Contact Tracing in Health-care Information System - with SARS as a Case Study

by

LEONG Kan Ion, Brian

Master of Science in Software Engineering

2009

Faculty of Science and Technology
University of Macau

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A thesis submitted in partial fulfillment of the
requirements for the degree of

Master of Science in Software Engineering

Faculty of Science and Technology
University of Macau

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Approved by _____
Supervisor

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Address: Rua Almirante Sergio, No. 143, Edf. San Seng, 13/F, Block-B, Macau.

Telephone:
Fax:
E-mail: brianleongki@hotmail.com

Signature _____

Date _____

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澳門大學

University of Macau

Abstract

CONTACT TRACING IN HEALTH-CARE INFORMATION SYSTEM – WITH SARS AS A CASE STUDY

by LEONG Kan Ion, Brian

Thesis Supervisor: Assistant Professor, Si Yain Whar
Master of Science in Software Engineering

The outbreaks of emerging infectious diseases [1], such as Severe Acute Respiratory Syndrome (SARS), Avian Influenza (H5N1) and currently Swine Influenza (H1N1), and re-emerging infectious diseases [1], such as Dengue Fever and Tuberculosis (TB), pose a significant threat to the health of the worldwide population. Control and prevention of infectious diseases is notoriously complex and problematic due to the ever increasing number of international travellers. In addition, the risk of being infected with an infectious disease in densely populated urban areas tends to be much higher compared to rural areas. When an outbreak occurs, the identifications of source of infection (or index case) and transmission routes between cases in a rapid manner are crucial to prevent further spread of the infectious disease. Contact tracing [2], [3] has proven to be helpful for these identifications. In the past, contact tracing has been a field work of the medical personnel with little assistance of Information Technology (IT), if any. During the worldwide outbreak of SARS in 2003, Health Care Information Systems (HCISs) were built to facilitate contact tracing in the infected regions. However, contact tracing has certain problems in its traditional approach. Since these HCISs have adopted the traditional approach of contact tracing in their implementation, so contact tracing in these systems have inherited the same problems. In this thesis, the author will point out these problems and propose a systematic method to solve these problems. For this reason, a HCIS will be proposed and its prototype will be built to show the applicability of this method.

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LIST OF ABBREVIATIONS

SARS	Severe Acute Respiratory Syndrome
HCIS(s)	Health Care Information System(s)
IT	Information Technology
CDC	Center for Disease Prevention and Control
TB	Tuberculosis
DNA	Deoxyribonucleic Acid
InfoVis	Information Visualization
SNA	Social Network Analysis
LAN	Local Area Network
WAN	Wide Area Network
AED	Accident and Emergency Department
ICU	Intensive Care Unit
GIS	Geographical Information System

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ACKNOWLEDGMENTS

I would like to give my sincere thanks to all who have helped me to complete my thesis. First of all, I would like to have my most sincere thanks to my supervisor, Dr Si Yain Whar, Lawrence. With Dr Si's innovative proposal on HCISs and infectious diseases, I took this proposal as the topics of my master thesis. During the developing process of my thesis, Dr Si has always given me his helpful and professional suggestions to let me go through all the difficulties incurred from the thesis. Yet without Dr Si's patience and encouragement, I would have not finished my thesis.

I am grateful to Dr Robert P. Biuk-Aghai for his professional and practical advice to my Java programming. Programming for the detection algorithms in this thesis has been a hard job and Dr Biuk-Aghai has worked with me to go through this difficulty.

I am grateful to Dr Lam Chong, Coordinator for Control of Communicable Disease and Surveillance of Diseases, CDC, Government of Special Administrative Region Health Bureau, Macau. The author and his supervisor have visited Dr Lam several times for his comments on this thesis. Without Dr Lam's specific knowledge on epidemiology and infectious diseases, the author would not be able to form up the domain knowledge for this thesis.

I am grateful to the University of Macau and the Research Committee, their stipend has assisted me very much for developing my thesis.

Last but not least, I acknowledge with gratitude my wife and my daughter and son for their supports and patience in all these years.