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Global Ethics of Collective Internet Governance: Intrinsic Motivation and Open Source Software

Chong Ju Choi
Sae Won Kim
Shui Yu

ABSTRACT. The ethical governance of the global Internet is an accelerating global phenomenon. A key paradox of the global Internet is that it allows individual and collective decision making to co-exist with each other. Open source software (OSS) communities are a globally accelerating phenomenon. OSS refers to groups of programs that allow the free use of the software and further the code sharing to the general and corporate users of the software. The combination of private provision and public knowledge and software, and the seeming paradox of economic versus social motivations have stimulated a wide debate between researchers and policymakers. In this article, we analyze OSS communities from the viewpoint of ''intrinsic motivation,'' knowledge creation, and collective Internet governance. We believe that the growth of global OSS has fundamental implications for business ethics and the governance of the global Internet in the twenty-first century.

KEY WORDS: ethics, Internet governance, open source software, intrinsic motivation, psychological contracts

Introduction

One of the key paradoxes of the global Internet governance is that the global Internet allows individual and collective decision making simultaneously. Open source software (OSS) development projects are globally growing at a rapid rate. Thousands of OSS developments have emerged in the past few years leading to the formation and proliferation of the globally dispersed virtual communities. A number of works across disciplines, including information science and management, have recently analyzed the growth and success of this phenomenon mainly in the quantitative and information technology perspectives (Spaeth et al., 2007; Zeitlyn, 2003). The purpose of this article is to analyze OSS communities from the viewpoint of ''intrinsic motivation'' (Frey, 1997; Frey and Stutzer, 2007), knowledge creation, and the interactivity in today's society (Bucy, 2004; Sundar, 2004). We believe that our analysis has implications for the global internet, and the nature of business ethics and global internet governance in the twenty-first century.

This proliferation has raised various academic and practical issues including the nature of collective action (Olson, 1965; Ostrom, 1998; Raymond, 1999), the nature of private and social innovation, and the right to privacy and rights over intellectual property exchanged over the Internet. Over 10,000 OSS projects that exist today fundamentally follow the same principle of Internet-based communities of software developers, making the software freely available as specified by the project (von Hippel and von Krogh, 2003). Leading examples include Linux, Apache, and Perl programming language (Lakhani et al., 2002).

The fundamental debate in the literature is between two schools of thought. The first is the more economic, self-interested, and market-based school of thought (Iannacci, 2002; Lerner and Tirole, 2006). This school of thought believes that the OSS phenomenon can be analyzed in the logic of traditional neoclassical economics, and the model of private reputation development; a type of extrinsic motivation similar to rewards. Participating individuals in the development project can increase their potential wages and income in the future due to development of market signals (Spence, 1974) and

individual reputation. The second is the more social and anthropological school of thought based on reciprocity, kinship, and gift economies (Zeitlyn, 2003). This model is based on the anthropological literature on gifts (Mauss, 1955; Strathern, 1992; Titmuss, 1970). Kinship, trust, and reciprocity drive this social anthropological approach (Schwimmer, 1995) to OSS development and is closer to a model of ''intrinsic motivation'' (Frey and Stutzer, 2007). The business ethics literature is relatively under represented in the global phenomenon of OSS.

In this article, we contribute to this interdisciplinary debate especially in the context of business ethics research and global Internet governance, by synthesizing two existing theories of reciprocity and motivation. The first theory we attempt to integrate is a psychological contract, a term introduced by Schein (1965) and Levinson et al. (1962) in the 1960s. Research on psychological contract has recently been further developed by Rousseau and her colleagues (Morrison and Robinson, 1997; Rousseau, 1989). OSS programmers have a psychological contract within the global community of software development programmers, linked by trust with shared values and professional backgrounds. The collective, public provision of OSS is possible, because an individual and a commercial behavior would be seen as violating the psychological contract to the global open source community.

The other theory is an intrinsic motivation developed by social psychologists (Deci, 1975; Deci et al., 1999; Pittman and Heller, 1987) and further elaborated by some economists (Frey, 1997; Frey and Stutzer, 2007; Kreps, 1997). Psychologists have long been considerably interested in the distinction between intrinsic and extrinsic motivation (Deci, 1975; Mortimer and Lawrence 1989). This interest in part reflects a contrast between *extrinsic* value that is associated with a thing viewed as a means to an end and *intrinsic* value that is associated with experiences sought for its own sake as an end in itself. People with strong tendencies toward intrinsic motivation will negatively respond to the monetary compensation or reward related to their intrinsically motivated behavior. An example in Titmuss (1970) is that monetary compensation to blood donators would undermine their social values and personal motivations, and thus lead to a lower willingness to donate blood (Frey, 1997; Frey and Stutzer, 2007; Titmuss, 1970).

