INTRODUCTION

Enterprise information systems are designed to integrate all of an organization’s information system computing. They increase the speed with which information flows through a company. They can lead to reduced inventories, shortened cycle times, lower costs, and improved supply chain management practices. Enterprise information systems:

- create value through integrating networks across a firm or firms (Metcalf’s Law),
- implement of best practices for each business process,
- standardize processes within organizations,
- provide one-source data resulting in less confusion and error, and
- can give on-line access to information.

All of these features facilitate better organizational planning, communication, and collaboration.

The enterprise system market has seen a great deal of evolution in the 21st Century. We have seen a great deal of change in this market, as Oracle has acquired PeopleSoft and J.D. Edwards, and BAAN has been acquired by another software firm. SAP and Oracle continue to dominate the high end of the lucrative enterprise system market, joined by Microsoft. While SAP claims in its television ads that it also serves small businesses, Microsoft has made great inroads in the enterprise system market by offering its products to medium enterprises that are more affordable than the prices needed for SAP or Oracle.

OPEN SOURCE SOFTWARE

OSS has become a viable means of software creation. Sun Microsystems long viewed OSS as a means to develop long-range market strength (Babcock, 2009), although this effort was insufficient to avoid short-term takeover by Oracle. Other firms, however, have been able to make OSS work, to include Dell computers (Conry-Murray, 2009).

Open source technology makes possible cooperative development of information technology tools, in turn making it possible to use small bits of functionality developed by others and tested by the market rather than having to develop everything yourself. With OSS, developers and users are free to utilize and modify OSS by accessing open code. Web 2.0 provides a cooperative development environment allowing widespread participation. Products such as the Web server Apache, the database query engine MySQL,
and the cash management system GNU Cash have been highly successful (Jaisingh et al., 2008-9). Hos-
sain and Zhu (2009) attribute open source software development as being faster and more responsive,
leading to more robust and secure software. Open source products have been developed for financial
applications (Kane and Masters, 2009), marketing applications (Fleisher, 2008), and many other fields.

While products in the Free Open Source Enterprise Resource Planning (FOS-ERP) domain are de-
veloped by proprietary firms, there is a related open source ERP business model for distribution.

**Open Source ERP**

There is a demand for less expensive systems by many organizations. Hauge et al. (2006) cited evidence
that few SMEs in Eastern Europe have implemented ERP systems, due to lack of needed financial and
human resources. Recently, ERP vendors have realized that open source systems (OSS) have robust
capabilities, both as a source of content for vendors as well as a threat to the proprietary enterprise sys-
tem market share from competitors based on OSS development or delivery (Grewal et al., 2006). Open
source ERP systems are used by firms such as Home Depot, Toyota, and Fidelity (Weber, 2005). Web
delivery has been selected as a means to distribute a number of interesting enterprise system software, led
by Compiere and Nexedi from France. Compiere (and many similar products) are open in the sense that
they are downloadable for free. The business model is based on collecting fees for service and support.

Olsen and Saetre (2007) reported that in-house development of ERP was feasible and cost effective
due to the availability of modern development tools. Open source ERP products can provide similar
flexibility, and we would expect that to be at even lower cost. Three potential benefits in using OSS
ERPs are increased adaptability, decreased reliance on a single supplier, and reduced costs.

**ERP Support to Small Organizations**

Open source ERP systems have appeared as a viable alternative for small businesses. The business driver
has been lower costs, but the ability to customize has also been important. Barriers to successful imple-
mentation include database migration, synchronization of software to company workflow, developing
user interfaces and user support, and integrating third-party software. This volume provides valuable
insights into the potential and risks involved in FOS-ERP.

**VOLUME CONTENTS**

The volume is opened by Carvalho and Johansson with a discussion of what is different about Free/
Open Source (FOS-ERP) and Proprietary ERP systems. They emphasize the cost benefits of FOS-ERP,
comparing that with what they offer their adopters. Balancing this cost advantage are issues in specific
software business model evaluation, software selection, customization, and maintenance. Challenges and
opportunities are discussed. There are different ways in which a small organization can adopt an ERP.
Offering a product in the FOS-ERP market is relatively easy, but that creates a dynamic market with
easy entry for new competitors. Furthermore, lower cost comes with lower service levels. Carvalho and
Johansson cite new developments in the form of improved training materials in the FOS-ERP industry, as
well as a changing market where Proprietary ERP vendors have responded by offering cheaper versions
of their software in software-as-a-service mode. The need for certification and consulting processes to match the quality of Proprietary ERP vendor networks was raised. This chapter provides a strong basis to describe the field of FOS-ERP.

Monsores and Tanaka survey the primary FOS-ERP systems available on the market, focusing on Brazil. A survey of SourceForge.net was the basis for this research. They draw upon their prior research to establish that FOS-ERP projects are maturing, and that there has been a significant increase in such projects in 2010 over 2009. Monsores and Tanaka also reviewed seven FOS-ERP projects (Adempiere, Openbravo, PostBooks, WebERP, Compiere, OFBiz, and ERP5) based on SourceForge.net as well as information gathered from vendor Web sites. Each system was qualitatively evaluated, concluding with report of market presence in Brazil. Their analysis concludes that FOS-ERP has a very promising market in that rapidly growing economy.

