Inter-Organizational Governance and Trilateral Trust Building: A Case Study of Crowdsourcing-based Open Innovation in China

Abstract

China has stepped into the Internet era with the emergence of a large number of e-commerce players. However, Internet-based crowdsourcing of R&D projects, a primary form of open innovation, is still lacking. In a case study of a Chinese crowdsourcing intermediary (CI), the authors explore the impact of inter-organizational governance on trilateral trust building. They show that formal control and relational governance mechanisms are essential for swift- and knowledge-based trust in R&D crowdsourcing. The case also indicates that Chinese businesses continue to use *guanxi* (informal personal connections) as a relational and contingent mechanism to maintain affect-based trust, but *guanxi* is shown to inhibit the growth of Internet-based crowdsourcing for open innovation in China.

Key Words: Chinese context, crowdsourcing, open innovation, R&D, trust

Introduction

Scientists and organizations are increasingly and broadly collaborating in engineering, computer sciences, chemistry, life sciences, and physical sciences research and development (R&D) projects through crowdsourcing intermediary (CI) platforms such as innocentive.com, innovationexchange.com, and yourcencore.com (Chesbrough, 2006). Companies are now widely accepting R&D crowdsourcing as a primary means for reducing the costs of R&D for innovation needs (West & Bogers, 2014). As China steps into the Internet era, many e-commerce players, Internet users, and websites have emerged to perform tasks such as logo and website designs and translation services. Although China's rapid economic growth has increased the demand for R&D, Internet-based open innovation platforms present a dual challenge (Gassmann & Han, 2004). Most small and medium enterprises (SMEs) lack internal R&D workforces, but China has a large pool of talent able to conduct essential R&D projects. However, China's companies and research institutions resist placing such high-value R&D projects on crowdsourcing websites, and few researchers have systematically addressed how the resistance affects the growth of R&D crowdsourcing for innovation in the Chinese context.

Crowdsourcing is an effective approach to innovation, but to avoid exchange hazards, build trust in online environments, and form customer–client relationships, crowdsourcing sites need formal controls such as written contracts, feedback, escrow services, and credit card guarantees (Ulset, 1996; Willamson, 1985). They also need relational governance emphasizing mutual trust, relational capital, communication, and collaboration (Dyer & Singh, 1998; Lee & Cavusgil, 2006). Inter-organizational trust is essential for business transactions and building successful long-term relationships and alliances among companies (Zaheer, McEvily, & Perrone, 1998;

Zaheer & Venkatraman, 1995). The extant literature mainly focuses on trust-building of vendor–client or alliance bilateral relationships, but few studies examine trust building of trilateral relationships comprising intermediaries that facilitate activities between two companies (Gefen & Straub, 2004; Pavlou & Gefen, 2004; Stewart, 2003). Because Internet intermediaries replace traditional agents in connecting geographically separated vendors and clients, we lack sufficient knowledge about trust development in the virtual world among clients, online intermediaries, and vendors in the context of crowdsourcing-based open innovation.

Drawing from the literature on inter-organizational governance and trust development, we address a research question: how can inter-organizational governance mechanisms be adapted to enhance trilateral trust building in crowdsourcing-based innovation in China? By focusing on the Chinese context and by using a case study, we provide additional insights into how Chinese firms utilize inter-organizational governance mechanisms for open innovation. We find that Chinese CI differs from western practices where CI is an open platform for inter-organizational exchanges to accomplish R&D crowdsourcing tasks. Instead, Chinese CIs more intensively govern crowdsourcing processes, trilateral interactions, and trust-building between users, but lack proper formal control and relational mechanisms to manage swift- and knowledge-based trust. More importantly, we find that Chinese CIs utilize *guanxi*, or informal personal connections, to maintain affect-based trust. Based on the case findings, we propose that *guanxi*-based relational governance challenges open innovation and prevents organizations from utilizing online crowdsourcing for R&D projects.

This study makes several important theoretical contributions to the open innovation literature. Foremost are theoretical contributions that incorporate the literature of inter-organizational governance and trust development. Our study underscores that CIs must have

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appropriate governance mechanisms to develop swift- and knowledge-based trust among

crowdsourcers, crowdsourcees, and CIs. We also contribute to the literature of open innovation

by identifying effective governance mechanisms specific to the Chinese context (Byrum &

Bingham, 2016). Second, extending the inter-organizational governance literature and e-

commerce trust concept (Ba & Pavlou, 2002; Benbasat, Gefen, & Pavlou, 2008) to the

crowdsourcing context, we contribute to understandings of trust building in trilateral business

relationships (Svensson, 2004) and show that swift- and knowledge-based trust is essential if

crowdsourcing is to grow. Third, we offer additional understanding of *guanxi's* (Chen et al.,

2013) double-edged functions in governing relations but preventing the growth of

crowdsourcing-based open innovation in China.

The paper is organized as follows: First, we discuss the related literature highlighting the

roles of crowdsourcing-based open innovation. Then we discuss inter-organizational governance

and trust development in the crowd-sourcing environment. We introduce our research context

and methods, followed by our main findings and discussion.

