# The Future of Collaborative Software Development

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## Abstract
*Software development organizations are changing from traditional enterprise or open source teams to decentralized, inter-reliant, multi-scale ecosystems of software developers. This transformation presents novel challenges and opportunities to those seeking to understand, evaluate, support, and influence these organizations. The goals of this workshop are to bring together researchers who are interested in the evolution of software development organizations, highlighting the role of collaboration technology, such as crowdsourcing, social media, software hosting, and application marketplace services, in shaping organizational transformation, and coordinating future efforts.*

## Keywords
Software development, crowdsourcing, social media

## ACM Classification Keywords
K.4.3 [Organizational Impacts]: [Computer-supported collaborative work]; H.5.3 [Group and Organization Interfaces]: [Organizational design, Computer-supported cooperative work, Web-based interaction]

## General Terms
*Human Factors, Management*

## Motivation

The emergence of globally-accessible Web 2.0 social media technologies has created opportunities for transformative change in the organization of software development teams [3]. In the coming years, classic organizations, such as enterprises, independent software vendors, consultancies, and open source communities, will be increasingly augmented or even supplanted by decentralized and inter-reliant software ecosystems [1] that employ crowdsourcing [2, pp. 187—190], outsourcing, offshoring, spontaneous collaboration, and social networking [1, 2, pp. 33—38] to create software products. The introduction of ubiquitous collaboration practices and tools [2, pp. 359—364] will modernize the design, development, testing, release, sales, and marketing of software. This change will enable ecosystems of software teams to become increasingly global and democratic, unobstructed by national and cultural boundaries. It will enable small organizations, even as tiny as a single, teenage programmer from a developing country, to take advantage of a global talent pool for the development and consumption of their software.

These changes are inspiring new multi-disciplinary research questions that mix CSCW, software engineering, organizational behavior, human incentives, and open source studies. For example, how do decentralized software teams form, establish processes, operate, and reflect on their work? What are their organizational characteristics (e.g. participants' roles, work practices, and performance incentives), and how do they differ from more traditional enterprise or open source teams? How do these characteristics vary over the course of a project or through extended collaboration? How can we adapt empirical research methods to study team communication that occurs solely in public social media channels and evaluate development which eschews centralized software repositories? Do software development practices co-evolve with collaboration technologies? And, why are particular application domains (e.g., socially-relevant projects, health, gaming, energy efficiency, citizen science, education) attracting the focus of decentralized software teams, and how do their development methodologies and tools enable them to successfully meet their goals?

Through this workshop, we bring together researchers to build a foundation for understanding how emergent organizations differ from the classic organization models, and explore the advantages and disadvantages of their structure, practices, and tools in the production of software.

## Citations

[1] L. Dabbish, C. Stuart, J. Tsay, and J. Herbsleb (2012). Social Coding in GitHub: Transparency and Collaboration in an Open Software Repository. In *Proceedings of Computer-Supported Cooperative Work* (to appear).

[2] K. Sullivan. 2010. *Proceedings of the FSE/SDP Workshop on Future of Software Engineering Research*. ACM. Santa Fe, NM, USA.

[3] C. Treude, M.-A. Storey, K. Ehrlich, and A. van Deursen. 2010. Workshop Report from Web2SE: 1st Workshop on Web 2.0 for Software Engineering. *SIGSOFT Software Engineering Notes* 35, 5 (October 2010), 45-50.