

The institutionalized open source project: Decoupling institutional myths and practical concerns to advance the institution of open source

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ABSTRACT

The institution of open source has evolved out of an era where distinction from proprietary software development methods was akin to a social movement of objection to certain business practices and has moved into an era where open source development methods are widespread. Membership in open source communities has continued to grow and the current participant base operates in a post-internet environment that is significantly different from the limited communication and collaboration environment that was present at the birth of the open source movement. As a result, certain institutional myths that influenced open source community structure with the intent of helping the communities develop legitimacy and grow in the early days of the institution now hinder the practical activities that the communities depend on to survive and thrive. This paper argues that open source communities need to find the balance of a loosely coupled state between their organization and the myths of the institution of open source, recognizing the institutional roots of the organization while adapting to modern practical concerns. Open source communities that strike the right balance will improve their performance and maintain their legitimacy in the eyes of their stakeholders. This balance will allow the institution of open source to continue to evolve, avoiding deinstitutionalization and remaining relevant in a changing environmental context.

Keywords: open source, institutional theory, institutional myths, organizational structure, peer production, productivity, decoupling, legitimacy, organizational environment, loose coupling

"Institutions will try to preserve the problem to which they are the solution."
—Clay Shirky

Open source¹ production communities have perked the interest of strategy researchers over the past decade as they do not conform to traditional models of organizational production such as markets, hierarchies, and networks (Demil & Lecocq, 2006). This form of peer production (Benkler, 2002) has had a net economic impact worldwide in the hundreds of billions of dollars range (MERIT, 2006) and nearly all major corporations depend on the resulting products. While the roots of the open source movement were grounded in an anti-corporate movement (Stallman, 1999), today, improving the production abilities of open source communities could be a strategic move that creates far greater value for firms than the value that they have the potential to create internally (Goldman & Gabriel, 2005).

From these historical roots, the open source movement has evolved into an institution and brought with it myths from its social movement roots that helped it form organizational structures that promoted legitimacy and productivity as it grew. In recent years, with the advances in communication and collaboration afforded by the Internet (Benkler, 2002), some of the institutional myths that are still present in open source communities have become impediments to practical activity and further growth. In this paper, I argue that in order to continue to improve the productivity of open source communities, and, in turn, to enable firms to continue to leverage the benefits of the products that these communities produce,

¹ Some communities have strong feelings about the choice of words used to describe them. Some insist that "free", in the sense of "liberty" as opposed to "at no cost", is the only apt description. Others prefer the use of "open" to avoid ambiguity. The term "open source" is used in this paper for simplicity. It should be read as a general term that encompasses all forms of free/libre/open source common goods and methods and not interpreted as referring to a specific model of production, development method, or license. Other terms will be used as appropriate in the text when the distinction is salient to the discussion.

established open source communities need to decouple from the institutional myths that impede them and help the institution of open source continue to evolve.

This examination is of relevance to strategy and organizational scholars as it considers the context and circumstances under which organizations should be loosely or tightly coupled to institutional myths and the resultant impact on levels of production. It further contributes to the literature on the boundaries of the firm by considering the reciprocal influence an organization and the institution in which it is embedded have on each other and the impact of this influence on organizational productivity.

The paper is organized as follows. The first section reviews the extant literature on institutional theory, loose coupling in organizations, and open source communities, and describes the gap that the paper is addressing. The second section describes the history of the open source movement and outlines the rise of the young institution and the institutional myth of free in open source communities. The third section discusses the myth of merit in the context of the structure of a sample open source organization, the Apache Software Foundation (ASF), and considers how the community was shaped by the institution. The fourth section describes the modern context in which some of the extant structural elements in the ASF are impeding practical activity, making the case for the need for decoupling. The fifth section proposes a loosely coupled state for a modern open source community to balance the need to comply with the institutional norms with considerations for practical activities. The paper concludes with a discussion of how the loosely coupled organization could help the institution

of open source evolve, along with suggestions for a research agenda that takes a closer look at the factors that influence the productivity of open source communities.

LITERATURE REVIEW

This section begins with a brief overview of the major issues in institutional theory and how they have been investigated to date. I then review the literature on loose coupling in organization studies including the nature and types of coupling that have been examined. The section wraps up with a comprehensive overview of the major areas of research in the open source literature, considering particularly the motives of individual and organizational participation, open source governance, and the foundational roots of the institution of open source. Throughout the literature review, the gaps in the literature that this paper addresses are identified and discussed.

Institutional Theory

Institutional theories of organizations have been considered for decades. They explain how organizations are shaped by external and internal legitimating forces. As organizations conform to the requirements imposed on them, they become isomorphic with the environment, which promotes their survival. Researchers have observed that concerns with conformity often draw the focus away from measures of organizational productivity (e.g. Zucker, 1987), which is a different predictor of survival that emphasizes the cost efficiency of production effort.

Organizations can be said to be institutionalized when they are "embedded in formal structures that are not tied to particular actors or situations" and their actions take on "rule-

like, social fact qualities" (Zucker, 1987:444). The result is imitative, coercive processes that transmit social facts from sources external to the organization (DiMaggio & Powell, 1983). These processes serve legitimating functions at the cost of reducing efficiency (Meyer & Rowan, 1977).

Institutional processes can persist within organizations in the form of formalized routines and roles that are "easily transmitted to newcomers, are maintained over long periods of time without further justification or elaboration, and are highly resistant to change" (Zucker, 1987:446). They are both stable and responsible for evolving the institution by creating new institutional elements that "infect other elements in a contagion of legitimacy" (Zucker, 1987: 446).

