

Please quote as: Durward, D.; Blohm, I. & Leimeister, J. M. (2016): Crowd Work. In: Business & Information Systems Engineering (BISE), Ausgabe/Number: 4, Vol. 58, Erscheinungsjahr/Year: 2016. Seiten/Pages: 1-6.

Crowd Work

David Durward · Ivo Blohm · Jan Marco Leimeister

Received: 19 August 2015 / Accepted: 7 February 2016
© Springer Fachmedien Wiesbaden 2016

Keywords Crowd work · Crowdsourcing · Digital work · Division of labor

1 Crowd Work as a New Form of Digital Work

Crowd Work is a phenomenon of the digital economy as well as of the modern IT era. It provides a great potential for changing the way in which businesses create value. For instance, the gold producer *Goldcorp*¹ made its geographical databases available to the public and offered a prize to anyone who could tell them where to find gold. The results of this open call enabled Goldcorp to increase its gold production from 53,000 to 504,000 oz a year, while it cut production costs from \$360 to \$59 per ounce. As a consequence, the value of Goldcorp increased from \$100 million to \$9 billion. This example illustrates Crowd Work as a form of gainful employment that creates digital goods and services by using human, informational, and physical resources or makes extant use of digital tools (Alter 2013). In general, work is a purposeful and conscious activity. By contrast, gainful employment denotes the part of work

individuals expend to ensure the means of subsistence and income generation.

The rise of digitization has linked the economy with all other areas of our society at different levels, resulting in new forms of labor (Brynjolfsson and McAfee 2014). These digital forms of work and types of digital gainful employment include all activities in the production of digital goods and services. In addition to the ever-continuing digitization of working processes, companies are increasingly profiting from new technological possibilities, for example, by benefiting from the large flexible labor pool Internet users provide. This kind of service provision by means of an anonymous crowd of potential contributors via an open call is designated as crowdsourcing (Leimeister 2012). In crowdsourcing, a Crowdsourcer (e.g., a company, an institution, a group, or an individual) proposes a task via an open call to an undefined amount of potential contributors (Crowd Workers). Crowd Workers are not merely single individuals per se, but also organize themselves into formal or informal groups and organizations to jointly work on corresponding tasks. The unfolding interaction process between Crowdsourcers and Crowd Workers is facilitated via IT-based crowdsourcing platforms. This concept of task processing is complex and includes a variety of different concepts and terms for the support of various corporate functions.

Since the late 1990s, a number of professional services has been established almost unnoticed by the general public, and today they are firmly anchored in the real labor world. In recent years, however, these approaches have surfaced under the common term of “crowdsourcing”. The number of companies that use crowdsourcing for different tasks and systematically implement crowdsourcing into a

Accepted after two revisions by Prof. Dr. Sinz.

D. Durward · Prof. Dr. J. M. Leimeister (✉)
Information Systems, University of Kassel, Pfannkuchstrasse 1,
34121 Kassel, Germany
e-mail: JanMarco.Leimeister@unisg.ch

D. Durward
e-mail: david.durward@uni-kassel.de

Dr. I. Blohm · Prof. Dr. J. M. Leimeister
Institute of Information Management, University of St. Gallen,
Unterer Graben 21, 9000 St. Gallen, Switzerland
e-mail: ivo.blohm@unisg.ch

¹ <http://www.goldcorp.com/>.

wide variety of business processes is steadily increasing (Hammon and Hippner 2012). As a result, almost all primary and secondary activities of an organization can today be passed on to the crowd (see Fig. 1).

