ONLINE LABOUR EXCHANGES, OR 'CROWDSOURCING': IMPLICATIONS FOR OCCUPATIONAL SAFETY AND HEALTH

1 Introduction

Since the 1970s it has been recognised that the combination of information and communications technologies has the potential to enable the relocation of work involving the processing of digitised information. In the 1980s, attention focussed on 'teleworking', 'telecommuting' or 'networking' involving the relocation of work from a traditional office to the worker's home. In the 1990s, with the improvement of telecommunications infrastructure, the opening up of global trade in services and the increasing interoperability of different software packages, it became apparent that work could be shifted internationally, in a development that became known as 'offshore outsourcing'. The next decade saw a growth in such practices and the emergence of large international companies supplying telemediated services, increasingly using practices described as 'global sourcing', in which workers from different parts of the world could be brought together on a just-in-time to basis to deliver particular services, regardless of location. In the present decade, the economy has entered a new phase, in which not only have such developments reached critical mass, but entirely new forms of online work organisation have also become possible.

A bewildering new vocabulary has sprung up to characterise these forms. A by-no-means exhaustive list includes terms such as 'cloudsourcing'[1], 'human cloud'[2], 'crowdsourcing'[3], 'collaborative consumption'[4], 'sharing economy'[5], 'mesh economy'[6], 'digital labour'[7], 'virtual work'[8], 'prosumption'[9], 'co-creation'[10], 'workforce on demand'[11], 'peer-to-peer networking'[12] and 'playbour'[13]. Mostly lacking clear definitions, these terms refer to related, but not necessarily identical, concepts, highlighting various features of the new, rapidly-evolving, online environment which is shaping and reshaping more and more aspects of contemporary labour.

Whilst there is a large and diverse literature discussing these developments, it is extremely patchy. At one extreme are theoretical articles debating whether new forms of online activity can be classified as 'labour' and whether the distinction between work and leisure has become redundant[14]. At the other are

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[1] Vaquero, L.M., Rodero-Merino, L., Caceres, J., & Lindner, M, 'A break in the clouds: towards a cloud definition', ACM SIGCOMM Computer Communication Review, 2008. 39(1): 50-55; Muhic, M., Johansson, B. (2014) 'Cloud Sourcing – Next Generation Outsourcing?' *Procedia Technology, 16*:553-561.

[2] Kaganer, E., Carmel E., Hirschheim, R. & Olsen, T. (2012) 'Managing the Human Cloud', MIT Sloan Management Review, December 18.

[3] Howe, J Robinson, M. (2005) 'The Rise of Crowdsourcing', *Wired, Issue 14.06,* June; Estellés-Arolas, E., González-Ladrón-de-Guevara, F. (2012), 'Towards an Integrated Crowdsourcing Definition', *Journal of Information Science,* 38 (2).

[4] Botsman, R., Rogers, R. *What's Mine Is Yours: The Rise of Collaborative Consumption.* New York: Harper Business, 2010.

[5] Benkler, Y. (2004). 'Sharing Nicely: On Shareable goods and the emergence of sharing as a modality of economic production'. 114 *The Yale Law Journal*, 273

[6] Gansky, L. (2010). *The Mesh: Why the Future of Business is Sharing*. Portfolio.

[7] Scholz, T. (2011). 'Facebook as playground and factory'. In Facebook and philosophy, ed. D. E. Wittkower, 241-252. Chicago: Open Court; Burston, J., Dyer-Witheford, N & Hearn, A. (2010) 'Digital Labour: Workers, Authors, Citizens', *Ephemera,* i0 (3/4).

[8] Huws, U. (2003) *The Making of a Cybertariat: Virtual Work in a Real World,* New York: Monthly Review Press.

[9] Toffler, A. (1980) *The Third Wave,* Bantam Books; Ritzer, G. & Jurgenson, N., 2010. 'Production, Consumption, Prosumption', *Journal of Consumer Culture,* 10(1), pp.13 -36

[10] Prahalad, C.K & Ramaswamy, V. (2000) 'Co-Opting Customer Competence'. *Harvard Business Review*, January/February; Banks, J. and Humphreys. S., (2008), 'The Labor of User Co-creators', *Convergence,* 14 (4): 401-418.

[11] Onforce. *Workforce as a Service,* http://www.onforce.com/features

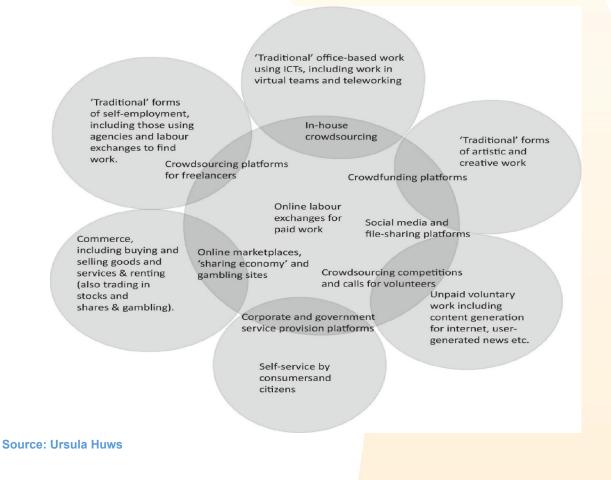[12] Bauwens, M. (2006), 'The Political Economy of Peer Production', *Ctheory.Net,* available at: http://www.ctheory.net/articles.aspx?id=499.

[13] Kücklich, J. (2005) 'Precarious Playbour: Modders and the Digital Games Industry', *The Fibreculture Journal,* Issue 5.

[14] See, for instance, M. Andrejevic, "Exploiting YouTube: Contradictions of User-Generated Labor," in The YouTube Reader, ed. P. Snickers and P. Vonderau (Stockholm: National Library of Sweden, 2009); A. Arvidsson and E. Colleoni, "Value in Informational Capitalism and on the Internet," The Information Society 28/3 (2012): 135–50; J. Banks and S. Humphreys, "The Labor of User Co-Creators," Convergence 14/4 (2008): 401–18; C. Fuchs, "Labor in Informational Capitalism and on the Internet," The Information Society 26/3 (2010): 179–96; C. Fuchs, "With or Without Marx? With or Without Capitalism? A Rejoinder to Adam Arvidsson and Eleanor Colleoni," Triple C 10/2 (2012): 633–45; D. Hesmondhalgh, "User-Generated Content, Free Labor and the Cultural Industries," Ephemera 10/3–4 (2011): 267–84; A. Ross, "On the Digital Labor Question," in The Internet as

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journalistic articles extolling the virtues of the sharing economy, or, conversely, drawing attention to its dangers. There is also a scattering of scholarly material in which these phenomena are analysed through a variety of academic lenses in the fields, inter alia of organisational studies, economics, geography, labour sociology, psychology, industrial relations, communications studies and development studies. Empirical studies, qualitative or quantitative, are scarce, with the trade press, consultants' reports and anecdotal evidence providing the main sources of up-to-date information[15]. It is clear, however, that, whatever contending interpretations may be put forward, there is a general consensus that profound changes are currently taking place in the organisation of work, enabled by digitisation.

This emerging picture can best be understood, not as a sudden transformation but as the evolution of a number of disparate trends, originating in different parts of the global economy, which have converged to generate a new reality. This new reality is still in formation, with many features still at an experimental stage. Nevertheless its scale is now such that the cumulative impacts on labour are beginning to be visible.

Some of the blurred boundaries and overlaps in this still-coalescing new landscape are illustrated visually in Figure 1. The central circle in this diagram represents the emerging 'new' field of online labour exchanges for paid work. The outer circles represent a range of traditional fields of economic activity some of the features of which were precursors of the new activities. Different types of online activity represents points on a continuum between the (offline) outer edge of the diagram and its online equivalent at the centre.

Figure 1: The new online labour landscape has evolved from previous offline practices

Source: Ursula Huws

Playground and Factory, ed. T. Scholz (New York: Routledge, 2012); and Tiziana Terranova, "Free Labor," in Scholz, Internet as Playground and Factory.
[15] The next section of this article draws on some of this material which is cited below where relevant.

It is possible, for instance, to see an evolutionary link in corporate practices, from traditional full-time office-based employment to a variety of different forms of flexible work, the development of virtual teams and the use of online platforms to organise work on a just-in-time basis. When this concerns the posting of employees on zero-hours contracts to different locations in multi-branch firms, or temporary assignments carried out remotely, in-house corporate practices increasingly resemble those used in open platforms.

Similarly, a line of development can be traced between the kinds of specialist agencies that self-employed workers traditionally used, in many sectors, to find customers (for instance translation bureaux or cleaning services agencies), the migration of some of these specialist agencies online, and the development of broader online freelance platforms (such as Elance or Taskrabbit) offering a much wider range of services. Crowdfunding platforms, increasingly used by freelancers and entrepreneurs to obtain funding for start-ups and new projects, have precursors in older means of soliciting for investment or microfinance loans.

The new online marketplaces for second-hand goods (such as eBay), craft products (such as Etsy) or bed and breakfast accommodation (such as Airbnb) can also be seen as descendants of the kinds of classified advertising that used to be found in the back pages of newspapers, telephone directories or advertisements posted on bulletin boards in local shops or community centres. In the same way, online dating agencies, gambling sites, shops and travel agents can all trace their ancestry to offline equivalents.

