Chapter 11
Trust in Open Source Software Development Communities: A Comprehensive Analysis

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ABSTRACT

This study presents the significance of trust for the formation of an Open Source Software Development (OSSD) community. OSSD has various challenges that must be overcome for its successful operation. First is the development of a community, which requires a healthy community formation environment. Taking into consideration various factors for community formation, a strong sense of TRUST among its members has been felt. Trust development is a slow process with various methods for building and maintaining it. OSSD is teamwork but the team is of unknowns and volunteers. Trust forms a pillar for effective cooperation, which leads to a reduction in conflicts and risks, associated with quality software development. This study offers an overview of various existing trust models, which aids in the development of a trust evaluation framework for OSSD communities. Towards the end of the study, various components of the trust evaluation along with an empirical framework for the same have been proposed.

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1. INTRODUCTION

Open source software development (OSSD) is an ideology, which has paved the way for which dedicated teams of volunteer software developers participate and contribute in various areas of software engineering. The aim of OSSD communities is to make a high quality and reliable software, no matter how complex an application may be (Asundi, 2001). The project is initiated by the core team and is made open for developers across the globe to contributing code and feature enhancements. The core team of the project analyzes the contributions from various contributors. The core team may have single or number of coordinators. Coordinators are project creators and are responsible for the evolution and growth of the community. They would take the final decision to incorporate the received code into the final build and release the next test version of the software. After rigorous testing and debugging when the required quality of software is achieved, test versions of software are promoted to be the next stable release. Further, with the passage of time new contributions in form of bug fixes and feature enhancements for the software are received. The same cycle of thorough testing and integration of code into existing software is followed. Every effort is done to attract more and more people towards the project and with the passage of time the community grows. The team members of the OSSD community provide feedback, which acts as a base for the planning of future project managing strategies. With constant efforts, gradually, the project attains high quality and upcoming issues are dealt with even better ways. The ways in which development work is coordinated and communicated amongst the developers makes it different from existing software development strategies and this is what is unique. It is intended to perform a study for improvement of the relationship among the virtual team members of an OSSD community, which in turn enhances the quality of the developed open source software. We move ahead with this work, keeping in mind the following research objectives.

1.1. Research Objectives

This study is performed to accomplish the following research objectives:

- To formulate various challenges associated with OSSD;
- To study the relevance of trust for open source systems;
- To study various methods for building and sustaining trust;
- To propose a trust evaluation framework for OSSD communities.

To achieve the aforementioned objectives of our research, a comprehensive literature analysis has been conducted. Various papers covering the nature of OSSD, existing models of software production, challenges associated with OSSD have been analyzed. Trust related aspects like trust characteristics, importance to OSSD communities, methods for building and sustaining trust in OSSD communities, existing OSSD trust models, contributions and suggestions of various researchers for trust building in virtual teams have been also analyzed.

To collect the relevant literature for this study, following search terms or keywords were used:

- Trust;
- Trust framework for open source software development communities;
- Trust in virtual teams;