

# Is it Egalitarianism or Enterprise Strategy? Exploring a New Method of Innovation in Open Source

*Full Paper*

**Matt Levy**

San Francisco State University  
mattlevy@sfsu.edu

**Matt Germonprez**

University of Nebraska-Omaha  
mgermonprez@unomaha.edu

## Abstract

This research article explores a new way of innovation found in open source communities. No longer is innovation closed where research and development is kept internal to the firm. Instead, it is becoming more open, where ideas, inventions, and intellectual property are readily traded in a global marketplace. Our research observed open source communities as something different from the received view on open source. We observed open source communities as highly organized platforms for strategic innovation where profit-seeking firms are actively involved in governance, strategic direction, and technology development. We explore the evolving relationship between firms and communities and provide insight into how these communities are organized. Our research depicts Open Innovation and open source in a new light – Federated Innovation – where open source communities are now acting as platforms to drive for strategic innovation.

## Keywords (Required)

Federated Innovation, Open Innovation, Open Source.

## Introduction

Closed Innovation, the practice of keeping research and development internal to the firm, has waned over the past 20 years (Chesbrough, 2003a; Chesbrough, 2006b; West and Gallagher, 2006). During this time, Open Innovation, where ideas, inventions, and intellectual property are readily traded in a global marketplace has become increasingly prominent. Open Innovation has emerged as a business model where partners, both internal and external to a firm, act as knowledge brokers, participating in an exchange of intellectual property. Open Innovation is based on the idea that knowledge and the people who produce it are mobile, as discovery, innovation, acquisition, and commercialization of intellectual property is acquired, licensed, and re-sold in secondary markets. It is also extractive, as innovation is procured from external sources so profit-seeking firms can benefit from its use. In this research, we report on Open Innovation as an ever-evolving idea, and one that is becoming ‘federated’ – a structure where there is a single centralized unit, while affiliated organizations retain some degree of internal autonomy – as firms broker and proliferate innovation in the public domain. We report on how firms are working collaboratively within the public domain to strategically innovate, and how firms can benefit from such a model.

A prime example of innovation in the public domain occurs within open source communities. Traditionally, Open source communities are viewed as a *recursive public* (Kelty, 2008) – a public vitally concerned with material and practical maintenance and modification of the technical, legal, practical, and conceptual means of its own existence, and a collective independent of external forms of constituted power. Much of extant research considers Open source communities to principally consist of egalitarian corps of volunteers, driven largely by personal recognition (Lerner and Tirole, 2002; von Krogh et al., 2003; von Krogh et al., 2012; West and Gallagher, 2006; Kogut and Metiu, 2001). In addition, this received view envisages Open source communities as distinct from the profit-seeking firm (West, 2003; West and Gallagher, 2006; Bonaccorsi and Rossi, 2003; von Krogh and von Hippel, 2006).

Our research observed Open source communities as highly organized platforms for innovation where profit-seeking firms are actively involved in governance, strategic direction, and technology development. In this research, we explicate the evolved relationship between firms and communities and provide insight into the organizing logic behind these communities. The following research question guides this enquiry:

*How do firms collaborate through open source communities to innovate and realize firm-strategic interests?*

This research proceeds as follows: The following section provides an analysis of open source communities in IS and related research. Next, we theorize on a new form of innovation occurring in open source communities, that of Federated Innovation. Given this new perspective, we ground our theorization using two cases from our research on open source communities. With evidence supporting this new perspective, we outline three strategic components to Federated Innovation: Outward Flows, Innovation Intermediaries, and External Innovation, giving new ideas to innovation strategy. Lastly, we discuss the contribution of Federated Innovation and offer concluding thoughts.

## **Research on Open Source Communities**

Open source has been an area of research for nearly fifteen years (von Krogh and von Hippel, 2006; Crowston et al., 2007). Early interest in open source stemmed from the egalitarian nature of participants, who were known for dedicating substantial time and effort to advance community goals absent of financial remuneration. This phenomenon portrayed new understanding of why and how people assemble to contribute and innovate, and how communities organize to share and redistribute knowledge. A significant portion of this research seeks to understand the volition of individual contributors (von Krogh et al., 2006; Lakhani and von Hippel, 2003; von Krogh et al., 2012) while also centered on individuals and the relationships with their participant communities. Bergquist and Ljungberg (2001) argue individual contributions are founded on ‘gift relationships’ and they explore the relationship between gift giving and maintaining power relationships between group and individual. Von Hippel and von Krogh (2003) describe open source as ‘private-collective.’ ‘Private’ as individual contributors leverage personal resources to develop code, and ‘collective’ as contributors choose to publicize their innovation and eschew property rights. Individuals engaging in a private-collective model pursue notoriety and obtain private rewards for writing and releasing code such as elevated reputation and communal reciprocity. Along these lines, Lerner and Tirole (2002) raise the question, “Why should thousands of top-notch programmers contribute freely to the provision of a public good?” They propose the answer rests in the importance of peer recognition as it relates to career concerns, such as future job offers and ego-gratification. They suggest a signaling incentive based on visibility of performance where the magnitude of impact is directly proportional to quality of performance. Von Krogh et al. (2012) provide a theoretical framework based on social practice and motivation (MacIntyre, 1981) in asking the following questions: Why do open source software developers produce high quality software when they do? Why do open source software developers change institutions? Why do developers sustain open source software development? Answers to these questions are based on standards of excellence retained in the social practice. If there is a high standard of excellence, the social practice will result in sustained, high-quality software development. In contrast, if standards of excellence degrade, the community should expect the best developers to readily change institutions.

