Editorial: Open Source Sustainability

Chris McPhee, Editor-in-Chief

Maha Shaikh, Guest Editor

From the Editor-in-Chief

Welcome to the January 2013 issue of the *Technology Innovation Management Review*. This month's editorial theme is Open Source Sustainability. It is my pleasure to welcome our guest editor for this issue, **Maha Shaikh**, Assistant Professor of Information Systems at Warwick Business School in the United Kingdom, who has assembled a diverse line up of authors to offer their perspectives on the sustainability and governance of open source software.

As always, we welcome your feedback, articles, and suggestions for future themes. We hope you enjoy this issue of the TIM Review and will share your comments online. Please also feel free to contact us (timreview.ca/contact) directly with feedback or article submissions.

Chris McPhee
Editor-in-Chief

From the Guest Editor

The theme of this issue was triggered by a discussion with Daniel Curto-Millet (a doctoral student and one of the authors in this issue), who is particularly interested in Elinor Ostrom's work in relation to sustainability (tinyurl.com/pcxroc) and how it is applicable to open source software. My own research more recently has made me very curious about the dimensions and conditions necessary to sustain an open source community, project, and ecosystem.

The idea of sustainability, though borrowed from natural resource management, is surprisingly applicable to open source ecosystem sustainability. The definition of sustainability that resonated the most with my understanding of open source was provided by Repetto (1986; tinyurl.com/afrmww9), and I have amended it slightly to make it sensible for open source:

> *Open source sustainability is the recognition and drive to manage all assets, and resources related to open source development, including the broader financial and physical assets in order to increase the long-term vibrancy and well-being of a project (and ecosystem). Sustainable development of open source, as a goal, rejects policies and practices that support current adoption and development in the short-term without regard for how this may deplete the productive base, including all resources, and that leaves future communities with poorer prospects.*

As this definition implies, time is a dimension that causes fluctuations in what is sustainable and desirable in open source. Each open source project has its own lifecycle (Schweik, this issue) though, of course, some never see growth and are simply abandoned. Is abandonment caused by a depletion of the productive base? The inability to recruit new editors in the case of Wikipedia, coupled with a loss of current editors, would seem to suggest that the answer is yes (Crowston et al., this issue). So, what are the relevant concerns that participants of an open source ecosystem must be aware of when they decide to collaborate on an open source project? The seven articles in this issue (introduced below) each provide their own distinctive answer to this ques-

Editorial: Open Source Sustainability

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tion, and borrowing from them and my own research, I have framed an initial understanding of eight factors that influence open source sustainability.

Open development process

Most of the authors of this issue would argue that an open source development process is just as important as keeping the code open source. Many of the articles touch on this implicitly, but Ingram and Arikan show how, in the case of openEHR, an open process becomes necessary. If a universal electronic health record is ever to emerge and sustain itself over time, then keeping only the code alone does not allow the type and depth of co-creation and expertise-sharing necessary to build an accountable and legitimate system.

License promiscuity

Depending on the needs of a particular project (and these will vary from organization to organization), it has been argued that, if the license is more rather than less permissive, then the project has better chance of survival. Asay (in this issue) who has many years of experience of open source software adoption and management in commercial organizations, persuades us that an Apache-style license is conducive to sustainability in an open source ecosystem because it entirely frees the code and the creator. In contrast, the General Public License (GPL) demands greater reciprocity and, with companies becoming more experienced with open source co-creation and adoption, it has become a less attractive license. Given that companies are now playing a very relevant role in sustaining open source projects, perhaps greater consideration should be paid to the topic of license promiscuity .

Adaptable and innovative business models

Companies that moved into the open source arena very early on were typically motivated by strategic purposes rather than profit. Traditional business models did not apply, and it took organizations some years before open source could be exploited with clear and novel business models. As more companies and the public sector take deeper interest in open source, the business models we have to take advantage of this phenomenon and innovation need to be adapted accordingly – and fast. Sustainability is indeed more about changing rather than just change, as Curto-Millet (in this issue) explains.

