Communication Server to have IVR, Text chatting, Video Chatting, Secure messaging for a care co-ordination team.

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Abstract— **Care coordination involves designedly organizing patient care activities and sharing information among all of the care team members concerned with a patient's care to achieve safer and more effective care. This means that the patient's records and details plus medical treatment are known ahead of time and communicated at the right time to the right people, and that this Data is used to make safe, appropriate, and effective care to the patient. Appropriate medical treatment for people with multiple diseases requires that clinicians be able to communicate with one another about their patients. Unfortunately, in today's care co-ordination system many clinicians are unable to communicate easily and efficiently with their colleagues. So for this we are implementing a communication server which will provide IVR, TEXT CHATTING, VIDEO CHATTING. Using WebRTC and JSP Java Project.**

Index Terms— **WebRTC, Signaling Server, WEB Socket, Communication Server.**

I. INTRODUCTION

Our aim is to create communication server for IVR,text chatting, video chatting. It will be a care co-ordination system having a set of doctors, physicians, pharmacists, family members of patients , insurance provider, lab co-ordinator , nurse last but not the list patients so that they can communicate online or offline .

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In our system we are trying to replace the traditional way of patient's interaction and communication with doctors, Pharmacist, Nurse and Family members.In proposed system an attempt is made to develop and deploy a communication server through which a care team can see the reports of patients, know the medicines and treatment details of the patient.

The care team can communicate using IVR i.e. offline based communication. Then Text chatting and video chatting features.

Care co-ordination system primarily provides a hearty environment between the patients his/her family and every single person related to the treatment. It provides various features like mention above Text chatting, IVR, video chatting and reminder services.

Procedure for Paper Submission

II. LITERATURE SURVEY

1. Evolution of Communication Server

A. In Traditional way

Problems with the Current Paper-Based System Paper-based information systems still used by most clinicians are not well suited to good-quality care, specially for people with multiple chronic conditions (Raymond and Doled 2002).This paper-based systems support to the clinical care are limited as information storage and get to the systems also having high rates of loss in retrieval and illegibility; that human memory–based medicine is increasingly unreliable system; that the capture of clinical information has become necessary for billing, accounting, appointment scheduling, prescription refills, and results reporting; and that consumers', patient expectations for improved care and service are rising. Their proposed system was the creation of electronic clinical data information systems.

Increasing, the medical care field is recognizing that it is far behind most other clinical industries in using electronic medical data (Short ell et al. 1996). At one side of the continuum is the huge visible and advanced use of strategy such as the remote sensing of main functions and the revolution in radiology and also surgery based on the ability to digitalize and communication information.

Some service provider groups recognized the benefits of better communication years ago and developed a prototype EHR model. The Computer-Stored Ambulatory Record (COSTAR), one of the first EHRs, was created in the early 1970s at Massachusetts General Hospital. It is technically feasible to digitally connect stand-alone electronic data systems so that an office-based physician, doctors can have quick access to results of diagnostic tests, electronic prescribing, body image, and dictated reports of visits or consultations from any other site.[1].

2. Why to Implement care co-ordination system

1. Physicians and their professionals should agree on a health record, such as the Continuity of Care coordination Record, that will provides facility of exchange clinical information among health providers, care coordination. The ability of physicians to have an up-to-date summary of clinical information to inform their decisions for care can improve patient care by reducing the redundancy of various diagnostic tests and avoiding pharmacy and possibly adverse drug events. Physicians, doctors will spend less time taking on previous of a recent medical visit, treatment and give the more time on the current problem and the taking care.

2. The common health record can be sent electronically, through secure Web sites or e-mail, web application, or patients can carry a disk with them. The record can be processed in a common word-processing format.

3. Preparing and transferring a Continuity of Care Record is recommended for patient with a chronic disease or those who may be consulting several different health providers. Less critical patients may need a Continuity of Care Record only for their own use.