Research into institutional theory has considered the strategic responses to institutional processes (Oliver, 1991), non-choice behaviours (Tolbert, 1985), impact on organizational structure (Meyer & Rowan, 1997), and types of legitimation resulting from institutionalization (Suchman, 1995). The relationship between institutional theory and other major theories in strategy research has also been considered, including institutional theory and agency (Eisenhardt, 1988), transaction cost economics (Roberts & Greenwood, 1997), the resource-based view (Oliver, 1997), and dynamic capabilities (Oliver & Holzinger, 2008). In much of this research, institutional forces are taken to be persistent, mature, and pervasive. There is limited consideration of young institutions, institutions that are simultaneously external and internal to an organization, the impact of the origins of specific institutional myths, and the diversity of consequences for organizational non-adherence. Some research has begun to investigate the

ways in which organizations selectively adhere to institutional forces and the resulting change the organization undergoes (Greenwood & Hinings, 1996).

The context of the institution of open source presents an opportunity to further investigate these different angles as it is a relatively young institutional context in a high-velocity technical environment. Open source communities as meta-organizational forms have permeable organizational boundaries, a flat or nearly flat hierarchical stratification, and are open communities embedded in larger ecosystems (Gulati, Puranam, & Tushman, 2012). As a result, the way they respond to institutional forces and the degree to which they are able to influence the evolution of institutions is liable to be different from traditional organizational forms.

Loose Coupling in Organizations

The concept of the loose coupling of organizations has been considered throughout the history of modern management research. It has grown into a theory of loose coupling that is broadly defined and underspecified (Orton & Weick, 1990). While some efforts have been made to bring focus to the literature (e.g. Orton & Weick, 1990), the concept has most often been evoked to describe the degree to which disparate elements of organizations are coupled to one another along with the nature of the linkages. Coupling is distinct from "connection", "link", and "interdependence" in that coupling implies that the elements that are coupled maintain a "logical separateness" and distinctiveness. Loose coupling, specifically, "carries connotations of impermanence, dissolvability, and tacitness all of which are potentially crucial properties of the 'glue' that holds organizations together" (Weick, 1976:3).

When examining an instance of loose coupling, the nature of the linkage is a separate consideration from the elements or systems that are coupled to one another. The linkage can be characterised by the activities between the elements (Glassman, 1973) or the degree to which the elements that depend on each other can be decomposed, which both provide an organizational perspective that can reduce complexity of analysis (Weick, 1976). It has been theorized that loose coupling can be an advantage for organizations in that it provides stability against short term environmental turbulence (Glassman, 1973), acts as a sensing mechanism for pending environmental change, allows localized adaptation, protects evolutionary diversity for adaptation to discontinuous environmental change, insulates against breakdowns in a given system, and preserves agency and autonomy (Weick, 1976).

In terms of what elements or systems can be coupled to one another, the literature has typically focused on systems within organizations, such as technological and administrative systems (Thompson, 1967). However, extra-organizational coupling has also been examined. Meyer & Rowan (1977) suggested that organizations, as a whole, could also be coupled to elements of the institutions in which they are embedded. Gordon (1991) suggested that a company's culture is coupled to its industry, leading to a reciprocal influence in the industry environmental context. Miller (1992) investigated organization-environment coupling in the context of the importance of organizations being a good fit for their environment as opposed to having the right internal configuration. Rao (1994) described a model of reputation as the coupling between past organizational performance and the expectations of stakeholders, suggesting that the systems that can be coupled can be conceptual, not only systems with clearly defined boundaries. Coupling could take place between suppliers and organizations,

between stakeholders in a knowledge network, between components in a complex product (Brusoni, Prencipe, & Pavitt, 2001), or between some combination of these systems depending on the level of analysis of the research. In all of these cases, the coupling of systems has had survivability, legitimacy, efficiency, or other important implications for organizations.

The literature on coupling has also examined when organizations should be loosely or tightly coupled. It has been suggested that organizations that thrive on product development should adjust their coupling depending on the degree of interdependency between components of the products and the rate of change of component technologies (Brusoni, Prencipe, & Pavitt, 2001). Other research has suggested that the choice of degree of coupling is a function of exploitation and exploration activities, where areas of the organization that are focused on exploration should be loosely coupled in order to allow leeway for discovery, while areas that are focused on exploitation should be tightly coupled in order to maximize production efficiency. One such organizational structure implementation is an "ambidextrous or dual organizational form" (Benner & Tushman, 2003: 247) that is suitable for most organizations that concurrently engage in exploration and exploitation. In this form, "multiple tightly coupled subunits are themselves loosely coupled with each other" (Benner & Tushman, 2003: 247).

Further research has suggested that there must be a paradox of both loose and tight coupling in organizations at the same time in order for them to be effective (Cameron, 1986). Outside organizational boundaries, loose coupling has been conceptualized as that which holds together the component social structures that enable the institutional change process, where

tighter coupling would prevent the divergence necessary for change to occur (Seo & Creed, 2002). In this context, coupling is the degree of rigidity that constrains change and the appropriate degree of coupling for a given context is determined by the relative advantage afforded by flexibility or consistency as measured by a particular goal. The context of organizational research on the degree of coupling appropriate for a given strategic situation necessarily implies that an organization has at least some agency when it comes to its relationship with its institutional context (Seo & Creed, 2002) and the nature of that relationship becomes an interesting research focus.

The present research addresses a call for investigating the question "what is available for coupling and decoupling within and organization" (Weick, 1976: 5) by considering the coupling between an organization and the myths of the institution in which it is embedded. This investigation is novel in that it stretches outside of traditional organizational boundaries and treats institutional myths and organization as systems that are linked to one another much in the same way departments in individual organizations are linked to one another. The advantage of looking at the impact of institutional factors on firms in this manner is that it reflects the reality of the reciprocal influence that institutional forces and organizations have on one another, embedded in a larger environmental context in a manner analogous to departments embedded in a larger organizational context. It also allows a different context for the examination of organizational praxis as a force that drives institutional change (Seo & Creed, 2002), providing a new angle on how that change takes place.

