AOM Operations Management Research Incubator – Jorge Colazo – Dissertation Summary

New product development success is an important research theme in OM and is also one of the keys for long-term business profitability. The computer software industry is particularly interesting as subject of research in innovation success, because since its inception it has been in a state of constant crisis regarding the effective introduction of new products, with success rates currently at a dismal 4% (Business Week 2005).

Project managers have tried different interventions to improve the software NPD process. In the last decade a new software development paradigm attracted the attention of businesses and academics: the Open Source Software (OSS) model. OSS is software under licensing terms that make publicly available the complete source code of the product and allow the redistribution of modified versions. OSS has generated a particular innovation model, where the programs are developed collaboratively by dispersed teams of mostly volunteer individuals who make intensive use of electronically mediated communication. The focus of this dissertation is then the analysis of OSS as *innovation paradigm*. In fact, the idea of "opening" the code of a native-proprietary application to lure external volunteer developers and improve the NPD process was rapidly caught by the private software sector. However, the industry is still struggling to understand how such projects can be designed to maximize their chances of success. Three main project design traits will be analyzed in this dissertation.

First, intellectual property (IP) management is a key concern in software innovation. Oppositely to prevalent norms, OSS thrives, at least in theory, not by enclosing IP but by opening it to draw external developers and skilled users to help in the innovation process. To analyze whether a firm can incorporate aspects of OSS's IP management style to boost its innovation processes while balancing an adequate control of its IP it is necessary to understand if and how different OSS licenses correlate to success. Then the first research question of this dissertation is: ***How do OSS licenses impact development success?***

Second, in the view of some researchers (Von Hippel 2001) the OSS model's truly innovative character resides in that it enables the collaboration of users as co-developers from the earliest stages of development. Moreover, the broad, community-level organizational structure of OSS consists of different layers of participants that differ in their function, hierarchy and degree of involvement. How these different layers interplay in order to improve the development process will be addressed as the second main research question in this dissertation: ***How does the community-level structure of an OSS software development project impact development success?***

Third, the "inner circle" of developers or "core developer team" is the locus of key decisions for the project such as the screening of contributions, the management of software releases and the general programming architecture of the project. This core team, for instance, can be organized in a centralized or decentralized fashion, generating different patterns of communication that may be related to the team's success. Nevertheless, no research has investigated what kind of core team organization is able to yield better performance. Thus the third main research question in this study is: ***How does the collaboration structure of the core development team impact development success?***

The dissertation will be an empirical field study of working OSS projects using archival data from electronic sources. The tools used to collaboratively work in OSS projects allow keeping track of most activities in the development process in the form of log files and other data archives, which are in general available for public inspection and can be downloaded using appropriate programs. These sources contain data related for instance to the time and nature of all modifications to the source code, records of e-mail communications among developers and other information such as project team composition, project licenses and project tenure.

Development process success will be measured along the dimensions of timeliness, productivity and quality. Social network analysis (Wasserman and Faust 1994) will be used for the characterization and measurement of the networked structure of the core developer teams. This choice also opens the door to the leveraging of a large body of extant literature on the structural view of team performance that up to this moment has not been incorporated to a good extent into the study of innovation teams. The analysis of empirical data will be done using ordinary least square regression and time series techniques.

This dissertation will contribute to our knowledge on the impact of intellectual property rights protection on innovation, will expand extant research on the impact of user-driven innovation on new product development success and will contribute to the study of the impact of communication patterns on development success. Moreover, it will include several dimensions of success against which the correlates can be evaluated, will analyze in addition to team-level structure, the impact of inter-project ties in the form of boundary spanning activity and will include as a dimension of structural complexity of the team its temporal dispersion.

References

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