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AN INTEGRATIVE THEORETIC APPROACH TO OPEN SOURCE SOFTWARE DEVELOPMENT

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Abstract:
A theoretic approach to integrate various influencing factors that lead to participation of an IT professional in Open Source Software Development is proposed and we also investigate various associated outcomes.

Keywords: Open Source, Software Development, Influencers, Outcomes

Introduction
Traditionally, in Software development, roles and responsibilities of the developers are assigned and expectations and rewards are mostly explicitly laid out. With Open Source Software Development (OSSD) a new paradigm is created (Raymond, 2001) that even organizations are trying to benefit from (Samuelson 2006). The question ‘Why people participate in OSSD?’ has been debated by researchers. Current research draws from Economics, Sociology and Organizational Sciences to explain the motivational aspects of OSSD (Benkler 2004). Some researchers argue that political ideology and anti proprietary sentiment goads open source development, while others argue for the feelings of enjoyment and creativity, satisfaction of user needs, building a reputation within the community, a need for affiliation or to maintain an identity are the primary factors which lead to participation in OSSD (Coleman 2005). Researchers are trying to understand the motivations and explain the mechanisms of OSSD (Bagozzi, Dholakia 2006, Roberts 2006).

Theory:
The factors we examine can be classified in two categories. External Influencers are the external pressures that influence an individual to participate in OSSD. Internal Influencers are the factors that are lead an individual to participate in OSSD mainly because the individual identifies himself or herself with the cause.
**External Influencers:**

In OSSD though we do not have an organization per se, yet the community behaves as an organizational whole (Raymond 2001). Institutionalization occurs when people get accustomed to expected ways of doing things. DiMaggio and Powell (1983, 1991) classify isomorphic institutional influences as coercive, normative, and mimetic to depict three kinds of pressures that act upon any community. The choice to participate can be imposed through coercive pressures (Adler 2005, Benders et al, 2006), normative isomorphism (Bagozzi & Dholakia 2006), and mimetic pressures (Truscello 2005).

**Internal Influencers:**

Social Identity theory has been generally considered as the glue that holds the community together (van Vugt & Hart 2004). According to Social Identity theory, people tend to classify themselves and others into various social categories defined by prototypical characteristics abstracted from the members with the view to enhance group distinctiveness and also differentiation when compared with other groups (Jetten et al, 2004). Ashmore et al (2004) articulated Collective Identity while exploring its various dimensions and developed a framework, which captures the multidimensional concept of collective/social identity.

**Control Standards:**

The OSSD process may not have a formal organizational structure, yet it follows closely a hierarchy. The following of this hierarchy is dependent upon the adherence to the ideology that the group holds and it consequently affects the effectiveness of the communities engaging in OSSD (Stewart & Gosain 2006). Prior literature suggests that in OSSD most control that can be exercised must be clan control due to lack of formal explicit structures (Ouchi 1979). Although, in OSSD the promotions are based on meritocracy, the initial controls flow from seniority. When a member starts a new project, he assumes an owner-like role. A project can contain many different codes contributed by community members. In his owner-like role, he can give access rights to active peripheral members (AlMarzouq et al. 2005) to report bugs and occasionally develop remedies.

**Outcomes:**

Bagozzi and Dholakia (2006) consider the affective, cognitive and social determinants of participation behavior of the user groups, we use similar typology to measure outcomes. Prior literature indicates that
there is a relationship between the control mechanisms and the emotional well being of the employees in Organizations (Ouchi & Johnson 1978), we classify such outcome as ‘Affective Outcome’. The degree to which the individuals found the participation in the OSSD to be useful in terms of learning is being considered as ‘Utility Outcome’ in this study. The recognition that an individual receives for prior contributions made is an important performance outcome used in recent research (Roberts 2006). The gain in Social status as a result of participation in the OSSD is considered under ‘Social Outcome’.

Research Model:

Based upon the discussion above, we posit the following model shown in Figure 1.

![Research Model Diagram]

**Hypotheses:** We have eight hypotheses as per the relationships depicted in the Research Model as shown in Figure 1.

**Research Methodology:**

We propose to use Survey Methodology for this study. Greater reliability can be achieved by using pre-validated measures drawn from prior research. Structural Equation Modeling can be used to test the theoretical model. And for Moderation we propose to use Stepwise Regression.
Conclusions:

In this study we attempt to develop a framework that integrates Institutional theory and Social Identity theory in explaining the participation of the individual software professional in the OSSD. We also analyze the various outcomes that could be associated with the participation in OSSD. The integrative framework will serve the dual purpose of consolidating the current research and provide guidance to the future researchers.

Bibliography