Economic Temporalities and the Frictions of Evaluating Work

Molly Q Feldman*
Oberlin College
Oberlin, OH, USA
mfeldman@oberlin.edu

Vera Khovanskaya*
University of Toronto
Toronto, Ontario, Canada
v.khovanskaya@utoronto.ca

Michael Muller*
Independent Researcher
Medford, MA, USA
michael.muller.hci@proton.me

Amanda Zadorian*
Oberlin College
Oberlin, OH, USA
azadoria@oberlin.edu

Abstract

This conversation examines why worker-centered research is simultaneously valuable and difficult to realize in practice. We suggest that the economic systems which surround workers affect not only their day-to-day working lives, but also the design of work technologies by HCI researchers. We hope to engage the CHIWORK audience in a wide-ranging discussion about the ways that economic factors introduce friction into, and may explain the origins of, our current system design practices. We hope to imagine together what a more worker-centered future could look like.

CCS Concepts

• **Social and professional topics** → *Economic impact*; • **Human-centered computing** → **Human computer interaction (HCI)**.

Keywords

labor, the economy, future of work, workers, HCI

ACM Reference Format:
Molly Q Feldman, Vera Khovanskaya, Michael Muller, and Amanda Zadorian. 2026. Economic Temporalities and the Frictions of Evaluating Work. In *Adjunct Proceedings of the 5th Annual Symposium on Human-Computer Interaction for Work (CHIWORK Adjunct '26), June 22–25, 2026, Linz, Austria.* ACM, New York, NY, USA, 4 pages. https://doi.org/10.1145/3805029.3819593

Motivation

The concept of "the user" remains foundational to HCI, grounding the field's interest in how people interact with and are affected by technology [13, 35]. This figure is meaningful not as an abstract individual, but as someone situated within the social, organizational, and technical contexts that shape their interaction with technological systems. Without attention to the user, the complexities they face [30], or the data they provide [9], studying interactions with technology or designing tools for use risks becoming detached from the circumstances that give those interactions meaning.

CHIWORK and related communities have increasingly pushed beyond narrow usability concerns toward broader commitments to worker-centered design, including attention to well-being, dignity, and the broader conditions under which work is performed [16, 17]. These approaches seek to support workers not merely as productive system users, but as people embedded in broader relations of care, solidarity, and organizational life [2, 37].

At the same time, researchers in CHIWORK are well-acquainted with the tensions of holding both user- and worker-centered orientations to design [24]. Systems designed for work must answer simultaneously to the worker as user and to the organization as an economic actor [31, 32]. Even technologies intended to support workers remain embedded in organizational settings where they are evaluated not only by how they support workers, but by how they improve productivity, coordination, accountability, and other organizational outcomes. As a result, technologies intended to support workers may also reorganize work in service of broader economic objectives.

This tension becomes especially visible in how computing research engages with workplace efficiency, particularly through efforts to optimize how workers spend and allocate their time. Efficiency is a recurring concern in CHIWORK and related venues [10, 23], and is often pursued through systems that help workers complete tasks faster, better allocate their time, or offload effort through automation. Notable examples include re-imagining how workers spend their time via on-the-go work tools [25, 41] or helping them understand how they spend their time through time-tracking technologies [3]. A recurring narrative about integrating AI tools at work is to help refocus [36], offload [12], or otherwise optimize [38] worker's time to allow them to work on more "meaningful" tasks.

Yet efficiency gains in workplace systems are rarely unambiguous in whom they benefit. Technologies that help workers "do more" or "work faster" may improve worker experience, but they may also increase throughput, intensify pace, expand managerial oversight, or otherwise serve the interests of managers and owners. As participatory design and value-sensitive design scholars have long argued, workplace technologies mediate competing stakeholder interests rather than serving a singular user alone [11, 29]. We therefore argue that evaluating workplace technology requires attention not only to the immediate user interaction, but to the broader economic arrangements in which work is organized and assessed. In most cases, workplace design is touched by existence within capitalist systems that shape how time, productivity, and value are defined, measured, and contested.

*Panelists are listed in alphabetical order by family name.

