

Collaboration as Commodity: What does CSCW have to offer?

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Abstract. CSCW as a research field has contributed to the development of digital tools and platforms to support collaboration. Historically, detailed studies of collaboration have played a central role in the development of theories in CSCW. Parties to collaboration have been the main actors, engaged in synchronous or asynchronous, co-located or distant collaboration. CSCW has often considered the platform, i.e., the place where data about collaboration is stored, as a neutral actor without own agency or agenda. This picture has however changed drastically with the recent emergence of digital labor platforms and data-driven business models. Digital labor platforms move the focus from collaborating actors to platform owners, from supporting collaboration to trading collaboration as commodity. In this paper, I attempt to describe this development from a CSCW perspective. I propose a way to re-frame existing knowledge to fit into the new paradigm of collaboration as commodity. I propose to use research from neighboring fields such as information systems to increase our impact as CSCW researchers. Finally, I discuss several research questions for CSCW. This is work in progress.

Introduction

My aim in this paper is to raise a discussion about the role of CSCW in the new landscape of *digital labor platforms* for the so-called gig or on-demand economies (Choudary, 2018; Frenken & Schor, 2017). Digital labor platforms – interchangeably called platforms in the rest of this paper – are IT-based online services that create a market for labor and facilitate its trade online. These platforms

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allow individual consumers and workers to find each other, and to buy and sell labor. Some of these platforms have become global powerhouses –Uber, Lyft, Amazon Mechanical Turk, UpWork etc. –and connect tens of millions of consumers and workers across continents. Several such platforms support mainly online work –e.g. Amazon Mechanical Turk –while others combine online and physical offline collaboration –e.g. Uber. Increasingly new types of labor are transformed into on-demand models supported by digital labor platforms. Between 9% and 13% of the population in several European countries report being frequent platform workers (Huws, Spencer, & Joyce, 2016).

So-called "platform models" (Tiwana, 2013) have attracted considerable attention among researchers in the fields of information systems and management (Constantinides, Henfridsson, & Parker, 2018; de Reuver, Sørensen, & Basole, 2018). Numerous CSCW researchers have also studied these platforms and their users under terms such as micro-task (Gupta, Martin, Hanrahan, & O’Neill, 2014), crowdsourcing (Gray, Suri, Ali, & Kulkarni, 2016), and on-demand or labor platforms (Harmon & Silberman, 2018). Such studies have shed valuable light on how users perceive and use digital labor platforms.

CSCW research has resulted in debate about current global labor platforms and the way users –in particular workers –are treated by such platforms. CSCW research often addresses the interactions among platform users, while some emerging studies also look at the interaction between platform users and owners, such as (Glöss, McGregor, & Brown, 2016; Harmon & Silberman, 2018; Kittur et al., 2013). Overarching models and theories to study and debate platform ecosystems –in particular, the interactions between platform owners and users –are so far less emphasized in CSCW research. Therefore, design implications that result from mainstream CSCW research often do not question the fundamental governance mechanism and business models inherent in current platforms.

At the same time, CSCW researchers are in an excellent position to impact the design and evolution of labor platforms based on our focus and understanding of how users perceive and use digital labor platforms. Impact based on a knowledge of users needs to be systematic and result in practical advice and design considerations if they are to be used by platform owners. Such an impact does not need to contradict the interests of platform owners. Examples of costly legal and reputational battles that global labor platforms are currently fighting are abundant (Rodes, 2017; Semuels, 2018). A CSCW research agenda taking into consideration the whole ecosystem of digital labor platforms can make itself relevant not only for user representatives –such as labor unions –but also for platform owners who struggle with a poor reputation and associated costs due to poor design choices and governance models.