Research on open source has evolved to theorize the relationships between the open source community and the profit-seeking firm (Crowston et al., 2012). Emergent research in this area has considered the benefits, drawbacks, barriers, and policies of using, and not necessarily participating with, open source communities (Askulu and Wade, 2011). Research has also begun to explore the increased risks associated with property maintenance and open source licensing (Stewart et al., 2006), the benefits community collaboration (Feller et al., 2008), and open source as a possible global sourcing strategy (Ågerfalk and Fitzgerald, 2008). Increasingly, collaboration with open source communities is becoming associated with strategy, as Germonprez et al. (2013) highlight *communities of competitors* participating as partners in a collaborative manner to share in the success of producing high quality, value-added, and non-differentiating technologies. These emergent streams signal new frontiers for research on open source. In particular, understanding the context of firm level dynamics and social design of how firms collaborate with communities to foster innovation.

## Theorizing a New Form of Innovation

The ability to freely extract innovation from the public domain is a key reason firms participate with open source communities. However, this view, one that keeps firms and communities distinct, often fails to recognize the innovation that occurs within these communities (Chesbrough, 2006a). Open source communities are more than just external sources of innovations where participants act as missionaries to create and advance technologies to serve a cause without profiting from the end-result. Instead, firms actively engage open source as a platform for a type of *federated innovation*, regulating the code base, managing the membership, and structuring the practices of community members. Firms organize otherwise independent practices around non-differentiating artifacts in the transformation of business models, knowledge sharing, intellectual property, and innovation intermediaries. Thus, Federated Innovation is a reflection of Open Innovation in the developed and managed practices of open source driven by partner firms.

In this new form of public innovation, firms actively work within a collaborative ecosystem – a federated space – to bring shared innovations to market through multiple channels. An innovation-focused ecosystem spans permeable organizational boundaries, focused on maturing non-differentiating innovations upon which localized business models are built. Federated Innovation straddles the boundaries (Star and Griesemer, 1989; Lee, 2007; Pawlowski and Robey, 2004) between firms with similar intrinsic and extrinsic motivations (Hars and Ou, 2002, von Krogh et al., 2012) coordinated around shared innovations. In this new form of innovation, open source communities serve as platforms to support innovation, involving multiple stakeholders from different organizations, financially incentivized to innovate under the conditions of a community alliance (Nooteboom, 1999). Federations in this context have much in common with organizations such as the United Nations or NATO, as members assemble for collective decision making while still retaining control of how those decisions shape their own internal affairs.<sup>1</sup> Innovation very much occurs within communities where the classic open source practices of contributions, leveraging, and licensing are necessary, but not sufficient conditions to foster innovation that is truly shared amongst members.

## Grounding: Two Cases of Federated Innovation in Open Source

To investigate Federated Innovation, we conducted two field studies of open source projects. Both of these projects were under the auspices of the Linux Foundation. These Linux Foundation projects were not focused on the Linux kernel, but instead on using open source as a platform upon which organizations can engage in collaborative activities. The Linux Foundation has gone well beyond kernel development, to support collaborative projects around networking, financial services, and embedded devices.

*The Linux Foundation provides the financial, operational, promotional, technical, and managerial support, and services needed so that your staff can focus on your project's technical development. With ten years of experience managing open source projects and support services, The Linux Foundation can provide the back-office, technical infrastructure, and legal framework to get your collaborative project off the ground quickly and efficiently. Most importantly, the Linux Foundation can share its expertise, networks, and promotional reach with your new hosted collaborative project, but within a clear framework that ensures your independence.<sup>2</sup>*

The projects we selected represent two open source communities predominantly comprised of firm-level participants. In addition, members of the research team have had ongoing and engaged contact with these projects over the past three years. The first collaborative project is the Software Package Data Exchange (SPDX). SPDX is an open source community whose mission is to:

*Develop and promote adoption of a specification to enable any party in a software supply chain, from the original author to the final end user, to accurately communicate the licensing information for any piece of copyrightable material that such party may create, alter, combine,*

---

<sup>1</sup> <http://dictionary.reference.com/browse/federation>

<sup>2</sup> [http://collabprojects.linuxfoundation.org/sites/collabprojects/files/lf\\_collaborative\\_projects\\_brochure.pdf](http://collabprojects.linuxfoundation.org/sites/collabprojects/files/lf_collaborative_projects_brochure.pdf)

*pass on, or receive, and to make such information available in a consistent, understandable, and re-usable fashion, with the aim of facilitating license and other policy compliance.*<sup>3</sup>

The SPDX community focuses on the advancement of open source standards to aid the license identification process. The community was originally started in 2008 to raise the issues of software pedigree and authenticity. Membership is primarily comprised of firm-level participants including Black Duck Software, Cisco, Freescale, Hewlett Packard, Motorola, Samsung, and Texas Instruments. As an indicator of the intensity of firm involvement, firm employees hold all six leadership positions within the SPDX community.