Crowdsourcing-Based Open Innovation

Open innovation is defined as an approach that firms use to acquire external knowledge across

industries to complement their internal knowledge base, to advance their technology, and to

acquire competitive advantage (Chesbrough, 2003, 2006). Firms often use internal employees or

the community for open innovation, but most frequently rely on online crowdsourcing for

sundry purposes (Cabiddu, Castriotta, Di Guardo, & Floreddu, 2013; Sieg, Wallin, & Von

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Krogh, 2010), from simple letter writing or graphic design projects to complex R&D innovation (Andriole, 2010; Erickson, 2012).

Online crowdsourcing website stakeholders include crowdsourcers, crowdsourcees, and crowdsourcing intermediaries (CIs) (Brabham, 2008; Cabiddu et al., 2013; Majchrzak & Malhotra, 2013). *Crowdsourcers* initiate the crowdsourcing process by submitting task requests and specifying the acceptance criteria. *Crowdsourcees* are registered members who are paid by the clients to undertake and execute tasks. *CIs* are the online brokerage companies acting as intermediaries or virtual knowledge brokers (Frey, Lüthje, & Haag, 2011; Howells, 2006; Katzy, Turgut, Sailer, & Klaus, 2013; Verona, Prandelli, & Sawhney, 2006), ensuring that crowdsourcees successfully complete projects and that crowdsourcers pay for the services (Zogaj, Bretschneider, & Leimeister, 2014).

Because CIs are increasingly important for driving open innovation, management scholars have turned attention to research on crowdsourcing (Chesbrough, 2006) to learn motivations for participating (Frey et al., 2011), the design of open innovation contests (Cabiddu et al., 2013; Terwiesch & Xu, 2008), managerial challenges and remedies for solving R&D problems through innovation intermediaries (Sieg et al., 2010), product solution capabilities and added value for product development processes (Tran, Hsuan, & Mahnke, 2011), and ways to attract participants that can substantially contribute to innovation challenges (Frey et al., 2011). Nevertheless, research needs more emphasis on governance, technology, and crowdsourcing outcomes (Pedersen et al., 2013). In summary, the literature has recognized that CIs are essential

for driving open innovation, but we need further understandings of how the Internet environment can successfully manage R&D projects.

Inter-Organizational Governance Mechanisms and Trust building in Crowdsourcing

Studies of inter-organizational sourcing relationships have focused on two governance mechanisms: formal controls and relational governance. Formal controls are "the written contracts and institutional mechanisms designed to guide behaviors toward desired objectives, whereas relational governance is unwritten, work-based mechanisms designed to influence inter-organizational behavior" (Goo, Kishore, Rao, & Nam, 2009, P. 120). Contracts are useful for preventing exchange hazards (Ulset, 1996; Willamson, 1985). In addition, CIs, as transaction intermediaries, can use "third-party institutional structures that provide a rational basis for interaction among marketplace participants" (Pavlou & Gefen, 2004, p.41), such as feedback, escrow services, and credit card guarantees for gaining trust.

Mutual trust, relational capital (Dyer & Singh, 1998; Lee & Cavusgil, 2006), and social actions such as open communication and cooperation (Goo et al., 2009; Lacity, Khan, & Willcocks, 2009) are essential for forming buyer–supplier relationships. Relational governance improves the performance of inter-organizational exchanges in general (McEvily, Perrone, & Zaheer, 2003) and IT outsourcing in particular (Sabherwal, 1999). Even the most fundamental discrete exchanges include some relational elements (Macneil, 1980).

Mutual trust is essential for alliance success and performance (Zaheer et al., 1998; Zaheer & Venkatraman, 1995). To maintain long-term and healthy relationships between organizations, *vulnerability* must be reduced (Bachmann & Inkpen, 2011; Doney & Cannon, 1997; Gambetta,

1988; Katsikeas, Skarmeas, & Bello, 2009; Kee & Knox, 1970). Trust is even more important for enabling online transactions among geographically dispersed users who lack prior history in information and communication technologies (ICT).

Before interactions occur, CIs can build swift trust based on third-party guarantees and recommendations (Shapiro, 1987; Zucker, 1986). Institutional warrants ease the development of swift trust (Kramer, 1999). In the crowdsourcing marketplace, third-party recommendations act as institution-based swift trust that users can generalize and transfer to related entities (Hamilton & Sherman, 1996; Stewart, 2003). Swift trust then transfers from CI to the crowdsourcers and crowdsourcees who lack previous transaction history. After initial contacts, however, knowledge-based trust depends on personal knowledge about past behaviours (Robert, Denis, & Hung, 2009). Online members may need a longer time to assess whether they can trust other members.

In traditional trading contexts, trade intermediaries go between sourcers (buyers) and sourcees (suppliers). Therefore, intermediaries must develop mutual trust with sourcers and sourcees; sourcers and sourcees share no direct contact and trust building with each other. However, crowdsourcing trust elements require trilateral trust building among CIs, sourcers, and sourcees. Trilateral trust is a dynamic construct: outcomes depend on mutual perceptions in the trilateral business network (Svensson, 2004). Therefore, as Figure 1 shows, the triadic nature of the relationship adds complexity to inter-organizational exchanges. It entails six types of inter-organizational trust-building: (1) crowdsourcer trust in the CI, (2) crowdsourcer trust in the crowdsourcees, (3) crowdsourcee trust in the CI, (4) crowdsourcee trust in the crowdsourcers, (5)

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CI trust in the crowdsourcers, and (6) CI trust in the crowdsourcees. Crowdsourcers,

crowdsourcees, and CIs can be trustors or trustees.

