Crowdsourcing in China
Opportunities and Concerns

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Crowdsourcing is a powerful technique that harnesses distributed human intelligence to solve organizational problems. Here, the authors critically review the latest developments in crowdsourcing in China.

Traditionally, organizations rely on management teams and employees to establish, implement, and continually improve organizational systems to deliver products and services that meet customer needs. When problems exist, an organization depends on its management and employees to generate solutions. However, organizations are now predominantly customer-driven, and many of their problems are associated with their failure to meet customer expectations. Hence, those outside the organization—people who aren't bound by factors such as the organization's structure, hierarchy, time constraints, and field of specialty—might be able to help. These people enjoy the greatest freedom in deciding whether to participate and in voicing their ideas, opinions, and suggestions, whether "good" or "bad."

The advent of IT has motivated organizations to tap into the enormous amount of spare processing power that millions of human brains can provide outside organizational boundaries.[1] Jeff Howe coined the term *crowdsourcing* and defined it as

> the act of a company or institution taking a function once performed by employees and outsourcing it to an undefined (and generally large) network of people in the form of an open call. This can take the form of peer-production (when the job is performed collaboratively), but is also often undertaken by sole individuals. The crucial prerequisite is the use of the open call format and the large network of potential laborers.[2]

Since its introduction, crowdsourcing has evolved as a pragmatic model for problem solving and an integral part of social commerce.[3–5]

Crowdsourcing's supporters argue that two heads are better than one and that a crowd is

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better than individuals; its opponents, however, suggest that a crowd's IQ equals the lowest individual IQ divided by the number of people in the crowd.[5] Hence, recognizing crowdsourcing's characteristics, exploring its application domains, and identifying the strengths, weaknesses, and obstacles to its implementation are crucial areas of study. With more than half a billion Internet users in China, crowdsourcing is a growing market. Here, we provide a critical review of crowdsourcing's development in China.

Crowdsourcing Application Domains

Crowds are the source of both power and problems in every society. Crowdsourcing's power comes from the brain's creativity and how it operates differently from a machine such as a computer. Thus, crowdsourcing's strengths are grounded in human cognitive ability, which is developed through learning, imagination, and fuzzy memorization, as well as the fusion of ideas, opinions, and experiences. In addition, numerous situations exist in which people consume the outputs of processes. Crowdsourcing is the best way to obtain solutions because an answer's correctness is judged based on people's perceptions, opinions, and feelings. In information retrieval and management, relational database systems are restricted by underlying assumptions,[5] including the stored data's completeness, correctness, and unambiguity. When these assumptions can't be met, the relational database systems will fail to return any answers or will return incorrect or incomplete answers to users even if the systems can do otherwise. Hence, Michael Franklin and his colleagues started exploring a crowdsourced query-processing system (CrowdDB) that provides answers to queries that can't otherwise be answered.[6]

However, crowdsourcing isn't without limitations. For example, in crowdsourcing, a problem is broadcasted to numerous people who have varying degrees of expertise and motivations. The quality of solutions or answers will thus depend greatly on the skills and motivations of the people who perform the tasks. Furthermore, the structure and interfaces that let participants communicate with the solution providers about those tasks affect performance in terms of both latency and cost.[6]

Crowdsourcing's success thus relies on

- how an organizational problem is defined,
- how it's broken down into workable items (that is, subproblems),
- how these subproblems are understood by the "crowd,"
- how much knowledge and experience the crowd members have,
- whether crowd members are actively participating in deriving possible solutions to the subproblems,
- whether crowd members are learning from the participation process, and
- how solutions for each workable item or subproblem are selected and integrated to solve the main problem.

