on how firms can deal with their technological and cultural strategies in a bid to boost the performance. Therefore, the study will contribute to the development of the academic community as it will shed light on the processes that take place during the implementation of CRM and cultural projects and can be found applicable for practical work in companies

In light of this, the importance of this research can be established from the fact that this research has attempted to close the existing research gaps to a greater extent than the previous ones in their quest to identify the determinants of business performance. Theoretically, it will be beneficial in contributing to the existing body of knowledge to include technological and cultural factors while outlining how the two elements synchronously exist. To that extent, potential implications of this study would be of use to business executives and managers specifically, as they would be provided with useful best practice guidance on how CRM technology should be deployed and integrated into the organization's focus on the customer to achieve superior results. Consequently, customers may be satisfied, organizations become more competitive, and businesses remain businesslike successful.

Literature Review

CRM Technology Adoption

Literature review shows that CRM (Customer Relationship Management) technology adoption has also been discussed widely with regards its effect on business performance. CRM is a business strategy that focuses on integrating customer information and communications to better create, organize, store, analyze, and apply customer information (Siddiqui, Yusheng et al. 2024).. CRM technology increases an organization's capacity to manage customer relation by offering timely information. The integration of CRM technology facilitates the automation of marketing, sales, and service processes, which can lead to improved customer satisfaction and loyalty. Furthermore, CRM technology supports personalized customer experiences by enabling businesses to tailor their interactions based on comprehensive customer profiles, thus potentially driving higher sales and revenue (Ullah et al., 2023; Aburub, Al Rifai et al. 2024).

However, the successful adoption of CRM technology is contingent upon various factors such as organizational readiness, employee training, and the alignment of CRM strategies with business goals (Rahman, Bag et al. 2023). However, some factors like, Implementation costs, resistance to change, Data integration are some of the barriers which make the efficient use of CRM systems a challenge. Several

earlier theoretical and empirical findings also support the propositions that the buyers' willingness to embrace technological change and the organisations' investment on CRM have positive impact on customer retention and business performance (Ioniță, Orîndaru et al. 2023).

Customer-Centric Organizational Culture

Customer-oriented organizational culture aligns the organizational focus with the customers thereby making them the reference point of the company's activities. This culture includes dedication to identifying and satisfying customers' requirements and aims at building up customers' satisfaction and loyalty. That only those organizations that have a customer-oriented culture would record better business performance because the firms would be continuously striving to offer value to the customers. This approach involves the integration of the organizational procedures, assets, and methods in a way that will optimize the management of customer needs as a means of improving the customer experience and thus achieving competitive advantage (Wahl 2023).

To build and maintain a customer-oriented culture, there should be a support from the leadership, the involvement of employees, and most of all, the vision of an organization that focuses on customers' satisfaction. It has been established that firms which are able to develop such a culture experience increased customers' loyalty, low customer attrition and better financial returns (Ullah et al., 2024; Al-Shammari 2023). Also, the customer-oriented organizational culture assists in the realization of CRM technology since employees are more willing to embrace and apply a tool that would enable them deliver better customer relations. The findings on IT customer culture and CRM technology adoption confirm the significance of everything about customer orientations and the technological applications of CRM in today's organizations (Hynninen 2024).

Customer Knowledge Management

Customer Knowledge Management (CKM) defines the flow of customer knowledge within an organization, the acquisition, application and sharing of knowledge about the customer for the improvement of organizational decision making and performance. CKM is an intervening variable in the way that the CRM technology adoption influences the customer focused organizational culture and the business performance (Seifollahi 2023). The authors have stated that effective implementation of CKM allows organizations to better understand the customer data to create more effective marketing strategies and designs products and services to better suit the customers and improve ways to engage with them as highlighted (Ullah et al., 2023; Bratianu, Stănescu et al. 2023).

Knowledge management system is a broad concept that covers several activities like knowledge acquisition, knowledge sharing and knowledge application. When CRM

technology is adopted in CKM and the two are well integrated, one can be able to get a summary of the customers' behavior and their preferences and this may be helpful in strategizing and innovating (Atapour, Hamdipour et al. 2023). Moreover, a customer-oriented culture assists CKM; this since customers' information is embraced throughout the organization and employees encouraged to use the details regarding customers in improving services as well as developing an excellent rapport with the clients. Literature has it that arises from research indicate that firms who excel in CKM are well equipped to address change in the environment, to understand the customers' needs and to remain relevant in the market (Sadeqi-Arani and Janavi).