Open source software developments can be seen as having both the characteristics of self-interest and economic markets, as well as the more reciprocity- and gift-based analysis of anthropology (Mauss, 1955; Titmuss, 1970; Zeitlyn, 2003). In this article, we attempt to contribute to the debate in the literature on OSS development, by focusing on the ''intrinsic motivation,'' interactivity in society (Spaeth et al., 2007; Newhagen, 2004), and the creation of global knowledge. Reciprocity, is fundamental to our analysis. Both aspects have fundamental implications for global business ethics research, in terms of the balance between the intrinsic and extrinsic motivation of individuals and society in the twenty-first century Internet-based society.

Reciprocal exchange and OSS

A framework in this article to conceptualize a growing global phenomenon of OSS (von Hippel and von Krogh, 2003) is rooted in the concept of ''exchange'' (Durkheim, 1974; Mauss, 1955). Economists, notably in the standard (simple) model of agency theory, consider exchange in the context of transfer of money for a product or self-gain, thus, without extrinsic incentives, effort is necessarily at the lowest possible level; social psychologists consider exchange in the context of the relationship between two actors; meanwhile anthropologists have considered the different functions of exchange within a specific group or organization. While the use of this broad concept may fail to draw specific conclusions, such use enables a more abstract theorizing and identification of issues that may not otherwise be obvious by utilizing the perspective of exchange. The anthropologists and social psychologists tend to emphasize the reciprocity of exchange relationships (Mauss, 1955; Titmuss, 1970).

Similar clashes of exchange systems may arise in the analysis of OSS development (von Hippel and von Krogh, 2003). For OSS, the global social community has an anthropomorphic identity (Morrison and Robinson, 1997; Rousseau, 1989), thus similar to the loyalty of employees to an organization.

In contrast with more traditional economic models of perfect competition with frictionless exchange, behaviorally oriented sociologists have helped to show that the complexities of imperfect competition and exchange based on social structures, personal contacts, and relationships better reflect the reality (Burt, 1992; Granovetter, 1985; Polyani, 1957). Such social capital structure and relational effects especially hold in knowledge-based industries (Dalle and Jullien, 2003; Hertel et al., 2003; Lanzara and Morner, 2003; Spender, 1996).

In line with Durkheim (1974), we begin by distinguishing two different concepts of value – economic value in which social interaction is negligible and ideal value which is created by strong social interaction. The former applies most strongly to commodity trades. Under market exchange of commodities, assets being exchanged are focalized, quantified, and valued in the market at a particular price (Gell, 1982). This market price serves as a universal and transparent mechanism to facilitate the exchange of these physical assets. Meanwhile, tacit and intangible assets, such as knowledge, are difficult to evaluate, and thus, the value can be context or situation specific to particular actors or organizations (Grant, 1996). As a concept, exchange is broader in scope in comparison with the networks, and does not, thus, have a unified definition across the social science discipline (Toyne, 1989; Uehara, 1990). In economics, as aforementioned in the simple model of agency theory, exchange involves a transfer of money or a product with monetary value, and leads to self-gain for the actors engaged in exchange, as a rational behavior of an individual (Ostrom, 1998). To anthropologists, exchange plays an important role for a particular group of actors or organizations (Toyne, 1989). In psychology and sociology research, exchange is seen as a joint outcome of a relationship between actors (Granovetter 1985). Although a unified definition of exchange has not emerged in social science research, a tangible object – asset or resource – is assumed to be exchanged in the process. Knowledge- and technology-based assets, such as OSS, provide two important research areas for the theory of exchange. First, how the nature of exchange in networks differs from the nature of exchange in markets, especially when the networks are characterized to be long term and strategic. Second, the nature and process of exchange frameworks for intangible assets or resources such as OSS (Spaeth et al., 2007; von Hippel and von Krogh, 2003).

