

Network Structure, Efficiency, and Performance in WikiProjects

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The internet has enabled collaborations at a scale never before possible, but the best practices for organizing such large collaborations are still not clear. Wikipedia is a visible and successful example of such a collaboration [1, 2] which might offer insight into what makes large-scale, decentralized collaborations successful. In this large-scale observational study, we analyze the relationship between the structural properties of 2079 English-language WikiProject coeditor networks and the success those projects. We make a distinction between two types of success: *performance* and *efficiency*. We confirm the existence of an overall performance-efficiency trade-off, while observing that some projects are higher than others in both performance and efficiency, suggesting the existence factors correlating positively with both. Namely, we find an association between low-degree coeditor networks and both high performance and high efficiency. We also confirm results seen in previous numerical and small-scale lab studies: higher performance with less skewed node distributions [3], and higher performance with shorter path lengths [4]. Our results suggest possible benefits to decentralized collaborations made of smaller, more tightly-knit teams. Our results also suggest the importance of distinguishing between efficiency and performance when evaluating the success of collaborative outcomes.

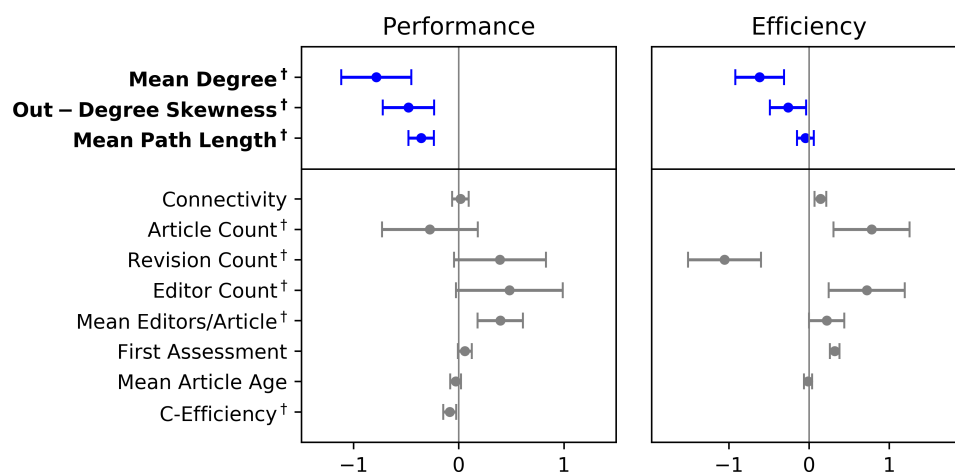


Figure 1: Regression coefficients for WikiProject success and coeditor network properties

[1] Giles, J. (2005). Internet encyclopaedias go head to head. *Nature.com*.

[2] Keegan, B., & Fiesler, C. (2017). The Evolution and Consequences of Peer Producing Wikipedias Rules. In *ICWSM*.

[3] Kearns, M. (2012). Experiments in social computation. *Communications of the ACM*, 55(10).

[4] Mason, W. A., Jones, A., & Goldstone, R. L. (2008). Propagation of innovations in networked groups. *Journal of Experimental Psychology: General*, 137(3).