For instance, the German drugstore *dm*² employed the crowd to design a slogan for a shower gel in a “Soap Sourcing” campaign (i.e., Crowd Promotion). *Netflix*,³ a video streaming provider, asked the crowd to develop an algorithm for predicting movie ratings (i.e., Crowd Production). The Australian telecommunications provider *Telstra*⁴ uses the crowd to realize their own customer support (i.e., Crowd Support). The software company *Microsoft*⁵ makes use of the potentials from the crowd in order to test its own software applications (i.e., Crowd Testing). *Dell*⁶ actively involves the crowd in the development of new hardware and software products (i.e., Crowd Ideation). Moreover, the (partial) funding of projects through the crowd constitutes a recent trend. In this context, the German TV producer *Brainpool*⁷ collected over a million Euros for a movie idea in 1 week (i.e., Crowd Funding). Finally, logistic companies such as *Deutsche Post DHL*⁸ engage the crowd in parcel delivery (i.e., Crowd Logistic).

These examples show that Crowd Work constitutes a distinct type of labor that is located at the intersection of digital work and gainful employment. From an individual’s perspective, Crowd Work reflects a kind of digital gainful employment that is based on the crowdsourcing concept. Thus it can be described by the following three definitional characteristics:

1. The contributions and achievements of the Crowd Workers are financially remunerated. The intrinsic motivation to participate usually plays a minor role.
2. To ensure the means of subsistence, Crowd Workers make a substantial contribution to their income through Crowd Work on a full- or part-time basis.
3. Crowd Workers act as self-employed agents since they are not employed by Crowdsourcers on a regular basis. Thus, Crowdsourcers usually do not pay any contributions for social security when employing Crowd Workers. Further, Crowd Workers are not economically dependent and can freely choose their working arrangements and their working time (see Fig. 2).

Recently, Crowd Work has shown a strong track record. The number of Crowdsourcing intermediaries and Crowd Workers has been growing continuously. For instance, more than 17 million Crowd Workers are registered on *Freelancer.com*.⁹ This trend can also be observed on German intermediaries such as *Testbirds*,¹⁰ which has an installed crowd of more than 100,000 testers. In this context, the World Bank expects the market size for Crowd Work to grow to \$4.8 billion by 2016 and estimates a gross revenue of up to \$25 billion for the Crowd Work industry (Kuek et al. 2015). Because a Crowd Worker is often active on crowdsourcing platforms of multiple intermediaries and partially performs highly diverse tasks, different time- or result-oriented payment models have been developed. For example, a Crowd Worker at *99Designs.com*¹¹ receives a result-based payment for the submission of the winning logo in a design contest, while Crowd Workers on *Freelancer.com* can receive an hourly wage, for instance, for the translation of a medical text.

By contrast, participation in crowdsourcing initiatives may have different motives and does not necessarily require financial remuneration. In this regard, the *British Museum*¹² turned to the crowd to have 30,000 handwritten documents from the 18th century transcribed – without paying for it. In this example, the participation of the crowd is unpaid. Thus, it cannot be referred to as Crowd Work. Rather, Crowd Work is a *digital form of gainful employment*, in which an *undefined mass* of people creates digital goods via an *open call*. Substantial parts of the value creation take place on *IT-facilitated platforms*.

2 Crowd Work as a Digital Working System

The phenomenon of Crowd Work is not only tied to the individual level of the Crowd Worker. From an organizational perspective, Crowd Work includes the transformation of permanent jobs into a flexible resource pool in which Crowd Workers undertake the tasks in a project-based manner. In line with an increasing erosion of corporate boundaries as well as the resulting closer linkage of internal and external business processes, different varieties of Crowd Work have been established in practice, which can be subdivided according to the type of the participating Crowd Workers (see Fig. 3).

In case I, the company’s internal workforce acts as a crowd. Consequently, every employee of the concerned

² <http://www.dm.de>.

³ <http://www.netflix.com>.

⁴ <http://www.telstra.com.au>.

⁵ <http://www.microsoft.com>.

⁶ <http://www.dell.de>.

⁷ <http://www.brainpool.de>.

⁸ <http://www.dhl.de>.

⁹ <https://www.freelancer.com>.

¹⁰ <http://www.testbirds.de>.

¹¹ <http://99designs.com>.

¹² <http://www.theguardian.com/science/2014/aug/18/volunteers-british-museum-crowdsourcing-archeology>.

