

Organizing Work on Creative Crowdwork Platforms: A Practice Perspective

Gol, Elham Shafiei

Copenhagen Business School, Copenhagen, Denmark, esg.digi@cbs.dk

ABSTRACT. The world of work is changing fast with the increasing popularity of platform-mediated work. Despite platform workers being the fastest growing segment in the alternative workforce, there is little known about how work is organized on gig economy platforms that operate under conditions of employment, scheduling and location flexibility. This paper explores how work is organized on crowdwork platforms with Topcoder serving as a case of a successful platform. Our findings demonstrate that professional socialization and career development are the main practices that organize employment relationship flexibility; time, budget, and task management are the main practices that organize scheduling flexibility; and virtual communication and cultivating work friendships are the main practices that organize location flexibility. Furthermore, we find that the combination of these practices can generate psychological safety for both workers and job providers, despite the usual risks involved in the gig and crowdwork arrangements.

Keywords: future of work, crowdwork, digital work, new forms of organizing, gig economy, psychological safety.

INTRODUCTION

Organization and design of work have been on the agenda of IS scholars since the 1950's Tavistock studies that advocated for the joint optimization of the social and technical sub-systems at work (Trist and Bamforth, 1951). Since then we have learned quite a lot about how traditional work is organized (Hackman,

1980; Spreitzer et al., 2017; Winter et al., 2014). However, the world of work is changing rapidly with the proliferation of advanced information technologies (Barley et al., 2017; Forman et al., 2014). One key area of change is the increasing popularity of platform-mediated work, otherwise also known as crowdwork and the gig economy (Mulcahy, 2016). Platform-mediated work is the fastest growing segment in the alternative workforce (Katz and Krueger, 2019), and research on the topic is flourishing (Ashford et al., 2018; Kuhn and Maleki, 2017; Petriglieri et al., 2019).

So far, much effort has gone into understanding the workers, for example their identities (Bellesia et al., 2018; Petriglieri et al., 2019), their behaviors and capabilities (Ashford et al., 2018; Daniel et al., 2018; Kuhn and Galloway, 2019), as well as the algorithmic management of workers on platforms (Wood et al., 2019). However, there is little discussion beyond anecdotal evidence as how work is organized and practiced on a daily basis on these platforms. We address this void by offering an empirical examination of paid, online crowdwork as a new model of work arrangement organized via online platforms such as Amazon Mechanical Turk (AMT), Crowdfunder, Upwork and Topcoder (Kittur et al., 2013).

Crowdworking is growing fast through connecting workers and job providers instantaneously across the world and different time zones as well as providing self-employment opportunity and an increasing sense of autonomy for workers (Spreitzer et al., 2017; Gol et al., 2018). Crowdworking helps job providers to harvest knowledge, skills, and innovation from an extensive and anonymous crowd in a flexible and cost-effective manner (Tate et al., 2017; Gol et al., 2019). Broadly, there are two types of crowdwork projects: those involving routine and micro tasks, which are usually repetitive with low level of skill necessity, minimal payment and very short time frames (e.g., tagging pictures) (Deng et al., 2016); and those involving more creative, complex, professional, and long-term tasks such as graphic design and web development with higher payment for workers (Margaryan, 2016; Gol et al., 2018). In this paper, we focus on the latter, which we call creative crowdwork, as it requires elaborated information processing activities such as data collection, task design, ideation, solution finding, and teamwork (Thuan et al., 2015) and, thus, also requires intricate organization that can handle the inherent socio-technical complexity.

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So far, most of the research on crowdwork has focused on the macro and meso perspectives, including studying labor market conditions in the gig economy (De Stefano, 2016), and the perspectives of workers, platform owners, and job providers, especially on routine platforms like AMT (Brabham, 2010; Kittur et al., 2013; Deng et al., 2016; Gol et al., 2019). We know how crowdwork platforms are governed via control and coordination mechanisms under different degrees of governance centralization and work routinization (Gol et al., 2019). In addition, the few studies from the micro perspective focus on issues such as job crafting (Tims and Bakker, 2010) and redesign of work (Deng and Joshi, 2013) where workers try to revise the social environment and work meaning to improve their job conditions. However, we do not know how the structures of work organization are formed and shaped through the combined practices of workers, platform owner(s), and job providers.

In general, crowdwork, as a platform-mediated type of work, offers flexibility in three dimensions: (a) flexibility in the employment relationship, (b) flexibility in the scheduling of work, and (c) flexibility in where work is accomplished (Spreitzer et al., 2017, p. 1). This enhanced flexibility is attractive to job providers because it provides economic benefits, which in turn, motivate them to hire more contract workers rather than full-time workers (Davis, 2016; Bidwell, 2009). For instance, in 2015, 9.7 million workers from more than 180 countries had registered to perform different tasks for 4 million job providers on crowdworking platforms (Boudreau et al., 2015). At the same time, such flexibility is difficult to manage, especially in creative crowdwork with its various complex projects (Thuan et al., 2015).

As the number of crowdworkers is growing fast (Spreitzer et al., 2017), research is needed to understand how work organization is achieved through the interweaving and combined practices of platform owner, job providers, and workers. Accordingly, this paper poses the following research question: *how is work organized on creative crowdwork platforms?* Building on the practice perspective (Whittington, 2003; Nicolini, 2012), we explore how work is organized and conducted in platform mediated contracting gig work (Spreitzer et al., 2017) that relies heavily on flexibility.