Hence, an integrated platform is necessary to crack a problem into elements that are understandable and workable, as well as to ensure an open, transparent, and informative evaluation of the submitted solutions. One example is InnoCentive, a crowdsourcing platform launched in 2001 with funding from the pharmaceutical giant Eli Lilly. InnoCentive lets organizations tap into the talent of a specific crowd (that is, a global scientific community) for innovative solutions to challenging R&D problems. It then presents scientists with financial awards for solving these challenges. At the other end of crowdsourcing applications, Amazon Mechanical Turk is a crowdsourcing platform used primarily for simple human intelligence tasks (HITs), such as data collection and simple text translation.

Organizations must also establish a systematic and efficient process to evaluate solutions because people in the crowd might submit a large number of answers or solutions. For example, more than 20,000 suggestions were submitted on how to stem oil flow during the 2010 BP oil spill,[7] but many of them were inadequate to address this highly technical problem. To maintain its reputation, BP had to evaluate all the submitted solutions under political and social pressure, which consumed a huge amount of human resources, time, and cost.

Table 1 shows the continuum of crowdsourcing platforms and associated examples in the US and China. As the table illustrates, crowdsourcing jobs vary significantly from very simple to highly

Table 1. The continuum of crowdsourcing platforms.[1,3–5]

Nature	Skills required	Openness	Time involved	Remuneration	Examples (Western)	Examples (China)
Simple human intelligence tasks such as data collection and matching	Minimum	To all	Minimum per task	US$1 `or less (micropayment)	Amazon Mechanical Turk	—
Data analysis, design, and so on	Intermediate	To all/the selected crowd	Various	US$10–$1,000	Humangrid, Wilogo, Freelancer	Zhubajie, Taskcn, Epweiki, 680
Problem solving, R&D challenges	Strong scientific knowledge	To the selected crowd	Exhaustive	US$1,000–$1,000,000 (huge)	InnoCentive	—

complex and challenging. Between these two extremes, an intermediate category of crowdsourcing relates to analytical and creative tasks, such as data analysis, artistic design, and photography.

Moreover, Western crowdsourcing platforms can be grouped into three transaction models: engagement, competition, and tender.[8] The *engagement model* refers to a buyer hiring multiple sellers to perform microtasks or works paid on an hourly basis. Amazon Mechanical Turk is one such platform. In a *competition model*, a seller must complete some or all of the tasks in competition with other sellers. A buyer then chooses the best work and pays the winner. In a *tender model*, a buyer selects a seller before the project begins. This selection is based on sellers' bids, which normally include cost, experience, and samples of previous work. Freelancer is one example. Erran Carmel indicated that Western platforms primarily adopt the tender model, whereas Chinese platforms such as Zhubajie and Taskcn mainly use the competition model.[8]

Crowdsourcing Development in China

At 1.3 billion, China is the world's most populous nation. In June 2013, the number of Web users in China was 0.59 billion; this number is expected to increase to 0.69 billion by 2017.[8] More than 65 percent of Chinese users access the Web through mobile devices.[9,10]

In recent years, the Chinese economy has developed rapidly, and the number of college graduates has increased to roughly 8 million a year. Many of these graduates studied vocationally oriented disciplines—including business, finance, marketing, management, sciences, and engineering—in universities and would like to apply their knowledge and skills to solve applied and practical problems.[11] With such a vast amount of brainpower and numerous people seeking to earn additional income during their spare time, crowdsourcing in China has developed rapidly in the past two years.

At the time of writing, Zhubajie (www.zhubajie.com) had established itself as a crowdsourcing leader with more than 9 million active workers (witkeys); it covers a range of online and offline services, including tutoring and logo and product design. Zhubajie has facilitated more than 2 to 4 million renminbi (RMB) of transactions a day and more than RMB 3.1 billion worth of transactions cumulatively. In July 2012, Zhubajie launched a global online crowdsourcing service market (www.witmart.com) to facilitate transactions in services and designs using English as a medium.

The second largest crowdsourcing company is Epweike (www.epweike.com), with roughly 5.6 million active workers, followed by Taskcn (www.taskcn.com) and 680 (www.680.com or www.vikecn.com), with 3.4 and 2.9 million witkeys, respectively. Many jobs available via Taskcn involve logo and product designs, with a remuneration of RMB 500 to 5,000.