Open Source

Researchers have been looking at the phenomenon of open source for more than a decade. Raymond's (1999a) classic book *The Cathedral and the Bazaar* explained open source as an alternative software development method to the proprietary methods used by large corporations such as Microsoft. At that time, most major software projects were developed by a few select people, behind closed doors, to a specification that was a tightly held secret. It was a long and laborious but clean process that Raymond equated to the construction of a cathedral. Open source, by contrast, was described as chaotic like a bazaar, where there were many different participants, each with different skills, goals, and ways of participating. It is a fast paced environment where software gets released quickly and often, regardless of how many defects a given version of the software might have. It promotes an incremental improvement model as opposed to a do-it-in-one-shot model. Raymond proposed that one of the major advantages of open source methods was that "given enough eyeballs, all bugs are shallow" (1999b:29), by which he meant that it is easier to identify and fix defects when you have a large number of people working on a product than when you have a small number of people. When Raymond formulated this principle, he focused on the programmer perspective and the measured outcome of bug identification and resolution. More recently, it has been recognized that the open source way is that a diversity of perspectives, skills, and approaches ultimately leads to a better product that addresses a broader array of individual and organizational needs (MacAulay, 2010). Mature projects already have solid code bases that will no longer see large improvements from the contributions of programmers alone. In such cases, Raymond's mantra may need to be updated to "With enough eyes, all open source project

issues, technical and non-technical, are shallow", implying that skills other than programming are important for continued contribution.

Research subsequent to Raymond's work sought to refine the understanding of open source production, including the relationship between core developers who develop the majority of a product and the rest of the project community. It was found that having a broader range of developers improves the usefulness of the product for end-user and that developer involvement increases with the age of a project (Krishnamurthy, 2002). Further, structuring the activities of participants more like a job, rather than focusing on individual motives and interest, leads to more motivated participants (Hertel, 2007).

Much research has been done to understand the motivations of both individuals and organizations to participate in open source. Lerner and Tirole (2002) first described what seemed like a crazy scenario of individuals and for-profit companies working on a project in order to freely share it with the public. They explained that individuals engage in open source production because it may help them address challenges they encounter in their jobs, as is the case when a systems administrator helps resolve a persistent problem that is common to his office environment and that of other organizations. Individuals also participate in order to develop a reputation in the community, to improve their career prospects through a portfolio of contributions and signaling effects, to entice participation in their personal projects, and because they identify as members of a community (Hertel, Niedner, & Herrmann, 2003; Bagozzi & Dholakia, 2006). These incentives can often be stronger than pure hard form work incentives such as salaried employment or contractual work (Lerner & Tirole, 2002). More interestingly,

the motivations are not independent. Rather, they are complementary, with intrinsic motivations enhanced by extrinsic motivations (Roberts, Hann, & Slaughter, 2006).

Firm participation in open source was thought to be even stranger given the profit focus of most firms. In this context, the firm is considered as distinct from the open source organization and may use a variety of means for interacting with and attempting to influence the community depending on its goals and its abilities to effectively manage the context (Dahlander & Magnusson, 2005). Firms sometimes create their own sponsored open source communities in an effort to balance control and growth surrounding an open source project (West & O'Mahony, 2008). At a first glance, such efforts were thought to be fruitless for the firm itself, while everyone else, including its competitors, could leverage the result. Yet a closer look has shown that firms that engage in open source production are not actually producing a purely collective good, but rather are using a "private-collective" (von Hippel & von Krogh, 2003) model of production that yields firm benefits in a range of ways. These benefits include learning and knowledge development (Lakhani & von Hippel, 2003), transaction cost reduction (Foss & Foss, 2005), access to resources that the firm might not otherwise be able to leverage (Dahlander & Magnusson, 2005), promoting faster adoption of products and standards (Bonaccorsi & Rossi, 2006), shifting the locus of value in the competitive ecosystem away from the strengths of competitors (Chesbrough & Appleyard, 2007), and increasing the sales of complementary assets (West & Gallagher, 2006).

In terms of the institution of open source, some research has examined the origins of the licensing and governance schemes used in open source projects. It has been suggested that

the most commonly used license, the GNU General Public License (GPL), discussed in more details in the subsequent sections, was a "basic institutional innovation in the governance structure of open source" (Franck & Jungwirth, 2003: 413) and that it enabled contributions from both those who participate in open source as profit seekers and those who participate as altruistic donors, addressing the needs of both of these prototypical participants without crowding one out (Franck & Jungwirth, 2003). Paired with normative pressures within open source communities, the legal tactics employed by the GPL "allowed a project's intellectual property to be publicly and freely available and yet governable" (O'Mahony, 2003: 1).

Governance forms have also received much attention in the literature, with investigations into the different dimensions of governance that uniquely appear in distributed production efforts (Markus, 2007), and the principles that are necessary for community governance to succeed, including independence, pluralism, representation, decentralized decision-making, and autonomous participation (O'Mahony, 2007). It has been argued that the major issue for governance is that open source production is a markedly different form than the traditional economics-based governance forms of markets, hierarchies, and networks, where there is loose control (Demil & Lecocq, 2006) and self-selection to tasks (Benkler, 2002).

There is no doubt that the institutional roots of open source lie in the licensing (Markus, 2007), yet accounts to date have not investigated the individual myths that became a part of the institution, nor have they tracked the evolution of the institution and its impact over time. Some work has considered the process by which new participants join established communities and the barriers that they face (e.g. von Krogh, Spaeth, & Lakhani, 2003), but there is room to expand on this initial foundation with an examination of the context of the last 10 years of

developments and the broader, less project-specific barriers that are embedded in the institution of open source itself. The present work complements the work of Stewart and Gosain (2006) that examined organizational adherence to specific ideology factors such as norms, beliefs, and values, and their impact on the production outputs of the community by looking at the myths in the broader institutional context and their impact on the organization. It examines the unresolved question of "to what extent open source governance structures are consciously designed to address specific environmental or technical challenges versus evolving organically through path dependence and institutional pressures" (Markus, 2007: 160). The following section describes the roots and rise of the young institution of open source in more detail, setting the stage for a deeper examination of the impact of the institution on the structure of open source projects in the subsequent sections.

