UNIVERSITY OF SCIENCE AND TECHNOLOGY OF HANOI

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Research and Development

**Bachelor Thesis**



Radiologist and Image management

on Lung cancer care website

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# Abstract

Because of the dangerous and rapidly increasing the rate of lung cancer, the system that initially assists doctors in the diagnosis of primary non-small cell lung cancer based on computer tomography has been created. I designed and implemented a web application that help doctors to manage the images of computer tomography. In order to achieve this goal, client-server model has been applied to this project. For the back-end, I use PHP for creating server, (Representational State Transfer) RESTful for designing Application Programming Interface (API), phpMyAdmin for making database. Also, the front-end, I use not only HTML, but also Bootstrap 4 to create the user interface, CSS for the effect and JavaScript for some functions. For displaying the DICOM files, I use library named Cornerstone.JS. This web application can be normally accessed by using Web Browsers.

**Keywords:** Web application, Client-Server model, PHP, RESTful API, phpMyAdmin, HTML, Bootstrap 4, CSS, JavaScript, DICOM, Cornerstone.JS.

# I -Introduction

## Lung Cancer Statistic

Worldwide, lung cancer is the most common malignancy and the most common cause of cancer deaths in the past few decades. In 2012, a total of 1.8 million new cases were estimated, accounting for 12.9% of all new cancer diagnoses. According to the Global Burden of Disease study 2020, the healthcare burden and costs attributed to lung cancer was substantial on a global scale. Its five-year survival rate (17.8%) was much lower than that of other leading cancers. Owing to the high fatality rate, its geographical mortality patterns closely follow those of incidence, and it remains to be an important public health issue.

Approximately 58% of all lung cancers occurred in less developed nations. The major types of lung cancer include adenocarcinoma, squamous cell carcinoma, small cell and large cell carcinoma, and a previous study showed that ethnic and racial differences in relative risk of lung cancer exist for all histologic types. The most important risk factor for lung cancer is tobacco smoking. Other contributory factors include environmental exposure to radon; asbestos; certain metals such as chromium, cadmium and arsenic; some organic chemicals; radiation; coal smoke; as well as indoor emission of fuel burning. Since these risk factors are highly preventable by smoking cessation and clean air initiatives, it should be possible to reduce its incidence and consequent mortality by population-based preventive strategies. Hence, it is crucial to understand its global epidemiology, particularly with respect to temporal patterns and trends.

In Viet Nam, around 22.000 new cases of lung cancer are recorded every year. Medical experts and doctors gathered at the seminar on the application of targeted therapy in improving survival for non-small cell lung cancer (NSCLC) patients hosted by K Hospital (National Cancer Hospital). Lung cancer is leading cause of death among Vietnamese males, and the second-most common cause for cancer-related fatalities among females. Over 34.000 people, man and women, in Viet Nam are forecast to contract the disease on an annual basis by 2020.

## Objective

The main objective of this project is to build the Webpage that helps doctors to manage their patient’s DICOM file. Not only supporting store all files in server, but also this web application displays whole images in “.zip” file when they uploaded. In addition to that, it provides some function that can support doctor in