

Original Article

# Integration of Salesforce Einstein AI for Intelligent Case Routing in Healthcare Systems

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**Abstract:** The constantly growing demands in the healthcare sector have increased the need to possess intelligent and scalable and secure systems to improve the quality of services, efficiency in operations, and patient outcomes. Healthcare routing of cases is a significant factor that defines how much clinical and administrative processes can be utilized fully as they are now able to allocate cases to the appropriate resources depending on urgency, expertise and needs of compliance. The author of the paper gives a detailed observation of the principles of healthcare case routing, the functional requirements, the non-functional requirements, and the artificial intelligence application in the modern healthcare setting. In particular, this paper discusses how Salesforce Einstein Copilot can be applicable in practice as an AI-based assistant in a healthcare CRM environment to support intelligent decision-making, automation, and personal recommendations. The proposed architecture takes into account such significant components as the user interface, AI engine, data layer, and integration layer that enable the application to connect Electronic Health Record (EHR) systems without complications and implement the HL7 FHIR standards. Moreover, the paper addresses the topic of safe data sharing, adherence to healthcare policies including HIPAA and GDPR, and advantages of Salesforce Health Cloud integration with EHR systems to obtain cohesive patient records, better care coordination, and patient engagement. The results prove that AI-based CRM systems can greatly improve the delivery of health care services by increasing the accuracy, scalability, transparency, and compliance with the regulatory framework and promoting the use of data-driven clinical and administrative decision-making.

**Keywords:** Healthcare Case Routing, Salesforce Einstein Copilot, Artificial Intelligence, Healthcare CRM, Electronic Health Records (EHR), Health Cloud.

## I. INTRODUCTION

Care that is essential is frequently not provided, and care that is provided is frequently unimportant." One of the subjects covered in the workshop on a new strategy for fragmented healthcare—the Learning Healthcare System (LHS)—was this contentious realization. Surprisingly, it can take up to 17 years before promising research findings are used in clinical settings and begin to enhance patient care. A learning healthcare system is structured to produce and implement optimal evidence for collaborative healthcare decision-making [1] developed by patients and clinicians to encourage discovery as a basic consequence of patient care [2], aiming at ensuring innovation, quality, safety, and value in healthcare. The Home Healthcare Routing and Scheduling issue (HHCRSP) contains components of the nurse rostering issue (NRP) and the vehicle routing problem with time windows (VRPTW). These are referred to as combinatorial optimization challenges. HHC constitutes a segment of health services, characterised by the provision of essential care to patients and their families inside the home environment [3]. The HHC aims at maximizing the access to treatment at minimum disruption of the daily life, minimizing the consequences of illnesses and disabilities, and boosting living conditions.

The Salesforce is a popular customer relationship management (CRM) system [4] that utilizes AI and ML to deliver customer insights and predictive analytics. This abstract examines how the introduction of AI and ML at Salesforce can transform the way businesses are run through predictive and actionable insights. The force behind this combination is Salesforce Einstein AI framework. Einstein is a combination of AI and Salesforce technology, which allows organisations to apply predictive analytics without the need of having data science skills. Companies can also use Einstein to find patterns, run data analysis automatically and create insights about large volumes of data [5]. The Salesforce cloud ecosystem is illustrated in Figure. 1 where the core Salesforce platform is at the centre of integrating various cloud services and AI in order to facilitate coherent, intelligent, and scalable operations.

The present Salesforce Einstein Artificial Intelligence (AI) is regarded as a major breakthrough. Parmar (2023) asserts that Salesforce Einstein AI algorithms can rapidly assess vast amounts of data. This program may be used to identify trends, themes, and patterns in medical data. Salesforce Einstein AI may be employed to assess the arrangement of health records. It's also important to note that Salesforce Einstein AI is a helpful tool because to its capacity to handle and analyze vast volumes of data [6].





