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 measures: *performance* and *efficiency*. We confirm the existence of an overall negative correlation between performance and efficiency, 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.

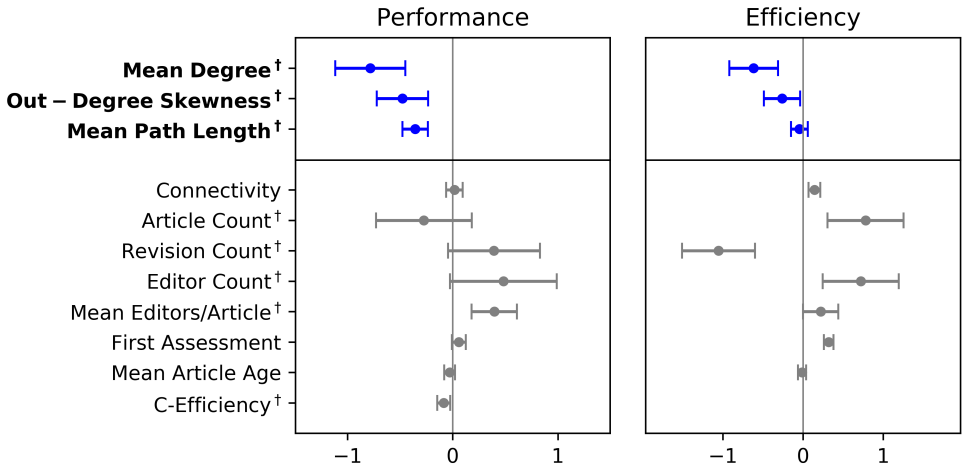

Figure 1: Regression coefficients for WikiProject success and coeditor network properties

[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).