CHIWORK Adjunct '26, Linz, Austria

In this Conversation, we examine why worker-centered research is simultaneously valuable and difficult to realize in practice. We begin from the observation that systems designed for work must continually reconcile the situated needs of workers with the organizational demands through which work is evaluated, compared, and made accountable. This requires translating heterogeneous and irreducibly situated forms of practice into representations that can be compared, measured, and acted upon across organizational settings. We argue that much of the friction facing worker-centered design emerges from this process (i.e., of rendering situated work into commensurable forms in order for organizational coordination and evaluation to occur at scale.)

We intend this Conversation to engage the range of CHIWORK attendees, specifically asking researchers and practitioners to communicate across institutional and generational boundaries towards what understandings of time, and related concepts like efficiency, ultimately motivate them and their work. We particularly want to engage CHIWORK researchers and practitioners who want to offer supporting or counter examples to the content below.

Panelists & Provocations

Molly Q Feldman *is an Assistant Professor of Computer Science at Oberlin College. Her research broadly studies how workers (and workers-in-training) craft both programming and natural languages.*

How does understanding the role of the economy aid the HCI researcher? We argue that it can help them, and those in training, understand the underlying assumptions of the field. Recent work has begun to acknowledge this directly, for example by connecting CHI's focus on novelty with capital [19]. Here we consider the discussion of efficiency above as an additional example. While efficiency is a normalized metric in HCI for work, the concept extends to other related disciplines, such as software engineering (SE). For instance, measurement practices aimed at efficiency are ubiquitous [1, 4, 21], but can range in effectiveness [34]. We argue that understanding the wider role of the economy may elucidate where such measurements come from, why they are deemed important, and what their alternatives are. This understanding can aid researchers who study workers in the tech sector [18, 20] as they start to experience an increasingly precarious labor position [6]. With SE as just one example, how can we extend this idea into other inter-disciplinary collaborations focused on the worker? In doing so, what barriers of translating ideas, concepts, and approaches may we encounter, and how can we work together to address them?

Amanda Zadorian *is a Visiting Assistant Professor of Politics at Oberlin College. She is a critical political economist trained at The New School for Social Research. She studies the role of ideas and identities in rentier capitalist development.*

What if we consider the future as a technology of the present? The future is paradoxical: it is inherently unknowable, yet we invent technologies (forecasting, planning, scenarios, discounting) to attempt to know it; it is desirable, and yet neglected by our supposedly inherent short-termism [14]. These qualities of the future are performative: in purporting to *describe* the future they in fact *shape* the present. To say that a particular practice represents "the future of work" is to intervene in present workplaces, because claims about the future create the rationale for investments in new technologies or training in the present.

As the field that studies, and arguably naturalizes, capitalism, economics is key to understanding the future as a technology of the present. Neoclassical economics adopts a point of view in which time itself is commodified: given a price [8]. Labor, too, is commodified through time [26]: we think of work extensively (how many hours?) rather than intensively. Rising employment precarity is a cancellation of promises that made the future knowable for workers, in favor of making the future more shapeable by capital–which controls more of the social surplus as it pays workers less.

What particular technologies of the future (discounting, forecasting, etc.) do HCI researchers and practitioners adopt, what are their disciplinary and ideological origins, and how do these technologies reproduce assumptions about the commodification of labor through time? What impact might this have on the balance of power in present workplaces?

Michael Muller*, Independent Researcher, has worked in participatory design, CSCW, HCI, and human centered AI. Michael co-proposed and co-founded the CHI reviewing subcommittee on Critical and Sustainable Computing and Social Justice.*

Who owns the knowledge of the work? The workplace democracy program in Scandinavian participatory design recognized that labor had knowledge of *how the work gets done*. Labor could unveil that knowledge to management in exchange for shared power to define work practices, work flows, and work technologies [15].

Historically, management have tried to move that knowledge into resources that they control, such as supervisors and technologies [7]. When successful, management can misappropriate the knowledge of workers, reducing labor's power to advocate for the health, safety, and wages of workers, and for humane working conditions [39].

One of the "success stories" of computing involves the Analytic Engine of Babbage and Lovelace [40], which was based on Jacquard looms. The punchcard-like Jacquard loom technology displaced workers' knowledge and skill of weaving, absorbing that knowledge into the management-controlled technology of the looms [33]. The loom became the computer, and the weaver became an attendant to the needs of the loom. Management could hire fewer, less-skilled workers, and could pay them poorly.