Business Performance

Business performance, as used in this paper, can be described as a phenomenon that has a variety of dimensions including business growth, financial returns, and market position as well as customers' satisfaction and operational effectiveness. The business performance, CRM technology adoption and customer-centric organizational culture have also received a lot of interest from academics and these have been found to have positive effects on the firms. For example (Alani, Alrubaiee et al. 2023) pointed out that CRM technology when implemented properly can improve a firm's customer retention rate as well as its sales resulting in improved business results. The mediating role of Customer Data/Benefit Control extend the relationship between the technology adoption of CRM system and customer orientation on business performance. On the same note, proper management of CK improves organizational decision making, efficient satisfaction of customer requirements and better customer relationships. This results in customers' loyalty, higher sales and operational profitability because more revenues will be generated as more employees have affinity to the company's products. Also, a strong sense of customers' values along with the corresponding focus on customer knowledge as the major organizational asset can provide a basis for improvement and relevant changes that may result in more effective and lasting business performance in the condition of market competitiveness (Aburub, Al Rifai et al. 2024).

Therefore, this paper posits that the interaction of CRM technology adoption, customer-oriented organizational culture, and customer knowledge management produces a multiplier effect on business performance. Benchmarking companies that embrace the above areas as strategic areas of investment will be more favorable for sustainable and competitive advantage in their organizations' fields (sadikan Abd-Alhasan and Mohammed 2023).

Methodology

This study uses a quantitative approach to analyze the effect of CRM technology adoption and customer-oriented organizational culture on business performance with customer knowledge management as a moderator variable. The

theoretical framework of this study is based on positivism, which focuses on quantitative data and hypothesis testing. The target population for this study includes Software industry of Pakistan that have adopted CRM technology and have a high emphasis on customer orientation. The number of respondents to be included in the study is set at 350 to allow for adequate data for analysis and to obtain meaningful results. The study employed a stratified sampling technique to select respondents from multiple cities of Pakistan.

It is achieved by filling the structured survey questionnaire developed for this purpose to capture all the variables of interest. This survey will include a set of questions on the technological level of CRM application, the overall degree of customer-orientation of the organizations, the quality of managing customer knowledge and several performance indicators. These items will be adapted from past research to guarantee the credibility and accuracy of most of the measures. From the mode of data analysis, the technique to be used is Partial Least Squares Structural Equation Modeling (PLS-SEM). Consequently, the method is chosen for its versatility in dealing with numerous constructs and suitability for exploratory investigation. PLS-SEM is going to facilitate a possibility to examine direct effects of CRM technology adoption and customer centric culture on business performance and mediated moderation of customer knowledge management. Therefore, with the help of this refined analytical tool, the study aims to provide a deeper view of these crucial organizational aspects of the organizational factors and their aggregated influence on the degree of organizational effectiveness.

Data Analysis

Measurement Model

Table 1: Reliability Analysis

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Business Performance	0.8053	0.8062	0.8569	0.5463
CRM Technology Adoption	0.7172	0.7349	0.8107	0.5243
Customer Centric organizational Culture	0.7179	0.7263	0.7994	0.5348
Customer Knowledge Management	0.769	0.7705	0.8455	0.5252

The analysis of reliability that has been done is already presented in the form of the table 4. 1 uses one or another statistical measure to evaluate one or another aspect of the business outcomes, effectiveness of CRM technology solutions, customer-centered management approach, and customer-related knowledge assets management. The Cronbach's Alpha values for all the constructs are above 0. 7, which is acceptable for internal consistency. In particular, Business Performance is the most reliable scale with the Cronbach's Alpha coefficient equal to 0. 8053, which indicates the reliability of the scale's items.

The rho_A values are also indices of reliability and these are in agreement with Cronbach's Alpha values. The Composite Reliability scores are all above 0. 8, which represents a high level of internal consistency of the items within the construct. Business Performance once more takes the lead with a Composite Reliability of 0. 8569, which means that the indicators are highly correlated with one another.

AVE values are higher than 0, hence, the Average Variance Extracted (AVE) values are high. 5 for all constructs, which means that more than 50% of the variance in the indicators is explained by the constructs, which points to good convergent validity. Customer Centric Organizational Culture has an AVE of 0. 5348, which can be considered a satisfactory level of variance captured. In total, these reliability statistics provide evidence that these constructs are reliable and suitable for gauging the dimensions of business performance, CRM technology adoption, customer-centric organizational culture, and customer knowledge management in the study.