However once they have migrated online, these activities alter their character, bringing qualitative as well as quantitative changes. Economies of scale enable them to standardise their offerings and lower their costs, thus consolidating their dominance in the market. Network effects bolster this consolidation: the larger the platform, the more likely it is to have suppliers in any given location, or for any given activity, so the more customers are likely to use it. These effects are further reinforced by the existence of secure means to transfer money (including micropayments) internationally, making it possible to expand seamlessly across borders and draw on global markets for supply and demand. Meanwhile the collection of large quantities of data on users makes it possible to target customers with ever-more sophisticated advertising, across a range of media, including mobile 'apps'.

Just as the demarcations between traditional offline and new online forms of employment and self-employment are becoming blurred, so too are those between unpaid and paid work. The term 'crowdsourcing', for example, was originally coined[16] to describe a practice whereby appeals for solutions to problems are broadcast generally on the Internet, in the expectation that the 'wisdom of crowds[17]' will produce the best answers, with members of the public contributing their ideas free of charge. However in practice a great deal of this type of crowdsourcing takes the form of competitions with a monetary reward for the winner (not unlike the traditional practices of using competitions for prestigious architectural projects, or calls for tender for public procurement). The unpaid labour is thus contributed with the idea that it is an investment in the possibility of generating future income. Similarly, many blog postings and self-made Youtube videos are carried out as a form of self-advertisement in the hope that they will lead to paid commissions.

The purpose of this article is not to map the entire online economy. Its focus is on paid work organised through online labour exchanges[18,] work which sits within the central circle on the diagram. More specifically, it focuses on the impacts of this form of work organisation on the health and safety of workers. However it does this in the recognition firstly that these forms of work represent points on a continuum that also include other forms of work, and secondly that, because these forms of work normally take place in spaces that are not designated only as workspaces, that the health and safety of workers cannot be strictly demarcated from other more general health and safety issues affecting the general public.

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[16] Howe, J Robinson, M. (2005) 'The Rise of Crowdsourcing', *Wired, Issue 14.06,* June.
[17] Surowiecki, J. (2005). *The Wisdom of Crowds*. Anchor Books.
[18] For the sake of convenience, such work is referred to below as 'crowdsourcing' in the knowledge that this is an ambiguous term, capable of several interpretations. For the purposes of this article, it should be interpreted as meaning 'paid labour organised through online platforms'.

2 Towards a typology of crowdsourced labour

It is clear that crowdsourced labour is extremely diverse, and cannot be captured by a single variable. There are several different dimensions that can usefully be taken into account, each of which may exist in any permutation with the others. Table 1 summarises some of these dimensions, giving examples of the variety of these. These dimensions are: the worker's occupation; whether the work is carried out online or offline; the location where the work is carried out; the worker's employment status; and whether the work is carried out for a company or for an individual. These variables are not always clear-cut, and it is useful to begin by discussing two other 'grey' areas which do not feature in the table.

Table 1: Varieties of work organised via online platforms, with indicative examples[19].

	Professional status			Work mode		Place of work			Employment		Final client	
	Manual	Clerical	High-skill[20]	Online	Offline	Own home	Office[21]	Public/other	Employee	Self-employ	Individual	Company
Elance/oDesk[22]			X	X		X				X		X
Task-rabbit[23]	X				X			X		X	X	
Click-worker[24]		X		X		X				X		X
Wonolo[25]	X	X			X		X		X			X
Star-bucks[26]	X				X		X		X			X
Mila[27]	X				X	X				X	X	
Axiom[28]			X	X		X	X			X		X

Source: Author

Pay

As already noted, the focus of this article is on paid work, whether carried out as an employee or on a freelance basis (i.e. on the worker's own account, under an – implicit or explicit – contract for the supply of services). It does not cover other forms of income generation, for instance from the sale of goods, rent or gambling, regardless of whether this income is obtained via online platforms. Also excluded is unpaid work, although it is recognised that the borderline between paid and unpaid labour is imprecise and shifting. Not only may unpaid work be converted into paid work (for instance through winning a competition, or attracting the attention of a paying client) but work which has been carried out in good faith on the basis that it will be paid for may be rejected if it does not meet the client's quality standards[29].

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[19] The information provided about the employment practices of the companies named here is indicative only, based on secondary evidence which is cited in the text of this article. It is possible that actual practices in these companies may vary depending on the particular context.
[20] Includes professional and technical qualifications.
[21] Includes other types of employer-controlled workplaces e.g. warehouses, cafes.
[22] https://www.elance.com/
[23] https://www.taskrabbit.com/how-it-works
[24] http://www.clickworker.com/en/
[25] http://wonolo.com/
[26] Reported at http://www.nytimes.com/interactive/2014/08/13/us/starbucks-workers-scheduling-hours.html?_r=0
[27] https://www.mila.com/
[28] http://www.axiomlaw.co.uk/
[29] Irani, L. (2015) 'Difference and Dependence among Digital Workers', South Atlantic Quarterly, January.

There is an enormous variety of payment methods. Workers may be paid a regular salary, an hourly rate or a piece rate, based on the completion of specific tasks or the total job. Online platforms may take a commission from the worker or from the client or from both, and this commission may be a flat rate or based on a percentage of the transaction cost[30.] In other cases, workers may be charged a fee for enrolling on the site but no commission is taken[31]. The rate may be fixed by the client, the worker or the intermediary, or may be negotiated competitively by means of some sort of auction[32]. Nationally- or sectorally-determined minimum wage rates may, or may not, be deemed to apply.

Main or secondary job

Another variable that is too complex to map in a simple table is whether the work is carried out as a main job or is a secondary source of income to a another job, a pension, rent or some other activity such as farming, trading, studying or artistic work. There is little hard evidence on this. A survey published in 2013 by *Elance* stated that for a third of its workforce, earnings from *Elance* constituted less than 10% of their income, with 35% gaining between 10% and 40%, 14% 41-70% and only 18% 71% or more.[33] *Taskrabbit* estimates that 10% of workers use it as their sole source of income while 75% 'rely on the service to pay their bills'[34]. A survey of 600 *Uber* drivers in New York found under a quarter saying that it was their sole source of income, and 38% saying that they viewed it 'as a supplement to earnings but not a significant source of them'.[35] Only 8% had been unemployed before they joined *Uber*. There is currently no way of ascertaining whether such patterns are typical of other forms of crowdsourced labour, but it seems likely that most forms cover a spectrum from providing the only source of income at one extreme to providing a minor supplement at the other.

Skills and occupational status

A wide variety of tasks are organised through online platforms, ranging from highly-skilled professional consultancy to routine microtasks. They can be grouped roughly into three categories: high-skilled professional and technical work, routine clerical work and manual work.

The first category includes lawyers, doctors and management consultants[36] as well as a wide variety of specialists in IT and creative occupations. Elance reported in 2014 that 37% of the demand for freelancers on its platform was for ICT and programming skills, 23% for design and multimedia skills and 17% for writing and translation[37]. The second category includes call centre work, data cleaning, transcription[38] and a variety of microtasks. These might include labelling visual images, taking part in surveys[39,] 'sentiment analysis'[40] or clicking 'like' or posting comments on social media posts[41]. The third category involves work which is co-ordinated online but carried out offline and includes the provision of services to consumers such as cleaning, hairdressing, household maintenance, running errands[42] or

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[30] Massolutions estimated that in 2013 the majority of crowdsourcing pricing models (76%) were transaction-based, with 16% based on workers' time and 8% performance-based. (Massolution, 2013, *The Crowd in the Cloud: Exploring the Future of Outsourcing.).

[31] The UK site Total Freelance is an example of a 'no commission' platform. See: http://totalfreelance.co.uk/.

[32] Green, A. de Hoyos, M., Barnes, S-A, Baldauf, B & Behle, H. (2014) *Exploratory Research on Internet-enabled Work Exchanges and Employability,* European Commission Joint Research Centre Institute for Prospective Technological Studies.

[33] Elance (2013) *Annual Impact Report*: 21. Available at: https://www.elance.com/q/sites/default/files/docs/AIR/AnnualImpactReport.pdf.html

[34] Kessler, S. (2014) 'Pixel and Dimed: On (not) getting by in the Gig Economy', *Fast Company*, May. http://www.fastcompany.com/3027355/pixel-and-dimed-on-not-getting-by-in-the-gig-economy

[35] Badger, E. (2015) 'Now we know how many drivers Uber has – and have a better idea of what they're making', *Washington Post blogs,* Wonkblog, January 22.

[36] The Economist, (2015) 'Freelance workers available at a moment's notice will reshape the nature of companies and the structure of careers', January 3.

[37] Hippler, K. (2014) 'The online work revolution', presentation to Dynamics of Virtual Work (COST Action IS 1202) Meeting, University of Bucharest, 28 March, 2014.

[38] See for instance some of the sites listed:http://workathomemoms.about.com/od/dataentrytranscription/tp/dataentryjobs.01.htm

[39] Schnieder, D. Z. (2015) 'Intellectual piecework', *The Chronicle of Higher Education,* February 16.

[40] Massolution (2013), *The Crowd in the Cloud: Exploring the Future of Outsourcing:* 17.

[41] See for instance http://www.getpaidforlikes.com/ (which claimed on February 19th, 2015, to have 66,745 members who had earned US$31,599.54 since 7th April, 2013).