Insert Figure 1 About Here

First, both crowdsourcers and crowdsourcees must trust the CI. CIs must provide reliable,

secure, and fair online platforms with open rules and procedures. They must use accredited

sourcers/sourcees who register online and encourage benevolent transaction norms. If sourcers

and sourcees lack initial trust, they will not sign up with the CI or continue operating in the

crowdsourcing environment.

Second, as intermediaries, CIs must trust sourcees for having the ability, skills, and

competency they claimed to be certified, and must trust that sourcers who initiate the sourcing

process will honour their promises to pay the sourcees once the tasks are completed

satisfactorily. Thus all three entities must trust each other to complete the dynamic transaction

system. Any missing links will cause the crowdsourcing project to fail.

Guanxi and Affect-Based Trust Building

Swift trust is institution-based (Kramer, 1999); knowledge-based trust is cognition-based

(Chua, Morris, & Ingram, 2009). Affect-based trust is unique in the Chinese context (Chen, Chen,

& Huang, 2013; Park & Luo, 2001). China is generally less trusting than comparable countries

(Bjørnskov, 2007). From individualist and collectivist country perspectives, Chinese people tend

to have lower-levels of trust than do citizens of the United States and Germany (Huff & Kelley,

2003). Chinese business people are less able to overcome the sense of distrust that naturally

exists between potential partners, especially in the initial stages of business relationships (Davison & Ou, 2008). *Guanxi*, an embedded and sophisticated concept in the Chinese trust context, plays an essential role in trust building. *Guanxi* indicates pre-existing personal connections and informal social networks (Hennart, 2015) with trust, bonding, reciprocity, and empathy dimensions (Park & Luo, 2001; Wong, 2007), based at interpersonal/individual levels rather than being in "the system" (Martinsons, 2008). In general, *guanxi* is a major factor for successfully conducting business and building partnerships in China (Millington, Eberhardt, & Wilkinson, 2005; Park & Luo, 2001; Wong, 2007). *Guanxi* networks are essential for developing successful inter-company relationships (Hutchings & Murray, 2002). *Guanxi* causes affect- and cognition-based trust to be more intertwined for Chinese managers in business transactions (Chua et al., 2009).

In the context of online intermediaries in China, B2B platforms such as alibaba.com explicitly represent trustworthy knowledge, enhance supplier selection, and diminish the salience of *guanxi* networks (Davison & Ou, 2008). However, high-stake R&D crowdsourcing projects are more complex than B2B platforms and require higher trust levels (Das & Teng, 1998; Economist Intelligence Unit, 2008). It is unclear whether Chinese companies can transact with distant parties and develop new partnerships without utilizing *guanxi*.

Methods

Research design

Recognizing the lack of prior research, we chose case study (Miles & Huberman, 1994) as our method for observing the uptake and development of R&D crowdsourcing in China. The

case study approach is particularly useful for observing, explaining, and exploring new phenomena within their real-life setting, especially for answering *why* and *how* questions (Verner & Abdullah, 2012) and for investigating unclear boundaries between contemporary phenomena and their context (Myers, 2013; Yin, 2003).

The unit of analysis is an R&D crowdsourcing project between the QC Corporation as crowdsourcer, cs.com as the CI intermediary, and Jack and Rachel, two actual crowdsourcees. The cs.com company was expanding its CI business into R&D crowdsourcing, and asked the authors to be outside observers for identifying the opportunity and challenges of R&D crowdsourcing activities. In response, the authors gathered feedback regarding the launch, implementation, and transaction of the project, in accordance with previous studies in which the authors had active and full access to the research site and with data sources, and were able to engage in extensive observation despite having minimal research resources (Heiskanen, Newman, & Eklin, 2008).

Data collection

The data were collected after the event and activities had already occurred and the outcomes were known. Retrospective researchers can observe final process outcomes. Consequently, retrospective designs are popular for learning about the past in organizational and strategic management research (Golden, 1997; Miller & Glick, 1997) and organization theory research (Bourgeois & Eisenhardt, 1988; Feeser & Willard, 1989; Huber & Power, 1985).

The primary data came from eleven written questionnaires with open questions. (See the appendix.) Questionnaires were mailed to participants because geographic and time-zone

differences prevented face-to-face interviews. Participants included the general manager of

cs.com, responsible for the general operation and management of the CI; the chief technical

officer who manages the IT-infrastructure and technical background of the CI; one crowdsourcer;

and two crowdsourcees involved in the crowdsourcing project. Cs.com initially invited six other

companies to use crowdsourcing, and they also answered questionnaires after we reached them

through the personal networks of the manager of cs.com. The six companies were from

knowledge-intensive industries potentially needing R&D outsourcing such as IT,

telecommunications, and aerospace. Approximately a month passed before all participants

returned the questionnaires. The questionnaires were originally conducted in Chinese, but we

then translated the key points into English. The questions included aspects of overall

experiences and concerns about participating in R&D crowdsourcing projects. The participants

were also asked whether the Chinese context affected their trust. They also gave suggestions for

growing R&D crowdsourcing in China.

