

DISCUSSION

Having taken a comprehensive look toward crowd work through the piecework lens, we can't help but take a step back to consider a number of meta-issues that arose in our analysis. Stated briefly, these issues are 1) the hazards of predicting the future, 2) polarizing tendencies, and 3) deciding our research agenda. We will attempt to grapple with these questions here based on what we brought up in the earlier case studies.

The Hazards of Predicting the Future

The past can't be a perfect predictor for the future; as [21] points out, "it would be wrong to conclude that in the realm of digital labor there is nothing new under the sun" [21]. Many of the challenges that *Dynamo* overcame — determining trustworthiness, ensuring anonymity, etc. . . [20] — were relatively unique challenges precipitated by the affordances of the Internet, specifically that people could (and often do) contribute to communities in a one-off manner [19]. The Internet seemed to make this kind of loose affiliation feasible where before it wasn't [8, 20].

But this does not mean that attempting to draw meaningfully from historical scholarship would be folly; as we have shown in the preceding sections, enough of piecework can and does inform crowdsourcing that we should take this as a cue to look first for historical framings on phenomena that we encounter, as this work can outline both the mechanisms that we should expect to play out as well as one of the (perhaps many) possible futures.

In particular, the predictions that have emerged surrounding crowd work have run the spectrum from deep pessimism to exuberant optimism. [a12: should I cite this?] In the next section, we will use the piecework foundation which informed our case studies to trace out possible Dystopian and Utopian futures for crowd work.

Polarizing Tendencies

It would be easy to think about the future of crowd work and end up at one of two extremes. On one hand, crowd work researchers imagine the application of crowdsourcing as a potentially bright future that enables the achievement of near-impossible goals [22, 15, 7]; on the other hand, researchers warn against crowd work as potentially exploitative sites of dispossession [21], a site of racial discrimination [11], and invisible, deeply frustrated workers [13, 6].

A uniquely challenging facet of this topic of inquiry is the public attention that this domain has attracted. Activists have described speculative work as having "essentially been turned into modern-day slaves" [4]. Meanwhile, advocates describe it as "a project of sharing aimed at providing ordinary people with more economic opportunities and improving their lives. . ." [10]. [a12: these are salient, but with the last paragraph it feels really flimsy. I'd really like to get this Uber quote in, but not if it means this paragraph gets that much weaker.]

There is evidence to support the claim that a Dystopian world awaits us at the end of the tunnel. The arbitrary na-

ture of on-demand work may permeate our lives, inducing us "to neglect tasks that are less easy to measure" [2] rewarding us not for creativity but predictability; payment for this work may ultimately be determined by an algorithm that fundamentally doesn't understand us; the layers between us and our managers might increasingly become "defective (simple, observable)" algorithms [3], just like those which already frustrate on-demand workers [17, 20, 13].

On the other hand, there is some evidence that offers hope.

Yes, piecework's nascent years were arguably grim, but they precipitated a century of the strongest labor advocacy the world has ever seen [12, 18]. Even today, the Geist that came out of the labor union revolution inspires collective action and worker empowerment around the world: in India, workers across the nation engaged in the largest labor strike in human history — perhaps as many as 150 million [1]. If labor advocacy groups can find ways to permeate on-demand labor markets, as some have called for [14], then the future of crowd work may follow the same trajectory of worker empowerment that piecework later found. [a12: The Internet may make this possible!]

Perhaps the most pressing question is this: is the future of crowd work going to look more Dystopian or Utopian?

If we have learned nothing, crowd work will probably end up somewhere in the middle.

Deciding our Research Agenda

1. We need to take a step back from the work that's been done so far and think about where we are going with the crowd work research agenda.
2. Piecework researchers pointed out long ago that piecework is problematized by the fact that "piecework does not compensate workers for time spent switching tasks" [5] — we've studied this phenomenon in crowd work [16, 9] and we should consider whether this remains a worthwhile area to explore unless we're actually finding ways to minimize the many forms of costs of switching tasks.
3. What questions are we trying to answer? If, as we assumed in the previous section on polarizing tendencies, our driving motivation is to empower workers, we

References

- [1] 150 Million Indian Workers Take Part In Largest Strike in Centuries. Sept. 2016. URL: http://therealnews.com/t2/index.php?option=com_content&task=view&id=31&Itemid=74&jumival=17170.
- [2] Jonas Agell. "Why are Small Firms Different? Managers' Views". In: *Scandinavian Journal of Economics* 106.3 (2004), pp. 437–452. ISSN: 1467-9442. DOI: 10.1111/j.0347-0520.2004.00371.x. URL: <http://dx.doi.org/10.1111/j.0347-0520.2004.00371.x>.
- [3] Erin Anderson and David C. Schmittlein. "Integration of the Sales Force: An Empirical Examination". In: *The RAND Journal of Economics* 15.3 (1984), pp. 385–395. ISSN: 07416261. URL: <http://www.jstor.org/stable/2555446>.