Property rights and OSS

There are two fundamental differences between the purely competitive nature of markets versus the more co-operative nature of relationships between and among actors. One notable difference is that co-operation in the networks fundamentally requires an analysis of exchange and property rights and how to make such exchange mechanisms more effective. The other difference is that the co-operative nature of long-term relationships requires an analysis of shared collective values (Etzioni, 1988; Olson, 1965, 1982), since a particular actor's incentives and interests may diverge from other actors in the community. Notwithstanding a vast amount of literature on networks in management (Burt, 1992), the above issues of exchange, property rights, and collective ownership have not been sufficiently analyzed in management research particularly in their applications to OSS.

The above issues, however, have been fundamental to research in social anthropology (Blau, 1964; Ekeh, 1974; Levi-Strauss, 1996; Sahlins, 1972; Simmel, 1978), law and economics (Alchian, 1965; Coase, 1960; Posner, 1992), and political science (Olson, 1965; Ostrom, 1998). These past works in the above disciplines have analyzed the nature of exchange as a process, as well as the divergence of incentives and interests within co-operative situations such as networks. The key distinction is that tangible, physical assets such as equipment can be evaluated and priced in the market; this market price serves as a universal, transparent mechanism to facilitate the exchange of the physical assets. Under market exchange of commodities, assets being exchanged are tangible, quantified, and valued at a particular price (Gell, 1982). Meanwhile, intangible assets with tacit and social elements such as OSS are difficult for evaluation, and the value can thus be context or situation specific to particular actors or organizations (Polyani, 1957; Spender, 1996). OSS may have a symbolic value (Bourdieu, 1977, 1990; Douglas and Isherwood, 1979; Zeitlyn, 2003) along with a purely economic and monetary value.

Research in social anthropology has shown that, in societies where multipurpose money exists, we can observe different yet parallel ''spheres'' of exchange: tangible items such as foodstuffs and raw materials were exchanged for multipurpose money; intangible items with uncertain monetary value would only be given as gifts without the exchange of money (Appadurai, 1986; Sahlins, 1972; Simmel, 1978).

Although the above spheres of exchange could be seen as the difference between the market- and the social-embedded exchanges (Baker, 1990; Granovetter, 1985; Marsden and Campbell, 1984; Mizruchi and Galaskiewicz, 1993), social and community-driven assets such as OSS, may at least partly be reliant on different spheres other than the spheres of exchange for tangible assets. This in turn complicates the transfer and protection of economic property rights as well as collective ownership toward intangible assets such as OSS.

Defining property rights

The nature of co-operation requires ongoing exchange between and among the actors in the network (Burt, 1992). For such continuities in exchange, the actors in the network need to understand each other's property rights. In the social science literature, there are two major definitions of property: A traditional and more legally defined property right is largely given by the state and the economic definition of property rights is linked to the economic value of assets or resources (Demsetz, 1967). Based on Barzel (1997) and our earlier discussion between the extrinsic and the intrinsic values, we distinguish between the above property rights: legal property rights are extrinsic in that the rights themselves are the means to achieve the ends and economic property rights are intrinsic in that the rights themselves are the ends.

Property rights require the recognition as well as the enforcement of the rights (Demsetz, 1967; North, 1991; Posner, 1992). Legal property rights tend to be recognized and enforced by governments and/or the state. Ellickson (1991) in his comprehensive study has shown that, in communities in highly legally oriented societies, such as the United States, social enforcement quite often replaces legal contracts. Demsetz (1967) has shown that economic property rights become more important as the value of particular resources increases; however, this again assumes that some type of transparent, singular market valuation. Internet-based assets such as OSS, in order to be properly developed and used, require mechanisms for co-ordination and exchange of assets, which take into account the transfer, capture, and protection of property rights of the assets (Posner, 1992). Economic property rights over OSS pose an especially complex problem, since there are social community and tacit elements (Polyani, 1957).

Enforcing property rights

North (1991) has indicated that, ''how agreements are enforced is the single most important determinant of economic performance....'' The theoretical frameworks in this article also believe that the enforcement of agreements concerning property is crucial for the continued success of collective action toward public goods and common property resources such as OSS. According to the academic research in law and economics:

> ...a system of contract enforcement is more valuable if property rights are clearly defined...better defined rights facilitate exchange, and the value of the exchange increases with the value of the rights.

The existing research on networks and the importance of social structure and relationships among organizations (Bradach and Eccles, 1989; Burt, 1992; Zajac and Olsen, 1993) assume that such enforcement is relatively automatic, ensuring a smooth transfer and protection of economic property rights. This becomes more possible if there is an assumption about homogeneity in the backgrounds of the actors who are members of the networks. For example, in related research, Landa (1994) has shown that how ethnic backgrounds can play a crucial role in the formation of successful networks, which in turn rely greatly on informal social codes and mechanisms for achieving co-operative and trust-based results.