For triangulation purposes, we collected additional documents (Myers, 2013) such as

archival project documents, memos, reports, intermediary webpages, and trial working

documents stored on the website. We also conducted real-life observations throughout the

project's lifecycle to observe how the events evolved from initiation to completion.

Data analysis

We examined the data using thematic analysis, widely used in qualitative research (Saldaña,

2012), to create meaningful patterns. Researchers study the data, generate initial codes, search

for themes; review, define, and name the themes; and produce a final report.

In addition to thematic analysis, we adopted "reflection in action" (Schön, 1983) in which

hypotheses are generated based on data acquired during case development (Heiskanen et al.,

2008). The idea was later developed to mean that researchers report their direct experience in a

way that makes sense to both academic and practical audiences (Heiskanen, 1995; Heiskanen &

Newman, 1997). The goals are to reflect on how a problem is solved, to observe the event

procedures and sequences, and to rethink the presuppositions.

The case of R&D crowdsourcing at cs.com

The high-tech QC Corporation (QC) is located in Henan Province, China. Founded in 2006

with the support of the Development and Reform Commission of Henan Province, QC's

primary business is electric automobiles, energy conservation, and alternative energy products.

As a pioneer in promoting and producing electric automobiles in China, QC saw a need for a

comprehensive analytical report examining the whole industry.

Cs.com, a crowdsourcing intermediary startup based in Shanghai, recently launched its CI

website, aiming to position itself as an innovation platform for finding external talents for highly

complex and challenging projects. In December 2010, QC licensed cs.com to crowdsource the

QC Corporation Electric Automobile Production Feasibility Analysis Report, for ¥150, 000

RMB (approximately $24,000 USD). To advertise the project, the staff of cs.com extensively

publicized it and the CI platform through posts in public forums, university forums, university

teach-ins, and emails from December 2010 through January 2011. About 20 crowdsourcees

submitted proposals to cs.com. Rachel, a graduate student from a prestigious university in China,

with little working experience, won the bid and contracted with cs.com to finish the report between February 1, 2011 and May 31, 2011.

Around April 15, 2011, the cs.com staff reminded Rachel of the approaching deadline and prompted her to hand in her half-finished proposal. Surprisingly, she had failed to make substantial progress because she had received other unexpected work. On May 1, 2011, she hastily submitted an unsatisfactory draft report. According to her contract, she should have received no payment, but cs.com recognized the work she had done by giving her 30% of the total payment.

The cs.com staff was highly frustrated. The manager then used his personal *guanxi* to find Jack, an expert with more than 20 years of experience working at a research institute, and hired him to complete the work by the end of June. The manager of cs.com negotiated with QC to extend the project deadline so that cs.com received no fine. Jack submitted the report at the end of June. Luckily, QC was satisfied with the final report and did not reduce the payment for the one-month delay. QC executed the payment on July 15, 2011. Jack got 70%, but cs.com made nothing for facilitating the project.

Results

Our theoretical background and the observation made it apparent that three main dimensions of trust were involved in the case of R&D crowdsourcing: swift trust, knowledge-based trust, and affect-based trust. Our respondents provided vivid accounts of difficulties in implementing R&D crowdsourcing in the Chinese context. Figure 2 shows a summary of the results from the perspectives of inter-organizational governance and trust development.

Insert Figure 2 About Here

Formal control mechanisms and swift trust

In the crowdsourcing context, swift trust is established before anyone has knowledge about

members' prior behaviour (Robert et al., 2009). As the starting point for sourcers and sourcees,

building swift trust and eliminating scepticism about opportunism is essential. Control

mechanisms can reduce the threat of opportunism and governance costs (Hödl & Puck, 2014),

so CIs should establish formal control mechanisms to develop swift trust in the Internet

environment. Our case study shows that the CI failed to provide the necessary formal control

mechanisms to promote swift trust.

The crowdsourcing marketplace vitally needs a large talent pool of people with knowledge,

backgrounds, and skills. QC indicated that one concern they had about using the CI was whether

it would have access to adequate talent that could complete the task successfully. To build the

sourcers' swift trust regarding sourcees, CIs must form highly recommended and large talent

pools based on experience and qualifications. The general manager of cs.com commented:

Now it's really the key to establish a large talent pool that can meet all kinds of needs.

The company might not be looking for the top one among the talent pool, but they surely

would look for the most appropriate one to do their work.

Thus crowdsourcers must have access to a large talent pool and must provide the most

appropriate workers. A recommendation system is the most effective institutional governance to

match appropriate talents to tasks and to help crowdsourcers develop swift trust towards CIs.

QC distrusted working with an unfamiliar individual, particularly for a high value R&D project:

> Usually, we prefer to outsource a task to people that we know or we have cooperated with before. It would be hard for us to accept the new model [crowdsourcing platform] first, while at the same time outsourcing R&D to someone we don't know. We need to escrow a big amount of money on the website and wait for a result that we are uncertain of. Although I know the manager well, I still have doubts about whether the firm can solve my problem.

Because the sourcers and sourcees lack prior knowledge of each other, speculation and mistrust inhibit the initial contact. Rachel and Jack expressed the same concerns as sourcees. They mentioned the uncertainty factor: working hard but not getting paid when the job was done.