We in HCI enable management's absorption [5] of labor's knowledge into technologies. We create technologies to measure work times, and we thereby assist management to govern those work times. What are our responsibilities when our technologies misappropriate labor's knowledges, skills, and work practices into management-controlled resources? How can we use our design power to create humane alternatives?

Vera Khovanskaya *is an Assistant Professor at the University of Toronto's Faculty of Information. She studies how technological systems reshape the labor process and how unions intervene in struggles over their design and deployment.*

For HCI researchers studying automation and technological change, the key question is not only whether new workplace technologies save workers time, but how new workplace technologies shape and expose the ways workers spend their time and reorganize expectations around work time. For example, time-tracking systems make

work more granularly accountable [22], support worker remote and on-the-go activities [27], and tie workers' activity to external market outcomes [28].

But these arrangements do not emerge from technology alone. The technologies themselves are shaped by broader political-economic conditions, while their adoption and interpretation within workplaces are mediated through organizational priorities, institutional norms, and market pressures. For CHIWORK, this suggests an empirical agenda focused not only on how workers adapt to evaluative systems, but also on the actors, systems, and practices involved in constructing, maintaining, and contesting how work is made measurable and organizationally legible. How are metrics and benchmarks for accounting for worker time selected, revised, and justified? And, while some of this mediation work is carried out by designers and technical practitioners familiar to HCI knowledge communities, it is likely that much of mediation is undertaken by analysts, managers, operations staff, and other organizational actors who remain peripheral to conventional HCI accounts of design. Who builds and maintains the systems through which work is made visible and comparable? And how might attention to these actors reshape how CHIWORK understands workplace design?

AI Disclosure Statement

The text of this submission was fully human generated. MQF used tools powered by large language models as part of search, including for related work, and for BibTeX conversions. All search results were validated via human confirmation before inclusion in this document.

References

[1] Krishan K Aggarwal, Yogesh Singh, and Jitender Kumar Chhabra. 2002. An integrated measure of software maintainability. In *Annual reliability and maintainability symposium. 2002 proceedings (cat. no. 02ch37318)*. IEEE, 235–241.

[2] Yoana Ahmetoglu, Duncan Brumby, and Anna Cox. 2024. Bridging the Gap Between Time Management Research and Task Management App Design: A Study on the Integration of Planning Fallacy Mitigation Strategies. In *Proceedings of the 3rd Annual Meeting of the Symposium on Human-Computer Interaction for Work* (New York, NY, USA, 2024) *(CHIWORK '24)*. Association for Computing Machinery. doi:10.1145/3663384.3663404

[3] Yoana Ahmetoglu, Akeisha Iskandar, Shermin Taoh, Andy Ying, Duncan P. Brumby, and Anna L. Cox. 2025. "I Work Much Better by Doing Less": How Task Duration Feedback Affects Optimistic Planning Bias in Academic Work. In *Proceedings of the 4th Annual Symposium on Human-Computer Interaction for Work* (Amsterdam Netherlands, 2025-06-23). ACM, 1–17. doi:10.1145/3729176.3729182

[4] Luca Ardito, Luca Barbato, Riccardo Coppola, and Michele Valsesia. 2021. Evaluation of Rust code verbosity, understandability and complexity. *PeerJ Computer Science* 7 (2021), e406.

[5] Harry Braverman. 1998. *Labor and monopoly capital: The degradation of work in the twentieth century*. NYU Press.

[6] Erik Brynjolfsson, Bharat Chandar, and Ruyu Chen. 2025. Canaries in the Coal Mine? Six Facts about the Recent Employment Effects of Artificial Intelligence. https://digitaleconomy.stanford.edu/wp-content/uploads/2025/08/Canaries_BrynjolfssonChandarChen.pdf

[7] Bob Carter. 2021. Defending Marx and Braverman: taking back the labour process in theory and practice. *International Socialism* 171 (2021), 171–96.

[8] Edward Chancellor. 2022. *The Price of Time: The Real Story of Interest*. Penguin Books, London.

[9] Stevie Chancellor, Eric PS Baumer, and Munmun De Choudhury. 2019. Who is the "Human" in Human-Centered Machine Learning: The Case of Predicting Mental Health from Social Media. *Proceedings of the ACM on human-computer interaction* 3, CSCW (2019), 1–32.