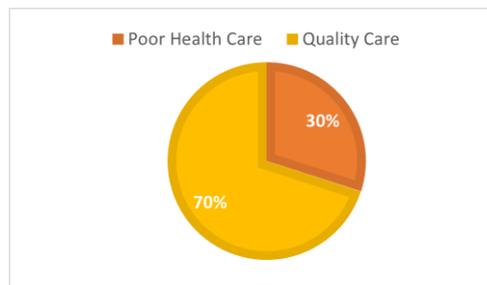
**Figure 1 : Components of the Salesforce Cloud Environment**

**A. Structure of the Paper**

This paper is organized as follows. Section II describes healthcare case routing concepts and requirements, Section III presents Salesforce Einstein Copilot concepts and architecture, Section IV discusses the integration of Einstein AI with healthcare systems, Section V reviews related work, Section VI concludes the paper and outlines future work.

**II. HEALTHCARE CASE ROUTING: CONCEPTS AND REQUIREMENTS**

It is certain that societies are incessantly looking for improving their health standards. These requirements can be reached by developing various public or commercial healthcare services. Healthcare activities may lead to several forms of wastes that may have serious implications on human health and on the environment. During the previous several years, there was an upsurge in public awareness regarding the worldwide handling of healthcare waste [7]. Healthcare rubbish, sometimes referred to as medical waste, is a unique type of junk that offers major health and environmental dangers, often encompassing sharp objects, human tissues or bodily parts, and many pathogenic elements. The emphasis on supporting geriatric care has changed from a largely institutional context, such as nursing or rest homes, to being given at patients' dwellings. Home healthcare services are now provided by trained caregivers who visit patients in their homes and provide certain services according to their requirements before moving on to the next patient [8]. The process of creating such a service includes determining the routing factor and coordinating the services with the patient's time windows.



**Figure 2 : People Having Quality Chart**

Figure 2 indicates that, out of all the healthcare cases, 70% end up having poor health care whereas only 30% are of quality care and this leaves a huge gap in the effectiveness of the healthcare services.

**A. Healthcare System Flow**

Case routing in a context of a healthcare system is an automated or semi-automated decision-making process in which case attributes, such as patient information, clinical urgency, type of case, expertise of the providers, workload [9], or compliance constraints are analyzed to route cases to the best clinical or administrative receiver (e.g. physicians, nurses, care coordinators, support agents or automated services).

*a) Data Acquisition*

This component includes an Arduino Uno ATmega 328P microprocessor, a digital temperature sensor (DS18B20), and a heart rate sensor. After this block detects the data, the data collecting procedure is completed [10]. The HLK-RM04 Serial to WiFi Module receives the most recent processed real-time data for additional processing.

b) *Cloud System*

Data is transferred via WiFi from the HLK-RM04 Serial-to-WiFi Module to the MySQL server [11]. It employs the HTTP protocol and offers serial communication. All of the data sent by the WiFi module is store in this database.

c) *Real-Time Health Portal*

The real health portal now allows users to examine the data and access the database. This solution uses an Android app that was made in Java and provides database access so that users may examine data from anywhere at any time. It may install this program on a PC, laptop, tablet, and Android smartphone. In this case, notifications are sent to the user's mobile device if the data is aberrant, and the caregiver or healthcare provider may also get mail.

**B. Functional Requirements in Intelligent Healthcare**

The following are typical functional requirements in health care systems under the broad areas of operation. They are generally applied when formulating EHR, case-management, patient portal, or healthcare IT platform requirements.

a) *Personalized Patient Management in Healthcare*

In the near future, clinical guidelines, diagnostic tools, and patient triage are appropriately revised in response to new information gleaned from big data, enabling more specialized and customized treatment to enhance patient outcomes [12]. Big Data enable feasible to deliver finest and modified patient care.

b) *Clinical Documentation and Care Delivery*

Accurate documenting of patient treatment and diagnosis in medical records is vital for establishing proper reimbursement and quality standards, as well as ensuring the correctness of publicly available data [13]. Accurate documenting of patient care and acuity is vital for establishing appropriate remuneration and the accuracy of key publicly declared quality indicators [14].

