



Customer Relationship Management as a Service (CRMaaS): A Cloud Computing Perspective on CRM in the Insurance Industry

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Abstract:

The insurance industry consists of a group of companies that effectively provide essential insurance-related services to users. To date, a unified software for managing customer relationships—one of the most critical strategies for company survival in today's market—has not been introduced within the Iranian insurance industry. With advancements in various industries and sciences, new concepts have entered the business domain, including Electronic Customer Relationship Management (e-CRM) and Cloud Computing. This paper attempts to examine the concept of cloud computing and its prospects within Customer Relationship Management (CRM) in the insurance sector. Furthermore, it proposes a model for CRM software operating under cloud computing technology. In essence, this model represents CRM as a suite of service offerings and views customer demands as specific service requests.

Keywords: *Insurance Industry, Customer Relationship Management (CRM), Cloud Computing, Electronic Customer Relationship Management (e-CRM).*

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1. Introduction

The current state of the Iranian insurance industry has compelled insurance companies to attract more customers as a vital strategy for survival. Gaining customer trust is a crucial element for the insurance sector; even in the short term, liquidity is targeted as a primary goal to ensure organizational persistence. In the long run, the objective of an insurance firm must be the integration of customer trust and the enhancement of loyalty. Given the mission and fundamental philosophy of insurance companies, a transition from traditional marketing approaches toward a value-oriented perspective is essential. Under these circumstances, merely reducing service costs is insufficient for attracting and retaining customers; rather, providing a diverse range of services in the most effective manner serves as a "winning card" to overcome these challenges. With technological advancements and the evolution of business models across various industries, the insurance sector must adopt modern technologies for marketing, acquisition, retention, and customer development, notably Customer Relationship Management (CRM).

Communications in Iranian insurance companies have predominantly been traditional, characterized by face-to-face interactions without the support of specialized software or tools. Furthermore, despite the vast and geographically dispersed customer base requiring diverse services, only a few insurance companies in Iran utilize CRM to manage their customer relationships. On the other hand, those firms or agencies that do implement CRM often do so in an isolated and proprietary manner. Consequently, access to the system's data is restricted solely to that specific agency, with no external access provided to the insurance company's headquarters. This lack of centralized oversight allows agencies to implement CRM based on their own—potentially flawed—policies and tastes. As a result, organizational integration is compromised, and agencies operate independently based on their localized databases, a practice that may jeopardize the powerful and prominent presence of an insurance company in a competitive market.

Moreover, advancements in various fields of Information Technology have led to the emergence of numerous tools and technologies that can be used either independently or in combination across different industries. One such technology introduced in recent years is Cloud Computing. By leveraging this technology, various software applications can be delivered as specialized cloud services (via the internet) to diverse users, offering personalized features tailored to their specific needs.

In this study, to overcome the aforementioned challenges, we analyze Electronic Customer Relationship Management (e-CRM) systems from a cloud computing perspective. Subsequently, we propose 'Electronic Customer Relationship Management as a Service (e-CRMaaS)' specifically tailored for the insurance industry.



2. Customer Relationship Management (CRM)

In recent years, following the transformations in Information and Communication Technology (ICT), we have witnessed the emergence of Customer Relationship Management (CRM) as a critical business approach. CRM is a term encompassing a suite of methodologies, processes, software, and systems that assist institutions and companies in managing customer relationships effectively and in an organized manner (Burnett, 2001). CRM systems can facilitate the retention of profitable customers while attracting new and potential ones. To achieve this, CRM leverages the creation and maintenance of personalized relationships with customers, particularly those who are highly profitable (Hippner and Wilde, 2001).

Reicheld reached the conclusion that there are five key reasons why retaining a profitable customer is essential:

1. **High Acquisition Costs:** The cost of finding a new customer is high; therefore, customers may not be profitable unless they are retained for several years.
2. **Recurring Profit Stream:** Once the initial acquisition costs are covered, a continuous stream of profit is generated from the customer each year.
3. **Increased Purchase Volume and Efficiency:** Customers tend to purchase more over time; consequently, revenue grows continuously, and companies become more efficient in serving them. Furthermore, costs decrease due to the "learning curve" effect.
4. **Referrals:** Satisfied and retained customers recommend products to other potential customers.
5. **Value for Customers:** Such relationships are valuable to customers as well; hence, retained customers exhibit less price sensitivity.