[42] One example is handy.com, which operates in 36 cities in the US, Canada and the UK and lists its most popular services as cleaning, handyman, plumbing, electrical, moving help, painting and furniture assembly. Mila.com, with a presence in over 100

providing taxi services[43] as well as providing 'just-in-time' allocation of workers to tasks in the catering and retail industries or in offices and warehouses[44]. Most commonly this is manual work with relatively low skill requirements. Nevertheless, there is considerable diversity in this category. Wonolo[45] and OnForce[46] are examples of companies that provide the services of workers with a range of skills, including IT professionals, to work onsite for corporate clients.

Online or offline

Generally speaking, the first two of the occupational categories described above concern work that can be carried out online, and therefore regardless of location, whilst the third category involves work that requires the physical presence of the worker on the client's or employer's premises. However in practice this differentiation is not so clear-cut. For instance when websites were visited in the course of research for this article, the first posting on *Twago* (in its section on freelance IT workers) included the words 'For our team we're looking for a CTO who can live in Switzerland or Berlin for minimum 9 month'[47] suggesting that at least some freelancers are expected to work on-site or at least report regularly in person to local clients.

Place of Work

For online forms of work, the independence of location clearly forms part of the attraction, enabling employers to draw on a global pool of labour. Many companies boast of their global presence. Clickworker, for example, claims that a quarter of its 700,000 workers are based in Germany, a quarter in the rest of Europe, a quarter in the USA and a quarter in the rest of the world, with a presence, all told, in 136 countries[48]. As an illustration of its independence of location, crowdsourcing is reported as a source of income in African refugee camps[49]. Freelance crowdsourcing is often promoted (using images of backpackers working on laptops in exotic locations) as a suitable form of work for people who want a nomadic lifestyle[50]. Nevertheless, there are some geographical limits. Amazon Mechanical Turk, one of the most-studied crowdsourcing sites, originally promoted as global in scope, has now purportedly pulled back to focus on the US market, although with some workers still in India[51]. We must nevertheless presume that online crowdsourcing is carried out in a variety of different types of location including homes, cafes and open-air locations, in countries with widely differing public safety regimes.

Turning to work that is carried out off-line, we find a greater likelihood that worker and client are co-located in the same region and country, even though the platform through which their work is organised may be a global one. However the variety of locations is, if anything, even greater than is the case with online work and, moreover, is less likely to be under the worker's own control: in some cases (e.g. drivers working for Uber or Lyft) the work may be mobile; in other cases it takes places on the commercial premises of employers or clients and in others in the homes of clients.

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neighbourhoods in Germany and Switzerland, offers cleaning, massage, IT support and beauty treatments among 154 different services.

[43] Well known examples here are uber.com and lyft.com.

[44] Wonolo.com offers such services on an outsourced basis in the USA whilst Slivers-of-time.com does so in the UK. But many companies in Europe and elsewhere use in-house systems for allocating staff on zero-hours contracts to posts when needed. One example of this is the British pub chain Wetherspoons (see: http://www.wsandb.co.uk/wsb/profile/2319667/profile-how-jd-wetherspoon-utilises-zero-hour-contracts)

[45] http://wonolo.com/

[46] http://www.onforce.com/

[47] http://www.twago.com/s/projects/) accessed on February 9, 2015.

[48] http://www.clickworker.com/en/about-us/clickworker-crowd

[49] Lease, M. & Alonso, O. (2014) 'Crowdsourcing and Human Computation, Introduction', *Encyclopedia of Social Network Analysis and Mining*, 5 October: 304-315

[50] See for instance http://www.travelettes.net/do-you-have-what-it-takes-to-become-a-digital-nomad/

[51] Irani, L. (2015) 'Difference and Dependence among Digital Workers', *South Atlantic Quarterly*, January: 231.

Employment status

The employment status of crowd-workers is a contentious issue. In the USA, most employers avoid conferring employee status on those who work for them , setting up arrangements whereby they have independent contractor status, using a variety of different intermediation models, including the use of companies which act as the 'employer of record'.[52] Four different models have been proposed for the governance of 'human cloud platforms': 'arbitrators', 'governors', 'facilitators', and 'aggregators'[53]. Although in each case, workers are selected and managed differently, in none are they direct employees of the ultimate customer although it seems clear that in many cases workers have an ongoing employment-like relationship. One example is the life insurance company Aegeon, which 'has an on-demand workforce of 300 licensed virtual agents managed through another online intermediary, LiveOps. They are not Aegean employees but are scheduled for inbound and outbound calling through LiveOps' routing software'.[54] Some of the US corporate literature considers that the 'marketplace model' (whereby there is a triangular relationship between the 'Variable labor management platform' (VLMP), the service buyer and the independent contractor creates too much legal uncertainty, and proposes instead a 'general contractor model' in which the VLMP enters into 'master service' agreements with both the other parties[55].

This situation is, however, increasingly contested. Suits demanding employee status for workers have been filed or considered on behalf of workers for Handy[56] in California and Homejoy in Massachussetts, despite the latter's insistence that it is 'not a cleaning company but a platform'[57]. In San Francisco, similar class action suits have been filed against Uber and Lyft demanding employee status for their drivers[58]. In addition to contractual features that suggest forms of dependency that resemble an employment relationship, there is also evidence that Uber drivers are pressured into dependency on the company by other means, such as loans for the lease or purchase of new cars[59].

In Europe, the situation is if anything even more complex. Some sites go to considerable lengths to ensure that the workers who use them comply with the relevant legal requirements to ensure their self-employed status. For instance Freelancer does not only describe itself as 'a "marketplace" that puts employers and contractors in direct contact with each other so that they can freely discuss the content of a job, fees etc.', it also specifies the legal documents a freelancer must provide to comply with French law[60]. Nevertheless, some of these platforms include requirements that sit uneasily with freelance status. For instance it is common to insist that all intellectual property rights in creative work rest with the client, not the worker. Some platforms, such as oDesk[61], also encourage clients and workers to use software that enables invasive real-time surveillance. In other cases, workers appear to be treated as employees. Although it is not entirely clear from its website, Berlin-based Mila[62] (which also has offices in Switzerland and Romania as well as Indonesia and China[63]) seems to treat its workers (termed 'friends'[64]) as employees, on a similar basis to a temporary employment agency. This company also claims to provide 'excellent social and accident insurance'.[65]

In other cases, crowdsourcing is effectively used by companies as an internal tool for assigning workers flexibly to jobs, often using zero-hours contracts. United Kingdom research by the Chartered Institute of Personnel and Development found that 64% of employers classify zero-hours staff as employees

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[52] Karpie, A. (2014) *Engaging the 21st Century Professional Workforce,* MBO Partners.

[53] Kaganer, E., Carmal, E., Hirschheim, R. and Olsen, T. (2013) 'Managing the Human Cloud' *MITSloan Management Review, Winter.*

[54] Kaganer *et al,* Page 1.

[55] Onforce (2013) *The General Contractor Model: A competitive advantage in It Field Services Delivery,* Onforce White Paper.

[56] Montgomery, K. (2014) 'Handy Sued for Being a Hellscape of Labor Code Violations' *Valley Wag, 12*, November. http://www.cnbc.com/id/102435316#.

[57] http://www.washingtonpost.com/news/storyline/wp/2014/09/10/at-the-uber-for-home-cleaning-workers-pay-a-price-for-convenience/

[58] CNBC.com (2015) 'Lawsuits facing Uber, Lyft could alter sharing Economy', 20 February. http://www.cnbc.com/id/102435316#.

[59] Henwood (2015) 'What the Sharing Economy Takes', The Nation, January 27. See also http://valleywag.gawker.com/uber-and-its-shady-partners-are-pushing-drivers-into-su-1649936785   and   http://bostinno.streetwise.co/2014/12/27/uber-santander-lease-to-own-for-uberx-martha-coakley-santander-investigation/

[60] http://www.freelance.com/en/contents/products-and-services, accessed on February 20, 2015.

[61] Caraway, B. (2010) 'Online labour markets: an inquiry into oDesk providers', Work Organisation, Labour and Globalisation, 4 (2): 111-125

[62] https://www.mila.com/

[63] http://venturevillage.eu/zurich-mila-fund-3m

[64] https://www.mila.com/friends

[65] https://www.mila.com/jobs. Accessed 9th February, 20--15.

and only 3% regarded them a self-employed[66], with 'confusion among employers over what employment rights "employees" are eligible for'[67]. It should not, of course, be presumed that all zero-hours workers are organised through in-house crowdsourcing arrangements, or that the UNITED KINGDOM is typical of Europe in this respect, but this does suggest that there may be cases where the employment status of these workers is unclear, although they are more likely than not to be treated as employees.

Case study research on crowdsourcing by Eurofound found that in most European countries 'the employment relationship between the client and the worker is based on individual agreement, hence pay, working conditions and other issues, notably intellectual property rights, are determined either by the two parties or the terms and conditions of the platform'[68].

Client

A final factor influencing the working conditions that pertain in crowdsourcing is whether the final client is an individual or a company. This does not just affect the working environment but also the power relations shaping the working relationship, which in turn have an impact on the worker's wellbeing.