Fig. 1 Applications of Crowd Work in the value creation of companies (Source: Own depiction, 2016)

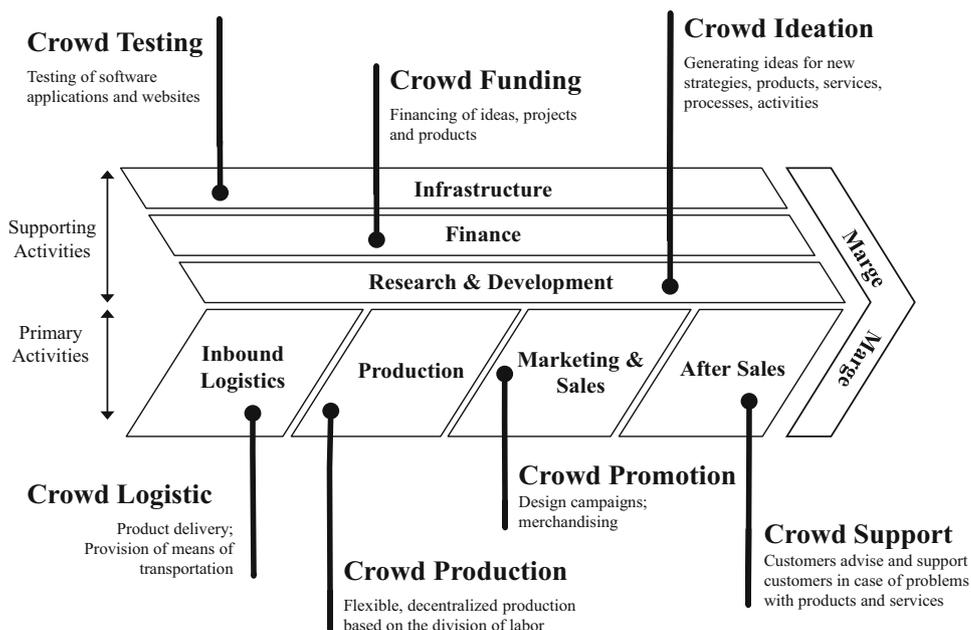
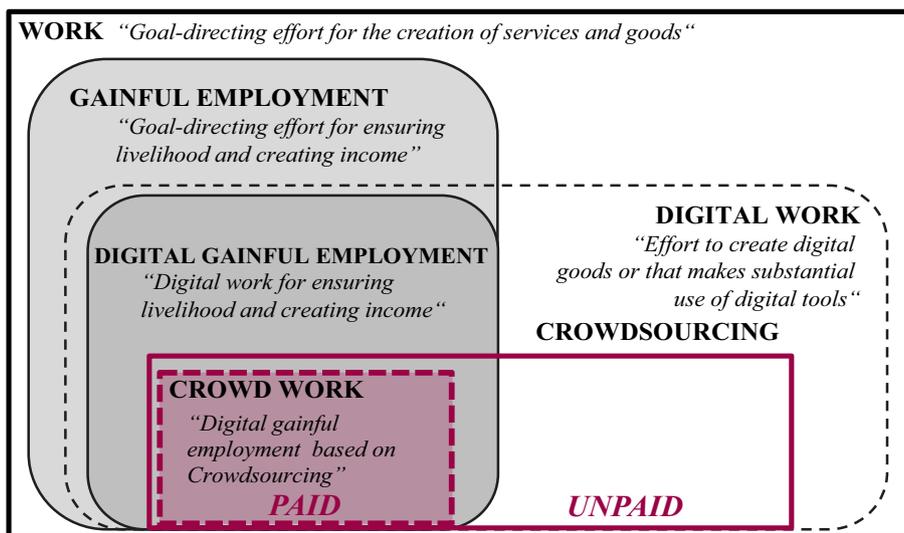