Subsequently, we use Topcoder as a case company to study the underlying phenomenon. Topcoder (founded in 2001) is a well-known and very successful creative crowdwork platform which acts as an intermediary between job providers and highly skilled computer programmers and designers. Our findings demonstrate that professional socialization and career development are the main practices that organize employment relationship flexibility; time, budget, and task management are the main practices that organize scheduling flexibility; and virtual communication as well as cultivating work friendships are the main practices that organize location flexibility. Interestingly, our findings show that, *together*, these practices can generate psychological safety for everyone involved, despite the usual risks involved in the gig and crowdwork arrangements for both workers and job providers (Gol et al., 2018).

The remainder of this paper is organized as follows: First, we articulate the theoretical foundations of this study by presenting the practice perspective for examining work and the concepts of creative crowdwork and flexibility as the focal points of our investigation. Next, we outline the research design, consisting of data collection and analysis methods, followed by the findings. Finally, we discuss the practical and theoretical implications of this research.

THEORETICAL BACKGROUND

Studying work (Barley and Kunda, 2001) plays an important role in Information Systems (IS) and associated fields. The main characteristic in studying work is to examine work from the perspective of those who accomplish it in order to “systematically investigate the concrete activities that constitute the routines of organizing” (Barley and Kunda, 2001, p. 84). Practice perspective involves a set of frameworks and ideas to investigate real activities and their emerging consequences instead of abstract entities (Stein et al., 2015). The practice notion implies close attention to the work done by people inside organizational processes (Whittington, 2003, p. 2).

The practice notion is explained in multiple ways, but a mutual thread is a comprehension of the skill through which individuals work with the existing resources in their everyday life (Whittington, 2003).

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Interpreted for the purpose of the study of work, practice perspective tends to investigate the “doing” of work (*working*), instead of such abstract subjects as “work role” or “my job”, which are seen to emerge from the doing of work. Specifically, “*practices perform meaning and support identity, so that the question of what people and things are depends upon the practices in which they are involved*” (Nicolini, 2007, p. 893).

From this perspective, work organization as “*the way work is structured, distributed, processed and supervised*” (Carayon and Smith, 2000, p. 1) is achieved through concrete practices of e.g., work scheduling (e.g. setting work hours, break- and other time schedules), work design (e.g. matching required skills to task complexity), work relationship development (e.g. relationships with colleagues or boss), management of teamwork, career advancement (e.g. creating development opportunities), and established organizational ways of doing things (e.g. communication and culture) (Carayon and Smith, 2000).

Flexibility is a significant factor that distinguishes crowdwork from traditional work as it enables workers to have control over how, when and where the work is performed (Spreitzer et al., 2017; Gol et al., 2019). According to Spreitzer et al. (2017), there are three dimensions of flexibility in alternative work arrangements such as crowdwork. The first dimension is *flexibility in employment relationship*, which refers to short-term work assignments. Contract workers (incl. crowdworkers) are usually employed to perform a short-term project related to their knowledge and skills (Spreitzer et al., 2017). Instead of a guaranteed monthly salary, they are compensated per hour or on a project basis that a job provider has specified in a contract (Gol et al., 2018). High-skilled crowdworkers are often referred to as freelancers who are able to perform complex projects on creative or open innovation platforms such as Upwork, Topcoder or Innocentive. This includes, for instance, writers, engineers, film producers or software developers. The second dimension is *flexibility in scheduling of work* which refers to workers having control over working hours (Spreitzer et al., 2017).

Crowdworkers usually have substantial schedule flexibility, specifically in relation to when they decide to apply for a new project. For instance, many high-skilled crowdworkers take time off after a big project

and before starting a new one. Having control over the timing of work and breaks has significant positive implications for recovery from work exhaustion (Spreitzer et al., 2017). The third dimension is *flexibility in the location of work* which refers to having control over choosing the place of doing a job (incl. away from the job provider or employer) (Spreitzer et al., 2017; Gol et al., 2018). Platform-mediated contracting, such as in creative crowdwork, involves all three flexibility dimensions. Yet, most of the research regarding the flexibility in scheduling and location has been accomplished exclusively on full-time employees with little attention to whether and how the results may apply to contract workers who operate under more risky employment conditions (Spreitzer et al., 2017).

The organization of work under these three dimensions of flexibility is an interesting challenge because it becomes necessary to organize work in a way that reinforces and, at the same time, manages these dimensions of flexibility. Based on the practice perspective, we assume that work organization is not achieved just by the actions of the platform owner(s), but also the everyday activities of the workers themselves and the job providers. Therefore, in order to understand how to organize work under conditions of the flexible employment relationship, flexible schedule, and flexible location, we need to study how the platform owner, job providers and workers all perform certain activities, which together make work under these flexible dimensions possible. Thus, this paper aims to investigate how work is organized through the combined practices of platform owners, workers, and job providers under the three dimensions of flexibility.

RESEARCH DESIGN

Given our interest in how work is organized in practice on creative crowdwork platforms, we used a case study approach that allowed us to gain a comprehensive and profound view of this emerging phenomenon (Eisenhardt, 1989; Walsham, 1995). According to Eisenhardt (1989), the case study approach is useful if *“little is known about a phenomenon, current perspectives seem inadequate because they have little empirical substantiation, or they conflict with each other or common sense”* (p. 548).

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Thus, as crowdworking is still in early stages of development and organizing platform mediated gig work is still unexplored, especially when it comes to more complex creative work, the case study approach offers a suitable research method for the present study. This study was accomplished on the Topcoder platform which is a well-known and successful creative crowdwork platform and partners with important agencies, crowdsourcing ecosystem corporations, and consultancies across the world such as TC3¹ and Appirio².

