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Exploring the Challenges of migration towards Software-as-a-Service in Iran: the case study of Cloud-based CRM using a multidimensional perspective

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ABSTRACT

Cloud-based CRM has emerged as a popular option for organizations due to its cost-effectiveness, flexibility, and ease of use. However, migrating to cloud-based CRM brings critical challenges that organizations must consider. The current study aims to comprehensively explore the main challenges of cloud-based CRM and investigate their importance by using a mixed method approach. First, to identify the main challenges regarding migration towards cloud-based CRM, a review of related literature, along with qualitative semi-structured interviews, were conducted; then, the extracted main challenges and sub-challenges were weighted and prioritized using the best-worst method (BWM). The research findings categorize the primary challenges of cloud-based CRM into four key areas: organizational, technical, vendor-related, and environmental. Findings from the BWM indicate that organizational and technical challenges are ranked as the most critical, followed by vendor-related and environmental challenges. This research contributes an integrated framework that provides a clearer understanding of cloud CRM's multifaceted challenges, essential for successful deployment.

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1. Introduction

In today's competitive landscape, building and maintaining strong customer relationships has become essential for organizational survival (Claybaugh et al., 2023; Cricelli et al., 2020). Customer relationship management (CRM) is now a key priority for industries aiming to gain deeper customer insights, enable proactive customer strategies, enhance the customer experience, reduce churn, boost profitability, and ultimately improve overall organizational performance (Ivens et al., 2024; Jami Pour & Hosseinzadeh, 2020). CRM represents a shift in business strategy, guiding organizations towards a customer-centric rather than product-focused approach to strengthen customer loyalty and establish long-term, profitable relationships with high-value customers (Ferrer-Estévez & Chalmeta, 2023; Martinez-Lira & Reimann, 2022).

A CRM system functions as the technological backbone for customer-centric initiatives, automating three primary customer-facing processes: marketing, sales, and service (Ivens et al., 2024; Buttle & Maklan, 2019). Statista (2024) projects that revenue in the CRM software market will reach $145.6 billion by 2029, with an expected annual growth rate of 10.34% from 2024 to 2029. CRM investments include software licenses, on-premises systems, and fees for cloud-based services. According to Gartner (2024), by 2027, 90% of new CRM marketing software expenditures will focus on cloud-based deployments, up from 86% in 2022, as on-premises solutions continue to decline.

Cloud computing, as a disruptive internet-based IT sourcing model, has revolutionized the enterprise software industry over the past decade by delivering highly scalable, flexible resources on a service and pay-per-use basis (Muhic et al., 2023; Matraeva et al., 2022; Souri et al., 2017). This paradigm shift enables organizations to shift away from infrastructure maintenance, focusing instead on core competencies and developing value-driven, innovative customer services (Jami Pour et al., 2020). As cloud capabilities advance, vendors are increasingly reengineering traditional enterprise software into cloud-based services, enabling partners and customers to co-create breakthrough applications (Muhic et al., 2023). Consequently, cloud computing has emerged as the dominant model for developing contemporary software, setting a new standard for creating real-time, cost-efficient, high-quality solutions at scale (Khan et al., 2024).

Cloud spending now constitutes a substantial share of IT budgets, with Gartner projecting that it will account for 51% by 2025 (Forbes, 2023). The rise of cloud computing has introduced a new generation of CRM systems, known as cloud-based CRM, which is widely regarded as a more cost-effective and adaptable solution. Cloud-based CRM enables employees to deliver services and information to customers without time or location limitations, providing organizations with a flexible, responsive customer service model (Fu & Chang, 2016). Latha et al. (2023) describe cloud computing as a rapidly expanding approach that offers convenient, on-demand access to a shared pool of IT resources. According to IDC (2023), Software as a Service (SaaS) is the largest cloud category, making up nearly 40% of all public cloud spending. Evidence suggests that cloud-based CRM, one of the most popular SaaS applications, remains a top investment area for organizations (Fu & Chang, 2016).

In response to this trend, many researchers have explored cloud-based CRM deployment (Karmakar et al., 2022; Koli et al., 2023). However, despite the clear benefits of cloud technology, the adoption of cloud-based services remains limited, and many organizations are hesitant to transition (Nguyen & Ali, 2021; Hadwer et al., 2021; Awan et al., 2021; Al-Mutawa & Saeed Al Mubarak, 2024). This hesitation stems from limited information on the risks and challenges involved in migration, including issues like data security and privacy, compliance (Yalamati, 2024; Raja, 2024), data integrity, authentication, authorization (Soveizi et al., 2023; Rehman et al., 2020), and data confidentiality (Soveizi et al., 2023).

While existing research has examined various challenges associated with cloud-based services (Akbar et al., 2020; Islam et al., 2023; Sharma & Sajid, 2021), it often remains fragmented and lacks a holistic view of the specific obstacles organizations face in adopting cloud-based CRM systems. Furthermore, much of the literature focuses on technical and operational efficiencies, often overlooking broader organizational, technological, and managerial complexities that critically shape the decision-making and adoption processes. Additionally, there is a theoretical gap in understanding how organizations prioritize these challenges to effectively allocate resources. To our knowledge, no study has thoroughly examined these multifaceted challenges in cloud-based CRM through an

integrated framework that addresses the full range of organizational perspectives. Thus, this study aims to fill this theoretical gap by addressing the following reseach questions (RQ):

> **RQ1.** What are the primary challenges organizations face when transitioning to cloud-based CRM systems?
> **RQ2.** How should organizations prioritize these challenges to ensure a successful transition to cloud-based CRM?

This paper aims to investigate the challenges of adopting cloud-based CRM through an integrated approach, providing managers with a valuable framework for assessing the risks and limitations of this emerging sourcing strategy. By presenting a comprehensive view of the obstacles to cloud-based CRM adoption, it offers actionable insights for both academic and industry stakeholders. This research contributes to existing knowledge by deepening the understanding of the complexities in cloud-based CRM implementation and delivering practical recommendations for organizations planning this transition.