Fig. 2 Classification of Crowd Work from an individual worker’s perspective (Source: Own depiction, 2016)



company who takes on responsibilities on corporate crowdsourcing platforms can be described as Crowd Worker. For instance, an international insurance company maintains an internal crowdsourcing platform on the intranet on which all employees of the insurance company can make suggestions for a new risk management system in the automotive sector and can jointly further develop these. In the case of external Crowd Work, the crowd includes individuals who do not have to have a relation to the Crowdsourcer. These are all people from outside the company boundaries, and thus in principle every individual with Internet access can participate as Crowd Worker. Here, the platform will either be operated directly by a

Crowdsourcer (case II) or provided by a crowdsourcing intermediary (case III). Crowdsourcing intermediaries install a crowd, the members of which can be invited by the Crowdsourcer via an open call to handle specific tasks by themselves.

The evolving exchange process between Crowdsourcer and Crowd Worker differs fundamentally from existing work processes and is mainly determined by the crowdsourcing platform (see Fig. 4). The task is specified and described at the beginning before the Crowdsourcer passes this information on to the crowd via an open call. After the Crowd Workers have signed up voluntarily to participate, the most suitable Crowd Workers are selected by the

Fig. 3 Varieties of Crowd Work (Source: Own depiction adopted from Zogaj et al. 2014)

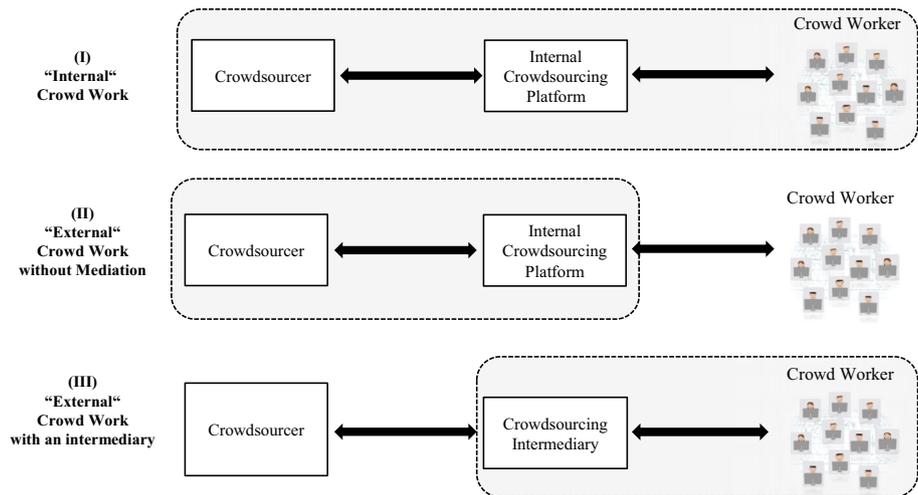
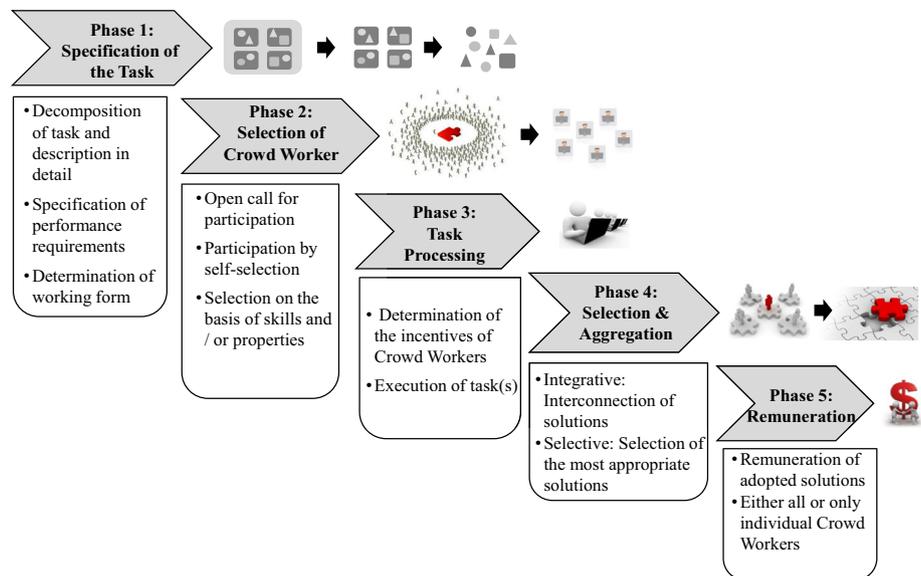