Community

Most would agree that sustainability in open source means sustainability of the pool of developers that contribute to the code. But, how is a community kept

healthy and vibrant, and more importantly, what is considered by ecosystem participants to be a sign of good health in a community? Crowston and colleagues (in this issue) explain that communities must manage recruitment with great care to keep themselves sustainable. However, we also note a change in attitude towards what amounts to a contribution in open source by a community. In the very early days, a contribution needed to be code-related, but with a growing diversity in ecosystem participants (both consumers and producers), there is a growing awareness of the value of other types of contributions, which can be as simple as just passing on the message about an open source project. This realization indicates a change in the nature of how and what we conceptualize as a community and as a valid contribution.

Open governance and accountable management

Different forms of governing an ecosystem, community, and organization lead to different outcomes. As Noori and Weiss (in this issue) argue, it is important for the long-term survival of an open source project and platform to adopt a governance style that changes and grows as the needs of the community change. This can be linked to Schweik's (in this issue) breakdown of a project lifecycle as stages of initiation and growth. How at each stage (and its variations) does governance become more governing-like and thus better able to manage change, growth, and then long-term sustainability over time? Flexibility may be the key to meeting these challenges, and as Curto-Millet (in this issue) argues, we therefore need to take a more process-oriented perspective.

Forking

Forking is often seen as a necessary evil in open source, but Nyman and Lindman show us another way to make sense of this process. They show that through governance and management at the levels of software, community and ecosystem, the right to fork can build greater strength and sustainability for the future.

Open source foundations

Open source foundations have had a presence for some while, but only recently has wide appreciation been given to their rather important role in keeping projects together by informing the community about various issues, offering legal protection, and providing governance through the development and implementation of rules and regulations. The number of foundations has grown, and Ingram and Arikan (in this issue) offer some possible causes for this change through their own example of openEHR and Opereffa. Sustainability in

Editorial: Open Source Sustainability

Chris McPhee and Maha Shaikh

open source projects does imply abiding by some form of regulations, standards, and codes of practice, all of which could slow the early stages of growth in a project. However, sustainability is not just about short-term thinking. In the long-term, Ingram and Arikan feel that some broader body of templates, archetypes, and rules will provide the infrastructure for a more sustainable open source project.

Ecosystem sustainability
Several of the articles in this issue move between sustainability at the levels of community, platform, and ecosystem. It can be argued that, because many projects are now built using a platform concept, to allow for an ecosystem to emerge around the code and participants, we need to be more focused on ecosystem sustainability rather than just sustainable communities.

Articles in this Issue

This issue contains seven articles relating to the theme of open source sustainability. The authors come from diverse backgrounds and geographical locations, including Canada, Finland, France, Spain, the United Kingdom, and the United States.

Linus Nyman and **Juho Lindman** from the Hanken School of Economics in Helsinki, Finland, argue that the ability to fork is a governance mechanism for ensuring sustainability in open source projects. Analysis at the levels of software, community, and ecosystem provide a more nuanced explanation of the motivations for forking, as well as the problems and benefits that can arise from it. Thus, the authors argue that forking need not be seen as negative behaviour; rather, it can be a way of building long-term sustainability.

Charles Schweik, Associate Professor at the University of Massachusetts, USA, discusses open source sustainability in relation to technological, community, and institutional attributes. Building on detailed survey data, Schweik adapts Ostrom's (2005; tinyurl.com/aesc7vd) Institutional Analysis and Development (IAD) framework, where projects are seen in initiation or growth stages (and more subtle variations as well). Public sector organizations interested in open source, commercial organizations, and other open source project based communities will be particularly interested in Schweik's framework.

Kevin Crowston, from Syracuse University in the United States, **Nicolas Jullien**, from Telecom Bretagne in France, and **Felipe Ortega** from the University Rey Juan Carlos in Spain, have studied Wikipedia in various languages with a focus on one criteria of project sustainability: the recruitment and retention of participants. In their essay, two notions emerge strongly: i) the management of projects and how they are organized, their hierarchy, and their rules influence who is recruited as editors to projects, but also who joins and participates, and ii) the size and maturity of the project greatly impact sustainability and recruitment.