On the other hand, the implementation of CRM offers numerous advantages, including:

1. **Product Customization:** Enabling the customization of products according to customer preferences (Galbraith and Rogers, 1999).
2. **Personalized Relationships:** Establishing and maintaining personalized and intimate relationships (Galbraith and Rogers, 1999).
3. **Information Integration:** Allowing organizations to utilize integrated information to deliver the best possible services to customers.
4. **Cost Reduction:** By focusing more on existing customers, CRM can reduce marketing costs by 6 to 11 times within organizations and companies.



5. **Implementing CRM** leads to increased customer satisfaction, which subsequently results in enhanced organizational and corporate profitability.

6. **CRM** facilitates the transformation of existing customers into loyal ones.

All the aforementioned points demonstrate that in today's competitive landscape—prevalent across various industries and particularly within the insurance sector—the implementation and utilization of CRM have become a necessity. In fact, the future survival of insurance companies is increasingly dependent on the effective adoption of CRM strategies."

3. Electronic Customer Relationship Management (e-CRM)

e-CRM encompasses a broad range of technologies used to support a company's CRM strategy. It should be considered one of the key achievements of the information revolution triggered by the adoption of the Internet. These operational applications enable organizations to care for their customers through the Web and other electronic tools, while allowing customers to manage their accounts online. The development of e-CRM has been concurrent with the rise of e-business, transforming traditional business models from mass production to mass customization. As previously mentioned, e-CRM can include various electronic technologies and modern communication channels, such as Interactive Voice Response (IVR), Voice of the Customer (VoC), and corporate portals. The utilization of these channels and tools indicates that organizations can manage their interactions with customers through e-CRM without the need for human intervention.

The primary objectives of e-CRM systems are to enhance customer service, retain high-value customers, and provide analytical capabilities for the organization and its senior executives. This system serves as an infrastructure that facilitates non-linear value creation and increases the value delivered to customers, encouraging high-value clients to remain with the organization. When correctly implemented, e-CRM can evolve into a cycle of "e-loyalty" that continuously improves to create a sustainable competitive advantage. By adopting e-CRM and redefining business processes for customer acquisition and retention, a company can strengthen its capabilities in key areas of customer purchasing decisions (Anton, 1996). The points mentioned above suggest that e-CRM

adoption can foster organizational growth and enhance profitability. Industries that are most inclined to utilize e-CRM are those acutely aware of the importance of differentiation in customer relations, are highly competitive, and consistently seek a distinctive and superior market presence (Riggins, 1999).

"The insurance industry is no exception to this rule; given current conditions, the adoption of e-CRM is highly recommended for insurance firms. Insurance companies can leverage this strategy to improve customer management, convert regular customers into loyal and profitable ones, attract



potential clients, enhance customer satisfaction, deliver superior services, and ultimately, increase overall profitability."

3.1 Advantages of e-CRM:

1. **Reduced Customer Interaction Costs:** Minimizing the expenses associated with communicating and engaging with clients.
2. **Enhanced Customer Loyalty:** Strengthening the long-term commitment of customers to the brand.
3. **Improved Customer Relations:** Leading to superior service delivery and higher levels of customer satisfaction.
4. **Focus on High-Value Customers:** Prioritizing clients who generate greater added value for the organization.
5. **Reduced Operational and Administrative Costs:** Streamlining internal processes to lower overhead.
6. **Increased Efficiency through Integration:** Leveraging more effective methods by integrating e-CRM with other core systems such as Production, Finance, and Supply Chain Management (SCM).
7. **Sales Optimization:** Improving sales performance through market segmentation techniques, which directly boosts corporate profitability.

3.2 The e-CRM Cycle:

As indicated by the definition of e-CRM, the primary focus is on utilizing new technologies to manage customer relationships, with the Internet being an inseparable component. To effectively utilize these technologies, the e-CRM cycle must be identified, which consists of:

1. **Customer Selection:** Defining target customers and segmenting them based on their specific needs and requirements.
2. **Customer Acquisition:** Focusing on service improvements and other incentives to attract new customers and encourage them to engage through online channels.
3. **Customer Retention:** Implementing operations and strategies aimed at converting occasional or "one-time" customers into permanent, loyal clients.
4. **Customer Extension:** Focusing on increasing "Customer Lifetime Value" (maintaining a long-term relationship with the organization) and further enhancing customer loyalty.