There are around 100 companies and enterprises such as Google, IBM, and NASA that rely on Topcoder for having access to hard-to-find skills³. The platform included 1.2 million high-skilled freelancers in December 2017, and this figure is reportedly growing by a rate of 50,000 computer engineers in each quarter (Talley, 2017). Topcoder runs online software design competitions (such as idea generation, application and web design, concept and icon design), software development competitions (such as Bug Bash, which refers to challenges that fix bugs in specified software products; First to Finish, which refers to rapid software development, quality assurance with focus on testing the software products, and UI prototype which refers to front-end development), data science competitions (such as data visualization and data science ideation), and competitive programming events (based on Topcoder website and Archak, 2010).

Data Collection

With the aim to explore how work is organized on creative crowdwork platforms, we were interested to study the dynamics among workers, platform owners and job providers which make the three dimensions of flexibility possible. Therefore, data were collected through 42 open-ended and semi-structured Skype interviews with Topcoder staff, workers and job providers, that were conducted from February to

¹ TC3 is a Japanese company with a focus on the Japanese market. TC3 team are knowledgeable in crowdsourcing and open innovations.

² Appirio is an American company with a focus on the design and development of next-generation worker and client experiences using crowd, cloud and solution accelerators.

³ Information retrieved from <https://www.topcoder.com>.

September 2018. Each interview lasted between 40 to 50 minutes. Furthermore, data were collected from Topcoder's forums, their Slack community channel (used by workers and staff), and the platform website.

The interviews were conducted with workers with a focus on two groups: experts (including co-pilots and reviewers) and competitors (see Table 1), who were from different countries (e.g., Chile, Indonesia, Greece, India). In addition, we did interviews with platform staff and used secondary data in the form of short interviews with platform staff provided on Topcoder website. The staff had different roles on the platform (e.g., project manager, community manager, creative director, product designer). Further, we also performed interviews with a few job providers. Finally, we observed and studied the communications and interactions among workers, staff, and job providers on different public Slack channels and Topcoder forums.

The anonymity of job providers and workers on Topcoder posed some limitations in our data collection. We used LinkedIn to find prospective interviewees where many workers specify their contributions on Topcoder on their profiles. We continued this research and employed snowball sampling and used recommendations of prior interviewees to reach out to workers with various attitudes and genders. Detailed information related to the interviewees is presented in Table 1.

Table I. Overview of interviewees

Interviewee	Number of Interviews	Roles	Areas of Expertise
Category			
Worker	23 [P1...P23]	Competitor, Co-pilot, Reviewer	Development, Design and data science, Programming
Staff	16 [P24... P39]	Project manager, Community manager, Product design, Information architect, Software architect, Platform architect, Creative director, Event organizer	Development, Community, Design and data science, Programming

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Job provider	3 [P40... P42]	Private company hiring workers through Topcoder	Software design and development, UI prototype
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Data Analysis

All interviews were recorded and transcribed. To ensure that nonverbal aspects were considered as well, we took notes throughout the interviews. Field observation notes were taken during observing the interactions and communications among workers, staff and job providers on public Slack channels and online forums. We conducted iterative coding of the interviews, online data, and observation notes, primarily using open coding and further by classifying and revising the codes according to both data and theory. We coded for the three dimensions of flexibility, as recommended both by the literature and the data exploration.

We then focused on identifying the practices that helped reinforce and manage these three dimensions of flexibility, such as professional socialization, career development, time management, budget management, task management, virtual communication, and workplace friendship as shown in Table 2. We assembled the codes based on different dimensions of flexibility to identify the most effective way of organizing our findings. This process helped us to explore and document the specific practices done by workers, job provider and platform owner and their interweaving.

Table II. Analysis process

Theme	Codes	Identified Practices
Employment	e.g., Contract, employment, part-time, full-time, feel free,	Professional socialization
relationship flexibility	control, rule, learn, support, community, beginner, competitor, novice.	
	e.g., Role, copilot, reviewer, experienced worker, promotion, grow, skill, feedback, win.	Career development

Scheduling flexibility	e.g., Time, schedule, control, night, day, break, travel, part-time, full-time, submission.	Time management
	e.g., Project, price, monetization, budget, award, financial issue.	Budget management
	e.g., Challenge, complex, task, design, divide, small task, coordination.	Task management
Location flexibility	e.g., Time zone, control, place, location, country, home, remote, copilot, reviewer, project manager, client, worker, competitor, communicate, discussion, consult, issue.	Virtual communications
	e.g., Relationship, talk, chat, friend, lonely, alone, solitary.	Workplace friendship

FINDINGS

In this section, building on the data analysis, we describe the key practices involved in shaping and managing flexibility in employment relationship, scheduling, and location of work on a creative crowdwork platform based on the case of Topcoder.

Flexibility in Employment Relationship

Flexibility in employment relationship refers to the temporary contract between an employee and a job provider. Flexibility in employment relationship plays a key role in the business model of crowdworking platforms that virtually broker between highly-skilled freelancers and interested job providers. On many crowdwork platforms (e.g. AMT and Upwork), workers report feeling marginalized and powerless due to lack of official employment status (Deng et al., 2016). Interestingly, we find that most of the workers on Topcoder were satisfied to be self-employed (Gol et al., 2018).