Table 2 shows these sites' rankings, the number of witkeys, the number of jobs completed, and the cumulative transactions in RMB.[12,13] Other crowdsourcing companies are much smaller than these top four, which have hundreds of thousands of witkeys providing specialized services.

Figure 1 shows the development of the dominant player in China, Zhubajie. The company officially launched its service in September 2006[13] and took almost four years to reach a total of RMB 100 million in cumulative transactions. This number increased from 100 million to 1 billion RMB in about two years. Cumulative transactions increased further from 1 billion in July 2012 to 3.1 billion RMB in February 2014. Figure 1 also

Table 2. Top four crowdsourcing companies in China*

Company	Traffic rank		Average number of visits per day	Number of witkeys	Number of jobs completed	Cumulative transactions (in millions of RMB)
	China	Global				
Zhubajie	363	4,962	777,000	9,822,200	2,205,551	3,104
Epweike	2,477	10,355	333,000	5,600,725	139,257	2,757
Taskcn	17,316	273,971	15,000	3,429,994	109,989	37
680	5,140	73,721	48,000	2,919,938	54,747	32

**Data were extracted from Alexa.com, Alexa.cn, and the company websites on 27 January 2014.*[12,13]

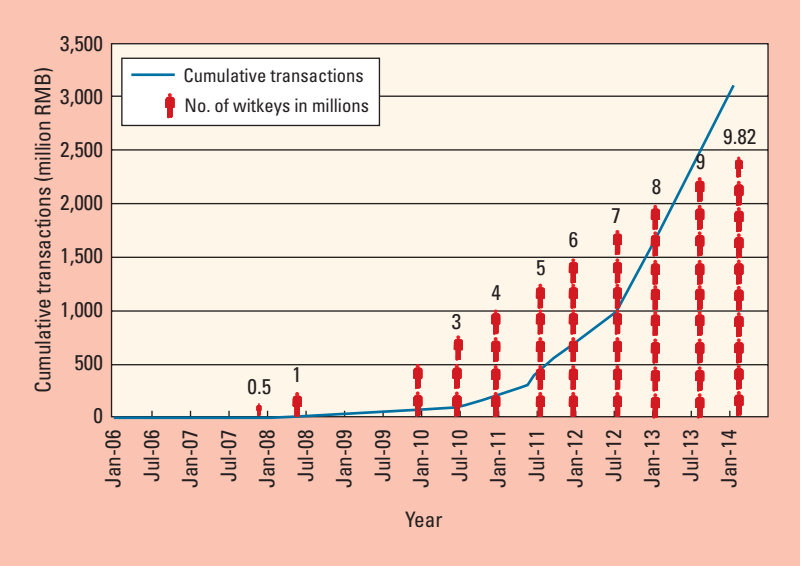

Figure 1. Development of Zhubajie from 2005 to 2014. The number of cumulative transactions (shown in millions of RMB) increased from 100 million to 1 billion in approximately two years.

shows that the number of witkeys has increased steadily since January 2010, with roughly 1 million witkeys signing agreements every six months.

Commercial Crowdsourcing Activities: Pepsi Creative Challenges

Crowdsourcing in China isn't restricted to those activities, jobs, or opportunities posted in crowdsourcing platforms such as Zhubajie. For example, Pepsi engaged Chinese consumers in co-creating its brand image in China by organizing annual Creative Challenges from 2006 to 2009.[14]

In Pepsi's first Creative Challenge, the company invited consumers to co-create its next TV commercial, starring Asian superstar Jay Chow, by submitting scripts of no more than 200 words. After the Challenge was officially launched, Pepsi's site received thousands of entries within a few days. In total, around 27,000 scripts were submitted within the six-week entry period. The winner of the Challenge was M. Li, a high school teacher in Zhejiang, who received RMB 12,500—more than a teacher earned in a year in China at that time. Li was also invited to participate in production meetings for the TV commercial.

