

# Scanning strategy for transition to an Electronic Health Record

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## Abstract and Objective

*The Hospital Italiano de Buenos Aires (HIBA) is a non-profit health care academic center. In 1998 HIBA began the implementation of a Healthcare Information System (HIS). Currently the inpatient electronic health record allows viewing the patient administrative data, order for further studies and visualize their results, referral request and display information from the patient's outpatient record and the scanned notes relating to the attention of the health team that are still on paper. The digitization project was initiated as a transition strategy for the inpatient electronic record. An Indexing Model was developed in order to result in a full migration to an electronic record. The aim of this paper is to describe our experience in this project, the creation of an ad hoc ontology of documents and stress the need for a multidisciplinary team working on projects of this magnitude.*

## Keywords:

Terminology, Nomenclature, Hospital information systems, Abstracting and indexing, Information storage and retrieval.

## Methods

Literature suggests different strategies to migrate to a paperless electronic record at all levels of care, scanning clinical documents are one of them. HIBA has developed a Healthcare Information System (HIS) to coordinate clinical information with preexisting administrative applications it includes an electronic health record, called ITALICA, in ambulatory care, home care, inpatient and emergency. Currently the inpatient electronic health record allows the clinicians viewing the patient administrative data, order for further studies and visualize their results, referral request and display information from the patient's outpatient record. However, the clinical notes related to the healthcare team activity are still on paper due to the lack of implementation of the digital signature of the records. We formed a multidisciplinary working group with representatives from each of the areas involved in the project. The first phase of the project was defined by the scanning process model and standardization of the size of paper documents. In order to create this data index our group began with an analysis of administrative and clinical paper documents in order to discover the terminology that was being used. We initially reviewed 250 inpatient medical records. The aim was

to build a classification similar to that used daily by physicians so as to achieve a quicker adoption because users would intuitively locate the documents.

## Results

We created a categorical model that represented a natural grouping of paper documents from our institution. We coded clinical terminology subclasses with LOINC (Logical Observation Identifiers Names and Codes) allowing the mapping to SNOMED CT. A software application was developed to associate the scanned images (digitalized documents) with the indexing model defined. With this model a volume of 4500 new images a day are processed.

In average 9 images per patient with 5 attributes per document are indexed daily. Up to July of 2009 we have scanned around 715543 images and indexed a total of 687514. Scanned images and data are parsed and stored in a single repository of CDA (Clinical Document Architecture) from the indexing process leading to logical documents. Once a document is scanned it is accessed from the EHR. This display permits exploration of the document content. The display has two simultaneous viewing regions: first, a navigation tree with all the documents contained in the episode, and second, an image or electronic document display which can be selected from the tree. In the case of the other affected areas (administrative and audit) access to digitized information was restricted according to the role assigned to each user based on the Master File from an ad hoc web application generated. In early 2009 HIBA launched a pilot in specific wards. Following the implementation the usability of the ontology of documents and indexing quality was assessed. Today the hospital has space for temporary filing in the main building in which the folders are kept for up to two months, after which are transmitted to an external filing facility. The digitization project will free up space in that area, taking into account that with the increased accessibility to documents will be reduced drastically to the consultation paper folders. As more documents are made available in electronic format, there will be a lower number of documents requiring scanning. This will result in a gradual migration to full electronic records, in line with the implementation of digital signature in our environment.