3   The evidence

Extent of crowdsourcing and future projections

It is evident that the crowdsourcing workforce is highly diverse and poorly defined. This means that there are no robust indicators for it, so there is a lack of reliable evidence as to its extent. Attempts to estimate this are rare, making anecdotal evidence, often based on the statistics produced by particular companies, the main source of information. These statistics are typically based on the number of workers registered on any given site, but are likely to be inaccurate in a number of respects. First, it is possible that some people who have registered on these sites are inactive and have done so out of curiosity, lack the qualifications to be selected or have moved on to other things; second, there is a possibility that individuals might register multiple times under different identities; and third it is likely that many register on multiple sites, so any attempt to generate a total figure by adding up the numbers registered on different sites may result in some double-counting.

Attempts to estimate the global scale of crowdsourcing are rare. Elance/oDesk estimated the total value at of the market $1.6 billion in 2013, projected to grow to between $16b and $47 billion by 2020.[69] Staffing Industry Analysts, estimated that in 2012 the value of this type of online work 'topped $1 billion for the first time; it will double to $2 billion in 2014, and reach $5 billion by 2018'[70]. However it is, presumably, just the market for skilled professional freelance work that is referred to here. In 2012, Massolutions estimated that the number of crowd workers was growing in excess of 100% per year globally, with nearly US $300 million of venture capital invested in crowdsourcing in 2011 alone. They also reported that 'large enterprises with revenues above $1B are early adopters of crowdsourcing; however, there is still significant untapped opportunity for crowdsourcing penetration across the board'.[71] Kaganer et al estimated that year-on-year growth in the global revenue of 'human cloud' platforms was 53% for 2010 and 74% for 2011, with the numbers of platforms and middlemen also growing rapidly[72]. There is no simple way to translate such estimates of market size into numbers of workers or numbers of platforms.

One possible basis for producing rough 'guesstimates' of the number of independent ('self-employed') crowd workers might be to estimate the number of platforms and then estimate an average number of active workers per platform. Unfortunately, however, both components of such a calculation are extremely difficult to quantify. It is clear that the number of platforms is large. No systematic surveys

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[66] *CIPD (2013) Zero-hours contracts: Myth and Reality, Chartered Institute of Personnel and Development: 29*
[67] *Ibid* Page 30
[68] Eurofound (2015), *New forms of employment,* Publications Office of the European Union, Luxembourg: 109.
[69] Hippler, K. (2014) 'The online work revolution', presentation to Dynamics of Virtual Work (COST Action IS 1202) Meeting, University of Bucharest, 28 March, 2014.
[70] The Economist (2013) '"Talent exchanges" on the web are starting to transform the world of work', *The Economist* June 1.
[71] Massolutions (2012) Crowdsourcing Industry report: Enterprise crowdsourcing: market provider and worker trends, http://www.massolution.com/
[72] Kaganer, E., Carmel, E., Hirschheim, R. and Olsen, T. (2013) 'Managing the Human Cloud' *MITSloan Management Review,* Winter.

have been undertaken but exploratory research has been carried out in Europe by IPTS-JRC[73] and by Eurofound[74] in each case finding large numbers, some serving local, regional or national markets. *Crowdsourcing.org*, provides a directory of sites[75] of various types and lists 137 in the category 'cloud labour', mainly in the USA but including some in the United Kingdom, but this is by no means a complete list. As regards the number of registered workers per platform, many sites advertise running totals prominently on their sites. For instance *Freelancer*[76] was in February 2015 advertising over 14.5 million registered users and over 7 million projects with over 22,000 users online at the time the site was accessed. *Elance*, (which merged with *oDesk* in 2013, producing a combined workforce of some 10 million[77]), was more specific, giving separate figures for the numbers of programmers (over 359,000), mobile developers (nearly 50,000), designers (over 272,000), writers (410,00) and marketers (87,000) currently available. Turning to smaller, European-based platforms, we find German-based IT platform *Twago* claiming over 242,000 experts and over 65,000 projects with a combined volume of € 338,027,750.[78] At the top end of the professional scale, numbers are smaller but still significant. For instance in the United Kingdom Axiom offers the services of 650 lawyers, and Eden McCallum 500 management consultants[79].

In the case of offline work organised via crowdsourcing platforms, statistics are somewhat harder to come by, partly because the local nature of service provision makes it irrelevant for the sites to advertise the total global workforce available to them. Some of the large US-based platforms are expanding aggressively around the world. Uber, for instance, claims that it will 'create 50,000 European jobs in 2015'[80]. In other cases, the geographical expansion of US companies is more limited, but similar platforms are started elsewhere. Taskrabbit, for example, has a major presence only in 18 US cities and London in the United Kingdom[81]. However Mila has been described as 'the Taskrabbit of Europe'[82] and Youdo 'the Taskrabbit of Russia'[83]. Other platforms are more modest in scale. For example United Kingdom-based Taskpandas, providing household services in London, Birmingham, Manchester, Leeds and Glasgow claims 'over 1,500 active Pandas looking to earn some extra money in these uncertain times'[84]. Growth forecasts for online staffing platforms tend to be embedded in larger categories of the 'sharing economy' which also include other peer-to-peer activities as accommodation rentals, crowdfunding, car sharing and sharing of music and videos. Price Waterhouse Cooper, for example, predicts that by 2025 this market will be worth $335 billion globally[85]. Another approach is to estimate the potential workforce from population statistics. One such attempt, carried out by Oxford Economic Forecasting for Slivers-of-time[86] (a United Kingdom-based platform which provides social care, retail, hospitality and administrative services at short notice) estimated that there was a potential workforce of 22 million people in the United Kingdom who could work in this way (based on part-time and temporary employees, plus the unemployed, economically inactive and retired people under the

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[73] Green, A., de Hoyos, M., Barnes, S-A., Baldauf, B. and Behle, H. (2014) 'Exploratory Research on Internet-enabled Work Exchanges and Employability. Analysis and synthesis of qualitative evidence on crowdsourcing for work, funding and volunteers', in European Commission Joint Research Centre Institute for Prospective Technological Studies, JRC Scientific and Policy Reports.

[74] Mandl, I., (2014) European Foundation for the Improvement of Living & Working Conditions, 'Status quo and first findings on crowd employment and ICT based, mobile work', presentation to Dynamics of Virtual Work (COST Action IS 1202) Meeting, University of Bucharest, 28 March, 2014

[75] http://www.crowdsourcing.org/directory

[76] http://www.freelancer.com

[77] The Economist (2015) 'Freelance workers available at a moment's notice will reshape the nature of companies and the structure of careers', *The Economist,* January 3.

[78] http://www.twago.com/#sthash.iU4hWAjT.dpuf

[79] The Economist (2015) 'Freelance workers available at a moment's notice will reshape the nature of companies and the structure of careers', *The Economist,* January 3.

[80] Waters, R. & Mishkin, S. (2015), 'Uber promises to create 50,000 European jobs in 2015', *Financial Times,* January 18: http://www.ft.com/cms/s/0/489cf62a-9f2e-11e4-a849-00144feab7de.html#axzz3SUnYrJEm

[81] Taskrabbit (2015) '19 cities and counting'. https://www.taskrabbit.co.uk/how-it-works

[82] Fowler, N. (2013) 'Zurich's Mila raises €2.5m for peer-to-peer market in Europe and Asia', http://venturevillage.eu/zurich-mila-fund-3m

[83] Starkell, N. (2013) 'Russian equivalent of TaskRabbit YouDo raises $1 Million from Flint Capital', October 3. http://goaleurope.com/2013/10/03/russian-equivalent-of-taskrabbit-youdo-raises-1-million-from-flint-capital/

[84] http://www.taskpandas.com/about_us.php

[85] TechUK (2014) 'New PwC analysis predicts dramatic rise of the sharing economy over next decade'. August 19. https://www.techuk.org/insights/news/item/2041-new-pwc-analysis-predicts-dramatic-rise-of-the-sharing-economy-over-next-decade

[86] http://www.sliversoftime.com/

age of 75)[87.] There is of course no suggestion that any more than a small fraction of this population is actually working in this way.

A third category of crowdsourcing is work carried out by employees organised internally via crowdsourcing-type online platforms. This can be subdivided into two broad categories: the assignment of people who are full-time employees to 'virtual teams' in project-based work; and the assignment of contingent staff on zero-hours contracts (or other forms of flexible working arrangements) to tasks on a just-in-time basis. Statistics for these forms are, of course, concealed in general employment statistics and there have been no systematic attempts to assess their scale. There is a large literature both on changing forms of work organisation and on changing employment practices, including some survey evidence, for instance from the European Working Conditions Survey, which provides some indication that these trends are growing but without clear definitions it is not possible to use them to extrapolate growth rates. In addition, zero-hours (or 'on call') working is not legally recognised in many European countries so no data exist on its prevalence. A 2010 Eurofound study[88] found that the highest prevalence (about 5% of the workforce) was in the United Kingdom and Austria, followed by Estonia and the Czech Republic (around 2.6%) and Malta and Norway (about 1%). In Finland and Italy trade union surveys found that between 4% and 8% of respondents were involved in on-call work. In Sweden, the number of such workers tripled between 1990 and 2005. More up-to-date figures from the United Kingdom Office of National Statistics found an estimated 700,000 workers on zero-hours contracts between October and December 2014. Using a broader definition of contracts that 'do not guarantee a minimum number of hours', the figure was 1.8 million in August, 2014 and 1.4 million in January 2014. People on such contracts were more likely to be women, in full-time education or working part-time. Over half of employers in Accommodation and Food Services and a quarter of employers in Education made some use of no guaranteed hours contracts in August, 2014[89].