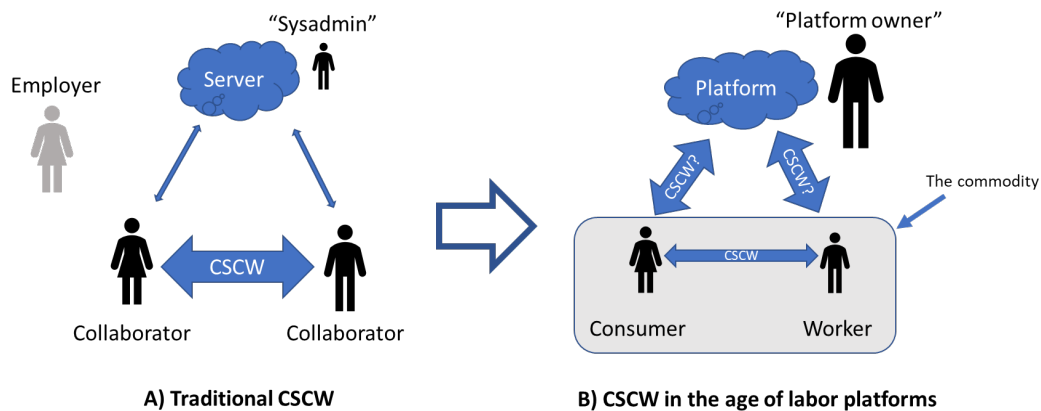


Figure 1: How platforms change the balance from collaborators to platform owners.

Digital labor platforms represent a fundamental transition for CSCW research. This transition is illustrated in Figure 1. Conventional CSCW (shown in the left side of the figure) focuses on interactions among collaborators and has generated a multitude of theories to explain and digitally support such interactions. Data about collaboration has always been central in CSCW –awareness data, context data, coordination data, etc. Historically, the system administrator – “sysadmin” –was a taken for granted agent who administered a “server” where this data was stored and accessed by collaborators and their tools. Sysadmin was often regarded as an actor without any political agenda, and his/her role has seldom been a subject of CSCW research. Employers, who on the other hand might have a political agenda –e.g. maximizing profit –have neither been the focus of mainstream CSCW research but their relationship with employees has been studied by e.g. participatory design researchers (Bratteteig & Wagner, 2016).

Fast-forward to the new landscape of online platforms, and we have a scenario where a digital labor platform has replaced the server, and the employer and the sysadmin have taken on a new joint role as the *platform owner* (shown to the right side of Figure 1). In this new scenario, the collaboration between collaborators is transformed into a transaction –or a series of transactions –between a *worker* and a *consumer* of labor. Seen from the platform owner’s perspective, collaboration in the conventional CSCW sense –and its outcome –constitutes a *commodity* that can be traded. To facilitate its trade, collaboration needs to be simplified and standardized. The details of the interactions between consumers and workers – which have traditionally been the core area for CSCW researchers –are of interest to the platform owner as far as these details can contribute to generating revenues for the platform. Platform owners –through their governance models as we will discuss later –restrict and guide these interactions with the aim of increasing platform revenues.

My argument in this paper is that CSCW researchers need to pay closer attention to this transition from “server” to “platform,” and the complex ecosystem that has

emerged among platform owners, workers and consumers. So far, most CSCW research on labor platforms, micro-task platforms, crowdsourcing, etc., has been concerned with how collaboration is done among workers and consumers, e.g. (Glöss et al., 2016; Kittur et al., 2013; Raval & Dourish, 2016). Additionally, CSCW researchers have recently created a research agenda promoting a quantitative view of collaboration. We see emerging studies that abstract away from the collaboration itself and look at its macro aspects. For instance, Hata et al. (Hata, Krishna, Li, & Bernstein, 2017) investigated long term worker fatigue and its effect on the quality of results among large groups of Amazon Mechanical Turk workers. Ahmed and Fuge (Ahmed & Fuge, 2017) used algorithms to discover and select high-quality ideas from mass online collaboration. De Boer and Bernstein (de Boer & Bernstein, 2017) used statistical models to identify well-performing crowd processes given a business objective. I believe this strand of research fails to build on the strength of CSCW in studying details of work practices. On the other hand, there is some emerging research that questions the relationship and the (lack of) collaboration between platform owners and platform users (Gupta et al., 2014). A coherent research agenda can increase CSCW's impact on how digital labor platforms are developed and evolve.