We found that a considerable number of workers on Topcoder left their traditional jobs and became contract workers on Topcoder because they preferred a more flexible work arrangement, as portrayed by

the following statements: “*Want to be free? Join Topcoder*” [P16]; “*I work as a freelance programmer and have the luxury of choosing which jobs I take. I usually pick those that I find interesting*” [P11]. This led us to investigate further how the flexibility in employment relationship is formed and managed in practice. We found that professional socialization and career development are the main practices that shape employment relationship flexibility on Topcoder.

Professional socialization. As crowdworkers do not work for one specific organization (instead they flexibly move between short-term employment contracts mediated by Topcoder), there is little traditional organizational socialization (Van Maanen, 1977) that helps workers find a place where they belong and a supportive environment. However, while crowdwork provides freedom from the iron cage of traditional employment, freelancers still yearn for a place to belong and a supportive environment (Petriglieri et al., 2019).

We find that in Topcoder this is achieved through the practice of professional socialization, which reinforces the values and norms of flexible employment, but manages the balance between the flexibility (and uncertainty) that comes from short-term contracting and the stability that comes from long-term professional networks. Professional socialization is defined as *the process of internalizing and developing professional identity through the acquisition of knowledge, skills, attitudes, beliefs, values, norms, and ethical standards in order to fulfill a professional role*” (Dinmohammadi, et al., 2013, p.1). Topcoder contributes to professional socialization in different ways, such as Topcoder blog, forums, help articles, learning competitions, and information which are available on their website for new competitors.

First, Topcoder runs learning competitions for beginners, as described by one of its employees: “*We run to learn and practice challenges on Topcoder, they don’t award you any money, but they help you learn about the technology*” [P28]. Second, Slack channels are provided for both novices and experts to ask questions; and different channels exist for design, development, data science and other areas of professional expertise [P2...P5, P7, P9...P12, P17...P20].

These channels, while maintained by Topcoder, allow workers to help each other to develop their professional knowledge and skills through discussion and tip sharing, as highlighted in the following quotes: *“I think Topcoder is the community of really talented people. I remember that I immensely enjoyed reading posts on Round Tables (Topcoder forums). I think one of the keys to success is listening to your community”* [P15]; *“Topcoder community brings many of the world’s best talent together in one place to compete, collaborate and learn from one another. While competition is core to everything we do, it’s our collaborative community atmosphere that makes Topcoder special. We compete together to make us all better practitioners of the technology we love; that is how Topcoder motivates me”* [P2].

Third, Topcoder has explicitly assigned employees for managing the community channels to keep them up to date and for paying attention to workers’ requirements, as explained by a senior community evangelist: *“My job is interacting with the community members personally and getting to know them: what they are doing, where they are facing issues...”* [P24]. He added: *“I am learning every day to become better (at least, I hope so) and keep the community happy and make the members more productive. The most challenging thing is to try and take everyone’s opinions and ideas into account. Sometimes there are members with different viewpoints. So, I try and interact with the community more and more to know what they need and how I can help them out”* [P24].

In sum, it is clear that the practice of professional socialization relies on the daily efforts of both the workers and the platform owner. The platform owner provides and manages the infrastructure (e.g. virtual channels, blog, forums) and creates an attractive supportive environment (through assigned community evangelists) that motivate workers to join the community and help each other. The workers, then, reinforce the community atmosphere that brings together top freelance technical talent to become even better practitioners that have the luxury to pick and choose the jobs they want (Spreitzer et al., 2017).

Career development. Another considerable challenge that burgeons from the gig working where crowdworkers do not belong to one specific organization is lack of promotion opportunities within their

workplace (Spreitzer et al., 2017). While crowdworkers have higher autonomy and free choice in contrast with traditional employees, they bare personal responsibility to remain employable and competitive and must deal with less formal rights and more uncertainty in contrast with traditional workers (Lo Presti et al., 2018). Therefore, they yearn to have growth opportunities that motivate them intrinsically to keep working as freelancers on crowdworking platforms (Gol et al., 2018). We detect that in Topcoder this is achieved through the practice of career development, which augments the values and norms of flexible employment by managing the balance between the boundaryless career (Briscoe et al., 2006) and the traditional career path.

The boundaryless career refers to *“both objective and subjective dimensions of career at multiple levels of analysis, including organizational position, mobility, flexibility, the work environment, and the opportunity structure while at the same time de-emphasizing reliance on organizational promotions and career paths”* (Briscoe et al., 2006, p. 2). Topcoder contributes to career development through different ways such as providing promotion opportunities as well as self-driven skill growing opportunities.

First, we observed that freelance workers who acquire a substantial number of “wins” in Topcoder are often offered something akin to a traditional promotion opportunity and can become “copilots” or “reviewers” within the platform. The copilot has the responsibility to run challenges on the platform, including communicating with the job providers, designing job specifications, and responding to the workers’ questions, as explained by one Topcoder manager: *“basically one of those members who has worked on many challenges and has a knack for writing specifications, clearly understanding what is part of a challenge, we tend to promote him as a copilot”* [P27]. Meanwhile, the reviewer role includes assessing workers’ submissions and selecting the winners of a challenge: *“you as a member become a reviewer, if you have the skill set of reviewing challenges and if I have done challenges in required technologies 50-55 times”* [P29].

