

**THE MT SOFTWARE: A COMPLETE SYSTEM FOR MEDICAL
TRANSCRIPTION**

**An Independent Research Presented to
The Faculty of the Computer Studies Division
Ateneo De Davao University**

**In Partial Fulfillment
Of the Requirements for the Degree
Bachelor of Science in Information Technology**

BY

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MARCH 2007



ATENEO DE DAVAO UNIVERSITY
Computer Studies Division

Senior Project

**THE MT SOFTWARE: A COMPLETE SYSTEM FOR MEDICAL
TRANSCRIPTION**

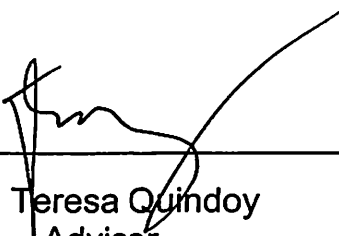
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Course: Bachelor of Science in
Information Technology

School Year: SY 2006 -2007

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Abstract

One trend storming the nation in the present is with the field of Medicine. This is Medical Transcription. Many nowadays are building academies and training centers primarily to train individuals how to be accurate and fast in medical transcribing. Thus, this trend seemed to be one of the most popular and in need when it comes to job offers and client flood. With this regards, the Industry of Information Technology has given the field of Medicine choices to ease and contribute for success the MT. Nowadays, many simple MT solutions when it comes to software and hardware are being offered in the market. Such are the EMR audio player and Foot rewind/fast forwarder. With the interference of IT in this area, questions began to rise regarding how to develop such industry. Speech-to-text has been a suggestion, which is, still, until today, has no plain ground. Still, amidst the interference of information technology, answers and issue arises in the field of MT such as, audio clarity, easy working factors and help desks as improvements. The proponents have identified such issues and factors that arise in the industry and wish to contribute on the said problems.

Keywords:

Medical Transcription, EMR (Electronic Medical Record), Transcriber, Audio.

Noise Reduction

Chapter 1

Introduction

The nationwide initiative mandated by US President Bush and being overseen by the Department of Health and Human Services to computerize and make electronic (EMR) those paper-based medical records that provide documentation of healthcare events has emphasized the need for effective medical Transcriptionist. Since the Philippines have become one of the top outsourcing hot spots in the world in 2006, the development of a cost-effective and efficient MT system will be of great help. This study discusses the possible improvements in the field of medical transcription using the existing technologies in developing an all-in-one (audio player with audio enhancement features, word processor with auto-correct and auto-complete, and an easy access electronic medical dictionary) MT system. The aim of this study is to provide an alternative for outsourcing companies in the Philippines to deliver accurate, timely, and cost-effective medical transcriptions.

1.1. Background of the Study

Medical transcription has existed since the beginning of medical care and research. Ancient cave writings attest to the earliest forms of healthcare documentation. While the medium changed from metal plates to clay tablets, from hieroglyphs on temple walls, to papyrus, to parchment, to paper, and most recently to electronic files, the reasons for maintaining records have always been

the same: to record an individual's health care and the achievements of medical science.

Until the twentieth century, physicians served both as providers of medical care and scribes for the medical community. After 1900, when standardization of medical data became critical to research, medical stenographers replaced physicians as scribes, taking their dictation in shorthand.

The advent of dictation equipment made it unnecessary for physician and scribe to work face-to-face, and the career of medical transcription was born. As physicians came to rely on the judgment and deductive reasoning of experienced medical Transcriptionist to safeguard the accuracy and integrity of medical dictation, medical transcription evolved into a medical language specialty.

In the twenty-first century, a single facility, such as a hospital or physician's office, may have an electronic medical record (EMR). Combining multiple EMRs from multiple facilities, however, will result in an Electronic Health Record (EHR), where the data produced from each becomes easily integrated in a single source that is easy to access and to navigate. It is the US government's belief that collectively interconnecting the health care data produced by the many health care facilities, doctor's offices, care providers, nursing homes, pharmacies, etc., will streamline medical practice, reduce redundancy and duplication of effort and testing, save time, and ultimately reduce healthcare costs across the country.

Various efforts have been performed to improve the medical transcription process. Some medical Transcriptionist is using speech recognition technology (SRT) to help them create even more documents in a shorter time. Others use word expanders that allow Transcriptionist to simply type in an abbreviation and the program will expand it to an entire word, phrase, sentence, paragraph, document, or macro. Audio player software is use to assist the transcription of audio recordings by using the keyboard (with 'hot' keys) and/or a transcription foot pedal. Some computer transcriber applications feature variable speed wave playback, foot pedal operation, and file management. Electronic medical dictionaries are also available for the use of Transcriptionist.

1.2. Technology Application Context

This study seeks to answer the general question: What are the solutions that will help improve the existing medical transcription process?

Specifically, it seeks to answer the following questions:

- What are the existing techniques and software used in medical transcription?
- What is the complete process of medical transcription?
- What are the software available and appropriate to use for the development of the system;
- What audio manipulation techniques are used to enhance the quality of the audio dictation?

- How are background and unnecessary noise from audio dictation reduced?
- How is manipulation of audio channels done?
- What possible text editor features will be useful for medical transcription?
- What are the available medical dictionaries appropriate for the medical transcription system?
- What technologies are being used by the MT Firms and academies in the present day?