[10] Xinyue Chen, Lev Tankelevitch, Rishi Vanukuru, Ava Elizabeth Scott, Payod Panda, and Sean Rintel. 2025. Are We On Track? AI-Assisted Active and Passive Goal Reflection During Meetings. In *Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems* (Yokohama Japan, 2025-04-26). ACM, 1–22. doi:10.1145/3706598.3714052

[11] EunJeong Cheon and Vera Khovanskaya. 2024. Amazon Z to A: Speculative Design to Understand the Future of Labor-Intensive Workplaces. In *Designing Interactive Systems Conference* (IT University of Copenhagen Denmark, 2024-07). ACM, 314–327. doi:10.1145/3643834.3661561

[12] Besjon Cifliku and Hendrik Heuer. 2026. They Think AI Can Do More Than It Actually Can: Practices, Challenges, & Opportunities of AI-Supported Reporting In Local Journalism. (2026). arXiv:2602.22887

[13] Geoff Cooper and John Bowers. 1995. Representing the user: Notes on the disciplinary rhetoric of human-computer. *The social and interactional dimensions of human-computer interfaces* 48 (1995).

[14] Liliana Doganova. 2024. *Discounting the Future: The Ascendancy of a Political Technology*. Zone Books, Brooklyn, N.Y.

[15] Pelle Ehn and Morten Kyng. 1987. The collective resource approach to systems design. In *Computers and democracy-A Scandinavian challenge*. Gower Publishing, 17–58.

[16] Sarah E. Fox, Vera Khovanskaya, Clara Crivellaro, Niloufar Salehi, Lynn Dombrowski, Chinmay Kulkarni, Lilly Irani, and Jodi Forlizzi. 2020. Worker-Centered Design: Expanding HCI Methods for Supporting Labor. In *Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems* (Honolulu HI USA, 2020-04-25). ACM, 1–8. doi:10.1145/3334480.3375157

[17] Susan Gasson. 2003. Human-centered vs. user-centered approaches to information system design. *Journal of Information Technology Theory and Application (JITTA)* 5, 2 (2003), 5.

[18] Werner Geyer, Jessica He, Daita Sarkar, Michelle Brachman, Chris Hammond, Jennifer Heins, Zahra Ashktorab, Carlos Rosemberg, and Charlie Hill. 2025. A case study investigating the role of generative AI in quality evaluations of epics in Agile software development. In *Proceedings of the 4th Annual Symposium on Human-Computer Interaction for Work*. 1–18.

[19] Eric Gilbert. 2025. Capital and CHI: Technological Capture and How It Structures CHI Research. arXiv:2501.14092 [cs] doi:10.48550/arXiv.2501.14092

[20] Harrison Goldstein, Joseph W. Cutler, Daniel Dickstein, Benjamin C. Pierce, and Andrew Head. 2024. Property-Based Testing in Practice. In *Proceedings of the IEEE/ACM 46th International Conference on Software Engineering* (Lisbon, Portugal) *(ICSE '24)*. doi:10.1145/3597503.3639581

[21] Stephen H Kan. 2003. *Metrics and models in software quality engineering*. Addison-Wesley Professional.

[22] Katherine C. Kellogg, Melissa A. Valentine, and Angéle Christin. 2020. Algorithms at Work: The New Contested Terrain of Control. 14, 1 (2020), 366–410. doi:10.5465/annals.2018.0174

[23] Charlotte Kobiella, Teodora Mitrevska, Albrecht Schmidt, and Fiona Draxler. 2025. When Efficiency Meets Fulfillment: Understanding Long-Term LLM Integration in Knowledge Work. In *Proceedings of the 4th Annual Symposium on Human-Computer Interaction for Work* (Amsterdam Netherlands, 2025-06-23). ACM, 1–15. doi:10.1145/3729176.3729180

[24] Shuhao Ma, John Zimmerman, Valentina Nisi, and Nuno Jardim Nunes. 2026. *Revisiting Worker-Centered Design: Tensions, Blind Spots, and Action Spaces*. arXiv:2602.13424 [cs] doi:10.1145/3772318.3791128

[25] Nikolas Martelaro, Jaime Teevan, and Shamsi T. Iqbal. 2019. An Exploration of Speech-Based Productivity Support in the Car. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems* (Glasgow Scotland Uk, 2019-05-02). ACM, 1–12. doi:10.1145/3290605.3300494

[26] Karl Marx. 1990. *Capital: A Critique of Political Economy. Volume I*. Penguin Books, London.