Pepsi's second Creative Challenge invited Chinese consumers to nominate people whose faces would appear on Pepsi cans, calling it the "I Want to Go on a Can" campaign. By leveraging the promotion of this challenge through online advertising, events, and TV advertising, the campaign attracted 2.5 million submissions within the six-week entry period. In the following three months, 25 million unique visitors cast nearly 144 million votes for their favorites; one of the winners was a Buddhist monk with a blog. In 2008, the year the Olympics was held in Beijing, Pepsi invited consumers to send in slogans and pictures of themselves via mobile phones to express their patriotic spirit in its "Go China" campaign. Pepsi received 28 million submissions and more than 122 million votes to pick the winners, whose photos and slogans were printed on Pepsi soda cans.

Pepsi's final Creative Challenge was called "Create Your Wish for China," a campaign marking the 60th anniversary of the founding of the People's Republic of China. Pepsi partnered with Tencent so that consumers could submit their wishes using one of Tencent's three social networking platforms (Taotao, QQ, and QZone).

In total, Pepsi received 34 million entries and 11.3 million votes. The winning wish, from Hubei province, gained about 200,000 votes. The 10 most popular wishes also won a coveted spot on a 2010 Pepsi TV commercial.

Through its Creative Challenges, Pepsi used crowdsourcing to enhance its brand image and awareness, and its efforts paid off—Pepsi became the leader of China's cola market.

Social Crowdsourcing Activities: Danger Maps

While the Pepsi projects were crowdsourced commercial activities, the Danger Maps project in China (www.weixianditu.com) is a social activity. Danger Maps arose in response to increasing concern about China's environmental pollution, including ground, water, and air pollution.[15] The project uses crowdsourcing to map known and newly identified environmentally contaminated and polluting sites, including landfills and oil refineries. Started by Liu Chunlei and supported by Chinese B2B e-commerce company Alibaba's charitable organization, the project currently lists about 6,000 pollution sites.[15] These sites are plotted onto Baidu Map, which lets users search for sites near them or near a particular location. Danger Map's creator was inspired to set it up after learning that his recently purchased apartment was located on a landfill site, a fact that wasn't disclosed prior to the sale.[16]

The social and operational implications of Danger Maps are interesting. Mike Wheatley explains that the site was inspired by similar crowdsourced activities,[16] such as tracking radiation leakage following the Fukushima nuclear disaster and monitoring post-election violence in Kenya. Thus, Danger Maps is firmly within the crowdsourcing ethos of user contributions that address environmental, social, and political problems. Interestingly, Danger Maps has yet to attract negative attention from authorities, though Liu does remove inaccurate or libelous entries as a quality control measure.[16] Although Wheatley attributes this state to interest from external investors,[16] it could also stem from the increasing demand for information about environmental and social conditions. Given that environmental pollution is the main cause of social unrest in China, Danger Maps speaks to a clear need for additional information about pollution and the growing social concerns. Thus, although the Danger Maps platforms are different from Western crowdsourcing efforts, the project arose from the same type of social movement.

Advantages and Opportunities

China offers several crowdsourcing advantages and opportunities, including the online population's size,[9,10] people's availability for crowdsourcing activities, and their willingness to participate (see Table 2 and Figure 1). Chinese online users are also strong content creators, with 76 percent of online users actively creating content—compared to approximately 25 percent of American and European online users.[17] Compared to these nations, Chinese online users are more ready and willing to engage with other content creators, create their own content, and socially connect with other users. Campaigns such as Pepsi's Creative Challenges demonstrate that the Chinese market is strongly accepting of crowdsourcing activities. This high participation rate isn't limited to recreational activities. Freelancing sites such as Zhubajie also have high participation, with a much larger base of workers or potential workers than similar Western sites such as Freelancer.[18] Thus, one key advantage to crowdsourcing in China is the large and willing participant group. In addition, Zhubajie and other Chinese crowdsourcing commercial platforms predominantly use the open competition model, in which witkeys' information is public; this lets people consider the task complexity, reward, and other witkeys' abilities when deciding whether to participate in a project or task.[19]

