

*Review Article*

# A Review of Cloud-Based CRM Systems in Healthcare: Advances, Tools, Challenges, and Best Practices

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## Abstract

*Cloud-based Customer Relationship Management (CRM) systems have become common in the healthcare sector using cloud computing technologies in monitoring and enhancing the interaction between the patient and the provider. These systems offer patient data with safe instant access to a number of processes such as telemedicine, billing, and Electronic Health Records (EHRs). This paper discusses the way cloud CRM system can enhance patient engagement, quality of services and operational efficiency. The advantages of these systems are many such as scalability, flexibility, and improved decision making, all of which help in the improved healthcare delivery. Regardless of these strengths, cloud CRM in healthcare is slow to adopt as compared to other sectors because there are challenges that include integrating with existing healthcare structures, regulations, and the data security threats. The paper identifies major tools, technologies and deployment models that are used in the implementation of cloud CRM amongst others and the need to overcome the barriers in order to make implementation effective. The future development is to be more dedicated to the improvement of the data security, the implementation of artificial intelligence (AI) to predictive analytics, and scalability issues, which would make cloud CRM systems more accepted and optimized in the healthcare environment.*

**Keywords:** *Cloud-based CRM, Healthcare, Cloud Computing, Data Security, Telemedicine, Healthcare Analytics*

## 1. Introduction

Healthcare organizations find themselves in a very difficult position, being pressured to sustain high-quality treatment, reduce costs at the same time and enhance safety. The challenge of ageing population, the growing demands and expectations of patients which continue to be increasingly demanding, challenges in getting skilled medical staff and the increasing number of chronic diseases have posed problems, which have complicated the attainment of the goals of healthcare institutions [1]. Health information technology (HIT), also referred to as e-health or medical informatics, is a major instrument used in achieving high-quality, safety, efficiency, and cost reduction. The benefits of HIT are an improved medical service and workflow, clinical information that aids health care professionals in making decisions, enhances the effectiveness, safety, and quality of patient care, prevents medical errors and reduces the cost and hospitalization and paperwork.

The most interesting topics in healthcare administration are strategies used to maintain the relationship between a medical professional and his/her patients to build a more understanding, trust, and patient involvement in decision-making. A good relationship between a healthcare provider and its consumers enhances consumer satisfaction, thus increasing the patient loyalty. Organizations can employ customer relationship management (CRM) software to establish and maintain relationships with its customers [2]. Healthcare providers can also apply CRM to know as much as possible about their clients and potential clients, deliver them with relevant and timely information and track the outcomes of a program to make any necessary adjustments to the program. Non-profit organizations [3] argue that hospitals should provide both insured and uninsured individuals with high-quality of medical care. To ensure that hospitals remain financially stable, they need to engage in effective customer relationship management targeting the customer population that is able to afford health insurance, creating loyalty, and generating additional revenue to cover the greater expense incurred by the uninsured population.

A cloud CRM relies on cloud computing technology in which data and functions are hosted on the internet.

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SaaS is one of the most commonly used models of IT outsourcing and software delivery, and it is also often used to provide CRM solutions [4]. This solution is also referred to as on-demand CRM as opposed to on-premise CRM. Typical on-demand CRM features include enhanced CRM capabilities, analytics, reporting, customer care and support, marketing automation, and sales force automation [5]. By determining client demands and offering premium healthcare services based on patient choices, the CRM system has been used to increase consumer happiness [6]. In addition to increasing patient happiness, a positive connection between healthcare personnel and patients facilitates efficient communication between them [7]. The CRM system may also result in higher hospital profits. These considerations have led many healthcare providers to build CRM systems, especially in health promotion centres.

Cloud-based apps can offer practical answers to today's healthcare problems. Nevertheless, in contrast to other industries, cloud computing acceptance and effective utilisation in the healthcare industry are still rather low, despite their potential advantages [8]. While sectors such as retail have shown high levels of adoption, healthcare continues to lag behind in fully leveraging cloud technologies.

#### *Structure of the Paper*

The paper is structured as follows: Section II discusses current advances in cloud-based CRM systems in healthcare, Section III examines the tools and technologies that support cloud CRM implementation, Section IV addresses the key challenges and best practices associated with cloud CRM adoption, Section V provides a review of relevant literature, and Section VI concludes the study with recommendations for future research directions.