In the rest of this paper, I will first introduce some background on collaboration as commodity, and two concepts from information systems literature, i.e., platform governance models and boundary resources, that in my view can help structure existing research in a new light. I will then in the discussion section try to propose a set of research questions for CSCW researchers who investigate digital labor platforms.

Theoretical Background

In this section, I give a short overview of how I believe the traditional view of collaboration developed in CSCW has been commoditized in digital labor platforms. I then discuss how platform owners facilitate this commoditization, mainly through their governance models. I conclude with a short description of platform boundary resources as one way to structure future research and impact.

CSCW research during the last decades has played a central role in the emergence of today's digital labor platforms. CSCW, through its rigorous studies of work practices, succeeded in creating an understanding, and partly codifying collaboration into various theories (Schmidt & Bannon, 2013). CSCW researchers created knowledge about collaboration, and how it can be supported across time and space using IT-based tools. Distributed coordination mechanisms were demonstrated in tools such as Ariadne (Simone & Divitini, 1998) and later made commercially available –albeit in modified versions –in workflow tools. Elements from the speech act theory (Medina-Mora, Winograd, Flores, & Flores, 1993) were incorporated in commercial messaging systems. Various systems were developed

to support situated action based on, e.g. awareness (Dourish & Bellotti, 1992; Gross, 2013) and so on. These experiments resulted in products and features that we take for granted today: Awareness information about our friends and colleagues is now everywhere (sometimes also too much of it!); various systems implement more or less flexible workflows guiding (or forcing) us to get the work done.

This understanding and codification of collaboration into theories and digital tools was a prerequisite for a full digitalization of collaboration in the form of platforms. An early prototype, the BSCW system (Bentley, Horstmann, & Trevor, 1997) is an illustrative example of how two basic concepts originating from CSCW, i.e., common information spaces (Bannon & Bødker, 1997) and awareness mechanisms (Dourish & Bellotti, 1992) were used to support any document-based collaboration across time and space and without any physical contact among collaborators. The ability to cross the boundaries of time, space and organizations –partly fueled by research from CSCW –has enabled platforms to go from being internal and isolated tools for individual organizations to become open platforms for global industries (Gawer, 2014). They have created a vocabulary known to a global workforce. Everybody knows now what an “Uber”, a “Google doc” or “retweets” or “likes” or “feed updates” etc. are¹.

Standardization often goes together with commoditization. Commodity was discussed and defined by Marx: “Hence, commodities are first of all simply to be considered as *values*, independent of their exchange-relationship or from the *form*, in which they *appear as exchange-values*” (Marx, 1867). Wikipedia defines commodity as “an economic good or service that has full or substantial fungibility: that is, the market treats instances of the good as equivalent or nearly so with no regard to who produced them.” In this extremely short review of definitions, three properties of a commodity appear to be central. First, commodities are created to be exchanged, so they need to be packaged. Second, commodities have values, so that they can be traded. Third, commodities are fungible, so a commodity from one source can be replaced by one from another. But can such an intellectually loaded activity such as collaboration become commoditized? My answer is yes. Platforms commoditize collaboration along at least two lines. First, they standardize collaboration by simplifying it and eliminating its contextual dependencies –i.e., packaging collaboration as goods. Second, they use various mechanisms to create and grow a market for trading “packaged collaboration.” I will shortly discuss each of these aspects.

Standardization and packaging of collaboration

A growing number of publications in CSCW and HCI already show us how platforms are simplifying and decontextualizing collaboration. The extreme

¹ This standardization is helped by the fact that CSCW often tends to be agnostic about who is collaborating with whom, and focuses instead on their actions and “embodiment” in a virtual world.