Table 2: Validity Analysis (HTMT)

	Business Performance	CRM Technology Adoption	Customer Centric organizational Culture	Customer Knowledge Management
Business Performance	0	0	0	0
CRM Technology Adoption	0.4709	0	0	0
Customer Centric organizational Culture	0.3674	0.5244	0	0
Customer Knowledge Management	0.3802	0.5356	0.3974	0

Besides reliability, the validity analysis using the Heterotrait-Monotrait (HTMT) ratio of correlations is shown in Table 4. 2, which in turn, assess the discriminant validity of these constructs. The HTMT values suggest how much these constructs are actually different from each other. The HTMT ratios for Business Performance

with CRM Technology Adoption (0. 4709), Customer Centric Organizational Culture (0. 3674), and Customer Knowledge Management (0. 3802) are below the threshold of 0. 85, which is a good discriminant validity.

Likewise, CRM Technology Adoption indicates HTMT values of 0. 5244 with Customer Centric Organizational Culture and 0. self: 5356 with Customer Knowledge Management, both below the threshold, further supporting discriminant validity. Customer Centric Organizational Culture and Customer Knowledge Management have an HTMT value of 0. 3974, which is still below the threshold. These results support the notion that each construct is different and measures different aspects of the phenomena under investigation. High reliability and strong discriminant validity guarantees that the measures applied in this study are accurate and unique, which forms a stable ground for other analysis.

Table 3: Factor Loading

	Business Performance	CRM Technology Adoption	Customer Centric organizational Culture	Customer Knowledge Management
BP1	0.682			
BP2	0.6834			
BP3	0.7445			
BP4	0.7294			
BP5	0.706			
BP6	0.6443			
BP7	0.5557			
CCOC1			0.6508	
CCOC2			0.6476	
CCOC3			0.5033	
CCOC4			0.5403	
CCOC5			0.5385	
CCOC6			0.4991	
CCOC7			0.6127	
CCOC8			0.6128	
CKM1				0.5828
CKM2				0.7671
CKM3				0.7868
CKM4				0.7694
CKM5				0.6979
CTA1		0.4768		

CTA2	0.7446
CTA3	0.7642
CTA4	0.696
CTA5	0.4875
CTA6	0.6768

The factor loadings presented in Table 4.3 offer a more precise analysis of the extent to which each observed variable correlates with its respective latent construct. For Business Performance (BP1 to BP7), the factor loadings vary from 0.5557 to 0.7445. Most loadings exceed 0.6, suggesting that these items are closely related to the construct. However, BP7 has a slightly lower loading at 0.5557, which is indicative of a moderate yet reasonable level of contribution to the overall construct.

For the CTA1 to CTA6 of CRM Technology Adoption, the loadings range from 0.4768 to 0.7642. Although the majority of the items have a loading greater than 0.6, CTA1 (0.4768) and CTA5 (0.4875) are less than the benchmark of 0.5 which is considered as the acceptable standard. This shows that these two items are less reliable in measuring the construct than the other items. The Customer Centric Organisational Culture (CCOC1 to CCOC8) has factor loadings ranging from 0.4991 to 0.6508. Several items have factor loadings close to zero, which is 0.05, specifically CCOC3 (0.5033) and CCOC6 (0.4991), which indicates that these items might be relatively less effective in measuring the construct. Nevertheless, the majority of loadings is higher than 0.5, thus providing evidence for the overall construct validity of the measure.

The items of Customer Knowledge Management (CKM1 to CKM5) have factor loadings ranging from 0.5828 to 0.7868, thus confirming that all the items fit well into the construct. CKM3 (0.7868) and CKM4 (0.7694) have particularly high coefficients, thus underlining their importance. These factor loadings together with other previously discussed reliability and validity indices demonstrate that most of the items have adequate loadings on the respective constructs. This method of validation through factor loadings ensures that the constructs are well captured and accurately measured, thus ready for analysis and interpretation in the study.