#### **Advances in Cloud-Based CRM for Healthcare**

In the healthcare industry, cloud-based CRM integrates EHRs, billing systems, and telemedicine platforms, providing secure storage and instant access to patient data. Innovations such as scalability, analytics, and flexible deployment models enable hospitals to enhance productivity, patient engagement, and informed decision-making. Applications such as remote monitoring, appointment scheduling, and personalized communication improve patient satisfaction, service quality, and hospital performance.

#### *Types of CRM in Healthcare*

CRM has been used as a business strategy from the beginning of time. Building relationships with customers is a concept and technique that helps businesses understand and meet each customer's demands, which in turn increases revenue, customer value, and service quality. Although the idea of CRM is

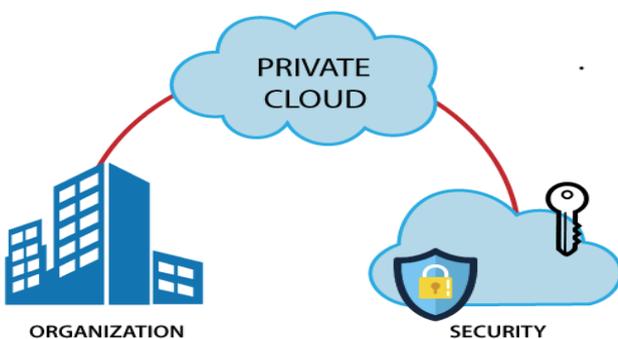
not new, it has become essential for businesses to customize all of their products and services owing to the ongoing rise in market demand [9]. CRM is utilized in the healthcare industry to manage patient relationships, enhance the standard of care, and improve the delivery of services. Each of the four primary CRM platforms widely used in the healthcare industry are Salesforce, Microsoft Dynamics 365, SAP, and HubSpot, with additional notable systems including Oracle and Zoho CRM mentioned in Table I, addresses a distinct facet of organizational strategy and patient management.

- **Salesforce Health Cloud** – Salesforce Health Cloud is one of the most comprehensive CRM platforms designed specifically for the healthcare sector. It enables healthcare providers to build stronger patient relationships through a unified view of patient data. The platform facilitates seamless communication between patients, doctors, and caregivers, while also supporting care coordination and patient engagement[10]. With its powerful analytics and AI-driven insights, Salesforce Health Cloud helps organizations deliver personalized care plans, improve patient outcomes, and streamline administrative workflows. Its cloud-based architecture ensures scalability, interoperability, and secure data sharing across systems in compliance with healthcare regulations such as HIPAA.
- **Microsoft Dynamics 365** – Microsoft Dynamics 365 provides an integrated suite of tools that combine CRM and Enterprise Resource Planning (ERP) functionalities. In healthcare, it is used to manage patient interactions, enhance operational efficiency, and improve decision-making through real-time analytics[11]. The platform's integration with Microsoft products such as Power BI, Teams, and Azure enables healthcare organizations to centralize communication, monitor patient journeys, and automate administrative tasks. Its modular design allows customization for hospital management, patient engagement, and appointment scheduling while maintaining strict data security and compliance standards.
- **SAP CRM** – SAP CRM focuses on optimizing healthcare operations through efficient data management and process automation. It enables healthcare institutions to manage patient information, coordinate care delivery, and analyze service performance effectively. The system supports end-to-end integration with other SAP modules, allowing a seamless flow of clinical, financial, and operational data[12]. Healthcare organizations use SAP CRM to enhance patient satisfaction by providing timely communication, efficient appointment handling, and proactive follow-ups. Its compliance with healthcare regulations ensures that sensitive patient information is managed securely.

- HubSpot CRM** – HubSpot CRM is a flexible and user-friendly platform, often preferred by small to medium-sized healthcare organizations due to its simplicity and affordability. It offers robust features for patient communication, marketing automation, and contact management. Healthcare providers use HubSpot to streamline patient outreach, track interactions, and improve engagement through targeted campaigns and reminders[13]. The platform’s intuitive dashboard and integration with telehealth tools make it ideal for managing both virtual and in-person patient relationships. Although not as specialized as Salesforce or SAP, HubSpot provides essential CRM capabilities that significantly enhance patient satisfaction and organizational efficiency.