We must therefore conclude that, whilst there is clear evidence that crowdsourcing labour in each of these categories exists on a significant scale, and is growing rapidly, there are currently no reliable estimates of its extent.

Characteristics of the crowdsourcing workforce

Information about the characteristics of the crowdsourcing workforce is even scarcer than on their numbers. The most-studied group are 'Turkers' working for *Amazon Mechanical Turk* in the USA. An early study by Ipeirotis[90] found that they tended to be highly educated, with 63% having college degrees, compared with the national average of 25%. They were young, with a median age of 30, and 69 percent were female.[91] However as the practice grows, the demography is changing[92] and Turkers are now considered representative enough of the general US population to be routinely used as a sample for surveys, although it is admitted that 'While Mechanical Turk surveys tend to be more representative of the US population than the usual group that shows up for in-person surveys, they're less representative than expensive, large-scale probability samples… Turkers in the United States skew female, and are more likely to Turk part-time and partly for fun, while Indians, skewing male, are somewhat more likely to depend on the Mechanical Turk income and less likely to enjoy the work'[93]. Lilly Irani reports that '[AMT] workers I have met include laid-off teachers, mobility-impaired professionals, military retirees, agoraphobic writers, undersupported college students, stay-at-home parents and even Malaysian programmers-in-training'[94]. Another study (based on a sub-sample of Turkers with a 95% acceptance rate from their clients) found that 'In keeping with a trend of increased male participation on AMT, 52%

[87] http://modernmarketsforall.com/wp-content/uploads/2013/05/OEF_-_Slivers_of_Time__Making_the_Labour_Market_work_better.pdf
[88] European Observatory of Working Life (2010) *Flexible forms of work: 'very atypical' contractual arrangements* http://eurofound.europa.eu/observatories/eurwork/comparative-information/flexible-forms-of-work-very-atypical-contractual-arrangements
[89] Office of National Statistics (2015) *Contracts with No Guaranteed Hours, Zero Hour Contracts, 2014.* February 25. http://www.ons.gov.uk/ons/rel/lmac/contracts-with-no-guaranteed-hours/zero-hour-contracts--2014/index.html
[90] Ipeirotis, P. G. (2010b). 'Analyzing the Amazon Mechanical Turk marketplace'. XRDS: Crossroads, The ACM Magazine for Students, 17(2), 16-21.
[91] Cushing, E. (2012) 'Dawning of the Digital Sweatshop', *East Bay Express,* August 1.
[92] Ross, J., Irani, L., Silberman, M., Zaldivar, A., & Tomlinson, B. (2010) 'Who are the crowd workers? Shifting demographics in Mechanical Turk'. Proceedings of the 28th of the international conference extended abstracts on Human factors in computing systems, ACM. pp. 2863-2872.
[93] Zentz, D. (2015) 'Intellectual Piecework', *The Chronicle of Higher Education,* February 16.
[94] Irani, L. (2015) 'Difference and Dependence among Digital Workers', *South Atlantic Quarterly,* January: 231.

of participants reported to be male. Consonant with prior surveys, almost half (48%) were born in the 1980s (although 13% were born in the 1960s or before and 24% were born in 1990 or later) and the group is predominately college educated (only 8% hadn't been to college). At 60/244 (25%), student participation is lower than usual, close to the lowest we have seen in our past AMT surveys. Thus participants in this study represent a population that is fairly young, well-educated, and Internet-literate'.[95] Another study found that the mean age of AMT workers in India was 27 and in the USA 33, with 27% of the Indian sample female, compared with 58% in the USA[96.]

The evidence on other forms of crowdsourced labour in the US is more anecdotal. Newspaper articles often focus on individuals, such as a 35-year-old African American single father of a 4-year-old, previously living in a homeless shelter, working as a cleaner for Homejoy interviewed by the Washington Post[97] or the 41-year-old single woman interviewed by Business Insider[98]. In the absence of survey evidence, however, all they can tell us is that the workforce is large and heterogenous and includes people driven to seek this kind of work from economic desperation.

Another source of qualitative information comes from the accounts of journalists who have enrolled on crowdsourcing platforms to gain first-hand experience. Examples of these include Sarah Kessler in the USA[99] and BBC correspondent L. J. Rich in the United Kingdom[100]. These confirm a picture of a wide variety of platforms, difficulty in actually obtaining work, extremely low pay, haphazard organisational arrangements, absence of guarantees and lack of insurance, but give only anecdotal evidence about the characteristics of the other crowd workers, though emphasising their diversity.

In Europe there is some limited case study evidence. A study carried out for the European Commission's JRC-IPTS[101] studied People-per-hour[102] and found that the majority of its users (63.5%) were based in the United Kingdom, with the next largest shares in India (9.9%), the USA (5.3%), Pakistan (2.6%), the Philippines (2.0%), South Africa (0.7%) and Canada (0.7%). In the United Kingdom 47% of users were in London. Just over half (52%) were female and there was a wide age spread, but the majority were in their 20s or 30s. Four of the six people interviewed for the case study said that their earnings from this site were a key component of their freelance income. Another case study focused on a site that organises offline work, Slivers-of-time. Here the age profile appeared to be significantly older. It is not clear how representative the interviewees were of the 65,000 people reported by this social enterprise to be on its database, but the youngest was in the 50-59 age group and all but one were female. Survey evidence is, unfortunately, lacking.

It can be concluded that the crowdsourcing workforce is extremely diverse, but further research is required before its demographic profile can be sketched out with any certainty.

4   Health and safety risks of online crowd work

The enormous variety of tasks carried out by crowd-workers and the diversity of locations in which this work is carried out indicates a range of health and safety risks that is too wide to encompass comprehensively. The aim here is to provide a summary of the most important. The risks can be broadly broken down into direct physical risks related to the labour process itself and the environment in which it is carried out; indirect physical risks related to the cumulative impact of these; and broader psychosocial risks. The physical risks can in turn be broadly grouped into two categories: those relating to online work, carried out a distance from the client; and those relating to offline work, carried out on the premises of clients (whether corporate or individual) or in public spaces. These are discussed

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[95] Marshall, C.C. and Shipman, F.M. (2014) 'Who owns your social networks?' Center for the Study of Digital Libraries and Department of Computer Science, Texas A&M University, February 15-19.

[96] Kittur, A., Nickerson, J.V., Bernstein, M.S., Gerber, E.M. Shaw, A., Zimmerman, J. Lease, M. and Horton, J.J. (2013) 'The Future of Crowd Work', *CSCW,* February 23-27.

[97] DePillis, L. (2014) 'At the Uber for home cleaning, workers pay a price for convenience', *Washington Post*, September 2014.

[98] http://www.businessinsider.com/confessions-of-a-task-rabbit-2011-12?IR=T

[99] See http://www.fastcompany.com/3027355/pixel-and-dimed-on-not-getting-by-in-the-gig-economy

[100] http://www.bbc.co.uk/news/technology-23959890

[101] Green, A. de Hoyos, M., Barnes, S-A, Baldauf, B. and Behle, H. (2013) Crowdemploy Crowdsourcing Case Studies: an Empirical Investigation into the Impact of Crowdsourcing on Employability, European Commission Joint Research Centre Institute for Prospective Technological Studies.

[102] A company whose website claimed on 22/02/2015 that it had 40,000 'curated freelances'.

separately below. The psychosocial risks for different categories or crowd worker are more difficult to disentangle and are addressed together.

Physical risks – online work

There is a very large literature on the ergonomics of office work and the safe use of display screens (addressed *inter alia* in the EC Directive 90/270/EEC). This recognises that work with computers may lead to visual fatigue, musculoskeletal problems, stress and other disorders. Employers are advised (and often required) to carry out risk assessments, provide furniture, screens and keyboards that meet ergonomic standards, ensure that lighting levels are appropriate, noise levels are low, temperature, humidity and air flow are comfortable, workers take regular breaks from screen work and other stipulations to ensure that working conditions and the working environment are safe[103].

When work is classified as freelance, these obligations can be externalised, with the risk transferred to individual workers. Although systematic survey evidence is lacking, it seems highly likely that in crowdsourcing many of these requirements are breached, for instance:

- Workers may be working on laptops or other computing devices on which the screen, keyboard and mouse do not meet ergonomic requirements for intensive work.
- They may be working in domestic environments or public spaces (such as Internet cafes) where seating and work surfaces are at the wrong height or otherwise require them to adopt poor postures that will lead to musculoskeletal problems.
- They may be working in environments which are inappropriately lit, noisy, polluted, overcrowded or too hot or too cold for comfortable work.
- Pressure to meet tight deadlines or work targets may force a rapid pace of work without breaks, exacerbating visual strain and leading to repetitive strain injuries.
- They may be unable to afford (or unaware of the need for) eye tests and the use of suitable lenses for screen work, also leading to visual strain and attendant problems such as headaches.

All these factors, in combination, may create synergistic effects leading to high levels of discomfort and stress, discussed below as psychosocial risks.

Physical risks – offline work

Crowdsourcing work that is carried out offline takes place in a space which is even harder to map than online work, both physically and legally. Its diversity and geographical spread frequently place it in an ambiguous terrain which may be regulated in a poorly-understood intersection between laws designed to protect workers, those designed to protect consumers and those that are focused on public safety.