4. A patient goes to Doctor for treatment he/she gives them medicines and required treatment which may include lab test

and need for nurse and other important people. The patient records were maintained by each of the care team member separately. This was tedious and even for care team to know the details of treatment like is medicine taken properly as the reports given its results even the family members will get to know about everything instantly

Using health care co-ordination system we can overcome all the drawbacks described and explained above. The health care co-ordination system signalize the communication between the patients, family members and doctor using a care co-ordination system the communication server will be helpful to establish both online and offline communication.

If family members want to see any kind of update or reports of patient then they can have easily available. The health care co-ordination also provides time to time reminders to the patients so the patient will never miss any appointment. Doctors can easily check the status of patient's health using Care co-ordination system

III. PROPOSED SYSTEM

Introduction to Proposed System

Fig 1: Care Co-ordination Team [5]

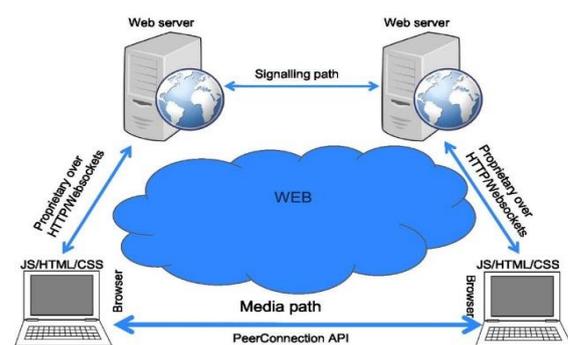In the above figure it is shown how one user interacts with the other.

Fig 2: System Architecture [5]

A. IVR Services

Interactive voice response (IVR) system works when a customer calls with a question about their problem or to talk to a support specialist, a calm pre-recorded voice guides them through the menu options, using speech-recognition software to understand the needs and meaning of "support." If the customer wants to talk to a "real" customer service representative he can always press zero. Pharmacies use IVRs for refilling prescriptions. And just about everybody uses IVRs to route calls to separate extensions or to access the company phone directory.

An interactive voice response system (IVRS) is easy, yet effective tale-health application that improves access to health care system by continuing care not only by hospital setting, with specially tailored programs that are easily accessible to patients around the clock. Besides educated medical professional healthcare Industry is putting lots of effort and Research to avail technology that can be used for the advancement of the healthcare sector.

Interactive Voice Response System (IVRS) is a new concept that can be explored in healthcare industry also. SO far IVR System/IVRS was used in other industry domains such as call centre technology. But of lately it is also implemented in healthcare sector. Sectors can be used in healthcare sector vis-à-vis hospitals, physicians, nursing homes, diagnostic laboratories, pharmacies, medical device business and other components for efficient workflow.

It started with a speech synthesis project at Bell Labs in 1936 that resulted in a device called "the Voder" which was presented at the 1939 World's Fair. A link between speech and mathematics resulted in a breakthrough in the year 1970s. Leonard E. Baum, and Lloyd R. Welch, invented a way to recognition based on a statistical concept called the Hidden Markov Model. In 1961, Bell System invented a new tone dialing methodology. Bell disclosed the first telephone that could dial area codes using DTMF technology at the Seattle World Fair in 1962. DTMF telephones enabled the use of in-band signaling, i.e., they transmit audible tones in the same 300 Hz to 3.4 kHz range engaged by the human voice. The blueprint for IVR was born.

In telecommunications, IVR system allows customers to interact with a company's host system via a telephone keypad or by speech recognition, after which they can facility, their own query by following the IVR dialogue. IVR systems can interact with pre-recorded or kinetically generated audio to further direct users on how to proceed. IVR applications can be used to control almost any method where the interface can be broken down into a series of simple interactions. IVR systems present in the network are sized to handle large call volumes.