Nadia Noori, a graduate from the Technology Innovation Management (TIM) program at Carleton University in Ottawa, Canada, and **Michael Weiss**, an Associate Professor and TIM faculty member, move beyond a community perspective to explore platform sustainability. The sustainability of a platform depends on what form of governance is exercised over the platform, and the authors identify three types of governance model: tight-control, loose-control, and hybrid-control. Their article creates a link from the community (or individual, organizational perspective) to a platform and finally to the larger ecosystem.

David Ingram and **Sevket Seref Arikan** from University College London in the United Kingdom explain how the problem of building a universal electronic health record system could be (mostly) resolved by a reliance on not only open source software, but also on a very open source process of development. The open development process would need to be clearly designed and implemented so that others can imitate it and truly hope to co-create a universal health record system. In their discussion of openEHR, the Opereffa framework, and archetypes and templates, they make evident the need for openness, governance, and controlled management to build not simply a local system but a universal electronic health record system. Their in-depth case is based in the United Kingdom National Health Service (NHS), but their offer of a possible solution has universal applicability and appeal.

Daniel Curto-Millet, a doctoral student at the London School of Economics and Political Science in the United Kingdom encourages us to ontologically redefine sustainability. His study of openEHR and the Opereffa framework have shown him how sustainabil-

Editorial: Open Source Sustainability

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ity is not a state that is stable (even in its desire for stability), but instead sustainability is a process where the multitude of actors, artefacts, archetypes, and so on, and are all in constant flux. He thus feels we need to conceptualize sustainability in a manner that allows us to make sense of it processually – in other words, as in "becoming" (Deleuze and Guattari, 1987; tinyurl.com/awujgdr). In order to be able to do this, he draws our attention to everyday negotiations, working outs, and engagements that openEHR and its larger ecosystem perform with and within to achieve a more detailed understanding of *sustaining* (and not sustainability).

Matt Asay, Vice President of Corporate Strategy at 10gen in the United States, discusses open source software ecosystem sustainability where the key issues according to his years of experience in the field are: i) community sustainability and ii) license permissiveness. He highlights the need to revaluate and redefine contribution in light of commercial interests in open source. This resonates strongly with my own findings and research in this area. OSS (open source software) has evolved into OSS 2.0 (Fitzgerald, 2006; tinyurl.com/dxwq3jx), and, whereas in the early days companies were considered parasitic by communities and developers, we now note a real shift. This shift in attitude is partly due to a changed understanding of contribution in open source – it no longer only implies a contribution of code (though this is still very relevant). It has taken on a more multifaceted role that is evident in practice, acceptance, and understanding. Contribution to open source can now be redefined to mean anything from code updates to use, interest, and generating a conversation on open source, activism, bug reports, training, education, and so on. Open source has truly grown up and matured. It has become more inclusive, malleable and perhaps in its more hybrid manifestations, even more interesting?

Maha Shaikh
Guest Editor

About the Editors

Chris McPhee is Editor-in-Chief of the *Technology Innovation Management Review.* Chris holds an MASc degree in Technology Innovation Management from Carleton University in Ottawa and BScH and MSc degrees in Biology from Queen's University in Kingston. He has over 15 years of management, design, and content-development experience in Canada and Scotland, primarily in the science, health, and education sectors. As an advisor and editor, he helps entrepreneurs, executives, and researchers develop and express their ideas.

Maha Shaikh is an Assistant Professor at Warwick University Business School. Prior to this, she was a Research Associate at the London School of Economics and Political Science (LSE). Other affiliations include the University of Limerick, where she worked on a number of projects including the OPAALS project with Professor Brian Fitzgerald. She has also worked with Professor Leslie Willcocks at the LSE, studying the relationship of open source to outsourcing, open innovation, and open business models. Dr Shaikh is a co-author of *Adopting Open Source Software: A Practical Guide.*