The paper is organized as follows: Section 2 provides a literature review, while Section 3 outlines the research methodology. Section 4 presents the findings, followed by a discussion of the conclusions in Section 5. Finally, Section 6 explores the practical and theoretical implications of the research.

2. Literature Review

2.1. CRM

CRM is a widely used application of information technology (IT), playing a crucial role in business success (Rodriguez & Develi, 2022; Kumar & Kalairaja, 2021). It encompasses a combination of methods, practices, and technologies that organizations employ to manage customer interactions (Idzikowski et al., 2019; Preece et al., 2015; Khodakarami & Chan, 2014). Various definitions of CRM have emerged from both marketing practitioners and scholars. To categorize these definitions, Zablah et al. (2004) identified five distinct perspectives on CRM: as a process, strategy, philosophy, capability, and technology. They describe CRM as an ongoing process aimed at initiating and maintaining a set of customer relationships that maximizes profit by leveraging market intelligence (Zablah et al., 2004). The implementation of CRM presents a multitude of compelling advantages that extend beyond mere operational improvements. It significantly enhances customer satisfaction (Sofi et al., 2020; Zeleke & Prabhu Kumar, 2020), drives superior marketing performance (Al-Gasawneh et al., 2022), and fosters increased customer loyalty (Munandar et al., 2022). Furthermore, CRM plays a pivotal role in reducing failure rates in new product development (Rezaei et al., 2020) and amplifying brand equity (Kim, 2012; Yang, 2010). Beyond these benefits, CRM is instrumental in assessing the performance of sales personnel and uncovering new market opportunities (Al-Arafati et al., 2019). Thus, the strategic implementation of CRM is not merely beneficial but essential for organizations striving to maintain a competitive edge in today's dynamic business landscape.

Despite the increasing adoption of CRM systems, significant challenges persist in this domain. Numerous studies indicate that CRM implementation often falls short of success, raising concerns about its effectiveness (Kampani & Jhamb, 2020; Rigby et al., 2002). Coupled with the substantial costs associated with implementing these systems, many have labeled CRM initiatives as inherently risky (Zablah et al., 2004).

Additional obstacles include the tendency to reduce CRM to a mere technological tool, neglecting its essential connections to organizational culture, human resources, and operational processes (Chen & Popovich, 2003; Ko et al., 2008; Minami & Dawson, 2008). This oversight can lead to underwhelming outcomes in terms of profitability and customer satisfaction (Liagkouras & Metaxiotis, 2014). The widespread adoption of CRM practices is closely linked to advancements in information technology in the contemporary era (Adnan et al., 2021; Çalık, 2022). Emerging technologies, such as the Internet of Things (IoT) and cloud computing, are increasingly integrated to enhance CRM capabilities. However, these innovations also introduce new complexities and challenges that organizations must navigate to realize the full potential of their CRM systems.

2.2. Cloud Computing and Cloud-based CRM

Cloud computing is a large-scale, heterogeneous, and distributed computing infrastructure designed for both scientific and commercial use. It provides services that are of higher quality, more cost-

effective, and require smaller budgets for developing the necessary hardware (Ismayilov & Topcuoglu, 2020; Schneider & Sunyaev, 2016). To define cloud computing comprehensively, various terms are associated with it, including automation, commitment, data, deterministic performance, hardware, network or Internet, no upfront costs, platform, pay-per-use, public services, scalability, software, Service Level Agreements (SLAs), and virtualization (Kamarudin et al., 2022). The key characteristics of cloud computing include lower costs (Tamzil et al., 2022), flexibility, scalability, and a "pay-per-use" or on-demand service model (Tsochev & Trifonov, 2022).

Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS), and Software-as-a-Service (SaaS) are among the most prevalent service layers offered by cloud computing in cyberspace (Al-Mashhadi et al., 2020; Ismayilov & Topcuoglu, 2020). SaaS has emerged as a key method for delivering software and outsourcing IT functions. One of the most widely adopted SaaS solutions is cloud-based Customer Relationship Management (CRM). Due to the high costs associated with traditional CRM maintenance, organizations are increasingly turning to cloud-based CRM systems as a more viable alternative (Ghafarian, 2015).

Cloud-based CRM refers to CRM systems hosted on cloud infrastructure, allowing various enterprises to access CRM services via the internet (Shan et al., 2015). This model is often referred to as on-demand CRM, in contrast to on-premise CRM solutions. In the realm of technology-enhanced CRM, the use of cloud-based systems has become a fundamental trend, enabling online services to be accessible from anywhere, enhancing scalability, increasing accessibility, and significantly reducing costs (Pohludka & Štverková, 2019).

Research on cloud-based CRM encompasses various important areas, including the design of conceptual models (Yang & Li, 2015; Rehman et al., 2019), factors influencing adoption (Tarani et al., 2021; Mezghani & Almansour, 2019; Baker & Kaur, 2020; Chen, Wu, Chu, et al. 2018), strategies for risk reduction (Quynh et al., 2014; Chen et al., 2017), performance assessment (Khorraminia et al., 2019; Chen, Wu, Chuang et al. 2018), benefits analysis (Nguyen & Ali, 2021; Sahlabadi et al., 2022; Chen et al., 2014), and the identification of challenges (Nguyen & Ali, 2021). These studies collectively contribute to a comprehensive understanding of cloud-based CRM, highlighting the various dimensions and considerations involved in its implementation and utilization.

2.3. Cloud-based CRM Challenges

Cloud computing technologies offer companies significant hardware and software advantages, but various challenges can arise at both the server-side and client-side during the implementation of these services (Rahul et al., 2022; Gupta et al., 2022). Recently, there has been a notable shift from in-house CRM systems to cloud-based CRM, which represents the fastest-growing segment of global software revenue (Winkler et al., 2014). As more companies leverage the benefits of cloud CRM, its adoption is expected to accelerate, with on-demand delivery emerging as the preferred option. However, it is important to acknowledge the challenges associated with the rising popularity of SaaS CRM, as these issues can complicate its effective use (Gandecha et al., 2021; Nguyen & Ali, 2021).