Some of the activities carried out by crowd workers are in occupations that are notoriously dangerous for workers. One example of this is construction work. The United Kingdom site Mybuilder[104], for example, lists a wide range of 'trades' (including garage and shed builders, tree surgeons, roofers, demolition contractors, groundworkers, window fitters, fencers and stonemasons) that are associated with above-average rates of accidents and injury to workers. It also includes many (such as gas engineers, electricians and insulation installers) that are subject to regulations designed to protect consumers from serious adverse physical consequences if the work is carried out incorrectly.

Other activities, such as driving a taxi, entail risks to the drivers themselves, to their customers and to other road users. Uber has already been sued for wrongful death by the parents of a six-year-old child killed by a car linked to the company[105]. There have also been cases of Uber drivers accused of rape

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[103] See for instance https://osha.europa.eu/en/publications/e-facts/efact13

[104] http://www.mybuilder.com

[105] Gullo, K. (2014) 'Uber Sued for Wrongful Death Over 6-Year-Old Child', *BloombergBusiness,* January 28. http://www.bloomberg.com/news/articles/2014-01-27/uber-sued-for-wrongful-death-over-6-year-old-child-killed

by customers in Chicago[106,] Boston[107] and in Delhi[108.] However the system also leaves drivers vulnerable to attack and harassment by customers. Female Uber drivers have been tracked down at their home addresses and harassed by former passengers using a combination of Uber's 'lost-and-found' system and Apple's 'find my iPhone' app[109]. The vulnerability of women drivers may be exacerbated by the use of sexualised advertising of crowd services in which women drivers are presented in erotic costumes and poses, illustrated by the 'Avions de chasse' campaign organised by Uber's Lyons office in France[110].

Risks of inter-personal violence or harassment both from workers (including to children and elderly or vulnerable adults) and to them are also present, along with a many possibilities for potential accidents, in a variety of other situations where crowdsourced workers provide services in the homes of clients. Here too, whilst it is clear that multiple physical risks are involved to a range of parties, it is less obvious which regulatory framework could best be used to address them.

Physical hazards to offline workers may be exacerbated by a number of factors, including:

- Lack of training of workers, for instance in the safe use of chemical products or power tools or the correct procedures for providing personal services (e.g. how to lift bedridden patients without straining one's back).
- Lack of certification (or understanding of what certification should exist) for the skills provided.
- Lack of knowledge or understanding of the relevant regulations (by either workers or clients).
- Lack of clarity in work specification, leading to situations where the worker (or client) cannot predict what tasks are required or what tools, equipment or materials should be provided or brought to the job.
- Lack of safety equipment and clothing (e.g. protection for eyes, ears, nose and mouth; extractor fans; fire extinguishers; safety shoes or gloves).
- Pressure to complete work to tight deadlines leading to cutting corners in terms of safety procedures and failure to take breaks.
- Interruptions and distractions leading to errors resulting from failure to concentrate on the task in hand. Whilst some of these distractions may be extraneous (e.g. those caused by the presence of children, pets, members of the public etc.) some may be related to the specific conditions of crowdsourcing, for instance the need to pay attention to alerts sent by the crowdsourcing platform to workers via mobile phone apps (e.g. to respond to a new request for work or provide an update on the process of a job). Such risks are particularly high when driving, when distractions caused by audio messages or phone calls could lead to serious accidents.
- Exhaustion caused by long working hours, whether incurred in another (main or secondary) job, in the crowdsourcing work itself, or as a side-effect of long travelling times or heavy domestic responsibilities.
- Exposure to risks which would not be accepted in a workplace environment[111].
- Lack of insurance, or lack of clarity about who is responsible for insurance (the online platform, the employer/client or the worker). Whilst not necessarily a hazard in itself, workers' and clients' worries about insurance are likely to shape working practices and the reporting of accidents.

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[106] Collman, A. (2014) 'Uber driver 'raped 22-year-old passenger he drove home drunk from bar', *Mail Online,* December 30. http://www.dailymail.co.uk/news/article-2891248/Uber-driver-court-allegedly-raping-22-year-old-passenger-drove-home-drunk-bar.html

[107] WBUR (2014) 'Boston Driver Accused of Raping Customer', *WBUR News,* December 18. http://www.wbur.org/2014/12/18/mass-uber-rape

[108] BBC (2015) 'Uber Delhi "rape": India court begins driver's trial', *BBC News India,* 15 January. http://www.bbc.co.uk/news/world-asia-india-30828132

[109] Bhuyian, J. (2015) 'Men Are Using Uber's Lost-And-Found Feature To Harass Female Drivers', *Buzzfeed News,* February 10, http://www.buzzfeed.com/johanabhuiyan/faced-with-harassment-female-uber-drivers-often-left-to-fend#.qkvA5JmRy

[110] Warzel, C. (2014) 'Sexist French Uber Promotion Pairs Riders With "Hot Chick" Drivers', *Buzzfeed News,* October 21. http://www.buzzfeed.com/charliewarzel/french-uber-bird-hunting-promotion-pairs-lyon-riders-with-a#.gyom0OL3V

[111] To give one example, a *Taskrabbit* worker is quoted as saying 'I had a client a couple of months ago who wanted me to do his laundry. I did it and there was something kind of nasty on his stuff. … I realized this nasty stuff was actually cat diarrhea all over his laundry. …The third time this happened, I actually called TaskRabbit and I said, "Look this is what's happening. Plus I'm allergic to cats and it actually says that in my profile." I said, "I think I should get paid more than $25 for doing this." … I got an email from TaskRabbit shortly thereafter that I was unprofessional. They said if I did that again, I was fired.' (http://www.businessinsider.com/confessions-of-a-task-rabbit-2011-12#ixzz3SxHiblS7).

Psychosocial risks

Crowdsourcing labour also carries a wide range of psychosocial risks, many of which are of relevance for both online and offline workers, so they are dealt with together here, although there may in practice be considerable variation in how, and to what degree, they apply to particular groups of workers.

One major risk relates to the extreme precariousness[112] of much the work, with many crowd workers unclear from one day, or even one hour, to the next, whether they have work, and if so, what that will consist of, or when, or even if they will be paid. An additional level of uncertainty is created in many cases by the fact that in some cases no payment may be received at all because the work is deemed unacceptable by the client[113]. Normally there is no right of appeal against such decisions, or any procedure to evaluate the quality of the work independently. It is a common complaint of crowd workers that failure to pay is unjust and may be a form of 'scamming for free work'[114]. Precariousness is therefore closely associated with income insecurity. However the inability to predict working hours also makes it difficult to plan ahead, with consequences for personal and family life as well as the organisation of working time. Precariousness of employment is not only found in work that is formally designated as freelance but also pertains where workers have the status of employees but are working on contracts with unspecified numbers of hours[115].

Another factor that plays a major role in many forms of crowdsourced employment is the role played by ratings from employers or clients in determining the employability of crowd workers. As with rejections of work, there is rarely any form of appeal against these ratings, which may determine not only whether the worker continues to receive work, or is able to charge a reasonable rate, but also whether they remain on the database at all. The possibility of receiving a poor rating is an ever-present source of uncertainty and anxiety for many crowd workers. Where workers are subject to online surveillance whilst they are working, this can lead to additional stress.

Another source of stress is the requirement to work at very short notice. Crowd workers working online may miss a job if they hesitate a few moments before clicking the button to 'accept' a task. Offline workers may find themselves summoned to jobs on a just-in-time basis via a mobile application, sometimes in the knowledge that if they arrive too late the job may have been given to someone else or cancelled. Being permanently reachable is often treated as being permanently available, leading to poor work-life balance and stress.

The interpenetration of work and non-work activities also means that crowd workers are exposed to a range of interruptions and distractions (for instance from children or from members of the public) making concentration difficult and adding to stress.

The intensity of work is another dimension of crowdsourcing which contributes to psychosocial, as well as physical, disorders. Online crowd workers may be working to tight deadlines (in the case of more skilled freelance crowd workers) or on low piece-rates for micro-tasks (in the case of lower-skilled clerical crowd workers) while offline workers are under pressure to complete fixed-fee jobs and move on to the next, all of which encourage a rapid space of work without breaks and contribute to stress.

It seems likely that crowdsourcing is also affected by emotional demands made on workers, which carry psychosocial risks. The literature on this is scant. This is interesting given that one of the tasks widely regarded as most suitable for crowd labour is 'affective computing'[116], a term which covers a number of different practices. One of these is simply coding the 'emotions' expressed in photographs, social media comments and other forms of digitised information. Such labelling carried out by large numbers of

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[112] For a discussion of the link between precariousness and psychosocial risk factors, see Eurofound (2009) *Rise in Psychosocial risk factors in the Workplace*. Dublin: European Foundation for the Improvement of Living and Working Conditions. Available at: http://kernelmag.dailydot.com/features/report/4732/my-gruelling-day-as-an-amazon-mechanical-turk/

[113] Many accounts of *Amazon Mechanical Turk* describe large numbers of rejections. See for instance: http://www.cnet.com/news/amazons-mechanical-turk-lets-you-make-sort-of/ and http://kernelmag.dailydot.com/features/report/4732/my-gruelling-day-as-an-amazon-mechanical-turk/

[114] See for instance, complaints by *Elance* users on http://www.consumeraffairs.com/employment/elance.html

[115] See Pennycook, M., Cory, G. & Alakeson, V. (2013) A Matter of Time: The rise of zero-hour contracts, Resolution Foundation.