*Cloud Deployment Models in CRM*

Cloud deployment models give businesses a variety of ways to access, control, and use computer resources. These models allow flexibility to accommodate various company needs, industry regulations, and technological goals by defining the structure of ownership, accessibility, and management of cloud services [14]. The implementation of cloud services may be roughly classified into four types: public, private, hybrid, and community clouds. Each of these approaches offers a distinct framework for distributing cloud infrastructure to stakeholders and consumers. It forms the basis for evaluating various aspects of the cloud environment, including cost-effectiveness, scalability, data security, and collaboration potential. Below is a brief overview of each of these deployment models, and a comparison of CRM types and cloud deployment models in the healthcare industry is shown in Table I:

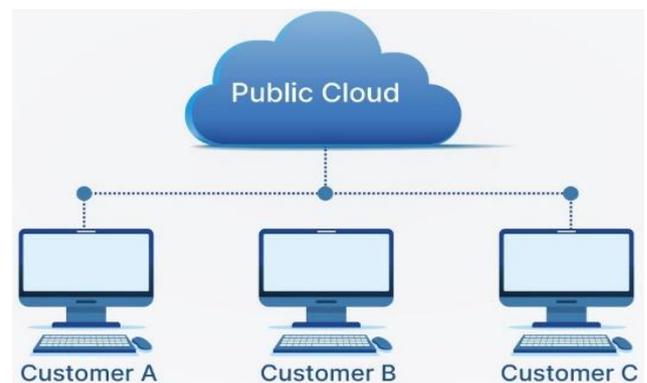


**Fig.1** Private Cloud Model

- Private Cloud:** An internal cloud is another name for a private cloud, which is utilized when a data Centre, proprietary network, or cloud infrastructure is run exclusively for a company or organization and provides services to clients behind the company's firewall. Large corporations or government agencies that want to preserve their data in a more regulated and secure setting typically employ private clouds. The process can

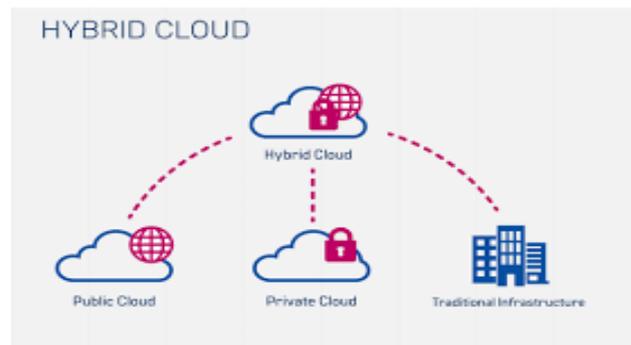
be seen in Figure 1. In healthcare CRM, private clouds allow hospitals to store sensitive patient data securely while providing doctors and staff with controlled access to patient records. This promotes the trustworthy and secure administration of patient interactions and guarantees adherence to laws like HIPAA.

**Public Cloud:** It facilitates easy access to the systems and services for the general population. As seen in Figure 2, the third party, acting as all physical resources are considered to belong to and be under the cloud service provider's obligation. Outstanding scalability and flexibility, and geographical independence are just a few of its many advantages [15]. In healthcare, public clouds enable hospitals and clinics to offer patient portals, appointment scheduling, and telemedicine services that can be accessed from anywhere, providing patients with convenient and secure access to their healthcare information.



**Fig2** Public Cloud Model

**Hybrid Cloud:** This cloud is composed of several public and private clouds that are utilized by various organizations with comparable needs and objectives. As seen in Figure 3, it may be handled both internally and by a third party, which may be located outside or inside. Some of the bill savings benefits of CC are achieved as a result of the cloud's bills rising for some clients [16].



**Fig.4** Hybrid Cloud Model

**Multi Cloud:** The use of two or more cloud computing services from several cloud providers is known as

multi-clouding. Multi-cloud environments can be either fully public, fully private, or a combination of the two. Companies utilize multi-cloud environments to distribute computing resources and lower the chance of data loss and outages [17]. Additionally, they can expand the amount of storage and processing capacity that companies have at their disposal [18] as shown in Figure 4. Multi-cloud setups allow hospitals to combining public cloud scalability with private cloud security, ensuring continuous access to patient records and services. Table I presents a comparative analysis of various CRM types and cloud deployment models in the healthcare sector, illustrating their unique features,

advantages, and implementation benefits across different organizational contexts.