The second collaborative project is OpenMAMA. The OpenMAMA project, started in 2011, is dedicated to the advancement of high performance middleware agnostic messaging systems:

*OpenMAMA, the Open Middleware Agnostic Messaging API, is a lightweight vendor-neutral integration layer for systems built on top of a variety of message-oriented middlewares. The objective of OpenMAMA is to enable users to develop high-performance, event driven applications against a single standard API, while providing a mechanism for easily switching between middlewares as requirements evolve.*

Like SPDX, the OpenMAMA community is comprised principally of firm-level participants. The steering committee is comprised of NYSE Technologies, J.P. Morgan, EMC, Exegy, IBM, Interactive Data, and Tick42, all for-profit organizations. In both SPDX and OpenMAMA, individual open source volunteers are welcome, however the technical specificity and targeted business application inherent in both communities appears to limit the number of freelance volunteers. Because of heavy firm-level involvement and targeted business focus of both communities, we believe that both communities provide a strong context to understand Federated Innovation.

### ***Participant Observation Research<sup>4</sup>***

With respect to SPDX and OpenMAMA, we employed participant observation research for data collection and analysis. Our involvement with the SPDX community has a long history as members of the research team have been directly involved in community tooling, standards development, and practitioner publications. The research team has had direct and unencumbered access to the SPDX open source community, collecting data through interviews, observations, development activities, and media releases. Our involvement with the SPDX community has spanned three years.

Our ability to connect as deeply with the OpenMAMA community was more limited than with SPDX, however our data was still generated through conversations, observations, and engagements. Our conversations were shorter and more direct than SPDX, as OpenMAMA is comprised of financial institutions that were not as forthcoming with respect to direct questioning regarding open source community engagement. As a result, we relied on conversations as available, interviews with community participants and the Linux Foundation, and bi-weekly meetings with NYSE Technology employees involved in OpenMAMA. In addition, observations were taken from press reports, web site information, Twitter feeds, mailing lists, and conference keynote presentations. Our involvement with the OpenMAMA community spanned one year.

While participant observation approach is naturally fallible, we used content analysis (Krippendorff, 1980) to overcome inconsistent analytical frameworks in this type of research, and to become acquainted with the communities. Our goal was to gain an understanding of the language, concepts, and practices used by community members (Van Maanen, 1998). We did not explicitly ask community members about Open Innovation concepts. Instead, we allowed the conversations, observations, and engagement with both communities to emerge as naturally occurring encounters, expecting innovation to be a common and relevant topic for open source participants (von Hippel and von Krogh, 2003). We also aimed to

---

<sup>3</sup> <http://spdx.org/about-spdx>

<sup>4</sup> Approximately Forty-five semi-structured interviews were conducted with the SPDX community, while approximately ten interviews were conducted at OpenMAMA.

adequately display the federated nature of the communities, getting as close as we could without distortion of the data (Van Maanen, 1998). In two different content analysis phases, we considered the primary units of analysis to be interview transcripts, published material, presentation slide decks, and community code streams. Within these primary units of analysis, we considered meaning through the sentences and paragraphs that related to each other and to the Open Innovation concepts of Chesbrough (2006b). Identifying meaning from the data reduced the overall size of the data set, focusing the remaining text on Open Innovation concepts. Finally, we paired the meanings derived against Open Innovation concepts. From this, we were able to consider how concepts such as external innovation or outward flows were understood in our selected contexts.

## Analysis: Federated Innovation as Enterprise Strategy

This study experienced open source communities as considerably more than communities of egalitarian volunteers, or missionaries (Chesbrough 2003b) solely interested in serving public good. In contrast, we experienced these communities as centrally governed, highly organized, and federated, consisting of skilled knowledge workers participating in a community for firm-specific strategic means. The SPDX and OpenMAMA open source communities are comprised almost exclusively of for-profit firms whose employees are financially compensated for participating in these communities. Employees of these firms, whether they were part of the steering committee or a technical working group, were invested in bettering communal innovation through an advancement of goals to proliferate innovation within a federated space, rather than simply extracting external innovation for their own profit-seeking firm.

Driven by the concepts from Open Innovation and open source communities, our study reveals key differences that evolve understanding of both. In this section, we advance three concepts related to Federated Innovation that emerged from data analysis of the two case studies: *outward flows*, *innovation intermediaries*, and *external innovation*.

### Outward Flows in Federated Innovation

OpenMAMA, which began at NYSE Technologies, was internally managing middleware to provide application-to-application messaging in the publishing of, and subscription to, NYSE data. NYSE Technologies understood that management of MAMA middleware was internally expensive and provided no competitive advantage to the organization. In turn, they worked with the Linux Foundation to move the technology outward and establish a federated space where the MAMA middleware could be contributed as the initial technical artifact, and a community around the technology would assemble. In this arrangement, the Linux Foundation provided a neutral platform for partner organizations (J.P. Morgan, Citicorp, Bank of America) to contribute to the open source version of MAMA, OpenMAMA. NYSE Technologies was not simply moving intellectual property into an open environment to find new paths to market (Chesbrough, 2006a). They were repositioning intellectual property into a neutral space, amongst partner organizations, creating an environment for Federated Innovation (Figure 1).

