Integration of Medical Scopy with MEDNET Software
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Abstract:
Endoscopy is the Medical Scopy device. The main role of Medical Scopy devices in Medical field is to observe the internal part of body like stomach, Ear, Noise etc. and to operate small operation. The Real Time images and video captured by a tiny video camera at the tip of Medical Scopy devices and send to Video processor and Image processor of Endoscopy Tower Area. We are capturing real time images and video with the help of Foot pedals. We are developing new path with the help of Raspberry pi board for Medical devices integrate with MEDNET Software with foot pedals and Photo editing or Image Annotation Options. These work for Third Party Software development. MEDNET Software makes Hospital Information System (HIS). They have completed 360 degree solution provide i.e. EMR, PACS, LIS and Device Integration. That solution which helps improve and standardize process, making patient care, predictable, quick and accurate. We are developing the Annotation Tool this tool providing Drawing tool option and also Patient or Doctor Information data and this data send to MEDNET servers and store into PACS. That data helps doctors for “ease of use” and “time saving” along with “prompt and accurate support”.

Keywords: PACS (Picture Archiving and Communication System), EMR (Electronic Medical Record), Java.

I. INTRODUCTION
In medical field, current approaches to Medical application development is very important role. The similarly sub system integration of medical devices. But the medical devices are costing very high. The time consume and frequently yield sub optimal results to get in Hospital or clinical.

In hospital the some doctors are very important role in Operation Theatre. But they have not a required time for fully observable. The Radiological field doctors operated operation on patient. The time is very important in doctor side the number of operation performing in short period then we are integrating the medical Scopy Devices like (Endoscopy, Laparoscopy, and Colonoscopy etc.) for smart work of doctor. We are connecting third party software by using MEDNET Software.

Medical Scopy Device interface with software by using new path generate and integrate medical scopy Device with Hardware like Raspberry pi board with the help of Foot pedals. The main role of medical field is to observe the internal part of body like stomach and to operate small operation. Real time images and video is captured by the camera from medical scopy device and send to Video Processor or Image Processor by Endoscopy Tower. The video of the entire process is not continuing captured for post process review or analysis. But in this process only few snapshot images may be taking to file the process [1]. ESGE (European Gastrointestinal Society for Endoscopy) and ASGE (American Gastrointestinal Society for Endoscopy) worked on snapshot images at recommended positions during colonoscopy [10].

MEDNET, software is using Hospital Information System (HIS). It has developed with reference to Medical Application and Device Integrate. By means of Low Cost devices for provide advanced system and by virtue of hardware host and integration to work parallel and different computed [4]. MEDNET means” Medical application development, Device integration, integration frame work and component”. It is complete solution provide like EMR, PACS, LIS and Device integration. That solution which helps improves and standardizes process, making patient care predictable, quick and accurate. The data is to store on PACS to help doctor of “ease of use” and “time saving” along with “prompt and accurate support”.

In MEDNET Software Company is creating third party software for Medical Scopy Devices and Supply for standard library. Enki HER is endo writer integrates endoscopy to transmit Real time procedure video and connect with HER but they can only create Notes. KARL STORZE, software is not fully integrated with endoscopy. VESALIUS HIS, It provides order entity add report can be integrated with PACS. Eunity is creating third party software for only Images [14] [15] [16] [17].

The MEDNET is working in Java, C, and C++ language. The main aim of the project, integrate medical scopy device like Endoscopy with MEDNET Software with Foot pedals and Image Annotation Tool.

II. LITERATURE REVIEW
In accordance with SMAIF (Standard Medical Application and Integration Framework) also send the data in MEDNET server use by third party software. With an eye to discussion on related topic, some particular techniques and Method as followed by main background of research on paper.

In [10] so much data provides to related Endoscopy units i.e. Endoscopy Electronic Medical Records (EEMR) and archiving system for remote access. Article therein Image Management system of number of Current Market list Endoscopy.

V.Lakshmi Narsimhan [5] takes to something MSPs (Medical Service Providers) of the Hospital Data. They were two facts of Mobile agent mechanism when context aware breed for in-
side hospital and out-side hospital information. They said MAT (Mobile Agent Technology) and RMS (Records Management Services) to use software and mobile devices by intelligent based system. In [4] With regard to online software are available in a Market. Telemedicine system is now providing web portal and web services through web portal technology for display patient data. By reason of a good level or standard High Performance location framework for transparent clinical.