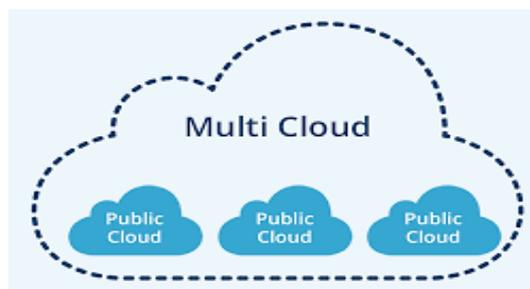


Fig.5 Multi-Cloud Environment

Table 1 Comparative Analysis of CRM Types and Cloud Deployment Models in Healthcare

Aspect	Types of CRM in Healthcare	Cloud Deployment Models in CRM	Impact on Healthcare	Key Considerations	Examples in Healthcare
Purpose	Focuses on managing patient relationships, engagement, and service quality through CRM platforms such as Salesforce, Microsoft Dynamics 365, SAP, HubSpot, Oracle, and Zoho CRM.	Defines how IT and CRM resources are delivered and managed via the cloud.	Both modernize healthcare by integrating strategic relationship management with digital infrastructure.	Balancing patient-centric care with secure and cost-effective technology.	CRM software for patient engagement; cloud storage for electronic health records (EHRs).
Main Categories	Includes general CRM, e-CRM, adoption and implementation models, and platform-based CRMs (Salesforce, Dynamics 365, SAP, HubSpot).	Includes private, public, hybrid, and multi-cloud deployment models.	Hospitals can align CRM types with appropriate cloud systems for secure scalability.	Proper pairing ensures operational efficiency, compliance, and data protection.	General CRM in hospitals; private or hybrid clouds for storing patient records.
Strategic Focus	Aims at personalization, satisfaction, data-driven care, and seamless communication using advanced CRM analytics.	Aims at scalability, flexibility, and compliance across healthcare systems.	Integration of CRM and cloud ensures responsive, secure, and patient-centered healthcare services.	Requires cultural readiness, skilled workforce, and technical infrastructure.	CRM analytics for patient insights; cloud-based compliance management.
Applications	Used for patient management, follow-up scheduling, online engagement, marketing automation, and telehealth integration.	Supports secure data storage, telemedicine platforms, and patient self-service portals.	Jointly improve accessibility, efficiency, and patient trust in healthcare.	Must balance usability, interoperability, and cybersecurity.	Patient portals via CRM; telehealth hosted on secure cloud servers.
Challenges	Barriers include organizational resistance, lack of digital readiness, and cultural adaptation issues.	Challenges include data privacy concerns, compliance with HIPAA/GDPR, and high infrastructure costs.	Both require strategic planning, training, and continuous improvement.	Sustainability depends on technological adaptation and leadership commitment.	CRM adoption delays; potential cloud data breaches or downtime.
Overall Contribution	Builds patient trust, loyalty, and operational efficiency through centralized relationship management.	Acts as the technological backbone supporting modern CRM systems.	Combined, they enable data-driven, patient-centered, and resilient healthcare ecosystems.	Success relies on aligning CRM strategy with secure cloud infrastructure.	Integrated CRM-cloud solutions enhance care coordination and health outcomes.

**Healthcare**

Cloud-based healthcare information systems (HIS) use tools such as EHR software, cloud storage, data analytics, AI diagnostics, and interoperability to improve patient care and manage health records. Advanced technologies, including IoT devices, telemedicine, and mobile health apps, facilitate remote

monitoring and patient engagement. These systems provide secure, real-time access to health information, enhancing care delivery while ensuring scalability and reliability.

*Interoperability and Integration Tools*

In order to accomplish domain goals, enterprise integration is the process of making sure that

enterprise entities communicate, whereas enterprise interoperability is the capacity of enterprise systems to interact [19]. In this regard, enterprise architecture serves as a formal component-level description of a system, facilitating enterprise modelling from several perspectives and directing its implementation. In cloud-based healthcare CRM, this integration and interoperability enable seamless data exchange between EHRs, telemedicine platforms, billing systems, and patient engagement tools [20]. It ensures that healthcare providers can coordinate care efficiently, maintain data security, and deliver personalized patient care across multiple cloud applications.