Another advantage to crowdsourcing in the Chinese market is that it can be less expensive than in Western markets (although this naturally depends on the scale and type of activity). The Danger Maps case demonstrates this reduced cost: initial startup funds provided by Alibaba totaled only RMB 50,000 (around US$8,150).[18] Commercial activities might also find reduced costs for microtasks and Mechanical Turk activities undertaken in the Asian market, including China; the same might be true for detailed graphic design and other custom work.[18] This situation is advantageous to both sides, with Western clients paying less than they would for comparable services, and various crowdsourcing service providers making substantially more than average in their area.[18] These services also aren't closed

off to English speakers; for example, Zhubajie's English subsidiary Witmart offers access to non-Chinese speakers.[18] Chinese freelancers also participate in other markets, meaning that the actual size and cost of the market might be understated. Thus, additional key advantages to Chinese crowdsourcing are that it's cheaper than similar Western activities (while not disadvantaging workers) and also more accessible.

Concerns and Obstacles

There are key advantages to crowdsourcing in China, but there are also several key concerns. One of the most basic is the language barrier between client and crowdsourcing partners. Although it's not uncommon for a Chinese crowdsourcing worker to speak English or another lingua franca, it can't be guaranteed. These barriers aren't insurmountable (as Witmart's development shows), but some potential barriers remain, such as gaps in understanding or communication. However, this disadvantage can be overcome through translation services (which crowdsourcing can also provide) or the careful choice of participants.

Another concern is censorship and government control. Several large and successful crowdsourcing activities are currently operating in China, including both commercial and social activities, as discussed previously.[14–18] These activities generally haven't attracted negative attention from Chinese regulators or censors. However, potential government censorship could still be considered a business risk. In some cases, firms might avoid operating in China entirely as a moral statement about the appropriateness of government censorship—most notably, Internet search firm Google.[20] Firms might also face a problem with customer perceptions of their operating in China, as Google did—especially if they are seen as contributing to censorship. Thus, while government control and censorship isn't a large problem for crowdsourcing sites, it can still be an obstacle.

Finally, cheating and infringement of intellectual property rights (including patent, trademark, and copyright) are serious problems that adversely affect crowdsourcing's development in China.[21] Intellectual property rights are considered risky for some firms entering China because the poor formulation and enforcement of such laws have left intellectual property open to misuse.[22] Broadcasting a problem to numerous people means that a company might leak its secret or strategic development plans to people outside the company. Hence, creating credibility and trust among project proponents, witkeys, and crowdsourcing platforms is critical to the future development of crowdsourcing technology in China.[22,23]

With nearly 0.6 billion potential crowdsourcing participants, China as a single crowdsourcing market is unrivaled in the West. Despite the size of China's Internet user population (slightly larger than the entire population of North America), market penetration is still low, with only approximately 40 percent of Chinese people using the Internet. Internet use rates in China are rapidly increasing, however, driven by growing real GDP and increasing per capita income and earnings, as well as by technological penetration outside urban areas. Thus, the potential size of the crowdsourcing market is likely to grow significantly over time.

Clear signs exist that China is actively engaged in crowdsourcing on both a commercial and social level. China is already one of the biggest suppliers of online freelance workers in the world through sites such as Zhubajie. Crowdsourced social projects such as Danger Maps also show that Chinese Internet users are actively engaging with crowdsourcing for various reasons. The relatively low cost of crowdsourcing, as well as the increasing access to Chinese markets through sites such as Witmart, means that Chinese crowdsourcing is both accessible and cost-friendly. Connecting Chinese and Western crowdsourcing represents a significant opportunity for both social and commercial activities, which can be driven by a large market, high enthusiasm and participation rates, and low costs. Barriers such as intellectual property and government censorship shouldn't stand in the way of this market's development. IT

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