Further, self-driven skill growing opportunity is provided for workers through receiving feedback from reviewers in each challenge to give them a chance to distinguish their weaknesses and reasons for their

failure and try to improve their skills and grow in their career, as highlighted in the following quotes: “I was able to submit; it wasn’t the best submission, but I will learn (from receiving feedback) why and next time my submission will be better and perhaps I’ll begin succeeding” [P2]; “It’s easy to design something that “looks cool”, but it’s something totally different than designing something that solves a problem. This is something that comes with experience and feedback” [P10].

Topcoder has explicitly assigned employees for managing the copilots and reviewers to control the quality of their work, as explained by an architect manager: “If copilots don’t have a passing submission, they don’t get paid. It’s rare. Typically, what that means is they run the challenge and they put more money, or they make the duration longer. Probably the one thing you don’t know that we do a lot is we do private tasks in private challenges that sometimes the copilots do themselves, sometimes other members do, sometimes we give the copilot the ability. Sometimes the copilot will do that and feel like that is part of their copilot payment, sometimes it will be something bigger and we will offer to pay them for that specific task, where sometimes we will give them the option to have another member do it as a specific task and give them the ability to pay directly” [P26] and following that, one of the copilots mentioned: “If I don’t manage to complete the project... I’m not sure because it never happened to me. But if you fail to run a project, you won’t get another one” [P4].

Thus, the practice of career development, similarly to professional socialization relies on the daily efforts of both the workers and the platform owner. The platform owner provides the promotion roles (e.g. copilots and reviewers) and manages these roles (e.g. through assigned project managers) to keep the quality of work high. The workers who got a promotion, then, through assessing the participants’ submissions, provide them feedback to help them grow their skills and increase their chance to win the competitions and get a promotion within the platform.

Flexibility in Scheduling of Work

Flexibility in scheduling of work refers to the control that workers have over their working hours and the schedule of work. Flexibility in scheduling and control over workload are among the key benefits of gig working (Zheng et al., 2011). Abandoning the traditional 9-5 workday model on crowdwork platforms (Nansen et al., 2010) makes crowdworkers satisfied through increasing the sense of autonomy (Gol et al., 2018). We found that a substantial number of workers on Topcoder were pleased to have control over their work time as highlighted by the following statements: *“I’m my manager. I have control over my time. I am able to choose working in the day or the night or during vacations”* [P7]; *“These were the times when I spent most of my free time with programming competitions. It may sound weird, I admit, a guy spends 8 hours of work with computers and does the same during commuting and also in his leisure time”* [P11].

Although it is known that the flexibility in scheduling can increase the satisfaction of workers, it is not clear how such flexibility is shaped and managed to avoid burnout and exhaustion. This led us to investigate further how the flexibility in scheduling is formed and managed in practice. We found that in Topcoder it is accomplished through a combination of practices of **time management, budget management, and task management**. Together, these practices balance the values and norms of flexible scheduling (Halpern, 2005) with the clarity and predictability that comes from traditional work scheduling.

Time management is the process of scheduling and planning mindful control of time spent on specific activities, particularly to improve productivity, efficiency, and effectiveness (Cottrell, 2013). Budget management is a process of financial planning for a specified period including planned incomes, costs and expenses, assets, resource amounts, obligations and cash flows (based on Sullivan and Sheffrin, 2003), and task management refers to the management and organization of interdependencies among tasks (Kittur et al., 2013).

As crowdworkers do not work specific hours like traditional workers (Spreitzer et al., 2017), managing time is difficult on gig working platforms, especially when there are workers who have a full-time job “on the side”, as explained by one of the workers: *“that is a critical issue for me, and I guess for everyone who*

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has a full-time regular job and wants to compete. What I try to do is to improve the “usage quality” of my time when I am working in a marathon, i.e., avoid just sitting in front of the computer and watch it running thousands of tests (as I already did in the past when I had more free time). Now I usually have few (1–8) hours during the night to work (plus part of the weekends). During these hours, I try to implement the most promising ideas, in a more or less organized way, and schedule longer tests batches to run when I am sleeping, at work, etc. Another thing that I often do is to prepare different versions of my solution, so even without working on the problem, I can still make a few submissions when I am busy” [P12].

Topcoder contributes to time management through the practices associated with specific roles on the platform, such as project managers and copilots, who have the responsibility to design the work and run the challenges in an optimal way in terms of time, budget and task design. For instance, for the software development projects, the project manager decides which technologies and skills are required for the new project and which copilot is suitable and has enough skills to run the new challenge.

The copilots, as expert workers, usually decide about the budget, scheduling, and design of the challenge as one of them described: *“It should be you who estimates the costs and schedule, not the client. I never commit to a task before fully understanding what the scope is. It’s ok if some of the details are unclear but you should have a more or less correct understanding of what exactly you want to achieve and how” [P3].* The main tasks of copilots include discussions with job providers to understand their project and shape it in the way that would be possible to run on the crowdwork platform. In addition, writing the project specifications, designing the training phase, testing the solutions, creating the online scoring application, and generating a visualizer tool are other responsibilities of the copilots. For each challenge, Topcoder dedicates a new forum where the copilot is responsible for answering the questions of participants regarding the project.

In order to successfully complete a project on Topcoder, time, budget and task management are inextricably linked and performed in a coordinated manner for each project. The Topcoder team (e.g. project manager), with the help of copilots and in consultation with job providers, break down the project into

separate challenges. Once the separate challenges have been successfully completed, the Topcoder team then integrate the challenge solutions back together to produce an overall solution to the job provider's problem [P4, P7, P10, P12, P13]. For example, one of the job providers explained: *“Topcoder team said we're going to break this up. They said we will break this down into sections and we will focus on these sections for you and we will help manage these challenges and then we will make sure all of these things get done to your specifications. So, they broke that down, they said we should do a challenge for aggregation, we should do a challenge for design and we should do a challenge for the API”* [P41] and one of the copilots described *“I have to schedule and create a game in line with the budget and the deadline of the project”* [P4]. Therefore, it is essential to consider the task division, time and budget together to achieve optimal work organization for solving complex problems with the help of the crowd.