c) *Appointment and Scheduling*

Appointment scheduling is extensively utilized in outpatient clinics and various healthcare establishments. Finding a plan to handle the unpredictability and variety of service time and patient attendance is a scheduling difficulty. Prolonged wait periods for patients and unproductive intervals for healthcare professionals stem from an insufficient strategy [15]. Consequently, these factors impact the perceived quality, cost-effectiveness, and capacity of healthcare services.

d) *Patient Service Requests*

Developing strategies to help primary care physicians handle patient requests may benefit from a comprehension of characteristics that signify whether patients submit requests. In the end, health systems could give priority to these therapies for doctors that treat patient panels with a higher propensity to make requests [16]. Additionally, given the correlations between patient happiness and request fulfillment, it could be necessary to modify physician-level patient experience metrics to account for patient attributes linked to increased request frequency.

e) *Care Coordination and Management*

The information acquired and aggregated through these interactions are utilized by the care coordination and care management teams to peel the onion, impediments found, and gaps in care revealed. An ideal care plan can only be created by utilizing the expertise of the whole care team, but especially that of case managers [17]. This care plan comprises precise objectives, tasks, and activities targeted at engaging members in desirable behaviors to improve health outcomes, boost efficiency, and save cost.

**C. Non-Functional Requirements in Healthcare**

The following are non-functional requirements in health care systems under the broad areas of operation. They are generally applied when formulating EHR, case-management, patient portal, or healthcare IT platform requirements:

a) *Scalability*

Scalability in the healthcare system is defined as the capacity of a healthcare system to be used by increasing numbers of people, patients and volumes of data without performance reduction. Clinicians, administrative, and patients should be able to all use the system at the same time and the system must be horizontally and vertically scalable to meet the needs of additional clinical encounters, billing transactions, and long-term data storage. Although the system may be at its prime efficiency times like clinic hours or when submitting insurance claims, it still has to ensure that it has acceptable response times and availability.

b) *Accuracy*

Accuracy is an important non-functional requirement since it is the dependability of healthcare decisions made based on precise and consistent data. The system should also maintain the integrity and accuracy of clinical, administrative, and financial data by performing a validation check, restricting the entry of data and maintaining a data consistency rule. It must reduce the occurrence of errors like duplicate records, wrong coding, or omission of clinical information and offer mechanisms of

identifying, recording, and highlighting irregularities. In the case of clinical decision-making systems, accuracy must also be done using validated and up to date medical knowledge and guidelines.

c) *Explainability*

Explainability is critical in healthcare systems that apply automated rules or algorithms to support decision making, prioritize or recommend. The system must also be in a position to give a clear understanding of why a specific alert or recommendation was aroused or decision made so that the user can know the logic, input data or rules behind it. The explanations are to be in a user-friendly format depending on the role of the user which could be clinicians, administrators or patients and they should be traceable and auditable to address clinical governance and regulatory expectations.

Adherence to laws, including HIPAA and GDPR: This guarantees the legal and ethical processing of sensitive health data. The system should defend against any type of confidentiality, integrity, and availability loss of patient data in terms of access control, encryption, and audit logging [18]. It must implement role-based access and the principle of least privilege, assist with patient rights regarding data privacy and correction and keep the record of all data access and changes. Also, the system should contain breach detection and reporting mechanisms, and incident response mechanisms, as per the relevant regulatory standards. Table I gives an overview of the essential non-functional requirements of healthcare information systems and indicates their purpose, essentials, areas of impact, and stakeholders involved in the process to underscore the importance of the requirements in guaranteeing the performance of the systems, reliability of data, transparency, and compliance with applicable regulations.