3.3 Technologies Used in e-CRM

Since e-CRM is a hybrid of traditional and modern methodologies, the following technologies are utilized within its framework:

1. Web-based Services: Such as corporate portals, email, etc.
2. Wireless Systems: Utilizing wireless communication infrastructures.
3. Mobile Services: Leveraging mobile platforms for customer engagement.
4. Telecommunication Systems: Including Interactive Voice Response (IVR) and toll-free numbers.
5. CRM-Equipped Operators: Human agents supported by integrated CRM software applications.

It is noteworthy that all the aforementioned technologies utilize the organization's integrated databases to deliver value-added services to users.

3.4 Differences Between CRM and e-CRM

Fundamentally, the distinction between CRM and e-CRM mirrors the difference between traditional commerce and e-commerce. In this sense, e-CRM is the evolution of traditional customer acquisition and relationship management tools, refined and adapted to meet contemporary digital needs. Companies are increasingly driven toward its adoption; however, traditional CRM will never become obsolete. Instead, electronic capabilities are being integrated into it. Consequently, a total separation of these two concepts is impractical, as they both strive toward the same ultimate objective. The following table outlines the key differences between the two:

Comparison Criteria	Traditional CRM	Electronic CRM (e-CRM)
Customer Interaction	Predominantly conducted through traditional methods such as fax, telephone, and mail.	In addition to traditional methods, it includes electronic channels such as the Internet, email, mobile, and wireless systems.
Scope of Activity	Generally defined around job functions and products, often restricted to a single organizational unit.	Operates across all organizational levels and focuses on the specific and individual needs of customers.
Cost and Time	Implementation is time-consuming and management is costly, as the system operates across various locations and multiple servers.	Reduces both time and costs because the system is centralized and operates on a single server.

Table 1: Comparison Between CRM and e-CRM



4. Cloud Computing

In numerous industries, the increasing complexity and the demand for high flexibility in meeting customer needs have challenged traditional Customer Relationship Management (CRM). Examples include the automotive, aerospace, shipping, and construction sectors, where insurers or customers on one side, and new service providers and partners on the other, require seamless integration. Concurrently, evolutions in software have complicated the fulfillment of customer demands. The question arises: how can complex individual customer needs be met effectively and efficiently through distributed resources? This inquiry led to the emergence of the cloud computing concept.

Fundamentally, the Cloud is a pool of shared resources. Users do not require detailed knowledge of the available resources or their specific properties. Instead, they need the ability to search for services, consume resources as a service, and subsequently pay based on their actual usage—a concept explored in *Cloud Computing* by Barrie Sosinsky. A middleware is utilized as an agent to match supply and demand. The objective of this research is to develop a method for coordinating CRM by leveraging the idea of cloud computing.

The term "cloud computing" emerged in 2007, describing a concept for resource delivery. Through virtualization, resources can easily be utilized in the form of a service. Service providers create offerings for end-users via internet-based interfaces. Depending on the type of resource and the capabilities provided, the cloud concept can be examined across three scenarios:

1. **IaaS** (Infrastructure as a Service): Describes pure computing resources such as storage and processing capacity.
2. **PaaS** (Platform as a Service): Refers to software platforms, including machines equipped with operating systems.
3. **SaaS** (Software as a Service): Describes software applications that execute within the cloud.

The cloud concept has garnered significant attention, as noted in "Supply Chain as a Service – A Cloud Perspective on Supply Chain Systems" by Joerg Leukel, Stefan Kirn, and Thomas Schlegel. Various types of clouds can be utilized as service consumption models, including public, private, hybrid, and community clouds; the decision to use a specific cloud depends on individual business needs and requirements (as discussed in research by Dr. Frank Fischer). Each of these service models can be used repeatedly. They function not only as individual services but can also be combined to provide value-added services as a single entity within a "Cloud CRM" framework. Hybrid environments can be defined as IT landscapes that utilize both private and public clouds. This cloud type allows users to benefit from scalability and cost reduction while maintaining the security of a private cloud.



Effective and efficient management of hybrid landscapes enables users to derive better benefits and optimal services from the hybrid cloud. Considering the cloud type is crucial in determining the requirements for cloud migration (Research by Dr. Ferda Turner and Frank Fischer). There is no universally agreed-upon and robust definition of the "Cloud," as cloud computing is a complex concept. It is associated with various similar technologies such as Grid Computing and Service-Oriented Computing (SOC).