What makes the practices specific to the crowdwork setting is the importance of managing tasks, time and budget to be in line with the norms of flexible scheduling and gig working, as one of the projects managers emphasized: *“I design tasks in a way that developers in their free time might be able to work on it and get it done in 3 days”* [P25]. In addition, one of the copilots mentioned: *“The reality is that Topcoder members do work on challenges/tasks part-time and things do come up. It can be quite difficult to estimate the time required for a task before attempting to solve a certain problem”*[P11], and another one explained *“The role of a copilot can be hard in the sense that you have more responsibility; with a poorly designed task you can spoil the fun of many contestants and also waste the money of the client”* [P4]. Interestingly, one of the job providers emphasized: *“Topcoder is very good at process management. So they put everything out on a timeline and they say this is going to be achieved here, this is going to be achieved here and then if there are some issues they'll push it back but a general idea of where we need to be and when we need to be there. They are great at managing our challenges”* [P41].

In sum, the combination of the practices of time management, budget management, and task management relies on the specific daily efforts of three parties: workers, platform owner, and job providers. The platform owner supervises and manages the expert workers (e.g., copilots) as well as do consultations with job

providers. The expert workers, then, design challenges in terms of time, budget, and task division through collaboration with job providers and the platform owner.

Flexibility in Location of Work

Flexibility in location of work refers to the control that workers have over their working place. The ability to decide where to work is another key benefit of gig working that increases workers satisfaction through enhancing the sense of autonomy as well as reducing the work stress (Spreitzer et al., 2017; Gol et al., 2018). We found that a considerable number of workers on Topcoder were satisfied with doing remote works as highlighted by the following statements: “*I do my work at my home while I’m in a playroom with my children*” [P20] and another emphasized “*I like Topcoder as I can choose where I want to work from. I don’t have to be in the office*” [P3]. This led us to investigate further how the flexibility in location of work is formed and managed in practice. We found that virtual communication and cultivating workplace friendships are the main practices that organize location flexibility on Topcoder.

Virtual Communication. As crowdworkers do not work from a specific place with a determined time zone (instead they flexibly work from different countries across the world), as well as do not work for one specific organization, there is little traditional organizational communication, i.e., “*sending and receiving messages that create and maintain a system of consciously coordinated activities or forces of two or more people*” (Tompkins, 1984, pp. 662-663). However, while crowdwork provides freedom from the defined workplace, freelancers still feel necessary to have a place to conduct their business communication and collaboration with their partners during a project (based on Hong and Pavlou, 2013). Unsurprisingly, virtual communication is essential in this. What makes Topcoder’s case interesting is the sheer number of dedicated virtual communication opportunities (per task, per job provider, per topic) available for different stakeholders.

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First, virtual communication is facilitated between workers and Topcoder through digital forums. There is a dedicated forum per each challenge where workers can ask questions and receive answers from the copilot running the challenge: *“forums are about troubleshooting, specifications, and clarifying things what I need to build, what I need to add, technical stuff and that’s it”* [P5]. Questions are usually answered promptly but sometimes there is a delay when the client is unavailable: *“I can answer questions posed by competitors during weekends, in case the clients/PM are not available. As for competitors and reviewers, interacting with them is not much of a problem as they are quite active and prompt on forums. In short, distance is not a problem at Topcoder”* [P11]. In addition, there is a different channel for workers on Slack where they can talk and discuss issues with each other not limited to a specific challenge: *“The Slack channel of Topcoder is very active and that’s where I mostly communicate with other members”* [P10].

Second, virtual communication is facilitated between copilots, reviewers and project managers regarding the challenges. It is usually done through Slack channels. They talk about the details of the project, required technologies, problems and everything about the projects. A separate Slack channel is also created for each job provider and includes Topcoder staff, copilots, reviewers, and the job provider representative to discuss the project. As described by one of the copilots: *“we have many Slack channels. We have a community channel, we have a Topcoder internal channel. In most cases, we create a different Slack channel for each customer. E.g. we have an IBM/ Topcoder channel where we discuss all the details related to the IBM projects”* [P8]. One of the challenge architects in Topcoder further explained: *“I spend the first 30 minutes catching up on emails and Slack messages. Following that, I start working on projects I am assigned to, attending meetings with clients, communicating with copilots, and collaborating with other architects”* [P29].

The enormous scale of this virtual communication architecture makes the daily achievement of the work possible, but virtual communication is also essential in maintaining the distributed organization and for handling conflicts. For example, Topcoder project managers often have to solve problems that appear among the expert workers (e.g. copilots and reviewers) and job providers during the projects. They

communicate with the job provider and aim to solve potential problems related to technology, time, project requirements, and price. For instance, one project manager mentioned: *“I work between the client and copilot. Sometimes there are technical problems where the copilots tell us, ‘What clients are asking for is a bad idea and here’s why or that can’t be done with X. So, we communicate with the clients and try to find a good solution”* [P28] and also one of the copilots mentioned: *“It happened to me a couple of times when the client doesn’t respect the timeline. I had the challenge that it had to be run in 2 or 3 days, but the client disappeared suddenly. So, I called the project manager and complained about that, because the client had to pick the winner. In these situations, usually, project manager extends the timeline and calls the clients and talks to them”* [P5].

