Chapter 14

Agile Management of a Mobile Application Development Project for Surgeon Workflows

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EXECUTIVE SUMMARY

This case describes the agile management methods for an iPhone software development project. The overall objective was to design a smartphone solution that allowed surgeons access to dynamic Electronic Health Record (EHR) data to optimize their workflow. Three separate organizations distributed the responsibilities. Specifically, the lead organization, Cerner Corporation, collaborated with the University of Missouri Health Care and University of Missouri Information Experience Lab to create the technology. Project goals included increased surgeon satisfaction; improved task efficiency, as measured by time spent retrieving lab and vital sign data on morning rounds; dynamic data accessibility; and increased revenue from new product sales. To accomplish these goals, agile project management was utilized, applying iterative usability methods to create deliverables within a short development cycle. Each development cycle focused on user-centered design principles. Several challenges were encountered related to the user-centered design methods, usability data extraction, academic collaborations, and interface design choices.

ORGANIZATIONAL BACKGROUND

Cerner Corporation is an international, publicly held healthcare information technology (IT) firm that provides software and services to hospitals and other medical organizations. The company has nearly 10,000 employees and more than 6,000 client organizations worldwide, with a net income of $306 million and revenues of $2.2 billion (2011). With the federal incentives to foster implementation of healthcare information technology (e.g. American Recovery and Reinvestment Act of 2009), Cerner has experienced healthy sales and growth in the past several years.

Cerner Corporation maintains large legacy systems previously developed using the waterfall method. The waterfall method outlines a linear process that includes requirements gathering, design, implementation, verification, and maintenance. However, these legacy systems were often developed for functionality rather than usability. Cerner has since transitioned to agile management methods and flexible software service infrastructures.

Based in Kansas City, Cerner is less than two hours away from the University of Missouri-Columbia (UMC), which hosts a full-scope university as well as professional campuses for medicine, nursing, law, and veterinary medicine. The University of Missouri and Cerner Corporation formed a not-for-profit technology collaborative entitled the Tiger Institute for Health Innovation, with the aim of developing a range of innovative new products and services that could benefit both organizations. Within the Tiger Institute, the research and development arm was called the Living Lab. The Living Lab promoted collaborations across the University of Missouri campus, including the physicians and other healthcare professionals from the School of Medicine. The partnership also included the University of Missouri Information Experience Lab, which is a user-centered design research group that blends traditional usability evaluation with human information behavior research. The School of Information Science & Learning Technologies (SISLT) department within the College of Education operates the Information Experience Lab.

SETTING THE STAGE

Across the US, hospitals and large healthcare organizations have been progressively adding sophistication to their use of health IT. By and large, the technical capacity for sharing health information across different Electronic Health Records (EHR) is in its infancy. Federal incentives have promoted the development of health information exchanges, but they are in the early developmental stages, often limited to data exchange within a single vendor, and limited to a highly constrained core data set and exportable/importable CCDA (Consolidated Clinical Document Architecture**).**

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