One significant challenge associated with cloud-based CRM is system integration. This integrated approach is essential for effectively identifying, acquiring, and retaining customers, allowing managers to oversee and facilitate customer interactions across various departments, channels, lines of business, and geographies (Svoboda et al., 2021; Rai, 2008). Additionally, security is a critical concern in cloud-based CRM, as the oversight of data storage and maintenance is not managed physically by the company itself (Aljanabi et al., 2021; Zhang et al., 2010; Shaqrah, 2016). Any significant changes in the conditions of the cloud service provider, such as the company's decision to exit the business or being acquired by another firm, can pose serious risks, including data breaches or data loss (Sharma & Singh, 2021). Additionally, the reduced control that companies have over their data and applications presents other challenges (Gandecha et al., 2021). Trust issues and legal considerations also emerge as critical factors in the implementation of cloud-based CRM (Sandhu et al., 2021). Given that cloud-based CRM merges the concepts of CRM and cloud computing, it is essential to examine the challenges associated with both domains, alongside existing studies on cloud-based CRM challenges (see Table 1).

Table 1. The Related Studies

Author(s)	Challenges related to			Research title	Challenges
	CRM	Cloud computing	Cloud-based CRM		
Rigby et al. (2002)	*			Avoid the Four Perils of CRM	Implementing CRM before creating a customer strategy, rolling out CRM before changing your organization to match, assuming that more CRM technology is better stalking, not wooing, customers
Starkey & Woodcock (2002)	*			CRM systems: Necessary, but not sufficient. REAP the benefits of customer management	Poor implementation of customer management projects, functional and departmental silos, excessive thinking, insufficient action, the necessity for senior executive ownership and leadership, the necessity for cultural shift and more education, the persistence ofa belief that IT is a panacea
Lee et al. (2006)	*			Security Issues in Customer Relationship Management Systems (CRM)	Denial of service, intrusion of sales automation systems and customer database, identity theft, malware attacks
Ramaseshan et al. (2006)	*			Challenges for Global Customer Relationship Management	**Technological**: IT Infrastructure, Telecom Infrastructure, PC Household Penetration, Internet Access **Economic & Market**: Industrial Structure, firm resources, market **Social & Cultural:** Cultural values and norms, corporate cultures, language conventions **Legal & Regulatory:** Privacy legislation, administrative regulations, commercial speech limitations
King et al. (2008)	*			Understanding success and failure in customer relationship management	**Context:** Knowledge management capabilities, willingness to share data, willingness to change processes, technological readiness **Supporters:** Top management support. **Project organization:** Communication of CRM strategy, cultural change capability, process change capability, and systems integration capability
Malik & Wood-Harper (2009)	*			CRM Challenges in the banking sector of Pakistan	Lack of centralized customer service, lack of telephone-based automated service
Zhang et al. (2010)		*		Cloud computing: state-of-the-art and research challenges	Automated service provisioning, virtual machine migration, server consolidation, energy management, traffic management and analysis, data security, software frameworks, storage technologies and data management, novel cloud architectures
Chou, (2019)			*	Exploring relationship quality of user's cloud service: The case study of SaaS CRM	To analyze the continuous use of cloud based CRM, this paper investigate the SaaS Qual model, consisting of rapport, responsiveness, reliability, flexibility, features and security
Svoboda et al. (2021)	*			Information systems integration to enhance operational customer relationship management in the pharmaceutical industry	Lack of customer relationship management system integration, inability to record customer's interaction sessions, insufficient information on customers, no consolidation in data warehousing
Sharma & Singh (2021)		*		Investigation of Cloud Computing Security Issues and Challenges	Core cloud technology vulnerabilities, cloud storage misconfiguration, insecure application programming interfaces, IP loss or theft, compliance violations and regulatory actions, loss of control over end-user activities, deficient management of user access, breaches with clients or business associates beyond SLA, defects in known security controls, essential cloud characteristic vulnerabilities, multi-tenancy failures, cloud migration vulnerabilities, compromised CSP supply chain

Table 1.

Author(s)	Challenges related to			Research title	Challenges
	CRM	Cloud computing	Cloud-based CRM		
Sandhu et al. (2021)		*		A review of trust and security concerns in cloud computing adoption intention in the higher education sector: research in progress	Trust of the customer, the secure network of the cloud for the integrity of the customer data
Aljanabi et al. (2021)		*		Cloud computing issues, challenges, and needs: A survey	The security requirement for cloud computing encompasses privacy, lack of user control, unauthorized secondary usage, data proliferation, and data flow. Meanwhile, the security issues cover ownership of the device, the trust issue, and legal aspects
Nguyen & Ali (2021)			*	Implementation of cloud customer relationship management in the banking sector: strategies, benefits, and challenges	Security, downtime issues, system integration, privacy concern
Gandecha et al. (2021)			*	Benefits and challenges of SaaS CRM over On-Premised CRM: A review	Not much control, slower speed, security risk, identity theft
Gupta et al. (2022)		*		security challenges for adopting cloud computing	Cloud protection, manageability, honesty, fraud, data loss
Kamarudin et al. (2022)		*		highlights the benefits and challenges faced by SMEs entrepreneurs in adopting cloud computing	Data management, the background of SMEs, cloud computing technology, SMEs expenses
Rahul et al. (2022)		*		challenges, and issues encountered in cloud computing services offered to the food industry	This paper also provides multiple levels of challenges during the implementation of cloud services in the food industry on both the server side and client side

2.4. Research Gap

The existing literature highlights notable gaps in the understanding of the challenges related to cloud-based CRM. A review of the literature reveals the following key limitations in this area.