- **Fast Health Interoperability Resources (FHIR):** The primary goal of FHIR is to preserve information integrity while streamlining deployment. The benefits of the current HL7 (v2, v3, and CDA) standards are anticipated to be combined with their disadvantages in this new standard [21]. Developers may utilize FHIR to create standardised web apps that let consumers access clinical data from any healthcare system, independent of the devices and operating systems used by the system.
- **API Gateways:** Microservices often offer APIs with a different level of granularity than clients. Clients must communicate with numerous services since microservices often offer fine-grained APIs. Data requirements vary among customers, and network performance varies among client types. Since the services' division may vary over time, it is vital to keep some information secret from clients [22]. API gateways help address these challenges by providing a single-entry point for clients, aggregating multiple microservice calls, and translating between internal and external API formats. They also enable centralized monitoring, security enforcement, and load balancing to ensure reliable and efficient communication [23].

#### *Data Security and Compliance Technologies*

A container holds packaged self-contained, ready-to-deploy parts of applications and, if necessary, middleware and business logic (in binaries and libraries) to run the applications. Tools like Docker are built around container engines where containers act as portable means to package applications. Data security and compliance technologies are crucial for cloud-based healthcare CRM solutions. They are necessary to preserve the availability, confidentiality, and integrity of sensitive patient data. The General Data Protection Regulation (GDPR), the Health Insurance Portability and Accountability Act (HIPAA), and regional health laws and regulations are all included in compliance frameworks to ensure that ethical and legal protections are in place. By supporting robust security and compliance strategies, cloud-based healthcare CRM solutions ensure the protection of patient data while also building trust at the communication channel

between patients and healthcare professionals, making cloud-based healthcare solutions more widely available.

- **Identity and Access Management (IAM):** Identity management systems are used to manage users, secure user access, verify credentials, and ensure that the appropriate individuals are using the services' resources. There are several methods for user authentication, including biometrics, token-based, certificate-based, and passwords [24]. In most organizations, identity management becomes more risky, expensive, and time-consuming as the organization expands.
- **Health Insurance Portability and Accountability Act (HIPAA):** HIPAA's comprehensive regulations for patient data protection and confidentiality have altered how businesses in the life sciences, health services, insurance, and other sectors observe and manage security, privacy, and health concerns [25]. HIPAA addresses a broad variety of technology issues, such as websites, electronic medical records, medical imaging, and medical equipment. The extensive usage of virtualization has made it more difficult for payers and healthcare service providers to comply with HIPAA, cloud computing, mobile devices, and mobile applications, among other recent technological advancements.

#### **Challenges and Best Practices**

Cloud-based healthcare CRM systems encounter various challenges, including security risks, integration and transition barriers, compliance with applicable regulations, and workforce training and adaptation. Security risks involve the handling of sensitive data and secure communication between the provider and users [26]. Due to potential latency, data transfer, and encryption issues related to integration, users may incur financial costs and technical burdens. Regulatory compliance requires adherence to applicable statutes governing data storage and sharing. Lastly, adaptation of the workforce would require effective training and change management to combat resistance.

**Data-Driven Learning:** AI and ML models can learn from vast datasets, extracting patterns and relationships that may be difficult to capture through traditional analytical methods. This enables systems to adapt to complex and non-linear dynamics.

**Real-Time Adaptation:** AI algorithms can process data in real time, allowing rapid adjustments to control parameters based on changing conditions. This is crucial in applications where quick responses are essential.

**Robustness:** AI-driven adaptive control systems can be more robust to disturbances and uncertainties. They learn to compensate for unexpected changes, ensuring system stability and maintaining performance.

- **Security Risk:** Sensitive information posted online, typically in multi-sentence format, should

be closely watched, as should any correspondence between the host organization and the end user. Protection of the stored kernels being lacking and the loss of control of personal information are two instances of security problem.