THE RISE OF THE YOUNG OPEN SOURCE INSTITUTION

The rapid growth of the computer industry in the 1970s and early 1980s took a turn in a new direction with the rise into prominence of Microsoft's Disk Operating System (MS-DOS), which was the operating system software sold with nearly every computer produced by IBM, the then leading personal computer (PC) manufacturer. The emergence of operating system software created by a company that was distinct from the company that produced the computer hardware was a novel concept, and over the next twenty years, it would change the face of the computer industry. Previously, computer manufacturers would produce hardware and package the necessary software to run the hardware together with it to sell to the client as a single package. The client would then take the software and modify it to its specific needs and computing environment. In essence, the end user had control over how to use the

hardware through the ability to modify the software to meet specific needs. But MS-DOS was different. It was software produced by a third-party company that was designed to interface with a specific set of hardware that could not be modified by the end user. If you wanted to perform any tasks with the hardware, you had to write another layer of software, called programs, in a compiled programming language such as C or BASIC, and run the program through the MS-DOS operating system. On the one hand, this new layer of modularity was a boon for fledgling companies that were suddenly able to create small, independent programs that were too small to draw the notice of large companies like IBM, essentially creating the modern software industry. On the other hand, it created a conundrum for end users, as they lost the ability to directly control the hardware that they purchased, as MS-DOS, the operating system itself, could not be user modified, and there was now an independent company, Microsoft, who controlled the end user experience through their products. In a very short amount of time, Microsoft's power position in the industry would grow to eclipse that of IBM, taking the lion's share of profits, with the profit margins of software growing geometrically over those of hardware (Porac, 1997). The net result was that the practicalities of having a modular layer between hardware and software and the resultant power that it gave a 3rd party company separated users from control over the hardware that they purchased and redirected technological expenditures towards software instead of hardware. It was this context that provided the primordial soup for the genesis of the open source movement.

By most accounts, the birth of the institution of open source took place at the Massachusetts Institute of Technology's (MIT) Artificial Intelligence Lab in 1984 when Richard Stallman, then a researcher, founded the GNU's Not Unix (GNU) project and wrote the GNU

manifesto (Stallman, 1999). The stated goals of the GNU project were to ensure that end users did not lose control over their computing experience by being forced to use software that they could not modify for their own purposes, and, to ensure that users were not forced to pay large amounts of money to purchase restrictive software in order to control their own hardware. Stallman followed the model used for scientific research and dissemination and proposed a system by which software could be shared freely—that is, without restriction—in order to ensure that the freedom of users was preserved and protected. The GNU project was conceived to create an operating system that would be freely available to all and compatible across a wide range of hardware, breaking the monopoly of software companies such as Microsoft, and restoring control over the hardware to user hands. In the GNU manifesto, Stallman argued that having access to the source code of a program, the instructions that make the program run, is fundamental to innovation in the technology industry, much in the same way that the review, reuse, and natural cycle of building upon previous research in academia is the model used to advance human knowledge (DiBona, Ockman, & Stone, 1999).

Stallman felt that the biggest threat to the success of the GNU project would be for-profit software companies co-opting the work of others while continuing to disempower users and enjoy growing profit margins. As such, instead of releasing the GNU project into the public domain, where anyone could use it in any way they saw fit, he came up with the ingenious idea of using the copyright system not to restrict the ability of others to use a copyrighted work, but rather to guarantee that others will always have access to a copyrighted work. The GNU General Public License (GPL) was born. The terms of the license state that anyone may use the copyrighted work for any purpose whatsoever, without restriction, so long as they guarantee

that others may do the same, and that any derivative works are also published under the same license terms (DiBona, Ockman, & Stone, 1999). The GPL has grown to be a powerful institutional force in open source communities and the source of many myths, as it was the foundational license that provided the legal framework for protecting and promoting the social movement at its infancy. The license is still popular today and, by virtue of its history, is often used in open source communities as the de facto standard. It is a classic example of a legitimated, taken-for-granted institutionalized activity that is rooted in tradition, but often persists today not on technical merit but rather on automatic social acceptance in open source communities (Zucker, 1987).

In 1985, the Free Software Foundation (FSF) was established to manage the GNU project and support and promote the principles of the GNU manifesto. The FSF enshrined the institution by providing a centralized resource for new projects to leverage in designing their processes, structure, and activities in a way that conformed to the institutional norms and gave them an immediate measure of legitimacy in the community. As new projects formed and began implementing the norms, values, beliefs, and shared understanding promoted by the FSF, institutional myths started to emerge and propagate.

I define institutional myths, along the lines of Meyer and Rowan (1977), as rationalized rules that specify the appropriate way of engaging in organizational practices and procedures or structuring an organization that are beyond the discretion of individual members of the organization and that give the organization legitimacy based on the assumption that these myths provide an effective way of addressing a historical phenomenon that is central to the

existence of the organization. Further, these myths are invented and maintained through complex rites and rituals that lead to a series of standardized organizational non-choice behaviours (Quaid, 1993).

One myth that is still present in many open source communities today is the myth of “free”. The term “free” has strong symbolic value and has become an embodiment of the foundational principles that started the movement. The myth has evolved into two related but separate principles. The myth of “free” as in “at no cost” derived from the idea of separating software development for users from software development for the benefit of software companies. Originally, this idea was separate from whether or not one could charge for software, as a part of a package with hardware, or independently. However, many open source organizations today still believe that all software should be available at no cost, that it is a social good, like knowledge, creating a norm that it is wrong to charge for software. The second “free” principle is that of “free” as in “liberty”. Originally, this idea was focused on the end user, ensuring that the end user always had control over the software that was acquired, regardless of the use to which it was put. However, many organizations today focus on restricting certain corporate users by only allowing uses that conform to the principles laid out by the FSF. In a way, this myth has evolved to become stricter and more extreme than its original formulation. Despite the modern environmental context of open source communities being very different from the circumstances of the foundation of the institution, the myth of free persists and resists change. For many organizations it is habit and taken for granted. For new organizations, its adoption is a sign of unreflective conformity and adherence to social convention (Zucker, 1987).

