The Current Research Landscape of Crowdsourcing: Implications for Emerging Economies

by

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ABSTRACT

From its beginning in mid-2000s, the crowdsourcing and collective intelligence initiatives have evolved into an emerging research field. The main objective of this paper is to contribute to a better understanding of the "research landscape" of the emerging field of crowdsourcing/collective intelligence, taking the information systems (IS) perspective. Though an in-depth literature review of the eighty-three journal papers published since 2008 across many different disciplines, we seek to understand their research foci, the underling theories, research methods as well as the main research and practical contributions, as reported in these papers. Informed by our analysis and synthesis, we also identify some important research gaps and suggest possible future research related to crowdsourcing in emerging and transition economies.

Keywords:

Crowdsourcing, crowdsourcing applications, crowdsourcing platform, collective intelligence, emerging economies, innovation, literature review, problem solving, research focus, reference theories, research methods, systematic literature review, transition economies.

INTRODUCTION

New information and communication technologies (ICTs) and their world-wide proliferation across all industry sectors and society continue to create new opportunities for digital collaboration on a global scale, which was never before possible.

Consequently, the research area of cross-border digital collaboration is receiving an unprecedented attention (Romano Jr., Pick and Roztocki 2010). For example, a systematic

literature review conducted by Madlberger and Roztocki (2009) identified a significant number of papers (eighty) published on this topic in recent years. Their research also confirmed a very limited research on cross-border collaboration. This is highly surprising given the global economy in which companies need to operate.

The same literature review and other related studies have confirmed that ICT-enabled collaboration has been studied for many years, by many different research communities and different context, such as digital collaboration, supply chains, e-commerce as well as collaborative business processes. While all these studies bring valuable insights, they remain focused on a single (disciplinary) perspective. Yet, complex research phenomenon of ICT-enabled global collaboration requires a truly multidisciplinary perspective and synergy rather than simple combination of isolated disciplinary insights.

Furthermore, Marjanovic and Roztocki (2013) show that the existing research focuses on collaboration across formal, normatively regulated organizations (e.g., a business-to-business (B2B) scenario) without considering involvement of individuals not formally employed by companies. Even more important for this research is their finding that the existing collaboration arrangements are implemented via systems and highly structured business processes designed to support flows/movements of goods or financial transactions rather than co-creation of knowledge.

However, in very recent times new forms of ICT-enabled digital collaboration have started to emerge that enable organizations and individuals (independent knowledge agents) to collaborate in new ways in order to co-create knowledge-artifacts, even of commercial value. Examples include a very large group of independent experts combining their knowledge and expertise to co-create a textbook (knowledge artefact) of commercial value (Walter and Back 2010). This mode of work is expected to become even more popular in the future due to many factors, including globalization, new technologies and economic situation in emerging and transition economies, as previously argued by Friedman (2005) and Tapscott and Williams (2010).

Our research presented in this paper focuses on this emerging category of ICT-enabled digital collaboration in the global context achieved through the so-called crowdsourcing. There are many definitions of crowdsourcing (Pedersen, Kocsis, Tripathi, Tarrell, Weerakoon, Tahmasbi,

Xiong, Oh, Deng and deVreede 2013), but most of the authors appear to agree that crowdsourcing is a model to solve specific problems by a dynamically formed large group of people. In essence, in this model specific problems are delegated, or outsourced, to a large group of participants, or crowd, while various ICTs serve as an enabler and a facilitator of this collaboration model.

We argue that this form of ICT-enabled digital collaboration opens brand new opportunities for developing, emerging and transition economies including organizations and more importantly, individuals. Many of these economies are still in the long process of closing the economic gap to the developed, mature economies (Kowal and Roztocki 2013). Frequently for highly qualified experts in these countries participating in global crowdsourcing initiatives presents a unique opportunity for exchanging their skills for financial means.