[27] Melissa Mazmanian, Wanda J. Orlikowski, and JoAnne Yates. 2013. The Autonomy Paradox: The Implications of Mobile Email Devices for Knowledge Professionals. (2013). https://dspace.mit.edu/handle/1721.1/112333

[28] Wolfgang Menz and Sarah Nies. 2024. The dual economics in the labour process: managerial contradictions and indirect control. (Nov. 2024). doi:10.1332/27324176Y2024D000000021

[29] Michael Muller, Justin D. Weisz, Stephanie Houde, and Steven I. Ross. 2024. Drinking Chai with Your (AI) Programming Partner: Value Tensions in the Tokenization of Future Human-AI Collaborative Work *(CHIWORK '24)*. Association for Computing Machinery, New York, NY, USA, Article 7, 15 pages. doi:10.1145/3663384.3663390

[30] Brad Myers. 1994. Challenges of HCI design and implementation. *Interactions* 1, 1 (1994), 73–83.

[31] Jenna E. Myers. 2024. Triadic Technology Configuration: A Relational Perspective on Technologists' Role in Shaping Cloud-Based Technologies. 77, 3 (2024), 307–335. doi:10.1177/00197939241232992

[32] Jenna E. Myers. 2024. When Big Brother Is Benevolent: How Technology Developers Navigate Power Dynamics among Users to Elevate Worker Interests. 10, 3 (2024), 438–462. doi:10.5465/amd.2022.0111

[33] Santosh Kumar Rai. 2022. Communities of skill in the age of capitalism: Handloom weavers in twentieth-century United Provinces, India. *Modern Asian Studies* 56, 4 (2022), 1183–1221.

[34] Mehwish Riaz, Emilia Mendes, and Ewan Tempero. 2009. A systematic review of software maintainability prediction and metrics. In *2009 3rd international symposium on empirical software engineering and measurement*. IEEE, 367–377.

[35] Christine Satchell and Paul Dourish. 2009. Beyond the user: use and non-use in HCI. In *Proceedings of the 21st Annual Conference of the Australian Computer-Human Interaction Special Interest Group: Design: Open 24/7* (Melbourne, Australia) *(OZCHI '09)*. Association for Computing Machinery, New York, NY, USA, 9–16. doi:10.1145/1738826.1738829

[36] Ambika Shahu, Philipp Wintersberger, Dinara Talypova, Alice Vitali, Charlotte Kobiella, and Tilman Dingler. 2025. Enhancing Performance or Hijacking Attention? A Workshop on the Use of AI in Workplace Environments. In *Adjunct Proceedings of the 4th Annual Symposium on Human-Computer Interaction for Work* (Amsterdam Netherlands, 2025-06-23). ACM, 1–4. doi:10.1145/3707640.3729211

[37] Jia Shen, Luca Iandoli, and Miguel Aguirre-Urreta. 2022. Human-centered design for individual and social well-being: editorial preface. *AIS Transactions on Human-Computer Interaction* 14, 4 (2022), 446–460.

[38] Prakash Shukla, Phuong Bui, Sean S Levy, Max Kowalski, Ali Baigelenov, and Paul Parsons. 2025. De-skilling, Cognitive Offloading, and Misplaced Responsibilities: Potential Ironies of AI-Assisted Design. In *Proceedings of the Extended Abstracts of the CHI Conference on Human Factors in Computing Systems* (Yokohama Japan, 2025-04-26). ACM, 1–7. doi:10.1145/3706599.3719931

[39] James Steinhoff. 2024. The universality of the machine: labour process theory and the absorption of the skills and knowledge of labour into capital. *Work in the Global Economy* 4, 2 (2024), 215–234.

[40] George Strawn. 2023. Masterminds of Computer Design: Charles Babbage and Ada Lovelace. *IT Professional* 25, 4 (2023), 7–10.

[41] Alex Williams, Harmanpreet Kaur, Shamsi Iqbal, Ryen W. White, Jaime Teevan, and Adam Fourney. 2019. Mercury: Empowering Programmers' Mobile Work Practices with Microproductivity. In *UIST 2019* (2019-10). ACM. https://www.microsoft.com/en-us/research/publication/mercury-empowering-programmers-mobile-work-practices-with-microproductivity/