The myth of “free” fits my definition of institutional myth in that it emerged from the historical need to distinguish the activities of the free software movement from the activities of commercial software companies; it is rationalized as it follows the logically derived mandate of the movement and was originally carefully conceived to address the purposes of the mandate; it describes what practices and procedures organizations that wish to gain legitimacy in the community must adhere to, resulting in specific structures such as organizational governance based around the GPL becoming common place; individuals in each community have little discretion over the implementation of the norms that the free myth represents, and little control over the revision of the norms over time; and, perhaps most importantly, the free myth is maintained through complex rites and rituals in the communities that lead to non-choice behaviours in many circumstances. For example, some community members have taken on a form of extremism where they object, on a moral level, to using any products or services that are not free software. In some instances, these members will disrupt the activities of other community members and intentionally block practices, procedures, or practical development activities on the principle of the free myth alone. The result is a sort of coercive isomorphism where organizations and their members must conform to the free myth, regardless of current practical value.

The first major push-back against the free myth took place in 1997 when a number of members of the free software community gathered together to discuss the free myth. The Silicon Valley technology boom was in full bloom, and many community members were concerned that the free myth was unduly excluding businesses from participating in the free software movement. They felt that the anti-business focus of the movement had grown too

strong. If it continued, they worried, the movement might quickly become irrelevant. The group formed the Open Source Initiative (OSI) and devised a set of principles that aimed at protecting the core principles of the free software movement, protecting users and preserving freedom of use, while allowing businesses to have more control over the investments that they made into such collective projects. One major difference from the principles enshrined by the FSF was the allowance of licenses that permitted businesses to take the work of others and incorporate it into their own proprietary code. Licenses that did not have a viral effect that required derivative works to bear the same license were also permitted. This work culminated in the Open Source Definition (Open Source Initiative, 2012) that coined the term “open source”, and defined the conditions that a license (and hence governance and structure of projects) must adhere to in order to be considered “open source compliant”. While these principles were generally looser than the conditions required to meet the “free software” definition that preceded them, it was widely believed that this move pioneered the business open source movement that has had such a huge economic impact over the past decade. Particularly, it allowed corporations that had long been experimenting with open source products internally, to start commercializing some of their offerings on terms that better suited their business models. Yet, many supporters of the free myth cried foul and a deep rift still exists between free software and open source communities today.

The last decade has seen an explosion in the number and size of open source projects, with some estimates at over 300,000 tracked projects (Sourceforge.net, 2012). When a new project is formed, its founding members must decide upon formation whether or not to adhere to the free myth in order to gain legitimacy in the free software community. Projects that

choose to conform to the myth must choose a license, governance, and organizational structure that match the historical free software roots. On the one hand, this form is familiar to many members of the free software movement and allows for easier contributions from existing members. On the other hand, most members of the free software community that have been around for a while are already at their maximum contribution capacity and have no time to devote to new projects. As such, any legitimacy gained from new organizations becoming isomorphic with the free myth must be weighed against the benefits to productivity in the organization. In the modern internet context, with inexpensive communication, rapidly increasing computing power, and worldwide distributed collaboration, attracting contributors to a project is no longer related to appeal to a specific, tight-knit community (Benkler, 2002). Rather, factors such as contextual relevance, the need to scratch specific technical itches (Bonaccorsi & Rossi, 2006), cost savings (Lerner & Tirole, 2002), ability to rapidly deploy and continuously adapt (Raymond, 1999a) have increased in prominence relative to the sociological and knowledge advancement goals of the young institution. As such, new projects might be able to actually attract more participants by appealing to a broader context of users by not conforming to the free myth, and using an open source approach. The context is somewhat different for older organizations that were founded in the early days of the institution and continue to operate today. Unlike new projects that have no existing structure, processes, and governance, older organizations have a form that is isomorphic with the institutional myths that helped them gain legitimacy in the tight-knit free software community. Most of the larger project communities are in this situation. They are faced with the challenge of evaluating the

modern production context and the institutional myths upon which they were dependent and striking the right balance between continued myth compliance and practical activity.

THE INSTITUTION OF OPEN SOURCE AND ORGANIZATIONAL FORM

The Apache Software Foundation (ASF; Apache Software Foundation, 2012) is a non-profit corporation registered in the USA with charity status that was formed in 1999. The organization began as The Apache Group, a collective of individuals who collaborated in the late 1990s to develop the Apache HTTP Server project, which grew to become the single most popular web server platform, eclipsing Microsoft's server offerings. It incorporated as the ASF in order to provide legal protection for its developers as the use of the Apache web server and other related products was becoming commonplace in enterprise settings. Its stated activities are to assist the development of the free and open source projects under its purview through hardware, communication, and business support; to provide a centralized legal entity for contribution of resources to be used to advance the foundation's mandate; and, to develop and protect the Apache brand and the brands of its projects.

The ASF formed in the early internet era, where explosive growth, distributed collaboration, and continuous communication were starting to become commonplace. As with the OSI, the ASF saw the strategic importance of these emerging practices, and sought to leverage them by creating an organization that could help foster participation. Yet, the historical roots of the free myth were still salient in the community. Some of the founders of the ASF and many of the community developers were active participants in the free software movement and held strong opinions about how software development should be done. On the

one hand, some members of the ASF understood the importance of not alienating enterprises, particularly given the rapid growth of the usage of the Apache server in enterprise settings. On the other hand, the free myth was a powerful legitimating factor and the organization had to create and maintain credibility in the community. After much deliberation, the ASF created the Apache License for use as the primary governance mechanism for the distribution and use of its products. The Apache License balanced some of the concerns presented by the FSF with some of the looser restrictions present in the OSI definition. It attempted to support both sides of the issue by requiring freedom for users, but not requiring viral propagation of the license to derivative works. The result was a license that met both the FSF and OSI definitions as free/open software, without completely subscribing to the principles of either. The myth of free had a powerful effect in the formation days of the ASF, and ongoing debates in the community over the past decade have led to minor updates of the Apache License, and appropriate structural and practical reforms. In order to further strike a balance in terms of the direction of the organization, the ASF designed its membership structure such that only individuals may join the foundation. There are no corporate members (Apache Software Foundation, 2012). Individuals may work on behalf of a company, on company time, but must sign agreements to ensure that they are acting solely on behalf of the ASF and that their employers' interests are not in conflict. This structural approach is notably different from open source communities such as the Eclipse Foundation, where corporate members make up the majority of the membership structure (Eclipse, 2012).