First, the majority of existing studies have focused on identifying challenges related to CRM and cloud computing separately, with only a limited number addressing the challenges of cloud-based CRM specifically (Nguyen & Ali, 2021; Gandecha et al. 2021). Despite the growing trend toward adopting cloud-based CRM, there is a pressing need for research that provides insights for managers regarding the challenges and barriers associated with this approach. Currently, there is a lack of comprehensive qualitative studies that thoroughly explore the specific challenges of cloud-based CRM. Second, the few studies conducted in this area have primarily focused on challenges related to data security, control, and general technical risks. However, critical challenges pertaining to organizational and managerial dynamics, outsourcing concerns for CRM projects, and the complexities of communication with cloud service providers have largely been overlooked. Lastly, none of the existing research on cloud CRM challenges has prioritized the obstacles and barriers faced during the implementation process. This lack of prioritization impedes organizations' capacity to allocate resources effectively and concentrate on the most critical issues that may hinder successful implementation. Consequently, managers lack the necessary guidance to identify priority areas, potentially resulting in inefficient resource allocation and inadequate responses to critical challenges. Hence, This study seeks to bridge this limitations by proposing an integrated framework that encompasses the main complex challenges of cloud-based CRM and prioritizes them using the Best-Worst Method (BWM).

2.5. Best-Worst Method

Several multi-criteria decision-making (MCDM) methodologies are available for calculating criteria weights and ranking alternatives, including AHP, ANP, VIKOR, TOPSIS, and DEMATEL. However, among these techniques, the Best-Worst Method (BWM) stands out due to its reduced requirement for comparison data, more consistent comparisons, and the generation of more reliable results (Oroojeni Mohammad Javad et al., 2020). BWM operates by comparing the best criterion against all other criteria and the worst criterion against all other criteria, rather than utilizing a complete pairwise comparison matrix. This methodology has been effectively applied across various fields, including green supplier selection (Oroojeni Mohammad Javad et al., 2020), vendor selection for cloud-based e-learning (Jami Pour et al., 2020), evaluating key risk factors in cold chain logistics operations (Ding et al., 2023), identifying barriers to circular economy implementation (Debnath et al., 2023), sustainability assessment in agriculture (Streimikis et al., 2024), and assessing blockchain technology adoption (Munim et al., 2022). The following steps outline the process for conducting BWM:

Step 1: Identify the decision criteria relevant to the decision-making problem through a literature review and expert interviews. The finalized criteria are represented as {C1, C2, …, Cn}.

Step 2: Determine the best and worst criteria, denoted as C_B and C_W, respectively.

Step 3: Assess the preference of the best criterion over all other criteria using a scale of 1 to 9, resulting in the best-to-others (BO) vector. This vector specifies the preference of the best criterion over all other criteria, and is denoted as:

$$A_B = \left(a_{B_1}, a_{B_2}, \ldots, a_{B_n}\right)$$

where, a_{B_j} represents the preference value of the best criterion C_B over criterion C_j.

Step 4: Determine the preference of all criteria over the worst criterion using a scale of 1 to 9, resulting in the others-to-worst (OW) vector. This vector can be defined as:

$$A_W = \left(a_{1w}, a_{2w}, \ldots, a_{nw}\right)$$

Where, a_{jW} shows the preference of criterion j over the worst criterion W.

Step 5: Finding the optimal weights $(W_1^*, W_2^*, \ldots, W_n^*)$ such that the objective is to find optimal weights so that the maximum absolute differences for all j are minimized of the $\left|W_B/W_j - a_{B_j}\right|$ and $\left|W_j/W_W - a_{jW}\right|$. Considering the non-negativity and summation of weights constraints, the following model is formulated:

$$\min \max \left\{ \left|W_B/W_j - a_{B_j}\right|, \left|W_j/W_W - a_{jW}\right| \right\},$$

Subject to $\sum_j W_j = 1$ Model (1)

$W_j \geq 0 \; for \; all j$

Model (1) can be solved by converting it into the following non-linear model:

$\min \lambda$,

$$\left|W_B/W_j - a_{B_j}\right| \leq \lambda \; for \; all \; j$$

$$\left|W_j/W_W - a_{jW}\right| \leq \lambda \; for \; all \; j \quad \text{Model (2)}$$

$$\sum_j W_j = 1$$

$W_j \geq 0 \; for \; all j$

Solving model (2), the optimal weights $(W_1^*, W_2^*, \ldots, W_n^*)$ and λ^* will be obtained.

The λ^* implies the consistency ratio (CR) of each decision-maker in comparing the most and least important criteria over other criteria, which is calculated as shown in Equation (5).

$$Consistency\ Ratio = \frac{\lambda^*}{Consistency\ Index} \quad (1)$$

The consistency index represents the maximum values of λ^* for different values of $\mathbf{a}_{BW}$, as presented by Rezaei (2015).

3. Research Methodology

3.1. Research Method and Procedure

Understanding the key challenges of cloud-based CRM is crucial for its successful implementation, as it helps guide managers in adopting effective migration strategies. To the best of the authors' knowledge, there is currently no comprehensive study addressing the barriers and challenges associated with cloud-based CRM strategies. Therefore, the primary aim of this paper is to fill this theoretical gap. To achieve this research objective, a mixed-method approach was employed to explore the main challenges related to cloud-based CRM.

In the first step, given the exploratory nature of the study, a literature review was conducted alongside a qualitative research approach, using semi-structured interviews to identify and categorize the challenges associated with cloud-based CRM. The literature review employed terms such as "cloud computing challenges," "CRM challenges," and "cloud-based CRM challenges." Due to the interdisciplinary nature of cloud-based CRM research, initial challenges were extracted from these three primary research areas. In this phase, interviews were also conducted to enhance the understanding of these challenges. Interviews, as a qualitative research method, are widely regarded as the preferred approach in exploratory studies. The thematic analysis method was then employed to analyze the qualitative data gathered from the interviews.

In the second step, the Best-Worst Method (BWM) was employed to prioritize the extracted challenges and their related measures. A questionnaire was designed in the BWM format to assess the relative importance of these challenges and their associated measures.