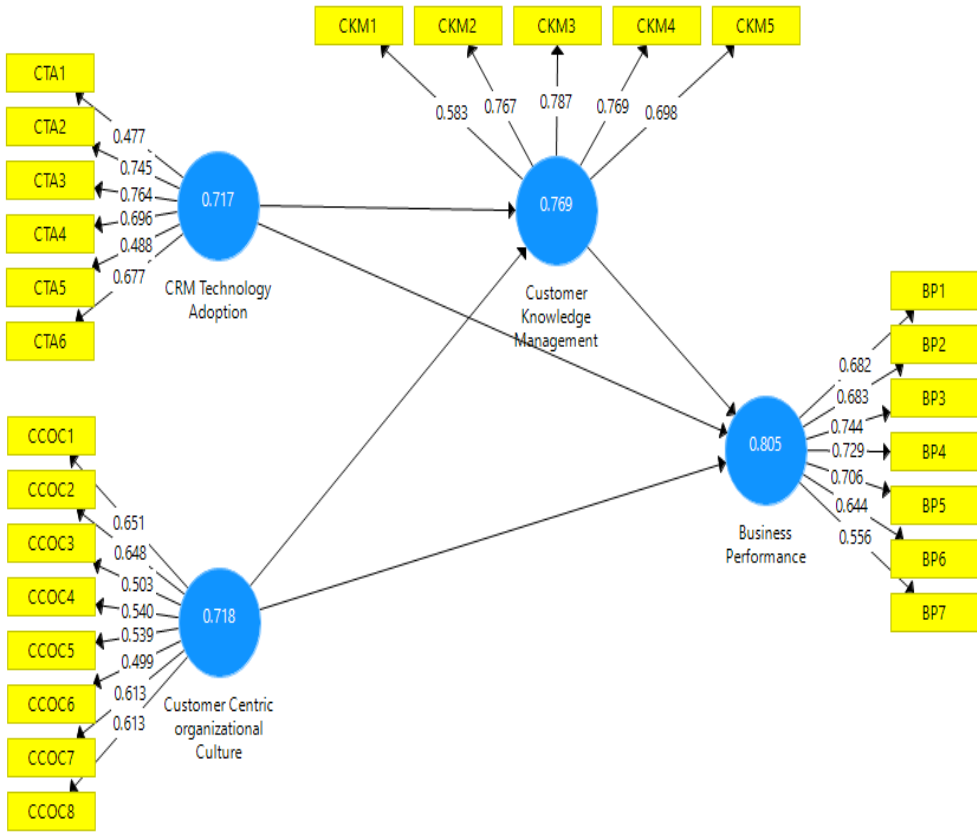


Figure 1: Reliability Analysis

Table 4: Structural Equational Model

	Original Sample (O)	Sample Mean (Al-Shammari)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
CRM Technology Adoption -> Business Performance	0.2465	0.2472	0.0472	5.2204	0
CRM Technology Adoption -> Customer Knowledge Management	0.3268	0.3257	0.0499	6.5433	0
Customer Centric organizational Culture -> Business Performance	0.1587	0.1569	0.049	3.2386	0.0013

Customer Centric organizational Culture - > Customer Knowledge Management	0.1846	0.185	0.0379	4.8682	0
Customer Knowledge Management -> Business Performance	0.1543	0.1564	0.0464	3.3252	0.0009

Comparison of the original sample statistics with sample means and standard deviations offers useful information regarding the relationships between various constructs. For example, when considering the relationship between CRM Technology Adoption and Business Performance, the coefficient obtained from the original sample (0.2465) is very much in tune with the sample mean (0.2472). The coefficient of variation (0.0472) points to the fact that there is not much fluctuation in the data. The calculated T-statistic is significantly high ($|O/STDEV| = 5.2204$), which suggests a positive correlation between CRM Technology Adoption and Business Performance, as supported by the p-value of 0.

Likewise, when comparing the overall impact of CRM Technology Adoption on Customer Knowledge Management, the original coefficient of 0.3268 is very close to the sample mean of 0.3257, and the standard deviation is relatively small at 0.0499. The resulting T-statistic ($|O/STDEV| = 6.5433$) is highly significant of the relationship between CRM Technology Adoption and Customer Knowledge Management as supported by the p-value 0.

In the case of Customer Centric Organizational Culture and Business Performance, the coefficient (0.1587) is not far from the sample mean (0.1569) but the standard deviation is moderate (0.049). The obtained T-statistic is equal to $|O/STDEV| = 3.2386$ and is significant, which means that there is a positive relationship between Customer Centric Organizational Culture and Business Performance, as it is supported by the small p-value of 0.0013.

Likewise, the evaluation of the correlation between Customer Centric Organizational Culture and Customer Knowledge Management shows a strong connection between the original coefficient (0.1846) and the sample mean (0.185), with the sample standard deviation of 0.0379. The calculated T-statistic is 4.8682 which is significant when $|O/STDEV|$ is used, and the p-value is less than 0.

