

# Chapter 2.17

## Understanding the Development of Free E–Commerce/E–Business Software: A Resource–Based View<sup>1</sup>

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### **ABSTRACT**

This study examines the development of open source software supporting e-commerce (EC) or e-business (EB) capabilities. This entails a case study within a virtual organization engaged in an organizational initiative to develop, deploy, and support free/open source software systems for EC or EB services, like those supporting enterprise resource planning. The objective of this study is to identify and characterize the resource-based software product development capabilities that lie at the center of the initiative, rather than the software itself, or the effectiveness of its operation in a business enterprise. By learning what these resources are, and how they are arrayed into product development capabilities, we can provide the knowledge needed to understand what

resources are required to realize the potential of free EC and EB software applications. In addition, the resource-based view draws attention to those resources and capabilities that provide potential competitive advantages and disadvantages to the organization in focus.

### **INTRODUCTION AND BACKGROUND**

Many companies face a problem in determining how to best adopt and deploy emerging capabilities for e-commerce and e-business services. This study employs a *resource-based view* of the organizational system involved in developing open source EC/EB software products or application systems. This chapter examines the

GNUenterprise.org (hereafter GNUe) project as a case study. The analysis and results of the case study focus attention on characterizing an array of social and technical resources the developers must mobilize and bring together in the course of sustaining their free EC/EB software development effort. Free EC/EB results from applying free software development concepts, techniques, and tools (Williams, 2002) to supplant those for open source software supporting EC and EB (cf. Carbone & Stoddard, 2001).

This study does not focus on the software functionality, operation, or development status of the GNUe free EC/EB software, since these matters are the focus of the GNUe effort, and such details can be found on that project's Web site. Similarly, it does not discuss what EC/EB application packages are being developed or their operational status, though the categories of software packages can be seen in Exhibit 1, presented later. Instead, the resource-based view (Acedo et al., 2006; Barney, 2001) that is the analytical lens employed in this chapter helps draw attention to a broader array of resources and institutionalized practices (i.e., resource-based capabilities) (Oliver, 1997) that may better characterize the socio-technical investments that provide a more complete picture of the non-monetized costs associated with the development of free/open source software (FOSS), as well as possible competitive advantages and disadvantages (Hoopes et al., 2003). Such a characterization might then eventually inform other studies that seek to identify and explain the "total costs of operations" involved in developing, deploying, and sustaining FOSS, or the commercial services that support these costs.

## **CASE STUDY: THE DEVELOPMENT OF FREE EC/EB SOFTWARE IN GNUe**

GNUe is an international virtual organization for software development (Crowston & Scozzi, 2002;

Noll & Scacchi, 1999) based in the U.S. and Europe that is developing an enterprise resource planning (ERP) system and related EC/EB packages using only free software. One of their overarching goals is to put freedom back into "free enterprise," as seen in the overview of GNUe shown in Exhibit 1, which is taken from the project's Web site. This organization is centered about the GNUenterprise.org Web site/portal that enables remote access and collaboration. Developing the GNUe software occurs through the portal that serves as a global information-sharing workplace and collaborative software development environment. Its paid participants are sponsored by one or more of a dozen or so companies spread across the U.S. and Europe. These companies provide salaried personnel, computing resources, and infrastructure that support this organization. However, many project participants support their participation through other means. In addition, there are also dozens of unpaid volunteers who make occasional contributions to the development, review, deployment, and ongoing support of this organization, and its software products and services. Finally, there are untold numbers of "free riders" (Olson, 1971) who simply download, browse, use, evaluate, deploy, or modify the GNUe software with little/no effort to contribute back to the GNUe community.

GNUe is a community-oriented project, as are most sustained FOSS development efforts (Scacchi, 2002a; Sharman et al., 2002; West & O'Mahony, 2005). The project started in earnest in 2000 as the result of the merger of two smaller projects both seeking to develop a free software solution for EC/EB applications. More information on the history of the GNUe project can be found on their Web site.

The target audience for the GNUe software application packages is envisioned primarily as small to mid-size enterprises (SMEs) that are underserved by the industry leaders in ERP software. These SMEs may be underserved due to the high cost or high prices that can be commanded for commercial ERP system installations. Many

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