Below is the definition proposed by Vaquero, who analyzed 66 different definitions of the cloud to formulate this perspective. Vaquero's definition reflects how the cloud concept is understood today:

Cloud: A large, virtualized pool of available and usable resources, such as hardware, operating systems, or services. These resources can be dynamically reconfigured to accommodate variable loads, ensuring optimal resource utilization. The cloud provides easy and scalable access to virtualized network computing resources, which is a highly attractive proposition for corporate Information Technology (Research by Dr. Ferda Turner and Frank Fischer).

When high capacity is required during peak times, the cloud can provide additional resources on-demand; these resources can be adjusted immediately when lower capacity is needed. The benefits of cloud computing include increased response times and automatic, instant software updates. Other advantages include resource accessibility; for instance, employees can access information from any location and focus on core tasks rather than routine maintenance (Research by Dr. Ferda Turner and Frank Fischer). This resource pool is managed through a "Pay-per-use" model. In this system, the infrastructure provider guarantees the requested services through a Service Level Agreement (SLA).

To describe Customer Relationship Management systems from a cloud computing perspective, the first step is to define the types of resources involved. A CRM system consists of resources engaged in delivering services from the insurer (or source) to the customer. Computing resources are used to enable and facilitate the dynamism and flexibility of the CRM system. These resources have a broad scope, including agencies, personnel, and their specific properties and relationships. By following the cloud concept, this diversity and complexity are significantly reduced through virtualization. This is achieved by masking the underlying heterogeneity of resources via a predefined interface.

The interface is used to access services without specifying a particular physical resource. In other words, services provide a capability that gives the end-user the impression of having more than one resource at their disposal. By adding new types of services not previously present in the cloud, this scenario becomes sufficiently definitive to be characterized as "CRM as a Service" (CRMaas).

Cloud computing manages a large set of similar resources with the ultimate goal of fulfilling all user demands and service requests while maximizing resource utilization. Similarly, a key objective



in CRM systems is to reduce the costs required to provide the necessary level of customer service within a specific segment. Numerous options exist for delivering a request—such as selecting the most cost-effective one—and this same objective is pursued in service delivery within CRM systems. However, some elements of CRM may not be easily replaceable due to existing constraints.

Reconfiguration refers to the process of adding, removing, or modifying resources based on customer demand. The cloud acts as a dynamic pool of resources relative to workload and flow. CRM systems are highly dependent on scalability, particularly in scenarios such as adding new agencies to meet unexpected demands or shifting operations due to resource failures. The scalability of e-CRMaaS is enabled by outsourcing CRM functions through information systems. The underlying theory is based on "Economic Transaction Costs" and their impact on intra-organizational coordination.

"Pay-per-use" is a model where payment is based on the consumption of a specific resource type, effectively turning computing into a utility. Such services can be easily metered and subsequently charged based on actual consumption. While this concept did not originate with the cloud, the cloud has integrated the computing model into it. Adapting this model to a CRM system is heavily dependent on the specific characteristics of the service.

Today, industry leaders seek to outsource their business processes. Evaluating the potential of this technology depends on organizational contexts and cultural determinants, which fall outside the scope of this work. Within the cloud, there are typically two distinct roles: the Infrastructure

Provider (IP) and the Service Provider (SP). In essence, the IP provides the actual physical resources, while the SP delivers services derived from those resources. Ideally, both roles are fulfilled by organizations. Consequently, the SP can concentrate its efforts on service delivery without being burdened by implementation issues; thus, the SP only interacts with the users. The obligations and service guarantees in the business relationship between the IP and SP are explicitly defined in the Service Level Agreement (SLA).

In supply chain systems, the distinction between IP and SP can be mapped to a company's subsystems (SP) providing customer service, and one or more upstream layers (IP). Within the upstream layer, contracts exist between CRM participants, finding their counterpart in the SLA. From the customer's perspective, the SP is seen as a single supplier, while the SP is also responsible for managing its own CRM system (a collection of IPs). In this sense, the customer perceives the CRM management as a "black box".

4.1 Advantages of Utilizing Cloud Computing:

1. **High Scalability:** Ability to grow or shrink resources seamlessly.
2. **Unlimited Storage Capacity:** Removing physical hardware constraints for data.