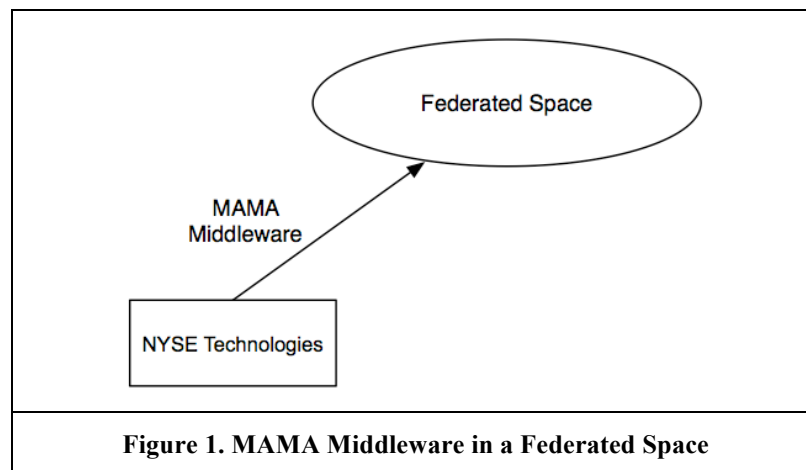
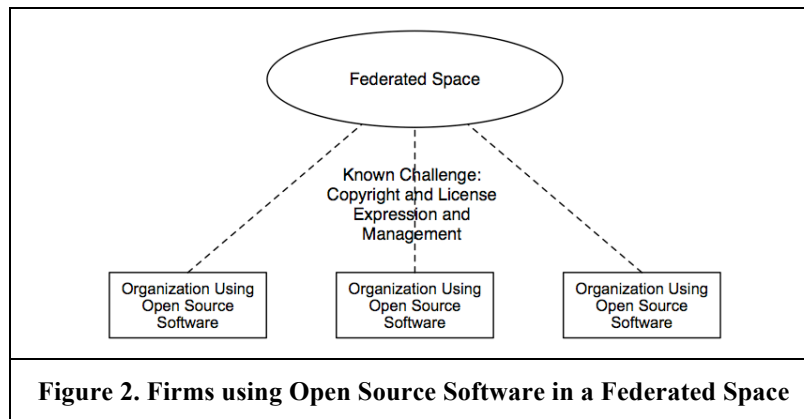


Figure 1. MAMA Middleware in a Federated Space

The outward flow of MAMA middleware repositioned the business practices associated with its management away from NYSE Technologies and into a federated setting. The MAMA middleware outward flow by NYSE Technologies enabled communal management of non-differentiating technology development. Subsequently, NYSE Technologies followed the technology into the federated space as a steering committee member and supplier of software development expertise. The outward flow of MAMA moved an internal, non-differentiating technology and its associated practices into an *open* position to improve management and distribution amongst partner organizations.

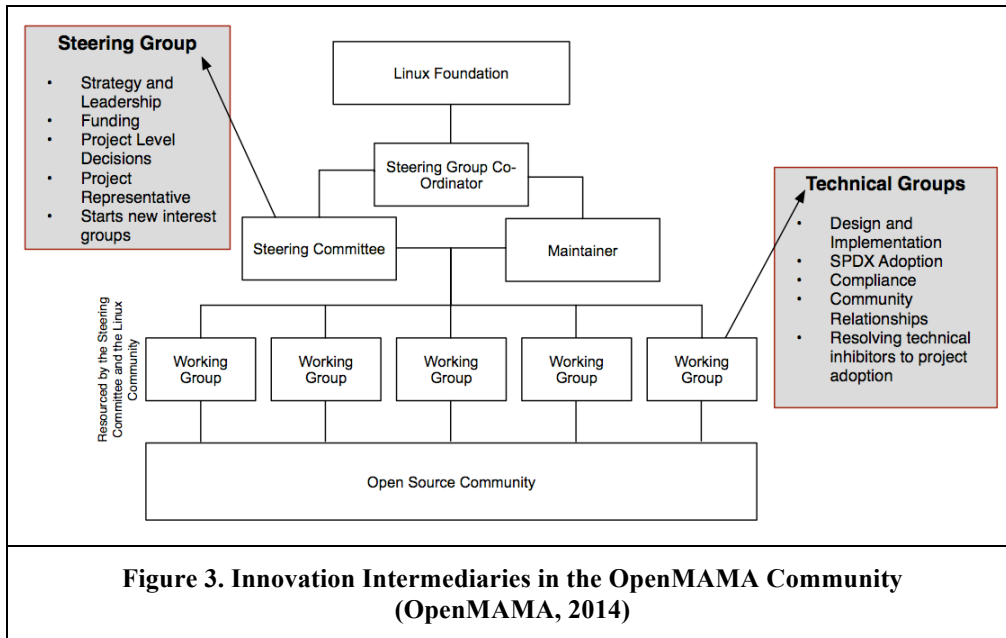
Interestingly, SPDX did not begin as a single technological outward flow as was the case with OpenMAMA. Instead, SPDX emerged as a challenge, as business individuals saw a need within firms to improve software compliance management. Corporate software portfolios increasingly contain an array of closed and open source software, and managing copyrights and licenses is a sophisticated challenge. The SPDX community extracted this known challenge, not a specific technology, but as the standardization of complex work across organizations in the expression and management of software license and copyright information. The SPDX community also formed a federated space to standardize the way copyright and licensing information was expressed and shared within and across open source business practices (SPDX, 2014) (Figure 2).



After nearly 3 years of lobbying the Linux Foundation from 2007-2009, in 2010 the SPDX specification was accepted as a Linux Foundation workgroup, and at that point, additional profit-seeking firms became members. Like OpenMAMA, SPDX was focused on the development of a non-differentiating technology around which a federated space was constructed. The technology (the SPDX specification) was communally emergent, with no early innovation occurring within any single firm. In SPDX, the outward flow was an extraction of the known challenge of copyright and license compliance. The outward flow was not a direct action of any one firm, but an external realization of the need for standard practices to which all participants can benefit.