[116] Morris, R.R. and McDuff, D. (2014) 'Crowdsourcing Techniques for Affective Computing', *Handbook of Affective Computing,* MIT Media Lab, MIT.(2014) http://affect.media.mit.edu/pdfs/14.Morris-McDuff.pdf

workers across the Internet can be used to create datasets to inform automated the development of expression recognition systems and other applications. Online crowd workers are often asked to tag offensive content on the Internet. It seems probable that the requirement to look repeatedly at pornographic, sadistic or violent images must take a psychological toll. No research appears to have been carried out on such psychosocial risk among crowd workers. However the adverse effects are well documented among other workers exposed occupationally to disturbing media images[117].

Like other workers providing personal services, crowd workers working offline in people's homes are placed under pressure to perform emotional labour. This has been shown to carry psychosocial risks in the case of other service workers[118], although research has not been carried out specifically among crowd workers.

Crowd workers typically carry a large number of expenses and risks ranging from having to provide their own working materials (such as cleaning materials, tools, computers etc.) to covering the cost of transport. In the case of companies such as Uber and Lyft, this also includes the cost of purchasing and maintaining the vehicle. In many cases, the cost of insurance and the risk of ensuring safety is also externalised to the worker. Sarah Kessler provides an illustration of this when reporting on her experience with Postmates, a New York-based company providing a crowdsourced courier service. 'I ask whether there are any health insurance or safety policies for couriers. He tells me in no uncertain terms, "You are not an employee of Postmates. So when it comes to safety, you are on your own." (I am, after all, my own microbusiness.) When I later visit the web page that Postmates uses to recruit employees, I can't help but notice that it boasts that Postmates pays 100% of its employees' medical, dental, and vision insurance premiums. "Your physical and mental health is a priority to us," it says. But that's only for Postmates' 45 engineers, designers, and executives. It does not include the 2,000 people who are making deliveries'[119]. In Europe, the extent to which lack of secure and permanent employee status affects access to and the costs of health services varies from country to country. But even when health care is available free of charge, many workers may face the worry of lack of pay during periods when they may be incapacitated by illness or injury. They may also lack other benefits, such as maternity or paternity leave or compassionate leave. The absence of such benefits does not just add to the economic pressures linked with precariousness but also creates a psychological burden, impacting family life as well as working life.

These difficulties are likely to be exacerbated by the fact that workers may lack direct channels of communication with the ultimate client and are thus deprived of an individual or collective voice, giving them no say in influencing the decision-making that shapes their labour processes[120]. Even if online work is carried out by employees working in 'virtual teams', it is likely that many of these effects will still occur, because the geographical distance from the employer acts to reduce the kinds of direct interaction that occur when employees are co-located in an office which is subject to regular inspection. Isolation, the need for self-management, lack of social support and the requirement to be autonomous all increase psychological stress.

When the employer does not take direct responsibility for the working conditions of workers carrying out stressful work this does not just transfer a range of risks to the individual worker. A worker who is unmonitored and unsupervised other than by indirect means (performance or output indicators, payment by results, customer ratings etc.) is also unobserved in other ways. There is, for instance, a possibility that serious mental illness may develop, or the worker may develop anti-social and/or health-threatening habits as a means of coping with stress (such as dependence on alcohol or drugs) which would be spotted by the employer in a normal working situation but can escalate rapidly if nobody is aware of them. This can lead not only to serious life-threatening risks for the worker concerned but also to clients and the general public.

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[117] Perez. L.M, Hones, J., Englert, D.R and Sachau, D. (2010) 'Secondary Traumatic Stress and Burnout among Law Enforcement Investigators Exposed to Disturbing Media Images', *Journal of Police and Criminal Psychology,* 25 (2).

[118] Pugliesi, K. (1999) 'The Consequences of Emotional Labour: Effects on Work Stress, Job Satisfaction and Well-Being', *Motivation and Emotion,* Vol 23 No 2,

[119] Kessler, S. (2014) 'Pixel & Dimed: On (not) getting by in the gig economy, *FastCompany,* March 18. http://www.fastcompany.com/3027355/pixel-and-dimed-on-not-getting-by-in-the-gig-economy

[120] For a discussion of the links between interruptions, work intensification, multitasking and work strain and distress in work involving ICT use, see Chesley, N. (2014) 'Information and communication technology use, work intensification and employee strain and distress' *Work, Employment and Society,* Volume 28 (4) 589-610.

A final source of psychosocial strain comes from the combined impacts of multiple jobs which may interact with each other in diverse ways[121].

We can conclude that crowd working is associated with a wide range of actual or potential psychosocial stressors. However these are poorly documented.

5   Unresolved issues

It is apparent that the rapid growth of online work exchanges has created major challenges, both conceptual and regulatory. On the one hand, it is difficult to envisage how online platforms fit into the legal, social, economic and institutional categorisations that have been used in the past to monitor changes in the evolution of labour markets and the development of new economic sectors. On the other, new questions are raised for policymakers concerned with the governance of labour and consumer markets and the protection of the rights of workers, consumers and the general public. Some of these unresolved issues are summarised below.

The status of online work exchanges

Online work exchanges have diverse origins and take multiple forms and are therefore difficult to categorise. Should they, for instance, be regarded as markets, temporary work agencies, labour exchanges, social enterprises, service providers (supplying, for example, taxi, cleaning or care services), advertising platforms or just online directories?

One possibility would be to regard them as 'private employment agencies', which would bring them within the scope of ILO Convention No 181. Article 1 of this Convention states that '… the term private employment agency means any natural or legal person, independent of the public authorities, which provides one or more of the following labour market services: (a) services for matching offers of and applications for employment, without the private employment agency becoming a party to the employment relationships which may arise therefrom; (b) services consisting of employing workers with a view to making them available to a third party, who may be a natural or legal person (referred to below as a "user enterprise") which assigns their tasks and supervises the execution of these tasks'; (c) other services relating to jobseeking...'[122]. The Convention requires adopting countries to ensure a range of measures to protect workers and jobseekers including freedom of association, collective bargaining, minimum wages, access to training, occupational safety and health, compensation in case of occupational accidents or diseases and working time. They must also have procedures for dealing with complaints. The Convention addresses the possibility that workers may be recruited in one country to work in another both in relation to migrant workers and to the possibility of fraudulent practices in cross-border transactions. There are also restrictions on the processing of personal data (which should 'ensure respect for workers' privacy in accordance with national law and practice') and on the fees that workers may be charged.

Two alternative options would be to regard these platforms as employers, or as temporary work agencies, which would immediately confer on them all the associated responsibilities in any given national context. If they are not regarded as falling into any of these three categories, then the open question remains: what are they? Until this can be answered it is difficult to know what regulations should apply.

Who is the employer?

Associated with the question of the status of the crowdsourcing platform is that of who is the legal employer in any given case. The variety of different models, as well as variations in national law, means that there is not necessarily a single answer to this question. Where online platforms are used internally

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[121] For a detailed discussion of the impact of multiple job-holding on psychosocial risks, see Brun, E. and Milczarek, M. (2009) *Expert forecast on emerging psychosocial risks related to occupational safety and health,* European Agency for Safety and Health at Work. https://osha.europa.eu/en/publications/reports/7807118

[122] http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_INSTRUMENT_ID:312326

by companies to manage their own employees, there are only two actors: the employer and the worker, and the main question in contention is whether the worker has the same rights as other employees. Otherwise, typically at least three actors are involved in any transaction taking place via one of these platforms: the ultimate client, the online intermediary and the worker. In the case of platforms matching professional freelancers with clients, the self-employed status of the freelancer is generally clear (though there may be borderline cases where there is some doubt). The most contentious cases are those involving the online co-ordination of low-skill online work and of offline work.

In the USA this question has been addressed in some depth in the literature in relation to online 'clickwork' or 'cognitive piecework'[123]. Such sites typically publish disclaimers telling 'requesters' and 'providers' that they use their services at their own risk. The implication is that workers are 'independent contractors' rather than employees. Nevertheless, the platforms often attach conditions such as requirements for all financial transactions to be processed via the site, and 'satisfaction' clauses which legitimate the rejection of unsatisfactory work without justification. Not untypically, Amazon Mechanical Turk also mandates that the work product is 'made for hire' which means that ownership rights, including intellectual property, remain with the 'requester' even if the work has been rejected[124]. It also has the right to 'terminate' workers, barring them from further participation in the platform. Such conditions suggest a level of control that goes beyond the mere provision of an introduction between two independent parties. Nevertheless, a number of conditions apply that make it difficult to establish definitively that clickworkers should be regarded as employees, including the fact that they may work for multiple platforms and supply their own equipment. In relation to offline workers, as noted earlier, there have been some class action suits in the USA seeking employee status for workers providing taxi services and domestic help but no clear judgement has yet been reached. Specific conditions vary from site to site but there are several in which pay rates are set by the online intermediary, who may also have the power to discipline or bar particular workers, suggesting a pattern of control and dependency that resembles that of a temporary employment agency or a service provider rather than a labour exchange or listing service but such hypotheses have yet to be tested.

The situation is unclear in Europe but it seems likely that, in many Member States, workers doing manual or low-skill clerical work organised via online platforms might be regarded as their employees. In the case of more highly-skilled freelance workers, further tests would have to be applied to establish whether workers are genuinely self-employed according to the relevant national regulations (for instance whether they work for multiple clients, their tax registration status etc.). A resolution of this question is of the utmost importance for occupational safety and health because without a clear designation of who the employer is, there can be no clear apportionment of responsibility.