3.2. Data Collection and Sampling

In the first step, a purposive (judgmental) sampling method was employed, allowing for the selection of research participants based on their specific expertise and experience. According to Marshall et al. (2013), a sample size of 10 to 12 participants is generally recommended for qualitative interviews. To identify qualified individuals, a list was compiled by contacting companies active in implementing CRM systems. We invited potential participants to collaborate on the research through in-person meetings, emails, and phone calls. After persistent follow-ups, several individuals agreed to participate, resulting in the final analysis of data from ten interviews.

The sample consisted of experts involved in cloud-based CRM projects, specifically those with over five years of experience in this field. Participants included both academics with relevant research backgrounds and practitioners—managers and specialists—who had firsthand experience working with cloud-based customer relationship management systems and implementing such initiatives. To achieve saturation in the qualitative data, ten semi-structured interviews were conducted. Among the interviewees, there were five women and five men, with educational qualifications including one holding a bachelor's degree, seven holding master's degrees, and two possessing Ph.D. degrees. On average, each interview lasted approximately 80 minutes, with all interviews conducted over a span of three weeks. With the participants' consent, the interviews were recorded, and comprehensive notes were taken to document the discussions. The data gathered from the interviews were synthesized with the initially extracted challenges identified in the literature. Some of the interview questions are listed as follows:

1. Can you describe your experiences in adapting to cloud-based CRM systems?
2. What challenges and obstacles have you faced while using cloud-based CRM?
3. What security, privacy, and control issues have you encountered in cloud-based customer relationship management?
4. What technical difficulties have arisen during the implementation of cloud-based CRM?
5. What obstacles have you faced in addressing user resistance to cloud-based CRM systems?

6. Are you aware of the terms and conditions from cloud-based CRM providers? What challenges have you experienced when dealing with these vendors?
7. How do organizational culture and structure affect the adoption of cloud-based CRM?

In the second step, the Best-Worst Method (BWM) was employed to prioritize the challenges associated with cloud-based CRM using a BWM questionnaire. The sample for this step comprised experts with practical experience in cloud-based CRM implementation. In a virtual meeting with five participants, the experts were tasked with reaching a consensus on the pairwise comparison scores of the challenges and their related measures. Achieving the final consensus regarding the best and worst criteria related to the main challenges and their measures required two hours across two separate virtual meetings.

3.3. Validity and Reliability

In a qualitative study, validity refers to the extent to which the researcher can reflect the phenomenon under study or the variables associated with it. To ensure the validity of the interviews, academic experts reviewed the interview questions and offered valuable revisions. Additionally, validity can be assessed through member checking, a process in which findings and interpretations are verified with the participants (Nowell et al., 2017). Accordingly, the results of the thematic analysis were shared with participants to confirm that the intended meaning was accurately derived from the interviews and that the researchers appropriately interpreted the participants' discussions.

Inter-coder reliability was assessed to evaluate the consistency of the interview coding, with Cohen's kappa calculated as a measure of reliability using SPSS software. Researchers frequently cite inter-coder reliability as a statistical metric to demonstrate the rigor of coding procedures in data analysis (Cheung & Tai, 2023). For this analysis, four interviews were selected for review by a research assistant who specialized in cloud-based CRM and thematic analysis. The results showed that the inter-rater agreement surpassed the acceptable threshold of 0.6, with Cohen's κ calculated at 0.85, thereby confirming the reliability of the analysis.

As noted by Rezaie (2015), the consistency ratio (CR) serves as a measure of the reliability of outputs, generated by multi-criteria decision-making (MCDM) methods. In the context of the Best-Worst Method (BWM), a CR is employed to validate the reliability of the comparisons made (see Table 7).

4. Findings

The findings are presented in the following steps as outlined in Section 3.1.

Step 1: In this step, challenges from three domains of study were reviewed in relation to the nature of cloud-based CRM, including challenges associated with cloud computing, CRM, and, specifically, cloud-based CRM. Alongside the literature review, ten semi-structured interviews were conducted to compile a comprehensive list of challenges related to cloud-based CRM. The content of the interviews was analyzed and categorized using thematic analysis. Table 2 provides examples of codes and illustrative quotes extracted from the interviews.

Table 2. Example of Illustrative Quotes and Codes Extracted From Interviews

Codes	Examples of illustrative quotes
Lack of top management support	For the successful implementation of cloud-based CRM, the attitude and support of top management are critical. In organizations where senior managers do not endorse the customer relationship management project, it often leads to project failure and the inability to achieve the anticipated results. The CEO, in particular, plays a pivotal role in securing the support of other stakeholders.
Privacy Violation	Customer privacy is one of the most significant and challenging issues in cloud-based CRM that requires careful attention. A primary concern for organizations is the privacy and protection of their customers' confidential information, which has been compromised in various cloud computing projects.
High cost of customization	Typically, cloud-based CRM vendors provide standard services that may not be tailored to the specific needs of organizations, necessitating further customization. However, this customization can be costly, presenting a challenge for many organizations.
Dependence on providers	If a company finds itself dissatisfied with the services of a particular cloud-based CRM provider, transferring to another provider or reverting to its previous services is neither a straightforward nor inexpensive process. This challenge arises from several factors, including potential data migration issues, the need to retrain staff on a new system, and the time and resources required to evaluate and implement a different provider's offerings.

The challenges associated with cloud-based CRM can be categorized into four distinct groups: organizational challenges, technological challenges, vendor-related challenges, and environmental challenges. The results of the first and second steps of the study are presented together in Table 7, following the description of the second Step.

Step 2: In this step, criteria weights were calculated using the BWM. Table 3 presents the best-to-others (BO) and others-to-worst (OW) vectors, representing, respectively, the relative importance of the main criterion compared to other criteria and the relative importance of other criteria compared to the least important criterion, in relation to the main challenges.

The BO and OW vectors for the sub-criteria associated with the organizational, technical, vendor-related, and environmental challenges are depicted in Tables 4-7, respectively.