**Table 1 : Key Non-Functional Requirements for Healthcare Information Systems**

Non-Functional Requirement	Purpose	Key Aspects	Impact Area	Stakeholders
Scalability	Handle system growth	Concurrent users, data volume, peak load handling	System performance, availability	Clinicians, patients, IT administrators
Accuracy	Ensure reliable data	Data validation, consistency, error prevention	Clinical safety, billing correctness	Clinicians, billing staff, patients
Explainability	Support transparency	Decision logic visibility, traceability, auditability	Trust, governance, compliance	Clinicians, administrators, regulators
Compliance (HIPAA & GDPR)	Meet legal requirements	Access control, encryption, audit logs, patient rights	Privacy, security, legal adherence	Patients, compliance officers, regulators

**III. SALESFORCE EINSTEIN COPILOT: CORE CONCEPTS AND FUNCTIONALITIES**

Salesforce Einstein Copilot revolutionize the industry thanks to an AI-powered tool. By providing contextual assistance and data that generates intelligent recommendations, it restructures CRM through task automation—routine activities—utilizing its proprietary internal AI. The processes even improve with the addition of new machine learning methods and the ability to combine natural language processing naturally, allowing the user to make an informed decision based on the data. This section outlines the design of Einstein Copilot, its elements and components and the way they are connected to enable users to simply utilize Salesforce platform.

**A. Understanding Salesforce Einstein Copilot**

Salesforce Einstein Copilot is a sophisticated AI-powered assistant which is integrated with the Salesforce platform, and which uses advanced AI capacities to transform the customer experience. The fundamental principle behind this solution is that Einstein Copilot applies natural language processing (NLP) to process the user query and provide real-time support to the user through the interpretation process and also give individualized suggestions to each user [19].

- Leveraging historical data and user behavior: To achieve it, Einstein Copilot summarizes vast amounts of historical information and user exchange. It applies ML algorithms, to project the requirements of the users and execute routines and provide pragmatic insights, including recommendations for further optimal activities, and automate the data input procedure for these actions.
- Enhancing operational efficiency: The integration of Salesforce with Einstein Copilot significantly improves operational efficiency. It results to high productivity of the user in that it frees the time of the user to enable him or her to engage in strategic actions rather than walking through the tedious ones.

- Learning and adaptive abilities: The learning and adaptation abilities of Einstein Copilot ensure the continued improvement in performance. The more advanced the assistance it provides is, the smarter its suggestions are, and the more pleasant user experiences are as it becomes familiar with the behavior of users and trends within the organization.

### B. Architectural Overview of the System

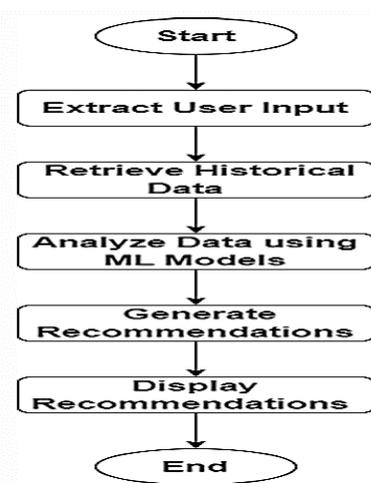
The integration of Salesforce Einstein Copilot within the Salesforce ecosystem and its working mechanisms are not unfamiliar; however, a more efficient method of pursuing them would be to look at its architectural model. There are also many interrelations among several elements in a complex manner to drive the performance of this AI-implemented assistant.

- The user: interface acts as a critical point of connect between the user and the architecture [20]. The Lightning Experience from Salesforce offers direct integration of Einstein Copilot within a healthcare CRM environment. Users may interact User Interface (UI): with Copilot's contextual assistance, intelligent recommended actions, and automated healthcare CRM features using this interface. The user interface's simplicity and reactivity facilitate effortless and efficient interaction with Copilot.
- AI Engine: The AI Engine is the crucial element of the working mechanism of Einstein Copilot. It is an engine that accept the input of the user, and process it and give an insight. It uses the most recent NLP and ML algorithms to handle the queries made by the users, understand them and provide adequate recommendations. The AI Engine receives its training according to the interactions and previous data. It enhances algorithms in a manner that a new version is generated every time, to give more accurate and relevant results.
- Data Layer: The Data Layer is another crucial component of this system. It also encompasses third-party data and Salesforce, on which Einstein Copilot is based to acquire raw material information to process the information to generate conclusions. Knowing how to retrieve and analyze such data, Copilot is capable of giving personal advice and automating the process because of the general awareness about user behaviour and interaction history. The combination of several data streams would allow the AI Engine to obtain holistic information, therefore, providing useful and practical findings.
- Integration Layer: The Integration Layer manages the connecting of Einstein Copilot to various Salesforce services and external platforms. It oversees Copilot's interaction with several Salesforce modules and third-party APIs. Copilot can be easily integrated into the rest of the Salesforce ecosystem with an operational Integration Layer which provides a seamless and integrated user experience. The architecture design for integrating AI with Salesforce is shown in Figure 3 below.