- **Integration and Transition:** The difficulties with data transport, latency, and encryption [27]. It is particularly pertinent to developing nations as they need funding and capacity to meet their security requirements, which are also a major financial concern because of the expenses associated with migration.
- **Regulatory Compliance:** Regulatory compliance is also an issue that financial organizations with cloud-based CRM solutions have to cope with. The laws that govern data processing, sharing, and storage are strict and vary across jurisdiction in the financial sector [28]. As an example, the organizations that carry out business in the EU must comply with the General Data Protection Regulation (GDPR).
- **Workforce Training and Adaptation:** Workforce training and adaptation also present additional challenges in case of cloud-based CRM solutions. Employees should be trained in order to use the new platform appropriately, and this requires extensive use of time and resources. Another common issue is unwillingness of the staff to adopt the new technology. To solve these issues, financial institutions must put change management techniques into place, making sure that staff members are aware of the advantages of the new system and have faith in their capacity to utilize it.

## Literature Review

This review highlights advances in CRM and cloud-based healthcare systems, focusing on implementation strategies, data integration, real-time analytics, and social CRM adoption to enhance decision-making, patient engagement, and service efficiency.

Baashar et al. (2021) explored the CRM deployment in the Malaysian healthcare industry, and a qualitative technique used to accomplish this goal. The COVID-19 outbreak and other restrictions have caused several private institutions in the state of Perak to postpone interviews. Many IT executives and medical professionals have come to the conclusion that no hospital has yet fully adopted CRM, and that people are often unaware of what CRM actually entails. However, if constraints were loosened, further research would be conducted in other states and hospitals to learn more about the present condition of CRM acceptance [29].

Yan et al. (2021) have demonstrated that the goal of the purpose of the retrieval and storage-based indexing framework (RSIF) is to increase the concurrency of cloud-based medical data access for both users and service providers. Time-constrained retrieval of stored data and continuous, replication-free indexing are the methods used to accomplish

concurrency. To classify the limitations for data augmentation and update for each storage instance, deep learning is used. The learning process establishes the approximate indexing and ordering for storage and retrieval, respectively, based on conditional assessment. As long as the process remains independent, this shortens the time needed for simultaneous access and retrieval [30].

Marcu, Popescu and Danila (2020) suggested a way to address the demands of the healthcare business by modifying a widely utilized marketing method. The volume of information accessible in healthcare systems and the need to examine all of the data, the primary area of adaptation has been determined to be the optimization of conventional recommendation procedures. Because medical data is so sensitive, caching results one of the most popular optimization approaches used in software implementation seems to be inapplicable [31].

Jalal, Bahari and Sherief (2019) these are the elements that were found to have an impact on Iraqi healthcare organisations' adoption of Social SCRM. For the sample of eight Iraqi hospitals, Semi-structured interviews with IT and marketing executives from five different hospitals were part of the mixed-methods approach. During the early stages of Social CRM implementation, data was analyzed and needs were provided using descriptive statistics and theme analysis. According to the official integrated Social CRM strategy and policy framework, Iraqi healthcare organizations' adoption of Social CRM is comparatively shallow, according to survey and interview results [32].

Singh, Kumar and Khatri (2019) suggested a planning approach based on distributed computing for the flexible management of e-healthcare services. To offer a framework for healthcare services, the suggested framework has been improved and currently consists of many elements. A client-side, application-side, and basic healthcare cloud-based health data management system creates an easily accessible network. In this instance, a biometric-based confirmation system is suitable as it overcomes the limitations of the traditional nominal id secret key security tool, which include nominal crime and password forgetfulness [33].

Nirabi and Hameed (2018) the Emergency Medical Care Mobile Cloud Computing Model (MCCEH), which is shown utilizing a cloud computing server, provides medical services in emergency scenarios with the aim of reducing reaction times to save patient lives. In the case that someone is ill or has been in an accident, the MCCEH model enables users to look for the closest medical institution or specialists in a certain field. The findings display each specialist's availability schedule along with whether or not he is accessible during that period. The user can choose a medical centre or expert depending on their past experiences, and they could even be able to browse ratings and comments left by other users [34].