However, the actors in today's global business environment are from diverse, heterogeneous, rather than simple, homogeneous backgrounds. The nature of global competition has created strategic networks and collaboration among actors from different

nationalities, industries, and cultures. The fact that such diversity complicates co-operative decision-making has long been researched across social sciences such as social anthropology, law, and economics (Greif, 1993; Posner, 1992; Schelling, 1960). This diversity is further complicated by the continuous change and uncertainty in today's global business environment. All these factors lead to the conclusion that the enforcement of property rights of OSS in diverse global networks is not automatic.

Psychological contract and intrinsic motivation

The majority of the literature on OSS has tended to focus on the market versus social and public good elements, and its links to innovation of new technologies (Lerner and Tirole, 2006; Spaeth et al., 2007; von Hippel and von Krogh, 2003). However, our focus on property rights highlights the importance of psychological factors, as well as the social community factors of OSS. We believe that these frameworks can be synthesized by incorporating the research on psychological contracts (Rousseau, 1989) and intrinsic motivation (Deci, 1975; Frey, 1997; Pittman and Heller, 1987).

Psychological contracts

The term psychological *contract* originates from the works by Schein (1965) and Levinson et al. (1962). These works define a psychological contract as expectations about "reciprocity" in terms of the obligations between organizations and employees. Early works on psychological contracts such as Levinson et al. (1962) and Schein (1965) assumed certain reciprocity and mutually shared expectations. Rousseau (1989), however, showed that such an assumption could not be easily made, with issues of promises, implied contracts, and expectations that may or may not be shared by employees and their employer organizations (McLean Parks and Conlon, 1995). More recent works such as Morrison and Robinson (1997) have analyzed the importance of psychological contract violation, and the negative effects on motivation within organizations.

We believe that OSS programmers have a psychological contract with the global community of such programmers, linked by trust, shared values, and professional backgrounds. The global community of open software programs has an anthropomorphic identity (Levinson et al., 1962; Morrison and Robinson, 1997; Rousseau, 1989; Schein, 1965) in the eyes of software programmers, thus creating a situation similar to psychological contracts within organizations. The collective, public provision of OSS is possible, because a more individual and commercial behavior would be seen as a psychological contract violation (Morrison and Robinson, 1997) to the global open source community.

Intrinsic motivation

A proliferation of OSS projects and further communities has triggered debates about the motivations of the software program developers of the OSS project and community. An analysis of the pure market-based economics views it as an intriguing puzzle:

> Why should thousands of top-notch programmers contribute freely to the provision of a public good? (Lerner and Tirole, 2006)

The economics explanation for such motivation is concerned with the individual reputation, which can create increased income and enhanced employment opportunities in the future for OSS programmers (Lerner and Tirole, 2006).

The approach of Frey and his colleagues better reflect the reality by distinguishing between extrinsic and/or monetary motivation and the intrinsic and/or psychological motivations (Frey and Stutzer, 2007). This intrinsic motivation, which has been termed, crowding in further develops the earlier cognitive social psychologists' researches such as Deci (1975) and Pittman and Heller (1987) that monetary rewards can undermine intrinsic motivation. A similar result was also shown by Titmuss (1970) in his argument that paying for blood would undermine social values and motivations and lead to a lower willingness to donate blood (Frey and Stutzer, 2007; Titmuss, 1970).

A growing academic debate about the phenomenon of OSS has tended to be polarized into two

groups (von Hippel and von Krogh, 2003). One group, comprised the mainstream economist, is based on a framework whereby individual open source programs are driven by the economic benefits of enhanced personal reputations and increased demand for their services and incomes in the future (Iannacci, 2002; Lerner and Tirole, 2006). The second group, based on social and collective values, is driven by the private provision of public goods framework (Harhoff, 1996; Raymond, 1999; Zeitlyn, 2003). Our framework attempts to bridge these polarized frameworks by placing psychological aspects. Psychological contracts and its violations (Morrison and Robinson, 1997; Rousseau, 1989), and the importance of intrinsic motivation (Frey and Stutzer, 2007) show the importance of the psychological elements in the proliferation of OSS.