Salesforce Einstein Copilot is an intricate framework that employs cutting-edge AI technologies to improve CRM connections. Copilot enhances business processes for end users through its intuitive interface, robust AI engine, comprehensive data layer, and flexible integration, delivering a seamless and transformative experience via process automation, essential business insights and efficiency improvement.

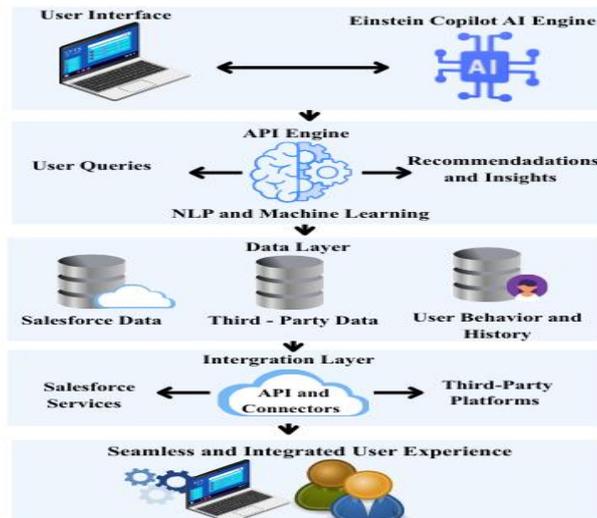
### C. Workflow and Pseudocode

Suppose a salesperson wants to provide a well-informed recommendation. The workflow flowchart below represents how they worked on this task with the help of the Einstein Copilot functionality.



**Figure 3 : Flowchart Of Integrating Einstein Copilot In Intelligent Recommendations**

Figure 3 demonstrates the process of an AI-powered recommendation, in which the first step is to extract user input, and then, the subsequent step is the retrieval of pertinent historical data.



**Figure 4 : The Architectural Diagram of Integrating AI with Salesforce**

This synthesized information is then processed with the help of machine learning models to produce the right recommendations, which are then presented to the user, and the process comes to an end. Table II shows the pseudocode for the integration of the Einstein copilot.

**Table 2 : Pseudocode for Integrating Einstein Copilot in Intelligent Recommendations**

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Function generateRecommendation(user input):
#Step 1: Extract user input data
inputData = extractData(userInput)
# Step 2: Retrieve historical data
historicalData = fetchHistoricalData(inputData)
# Step 3: Analyze data using ML models
analysisResults = analyzeData(inputData, historicalData)
# Step 4: Generate recommendations based on analysis
recommendations = createRecommendations(analysisResults)
# Step 5: Provide recommendations to user
displayRecommendations(recommendations)
End Function

Function extractData(userInput):
# Extract relevant data from user input
return parsedData

Function fetchHistoricalData(inputData):
# Query database for historical data related to inputData
return historicalData

Function analyzeData(inputData, historicalData):
# Apply ML models to analyze data
return analysisResults

Function createRecommendations(analysisResults):
# Create actionable recommendations based on analysisResults
return recommendations

Function displayRecommendations(recommendations):
# Present recommendations to the user via the UI
showOnUI(recommendations)
    