Huq, Shah and Mihailescu evaluate key factors motivating small organizations to adopt FOS-ERP. Reported reasons for ERP system selection were reviewed, along with critical success factors. Huq et al. then develop a theoretical framework based upon results from a purposive sample of nine international small business ERP installations and one organization classified as of medium size. The sample was generated from a list of FOS-ERP users, querying them concerning motivations for their selection decision. Ten consultants and vendors were also sampled on the same questions. Differences in rankings were analyzed, along with expert judgment (obtained from one of the editors of this volume). The article is a source of factors that were found to be most important in FOS-ERP adoption by small businesses.

Herederro, Berzosa and Seco give a case description of FOS-ERP implementation for a Spanish financial company. The processes of selection and implementation were described with the intent of demonstrating decision making processes, inferring critical success factors, and identifying relative advantages obtained from FOS-ERP. The characteristics of successful implementation project leadership were inferred based upon the experience. A specific technical factor found to be critical to success was the importance of software testers.

Deodhar, Saxena, Gupta and Ruohonen analyze business models of open source ERP, emphasizing the importance of software licensing and partner networks. Business models are defined in terms of product strategy, revenue logic, distribution model, and delivery of maintenance and service. Concepts are demonstrated through a case of implementation of an OpenBravo ERP system in Spain. The approach these authors give emphasizes viewing FOS-ERP benefits and risks from both vendor and user perspectives.

Tambo and Koch review the expenses involved in proprietorial ERP systems. FOS-ERP offers a way to obtain needed computing system support at lower costs. But barriers to FOS-ERP adoption exist. These barriers are reviewed through desk study, and means of managing them outlined. The potential of software-as-a-service and other rapid developments in the ERP market give FOS-ERP relative advantages over proprietary ERP. But while there are cost advantages, risks are more uncertain. Tambo and Koch emphasize the need to view FOS-ERP adoption as risk taking, balancing opportunities with threats.

De Silva examine legal risks of FOS-ERP with respect to England and Wales. The developing nature of this legal domain was recognized. The need for licensing was argued, and copyright restrictions listed. Twenty open source licensing systems were measured by popularity. Risks included enforceability and the distinction between copyright and contract. Key legal challenges to date were reviewed.

Wölfel and Smets discuss the role of consulting support available to aid small and medium enterprises (SMEs) in selecting FOS-ERP. Smets is associated with Nexedi, the provider of ERP5, and thus this chapter gives valuable advice concerning tailoring FOS-ERP. The research questions addressed are: (1) which tailoring options are most suitable for automation in general, and specifically for ERP5; and (2)
How can ERP5 tailoring options be automated? A design science paradigm consisting of expert interviews, desk research, and an example was used to answer these questions. The development of ERP5 was reviewed, with a presentation of tailoring options. The problem of automatic system configuration (tailoring) was discussed from the perspectives of knowledge engineering and artificial intelligence. The ERP5 AI Toolkit was described. Wölfel and Smets show how ERP5 category configuration can be automated. Prototypes and initial validations were found to be promising, yielding decision trees that worked well. Further research needed for more complex configurations was outlined.

Stefanou provides a chapter elaborating on opportunities and risks for smaller organizations in adopting FOS-ERP. Because they have revolutionized the way in which business software is developed and distributed, Web 2.0, cloud computing, and open source software are reviewed to frame these opportunities and risks. The primary risks considered are security and hidden costs. Stefanou offers guidelines to eliminate such risks. He also reviews small organization characteristics favorable to either FOS-ERP or Proprietary ERP. Given the importance of risk management in today’s world, this chapter is a very good source for potential adopters in their initial evaluation of FOS-ERP.

Ven and Van Nuffel describe adoption of an open source ERP in Belgium. Barriers to adoption identified from prior research included lack of functionality and lack of support. Literature reporting ERP selection criteria of SMEs was reviewed, as were specific criteria used by Belgian SMEs. Ven and Van Nuffel went to SourceForge.net and Freshmeat.net to obtain information about open source ERP adoption in Belgium. Functionality of 36 open source ERP products was compared. Ven and Van Nuffel then selected ten of these products (those demonstrating the most comprehensive functionality) and analyzed the network of consultant support available for each, categorized by areas of Belgium, its neighbors, the European Union, and the world. The study concluded that lack of open source ERP functionality is not an issue, but that lack of support continues to be a problem.

Stojanovic, Acimovic-Raspopovic and Bostjancic Rakas focused on the issue of security in FOS-ERP. FOS-ERP system security can be vulnerable to external threats. The state of current technology was reviewed, along with a listing of security issues. Means to secure network infrastructure are given. These authors identified properly defined service level agreements as a starting point to assure required security, and proposed a security management architecture to fit within a service management quality system. This chapter gives excellent advice in designing a more secure FOS-ERP.

THE POTENTIAL FOR OSS ERP

As demonstrated by the chapters in this volume, many ERP products have been developed to serve smaller organizations (Business, non-profit, government). The open source approach can be applied to any type of product development. However, since the code is freely distributed, the business model is complicated. Revenues can be generated through a variety of strategies, to include sale of complementary products and services.

This volume brings together an outstanding selection of papers describing FOS-ERP, comparing differences with proprierial ERP products, and demonstrating key research factors. It includes cases demonstrating how small enterprises have benefited from FOS-ERP in Spain and in Belgium, along with difficulties encountered and solutions developed. It addresses key issues such as security and legal risks. There are excellent discussions of challenges and opportunities, along with barriers to adoption.
This edited edition should serve as an excellent resource to researchers in the field of enterprise information systems.

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REFERENCES