The institution of open source was born in highly technical software development communities and focused initially on the needs of those developers in the context of their

activities at the time. As a result, one of the institutional facets that became a myth is the myth of merit. The merit myth is the notion that open source communities are best governed by those who have demonstrated technical competency in the development of the software around which the community is based. The myth of merit fits my definition of institutional myth in that it emerged from the historical need to focus on software development and leading projects in directions that required keen internal technical understanding of the specifics of the project; it is rationalized as it originally had a practical purpose when projects were at a low level of technical maturity and survival of the projects depended in part on their technical viability; it describes what practices and procedures organizations that wish to gain legitimacy in the community must adhere to, resulting in specific structures such as organizational governance based on meritocracy and technical leadership rather than skills related to management, community organization, communications, or financial management; individuals in each community have little discretion over the implementation of the norms that the merit myth represents, and little control over the revision of the norms over time, specifically because in order to have say over the norms, one must already pass the meritocratic bar, at which point there is little incentive to change the system to give more power to members who haven't contributed in the same way as the previous means of evaluation assessed; and, the merit myth is maintained through complex rites and rituals in the communities that lead to non-choice behaviours in many circumstances such as technically competent members deciding the direction and evolution of projects rather than members who might not have technical competence but who have competence in strategic management, financial management, or community organization.

The ASF chose to adhere to the merit myth in its structure, clearly stating in its mission statement:

The Apache Software Foundation is a meritocracy, which means that in order to become a member you must first be actively contributing to one or more of the Foundation's collaborative projects. New candidates for membership are nominated by an existing member and then put to vote; a majority of the existing membership must approve a candidate in order to [sic] the candidate to be accepted (Apache Software Foundation, 2012).

And:

All software developed within the Foundation belongs to the ASF, and therefore the members. The members own the code and the direction of it and the Foundation. Committers get a shot at working on the code; good committers become members and thus get a piece of the ownership of the software and the direction. Commit access is a privilege, not a right, and is based on trust (Apache Software Foundation, 2012).

Of particular interest is the connection with the meritocratic structure with the concept of “trust”. This connection is a strong example of the legitimacy that emerges from the merit myth. In other words, the ASF community has set up its governance structure such that those who have the ability to contribute to the community must have earned “merit”, where “merit” is based on technical competence (active contribution), and where those who have technical competence are those who are trusted in the organization and have the discretion over which new members get to join and contribute to the organization. As a result, this myth not only has a profound effect on the structure of the organization, but also on its evolution and growth, particularly the growth (or lack thereof) of participants.

STRUCTURAL IMPEDIMENTS TO PRACTICAL ACTIVITY

The merit myth and the resultant structural development in communities such as the ASF are particularly problematic because they focus on a specific type of participation in the community as paramount. I have argued elsewhere (MacAulay, 2010) that there are many different ways to contribute to open source projects and that software development, writing lines of code, is only one means of participation. Early in the history of open source development, when projects were young and their growth depended on useful features, stability, and robustness of the code, development talent was paramount. It's in this context that the merit myth emerged, and it was certainly rational. However, most major open source projects today are mature, have stable code bases, and an array of features to address even the most specific user needs. As a result, these projects have reached a point where the participation of additional developers leads to diminishing returns in terms of project success metrics. Adding one or a thousand new lines of code is unlikely to have a major impact in terms of number of users of the project, change percentage of market share in a specific corporate environment, lead to a new set of users or participants, nor is it likely to increase the likelihood of survival of the project. For mature projects, a different type of participation is required to have a major impact on the community. For example, a community manager whose expertise is in increasing collaboration in a distributed context with participants that have a diverse skill set may be able to have a geometric impact on the productivity of other members by helping them work more efficiently, avoid redundancy, and parallelize tasks. In this context, the merit myth is particularly harmful as it enshrines a specific skill set as the most valuable into the structure of the organization, impeding other means of contribution by relegating them to

insignificance. Worse, because it is embedded in social convention and is self-sustaining, the structure resists change, not because there is an absence of rational reasons to change the structure, but because the rational reasons are masked by the myth itself. When those members who have “merit” evaluate the merit myth, they see a reflection of themselves and their needs and not those of the organization as a whole. They see a reflection of their own norms, values, and beliefs, which may be completely uncorrelated with economic or social fitness in a context more recent than the historical one in which the myth emerged. As a result, the practical activity suggestions of newcomers, or those not legitimated by the merit myth, are often unreflectively dismissed as irrelevant or contrary to the organization’s institutionalized values, independent of their objective merit.

The case of the ASF and the impact of the merit myth are particularly salient as the Apache server project is so significant to enterprise, with an estimated 425 million websites hosted on the platform, more than four times the amount of Microsoft’s IIS platform (Netcraft, 2012). At this level, given the stability of the server code that has been in constant development for more than ten years, it is quite likely that the largest economic impact of the project will not be related to technical advancements, but rather project administration, branding, partnerships, new market development, and legal battles. As such, it seems to make very little sense that membership in the ASF, and, by consequence, the control over its direction, is kept in the hands of purely technical contributors. It would seem that technically oriented members would not be the best suited to make economic decisions. Rather, participants who had expertise in other areas and who shared the goals and motivations of the organization might be able to make the most sizable contributions. The tight coupling with the

institutional myths has led some community members to express their frustration about the immutability of the organization:

The way I think about technology, open source, and community has been shaped by Apache and while I appreciate all they have done I no longer believe they embody the values they claim. [...] The problem here is [...] the chasm between Apache and the new culture of open source. There is a growing community of young new open source developers that Apache continues to distance itself from and as the ASF plants itself firmly in this position the growing community drifts farther away. There are great voices at Apache who understand that the world is changing and are determined to change with it but their pleas for Apache to evolve are drowned in the politics of an aging organization resistant to change. People have a great capacity for change. Those people can and will continue to lead us as our institutions fail and eventually harm us. (Rogers, 2011).