```

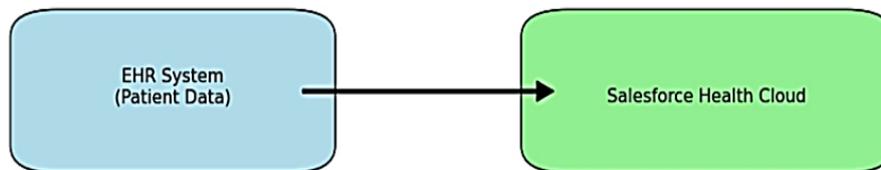
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#### IV. INTEGRATION OF SALESFORCE EINSTEIN AI IN HEALTHCARE SYSTEMS

Medical data management is becoming increasingly important for offering patients high-quality care as a result of the rapid digitization of healthcare. EHR systems allow the administration and storage of patient medical data, are used to store and administer whole healthcare information systems. This solution gives healthcare workers who often contend with perilous and fragmented patient data and medical records a comprehensive solution by enabling them to handle EHR systems with Salesforce Health Cloud. Healthcare companies may enhance patient engagement, care team communication, and care quality using Salesforce. In modern culture, confidence in the medical and healthcare industry is closely associated with the secrecy of patient data. The Health Insurance Portability and Accountability Act of 1996. It is the duty of every company that works with protected health information. As the act's name suggests, the information and all of its records technically pertain to a person's past, current, or future health state.

##### A. Overview of Salesforce Health Cloud

Salesforce Health Cloud is a patient relationship management system application based upon the Salesforce platform, built on top of regular patient health records, and is used to help patients engage and interact with them, coordinate care, and engage with the patient as a whole. Data from a strong integration with EHR systems and other sources is compiled on a single page by Health Cloud. Figure 5 shows the health cloud data flow to EHR.



**Figure 5 : EHR to Salesforce Health Cloud Data Flow**

##### B. Steps for EHR Integration

There are several crucial processes involved in implementing EHR systems on Salesforce Health Cloud, including:

###### a) Data Mapping and Transformation

The initial stage in integrating Salesforce with EHR systems involves transferring the data model of the EHR system to that of Salesforce. Local medical data tables provide patient test results, pharmaceutical information, diagnoses, treatments, prescriptions, and vital signs, which are offered by several EHR systems. The relevant Salesforce Health Cloud variables must be matched to this medical data.

###### b) Apis for Data Segmentation

Salesforce Health Cloud and EHR systems may communicate data using suitable application programming interfaces (APIs). Salesforce has announced its adherence to many API standards, including HL7 FHIR (Fast Healthcare Interoperability Resources), a contemporary standard for the inter-system transmission of healthcare data. Healthcare personnel may retain attention by utilizing real-time data transfers from an integration of the EHR system with Salesforce Health Cloud using an API.

###### c) Secure Data Transfer

To enable the safe exchange of private patient information, the integration must use JWT for authentication and OAuth 2.0 for authorization. This satisfies HIPAA and other healthcare data privacy regulations by providing strong encryption for patient data in transit and at rest.

###### d) Data Reconciliation and Synchronization

Massive volumes of data are imported into Salesforce, frequently via the EHR system. To ensure that the data is accurate and current, a process known as "extraction, transformation, and reconciliation" is employed: "extraction" denotes the bulk copying of data, this occurs when data from the EHR is transmitted to Salesforce Health Cloud [21]. The term "transformation" describes the modifications that might be made while importing the data to make it fit the target system whereas Reconciliation refers to the process of ensuring that what is imported into the target system is consistent with the data in the source system. In order to have real time functionality between the two systems firms can utilize multiple methods of synchronization.

###### e) Customization and Configuration

Salesforce Health Cloud may be readily customized to support different research or general healthcare operations. through the creation of additional components, fields, and record types that match the EHR data model and enable a smooth integration of data.

### C. Perks of Integrating EHR with Salesforce Health Cloud

Salesforce Health Cloud has a number of advantages in connection with EHR in healthcare. This section presents the following benefits:

#### a) Unified Patient View

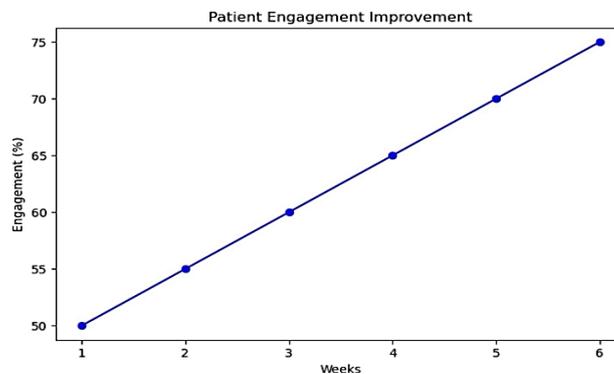
A unified perspective on the patient is one of the most desirable effects of combining Salesforce Health Cloud with EHR. By cross-referencing the information on various systems, the healthcare professional has a clear picture of the medical background, ongoing treatment, and future care of the patient. This provides more targeted financial management, coordination, and care planning.

