ECLIPSE FOUNDATION **Expression of Interest**

“The machine economy will be open source or will not be”

Motivation

The machine economy is on our doorstep. Current technologies already enable direct communication between machines and devices through networks, whether wired or not. At a basic level, machine-to-machine encompasses anything related to connecting, remote monitoring, sensing, and actuating devices. Add machine learning and blockchains to the mix, and you transform the fundamentals of the European economy. As Megan Doyle wrote in 2021, “*Technology is laying the foundation for a future of automated machines, trustless smart contracts, and interconnected sensors – all with the end goal of improving human lives.*”

While the industrial revolution improved our lives, it was not built on sustainable energy sources and infrastructure. We cannot afford to build the machine economy in the same way. A sustainable machine economy will only emerge from a shared, vendor-neutral ecosystem, inside which commercial and non-profit organizations will pool resources towards common goals. In other words, the European machine economy platform must be open source, and its governance must be under the stewardship of a truly European open source foundation.

The Kubernetes ecosystem provides a good contemporary example of the dynamics at play. Nowadays, anyone willing to orchestrate containerized applications at scale will rely on the Kubernetes platform. Kubernetes could marginalize all other competing platforms because of its ecosystem's openness. Anyone can freely use, modify, and build commercial products leveraging Kubernetes technology. No single participant in that ecosystem can assert control over the platform. Kubernetes has clearly become a community-owned platform. The machine economy platform should be the same.

The Eclipse Foundation does not employ developers or researchers; its members and partners do. However, we have strong expertise in coordinating research and development activities and assessing market trends through surveys. Thus, our contribution to future projects would tap into that expertise and the mature open source governance and process we provide.

Current Status

Open source is often appreciated in research projects, as it favors open collaboration, community building, and improves the sustainability of the results of a project. But open source is often neglected and considered as an afterthought, as a nice to have, whereas it should be considered as a *sine qua non* condition for the success of new technologies. One of the many reasons for this is that consortia are sometimes not familiar with Open Source Software (OSS) development practices and that some clichés still persist like : "open source is not compatible with patents", "you don't make money with open source", or "OSS is not safe".

Another reason is that it is not easy to develop an open source solution within a consortium of ten or more partners with different development approaches, different motivations, or even internal rules that may refrain some partners from collaborating in open source. Lack of alignment makes open collaboration complex and may discourage partners if they don't get the proper support.

This is why it is essential to consider the ambitions of the project and its consortium and to evaluate if there is a strong wish by the partners to develop and maintain a sustainable open source platform. If the consortium is not aligned enough it is likely better to focus on a subset of components whose maturity and developers' motivations can build a solid foundation for sustainability and exploitation in open source.

Research Challenges

Research projects can overcome the challenges of open collaboration in open source. Partners must assimilate the good practices of open source, and understand the business articulations that encourage a company to move from being a consumer of open source components, to contributing to open source components, and even to leading its market in its domain by gaining worldwide adoption thanks to the network effects of open source.

With open source, there is a chance to implement a continuum from research to industry: an open source component does not have to be "rewritten" in order to be used by industry. Sometimes, it can simply be hardened and this makes dissemination and exploitation faster and easier.
But not everything should be open source: open source is particularly efficient to pool resources and efforts between different stakeholders, including competitors, to create an open source platform, and share the burden of the 80% (innovative but still) non differentiating software.

The main challenge is to adopt a code first approach, because open source gives super powers to code: it creates de facto open standards, enables various business models for exploitation, and fosters adoption without borders.
Unless they have been immersed in open source for many years, researchers and industry players need the support of a foundation such as the Eclipse Foundation to build their success on top of a solid governance, proven intellectual property rules, and collaboration best practices.