Table 3. Best-To-Others (BO) and Others-To-Worst (OW) Pairwise Comparison for the Main Challenges of Cloud-Based CRM

BO	**Organizational**	**Technological**	**Vendor-related**	**Environmental**
Best criterion: Organizational	**1**	**2**	**3**	**5**
OW	Worst criterion: Environmental			
Organizational	5			
Technological	4			
Vendor-related	3			
Environmental	1			

Table 4. Best-To-Others (BO) and Others-To-Worst (OW) Pairwise Comparison for Organizational Sub-Criteria

BO	**O1**	**O2**	**O3**	**O4**	**O5**	**O6**	**O7**	**O8**	**O9**
Best criterion: O1	**1**	**4**	**6**	**3**	**2**	**3**	**4**	**4**	**4**
OW	Worst criterion: O3								
O1	6								
O2	3								
O3	1								
O4	4								
O5	5								
O6	4								
O7	2								
O8	3								
O9	3								

Table 5. Best-To-Others (BO) and Others-To-Worst (OW) Pairwise Comparison for Technical Sub-Criteria

BO	**T1**	**T2**	**T3**	**T4**	**T5**	**T6**	**T7**	**T8**	**T9**
Best criterion: T2	**2**	**1**	**6**	**3**	**4**	**3**	**3**	**2**	**3**
OW			Worst criterion: T3						
T1			5						
T2			6						
T3			1						
T4			4						
T5			3						
T6			4						
T7			3						
T8			5						
T9			4						

Table 6. Best-To-Others (BO) and Others-To-Worst (OW) Pairwise Comparison for Vendor-Related Sub-Criteria

BO	**V1**	**V2**	**V3**	**V4**	**V5**	**V6**	**V7**	**V8**	**V9**
Best criterion: V8	**1**	**3**	**4**	**5**	**3**	**2**	**5**	**1**	**2**
OW			Worst criterion: V7						
V1			5						
V2			3						
V3			3						
V4			2						
V5			3						
V6			5						
V7			1						
V8			5						
V9			4						

Table 7. Best-To-Others (BO) and Others-To-Worst (OW) Pairwise Comparison for Environmental Sub-Criteria

BO	**E1**	**E2**	**E3**	**E4**	**E5**	**E6**	**E7**
Best criterion: E1	**1**	**6**	**2**	**5**	**3**	**2**	**4**
OW			Worst criterion: E2				
E1			5				
E2			1				
E3			4				
E4			2				
E5			4				
E6			5				
E7			3				

Next, the optimal weights for each criterion and sub-criterion were determined by solving Model 2. Table 8 presents these optimal weights for both the main criteria and sub-criteria, along with the consistency value, which verifies the reliability of the findings.

Table 8. Extracted Cloud-Based CRM Challenges and Their Weights Using BWM

Main criteria	**Codes**	**Sub criteria**	**Main categories weights**	**Criteria weights**	**Global weights**	**Consistency ratio**
Organizational challenges	O1	Lack of top management support	0.4548650	0.2470505	0.112374626	(0.8377228 /3) = 0.27924093
	O2	The cost of bandwidth		0.07812424	0.035535982	
	O3	Lack of organizational culture receptive to change		0.03613051	0.016434504	
	O4	Lack of alignment between cloud services with customer-facing processes (Marketing, sales, and customer service)		0.1142547	0.051970464	
	O5	Staff resistance		0.1937407	0.088125864	
	O6	Discontinuous usage		0.1142548	0.05197051	
	O7	Lack of change management		0.06019611	0.027381104	
	O8	Lack of performance evaluation of cloud-based CRM vendor		0.07812423	0.035535978	
	O9	Lack of project management during cloud-based implementation		0.07812423	0.035535978	
Technical challenges	T1	Lack of integration with legacy systems (such as ERP, marketing automation, etc.)	0.2725676	0.1549314	0.04222928	(0.8377224 /3) = 0.2792408
	T2	Csutomer database security		0.2315638	0.063116789	
	T3	Interoperability		0.03386563	0.009230673	
	T4	The complexity of system use		0.1070925	0.029189946	
	T5	Lack of timely updates		0.07322689	0.019959278	
	T6	Interruption of service		0.1070925	0.029189946	
	T7	Service delay (long processing time)		0.07379203	0.020113317	
	T8	Low reliability of the provider		0.1113426	0.030348385	
	T9	Limitation of systems recovery		0.1070925	0.029189946	
Vendor-related challenges	V1	High cost of customization	0.1917416	0.2208191	0.042340208	(1/2.3)= 0.43478
	V2	Dependence on providers		0.07360638	0.014113405	
	V3	Lack of clear criteria for selecting cloud-based CRM service providers		0.07360638	0.014113405	
	V4	Loss of control of data and processes		0.04305552	0.008255534	
	V5	Lack of innovation in customer service provided		0.07360638	0.014113405	
	V6	Lak of timely customer support		0.1472128	0.028226818	
	V7	Unauthorized copying of large software		0.03680319	0.007056703	
	V8	Failure to develop flexible SLA		0.2208191	0.042340208	
	V9	Inability to identify service specifics in SLA		0.1104711	0.021181905	
Environmental challenges	E1	Dependence on internet speed	0.08082582	0.3089851	0.024973974	(0.8377224 /3) = 0.2792408
	E2	Lack of world-class standards for cloud-based CRM services		0.04518831	0.003652382	
	E3	Legal issues due to the geographic distance between vendor and organization		0.1428980	0.011549848	
	E4	Lack of appropriate legal authority to handle users' complaints		0.07423460	0.006000072	
	E5	Restrictions on changing service provider		0.1428980	0.011549848	
	E6	A limited number of cloud-based CRM vendors in the market		0.1880863	0.015202229	
	E7	Market dominance of domestic providers		0.09770968	0.007897465	

As indicated in Table 8, the "organizational challenges" category, with a weight of 0.4549, emerges as the most critical category among the challenges associated with cloud-based CRM. The "technical challenges" category follows as the second priority, with a weight of 0.2726. "Vendor-related challenges" and "environmental challenges" are ranked third and fourth, with weights of 0.1917 and 0.0808, respectively.