Fig. 4 Ideal-typical process of crowd work projects (Source: Own depiction, 2016)



Crowdsourcer or the intermediary. The chosen Crowd Workers start to process the actual tasks and submit their solutions. Finally, the solutions are merged, and the remuneration of the Crowd Workers completes the project.

Following this line of reasoning, Crowd Work describes a new system for the coordination of work that can be classified as ranking between the established forms of the two organizational principles of Market and Hierarchy (Table 1).

Concerning the type of participants, Crowd Work can be found both in an internal and external business context, where mixed forms can be observed as well. Thus, a company whose employees develop new products as part of an internal design competition can have the subsequent implementation accomplished by an external crowd. Furthermore, prices serve as a means of coordination on

markets, while rules specify the workflow in a hierarchical form of organization. In contrast, terms and conditions in Crowd Work are primarily coordinated by the self-selection of the Crowd Workers and the skill-based (pre-) selection by the Crowdsourcer or the intermediary.

In Crowd Work, tasks vary significantly in their degree of flexibility. On the one hand, Crowd Work can include the flexibility of market-like interactions. Particularly in creative tasks, such as the design of a new corporate website, the Crowd Worker enjoys a lot of freedom regarding sequence, method and procedure of task processing. On the other hand, other tasks, for example transcribing sound recordings or searching for addresses, can be stringently pre-defined and very restrictive. This is particularly the case in the domain of microtasking. Furthermore, *decision-making mechanisms* in Crowd Work are

Table 1 Crowd Work as a new organizational form between market and hierarchy (Source: Own depiction adapted from Powell 1990)

Characteristic	Organizational form		
	Market	Crowd work	Hierarchy
Type of participants	External	External, internal, mixed	Internal
Coordination mechanism	Price, quality	Self-selection, skill-based (pre-) selection	Rules, authority
Degree of flexibility	High	Varying	Low
Decision-making mechanism	Independent	Interdependent, mutual	Dependent, unilateral
Duration of relationship	Short-term	Varying	Long-term
Division of labor	Low	Varying	High

of mutual nature. The Crowdsourcer and the Crowd Worker are interdependent, since they negotiate the terms and conditions of tasks; thus, decisions are usually made within the framework of bilateral interaction. Finally, the duration of the relationship between Crowdsourcer and Crowd Worker varies considerably in Crowd Work. Designing a book cover is usually a onetime interaction resembling a short-term contractual relationship, while other Crowd Workers (e.g., in the field of translation services) frequently maintain long-term relationships with individual clients during which they receive tasks on a regular basis.

Another characteristic of Crowd Work is that the division of labor occurs in various forms. Designing a company logo does not usually involve any division of labor. After the Crowdsourcer has broadcasted the design task, the actual creation of each design proposal is performed by only one Crowd Worker. By contrast, Crowd Work in the field of software development has a high degree of division of labor. The actual task of developing new software is decomposed into several smaller subtasks, which are then processed by different Crowd Workers. The individual contributions of the Crowd Workers (e.g., software design, programming, validation, and verification) are merged and aggregated to arrive at a final solution. This crucial stage, including decomposition, distribution and aggregation of subtasks, is performed primarily by the Crowdsourcers themselves or by the intermediaries. What is more, even though there was originally no division of labor required, tasks – for example, creating a website – are increasingly decomposed by Crowd Workers who distribute subtasks to other Crowd Workers and eventually present a final solution to the Crowdsourcer.