Danyu Lua, Yu Caoa, Ki-Hwan Kima [1], they have looked into Image Annotation Software for Medical colonoscopy video database and Java. They have completed to work on database video of colonoscopy for purpose of cancer but they have increasing speed of video frame and capture the some important snapshot. The frame rate is up to increase by 30fps of normal speed of video but in this case loss of some important part of images. When rate of video speed increases the frame rate is increasing and also loss of frame rate is growing. The proper efficiency is not given for doctor observation. They not worked on Real time capture image and video. They were working at video database those video stores in the system. We are overcome this loss and interface Medical scopy Device with hardware at Real time data Images and video capture.

J. Bobwdilla, L. Mengual [6], to get there video was captured by Real time for individual pixel in each frame. They have implemented own image signal processing algorithm (MyAlgorithm) for video effect class. It based on Java Media Framework (JMF) API. JMF provided multipoint operation and good output system by plug-in API.

Dilvan A. Moreira [7], Image Annotation performed by machine computable at electronic Physician Annotation Device (ePAD). In medical software field user interfaces on create one part. Elena Zamsa, The goal of the system is to implements efficient visual data introduction and knowledge extraction based on a predictive model implementation.

In compliance with, a medical data records at Electronic Medical Record (EMR) and Picture Archiving and Communication System (PACS) and Mostly using ESGE and ASGE allows [9][10]. In [2] [3] higher order logic language to get through builds Integrate Clinical Environments (ICE) in the Prototype Verification System (PVS) and also commercial medical devices integrated with the help of iDTV (interactive Digital TV).


III. PROPOSED METHODOLOGY

Flow Graph:

Overall idea of Project shows in flow diagram as below. Project simulation is working on JAVA language with Net beans or Eclipse IDE. Data capture tiny video camera and send to Endoscopy. The next stage Raspberry pi board connects Endoscopy device and selected data collects. Than Annotation Tool uses at photo edit options. The annotated images store into PACS and EMR on MEDNET software.

Figure 1. Flow graph of Proposed System

IV. WORKING OF SYSTEM

The first interface endoscopy with Raspberry pi board for purpose of third party software integrations. Many software company are available for third party software integration for endoscopy name of company enki HER, KARL STORZ OR1, VESALIUS HIS and eunity but they cannot fully integrate endoscopy with them software [14]-[17]. In fig. block stage are as follows Endoscopy Tower and Foot Pedal, Raspberry Pi board, Computer system and MEDNET. Any Medical Scopy device has display board, Video Processor and Image Processor these combinations called Endoscopy Tower. The endoscopy tower connected with Foot Pedals.

In this project we are working of images capture, video capture, and annotation tool and send data on MEDNET Server. The fig show that when doctor operated the endoscopy on the patient. The tiny video camera use time. This camera captures the Real time video signals. These video signals send to video processor and image processor. They have many
input output ports are present on Video Processor for example DVI, BNC and RCA as shows below diagram.

![Block Diagram](image)

**Figure 2. Main Block Diagram**

These output ports connects to the Raspberry pi board with one of the video cable and also Foot pedals. Raspberry pi board has HDMI and USB ports. That video signal passes through Raspberry pi board and to store in SD card. At that time real-time images capture and video capture with the help of Foot Pedals. In this stage Raspberry pi board is working as controller. Foot pedals have two switches one for capture images and second for video start and stop state these type of arrangement show in fig. Than selected images and video send to Computer System via HDMI/RCA cable. Next part, we are developing Annotation tool for doctor User Interface (UI). In this Annotation tool drawing tool provide. The doctor observes this images and indicating particular symbol of image and store in folder. When doctor use annotation tool one more additional information fill. That information is patient related and doctor related i.e. patient name, age, gender and DOB and also doctor name, doctor post and Hospital name. In Annotation tool video player facilities provide for watching video and to take image snapshot option for specific frame. The Annotated images and patient information send to on MEDNET server. Patient information and important data store the Electronic Medical Record (EMR) and Picture Archiving and Communication System (PACS) by using MEDNET Software.

**V. CONCLUSION AND FUTURE WORK**

Medical Scopy Interface problem solve with Raspberry pi 3 board by use Java Language. The Java special function on anywhere runs at any time. The previous research they were not Real-time interface endoscopy. They were used Medical store data base video and images for image annotation. We will develop smart interfacing with Foot pedals and photo editing options. When the doctor operates endoscopy he will take maximum images in minimum time and easily Annotated images send to server. The annotated images store into PACS and EMR on the Server. The future work provide video player for again some important images captured and reaming Medical Scopy devices like Laparoscopy, Colonoscopy, Bronchoscopy etc. interface with MEDNET software.
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