Rogers (2011) and other community members have gone as far recently to suggest that the very institution of open source, as it is embodied in the structure of organizations such as the ASF, may be leading the organizations to failure. He points out that the context in which the organization was founded was “a time when companies were still very afraid of open source and many people in the open source community were very afraid of companies”, and that “ten years ago, open source projects faced a long list of barriers to entry” including hosting, communication, bug tracking, things that “we can now take for granted”. The concerns with businesses were much larger too, particularly regarding the issue of “what protected one company from another company taking over a project if the project became big enough”? To address these issues, the structure of the organization, including projects, voting, elections, and rights, was set up to ensure that it protected the developer, the focus of the merit myth. As a result, the ASF “became a very political organism and navigating these politics has come to require more and more institutional knowledge over the years”. Gaining this

knowledge and figuring out how to contribute is a constant draw on the actual contributions of participants, reducing the productivity of the organization significantly. The resulting organizational hierarchy, different as it may be from traditional company hierarchies, and as necessary as it was for legitimacy and growth in the early days of the organization, still significantly limits individual contributions.

Community members of the ASF are making the case for the need to decouple from some of the institutional myths in order to advance the organization and perhaps the whole of the institution of open source. As Rogers (2011) puts it, many “barriers no longer exist, but the ASF is determined to preserve the problem they had been solving rather than turning to their core values and re-structuring the organization to promote their ethos in a changed world”. The myths as they have evolved are no longer rational and no longer reflect the best way to implement the core values of the organization in the modern context. The organization needs to rethink its processes and structures and decouple itself from the myths that are no longer relevant for legitimacy and practical concerns such as productivity in the modern context. Given the ASF’s central role as a leading open source community, the implications of decoupling and rethinking processes and structure could be significant for other communities as well, evolving the institution of open source.

BALANCING RESPECT FOR INSTITUTIONAL MYTHS AND PRACTICAL ACTIVITIES

Rogers’ arguments about the organizational effects of institutional myths mirror those of Meyer and Rowan (1977). Particularly, Meyer and Rowan suggested that institutionalized

organizations have trouble balancing the needs arising from adhering to the myths and practical activities. When the organization structure becomes isomorphic with the myths of the institution, organizations use a logic of confidence and good faith instead of coordination, inspection, and evaluation of processes and structure. The result is a sort of “ritual conformity” to the institution, with more time devoted to managing the internal structural and process elements of the organization at an abstract level rather than focusing on practical activities and the interdependencies between them to improve performance. If an organization is to survive and grow, a decoupling process must occur.

Meyer and Rowan (1977) suggest that an organization is at the stage where decoupling begins when “activities are performed beyond the purview of managers” and “human relations are made very important; the ability to coordinate things in violation of the rules—that is, to get along with other people—is highly valued” (357). These activities have been taking place in the ASF for some time. Some projects have begun to perform activities without the explicit approval of the meritocratic hierarchy, such as switching the technologies used to organize programmer contributions (Rogers, 2011), which has led to tensions in the community. Further, one of the mottos of the ASF, “Community over code”, has become more and more prominent in the community, where getting along with other community members is considered more important than making practical decisions that benefit the community as a whole (Rogers, 2011). Decoupling from the institutional myths would address these issues and promote productivity, but too much decoupling would put the legitimacy of the organization at risk. The organization needs to decouple while maintaining face, supporting the institutional myths while attending to practical activities. Striking a balance requires finding a “loosely

coupled state” (Meyer & Rowan, 1977), allowing adherence to the institution, while improving organizational productivity and effectiveness.

For the ASF, a loosely coupled state already exists with the myth of free. The organization has carefully walked the balance between subscribing to historical roots and balancing modern concerns with the participation of enterprises, licenses, and protecting users. But the myth of merit still dominates the organization and is seen as a major limiting factor. One way of achieving a loosely coupled state with the myth of merit may be to leverage technologies that are designed to automatically manage contributions and assess them for validity, usefulness, and the degree to which they address the current needs of the community as a whole, without the need for validation from the meritocratic hierarchy. The Github (Github, 2012) hosted collaboration system offers just such a solution and has already seen significant adoption in many younger open source communities. Some ASF member projects have begun transitioning to Github in order to improve their productivity, but there is significant resistance from the ASF meritocracy. There is also controversy surrounding the origins of Github. The project is hosted by a for-profit company who has built their system around the Git (Git, 2012) open source project. Github took the project and built a proprietary hosting system around it to facilitate web collaboration. In so doing, they subscribed neither to the myth of free nor the myth of merit for how the hosting portion of their project is run. The result is that some community members see Github as just another traditional software company leveraging the work of others to make a profit. The original Git project emerged as an open source variant that gained legitimacy in open source communities by implementing the institution. Yet, the Github hosting built around the original project concerns some community

members sufficiently that they refuse to transition to the Github system and prefer to remain with legacy open source products that may no longer meet the productivity needs of the organization (Rogers, 2011).

Apache is in a unique position as one of the oldest and most well established open source communities in that it has the power to influence the institution of open source as a whole through its actions. Many other open source communities look to the ASF for guidance on the appropriate standards of the implementation of the institution of open source. By taking a stance and decoupling itself from some of the myths, not only will the ASF see a productivity gain in its community, but it can also help modernize the institution of open source and advance it such that it maintains relevance in the current environmental context that is very different from the environmental context from which the institution emerged. Following the lead of the ASF, other open source communities can decouple from the myths that hinder their productivity the most without suffering the penalty to their organizational legitimacy that they would otherwise suffer if an established and respected community weren't paving the way forward.