Maintaining the distributed organization is a particular challenge in crowdworking that needs ever more sophisticated means of virtual communication, as explained by a community manager: *“Personally I would say communication with the members is something that is particularly challenging, because when the community team needs our members to know a particular piece of information or an announcement, we place them all over in hopes that it reaches them (Social Media, Forums, Slack, etc.), although we still get messages like ‘We didn’t know this was happening’”. To become better at this, we will be incorporating a lot of these types of announcements on my dashboard page, which will be sure to reach all of our active members”* [P24].

Moreover, virtual communication does not eliminate the challenges arising from different time zones, as explained by one of the copilots: *“Topcoder copilots have a lot on their plate: from interacting with clients, updating admins about ongoing projects, to answering queries from competitors and reviewers. Coordination among all these stakeholders is an uphill task given the physical distance and different time zones”* [P6]. Therefore, workers and Topcoder staff along with the job providers need to manage these kinds of challenges through indicating regular times to check the announcements over the virtual channels and coordinating their activities across different time zones.

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In sum, the practice of virtual communication relies on the daily efforts of the workers, the platform owner, and the job providers. The platform owner provides and manages the infrastructure (e.g., Slack channels, and forums), steers the collaborations and discussions with the two other parties, and solves potential issues that arise during the project. The workers consult with job providers to specify their project requirements, both directly and through a platform representative (e.g., project manager). Finally, job providers attend to their own channel to answer the questions of expert workers and Topcoder staff regarding the project, express their opinions about the project processes and engaged in a consultation process with both parties.

Thus, virtual communication plays an important role in organizing work in creative crowdwork platforms where a lot of coordination and management is needed among people who work on complex projects. In platform mediated gig work, virtual communication is not just a practice of *interaction*, it becomes a practice of *placement*, maintaining the balance between the flexibility in the location of the workers and the specificity in the location of the work.

Cultivating Workplace Friendships. Another considerable challenge that belongs to the gig working platforms where crowdworkers do not work from a specific location with a unique time zone is social isolation (Spreitzer et al., 2017). While crowdworkers feel satisfied with having an ability to choose their workplace, the associated potential isolation from peers and colleagues is an oft-reported negative side effect that workers seek to overcome (Brabham, 2010). We find that in Topcoder this is achieved through the practice of cultivating workplace friendships, which reinforces the distributed nature of the workforce and manages the balance between task-oriented and personal interactions on the platform.

Workplace friendships include “*mutual commitment, trust, and shared values or interests among workers, in ways that go beyond mere acquaintanceship but that exclude romance*” (Berman et al., 2002, p. 1). Workplace friendship helps to decrease stress, improve communication, and assist workers and managers

perform their tasks (Berman et al., 2002). The virtual interaction and placement architecture of Topcoder (e.g., Slack channels, as described above) are essential in helping to cultivate workplace friendships.

We observed that Topcoder strives to establish a friendship-focused environment to overcome the solitary feeling among workers by providing a good infrastructure via its Slack channels and forums within the platform for workers to talk and have discussions with each other anytime, anywhere beyond the technical aspects, as one of the workers emphasized: *“I feel Topcoder is an extension of my family right now, because I talk to members and Topcoder managers every day. It is like a real office for me. I spend the whole day talking about the project, challenge, and it is just for fun. Actually, the best friends that I already have are from Topcoder. They are from India, Romania, France, Italy... around the world. When I got started, I really liked this communication, because I felt I’m part of something. The communication of Topcoder, especially with the new members, is really good”* [P4].

Another worker described *“I know many members in person. By the way that is a great part of the “Topcoder experience”, meeting awesome people from all over the world, I have a lot of friends now and we talk about everything there such as our interests, sports, games and many other things”* [P10]. Moreover, one of the expert workers explained how supportive members of the Topcoder community are and mentioned: *“I really enjoy being part of the community. It is amazing how helpful people are on the platform”* [P8].

In sum, the practice of cultivating workplace friendships relies on the regular efforts of both the workers and the platform owner. The platform owner provides and manages the infrastructure (e.g., virtual channels, and forums) and participates in the creation of a friendly environment through attending to personal chats with workers as well (e.g., personal chats between project managers and copilots that go beyond challenge or project-related discussions) that motivate workers to join these channels. The workers reinforce the friendly community atmosphere that helps overcome the solitary nature of freelance work (Spreitzer et al., 2017).

DISCUSSION

This study explored how work is organized in creative crowdwork platforms through the combined practices of workers, platform owner, and job providers to achieve and manage three dimensions of flexibility. Topcoder was investigated as an extreme case of creative crowdwork platforms that is (a) highly successful, (b) attracts both top technical talent and top job providers, and (c) stands out among crowdwork platforms with high rates of satisfaction among both workers and job providers. This study contributes to a better theoretical and practical understanding of how work is organized in crowdwork platforms by delineating how the combined practices of three key parties in the platform create these positive outcomes.

The identified practices include professional socialization and career development for successfully organizing flexible employment relationships; time management, budget management, and task management for successfully organizing flexible scheduling; and virtual communication as well as cultivating work friendships for successfully organizing location flexibility. We note that one interesting and significant emerging outcome of the combined practices is the social construction of *psychological safety* (see Figure 1).