Finally, the relationship between Customer Knowledge Management and Business Performance presents a stability between the coefficient (0.1543) and the sample mean (0.1564) with a moderate standard deviation (0.0464). The obtained T-statistic ($|O/STDEV| = 3.3252$) is significant, which points to a significant association between Customer Knowledge Management and Business Performance, as evidenced by the p-value of 0.0009. These results highlight the importance of these

constructs in interacting with each other in the studied environment and offer insights for further research and management decisions.

Mediation Analysis

	Original Sample (O)	Sample Mean (Al- Shammari)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
CRM Technology Adoption -> Customer Knowledge Management -> Business Performance	0.0504	0.0516	0.0189	2.6661	0.0079
Customer Centric organizational Culture -> Customer Knowledge Management -> Business Performance	0.0285	0.0292	0.0112	2.5511	0.011

The findings of this mediation analysis help to understand the indirect effects of CRM Technology Adoption and Customer Centric Organizational Culture on Business Performance through the mediator, Customer Knowledge Management. In the case of CRM Technology Adoption, the value of the original coefficient 0.0504 reveals that CRM Technology Adoption has a positive indirect impact on Business Performance through Customer Knowledge Management. This coefficient is quite close to the sample mean of 0.0516 and the standard deviation of 0.0189, meaning that the results are fairly consistent across the sample. The resulting T-statistic ($|O/STDEV| = 2.6661$) is significant, indicating the existence of the indirect relationship. Further, the p-value of 0.0079 also strengthens the indirect effect by stating that CRM Technology Adoption affects Business Performance by improving Customer Knowledge Management.

Likewise, for Customer Centric Organizational Culture, the mediation analysis shows a positive indirect effect on Business Performance through Customer Knowledge Management. The sample mean (0.0292) is very close to the original coefficient (0.0285) and the standard deviation is not very large (0.0112). The obtained T-statistic ($|O/STDEV| = 2.5511$) points to the significance of this indirect relationship. The small p-value of 0.011 strengthens the mediation effect argument by proposing that Customer Centric Organizational Culture positively affects Business Performance through improved Customer Knowledge Management.

In sum, these mediation analysis results emphasize the role of Customer Knowledge Management as mediator in the linkages between CRM Technology Adoption, Customer Centric Organizational Culture, and Business Performance. They give a good understanding of how these factors influence Business

Performance, especially the importance of knowledge management practices in improving organizational performance.