This structural shift in the ASF would answer the call of Letellier (2008) for it to evolve into a third generation open source organization. Unlike second generation open source organizations (the first generation being the generation of independent, individual open source projects) that focus on the concerns of individuals and are mainly made up of individuals who are technically oriented who work on projects in their spare time, third generation open source organizations explicitly involve companies in the organization and promote and facilitate a

broad range of types of participation that extend well beyond the traditional narrow code production focus that is maintained by the meritocratic hierarchy. Unlike other meta-organizations such as standards bodies, the focus remains on developing products that meet the needs of members. The result is a healthy ecosystem of participants that improves the benefits that each other participant receives from the common goods produced (Letellier, 2008).

DISCUSSION AND CONCLUSION

A move to focus on productivity in open source communities will be useful to bring new vitality, participants, and collaboration methods to the communities, renewing the institution of open source and setting new standards for legitimacy in the current environmental context. It will also address some of the concerns of community members that the deinstitutionalization of open source was under way as the institution that emerged in a different environmental context continued to lose relevancy and focused on problems that no longer exist (Rogers, 2011). A loosely coupled approach, with productivity in the spotlight, will help organizations that conform to the modern institution of open source differentiate themselves from traditional organizations in an environmental context where production methods, efficient collaboration, and broader participation are more important for legitimacy, survival, and growth than the promotion of the sociological agendas that were the distinguishing factors in the institution's infancy. Not only would this move be positive for the productivity of the organization and its members, but it would also serve to further increase the legitimacy of the organization in the eyes of corporations who had found the previous incarnations of the institution of open source incompatible with their approaches to business. With enough other

open source organizations following suit, the ASF's advancement of the institution could increase the economic impact of open source production by an order of magnitude or more.

The example of the Apache Software Foundation embedded in the context of the institution of open source is representative of a broader phenomenon that organizations experience when the environment is witnessing the birth of a young institution. Organizations that are prominent representations of the institution go through a cycle of coupling, legitimacy attainment, and decoupling in order to advance the institution and remain relevant over time. In this young institution adaptation cycle, they couple to the institutional myths that form in order to take on a prominent position in the institution in the first place. The coupling leads to legitimacy in the eyes of stakeholders and allows the organization to thrive and grow. Over time, as the environment changes, the organization must decouple from certain institutional myths that are no longer relevant and take a leading position in changing the institution such that it remains relevant in a novel environmental context. Once the adaptations are complete, the organization will couple to the new institutional myths and the cycle begins anew. Without this iterative process, with a single coupling that leads to initial organization legitimacy in a specific environmental context, the organization has no ability to adapt to a changing environment.

In order for both the organization and the institution to which it subscribes to survive, at least in the case of younger institutions that are salient to the survival of the organizations, the organization must be the driving force of change. In this model, the institution acts as an insulating layer between the organization and its environment, where coupling and legitimacy

allow the organization a degree of protection against environmental change. But, over time, if the layer is not modified and adapted to the new environmental circumstances, deinstitutionalization will occur and the organization and the institution will lose relevance and disappear. A further cost is that subscription to the institution constrains organization structure, reducing its flexibility to adapt to environmental stimuli. This model reconceptualises the organization-environment link by suggesting a mechanism by which the organization can change how the environment affects it by acting on the institution in which it is embedded. In this manner, even smaller organizations that could not possibly affect the entire environment in which they are embedded can still change how the environment affects them by coupling and decoupling with the institutions that best sustain the organization's legitimacy over time as environmental conditions change.

This paper contributes to the bridging of the information technology and organizational research literatures, specifically in the context of examining the institutional factors in technology development and technology production organization, answering a call for more such research (Orlikowski & Barley, 2001). By examining the unique contexts of both the institution of open source and productivity in peer production organizations this research provides a novel perspective on the emergence and evolution of young institutions, the impact of institutions on organizations, the effect of leading organizations on the evolution of young institutions, and the impact of institutions on organization structure and productivity.

A further contribution is made by examining the contexts in which organizations should be tightly coupled or loosely coupled to institutional myths. Contrary to traditional

organizational forms, in the context of open source communities, the selection of which institutional myths to couple to when a novel organization forms can have a significant impact on the participant interest that it draws, affecting the levels of contribution and the success of the organization. Particularly, legitimacy may be a secondary concern when seeking participants for a project if all the older open source community members who demand adherence to the institutional myths are already at their maximum capacity to contribute to projects. In such contexts, decoupling from the myths early on could be a more successful strategy for attracting a different class of participants. By contrast, older, established open source communities may need to decouple from the institutional myths that were present at their founding in order to recognize the differences in the modern environment and adapt both the organization and the young institution to keep them relevant and to ensure practical production concerns are not ignored.

This paper also contributes to the literature a novel exploration of the reciprocal influence between organizations and environments by suggesting that institutionalization may act as an insulating layer for young organizations to survive in an otherwise hostile environment. By influencing young institutions and helping them grow and remain relevant, organizations promote their survival in a changing environment. So long as organizations remain vigilant for signs of deinstitutionalization and loss of relevance and prominent organizations take the lead in modernizing the institutions in which they are embedded, the result is a local ecosystem of organizations that support one another and promote each other's survival.

Further research could concentrate on examining the young institution adaptation cycle in the context of emerging institutions in which traditional organizations are embedded to compare and contrast the interactions with those described in the context of peer production organizations. Another area of focus that deserves research attention is a more fine-grained analysis of the factors that affect productivity in open source communities. Given the major differences in the structural forms of open source communities and the nature of production activities, it is quite likely that the factors that lead to increased productivity and survival of the organizations are distinct from those of traditional organizational forms described in the literature. A better understanding of productivity factors in this context could provide significant improvements to theoretical understandings of modes of organizational production and have significant normative implications for the production of collective goods.

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