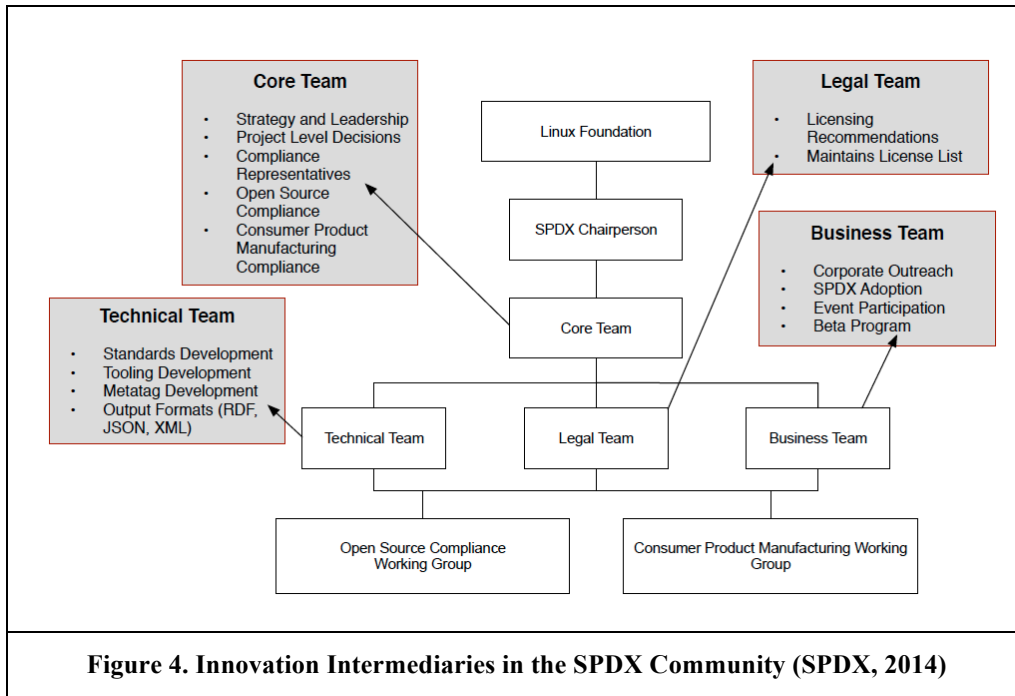
### ***Innovation Intermediaries in Federated Innovation***

OpenMAMA is a centrally governed and highly coordinated community. At the top of its organizational structure is the Linux Foundation. They provide a governance framework and technology platform by which the community innovates while still leveraging that technology into internal innovation streams. Governance within OpenMAMA is regulated through a central steering group that provides strategy and leadership, manages funding, votes on project-level decisions and project representatives, and decides on the inception of new interest groups. The OpenMAMA space is federated as technical groups are internally managed to provide design and implementation, quality assurance and validation, legal and technical compliance, maintaining community relationships, and resolving any technical issues that may inhibit the adoption of the project. In addition, becoming a member of the OpenMAMA steering group is not financially trivial. To become a member of the committee, a person or organization must be 'voted in' and must be a Linux Foundation Silver Member, a minimum of \$5,000 USD, and pay an annual membership fee to OpenMAMA of \$25,000 USD. All of the informants we spoke with were employees of organizations who had paid to be a part of the steering committee. Figure 3 depicts the innovation intermediary structure within OpenMAMA.



The role of innovation intermediaries takes on several forms in the OpenMAMA community. For example, the Linux Foundation provides an intermediary to the community, offering governance, technical, and marketing support. The Linux Foundation intermediary does not provide any technical advice to the community, but makes connections and provides support that advances its predetermined goals. Each participant organization also provides an intermediary to offer strategic, business, legal, and technical support for the community. In both, innovation intermediaries are not focused on the extraction and alignment of external innovations with internal innovation streams. Instead, innovation intermediaries support the federated space, as the threat of a collapsed domain will result in the immediate return of OpenMAMA as individually managed, proprietary technology. Innovation intermediaries play a critical role as the stabilizers of the community for long-term sustainability of shared, non-differentiating technologies and practices.