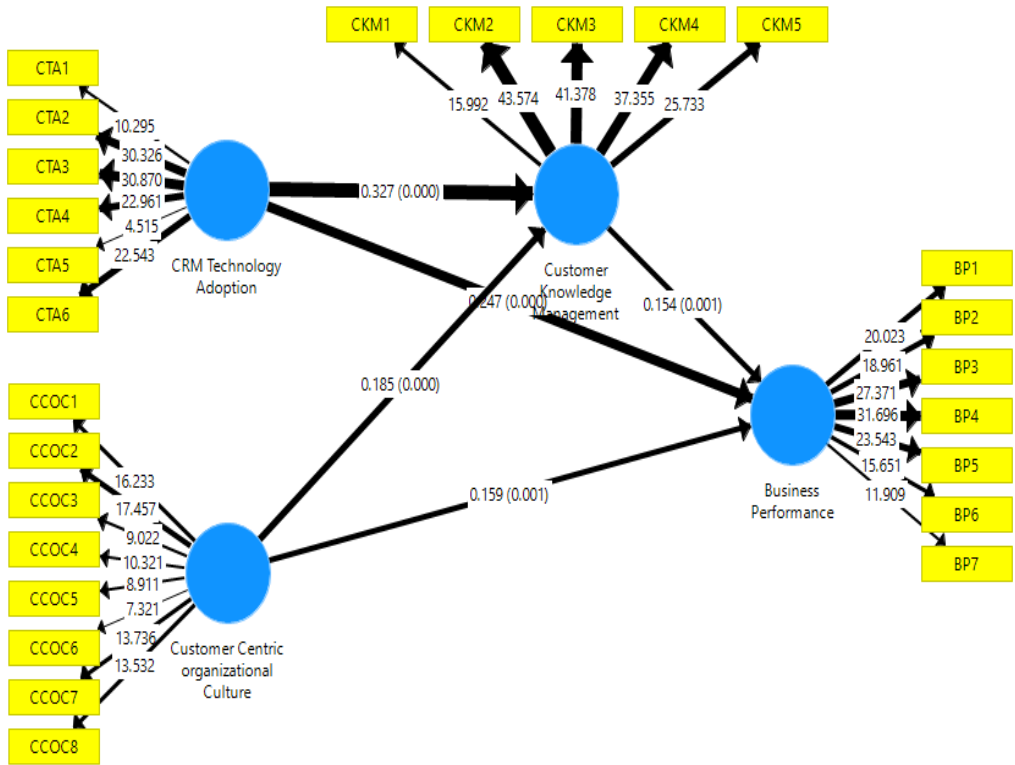


Figure 2: Structural Equational Model

Discussion

In the discussion of the findings, both the direct effects and mediation effects highlighted in the study are discussed to help understand how CRM Technology Adoption and Customer Centric Organizational Culture Impact Business Performance through Customer Knowledge Management. Beginning with the direct impacts, this study establishes that CRM Technology Adoption and Customer Centric Organizational Culture have a positive influence on Business Performance (Maleksadati, Ziaei et al. 2023). These direct effects underscore the significance of these factors to organizational outcomes. Companies that implement CRM tools and create a customer-oriented environment are likely to achieve better Business Performance results. This corresponds with previous research identifying the use of technology and organizational culture that puts much value on customers (Al-Shammari 2023).

Furthermore, the mediation analysis reveals the pathways by which CRM Technology Adoption and Customer Centric Organizational Culture Influence Business Performance. More precisely, the study reveals that Customer Knowledge Management fully mediates these relationships. This implies that CRM Technology Adoption and Customer Centric Organizational Culture have an indirect positive effect on Business Performance through the customer knowledge management capability of an organization (Gazi, Al Mamun et al. 2024). The mediation effects suggest that it is not only advantageous for organizations to implement CRM technologies and encourage customer-oriented cultures but also beneficial because of the positive effects they have on knowledge management. Customer Knowledge Management is the middleman that translates technological assets and cultural beliefs into actionable knowledge and strategies that enhance Business Performance. This underlines the importance of knowledge management as a process that enables the use of organizational resources to create competitive advantages and a tangible result (Sadeqi-Arani and Janavi 2024).

Conclusion

Consequently, the results of this study provide rich theoretical and practical implications for understanding the relationship between CRM Technology Adoption, Customer Centric Organizational Culture, Customer Knowledge Management, and Business Performance in organisational settings. Theoretical contributions derive from the clarification of the processes that underlie the connections between these constructs. The study, therefore, supports the theoretical foundations that suggest how CRM Technology Adoption and Customer Centric Organizational Culture have direct positive impacts on Business Performance. Furthermore, the identification of Customer Knowledge Management as a strong mediator contributes to theoretical advancements by elaborating on the part played by knowledge processes in turning technological and cultural assets into business benefits. These ideas help to enhance the existing theories on organizational behavior, knowledge management, and strategic management. In practice, the study provides suggestions for improving organizational performance for organisations that wish to do so. Thus acknowledging the significance of CRM Technology Adoption and Customer Centric Organizational Culture, organizations can plan their investments and develop cultures that focus on customer satisfaction and interaction. However, this study highlights the importance of strengthening knowledge management practices to support such initiatives. Businesses should pay particular attention to the ways and means of acquiring, managing, disseminating and exploiting customer knowledge so as to optimize the returns on their technological and cultural investments for Business Performance.

The contribution of this study goes beyond the theoretical and practical domains to the strategic planning and management of organizations. The findings can be used by managers and decision-makers to implement Business Performance

enhancing initiatives. Consequently, organisations can build a more in-depth understanding of how CRM Technology Adoption, Customer Centric Organizational Culture and Customer Knowledge Management build on each other, and how they can be better aligned with the overall business strategy. However, it is important to note some of the limitations of the study as follow: However, the study has its strength and the weaknesses at the same time since the findings are only generalizable to the specific context and sample of the study. Future studies can overcome this limitation by conducting the study in different settings and organizations to confirm the results. Moreover, the study uses cross-sectional data, which limits the possibility of establishing cause-and-effect relationships. Perhaps, more comprehensive and longitudinal research designs could provide a better understanding of the changes and interdependence of these constructs.

Thus, this research enhances the knowledge of the relationship between CRM Technology Adoption, Customer Centric Organizational Culture, Customer Knowledge Management, and Business Performance in organisational environments. Overall, theoretical contributions, practical relevance, strategic recommendations, and a discussion of study limitations all highlight the importance of these findings for academic research and organizational practice and provide a foundation for future studies and strategic initiatives focused on improving organizational performance.

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