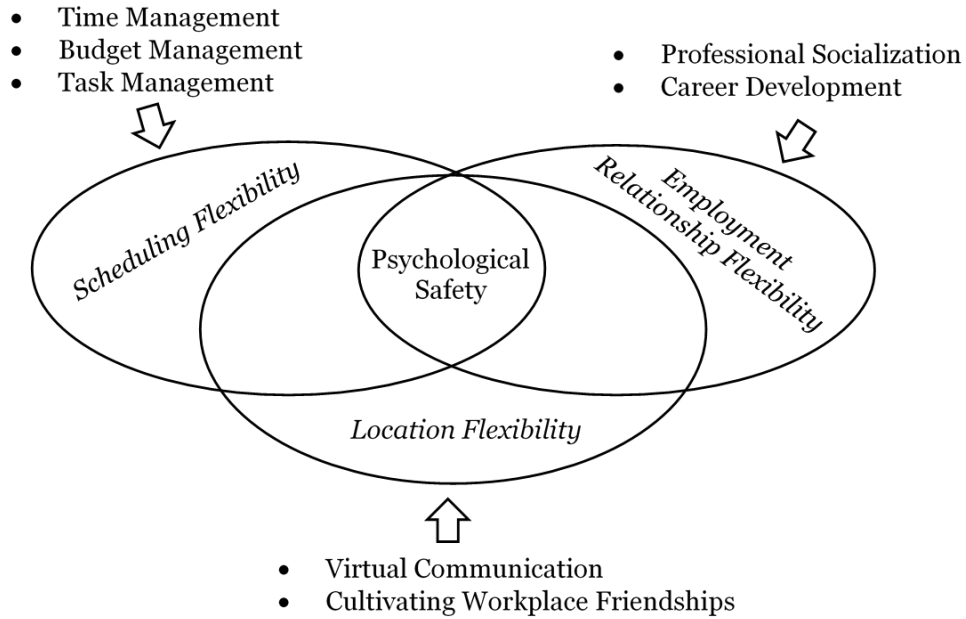


Figure 1. Work Organization for Psychological Safety Under Three Dimensions of Flexibility

Psychological safety (Edmondson, 1999) refers to the “individuals’ perceptions of the consequences of taking interpersonal risks in their work environment” (Kark and Carmeli, 2009, p. 787). When workers feel psychologically safe, despite the small chance of winning a competition on Topcoder, they have the ability to expose and employ themselves without concern of negative effect on self-image, position, or career (Kahn, 1990; Gol et al., 2018). As shown in Figure 1, psychological safety as an outcome is conceived through the combined practices of the three key stakeholders in the creative crowdwork platform.

For example, professional socialization and cultivating work friendships provide professional and personal learning opportunities for workers, supported by the extensive virtual communication practices and architecture. The involvement of the platform owner and job providers in many of these interactions bring all three parties closer together and ensures collective responsibility for not just the successful accomplishment of work projects but also the successful maintenance of the Topcoder spirit. As described by one worker: *“We have many practices regarding how to help each of our team members grow, as continuous improvement is one of our core values. I believe growth can happen when there is psychological*

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safety for each team member to admit their weaknesses and mistakes without fear of being laughed at or judged. We achieve it through trust, transparency, and regular constructive feedback” [P9].

In addition, time management, budget management, and task management interweave with virtual communication and career development to achieve sophisticated work organization that relies on platform owner, job provider and workers as well as is inherently designed to provide workers with growth and development opportunities. For example, the close collaboration between copilots and project managers, as well as the consultation process between copilots, project managers, and job providers ensures that the questions of workers are answered, the requirements of job providers taken into consideration and the ability of Topcoder to deliver results on the project guaranteed.

The combined practices of time, budget and task management not only improve psychological safety among workers, but also increase it in job providers as one of the companies articulated: *“this is actually the first project that we’ve worked with Topcoder, but I have to say it’s probably one of the best projects that I have worked on as far as process is concerned. This platform allowed us to actually build a product and work in a process that was five times faster than it would have been if we had done this internally. We had a big innovative idea, but we had to find a way to make it happen that didn’t take a decade. So, Topcoder was a great means to that end because we could engage these groups to help us build parts of this thing in a faster, more efficient way” [P40].*

Thus, psychological safety not only provides intrinsic motivation to workers to keep offering their services via the crowdworking platform despite potential lack of financial reward (Gol et al., 2018), but also motivates job providers to take the risk of using the crowdwork platform. In addition, the work organization that generates psychological safety also provides all parties with a feeling of trust in the process of work, despite the known challenges with trust under conditions of employment relationship, scheduling, and location flexibility.

From a practical perspective, this study can guide practitioners in the design of a successful creative crowdwork platform. While our study revealed the practices of organizing work for psychological safety

under the three dimensions of flexibility, work (re)design recommendations (e.g. task, relationship, and infrastructure design) can be derived from the identified practices. Our findings suggest three potential principles - task achievability, career significance, and relationship variety – to be explored in future research.

CONCLUSION

In this paper, we explored how work is organized in creative crowdwork platforms to achieve and manage three dimensions of flexibility through interweaving and combining practices of three parties (workers, platform owner, and job providers) by considering Topcoder as a successful case. We explored professional socialization and career development as the main practices to achieve and manage employment relationship flexibility; time management, budget management, and task management as the main practices to achieve and manage the scheduling flexibility; and virtual communication and cultivating work friendships as the main practices to achieve and manage the location flexibility. In addition, we found psychological safety for both workers and job providers as an important outcome of the interweaving of these practices.

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