Chapter 4.10
Collaborative Development within Open Source Communities

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INTRODUCTION

Open source communities are one of the most successful--and least appreciated--examples of high-performance collaboration and community building on the Internet today. Open source communities began as loosely organized, ad-hoc communities of contributors from all over the world who shared an interest in meeting a common need. However, the organization of these communities has proven to be very flexible and capable of carrying out all kind of developments, ranging from minor projects to huge programs such as Apache (Höhn, & Herr, 2004; Mockus, Fielding, & Herbsleb, 2005).

Other collaboration-intensive communities could benefit enormously by learning what open source communities are and how they work. In fact, their motivation and objectives are not confined to software development projects. They are increasingly taking shape around non-software-related collaborative activities (Shah, 2005). Moreover, open source has come to stand for much more than software whose source code can be freely modified and redistributed subject to just a few restrictions imposed by the terms of its distribution license. Information, documentation, and other "sources" generally related to innovation, and knowledge building and sharing processes, tend to come under the open source umbrella.

A full comprehension of open source communities requires an in-depth understanding of

the underlying organizational process (e.g., the software development process for software development projects). Some of the patterns underlying these organizational processes are not confined to software development and are common to other successful communities as well. One of the main goals of current research into open source communities is to identify these patterns (Kim, 2003) and develop a pattern language that can be used to describe, build, and improve other types of successful communities.

Finally, there is a trend toward two traditionally different development styles derived from opposing assumptions about the nature of development tasks—the model of most of the commercial world vs. the model of the open source world—converging. People would be astute to try to import some of the open source community model's virtues into a commercial context and will find it worthwhile taking a look at the conditions necessary for creative work.

Bearing these premises in mind, this article begins by defining and characterizing the term "open source community." It then tackles the issue of how these communities work (i.e., what the *patterns of collaboration* within successful open source communities are) and describes how these patterns could be applied in other types of communities apart from software related communities, and vice versa. This is intended to further the understanding of the open source model and its implications outside the realm of software development. In examining these questions, the article discusses existing, relevant research, and presents original case studies of working open source communities. These case studies hit at how collaboration works within successful projects.

OPEN SOURCE COMMUNITIES FUNDAMENTALS

We can define an *open source community* as a loosely organized, ad-hoc community of contributors from all over the world. These contributors share an interest in meeting a common need, ranging from minor projects to huge developments, which they do through a high-performance collaborative development environment, allowing the organizational scheme and processes to emerge over time. The term derives from the notion of *community* (i.e**.,** an amalgamation of people with related interests), where intent, belief, resources, preferences, needs, goals, and a multitude of other conditions may be present and common, affecting the degree of adhesion within the group. Communities may meet to share information, to participate in shared projects, or to complete group tasks. What most characterizes a community is the pursuit of a common productive goal and sharing interaction in many ways.

Essentially born out of a desire for increased general access to source and binary code, open source communities have been bound to computer networks, and have evolved at the same pace as the Internet. Inexpensive access to Internet resources and source or binary code has allowed programmers to collaborate irrespective of where they are, and is one of the major factors in the growth of the number and size of communities.

The open source collaborative development carried out by open source communities has led to the use and spread of more and more sophisticated collaborative development environments (CDEs), virtual spaces where all the stakeholders of a software project, possibly distributed in time and space, can negotiate, brainstorm, discuss, share knowledge and resources, and generally labor together to carry out some task in the context of a software development process (Booch & Brown, 2003). CDEs serve as the meeting point not only for the developers of the community, but also for the users, who play an important role in open source software development.

The philosophy behind open source communities is founded on peer-to-peer collaboration and delegating tasks for other developers to provide input at will. They are based on meritocracy, where

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