Examining PACS Impacts in the Malaysian Context: Its Utilization and Potential Work Interruptions in Radiology Work Practices

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Abstract

Utilization of a large-scale PACS has resulted in substantial changes in radiology work practice of a hospital-based radiology department in Malaysia. Based on a three-month period undertaking field work with this organization, this study found that PACS application has contributed to systematic radiology work processes as compared to the traditional-based radiology work practice that centered around the usage of x-ray film and paper-based medical record. Radiologists and radiographers were generally satisfied with the existing PACS infrastructure. However, this study also found that the radiologists and the radiographers have also experienced disruptions in their routine work practice. This paper reports evidence of the nature of interruptions linked with a large-scale PACS utilization in the radiology work practice. Analysis of the data reveals that both human and technical related factors are the root causes of the interruptions.

Keywords:

PACS (Radiology), Radiology information system, Malaysia

Introduction

This study is concerned with a large scale PACS implementation and its application to support radiology work tasks of radiologists and radiographers in the Malaysian context. PACS is a system that specializes in the acquisition, storage, processing, and distribution of radiographic image data [1]. A large-scale PACS, which is commonly termed as enterprise PACS, consists of wider system integration with various imaging modalities and other hospital systems such as RIS and HIS.

Methods

This study used a qualitative approach and deployed multiple research methods, namely case study, direct observation, interview and survey. Two radiology-based hospital departments were chosen as case studies. One of these departments utilized PACS and the other did not. The first department, hereafter called PACS-DPMT belongs to an IT-based community hospital, while the other, COV-DPMT, is attached to a conventional community hospital. The COV-DPMT hospital was established before Malaysia gained her independence from the British Government in 1957, whereas the PACS-DPMT hospital is a relatively new hospital. PACS-DPMT began its operation at the end of 1999 upon the completion of the hospital building and the successful implementation of a large-scale PACS.

Observational data was gathered using note-taking and audio recording was used in a number of observations. At both sites, semi-structured interviews with the senior management of the department (the head of department, chief radiographer, senior radiologists), and also with a number of clinicians were conducted. The interviews were audio recorded and transcribed. The survey instrument was further used to obtain the radiographers' socio-demographic information and to gain understanding about their perceptions on issues related to their work practice. 18 out of 22 radiographers of PACS-DPMT and 52 out of 73 radiographers of COV-DPMT participated in the survey. For qualitative data, further data analysis was performed using NVivo 7 and this study particularly adopted three coding techniques (open, axial and selective coding) [2] in doing data analysis.

Results

- The application enables immediate retrieving and viewing of patient old images, and has led to better communication quality in reviewing patient examination request. Further, online information via RIS/HIS facilitates patient radiology examination. It was also found that parallel access to RIS/PACS/EMR applications has led systematic diagnostic reporting.
- The survey result (based on open-ended questions) revealed that both human and technical related factors can cause routine interruptions linked with the application. For technical related factors, the top three problems mentioned are: network breakdown, system error and modality problems. For human related factors, the top three issues mentioned are: inadequate support service, lack of cooperation by other departments and clinician did not perform online ordering.

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