

# Preparation of a database of endoscopy and colonoscopy images and data applied to management in a public health system

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## Abstract

This study refers to an application of a new prototype that will help doctors identify gastrointestinal diseases. It was developed by the use of various databases and computer programs. All of this data refers to statistics gathered from colonoscopy and endoscopy was collected in partnership with Sao Jose dos Campos Municipal Hospital. The aims of this study were to reduce the amount of paper documentation at the hospital and to share the information safely on multiple data banks via the internet. Nowadays technology allows us to manage quality information. This is very important for doctors to identify of various diseases at early stages of development and this data can bring the medical practice a more effective and efficient treatment.

**Keywords:** Diagnosis, Prototype, Endoscopy, Management.

## 1. Introduction

In recent decades, the demand of clinical examinations and tests has grown exponentially. It is very important to have an early diagnosis of disease [1]. It has been a demanding challenge to diagnose patient in a

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short time because they are overwhelmed by paper documentation. There are computational tools in association to specific applications that is used to manage the tremendous amounts of data. These tools can be used to manage the enormous amount of information from ongoing tests and medical practices. With all the medical data that are trying to manage, one of the problems is to have an early diagnosis of diseases and these tools can contribute to the quality of life for the patient [2]. To develop this computational tool, it is necessary to obtain vital information from an existing database. The aim of this study was to develop a computational prototype tool that will provide a number of essential organized data for the medical experts. These data will assist doctors have an effective diagnoses of patient. This tool aims to be a storage bank and remote access management system (via the internet) of medical images and medical data.

## **2. Material and Methods**

The information was obtained from databases in the *Municipal Hospital Dr. Jose de Carvalho of Florence*. The two databases used were developed in the endoscopy office of the hospital. One of the databases was developed in an Excel table for clinical information including sex, age, symptoms, tests completed (colonoscopy or high digestive endoscopy), diagnosis (name of the lesion), degree of seriousness (mild, moderate and intense), organ (stomach, rectum, etc.) and location in the organ (for example antrum or body of the stomach). To help clarify the above mentioned information, there were 3 meetings with experts in endoscopy and gastroenterology. The other database is the storage of the images in the program Zscan, with these images containing information from the colonoscopy or high digestive endoscopy tests, organ and diagnosis.

To construct the computational tool, it used the Firebird and Flame Robin software for managing information in the database that are accessed via MySQL language. PHP was also used as a language program, it focuses on the development of algorithms for web platforms, and enable resources to connect to different types of database management systems [3].

## **3. Results and Discussion**

It had three meetings with the medical specialists to discuss their requirements for an efficient accessible data resources that would aid them in their diagnostic analysis. According to the patients complaints, anatomy, morphology, and diagnosis on the colonoscopies and high digestive endo-

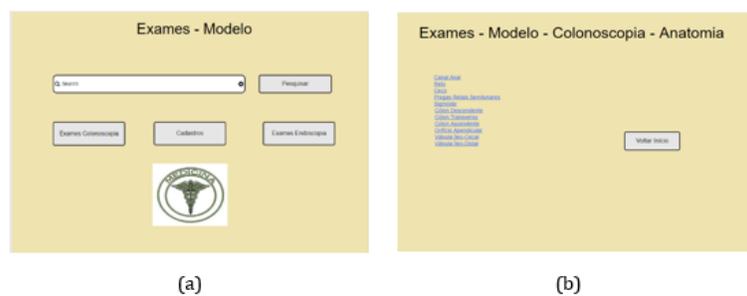
scopies imaging tests. The prototype was created using network for reliable information sharing network accessible via the Internet and intranet.

An important purpose of this prototype is also to analyze the images obtained by endoscopy examinations. The logical steps of this computational prototype are the information storage of the registration of patients, their accurate diagnosis and images. All the data is stored in the database management system (DBMS) this is accessible via the Internet. From this DBMS, doctors can conduct research comparing the patients anatomical and diagnostic titles to previous clients rapidly.

### 3.1 The Interface

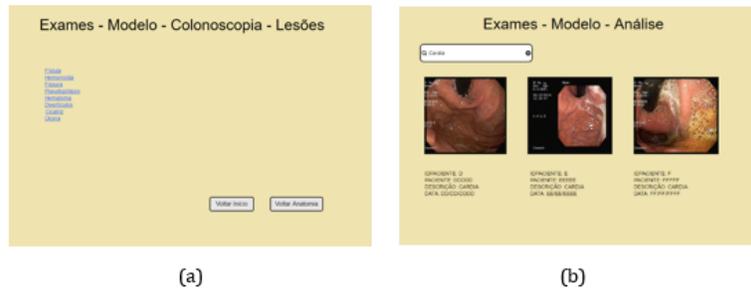
As illustrated in Figure 1 (a), there is a search field, here the user can enter data to search using specific terms. There is also a register button to insert new images, a examination button for each type of examination (high digestive endoscopy or colonoscopy) and after this the user is conducted to a page containing the terms of anatomy and a button statistics that directs the most cited terms (lesions) and according to the quantity of information in the database.

Figure 1 (b) illustrates the list of related terms the anatomy of the intestinal tract, specifically: anal canal, rectum, semilunar rectal folds, sigmoid colon, descending colon, transverse colon, ascending colon, cecum, appendicular orifice, ileocecal valve and ileum valve-distal, terms identified in the database. All of these terms were required by the medical experts.



**Figure 1** - Examples, (a) Endoscopy Test - Model screen (b) Tests Model Colonoscopy - Anatomy screen.

In Figure 2 (a) is a list of terms related to the intestinal tract diagnosis, specially: fistula, hemorrhoids, fissures, pseudo polyp, hematoma, diverticula, scar and ulcer and Figure 2 (b) shows the result of the search for a term of anatomy and other terms for the diagnosis.



**Figure 2** - Examples, (a) Test Model Colonoscopy - Diagnosis screen and (b) Test Model - Analysis screen.

#### 4. Conclusions

This study presents a computational tool prototype to aid the analysis of disease diagnosis from images of the colonoscopies and high endoscopies test. This tool aims to maximize the time used for decision-making and is intended to allow a reduction in the rate of uncertain diagnosis and delays in the delivery of these diagnosis. The possibility of remote access by internet is very important for the medical community, it allows access to computer experts, administration, and state and municipal health systems.

#### Acknowledgments.

I thank the financing PIBIFSP and I thank teacher Kevin Barry Kelly for the additional orientation on this project.

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