Ethics of Internet governance: beyond OSS

An interesting question for business ethics and Internet governance is whether the open source model can be transposed to other industries. Could semiconductor components be developed in an open source mode, with Intel and Samsung performing an assembler function similar to that of Red Hat for Linux? Many industries involve forms of cooperation between commercial entities in the form of collective action; the global Internet allows such global collaboration. In areas such as biotechnology, it may be impossible to break up large projects into smaller components, which are characteristic of OSS collective behaviors. Many industries such as biotechnology also require substantial capital costs, and without such initial capital investments, OSS style collaboration may not be possible. Others industries provide innovation and open source-driven cultures – the business ethics implications of such collective behavior is a fundamental issue in global Internet governance research.

Global organizations in the twenty-first century may emulate some of the benefits attached to open source production either by getting involved in open source themselves or by adopting institutional arrangements that deliver such collective and aggregate behaviors over the global Internet. Open source production may seem like a unique phenomenon. However, we believe that the global Internet will increasingly create such behavior – which combines individualism and collective behaviors. Open source projects and traditional firms can borrow from each other innovative approaches to the governance and innovation of the global Internet in the twenty-first century.

Conclusions and future research

One of the key paradoxes of the global Internet governance is that the global Internet allows individual and collective decision making simultaneously. The rapid growth of OSS development has led to a vast amount of literature in social sciences, business, and management on the frameworks and models to analyze this phenomenon; however, this topic has been relatively under research in the business ethics literature. The fundamental debate in the literature is between two schools of thought. First is the more economic, self-interested, and market-based school of thought, analyzed in works such as Spaeth et al. (2007), Lerner and Tirole (2006), and Iannacci (2002). This school of thought believes that the OSS phenomenon can be analyzed according to traditional neoclassical economics, and the model of private reputation development; individuals who participate can increase their potential wages and income in the future due to development of market signals (Spence, 1974) and individual reputation. OSS exchange is driven in this model by traditional measures or metrics or quantity, time, and price.

The second school of thought is the more social anthropological school of thought, based on reciprocity, kinship and gift economies, analyzed in works such as Zeitlyn (2003). This model is based on the anthropological literature on gifts such as Mauss (1955) and Strathern (1992). Kinship, trust, and reciprocity drive this social anthropological approach (Schwimmer, 1995) to OSS development. Institutional factors and reciprocity drive the nature of such gift exchange.

In this article, we contributed to this debate across disciplines by synthesizing two existing theories of reciprocity and motivation with an emphasis on the ethical aspects of global Internet governance. First is the theory of psychological contracts, analyzed in

works such as Rousseau (1989), Robinson and Morrison (1995), Morrison and Robinson (1997). We believe that OSS programmers have a psychological contract with the global community of such programmers, linked by trust, shared values, and professional backgrounds. The collective, public provision of OSS is possible, because a more individual and commercial behavior would be seen as a psychological contract violation (Morrison and Robinson, 1997) to the global open source community. Second, the intrinsic motivation theory, proposed by Frey and his colleagues (Frey and Stutzer, 2007), was further developed into the cognitive social psychologists' research (Deci, 1975; Pittman and Heller, 1987). Deci et al. (1999) demonstrate that monetary rewards can undermine intrinsic motivation. A similar result was also found by Titmuss (1970) in his argument that paying for blood would undermine social values and motivations and lead to a lower willingness to donate blood (Frey, 1997; Frey and Stutzer, 2007; Titmuss, 1970).

We believe that our emphasis on psychology and motivation, with implications for business ethics and Internet governance, can build a bridge between these opposing schools of thought in the growing debate on OSS (Spaeth et al., 2007; von Hippel and von Krogh, 2006). In our opinion, two areas, in particular, warrant further research. First, our understanding of issues of OSS exchange and their relation to social exchanges can be enhanced by studying the nature of exchange in societies where non-monetary types of exchanges are relatively more important. Second, more in depth, empirical work needs to be carried out on the complexities of intrinsic motivation and the nature of economic and social value. We suggest that comparative case studies may be most appropriate in order to bring out the issues related to the nature of value in business ethical environments for OSS development.

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Chong Ju Choi
Department of Shipping, Trade & Finance,
Cass City University Business School,
London, U.K.

Sae Won Kim
Graduate School of International Studies,
Korea University,
Seoul, Korea
E-mail: bluelion98@naver.com

Shui Yu
C21st Investments Limited,
Haidian, Beijing, China