Insurance and legal liability

A similar lack of clarity pertains in relation to insurance, a question that is particularly important in relation to offline work. If an accident occurs in the home of a client who has booked a cleaner via an online platform, for example, who is responsible? Should it be covered by the insurance of the householder or that of the platform or could the individual worker be held responsible? What if the worker were attacked or had an accident on the way to or from the job? In the case of online work, who would be responsible if an article commissioned from a writer via an online platform turned out to be libellous? Whilst some online platforms include clear statements about insurance and liability (most usually in the form of disclaimers) this is by no means universally the case. Some, on the other hand, reassure their users that insurance is in place.

Applicability of EU Directives and national labour regulations

Another major area of uncertainty is how national and EU regulations can be applied. At the European level, these include Directives on Working Time, Part-Time Work, Temporary Agency Work, Undeclared Work, Equal Pay and Equal Treatment and Parental Leave. Of particular relevance in this context is the

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[123] For an overview, see Felstiner, A. (2011) 'Working the Crowd: Employment and Labor Law in the Crowdsourcing Industry', *Berkeley Journal of Employment & Labor Law,* 32 (1).
http://scholarship.law.berkeley.edu/cgi/viewcontent.cgi?article=1433&context=bjell
[124] AMT agreement quoted in Felstiner *op cit.* p 163.

Directive on Health and Safety in Fixed-Term and Temporary Employment (91/383/EEC) which extends the same level of protection to fixed-term and agency workers as to other employees. It also imposes a duty on undertakings to give adequate information and training to these workers to protect their safety and health, specifies appropriate medical surveillance and clarifies the division of responsibilities between temporary employment agencies and user undertakings. As already noted, it is difficult to apply this, or other Directives, to online work exchanges if their legal status, and that of their workforce, is unclear.

At a national level, similar problems arise in relation to the applicability of national regulations such as those referring to minimum wages, equal treatment, tax and national insurance deductions and safety regulations. A particularly important question is what forms of social protection are available to crowd workers, how eligibility can be established and how rights can be claimed.

Consumer protection and public safety

Where workers organised by online platforms are providing services directly to the public there is considerable overlap between issues relating to worker protection and those relating to consumer protection. In some cases there is a lack of clarity about whether the consumer's 'contract' is with the crowd worker or with the online platform. This affects the consumer's rights, for instance to fair contract terms and guarantees. Consumers also have specific rights in relation to unsafe, dangerous or faulty goods, pre-contract information, data protection, misleading advertisements for goods and services, and purchases made over the Internet, which may be applicable when they use online work exchanges. Crowd workers may find themselves at the centre of any disputes about these rights.

More broadly, issues relating to safe and healthy working practices in public spaces or private residences may affect both workers and members of the public. It is not always clear, however, whether they should be addressed as matters of public safety, using environmental protection or public health regulations, or more specifically as labour or consumer protection issues. In many countries this question has practical implications since it will determine which body should be responsible for inspection, dealing with complaints and enforcement.

Accreditation of qualifications and professional responsibility

Many online platforms advertise the services of workers with particular skills. However it is not always clear what evidence exists that they actually have the relevant qualifications or whose responsibility it is to check these credentials. This question has implications for professional responsibility, especially important in cases where there are regulations in place requiring that practitioners have the relevant certification (e.g. in accountancy, medical services, electrical installation) or requirements for checks for past convictions (e.g. for theft, dangerous driving, child abuse, sexual assualt). Some platforms, but by no means all, state that all their workers are fully vetted (without necessarily explaining how). The absence of such checks can lead to situations where the safety and health of the worker concerned, and of clients and members of the public, can be put at risk.

6   Policy questions

It is evident from preceding sections that the emergence of online employment exchanges raises major questions for regulators, employers and the social partners. It seems likely that even parts of the labour market not currently directly involved in crowdsourcing may be indirectly affected by it in a number of ways. These include pressure to reduce prices or wages in order to compete with services supplied by online platforms, with knock-on effects on collectively-agreed standards. Some companies, such as those providing translation, editing, transcription taxi, constructions or cleaning services may find that their existing business models are no longer viable at all, with SMEs particularly vulnerable. Creative workers (such as designers and writers) who have in the past managed to make a living from freelance work and independent tradespeople (such as window-cleaners, decorators or cleaners) may similarly find themselves driven out of business. Even in apparently unaffected sectors there may be an increase

in the numbers of staff carrying out additional work in their spare time on crowd platforms, leading to exhaustion and the possibility of the loss of motivation and loyalty.

At a broader level, policymakers will have some difficult decisions to make about how, and to what extent, the 'sharing economy' should be encouraged and regulated. It is undoubtedly the case that it brings major new social and economic opportunities as well as risks.

The opportunities include:

- Enabling access to work for people who would otherwise be excluded (eg people with disabilities, carers and people in developing economies).
- Enabling consumers to access affordable services on a just-in-time basis.
- Creating new opportunities for flexible ways to combine work and private life.
- Enabling low-cost entry into the market for new enterprises or firms trying out new products or services, thus contributing to growth and competitiveness.
- Enabling social innovation.
- Enabling creativity and self-expression and the generation of new cultural products and services.
  Helping to consolidate a European digital single market.

The risks include:

- Widespread evasion of existing regulations designed to protect workers and consumers
- Health and safety risks to workers and consumers.
- Distortion of markets for existing services (including housing, transport etc.)
- Growing precariousness and a 'race to the bottom' in relation to employment and working conditions
- Threats to European employers through undercutting by companies based elsewhere.
- Loss of quality control (including the ability to verify the authenticity of products and qualifications).
- The possible unravelling of the EU regulatory environment.

The challenge for policy stakeholders is to find a balance between these and to identify the forms of intervention that will reduce the risks whilst encouraging the opportunities. This may involve far-reaching reappraisal of existing regulatory instruments and institutions to see how they can be adapted to address the new challenges. It may also involve examining how social protection systems can be adapted to cater to the new realities in which the binary distinction between being employed or unemployed increasingly fails to capture the reality of life for contingent workers.

In order to do so, policymakers will need accurate information about the scale of crowdsourcing, the range of activities involved, the legal and contractual conditions under which they are carried out, the characteristics of crowd workers, their working conditions, the environments in which they work and the associated risks for workers, clients and the general public. Some suggestions for research that will help to assemble such information appear below.

7   Towards a future research agenda

Research on crowd work is in its infancy, although it is beginning to be addressed by scholars in a number of different academic disciplines[125] including labour sociology, communications studies, political economy, economic geography, development studies, gender studies and industrial relations. There is considerably more work to be done, both by academics and by public statistics offices, to gain a comprehensive overview. This might include:

Addition of questions to existing employer/ enterprise surveys

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[125] COST Action IS1202 on the Dynamics of Virtual Work has brought together a number of these experts from 31 European countries plus many non-European ones. See http://dynamicsofvirtualwork.com/ for further information.

There is currently a lack of information about how and in what circumstances companies make use of crowdsourcing services and the prevalence of this use. It would be useful to add questions to existing national and European enterprise and employer services to capture this information. Surveys could also be used to identify companies providing such services.

Analysis of business registers and other sources of enterprise data

In addition to survey information, it is possible that further information, such as the size categories and sectors of companies supplying online crowd services, can be gleaned from administrative data such as business registries.

Addition of questions to existing population/labour force surveys

There are a number of existing surveys at EU and national levels including household panel surveys, working conditions surveys, labour force surveys, surveys on income and living conditions and attitude surveys to which additional questions could be added to gather information on the demographic characteristics of crowd workers, their motivation for carrying out such work, the extent to which it forms a primary source of income, satisfaction with the work, attitudes to it, hours and working conditions.

Analysis of user data from online labour exchanges

A few online labour exchanges have already allowed researchers access to their data. It would be useful if others could be encouraged to do so, since this provides a valuable source of information on the characteristics of both buyers and sellers of labour on these platforms, including their geographical spread.

Qualitative research on crowd workers

So little is currently known about crowd workers that there is a need for a large amount of qualitative research, including research on their motivation, living and working conditions, work-life balance, gendered characteristics, psychosocial wellbeing and the relationship of crowd work to the rest of their lives, for instance whether it constitutes a primary source of income and identity or is a stop-gap solution or a supplement to other activities. Research that compares different types of crowd work, different social groups or different national contexts would also be interesting here.

Legal analysis

The pressing questions of what kind of legal status online exchanges should have, the employment status of the workers who use them, the contractual rights and obligations of platforms, workers and clients and where legal liability lies require research by legal scholars, perhaps complemented by case studies.

Policy analysis

The spread of crowdsourcing raises major questions for economic and social policy, in particular for labour market regulation, social protection and public safety. There is a need for policy analysis to clarify the ways in which these different areas currently interact with each other and identify aspects that may need reconsideration or adaptation in the future.

Foresight studies

In the absence of reliable information about future trends in crowdsourcing, foresight studies have a useful role to play.

Consultative research with the social partners

If it becomes widespread, crowdsourcing has the potential to bring about fundamental changes in the ways that labour markets are organised and thus in industrial relations. Indeed, it could threaten many of the features of current European social dialogue models. It is thus of the utmost importance that the Social Partners are able to hold informed discussions about these developments in order to formulate policy responses to them. This calls for focused research designed to meet their informational needs.