Authentication (Luo, 2002) in an e-commerce setting is necessary for R&D crowdsourcing. Consequently, both sourcers and sourcees must be authentically registered so that the CI will trust them both. In our case, cs.com recruited the candidates through an online job posting without a valid authentication system to verify sourcee qualifications, and failed to initiate swift trust between the sourcer and sourcee.

In China, crowdsourcers are commonly required to guarantee payment by depositing the full charge. When the task is completed successfully, the CI then releases the payment to the sourcee after collecting the CI commission. In our case, both QC and the manager of cs.com indicated concerns about the large deposit, but cs.com still asked QC to deposit the full amount. Because R&D projects are usually quite costly, crowdsourcers take financial risk when make a full

deposit. However, the crowdsourcees were assured payment by seeing that the CI held a full

deposit. It is more difficult to build trust under high uncertainty and risk (Dong & Glaister,

2007). Indeed, Cis must establish effective formal control mechanisms tailored to R&D projects

and minimizing e-commerce uncertainties through third-party recommendations, escrow

services, and mutual ratings (Pavlou, 2002; Pavlou & Gefen, 2004). In our case, cs.com failed to

implement appropriate formal control mechanisms and to build swift trust. Hence, we propose

several effective control mechanisms that CIs can adopt to drive swift trust:

> *Proposition 1. CI-based formal control mechanisms can build trilateral swift trust*
>
> *between crowdsourcers, CIs, and crowdsourcees.*
>
>> *P1a. Talent pools and mutual recommendation systems will help crowdsourcers*
>>
>> *trust CIs and crowdsourcees.*
>>
>> *P1b. Authentication systems will help crowdsourcers and crowdsourcees build*
>>
>> *mutual trust.*
>>
>> *P1c. Partial payment escrows and CI warranty systems will help crowdsourcers*
>>
>> *trust CIs, crowdsourcees trust CIs, and crowdsourcees trust crowdsourcers.*

Relational mechanisms and knowledge-based trust

Also essential in the CI context is *knowledge-based trust*, based on knowledge and

assessment of past behaviour (Robert et al., 2009). QC needed to trust that both cs.com and,

particularly, that the selected crowdsourcee would be able to complete the R&D task. CIs could

use relational mechanisms requiring frequent interactions between partners to develop mutually

reinforcing knowledge-based trust (Lavie, Haunschild, & Khanna, 2012; Robert et al., 2009).

Again, we observed that cs.com lacked proper relational mechanisms to establish knowledge-based trust among members. First, the project was not finished on time, which indicates poor performance management. Rachel explained:

It's not that we are not trusting QC; it's not that we intentionally delayed the job; it's purely our fault because of poor time management. We should have planned well. However, it would be helpful if the website could in some way monitor each project that is being crowdsourced on the platform.

The manager of cs.com also said:

We didn't do a good job monitoring the process. For sure, we have to reconsider the crowdsourcing mechanisms and website features.

This quote suggests that CIs must do more than just act as intermediaries to connect sourcers with sourcees. To keep the platform in business, they must also be facilitators using relational mechanisms to enhance knowledge-based trust between sourcers and sourcees. Performance management often requires formal control mechanisms. In the crowdsourcing context, a performance tracking application, such as a status report, could be the relational mechanism that enhances knowledge-based mutual trust. A status report allows the sourcee to provide regular progress reports that keep the sourcer informed so that both can track the progress and ensure that it is completed on time. In our case, QC never actually engaged in performance management. Therefore, it is no a surprise that Rachel failed to complete the task.

Cs.com also failed to provide a platform to allow QC to communicate directly with the sourcee. We suggest a workroom platform as a CI-based communication application that can

allow sourcees and sourcers to directly interact. Both status reports and workrooms can facilitate open communication and timely information exchange to build the necessary mutual knowledge-based trust (Goo et al., 2009). The manager of cs.com later realized that the design of a performance tracking and communication applications is essential for R&D CI settings.

Third, arbitration is necessary when sourcers and sourcees cannot resolve contract disputes. Arbitration strives for harmonious conflict resolution (Goo et al., 2009) and should be highlighted in the R&D CI setting. In the case of cs.com, arbitration was more *guanxi*-based than legal-based, which might apply well in the Chinese context. However, a mature CI would require arbitration justice as an effective way of managing outsourcing risks if contractor performance is unsatisfactory (Vining, 1999). An arbitration mechanism will increase mutual trust between sourcers and sourcees, and their mutual trust in the CI.

Proposition 2. Relational governance mechanisms can help sourcers, sourcees, and CIs build trilateral knowledge-based trust.

P2a. Performance tracking systems will help sourcers and sourcees share knowledge-based trust.

P2b. CI-based communication systems will help sourcers and sourcees share knowledge-based trust.

P2c. CI-based arbitration systems will help crowdsourcers/crowdsourcees trust the CI and will help crowdsourcers and crowdsourcees build mutual trust.

Guanxi and affect-based trust

Affect-based trust is the overall trust environment that affects perceptions and behaviour. In China, *guanxi* indicates pre-existing informal relational connections that maintain affect-based trust. The manager of cs.com summarized the importance of *guanxi*:

> People do business in China by *guanxi* in most cases, so the job is not outsourced to the most appropriate person, but to the most familiar person. So the key to success is to get to know the person.

