

The web application allows the doctor to remotely login and check each patient's sensor data remotely. Since the data is given in real time, the doctor can interact immediately on this real time data. A reasoning procedure is also embedded in the system. Thus, if critical situation arises and if there is absence of the doctor, the reasoning system should be able to contact the emergency services.

Compressed ECG [6] can also provide ECG diagnosis information compared with decompressed ECG data. The attribute selection is given importance in this system. The system is comprised of the signal acquisition by ECG and sending the compressed ECG packets to the hospital server. The hospital server uses the data mining techniques such as attribute selection and expectation maximization (EM)-based clustering.

The selected attribute set is sent to patient's mobile phone, so the patient's mobile phone can perform analysis. Thus patient's mobile phone does the job of disease estimation using a rule based system.

The difference in various ECG formats [7] representation in the market and no particular standard for them to represent creates a biggest problem while bringing together all these information under one Enterprise information system for management of ECG data.

The ECG formats selected over here are ISO/IEEE11073, Standard Communications Protocol for Computer-assisted electrocardiography, and ECG ontology. Web services, simple object access protocol, extensible markup language, or business process execution language were used to achieve above purpose. The business processes that provide intra and inter country border business extension include Enterprise application integration (EAI), Service oriented architecture (SOA), or Business Process Management (BPM).

Here they have represented communication between personal monitoring ECG devices (1-3 leads) and concentrator devices (such as mobile or PDA). Thus interoperability of devices communicating with each other is a major issue to be solved. A solution they represent here is that they convert the different ECG formats to a central format. In their system Medical device to concentrator device interface ECG format exchange standard was selected to be X73PHD. For the Concentrator to Host System interface the ECG format exchange standard was selected to be SCP-ECG standard. Host system was selected to be ontology based. Host system consists of four main parts such as Java-Servlet, Java-Applet, Database, and Web page.

Likewise studying one more system [8] in which the different ECG formats are mapped to ECG ontology and then encoded in XML and then Internet browser is used to display the ECG.

The cardiac abnormalities that are detected using many systems are in a manner such as one, two, four cardiac abnormalities are detected using ECG models. But a group of cardiac diseases detection has not been possible yet. Even the

data that is diagnosed cannot be viewed of one system using the other system. Hence interoperability of the systems regarding ECG formats is necessary. Thus various abnormalities can be detected simultaneously in the ECG output using the author's mentioned system. At most 37 cardiac abnormalities can be detected using the author's system.

Health level 7 standard was selected to be exchange standard. The ontology was derived to achieve a combination of ECG data, HL7 ECG data descriptions, and cardiac diagnosis rules. XML was used to implement the ontology.

The software framework consisted of three parts such as creating XML documents from ECG data, then including the diagnosis in the XML documents, then representing this information in graphical and Text information. Interoperability being the main concern it was checked with numerous ECG files in the Internet Explorer.

3. Product Survey

The Mortara Rscribe 5 is a PC-based ECG system is used for ECG display & interpretation by both wireless as well as wired USB system. It can be used on the present PC system and there is no need to buy an additional dedicated PC platform. It can work over network infrastructures as well. Achieving interoperability is done using various industry standard protocols and data formats. HL7 Gateway is also supported for automated data exchange with HIS, EMR systems. Many interpretive statements are also provided to obtain second opinion and help in final diagnosis.

Welch Allyn PC-Based Resting ECG can be provided on single PC or even enterprise wide. ECG measurements that are provided are automatic and can be used to speed clinician review. The clinician can perform checking of ECG from anywhere using the network.

ECG readings are also available using Philips Pagemaster TC30 Electrocardiograph. It has a touch screen which finally increases the speed of accessing ECG data. PDF or XML format is used to represent ECG report. Availability of five minutes ECG patient history allows better creation of ECG reports.

Another application provided by GE CardioSoft Diagnostic System Resting ECG transforms a ordinary PC to a resting ECG device. The ECG report generated by this system is DICOM formatted and can be exported to PACS workstation for faster ECG review. Networking options are also available. Connectivity with other other versions is also facilitated.

PC usage as a resting ECG device is also available using Universal 12-Lead Interpretive ECG machine from QRS Diagnostics. The working software is CardioView ECG Interpretive Software. It also facilitates using of this software on many hospital PCs to enable ECG check in any room.

All the above mentioned products are costly and most of them are suitable for Hospital environment. Hence these equipment are not preferred for home usage or for monitoring remotely from home.

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