

AN OPEN ONION PROCESS MODEL TO SUPPORT
OPEN SOURCE DEVELOPMENT

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ABSTRACT

The need for technologies to building high quality software faster and cheaper has led to the advances in software development techniques such as software component, object orientation, software reuse and open source methodologies. Ability to revamp existing codes is the leading edge of open source over other methodologies. Interestingly, literature has often described open source development with onion. However, the previous open source onion descriptions have not been put to test. This research presents an improved onion model that has streamlined four prominent open source onion models into a newly evolved five layered open onion model whose layers are distinctively modeled diagrammatically, evaluated statistically and validated with Delphi's approach. Relevant parameters, such as programming language support, user interface, and natural language support, were extracted from ten highly ranked SourceForge case studies and statistically evaluated using correlation, regression and averages; while a cross verification was performed by statistical analysis based on extracted details of 1104 open source software projects details. The support for Pareto (80/20) principle in open source shows that 80% of project developers' activities are actually regulated and controlled by 20% project administrators' activities. The development and validation of open source user satisfaction equation as well as the newly evolved open source success tree provide excellent measure; such as 100% Delphi experts' support for ability to avoid fatal errors and 100% for ability to build strong support for the project; to which an open source success rate largely depends. Major contributions of this study are that the open onion model evolves to improve the existing onion models of open source through the modeling, verification and the 4-round open onion Delphi validation stages.