Despite unenthusiastic attitudes towards the crowdsourcing model, both sourcers and sourcees are participating in the new practice, in accordance with trust transference theory (Stewart, 2003), even in an online environment. In this case, because both the sourcer and the sourcee trust the manager of cs.com, trust transferred through the *guanxi* network and they agreed to try the new model. In addition, they expressed positive support, as the manager from QC stated:

> Companies have difficulties all the time, big or small. Sometimes they cannot solve them because of limited resources, like us. Our city is small, and we are short of talents; for China, the most excellent talents flow into big cities like Beijing and Shanghai. Therefore, if a mature crowdsourcing intermediary with solid mechanisms can protect its users from inappropriate behaviors or harm in the meantime, and if they can help us save costs, shrink working periods, and find better solutions for difficulties, why not try it?

> Initially, the manager of cs.com wanted to apply the fundamental idea of crowdsourcing:

the open call for participants and the selection of candidates based on qualifications rather than

personal *guanxi*. However, when the project began to show signs of failure, he used his personal

guanxi to look for a substitute to finish the job. Otherwise, the project could have been a

complete failure. As the manager of cs.com said:

> The Internet has been changing the structure of Chinese society, including people-to-
>
> people trust. But it's a slow process. What we can do is to take full advantage of the
>
> surging trend of crowdsourcing and figure out the mechanisms to make it work, just like
>
> when e-commerce sprang up decades ago.

His statement shows that *guanxi* connections are still significant in the R&D crowdsourcing

market, and that relationship-based management capabilities and strategies potentially enhance

product innovation (Xin & Pearce, 1996). In fact, QC hired cs.com to crowdsource the project

mainly because their managers knew one another personally. Cs.com selected Rachel as the

service provider, but when they realized that she could not accomplish the task as expected, the

cs.com manager used his personal relationships to find someone outside the sourcing pool to

complete the task. In other words, he used *guanxi* connections as a contingent relational

mechanism to ensure that the crowdsourcing project succeeded, to maintain the relationship, and,

particularly, to restore affect-based trust with QC.

Intermediaries go beyond simply linking parties; they search for and transform ideas, and

combine solutions to fit their clients (Hargadon & Sutto, 1997). In the Chinese context, *guanxi*

connections can be contingencies or supplements for finding the right crowdsourcers or

crowdsourcees and enforcing transactions (Hennart, 2015). Indeed, in China, *guanxi* is more

influential in the search for suitable suppliers than other information sources such as company

websites, trade fairs, and the trade press (Millington et al., 2005). *Guanxi*-based transactions

help maintain affect-based trust, but they can lower levels of swift and knowledge-based trust.

In our case, cs.com retained their *guanxi* within the company, and provided no online path

allowing Rachel and QC to directly communicate. Instead, cs.com monitored the progress and

performance. When the project was failing, cs.com utilized their *guanxi,* which prevented the

sourcers and sourcees from building swift and knowledge-based trust building or a continual

working relationship. Nevertheless, open innovation should allow direct choice and engagement

between sourcers and sourcees. Consequently, *guanxi*-based transactions violate the nature of

open innovation and are a major hurdle for the organic growth of open innovation.

   Our analysis leads to the following propositions:

   Proposition 3a. In China, guanxi *is a complementary and contingent relational governance*

   mechanism for providing open innovation and maintaining affect-based trust.

   Propostion 3b. In China, guanxi *inhibits the development of swift- and knowledge-based*

   trust and the organic growth of crowdsourcing-based open innovation.

Discussion and Conclusions

Theoretical implications

   In our case study, we incorporate the literature of inter-organizational governance and trust

development as a theoretical contribution to the open innovation literature. Although

crowdsourcing can be used to drive open innovation (Zhao & Zhu, 2012), few researchers have

explored how innovation projects are successfully managed in the Internet environment. Our

study underscores that Internet crowdsourcing intermediaries (CIs) are critical for providing

open innovation opportunities to manage R&D projects, but they must utilize appropriate

governance mechanisms to facilitate trust development among crowdsourcers, crowdsourcees,

and CIs. The case highlights the additional importance of relational governance mechanisms for

managing highly complex R&D crowdsourcing, such as through open and timely

communication between sourcers and sourcees, mediation from the platform for resolving

conflicts, and performance management tools. Considering that most open innovation studies

have focused on western practices, we contribute by identifying effective governance

mechanisms specific to the Chinese context (Byrum & Bingham, 2016) and show that Chinese

CIs should safeguard transactions and ensure that innovation projects will grow through

customized technical functions such as partial payment and CI warranty systems.

Second, we extend the inter-organizational governance literature and e-commerce trust

concept (Ba & Pavlou, 2002; Benbasat, Gefen, & Pavlou, 2008) to the R&D crowdsourcing

context, and thus contribute to understandings of trilateral trust building with intermediaries in

business transactions (Svensson, 2004). Businesses traditionally use relational governance to

enhance trust between intermediaries and buyers or between intermediaries and suppliers. They

have no need to govern or enhance trust between suppliers and buyers. However, crowdsourcing

involves a different business environment: crowdsourcing intermediaries are facilitators and

must provide formal and relational governance mechanisms to enhance swift-trust and

knowledge-based trust between crownsourcers and crowdsourcees. Swift trust encourages their

initial contact; knowledge-based trust further ensures that they will return for future transactions.