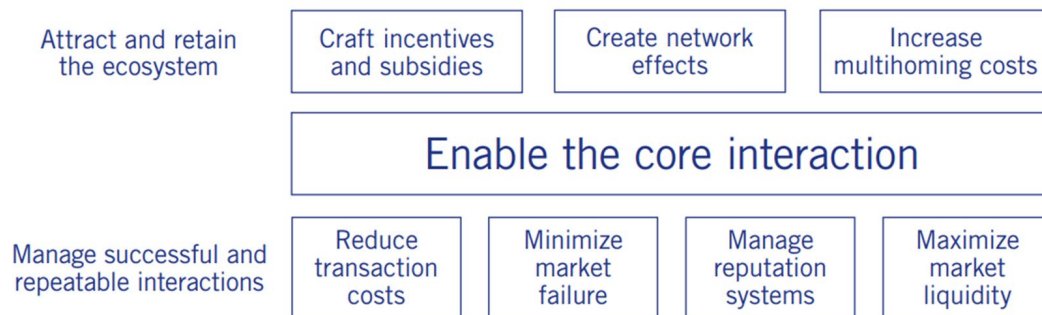


Figure 2: Mechanisms used by digital labor platforms to create and grow a marketplace for collaboration (Choudary, 2018).

examples come from micro-task platforms such as Amazon Mechanical Turk. Micro-task platforms, as the name suggests, break down the tasks into small pieces: "Turkers (termed 'Providers' by AMT) are the users completing the [Human Intelligence Tasks], which typically take seconds or minutes paid at a few cents at a time" (Martin, Hanrahan, O'Neill, & Gupta, 2014). This breaking down of tasks helps eliminate the need for specialized skills: "Such simple, small-scale work has engendered low-pay, piece rate reward structures, in part due to the perception that workers are homogenous and unskilled" (Kittur et al., 2013). Kittur et al. also argue that crowdsourcing platforms fail to support more –intellectually –complex tasks and workflows: "The current model is... insufficient to support the complexity, creativity, and skills that are needed for many kinds of professional work that take place today. Nor can it drive factors that will lead to increased worker satisfaction, such as improved pay, skill development, and complex work structures" (ibid, p. 1303).

In addition to breaking down and simplifying tasks –thereby increasing fungibility and facilitating trade –platforms replace the need for local skills and knowledge with less specialized or completely new standardized skills –often in favor of consumers. A much-discussed example is the new skills of “emotional labor” (Raval & Dourish, 2016) that are increasingly required from platform workers. Uber drivers, for instance, are not anymore required to have “the knowledge” –of all the local streets and addresses –but use GPS guides and instead engage in standardized emotional labor: "skills of engaging with passengers shape the self- image of the Uber driver" (Glöss et al., 2016, p. 1637). In this way, standardized packages of exchangeable labor are created that allow platforms to be deployed in different settings and cultures without the need for any specialized or local knowledge.

Marketplace mechanisms

Once the collaboration is “packaged”, it needs to be sold. So, there is a need for a marketplace. Labor platforms do not only standardize and support collaboration

between consumers and workers. They also use several mechanisms to create and grow a marketplace for collaboration. Some of the mechanisms that operate in such a marketplace are excellently described by Choudary (Choudary, 2018) and shown in Figure 2. The core interaction –the large central box in the figure—depicts the support for collaboration between consumer and worker –what has traditionally been of interest for CSCW. The boxes surrounding the core interaction are the mechanisms often implemented by platform owners to grow the marketplace.

The top row of mechanisms is aimed at attracting and retaining collaborators. Digital labor platforms –as many two-sided economies –create network effects to attract new users. For instance, the more workers with a good reputation you have on your platform, the more consumers and workers will want to use the platform. Platforms also use incentive systems to attract new users. Many labor platforms subsidize consumers at the expense of workers because consumers who are willing to pay will bring new workers to the platform. Platforms use various mechanisms to make it difficult for users to move to other platforms or operate on multiple platforms (multihoming). For instance, building a reputation through e.g. star ratings (Wilson & Paoli, 2018) is a demanding task for workers. Platforms often take ownership of a worker’s star ratings and make it impossible to move reputation to other platforms if a worker wanted to do so.