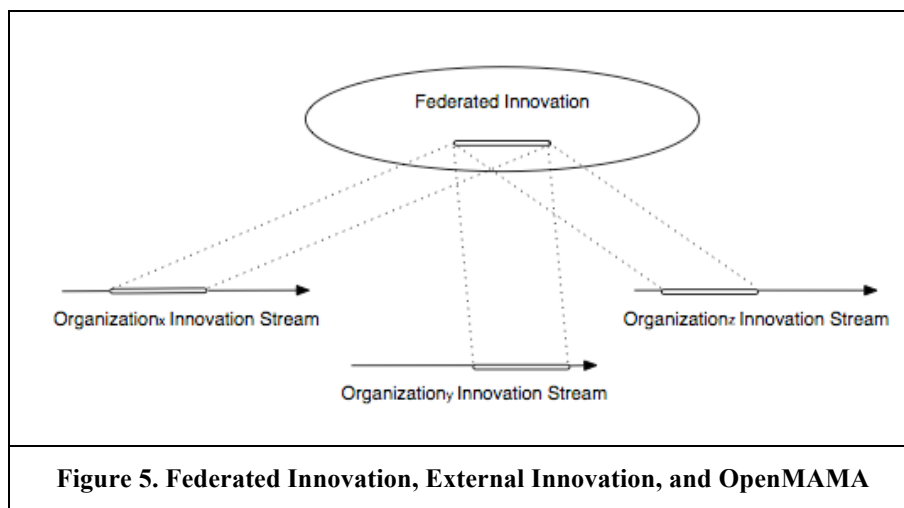
Innovation intermediaries also play a critical role at SPDX. The SPDX community is a structured organization, having a chairperson, a steering committee, and three working groups. The technical working group develops the standards and tooling to advance the SPDX specification. The business working group supports the specification's promotion and use, while the legal working group ensures alignment between open source licenses and SPDX. Each workgroup operates semi-autonomously, but continuously aligns with each other through the community's centralized structure. Unlike OpenMAMA, membership in the administrative positions of SPDX carries no cost commitment, however membership is largely comprised of organizations that directly benefit from the advancement of the specification, including open compliance organizations, auditing organizations, and large-scale open source software distributors. Figure 4 depicts the innovation intermediary structure within SPDX.



Like OpenMAMA, innovation intermediaries do not aim to simply extract external innovation for use in an internal innovation stream. Instead, the responsibilities of innovation intermediaries are to provide governance, technical, and marketing support and advance the SPDX specification put forth by the SPDX community. These types of structures aim to advance and stabilize the SPDX federated space, so that it is recognizable as providing viable solutions toward software compliance challenges.

**External Innovation in Federated Innovation**

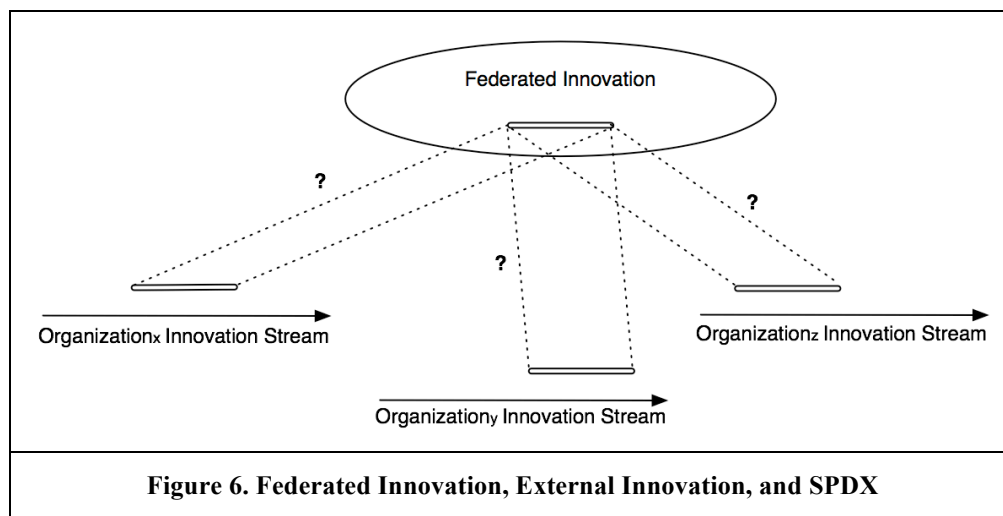
In Federated Innovation, leveraging external innovation is not exclusively an exploratory, nor egalitarian activity. In the OpenMAMA community, external innovation is part of an overall strategic business model. The OpenMAMA middleware was something managed internally at partner organizations. With the development of the federated space, the management of the middleware becomes standardized and accepted as part of an internal business model for each organization. Federated Innovation provides the centralized management of a shared technology and its associated practices, highlighting external innovation as a critical piece of a firm’s internal innovation stream (Figure 5).





In OpenMAMA, the relationship between Federated Innovation and its use inside a firm's internal innovation stream is a pragmatic one. It is not discovering new features. It is not selling intellectual property. It is not reducing the complexity of technology through collaborative engagement. It is certainly not improving a social condition. *It is federating innovation* much the way that firms form internal, strategy-level committees to improve local departmental processes. OpenMAMA participants have formed an external, federated space to improve the quality of middleware management in local firm-level business models.

In SPDX, external innovation is a specification in the explication of license information in a standard way such that organizations can design tooling, evolve business practices, and standardize software supply chain relationships. Like OpenMAMA, the SPDX specification is envisioned as innovated externally (community) and realized internally (firm). *Unlike* OpenMAMA, the relationship between external and internal innovation streams is less well defined, with current efforts focused on the identification of how the SPDX specification connects with internal innovation streams. In the case of the SPDX federated space, innovation is produced external to the firm, and connections are still being forged with internal innovation streams.



The relationship between Federated Innovation and its use in internal innovation streams is emerging as a strategic business model of critical importance. As seen in the case of SPDX, Federated Innovation is not an orderly process where clear internal/external relationships are defined *a priori*. In SPDX, the outward flow (i.e. the business challenge of compliance) necessitated the assembly of various innovation intermediaries (e.g. central governance, technical, business, and legal). The solution to the business challenge emerged externally. As a result, the solution must now find fit with the various business cases that accommodate open source copyright and license compliance. In both the OpenMAMA and SPDX cases, Federated Innovation is explicated as a strategy that can be delineated to further research and benefit practice.