The proposed trilateral trust building is therefore critical to provide a healthy environment for the growth of crowdsourcing-based open innovation.

Third, we offer additional understanding of China's *guanxi* tradition and provide evidence that it can have double-edged functions (Chen et al., 2013) for the growth of crowdsourcing. *Guanxi* provides social capital that substitutes for formal institutional support (Xin & Pearce, 1996), enforces transactions (Carlile, 2002; Hennart, 2015), and provides business opportunities (Wong, 2007). Therefore, *guanxi* connections are contingent formal control and relational governance mechanisms for maintaining affect-based trust. However, they can inhibit swift- and knowledge-based trust development among key players in China's R&D crowdsourcing marketplace. In our case study, *guanxi* prevented the CI from providing open and transparent selection of crowdsourcers and crowdsourcees, which indicates that ventures pursuing new technological innovations may find *guanxi* to be an ineffective strategy (Li & Atuahene-Gima, 2001). We suggest that the cultural tradition of *guanxi* as a prerequisite for business relationships violates the needs of R&D crowdsourcing to provide open biddings and open communications, and is, consequently, a major barrier to the growth of open innovation in China.

Limitations and future studies

Our study has limitations that should be considered. We urge practitioners and researchers in the field to further examine crowdsourcing in other areas. First, we examined the issue from the perspective of trust building, but Chinese businesses may avoid crowdsourcing R&D tasks for other reasons, such as the characteristics of the tasks and management issues. We challenge

future research to follow up the study and offer more insights, particularly by exploring non-

intermediary and re-intermediary processes (Sun, 2006) and comparing the new online

crowdsourcing model with traditional intermediary services. Second, our single case study helps

to explain the research context, but case studies lack transferability. Future studies could

incorporate additional cases to allow "replication" logic to confirm or disconfirm conceptual

insights (Brown & Eisenhardt, 1997; Yin, 2009). Third, we conclude with managerial

implications to be drawn from the analysis. Future study could use a quantitative approach to

test the concept empirically and continue to enhance understandings.

Managerial implications

China will gradually and inevitably accept open innovation and thus provides a dynamic

setting for examining firms as they adopt crowdsourcing as the open innovation approach..

Therefore, our study provides practical implications for the development of crowdsourcing in

China. That is, we show that trust is essential for all three entities involved in R&D

crowdsourcing. To meet the demand for innovation through Internet-based crowdsourcing in

China, CIs should build trust by incorporating and promoting various website features to build

personal and social relationship among crowdsourcers and crowdsourcees.

Clearly, *guanxi* practice continues to affect innovation crowdsourcing in China, although

guanxi is declining as modern China transitions toward legal contracts (Guthrie, 1998).

Organizations with substantial resources, minor agency problems, and well-structured or

formalized routines are likely to use contracts as their basic governance mechanism. In contrast,

organizations with few resources, acute agency problems, and informal, relation-oriented

organizational routines are more likely to use *guanxi* as a governance mechanism (Zhang & Keh, 2010). To minimize the reliance on *guanxi* and to develop the marketplace for open innovation, Chinese CIs must gradually build their talent pools for crowdsourcing R&D projects and strengthen their formal control, relational mechanisms, and performance management tools; for example through escrow systems and arbitration processes.

Conclusion

Our case study allowed us to observe the developing trend of Internet-based crowdsourcing to achieve open innovation in China and to identify the challenges facing R&D crowdsourcing. We identify inter-organizational governance mechanisms for building trilateral trust among crowdsourcers, crowdsourcing intermediaries, and crowdsourcees. We propose that formal control and relational governance mechanisms must be adapted to the Chinese context. We highlight that *guanxi* is a temporary relational source but a long-term barrier to the growth of open innovation in China.