5. Conclusions and Discussion

Cloud computing has emerged as a compelling IT sourcing strategy, providing organizations with the ability to access information technology resources via cyberspace, as noted by Jami Pour et al. (2020). These resources possess an on-demand nature, enabling subscribers to tailor their service levels to meet specific requirements (Souri et al., 2017). The significant costs associated with implementing CRM infrastructure, coupled with the challenges users face in both the implementation and maintenance phases (Chen, Wu, Chu, et al. (2018), have prompted many organizations to adopt cloud-based services (Fu & Chang, 2016). While extensive research has been conducted on the challenges of both cloud computing and CRM independently, there remains a notable scarcity of studies specifically addressing the challenges associated with cloud-based CRM.

The results of the BWM reveal that organizational challenges are the primary obstacles to the successful implementation of cloud-based CRM systems. Within this category, the lack of top management support stands out as a significant barrier contributing to the failure of cloud-based CRM projects, as noted by King and Burgess (2008). Yigitbasioglu (2015) argues that this deficiency in support involves two critical components: belief in the initiative and active participation in its execution. Another significant challenge within the organizational category is staff resistance, which can be defined as the reluctance or opposition exhibited by employees towards changes in policies, procedures, or organizational structures. This resistance may arise from various factors, including psychological, economic, and age-related influences (Lamproulis, 2016). Furthermore, a lack of alignment between cloud services and customer-facing processes—such as marketing, sales, and customer service—along with the phenomenon of discontinuous usage (where users abandon their engagement with a product or technology, impeding its future development) are major concerns associated with cloud-based CRM (Huang et al., 2023; Svoboda et al., 2021). Furthermore, challenges such as inadequate performance evaluations of cloud-based CRM vendors, insufficient project management during implementation, ineffective change management practices, and the costs associated with bandwidth constitute significant organizational hurdles. Lastly, the lack of an organizational culture that is receptive to change is deemed the least critical sub-criterion within the organizational challenges.

Technological challenges represent the second most significant category. Within this category, information security emerges as the foremost dimension, garnering considerable attention from scholars (Nguyen & Ali, 2021; Gandecha et al., 2021). Following this, issues such as the low reliability of service providers (Ramaseshan et al., 2006) and the lack of integration with legacy systems (Aljanabi et al., 2021) are identified as critical concerns. The complexity of system usage, service interruptions, limitations in system recovery, and delays in service (long processing times) rank fourth. Finally, the lack of timely updates and interoperability constitute the remaining sub-criteria within the technological challenges of cloud-based CRM.

Vendor-related challenges constitute the third category in this research. The high cost of customization and the failure to develop flexible Service Level Agreements (SLAs) are the most significant issues identified, exacerbated by a lack of timely support and the inability to clearly define service specifics within SLAs. Additionally, dependence on providers, a lack of innovation in customer service offerings, and an absence of clear criteria for selecting cloud-based CRM service providers represent other important concerns. Other notable challenges include the loss of control over data and processes, and the unauthorized duplication of large software applications.

Finally, environmental challenges are considered the least significant by our experts. The primary sub-criteria within this category include dependence on internet speed, a limited number of cloud-based CRM vendors in the market, and legal issues arising from the geographic distance between the vendor and the organization. Additionally, the lack of appropriate legal authority to address user complaints and restrictions on changing service providers rank third in importance. This is followed

by the dominance of domestic providers in the market and the absence of world-class standards for cloud-based CRM services.

Based on the global weights assigned to the sub-criteria, "lack of top management support" emerges as the most significant challenge identified. As El-Gazzar (2014) noted, top management's expertise in IT, competence, and ability to cultivate an appropriate organizational climate for adopting cloud computing are crucial. This includes ensuring sufficient budgets, adequate human and IT resources, and appropriate time allocations. The second challenge, according to the global weights, is "staff resistance." Ibrahim et al. (2023) emphasized that addressing resistance to change is vital in cloud computing environments. They highlighted that providing adequate training and educational initiatives empowers staff to acquire the necessary skills and expertise for effectively utilizing cloud technology. This approach not only boosts confidence but also helps mitigate organizational resistance to change. Lastly, "information security" is recognized as the third most significant challenge. Information security remains a primary concern when migrating to cloud-based applications (Mughaid et al., 2024; Abdullayeva, 2023).

In contrast to previous research in this field, which has predominantly emphasized the technical aspects of Customer Relationship Management (CRM), there remains a notable gap in exploring other critical dimensions, including management, vendor, and environmental factors. Organizational challenges are particularly significant within the managerial dimension, which encompasses the drivers for migrating to cloud-based CRM, as well as the effective management of change and implementation processes. While criteria such as "lack of top management support" and "staff resistance" have been highlighted by King and Burgess (2008), other critical managerial factors—including "lack of performance evaluation of cloud-based CRM vendors," "insufficient project management during cloud-based implementation," "inadequate change management," and "the cost of bandwidth"— have not been thoroughly examined in the context of cloud-based CRM. These factors are essential considerations within the broader landscape of cloud computing and IT outsourcing research.

Similarly, vendor-related challenges focus on the effective management of long-term relationships and support with service providers. Aljanabi et al. (2021) have identified issues such as "dependence on providers" and "loss of control over data and processes." However, other important vendor-related concerns—including "lack of timely support," "high costs of customization," "absence of clear criteria for selecting cloud-based CRM service providers," and "unauthorized copying of large software"—have been insufficiently addressed in the existing literature on cloud-based CRM.

6. Theoritical and Practical Implications

Despite numerous empirical and conceptual research efforts in the area of cloud-based systems, only a limited number of studies have specifically addressed the challenges associated with cloud-based Customer Relationship Management (CRM). A few studies in this domain (Nguyen & Ali, 2021; Gandecha et al., 2021) have identified a range of challenges related to cloud-based CRM, including security concerns, downtime issues, system integration difficulties, privacy concerns, control issues, slower operational speeds, security risks, and identity theft. However, these studies reveal a significant gap in the literature: The absence of a holistic framework that integrates the multifaceted aspects of these initiatives. Addressing this gap is a primary objective of the current study. Furthermore, while prioritizing these challenges is crucial, there is a notable lack of research focused on the prioritization of challenges specific to cloud-based CRM in previous works. To sum up, we might assert that this study contributes to organizations in three distinctive ways, which are discussed in the following.