Candela-Mendoza, Cruz-Ipanaque and Armas-Aguirre, (2018) The healthcare organization's usage of real-time data analysis is another essential element of the proposed idea. Prior to a medical consultation, also evaluated the information systems and technology currently in use for patient treatment. The model consists of four stages: using a data analysis service to test data in real time; selecting organized information, combining and keeping information in a cloud database. A mobile application displays the findings of

the pharmacological consultation, and the closest pharmacies to the patient's current location can be found using the geolocation function [35].

Table II summarizes recent studies on CRM and cloud-based healthcare systems, covering areas such as CRM implementation, healthcare cloud frameworks, social CRM adoption, and real-time data analytics. Future directions emphasize broader implementation, scalability, and the development of secure, adaptable healthcare solutions.

**Table 2** Comparative Analysis of Recent Studies on CRM and Cloud-Based Healthcare Studies

Reference	Study On	Approach	Key Findings	Challenges / Limitations	Future Directions
Baashar et al., (2021)	CRM implementation in Malaysian healthcare sector	Qualitative interviews with private hospitals (Perak)	No hospital had fully implemented CRM; lack of CRM awareness among executives	COVID-19 restrictions delayed study; limited current scope	Extend study to more states and hospitals post restrictions
Yan et al., (2021)	Retrieval and Storage-based Indexing Framework (RSIF) for Healthcare Cloud Data	Deep learning for classification, indexing & retrieval	Improved concurrency and reduced access/retrieval time	Dependent on continuous indexing accuracy	Explore large-scale healthcare cloud deployments
Marcu, Popescu & Danila, (2020)	Adapting recommendation systems for healthcare	Optimization and caching analysis	Identified adaptation needs due to large data volumes	Caching unsuitable due to medical data sensitivity	Develop alternative optimization strategies
Jalal, Bahari & Sherief, (2019)	Social CRM use in Iraqi healthcare	Mixed-method: surveys & interviews (8 hospitals)	Social CRM adoption is superficial; weak integrated strategy/policy	Lack of formal CRM framework	Build robust Social CRM strategy and adoption policies
Singh, Kumar & Khatri, (2019)	Planning adaptable e-healthcare services via cloud	Model of distributed healthcare framework with biometric security	Enhanced healthcare cloud services; better data security with biometrics	Complexity in multi-division integration	Expand scalable, secure cloud-based e-healthcare services
Nirabi & Hameed, (2018)	Emergency Healthcare Using Mobile Cloud Computing (MCCEH)	Cloud-based emergency model for real-time response	Enables fast specialist/center search; reduces response time	Limited by network connectivity and real-time data	Improve coverage, real-time feedback, and scalability
Candela-Mendoza, et.al., (2018)	Real-time data analysis for healthcare consulting	Four-phase model: data selection, integration, testing, results via mobile app	Provides real-time consulting and nearest drugstore info	Dependent on data quality and integration	Extend to broader healthcare ecosystems and predictive analytics

**Conclusion and Future Work**

Cloud-based CRM in healthcare leverages cloud computing technologies to manage relationships between healthcare providers and patients, enhancing care delivery by integrating systems like telemedicine, billing, and Electronic Health Records (EHRs). This paper has explored the possible uses of cloud CRM in enhancing patient interaction, service quality and performance efficiency. Cloud CRM solutions are scalable, flexible and secure with the ability to streamline healthcare processes, optimize decision-making and improve patient satisfaction at large. Nevertheless, several challenges, including those related to data security, the need to connect with the

existing healthcare systems, and regulations, are hindering the adoption of these systems in the healthcare sector. These barriers to the universal adoption of cloud CRM are present even though it is apparent that both the healthcare provider and the patient will be benefited. To deal with these issues, it is necessary to make special efforts to enhance data protection, make healthcare facilities compliant with the policies and regulations, and train healthcare personnel properly. As the cloud technology continues to evolve and more secure and scalable cloud-based systems are designed, the extensive use of the cloud-based CRM in the healthcare environment has a strong potential to revolutionize patient care and advance healthcare operations.

Further studies will be forced to focus on addressing the concerns posed by this research, particularly data security and compliance with medical legislation. By incorporating AI and ML into cloud CRM systems, data analytics may be improved, allowing for more individualised and predictive healthcare services. Further studies should also evaluate the economic impact and scalability of cloud CRM systems across diverse healthcare environments, exploring both their short-term and long-term benefits.

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