## The Contribution of Federated Innovation

Open source communities are becoming increasingly designed to support coordinated innovation and include a variety of stakeholders. To understand Federated Innovation – the outward flow of technology from the firm to a federated space, brokered by innovation intermediaries, and innovating publicly with non-differentiating technologies – is to begin to understand new economies for innovation. From a historical perspective, corporate innovation began within the boundaries of the firm, and was kept proprietary to that firm. With the infusion of external sources of funding such as venture capital and seed accelerators, both knowledge and the people who came up with innovative ideas became more diffuse as

smaller companies had (and have) the capital to innovate. Open Innovation captures these ideas. It assisted us in understanding this shift in our innovation economy from private to public. However, Chesbrough's concepts are also bound to the proprietary use and licensure of intellectual property as a direct means of profit (Chesbrough, 2003b, pg. 38). In contrast, Federated Innovation exposes a shift in the very definition of intellectual property in the context of a collaborative economy (Collen, 2014). Federated Innovation, as a model predicated on non-extractive, non-proprietary use of knowledge, exposes three landmark concepts that alter a firm's innovation strategy: (1) outward flow of knowledge from the firm to the federated space; (2) innovation intermediaries for governance and technology support; (3) external innovation of non-differentiating technologies.

In our observations on Federated Innovation, engagement with open source communities by the firms working on the SPDX and OpenMAMA projects was considerably strategic, as viable parts of their business relied on the proliferation of these communities. In turn, an open source community can serve as a 'stage' upon which multiple firms innovate, and interestingly, the federation itself is not designed by any one organization but instead by a neutral broker (Germonprez, et al., 2013). In OpenMAMA and SPDX, the Linux Foundation served in this role. However, the nature of innovation by which the federation is couched can greatly differ. In OpenMAMA, innovation is the ability to create applications without being concerned about the requirements or structures of an underlying messaging middleware. In SPDX, the innovation is standards and tooling to support open source licensure.

To 'federate' is to form a single centralized unit, within which each state or organization keeps some internal autonomy. From our research, we observed multiple profit-seeking firms, sometimes with competing interests, federating innovation to collaborate on common technologies to advance their own respective strategies. OpenMAMA and SPDX went about this by maintaining several semi-autonomous working groups consisting of organizations with competing interests. Some of these working groups were responsible for the production of knowledge to advance standards and technology within the group, while others were steering in the direction of the project. In Federated Innovation, the space where innovation occurs is exclusive of the profit-seeking firm. Instead, the firm's engagement takes place through an established governance schema, and a firm's participation in technology development. As Kelty (2008, 2013) points out, each of these forms of participation represents a method of strategic communication, as knowledge is not something extracted and made proprietary, but leveraged and reciprocated upon as a means of communication, proliferating strategic innovation in the public domain.

## **Conclusion**

This research depicts a new form of innovation in the information economy. Innovation may no longer strictly reside within an organization as part of research and development activity, but an activity involving a network of corporations coordinating through highly centralized means to exchange products in a global marketplace of ideas (Chesbrough, 2003a; Chesbrough, 2006; West and Gallagher, 2006; Feller et al., 2008). Within this network, we observed people and organizations working in new and exciting capacities. We observed communities of corporate competitors (Germonprez et al., 2013) working collaboratively to produce strategic technology, and we experienced these same corporations working together to advance their own self-interests in the public domain. In addition, we experienced innovation intermediaries working to create and enact stabilizing actions to maintain the structural integrity of the community. In our research, we depict two cases of open source communities where a separate organization, the Linux Foundation, acted as an innovation intermediary to host a multitude of projects where profit-seeking firms were active participants in innovating project components and steering the direction of the community.

Our research depicts Open Innovation and open source in a new light. We theorize on a new era of open source where these communities are far more than egalitarian volunteers acting for nothing other than public recognition. Instead, we theorize on open source communities as a platform and driver for strategic innovation. Open source communities are now considered to be richer, more powerful, and have significantly increased value for profit-seeking firms (Kelty, 2013; Dahlander and Magnusson, 2008; Wasserman, 2009). As a research community, we have just begun to understand how profit-seeking firms are steering and shaping open source community efforts and how open source communities are being used to drive strategy. It is our hope this research serves as a call to understand open source communities

in a new light, as some open source communities still exist to act as checks against external powers (Kelty, 2008), while others are being used as platforms to drive strategic innovation.