The bottom row in Figure 2 depicts activities that are used to alter the core interaction in order to grow the platform. These are activities that have greatest impact on the core interaction and thereby of high relevance for CSCW. Reducing transaction costs is done partly by simplifying tasks as discussed above. Additionally, platforms use automated matchmaking, with the consequence that collaborators on a labor platform rarely know or see each other: "the task creator [in Amazon Mechanical Turk] has no way of knowing if the task worker is male or female, young or old, religious or atheist, etc." (Gray et al., 2016, p. 134). Researchers have shown that there is an asymmetry in access to information in platforms. Normally, users know very little about each other, and platform owners know much more about users: "[Amazon Mechanical Turk] is something of a 'black box.' That is, while Amazon does publish their terms and conditions, little information is released about how these policies are specifically realised " (Gupta et al., 2014). This lack of transparency can often result in decreased quality in the collaboration between workers and consumers (Kittur et al., 2013). The use of data-driven algorithms is pointed out as a contributor to information asymmetry and imbalance of power between Uber and its drivers (Rosenblat & Stark, 2016). Reputation systems, such as star ratings, intend to control the quality of the provided services but can do the opposite because of the sanctions posed on platform users that strongly affect the interactions among them: "The drivers are scared of the customers but also the customers are scared of the drivers" (Glöss et al., 2016, p. 1635). Through automated matchmaking and global competition,

platforms also try to exploit fungibility and bring the price of labor to a minimum (Martin et al., 2014).

Co-creating platform governance models

Standardization, simplification, and packaging of interactions, and the additional activities of creating a marketplace for labor are not done in a vacuum. They are often parts of orchestrated activities to increase revenue and market share for platform owners. These activities are often aimed at creating so-called *platform governance models*. The way a platform uses labor standardization, subsidies, network mechanisms etc., as discussed above, constitutes that platform's governance model. Governance models "would let platforms control interactions between multiple stakeholders without jeopardizing their incentives for value-creation" (Constantinides et al., 2018, p. 383). Platform governance models have emerged as a major research topic in the information systems research field. Most research on platform governance models takes the perspective of the platform owner (Schreieck, Wiesche, & Krcmar, 2016). However, as I hope I have demonstrated above, the impact of governance models on collaboration, and therefore on CSCW, can be very real.

Platform governance models can be an instrument for CSCW researchers to increase our impact. Governance models have the advantage of taking an ecosystem perspective and avoid focusing on only one or a few actors. Emerging research in information systems shows how governance models can be co-created, as pointed out by Schreieck et al.: "Including the complementors and end-users into the analysis, will also allow to discuss a bottom-up approach in the design and governance instead of interpreting it as a top-down approach only" (2016). By leveraging CSCW research on work practices, we increase the chance of influencing the design and evolution of governance models. We have argued elsewhere (Paper submitted to ECSCW 2019) how governance models can be co-created by using IT-based *boundary resources* that platform owners implement in order to enable interactions with their platforms (Ghazawneh & Henfridsson, 2013). The model of platform boundary resources can be useful for CSCW research because of several reasons. First, as shown in the literature, e.g. (Eaton, Elaluf-Calderwood, Sorensen, & Yoo, 2015; Islind, Lindroth, Snis, & Sørensen, 2016), it gives us an analytical tool to connect digital workplace studies to the study of platform governance models. In this way, it creates a bridge for dialog and a point of impact for CSCW. Second, CSCW researchers are already familiar with the concept of boundary resources (Leigh Star, 2010). This knowledge can be used to make efficient use of the model and create better and fairer platform designs.

Discussion

In this paper, I have aimed to demonstrate how digital labor platforms build on the notion of collaboration as commodity, and how platform governance models are used to simplify, standardize, package and trade collaboration as commodities in a marketplace. I have argued that CSCW needs to reconsider its impact on how these platforms are developed. CSCW research on digital labor platforms, in order to have lasting impact, needs to construct new, viable –bottom-up-driven – alternatives to existing platform governance models. This implies addressing several research questions that I aim to emphasize in this discussion section.

In dealing with the emerging landscape of digital labor platforms, CSCW researchers have done what they are good at, i.e., studying how people use these digital tools to cooperate. Digital workplace studies have provided us with crucial knowledge about users’ interactions with, and opinions of, platforms. Although such digital workplace studies are important, CSCW researchers also need to focus on the whole ecosystem of stakeholders and not only workers. Finding a balance between the values held by workers, consumers and platform owners can result in increased impact. This impact is sorely needed in order to redirect the development of platforms and include more of the needs and preferences of the users.