- [4] Jeff Bercovici. *AOL-Huffpo Suit Seeks \$ 105M: 'This Is About Justice'*. Apr. 2011. URL: <http://www.forbes.com/sites/jeffbercovici/2011/04/12/aol-huffpo-suit-seeks-105m-this-is-about-justice/#1544785f305d>.
- [5] Truman F Bewley. *Why wages don't fall during a recession*. Harvard University Press, 1999.
- [6] Jeffrey Bigham. *My MTurk (half) Workday*. July 2014. URL: <http://www.cs.cmu.edu/~jbigham/posts/2014/half-workday-as-turker.html>.
- [7] Jeffrey P. Bigham et al. "VizWiz: nearly real-time answers to visual questions". In: *Proc. UIST '10*. 2010.
- [8] Justin Cheng and Michael Bernstein. "Catalyst: Triggering Collective Action with Thresholds". In: *Proceedings of the 17th ACM Conference on Computer Supported Cooperative Work & Social Computing*. CSCW '14. New York, NY, USA: ACM, 2014, pp. 1211–1221. ISBN: 978-1-4503-2540-0. doi: [10.1145/2531602.2531635](https://doi.org/10.1145/2531602.2531635). URL: <http://doi.acm.org/10.1145/2531602.2531635>.
- [9] Lydia B. Chilton et al. "Task Search in a Human Computation Market". In: *Proceedings of the ACM SIGKDD Workshop on Human Computation*. HCOMP '10. New York, NY, USA: ACM, 2010, pp. 1–9. ISBN: 978-1-4503-0222-7. doi: [10.1145/1837885.1837889](https://doi.org/10.1145/1837885.1837889). URL: <http://doi.acm.org/10.1145/1837885.1837889>.
- [10] Jan Drahokoupil and Brian Fabo. *The Sharing Economy That Is Not: Shaping Employment In Platform Capitalism*. July 2016. URL: <https://www.socialeurope.eu/2016/07/sharing-economy-not-shaping-employment-platform-capitalism/>.
- [11] Benjamin G Edelman, Michael Luca, and Dan Svirsky. "Racial Discrimination in the Sharing Economy: Evidence from a Field Experiment". In: *Harvard Business School NOM Unit Working Paper* 16-069 (2015).
- [12] Robert A Hart and J Elizabeth Roberts. "The rise and fall of piecework–timework wage differentials: market volatility, labor heterogeneity, and output pricing". In: (2013).
- [13] Lilly C. Irani and M. Six Silberman. "Turkopticon: Interrupting Worker Invisibility in Amazon Mechanical Turk". In: *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. CHI '13. New York, NY, USA: ACM, 2013, pp. 611–620. ISBN: 978-1-4503-1899-0. doi: [10.1145/2470654.2470742](https://doi.org/10.1145/2470654.2470742). URL: <http://doi.acm.org/10.1145/2470654.2470742>.
- [14] Sarah Kessler. *What Does A Union Look Like In The Gig Economy?* Feb. 2015. URL: <http://www.fastcompany.com/3042081/what-does-a-union-look-like-in-the-gig-economy>.
- [15] Aniket Kittur et al. "The Future of Crowd Work". In: *Proceedings of the 2013 Conference on Computer Supported Cooperative Work*. CSCW '13. New York, NY, USA: ACM, 2013, pp. 1301–1318. ISBN: 978-1-4503-1331-5. doi: [10.1145/2441776.2441923](https://doi.org/10.1145/2441776.2441923). URL: <http://doi.acm.org/10.1145/2441776.2441923>.
- [16] Walter S. Lasecki et al. "The Effects of Sequence and Delay on Crowd Work". In: *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*. CHI '15. New York, NY, USA: ACM, 2015, pp. 1375–1378. ISBN: 978-1-4503-3145-6. doi: [10.1145/2702123.2702594](https://doi.org/10.1145/2702123.2702594). URL: <http://doi.acm.org/10.1145/2702123.2702594>.
- [17] Min Kyung Lee et al. "Working with Machines: The Impact of Algorithmic and Data-Driven Management on Human Workers". In: *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*. CHI '15. New York, NY, USA: ACM, 2015, pp. 1603–1612. ISBN: 978-1-4503-3145-6. doi: [10.1145/2702123.2702548](https://doi.org/10.1145/2702123.2702548). URL: <http://doi.acm.org/10.1145/2702123.2702548>.
- [18] Jamie K McCallum. *Global unions, local power: the new spirit of transnational labor organizing*. Cornell University Press, 2013.
- [19] Brian James McInnis et al. "One and Done: Factors affecting one-time contributors to ad-hoc online communities". In: *Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work & Social Computing*. ACM. 2016, pp. 609–623.
- [20] Niloufar Salehi et al. "We Are Dynamo: Overcoming Stalling and Friction in Collective Action for Crowd Workers". In: *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*. CHI '15. New York, NY, USA: ACM, 2015, pp. 1621–1630. ISBN: 978-1-4503-3145-6. doi: [10.1145/2702123.2702508](https://doi.org/10.1145/2702123.2702508). URL: <http://doi.acm.org/10.1145/2702123.2702508>.
- [21] Trebor Scholz. *Digital labor: The Internet as playground and factory*. Routledge, 2012.
- [22] John C. Tang et al. "Reflecting on the DARPA Red Balloon Challenge". In: *Commun. ACM* 54.4 (Apr. 2011), pp. 78–85. ISSN: 0001-0782. doi: [10.1145/1924421.1924441](https://doi.org/10.1145/1924421.1924441). URL: <http://doi.acm.org/10.1145/1924421.1924441>.