(1) This research presents an innovative framework that comprehensively addresses the multifaceted challenges associated with the implementation of cloud-based CRM systems. By integrating technological, organizational, vendor-related, and environmental factors, the framework provides a holistic approach to understanding the complexities involved in cloud-based CRM initiatives. The proposed framework equips organizations with the necessary tools to navigate these challenges effectively.

(2) The framework provides an organized presentation of the ranks and weights of all relevant challenges using BWM, thereby enabling stakeholders to conserve valuable time and resources while addressing complex issues within the implementation of cloud-based CRM. This study highlights the

significant advantages of utilizing the BWM for evaluating the key factors and their associated measures, as articulated by experts. By effectively applying this powerful decision-making tool to cloud-based CRM, we have established a clear ranking of the challenges involved in implementation.

(3) The framework can also serve as a comprehensive guideline for evaluating cloud-based CRM projects. It offers a structured approach to assess various aspects of implementation, enabling organizations to systematically analyze challenges and opportunities. By following this framework, decision-makers can ensure a thorough evaluation process, enhancing the likelihood of successful project outcomes and optimizing resource allocation throughout the implementation journey.

This study also offers valuable insights for managers aiming to enhance the success of their cloud-based CRM implementations and improve project efficiencies, as outlined below:

First, this study highlights the key categories of challenges that play a critical role in the successful implementation of cloud-based CRM initiatives. The findings emphasize the need for Chief Marketing Officers (CMOs) to focus on four primary challenge categories: organizational, technical, vendor-related, and environmental. By gaining a comprehensive understanding of these multifaceted challenges, managers can navigate the complexities of the cloud-computing ecosystem more effectively. To enhance the likelihood of success, it is essential for managers to adopt a holistic approach that simultaneously addresses both technical and managerial challenges. By proactively identifying and tackling these obstacles, CMOs can streamline their strategies for cloud-based CRM migration and execution. This not only optimizes project outcomes but also positions organizations to fully leverage the potential of cloud technology in enhancing customer relationships. Taking these steps will enable managers to turn challenges into opportunities for innovation and growth in their CRM initiatives.

Second, the challenge of "lack of top management support" has emerged as the most significant barrier to successful cloud-based CRM implementation, as highlighted by the BWM analysis. To mitigate this challenge, it is essential to actively involve top management from the project's inception. Early engagement ensures that senior leaders understand the benefits and potential impacts of the initiative, fostering a sense of ownership and commitment. To maintain this engagement throughout the project, regular updates on progress and milestones should be provided. These updates should not only inform but also demonstrate how the initiative aligns with organizational goals. Additionally, crafting a compelling business case is critical. This document should clearly articulate the strategic importance of the cloud-based CRM initiative, outlining its value, anticipated benefits, and alignment with broader business objectives. By effectively demonstrating the potential return on investment and how the initiative supports organizational strategy, managers can secure the necessary backing and commitment from senior leadership. This proactive approach will enhance the likelihood of successful implementation and maximize the benefits of cloud-based CRM for the organization.

Third, with "staff resistance" identified as the second most critical challenge, managers must implement several strategic measures to effectively address this issue. First and foremost, it is crucial to articulate a compelling vision for migrating to cloud-based CRM, clearly demonstrating how this transition aligns with the organization's overarching strategies and goals. Effective communication is vital. Managers should emphasize the professional benefits of adopting cloud-based CRM, illustrating how it will enhance employees' roles and contribute to the organization’s success. This transparency helps employees understand the value of the initiative, and fosters a sense of ownership. Additionally, implementing robust incentive mechanisms can motivate staff and encourage active participation in the transition process. These incentives should be closely aligned with the objectives of the CRM implementation, recognizing and rewarding the contributions of employees involved. By cultivating understanding, buy-in, and motivation among staff, managers can effectively mitigate resistance and facilitate a smoother transition to cloud-based CRM.

Fourth, with “information security” recognized as the third most critical challenge, managers must prioritize robust security measures to safeguard their cloud-based CRM systems. To achieve this, it is essential to conduct regular security audits and assessments of the cloud infrastructure, configurations, and applications. These audits will help detect vulnerabilities and ensure compliance with established security policies. Moreover, implementing stringent access control measures is vital to restrict access to sensitive data and services, protecting critical information from unauthorized users. Additionally, evaluating vendors’ security practices is imperative. Managers should assess factors, such as

encryption algorithms, security controls, certifications, and compliance with industry standards. By taking these proactive steps, organizations can foster a secure environment for their cloud-based CRM implementations, thereby enhancing overall data integrity and customer trust.

7. Limitations and Future Research

Despite the contributions of this research to the body of knowledge as outlined above, it has limitations, similar to other studies, which serve as a basis for future quantitative and qualitative research. The first limitation of this study is that the data is limited to the perspectives of Iranian experts specializing in cloud-based CRM. Although the participants were well-qualified experts, the ranking and results may differ in other contexts with unique cultural, technological, and environmental conditions. Hence, Replicating this research in other settings could yield alternative rankings, offering further insights and enhancing the framework's applicability across varying contexts. Second, another limitation of this paper is that while categorizing challenges into organizational, technical, vendor-related, and environmental aspects, the potential overlap and interdependence between challenges were not explicitly addressed. Some challenges may span multiple categories or influence each other in complex, interrelated ways. Future research could provide a deeper understanding of these interrelationships by applying methods like Social Network Analysis (SNA) or the Dematel approach to analyze the causal connections and interactions between challenges more precisely. In conclusion, we encourage future researchers to examine some cloud-based CRM challenges practically using the framework we presented in this study.

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