A fundamental first research stream is needed in order to understand the consequences of packaging and decontextualizing collaboration. At the core of CSCW is the fact that collaboration is local and contextual (Suchman, 1987). The research question is “What are the consequences of packaging and decontextualization of labor for workers and consumers?” We already see emerging research looking into the challenges that simplification of labor introduces both for workers, in terms of workplace quality, and for consumers, in terms of the quality of the results they get (Kittur et al., 2013). It is important to demonstrate through research how workers and consumers are affected –positively or negatively by platforms.

Second, we need to look at how commoditization activities –subsidizing, increasing multihoming costs, etc., as discussed above –impact collaboration and its results. Our well-established theories about IT-based collaboration might be affected by the fact that a new –and strong –agent, i.e. the platform owner, has entered the stage and is willing to impose changes on how we collaborate. An important research question might then be: “How do platform owners and their governance models affect collaboration among consumers and workers? And what is the impact on the quality of the results?” Several referenced studies in this paper try to answer this question. We need to further look into what commoditization of collaboration means, i.e., when buying and selling collaboration becomes the main focus –instead of how collaboration is done –how will that affect our research? A research stream might be to investigate: “What is the perceived business value of collaboration for its beneficiaries?”

Third, we need to start addressing a new set of research questions regarding the collaboration between platform owners and platform users. We already know something from existing research about the nature of this collaboration. But in general, most CSCW research is about users only, as most IS research is about platform owners only. We need to continue generating more knowledge in order to be able to address the research question: “How does the collaboration between platform owners and platform users happen? What are the underlying values for each collaborating party? And how can the goals of this type of collaboration be achieved?” Moreover, we need to know how this collaboration can be supported digitally. Therefore, another research question for CSCW should be: “How do we make collaboration happen between platform owners and users? What arenas – digital or offline –do we need for this type of collaboration?” One particular area in need of research is how we can replace off-line arenas for discussing working conditions and wages with online arenas, as noted by Glöss et al.: " [Amazon Mechanical Turk] and Airbnb return labour issues to relevance, since the apps are involved in payment income, rates, productivity and conditions of the work being completed through them" (Glöss et al., 2016).

A more fundamental question in my view is related to platform governance models. As CSCW researchers, we need to know more about these models and find ways of influencing them with our knowledge. Our knowledge needs to be combined with other types of knowledge from management, economics, market regulation, labor unions, etc. A better workplace for workers cannot be created if it is not economically viable for the platform owner, if it is not manageable, or if it is not regulated by laws. So, the research question to address is: “How can CSCW researchers, together with researchers from other disciplines, help co-create digital labor platform governance models that are fair?”

Conclusions

In this paper, I have discussed the role of CSCW in the landscape of digital labor platforms. My argument has been that CSCW needs to pay more attention to the underlying governance models of these platforms. I have argued that we need to have new models and tools that allow us to co-create these governance models. I use the model of Platform boundary resources as an example of how such co-creation can be done practically².

Our future research in this direction includes a thorough analysis of existing CSCW and HCI research with the lenses of governance models. One goal is to construct design guidelines for boundary resources based on our knowledge

² See also our case study of small-scale platform co-creation, to be presented at ECSCW 2019: Farshchian, B.A., Thomassen, H.E. (2019 forthcoming): *Co-creating platform governance models using boundary resources: A case study from dementia care services*.

contained in workplace studies. Such guidelines can be used as a tool for dialog among the different stakeholders in the digital labor ecosystems.

Confronted with the global reach and market size of some of the largest global labor platforms, it is easy to doubt that our research can have an impact on platform governance models. My view is that CSCW has a lot to offer and can act as a force for creating alternative realities in the field of platform governance models. Such alternative realities have a big chance of being both fair and sustainable at the same time, and in this way create our future global labor platform models.

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