Collaborative Writing and Visibility at Work

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Extended Abstract

Professional networks play a crucial role in both individual success and career growth (Frederiksen et al., 2020) and in aggregate productivity (Herkenhoff et al., 2024). Junior workers particularly benefit from exposure to more senior managers, both because they receive informal training (Lazear et al., 2015) and because visibility helps managers guide workers into jobs that suit their skills and help them up the promotion ladder (Minni, 2023). In the years following the Covid-19 pandemic, the permanent rise of remote and hybrid work has shifted the dynamics of workplace collaboration and potentially reduced the opportunities for young workers to receive mentorship and gain visibility as they develop their careers. Generative AI has the potential to shift workplace norms once again by automating some core tasks for knowledge workers, particularly the semi-routine cognitive work often performed by workers at the beginning of their careers (Eloundou et al., 2023).

In this paper, we explore the dynamics of collaborative writing by analyzing a novel large-scale data sample built from the user interaction logs of a popular digital writing platform. For many knowledge workers, professional writing is both a core component of their job and an important environment for giving and receiving mentorship and training. Several workers can collaborate in producing a document, with different responsibilities: outlining the content, producing a rough draft, providing feedback, and incorporating comments. The move towards cloud-based document creation (i.e. through Google Docs or Microsoft 365 on the Web) provides new opportunities for researchers to observe the process of collaborative writing at scale (Sarrafzadeh et al., 2021).

We consider data for roughly 1.4 million office workers across 60 major multinational corporations over the course of 2023. On average, these workers edit 4 documents a week

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while working with an average of 6 within-firm collaborators. We use meta data already collected by the writing platform to track the contributions of each worker to each document, from creation, through editing, commenting, and publishing. We pair this collaborative writing data with email and meeting behavior for the same sample of workers, which allows us to compare the within-firm work networks identified through communication behavior, as in Impink et al. (2020) and others, to co-writing relationships. Finally, we add imputed manager status[2] to consider collaborative work separately for managers and the individual contributors on their team.

This paper has two goals. The first is to build a clearer picture of how collaborative writing takes place now: what share of documents are created by a group rather than a single author? Does collaboration take place mainly between peers or between managers and their team? How are responsibilities allocated across the stages of writing? The second goal is to situate this form of collaboration within other forms of work networks. Do workers write with the same people they meet and email with, or does collaborative writing build new connections? Does more intensive writing collaboration go hand in hand with more intensive communication through other channels, or can effective in-document collaboration reduce the communication load of email and meetings?

A growing literature establishes the validity and value of mapping workplace networks using email and meeting data (De Choudhury et al, 2010, Impink et al., 2020). More recently, researchers have used this type of data to study the effects of remote work. Yang et al. (2022) use email networks to show that communication networks became more siloed and that communication became more asynchronous with the rise of remote work. Emanuel et al. (2023) also analyze data from workplace software (in their case a code review system) to study the effects of remote work. They find that working together in an office increases the feedback engineers receive, but reduces the code they directly create, particularly for senior engineers. Their findings suggest a potential tradeoff between short-term productivity and mentorship for long-term growth.

We build on this work by studying the networks developed through collaborative writing, a core task for a wide range of knowledge workers, using data that spans many large firms. Co-writing on cloud platforms is an important and understudied form of collaboration. Effective online collaboration can mediate some of the risks to network building inherent in new, flexible work arrangements (Emanuel et al., 2023). We provide a portrait of co-writing at an inflection point: in a new era of settled hybrid work arrangements, but before the

[2] We impute manager titles based on centrality within email and meeting networks and other meeting and email behavior, such as frequency of meetings and emails to many recipients, trained on a sub-sample of workers for whom we have data on job title and managerial status.

widespread adoption of generative AI at work. The dynamics we will uncover can highlight both new opportunities for workers to build networks outside of traditional office environments, but also the kinds of interactions that may be at risk as new technologies continue to disrupt creative work.

References

De Choudhury, M., Mason, W. A., Hofman, J. M., & Watts, D. J. (2010). Inferring relevant social networks from interpersonal communication. In *Proceedings of the 19th international conference on World wide web* (pp. 301-310).

Eloundou, T., Manning, S., Mishkin, P., & Rock, D. (2023). GPTs are GPTs: An early look at the labor market impact potential of large language models. *arXiv preprint arXiv: 2303.10130*.

Emanuel, N., Harrington, E., & Pallais, A. (2023). The power of proximity to coworkers: training for tomorrow or productivity today? (No. w31880). National Bureau of Economic Research.

Frederiksen, A., Kahn, L. B., & Lange, F. (2020). Supervisors and performance management systems. *Journal of Political Economy*, *128*(6), 2123-2187.

Herkenhoff, K., Lise, J., Menzio, G., & Phillips, G. M. (2024). Production and learning in teams. *Econometrica*, *92*(2), 467-504.

Impink, S. M., Prat, A., & Sadun, R. (2020, May). Measuring collaboration in modern organizations. In *AEA Papers and Proceedings* (Vol. 110, pp. 181-186).

Lazear, E. P., Shaw, K. L., & Stanton, C. T. (2015). The value of bosses. *Journal of Labor Economics*, *33*(4), 823-861.

Minni, Virginia (2023). Making the invisible hand visible: managers and the allocation of workers to jobs. *Manuscript*.

Sarrafzadeh, B., Jauhar, S. K., Gamon, M., Lank, E., & White, R. W. (2021). Characterizing stage-aware writing assistance for collaborative document authoring. *Proceedings of the ACM on Human-Computer Interaction*, *4*(CSCW3), 1-29.

Yang, L., Holtz, D., Jaffe, S., Suri, S., Sinha, S., Weston, J., ... & Teevan, J. (2022). The effects of remote work on collaboration among information workers. *Nature human behaviour*, *6*(1), 43-54.