3 Relevance for Business and Information Systems Engineering Research

Crowd Work is an IT-enabled process innovation for the organization of work that has the potential to change the nature of value creation in a disruptive fashion. Through

increasing digitization, the expansion of Crowd Work will gain momentum, providing many opportunities and challenges for IT professions and organizations. On the one hand, organizations can realize quality gains through the flexible, scalable and fast access to remote employees, resources and skills. On the other hand, the location- and time-independent distribution and parallelization of tasks may result in significant reductions of the time needed for task processing. Moreover, additional productivity gains (i.e., industrialization and hyperspecialization) are potentially realizable for Crowdsourcers due to increasing standardization and decomposition of tasks into smaller subtasks. On the individual level of the Crowd Workers, new employment opportunities and an increased availability of work emerge. Almost every Internet user can register at a crowdsourcing intermediary's platform and start undertaking tasks without any of the restrictions that may be found in offline labor markets. Due to the great variety of job offers in the crowd, the Crowd Worker can select the type and the scope of tasks in a more self-determined and flexible way.

On the flip side, various challenges need to be addressed if Crowd Work is to be widely adopted. From an organizational perspective, there exist risks of knowledge losses and losing control over the crowd's activities. Also, the internal workforce may develop resistance. For Crowd Workers, the greatest risks are not only the very low payment and monotonous working processes but also the automatic monitoring system by the crowdsourcing platform. Furthermore, Crowd Workers build up a digital reputation while processing tasks by obtaining positive reviews, which, however, are usually bound to a particular intermediary and thus cannot be transferred to another intermediary. Against this background, general considerations aiming at designing fair and good work conditions for Crowd Work from a socio-technical point of view will become increasingly relevant. In this context, fair rules addressing compensation, access to information, intellectual property, and existing power asymmetries between Crowdsourcer and Crowd Worker will be of high relevance.

In addressing these issues, Business and Information Systems Engineering (BISE) research could and should play a leading role. The design of IT-facilitated work systems and collaboration mechanisms is at the very core of this discipline. The design of these prerequisites are essential for defining guidelines for Crowd Work that, on the one hand, allow organizations to benefit from the potentials of Crowd Work, and, on the other hand, ensure good and fair working conditions for individual Crowd Workers. Therefore, the design of appropriate incentive and remuneration mechanisms for Crowd Workers as well as effective collaboration structures among participants will play an essential role.

Acknowledgments The authors express their gratitude to the Hans-Böckler-Stiftung (HBS), the International Labour Organization (ILO) and the Foundation for European Progressive Studies (FEPS) for assistance in writing this article. This catchword was composed as part of the project “*Crowd Work – Arbeiten in der Wolke*” financed by the Hans-Böckler Stiftung.

References

- Alter S (2013) Work system theory: overview of core concepts, extensions, and challenges for the future. *J Assoc Inf Syst* 14(2):72–121
- Brynjolfsson E, McAfee A (2014) *The second machine age: work, progress, and prosperity in a time of brilliant technologies*. WW Norton & Company, New York
- Hammon D-KL, Hippner H (2012) Crowdsourcing. *Bus Inf Syst Eng* 4(3):163–166
- Kuek SC, Paradi-Guilford C, Fayomi T, Imaizumi S, Ipeiros P, Pina P, Singh M (2015) *The global opportunity in online outsourcing*. World Bank Group, Washington
- Leimeister JM (2012) Crowdsourcing. *Control Manag* 56(6):388–392
- Powell W (1990) Neither market nor hierarchy. In: Handel MJ (ed) *The sociology of organizations: classic, contemporary, and critical readings*. Research in organizational behavior. Sage, Thousand Oaks, pp 104–117
- Zogaj S, Bretschneider U, Leimeister JM (2014) Managing crowd-sourced software testing: a case study based insight on the challenges of a crowdsourcing intermediary. *J Bus Econ* 84(3):375–405