

# Chapter 102

## Tailoring FOS–ERP Packages: Automation as an Opportunity for Small Businesses

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### ABSTRACT

*Free/Open Source software (FOSS) has made Enterprise Resource Planning (ERP) systems more accessible for Small and Medium Enterprises (SMEs) including overseas subsidiaries of large companies. However, the consulting required to configure an ERP to meet the specific needs of an organization remains a major financial and organizational burden for SMEs. Automatic ERP package configuration based on knowledge engineering, machine learning and data mining could be a solution to lessen the burden of the implementation process. This chapter presents two approaches to an automation of selected configuration options of the FOS-ERP package ERP5. These approaches are based on knowledge engineering with decision trees and machine learning with classifiers. The design of the ERP5 Artificial intelligence Toolkit (EAT) aims at the integration of these approaches into ERP5. The chapter also shows how FOS-ERP can boost Information System (IS) research. The investigation of the automation approaches was only possible because the free source code and technical documentation of ERP5 was accessible for TU Dresden researchers.*

### INTRODUCTION

Enterprise Resource Planning (ERP) systems are said to enable organizations to manage their resources efficiently and effectively by providing a total and integrated solution for their information

processing needs (Nah, Lau, & Kuang, 2001). Due to technical and economical restrictions, ERP systems traditionally have been focused on larger organizations. In recent years however, a turn of the market towards Small and Medium Enterprises (SMEs) can be observed (Deep, Guttridge, Dani, & Burns, 2008). Adam and O’Doherty (2000) show that SMEs are as likely to be interested in

DOI: 10.4018/978-1-4666-2455-9.ch102

ERP as multinational organizations. ERP packages are being viewed as a key factor for gaining competitive advantage in the SME sector and empirical findings confirm these expectations (Koh & Simpson, 2007).

However, Morabito, Pace, and Previtali (2005) identify a lack of human and financial resources as well as lock-in risks as major problems that SMEs face when adopting ERP technology. They often do not have dedicated teams for implementation and software maintenance and cannot spend as much money on Information Technology (IT) as large enterprises, which in turn makes them more vulnerable to the risk of lock-ins in ERP packages when requirements change after implementation.

FOS-ERP systems are considered a viable alternative for SMEs as they tackle their specific problems. They not only help to save license costs, but they also prevent lock-in. As their source code is free to everyone they lower the barrier for third parties to perform modifications. (Campos, Carvalho, & Rodrigues, 2007).

Business models, where SMEs access ERP functionalities through the Internet could further alleviate the SME-specific problems and broaden the ERP market (Adam & O'Doherty, 2000). Recently Software as a Service (SaaS) is associated to this kind of business model (Hofmann, 2008). By providing applications directly through the Internet, SaaS eliminates installation and update tasks, thus saving clients from maintenance work and reducing IT expenses by on-demand pricing (Wang et al., 2008).

Despite these promising perspectives the consulting effort remains a financial burden for an ERP implementation project (Janssens, Kusters, & Heemstra, 2007). Although ERP systems are cheaper and easier to implement for SMEs than for large enterprises (Morabito et al.), SMEs may face challenges in affording major consulting support (Snider, Da Silveira, & Balakrishnan, 2009; Kinni, 1995). FOS-ERP help to save license costs, but implementation costs are often far exceeding the costs for ERP package licenses. Thus the greatest

savings can be achieved during implementation (Timbrell & Gable, 2002).

To make implementation less complex and less costly, ERP vendors try to reduce the amount of knowledge required for the implementation by various degrees: cutting down functionality, designing package templates or giving customers and system integrators a common implementation methodology (Timbrell & Gable, 2002). Functionality cut-down and package templates are static approaches and therefore only suit a defined group of companies sharing common business needs. A common implementation methodology does not permit the CEO of a small business to configure his ERP all on his own. Therefore, we propose automation as an alternative or complementary approach to ERP package tailoring for small businesses.

Off-the-shelf ERP packages are implemented mainly by configuration (Brehm, Heinzl, & Markus, 2001). Automating this configuration process would lessen the burden of the implementation process and make ERP more accessible for SMEs. The vision is that a packaged ERP system will be automatically configured based on a questionnaire filled out by the Chief Executive Officer (CEO) of a small business. The first example of such automation is the SaaS "TioLive" which uses various wizards to automate the configuration of the FOS-ERP system "ERP5".

However, current technology is still very simple. To further pursue this vision, two approaches for automating the configuration of packaged ERP Software based on questionnaires are investigated: knowledge engineering with decision trees and classification based on machine learning algorithms. The public availability of source code and technical documentation allows to analyze ERP5's configuration options and to implement the automation approaches in the ERP5 system. This will make those wizards more intelligent and will allow to provide a solution which matches the requirements of a small business far better than before.

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