It is basic requirement in industries that have recently entered the telecommunications industry to refer to an automated attendant as an IVR. The terms and conditions, however, are unique and mean different things to traditional telecommunications professionals, whereas upcoming telephony and VoIP professionals often use the term IVR as a catch-all to signify any kind of telephony menu, even a basic automated attendant [2].

B. Video chatting and conferencing

In health care, nothing is more important than giving your patients the care they need. But for many home bound or hard-to-reach patients, visiting a physician can be a challenge. Medical video conferencing solutions make doctor, patient and expert access as easy as dialing a phone. Video conferencing call with multiple doctors for a real-time diagnosis is possible. Taking a deep look at how one healthcare provider, JSA Health, uses HD video to connect doctors with their patients.

Video conferencing (VC) is the transmission of a video conference (also known as a video conference or video teleconference) by a set of telecommunication technologies which makes it possible for two or more locations to communicate by simultaneous two-way video and audio transmissions. It is also called as 'visual collaboration' and is a type of group ware.

Video conferencing and video phone calls are different scenarios. In that it's designed to serve a conference or multiple locations rather than individuals. It is a sub-terminal form of video telephony, first used commercially in Germany during the late-1930s and

followed by United States during the early 1970s as part of AT&T's development of Picture phone technology.

With the commencement of relatively low cost, high capacity broadband telecommunication services in the late 1990s, coupled with more powerful computing processors and video compression techniques, video conferencing has made significant inroads in business, education, medicine and media. [2]

Video conferencing comprises of audio and video telecommunications to bring people at different sites together. This can be as similar to a conversation between people in private offices (point-to-point) or involve several (multipoint) locations in large rooms at multiple locations. apart from the audio and visual transmission of meeting activities, allied video conferencing technologies are used to share documents and display information on whiteboards.

Simple analogue videophone communication could be established as early as the invention of the television. Such an antecedent usually has two closed-circuit television systems connected via coax cable or radio. An example of that was the German Reich post office video telephone network serving Berlin and several German cities via coaxial cables between 1936 and 1940. [3]

C. Text Chatting:

Online chat may refer to any kind of communication over the Internet that offers a real-time transmission of text messages from sender to receiver. Chat messages are generally short in order to enable other participants to respond quickly. Thereby, a feeling similar to a spoken conversation is created, which distinguishes chatting from other text-based online communication forms such as Internet forums and email. Online chat may address point-to-point communications as well as multicast communications from one sender to many receivers and voice and video chat, or may be a feature of a web conferencing service[4].

The classic Web architecture semantics is based on a client-server paradigm, where the browsers send an HTTP request for content to the web server and the server replies with a response containing the information requested.

In the WebRTC Trapezoid model both browsers are running a web application, downloaded from a different Web Server. A Peer Connection configures the media path to flow directly between browsers without any intervening servers. Signaling goes over HTTP or Web Sockets, via Web Servers that can modify, translate or manage signals as needed. It is worth noting that the signaling between browser and server is not standardized in WebRTC as it is considered to be part of the application (see Signaling). The two web servers can communicate using a standard signaling protocol such as SIP or Jingle [XEP-0166]. Otherwise, they can use a proprietary signaling protocol.

The most common WebRTC scenario is likely to be the one where both browsers are running the same web application, downloaded from the same web page. In this case the Trapezoid becomes a Triangle The most common WebRTC scenario is likely to be the one where both browsers are running the same web application, downloaded from the same web page. In this case the Trapezoid becomes a Triangle

Room:

A chat room will be created at first then doctors, patient, his/her family member and all will connect it according to the involvement in the treatment.

EHR :

An EHR system stands for electronic health record also known as electronic medical record (EMR), refers to the systematized collection of patient and population's electronically-stored health information and data in a digital format. These records can be viewed across different health care settings. Records are shared through network-connected, enterprise-wide information and data systems or other data networks and exchanges. EHRs may include a range of data, including demographics, medical history, medication, treatment and allergies, immunization status, laboratory test results, radiology images, vital signs, personal statistics like age, weight, height, and billing information

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