## References

- Agerfalk, P., & Fitzgerald, B. (2008). Outsourcing to an Unknown Workforce: Exploring Opensourcing as a Global Sourcing Strategy. *MIS Quarterly* , 32 (2), 385-409.
- Aksulu, A., & Wade, M. (2010). A Comprehensive Review and Synthesis of Open Source Research. *Journal of the Association for Information Systems* , 11 (11).
- Bergquist, M., & Ljungberg, J. (2001). The power of gifts: organizing social relationships in open source communities. *Information Systems Journal* , 11, 305-320.
- Bonaccorsi, A., & Rossi, C. (2004). Altruistic individuals, selfish firms? The structure of motivation in Open Source software. *First Monday* , 9 (1).
- Chesbrough, H. (2006a). *Open Business Models: How to Thrive in the New Innovation Landscape*. Boston, MA: Harvard Business School Press.
- Chesbrough, H. (2006b). Open Innovation: A New Paradigm for Understanding Industrial Innovation. In H. V. Chesbrough, *Open Innovation: Researching a New Paradigm*. Oxford, UK: Oxford University Press.
- Chesbrough, H. (2003a). *Open Innovation; The New Imperative for Creating and Profiting from Technology*. Boston: Harvard Business School Press.
- Chesbrough, H. (2003b). The Era of Open Innovation. *Sloan Management Review* , 44 (3), 35-41.
- Collen, J. (2014, February 6). Does Airbnb.com Need A Trademark? Branding In The Collaborative Economy: Are Intellectual Property Rights At Risk? *Forbes Magazine* .
- Crowston, K., Wei, K., Howison, J., & Wiggins, A. (2012). Free/Libre Open Source Software Development: What We Know and What We Do Not Know. *ACM Computing Surveys* , 44 (2), 1-37.
- Crowston, K., Wei, K., Howison, J., & Wiggins, A. (2007). Self-organization of teams for free/libre open source software development. *Information and Software Technology* , 49, 564-575.
- Dahlander, L., & Magnusson, M. (2008). How do firms make use of open source communities?. *Long Range Planning*, 41(6), 629-649.
- Feller, J., Finnegan, P., Fitzgerald, B., & Hayes, J. (2008). From Peer Production to Productization: A Study of Socially Enabled Business Exchanges in Open Source Service Networks. *Information Systems Research* , 19 (4), 475-493.
- Germonprez, M., Allen, J., Warner, B., Hill, J., & McClements, G. (2013, November). Open Source Communities of Competitors. *ACM Interactions* .
- Hars, A., & Ou, S. (2001). Working for Free? – Motivations of Participating in Open Source Projects. *Proceedings of the 34th Hawaii International Conference on System Sciences* (pp. 1-9). Hawaii: Hawaii International Conference on System Sciences.
- Kelty, C. (2008). *Two Bits: The Cultural Significance of Free Software*. Durham: Duke University Press.
- Kelty, Christopher M. "From participation to power." *The participatory cultures handbook* (2013): 22-31.
- Kogut, B., & Metiu, A. (2001). Open Source Software and Distributed Innovation. *Oxford Review of Economic Policy* , 17 (2), 248-264.
- Krippendorff, K. (1980). *Content Analysis. An Introduction to its Methodology*. London: The Sage Commtext Series, Sage Publications Ltd.
- Lakhani, K., & von Hippel, E. (2003). How open source software works: "free" user-to-user assistance. *Research policy* , 32, 932-943.
- Lee, C. (2007). Boundary Negotiating Artifacts: Unbinding the Routine of Boundary Objects and Embracing Chaos in Collaborative Work. *Computer Supported Cooperative Work* , 16, 307-339.
- Lerner, J., & Tirole, J. (2002). Some Simple Economics of Open Source. *The Journal of Industrial Economics* , L (2), 197-234.
- MacIntyre, A. (1981). *After Virtue: A Study in Moral Theory*. Notre Dame: Notre Dame Press.
- OpenMAMA. (2014). OpenMAMA Governance. Retrieved 2014, from OpenMAMA.org: <http://www.openmama.org/what-is-openmama/the-openmama-organisation/governance>
- Pawlowski, S., & Robey, D. (2004). Bridging User Organizations: Knowledge Brokering and the Work of Information Technology Professionals. *MIS Quarterly* , 28 (4), 645-672.
- SPDX. (2013). *Software Package Data Exchange*. Retrieved April 2014, from SPDX Governance: <http://spdx.org/about-spdx/governance>

- Star, S., & Griesemer, J. (1989). Institutional Ecology, 'Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology. *Social Studies of Science* , 19 (3), 387-420.
- Stewart, K., Ammeter, A., & Maruping, L. (2006). Impacts of License Choice and Organizational Sponsorship on User Interest and Development Activity in Open Source Software Projects. *Information Systems Research* , 17 (2), 126-144.
- van Maanen, J. (1998). *Qualitative Studies of Organizations*. Newbury Park: Sage Publications.
- van Maanen, J. (1988). *Tales of the field: On writing ethnography*. Chicago: University of Chicago Press.
- von Hippel, E. (2005). *Democratizing Innovation*. Cambridge, MA: MIT Press.
- von Hippel, E., & von Krogh. (2003). Open source software and the "private-collective" innovation model: Issues for organization science. *Organization Science* , 14 (2), 209-223.
- von Krogh, G., & von Hippel, E. (2006). The Promise of Research on Open Source Software. *Management Science* , 52 (7), 975-983.
- von Krogh, G., Spaeth, S., & Lakhani, K. (2003). Community, joining, and specialization in open source software innovation: a case study. *Research Policy* , 32, 1217-1241.
- von Krogh, G., Spaeth, S., & Wallin, M. (2012). Carrots and Rainbows: Motivation and Social Practice in Open Source Software Development. *MIS Quarterly* , 36 (2), 649-676.
- Wasserman, A. I. (2009). Building a business on open source software. *Cases in technological entrepreneurship: converting ideas into value*. Edward Elgar, Cheltenham Glos, 107-121.
- West, J. (2003). How open is open enough?: Melding proprietary and open source platform strategies. *Research Policy* , 32 (7), 1259-1285.
- West, J., & Gallagher, S. (2006). Challenges of Open Innovation: The Paradox of Firm Investment in Open Source Software. *R&D Management* , 36 (3), 319-331.