

# Chapter 1.11

## Open Source Health Information Technology Projects

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### ABSTRACT

*This chapter discusses the growth of open source software projects in healthcare. It proposes a research framework that examines the roles of project sponsorship, license type, development status and technological complements in the success of open source health information technology (HIT) projects, and it develops a systematic method for classifying projects based on their success potential. Using data from Sourceforge, an open source software development portal, we find that although project sponsorship and license restrictiveness influence project metrics, they are not significant predictors of project success categorization. On the other hand, development status, operating system, and programming language are significant predictors of an OSS project's success categorization. We discuss research and application implications and suggest future research directions.*

### INTRODUCTION

“Rapidly rising health care costs and an epidemic of inferior health care quality over the past decade” (Brailer, 2005) call for an urgent and aggressive adoption of health information technology (HIT). HIT has the potential to transform the

health care industry by increasing productivity, reducing errors and costs, facilitating information sharing and improving the quality of healthcare services (Brailer, 2005), effectively transforming the healthcare system. Yet, adoption of HIT has been slow and appears to lag the effective application of IT and related transformations seen in other industries (Goulde et al, 2006).

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With the renewed urgency to adopt HIT, open source approaches are gaining attention (Goulde et al, 2006, Kantor et al, 2003, McDonald et al, 2003, Raghupathi & Gao, 2007). For example, under development in Europe is the open source project Care2X, an application with four components: hospital information system, practice management, a central data server and a health exchange protocol. The software is distributed under the GPL license. Another initiative, OpenEHR, funded primarily by the U.S. Department of Health and Human Services, is an open source application that will support health record exchange and access control services in rural Mendocino County, California. These and other similar initiatives have the potential to create low cost tools for physicians. Medfloss.org (<http://www.medfloss.org/>) provides an overview of active medical open source projects. Indivo (<http://indivohealth.org/>) is a free and open source personally controlled health record system. Janamanchi et al (2009) discuss in depth the profiles of health-related software projects on Sourceforge. Vetter (2009) discusses factors favoring and factors disfavoring adoption and growth of open source in electronic health information domain. Pare et al (2010) contacted in-depth interviews with 15 CIOs to identify impediments to open source adoption, such as policy orientation and lack of information. Fang and Neufeld (2009) discuss sustained participation in open source software development projects. Rajagopalan et al (2010) examine diffusion patterns for healthcare open source software. Seebregts et al (2009) discuss the development of an implementer network for OpenMRS ([www.openmrs.org](http://www.openmrs.org)), a configurable open source electronic medical record application. Miller and Tucker (2009) analyze the relationship between privacy regulations and adoption of EMR.

On a larger scale, government agencies (the predominant payers of health care bills) are looking for open source to meet their primary objectives of lowering costs and enabling connectivity. Canada Health InfoWay, funded by federal and

provincial grants, started an open source initiative in 2005 to develop software that hospitals and HIT developers could use to ensure the reliable exchange of patient health records among various entities. The U.S. government already has placed its VistaA integrated hospital software package in the public domain to provide adopters with open source software (Goulde et al, 2006).

The most significant open source health care application is OpenVista, the open source version of Vista, developed and used by all medical centers of the U.S. department of Veterans Affairs. The Vista software and its EMR module can be purchased for \$25.00 or less<sup>1</sup>, are open source by virtue of the Freedom of Information Act, and are being actively marketed by new vendors. Other open source applications include TORCH, a web-enabled EHR application believed to be usable in single practitioner offices and scalable to multi-site practices. Written in an interpreted language, TORCH is therefore operating system independent. Another clinical medical records type application is tkFP, which was implemented using a number of languages including C, C++, Python and Perl. OSCAR, an application from McMaster University, Canada, comprises several modules including an electronic patient record system, billing, referrals and secure messaging. The system requirements include Linux, Java2 SDK, MySQL and Jakarta Tomcat. GnuMED is yet another EMR built using a cross platform WxPython GUI and the Postgres relational database. FreeMed, on the other hand, uses the popular LAMP (Linux, Apache, MySQL and PHP) platform, to provide web browser-based interface.

These advances suggest that the open source development approach is a viable means to developing HIT applications. Considering these activities, OSS, itself a transformative force in the software industry, may have a significant role in this hoped-for HIT revolution, potentially affecting the development and adoption of HIT and the strategic positioning of HIT vendors. For example, a recent joint venture of Red Hat Inc.

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