#### b) Improved Care Coordination

The characteristics of Salesforce Health Cloud allow care teams to cooperate to give patients the essential care at the correct timing, syncing care providers during the care journey of each patient and allowing the tracing of all contacts integrating sales workers, primary care, and specialty providers under one safe and encrypted lock. These tools interact effortlessly with EHR data within Health Cloud.

#### c) Enhanced Patient Engagement

Salesforce Health Cloud additionally includes patient-related functionality, such as appointment reminders, automated medication and follow-up adherence and follow-up. Reminders may be tailored to individual patient's requirements in the medical field using EHR data, improving patient compliance and engagement. The improvement graph is shown in Figure 6.



**Figure 6 : Patient Engagement Improvement**

## V. LITERATURE REVIEW

This section provides an overview of the latest research on Healthcare Optimization and Intelligent Systems, and the conclusion is presented in Table III, which highlights key methods and contributions.

Lin et al. (2025) they propose crowdsourced home healthcare service (CHHS) platforms, where carers (including nurses, personal care attendants, and housekeepers) from different locations (rather than centralized institutions) offer diverse home healthcare services to caretakers at home. The CHHS system using cloud computing enables real-time, dynamic, and large-scale caretaker to caregiver matching depending on their preferences and constraints, and calculates the plan of caregivers rostering and routing, including the NP-hard nurse rostering issue (NRP) and the vehicle routing problem (VRP). [22].

Parvathy et al. (2025) proposed that Customer Relationship Management (CRM) combined with AI improve the precision of marketing and that it also reduce operational expenses as it eliminates human segmentation and projections. A flexible ability to change with changing consumer tastes gives the marketers a competitive advantage. Agile and responsive marketing structures are facilitated by Salesforce Einstein that has inbuilt artificial language processing, image recognition and analytics. Deciding on the future of advertising in the modern digital landscape, AI capabilities can allow this platform to deliver scalable, personalized, and quantified marketing outcomes that are essential to long-term success [23].

Sbai, Nouaouri and Krichen (2024) presented a new design based on the concurrent Spark-GA and big data analytics for the DHWVRP. The design continuously dynamically reconfigures the transportation state and rates of trash creation by incorporating real-time information streams of multiple sources. Nevertheless, decision-making can be made more efficient through Spark-GA's real-time processing. The Spark-GA optimizes routes used in collection based on the changing data, taking into account such aspects as time constraints, truck capacity and quantity of trash. When compared to conventional approaches, the results show notable gains in route efficiency and resource use [24].

Kassem et al. (2023) Deliver flexible VNF to implement security requirements across diverse data sharing scenarios, meeting all concerns. They explain a network orchestrator that is cloud-native and developed on a cluster mesh architecture

with several nodes for adaptable and dynamic container scheduling. Before performing Service, the suggested method evaluates the desired data-sharing use case, relevant legislation, and infrastructure considerations while building routing configurations with little human involvement and Function Chaining (SFC). Consequently, they provide adaptable network that is cognisant of policies, requirements, and resources orchestration for digital health twin application contexts [25].

Ma et al. (2023) suggested an HHCSRП that takes into account a number of care facilities where a group of clients (such as sick and the elderly) need to be allocated to care facilities. Then, caregivers offer a variety of services to clients in various locations. In order to minimize service costs and delays, this article develops an optimization model with several goals by taking into account talent matching, client appointment times, and caregiver workload balance. They then use an optimization strategy utilizing a brainstorming process that incorporates the characteristics of the investigated HHCSRП and certain multi-objective search mechanisms (MOBSO) [26].