3. **No Need for Manual Data Backups:** Automated redundancy within the cloud infrastructure.
4. **Universal Access to Software and Documents:** Access from any location or device.
5. **Access to the Latest Software Versions:** Automatic updates and use of the most optimized versions.
6. **Software Licensing Cost Savings:** Eliminating the need for purchasing expensive individual licenses for every user.
7. **Infrastructure Cost Reduction:** Significant savings in the procurement, installation, and maintenance of physical servers.
8. **Energy Efficiency:** Reducing expenditures on electricity and Uninterruptible Power Supply (UPS) systems.
9. **Streamlined Support:** Minimizing costs associated with the maintenance and support of end-user software.
10. **Data Storage Optimization:** Lowering the overhead costs of data preservation and storage management.
11. **Human Resource Efficiency:** Reducing the need for dedicated technical staff for server maintenance and onsite support.
12. **Outsourcing Network Services:** Delegating network support tasks to specialized providers to focus on core business activities.

5. The Proposed Solution

As previously discussed, CRM, e-CRM, and cloud computing each offer distinct advantages that, when applied to the insurance industry, can provide substantial capabilities for insurance firms. However, by integrating these technologies and approaches, companies can not only benefit from their individual strengths but also leverage the powerful synergy created by their combination. This paper introduces and proposes the implementation of Electronic Customer Relationship Management (e-CRM) software under cloud computing technology, delivered as e-CRM as a Service (e-CRMaaS), to enhance customer relationship management within the Iranian insurance industry.

Under current conditions in the insurance sector, agencies belonging to a single insurance provider often utilize their own proprietary and fragmented CRM software. Consequently, the parent insurance company is unable to access the decision-making data from its agencies to improve services or expand market share. To address this issue, this paper proposes a model in which the parent company develops e-CRM software specifically tailored for cloud environments and delivers



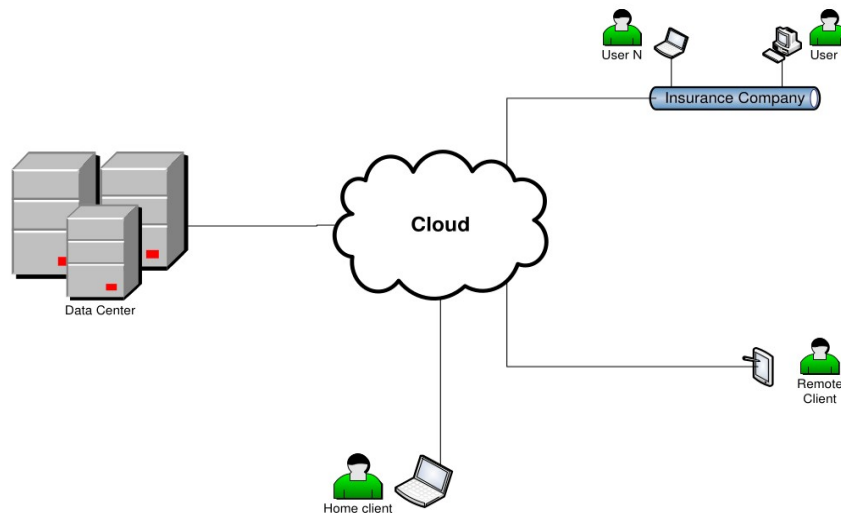
it to its agencies as e-CRMaaS. In this framework, the customer-centric tool (the e-CRM software) is managed centrally by the parent company, while all agencies can utilize the software independently.

In the insurance industry, it is vital for the parent company to have access to the granular customer data collected by agencies to analyze trends and improve customer-centric mechanisms, service delivery, market development, and agency support. Conversely, it is equally important for each insurance agent to ensure that other agents do not have access to their specific customer information. To achieve this, Data Isolation is employed for each agent's customer base. Since each agent's clients are exclusive to them, their data must not be accessible—intentionally or accidentally—to other agents. By utilizing this feature, the e-CRM software provided via cloud technology functions for each agent as if it were local, proprietary software, with their customer data isolated and hidden from other agents. This represents the primary advantage of Software as a Service (SaaS). Overall, this technology enables the simultaneous masking of customer data from other agencies while providing the central insurance headquarters with a comprehensive view of data across all agencies.

