An Innovation Decision Process View in an Adoption of Total Laboratory Automation

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Abstract : With fast advances in healthcare technology, various total laboratory automation (TLA) processes have been proposed. However, adopting TLA needs quite high funding. This study explores an early adoption experience by Taiwan's large-scale hospital group, the Chimei Hospital Group (CMG), which owns three branch hospitals (Yongkang, Liouying and Chiali, in order by service scale), based on the five stages of Everett Rogers' Diffusion Decision Process. 1.Knowledge stage: Over the years, two weaknesses exists in laboratory department of CMG: 1) only a few examination categories (e.g., sugar testing and HbA1c) can now be completed and reported within a day during an outpatient clinical visit; 2) the Yongkang Hospital laboratory space is dispersed across three buildings, resulting in duplicated investment in analysis instruments and inconvenient artificial specimen transportation. Thus, the senior management of the department raised a crucial question, was it time to process the redesign of the laboratory department? 2.Persuasion stage: At the end of 2013, Yongkang Hospital's new building and restructuring project created a great opportunity for the redesign of the laboratory department. However, not all laboratory colleagues had the consensus for change. Thus, the top managers arranged a series of benchmark visits to stimulate colleagues into being aware of and accepting TLA. Later, the director of the department proposed a formal report to the top management of CMG with the results of the benchmark visits, preliminary feasibility analysis, potential benefits and so on. 3.Decision stage: This TLA suggestion was well-supported by the top management of CMG and, finally, they made a decision to carry out the project with an instrument-leasing strategy. After the announcement of a request for proposal and several vendor briefings, CMG confirmed their laboratory automation architecture and finally completed the contracts. At the same time, a cross-department project team was formed and the laboratory department assigned a section leader to the National Taiwan University Hospital for one month of relevant training. 4.Implementation stage: During the implementation, the project team called for regular meetings to review the results of the operations and to offer an immediate response to the adjustment. The main project tasks included: 1) completion of the preparatory work for beginning the automation procedures; 2) ensuring information security and privacy protection; 3) formulating automated examination process protocols; 4) evaluating the performance of new instruments and the instrument connectivity; 5)ensuring good integration with hospital information systems (HIS)/laboratory information systems (LIS); and 6) ensuring continued compliance with ISO 15189 certification. 5.Confirmation stage: In short, the core process changes include: 1) cancellation of signature seals on the specimen tubes; 2) transfer of daily examination reports to a data warehouse; 3) routine pre-admission blood drawing and formal inpatient morning blood drawing can be incorporated into an automatically-prepared tube mechanism. The study summarizes below the continuous improvement orientations: (1) Flexible reference range set-up for new instruments in LIS. (2) Restructure of the specimen category. (3) Continuous review and improvements to the examination process. (4) Whether installing the tube (specimen) delivery tracks need further evaluation.

Keywords : innovation decision process, total laboratory automation, health care

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