Chhabra and Barwar (2022) Employed SUMO and NS-3 to alter the through traffic factor in Jodhpur city to assess the performance of VANET routing protocols, notably GPSR, MM-GPSR, and PA-GPSR, in both dense urban and highway contexts. These protocols' performance is assessed using a variety of metrics, including throughput, average end-to-end latency, and packet loss rate. This research on GPSR-based routing protocols may assist society since it may be utilized to healthcare apps that facilitate the selection of optimal routing options in emergencies scenarios so that the ambulance can offer patients with quick services in an immediate environment [27]

**Table 3 : Summary of Related Work in Healthcare Optimization and Intelligent Systems**

Reference	Proposed System	Application Domain	Methods Used	Problem Addressed	Key Contributions	Challenges
Lin et al. (2025)	Crowdsourcing Home Healthcare Service (CHHS) system	Home healthcare service management	Cloud computing, preference-based matching, optimization	Efficient caregiver-caretaker matching, nurse rostering and routing	Enables real-time, large-scale matching and optimized rostering and routing in home healthcare	NP-hard complexity of NRP and VRP; scalability and real-time computation
Parvathy et al. (2025)	AI-enabled CRM using Salesforce Einstein	Healthcare marketing and customer engagement	AI, NLP, image recognition, analytics	Inaccurate segmentation, forecasting errors, high operational costs	Improves marketing accuracy, personalization, and scalability while reducing manual effort	Dependence on data quality; explainability of AI-driven decisions
Sbai et al. (2024)	Big data-driven healthcare waste routing architecture	Healthcare waste management	Spark, Genetic Algorithm, real-time data analytics	Dynamic waste collection and transportation routing	Enhances route efficiency and resource utilization using real-time optimization	High computational overhead; real-time data processing complexity
Kassem et al. (2023)	Adaptive cloud-native network orchestration framework	Digital health data sharing and security	VNFs, Service Function Chaining, cloud-native orchestration	Secure and flexible data sharing under varying policies	Policy-aware, resource-aware, and automated network orchestration	Infrastructure complexity; deployment and management overhead
Ma et al. (2023)	Multi-objective HHCSRП optimization model	Home healthcare service planning	Brain Storm Optimization (MOBSO), multi-objective optimization	Service assignment, scheduling, and workload balancing	Minimizes service cost and delay while considering skills and time constraints	Scalability for large insta

## VI. CONCLUSION AND FUTURE WORK

Health care is a significant contributor to climate change, which is predicted to cause considerable illness and mortality in the future decades. Health care professionals are committed to the "first, do no harm" philosophy, which includes minimizing any indirect negative effects of their medical practice. In order to lessen the carbon footprint of their practices, healthcare professionals can adopt the behaviours and actions listed here, several of which also offer a financial advantage in the form of cheaper utility and equipment expenditures. This paper has revealed that smart healthcare case routing with the help of artificial intelligence and cloud-based solutions is crucial towards enhancing the efficiency of the healthcare systems, their quality, and reliability improvement. The paper presents the significance of scalability, accuracy, explainability and regulatory compliance in healthcare information systems by examining the concepts of healthcare routing, functional and non-functional requirements, as well as real-life issues. Salesforce Einstein Copilot integration with Salesforce Health Cloud and EHR systems allow intelligent automation and data-driven suggestions and smooth coordination of care with guaranteeing secure and compliant data transfer. The suggested architectural architecture demonstrates the way in which AI-based CRM solutions can optimize clinical workflows, patient interactions, and operations decision-making. Altogether, this research paper concludes that the use of AI-powered medical platforms might improve the standard of treatment provided and expedite the resource management process, and provide patient-centred and data-driven healthcare services to an ever-digitised healthcare ecosystem.

The future progress of the work will be the implementation and testing of the suggested framework in practical healthcare facilities, the introduction of more advanced explainable AI models, real-time predictive analytics, and more comprehensive interoperability with various EHRs to further streamline clinical decision making, automation, and patient-centric care delivery.

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