Furthermore, by leveraging cloud computing capabilities, both the e-CRM software and other enterprise applications—such as insurance policy issuance systems—can be delivered as Software as a Service (SaaS). This approach allows for the provision of specific operational modules tailored to each agency's requirements and the particular services they offer. Through this feature, the software is delivered to users in a highly customized manner. Consequently, if agencies are required to pay the central headquarters for software usage, they only pay for the specific services they consume (Pay-per-use).

For instance, an agency that exclusively provides auto and fire insurance has no need for life insurance modules. Therefore, when utilizing the e-CRM system provided by the central branch, they only incur costs for the received services, eliminating any unnecessary expenditures.

The model proposed in this paper is illustrated in the figure below:



Analysis of the Proposed Model: By implementing the proposed model, insurance companies can fully leverage the collective advantages of CRM, e-CRM, and cloud computing across their entire organizational hierarchy and agency networks. Under this framework, insurance personnel and users can securely connect to the company's Electronic Customer Relationship Management system from any location globally. This enables a robust remote work (telecommuting) capability, allowing staff to utilize the comprehensive resources provided by the system without geographical constraints.

One of the software solutions developed based on this conceptual idea and currently ready for deployment in the insurance industry is the "Gif" Customer Relationship Management System, produced by the Faraz Andishan-e Farda group.

Inter-Cloud Insurance Cooperation and Automated Outsourcing Model

The points mentioned above assume a scenario where a parent insurance company provides services exclusively to its own agencies. However, if a parent company lacks a specific service—such as Life Insurance—in its portfolio, it will be unable to fulfill the demands of its clients. This failure can lead to customer dissatisfaction and drive policyholders toward competitors.

To address this issue, which is particularly prevalent among startup and small-scale insurance firms, this paper proposes an advanced collaborative model. The core of this process is the coordination between the parent company, other insurance providers, and their respective agents to deliver seamless services to the end-user. In the proposed model, when a customer requests a service that the primary insurer cannot provide, the system automatically gathers customer data and identifies the appropriate insurance product.

This process occurs autonomously and transparently (behind the scenes) to find the best agency or even a different parent company capable of providing that service. Through a cloud-based interface, the system simultaneously scans all internal agencies, external parent companies, and their



representatives. The system then initiates a "Reverse Auction" among the qualified entities to identify the provider offering the best terms for the requested service.

If this internal search fails, the system resorts to Outsourcing by holding a public auction to find an external insurer. Consequently, without the customer's awareness, the system executes a contract with the selected agency (either intra-organizational or extra-organizational) and issues the policy.

A significant challenge in the current insurance industry is the lack of coordination among parent companies; they often operate as "Information Islands" with isolated customers and activities. By adopting the proposed model, companies no longer need to implement proprietary CRM systems, resulting in substantial savings in infrastructure, human resources, and time. All insurance data is integrated into a unified environment where the system intelligently identifies customer needs and suggests the most suitable insurer.

It is crucial to emphasize that while the data is integrated, the information of each company and its agencies remains masked and strictly isolated from others, preventing any possibility of data misuse. For example, if a customer requests Service X from Company Y, and that company does not offer it, the system negotiates with Company J. After finalizing the contract, the service is delivered

to the customer under the brand of Company Y. Effectively, insurance firms can virtually utilize the branches of other companies to fulfill demands they cannot meet alone. Similarly, this allows a customer insured by Company U to receive compensation or claim settlements from Company W, while the companies perform their financial settlements internally through the cloud platform.

Dynamic Scalability in Emergency Scenarios In this model, during specific periods when a sudden surge in demand for a particular insurance coverage occurs—for instance, due to unforeseen natural disasters—the cloud's scalability feature allows the insurer to rapidly apply necessary changes to the system. By dynamically increasing resources, the provider can efficiently handle the spike in requests and deliver the required services without system degradation.

6. Conclusion

We have determined that Customer Relationship Management can be effectively transformed into Web Services. Once this transition is established, the Service-Oriented Computing (SOC) infrastructure and Cloud platforms become fully accessible for CRM systems. In our primary model, we utilize Service Middleware, which is primarily designed to provide coordinated service delivery.

The implementation and conversion of CRM functions into web services result in the availability of supply chain services through standard electronic interfaces. In this context, providing equal access to available resources from third parties—particularly for Small and Medium-sized Enterprises (SMEs)—becomes feasible. This approach enables smaller firms to compete and integrate within the broader insurance ecosystem.



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