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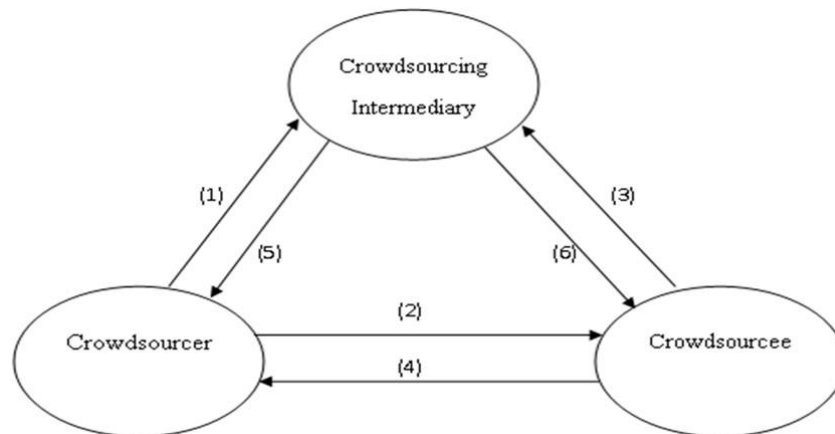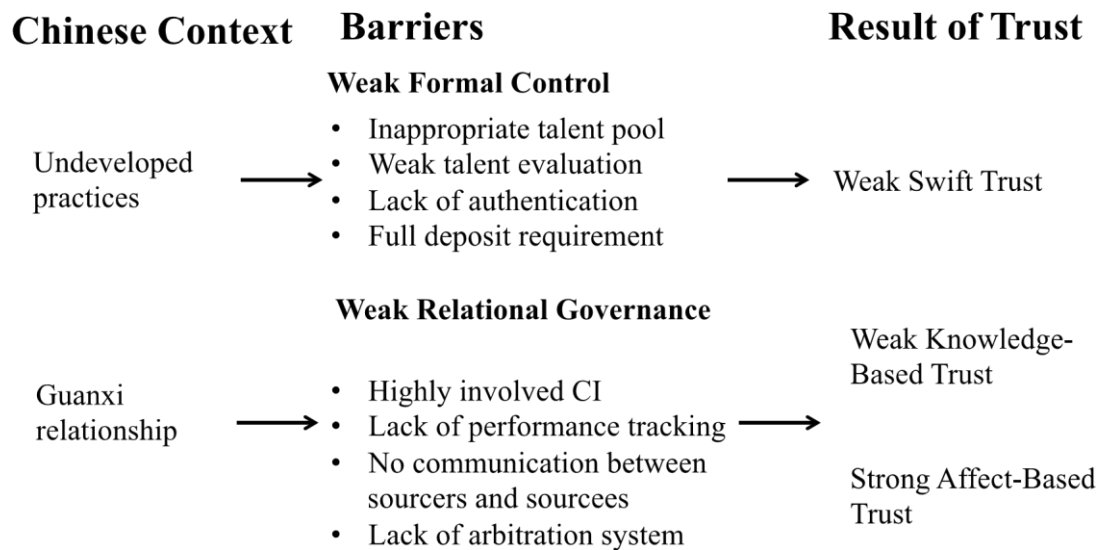**Figure 1. Trilateral Trust Relationships in the CI Setting**

Figure 2. The Summary of Findings

Chinese Context	Barriers	Result of Trust
	Weak Formal Control	
Undeveloped practices →	• Inappropriate talent pool • Weak talent evaluation • Lack of authentication • Full deposit requirement	→ Weak Swift Trust
	Weak Relational Governance	Weak Knowledge-Based Trust
Guanxi relationship →	• Highly involved CI • Lack of performance tracking • No communication between sourcers and sourcees • Lack of arbitration system	Strong Affect-Based Trust

Appendix

Cs.com initially invited six companies to use crowdsourcing.

Employees were asked to respond to the following questionnaire, according to their work experience:

1.   Do you think your organization will crowdsource their R&D tasks to external clients, for example, through an Internet-based platform? If yes, list the reasons. If not, what resistances or concerns do you expect?

2.   How will the Chinese macro-environment positively and negatively influence trust regarding R&D crowdsourcing activities in China?

3.   What mechanisms will be effective for regulating vendor behaviours in Internet R&D crowdsourcing?

4.   What specific changes in the macro-environment are needed to improve the development of R&D crowdsourcing?

General manager of cs.com:

1. What are the advantages and disadvantages of R&D crowdsourcing in China? What benefits or resistance will China's macro-environment bring to R&D crowdsourcing activities in China?

2. What difficulties did you encounter when you looked for vendors to bid for the tasks on cs.com? Please list common concerns that vendors might have.

3. When you looked for clients to place tasks on cs.com, what difficulties did you encounter? Please list common concerns that clients might have.

4. How is R&D crowdsourcing unique to China in comparison with the popular crowdsourcing intermediaries in the United States or Europe?

5. How does the macro-environment of Chinese society positively and negatively affect trust in R&D crowdsourcing processes?

6. What arbitration role should cs.com play? Is it necessary?

7. What will cs.com do to improve client/vendor trust? Will cs.com take concrete measures?

8. How should China's macro-environment be changed specifically to improve the development of R&D crowdsourcing?

Artifact Designer/Director:

1. When the development team designed the website, did they consider trust as a factor? What has the company done to improve trust?

2. How was the website developed to increase user trust? How effective was it?

3. Have users made any suggestions to cs.com since it launched?

4. How should China's macro-environment be changed to improve the development of R&D crowdsourcing?

Manager of QC Corporation
1. Compared with traditional outsourcing approaches, are you willing to use an online crowdsource approach to handle your R&D tasks? What do you think about Internet-based R&D crowdsourcing?
2. Do you trust cs.com and the client? Do you think they will do a good job?
3. Were you satisfied with the online crowdsourcee? Did cs.com recommend a sourcee?
4. Did you encounter difficulties in completing the transaction? How did you solve the problem?
5. How do you feel about your contract with cs.com? Did it cover all your concerns? Did it fail to cover any issues? How can problems be solved if they arise?

Rachel：
1. Why were you motivated to take an online job?
2. Did you trust cs.com and the tasks it advertised?
3. Why did you fail to finish the transaction with the QC Corporation?
4. What do you think about cs.com's design and website features? Are you satisfied with the payment and work mode?
5. What aspects of cs.com should be improved to attract more users?

Jack:
1. Why are you motivated to take online jobs?
2. Do you trust cs.com and the tasks it advertises?
3. What do you think about cs.com's design and website features? Are you satisfied with the payment and work mode?
4. What aspects of cs.com should be improved to attract more users?

Note: Jack and Rachel were crowdsourcees at two phases, so their questionnaires differ.