1.3. Objectives of the Study

This research intends to develop a system, which will be able to improve the medical transcription process.

The specific objectives are:

- To identify existing techniques and software used in medical transcription;
- To understand the medical transcription process;
- To identify what software are available and appropriate for the development of the system;
- To manipulate audio dictation and apply enhancements to this dictation to achieve speed and accuracy;
- To reduce background and other unnecessary noise from audio dictation for more clearer dictation;

- To increase the volume of the main vocal of the audio dictation for clearer listening and precise transcription;
- To develop a word processor which has auto-correct feature to help transcribers cut transcribing time into half;
- To have a medical data dictionary for easy access;
- To incorporate the foot pedal technology in the project.

1.4. Significance of the Study

This study is noteworthy for all involved in the area of Medicine and medical transcription. Through the suggested improvements of the project, medical transcribers will have ease and improve their speed and accuracy. This project will cut the time of work for these MT's. The field of Medicine will benefit in this study since majority of the users of the MT's are in this area. This study will be a great contribution not only in the field of Medicine, but also in the field of Business. The study may also be used as a reference for those who plan to start a medical transcription firm. The study may be used by existing medical transcription firms in order to evaluate their present operations. This study will also be useful to those people who aspire to be a medical Transcriptionist by giving them a background on how medical transcription works.

1.5. Scope and Limitation of the Study

This project wishes to address only a few of the suggested improvements. These are the captured-recording audio enhancements and improvements, word

processor and features like auto suggest or word suggestion with medical dictionary reference and editable medical dictionary and existing technology application related to MT.

The proponents have no plans in addressing the speech to text transcriber in this study. The proponents also will not be including file management systems and networking operations for file transfer and data encryption. These are no longer part of the study.

For the audio enhancement and improvements, the proponents wish to apply a background noise reduction and channel volume control to enhance recorded audio. The proposed system will cater to other audio enhancement features like tempo, pitch and noise hiss reduction and channel controls.

The proponents will also apply different features for text editor that is related to medical transcription. An automatic word suggest of terms that is commonly used in the field of medicine. There will be a data dictionary for medical terms with pre-added terms and definitions. This data dictionary will also have a manual update features like add, edit and delete of medical terms. The Medical dictionary will also have meaning and word origin for the medical terminologies existing depending on the reference materials the proponents will use.

The proponents will also be incorporating an existing technology that Medical Transcription firms and academies used. From further research, the hardware known as foot pedal, which is a human interface device that manipulates the controls of play, pause, fast forward and rewind in an audio

player, is the most used hardware in the MT firms and academies. The key is to incorporate the device and let it work synchronously together with the project the proponents wish to undergo.

This project also aims to address problems and improve the process of medical transcription in general. For purposes of actual trials and references, companies based in Davao City, Philippines are the only ones accessible to the proponents. The proponents will make use of the World Wide Web research reference and actual medical transcription processes made globally; thus portraying the process and knowing how medical transcription is done internationally.

The study will look into the different ways of developing a system that will suffice the needs of the Medical field. This paper aims to document and elaborate on the possible processes in developing the MT system as well as in clarifying the suggested improvements. Thus, the proponents estimate an ample time to research on the different platforms that will help in the development of the system. Since research has already started, the proponents are hopeful of finishing it within the given time.

1.6. Definition of Terms

Audio – Sound or streaming media, either recorded or live, that can be heard. This also refers to the broadcasting of sounds. In general, audio is sound recording, reproduction and broadcasting.

Electronic Medical Record (EMR) – Is a technology and computer-based patient medical record, clinical notes and prescriptions or any other related information kept for medical filing. The term has become expanded to include systems, which keep track of other relevant medical information. The practice management system is the medical office functions, which support and surround the electronic medical record.

Medical Transcription – is an allied health profession, which deals in the process of transcribing or converting recorded dictations by physicians and/or other healthcare professionals regarding patient medical record to a written text. This written text may be stored as printed and/or electronic data. The electronic storage of medical records is the preferred means of most medical professionals in order to document patient care and facilitate healthcare delivery regardless of geographical distance. Medical transcription establishes document format, data entry, corrects spelling and medical terminology errors, transcribe/edit documents, and complies with medical-legal policies and procedures.

The medical transcription is also used as the name of the document (electronic or physical) that results from the medical transcription process, normally in reference to a healthcare professional's record of the medical encounter with a patient. Some as a “medical record” refer to it. A transcribed record can also be merged into a larger document, again called a medical record, which contains additional information from the patient encounter.

Current forms of medical transcription involve digital voice files and speech recognition. Today, medical transcription is the primary mechanism a physician communicates with another physician about the state and treatment of a patient. In more recent time, it is required to be used as justification for a medical bill or application for worker's compensation benefits.

Noise Reduction - The process of removing noise from a signal. Noise reduction techniques are conceptually very similar regardless of the signal being processed, however a priori knowledge of the characteristics of an expected signal can mean the implementations of these techniques vary greatly depending on the type of signal.

All recording devices, either analogue or digital, have traits that make them susceptible to noise. Noise can be random or white noise with no coherence or coherent noise introduced by the devices mechanism or processing algorithms.

Transcription - is the conversion into written, typewritten or printed form, of a spoken language source, such as the proceedings of a court hearing. It can also mean the conversion of a written source into another medium, such as scanning books and making digital versions. A transcriber is a person who performs transcriptions.