The main objective of our work is to bring this increasingly important form of collaborative work to the attention of the already established research community interested in ICT-enabled digital collaboration in the global context. As a starting point, in this paper we offer an in-depth literature review of the crowdsourcing research landscape. Compared to other crowdsourcing literature reviews, such as the recently published papers (Estelles-Arolas and Gonzalez-Ladron-de-Guevara 2012; Hetmank 2013; Parent and Eskenazi 2011; Pedersen et al. 2013; Smith, Gharaei and Alshaikh 2013; Zhao and Zhu In Print) our research offers a very different perspective by focusing on the emerging and transition economies. In context of this paper, we define emerging economies as countries with vigorous economic growth (Roztocki and Weistroffer 2011b) while transition economies are economies that are in long-term transition process from a centrally planned economic system to a market driven system (Roztocki and Weistroffer 2008, 2011a).

Our main research contribution is an in-depth analysis of the research foci, reference theories and research methods used across a very wide range of disciplines leading to a discovery of an important research gap related to crowdsourcing research and practice in the context of transition and emerging economies. Our main objective is to suggest possible future research that is relevant for this growing sector of the global economy.

The reminder of the paper is structured as follows. In the next two sections, we introduce the foundation concepts and further motivate our research. We then present the analytical framework for our literature review. After describing the sample of the eighty-three papers used in our literature review, we discuss the results of our analysis. We conclude with summarizing our contributions and point out to several proposing future research avenues.

FOUNDATION CONCEPTS

From its humble beginning of isolated purpose-built applications, the crowdsourcing and collective intelligence initiatives have evolved into a growth industry currently employing over 2 million knowledge workers, contributing over a half a billion dollars to the digital economy (Vukovic and Bartolini 2010).

Frequently, the term "crowdsourcing," a combination of two words "crowd" and "sourcing," is attributed to Howe (2006). In this form it was first mentioned in Howe's article in 2006 and defined as "the act of a company of institution taking a function once performed by employees and outsourcing it to an undefined and generally large network of people in the form of open call" (Howe 2006). Later on this definition was extended by Howe himself to involve some form of payment in order to distinguish it from community based examples of collective intelligence such as, Wikipedia and Linux, with large groups of people working together "without relying on either market signals of managerial commands" (Whitla 2009).

As the practical applications in this area continue to evolve, it is possible to observe new, broader interpretations of this term. For example, in their study of crowdsourcing innovation, Ren (2011) talk about "innovation requesters" that could be individuals or organizations and whose work is now made possible by a global 3rd multi-sided service platform or a crowsourcing system such as the well-know Mechanical Turk. Accordingly, Doan et al. (2011) "crowdsourcing system enlists a crowd of humans to help solve a problem defined by systems owners".

Furthermore, crowdsourcing is also seen as an area of application of the so-called collective intelligence broadly defined as a group of individuals doing things collectively that seem intelligent (Malone, Laubacher and Dellarocas 2010). Thus, the MIT Center for Collective intelligence focuses on the key research question: "How can people and computers be connected so that – collectively – they act more intelligently than any individuals, groups or computers

have ever done before" (MIT center). One of the key outcomes of their work is a framework for identifying building blocks ("genes") of collective intelligence systems; the conditions under each gene is useful and possible patterns of their combinations could be used to harness the crowds effectively. These patterns are then used to express and analyze different examples of collective intelligence.

BACKGROUND AND MOTIVATION

The initial confirmation of our research direction came from an in-depth analysis of the six systematic literature review papers on crowdsourcing, recently published by different research communities, as depicted in Table 1.

Authors	Publication Type	Number of Reviewed Studies	Major Focus	Major Results
Estelles-Arolas and Gonzalez-Ladron-de-Guevara (2012)	Journal	209 documents in total: 111 conference papers 68 journal papers 14 others	Indentify a common definition of crowdsourcing	Definition of crowdsourcing
Hetmank (2013)	Conference	72 papers	Indentify definitions of crowdsourcing	Seventeen definitions of crowdsourcing were indentified and classified
Parent and Eskenazi (2011)	Conference	29 papers in total	Examine the literature on the use of crowdsourcing for speech-related tasks	Challenges in using of crowdsourcing for speech-related tasks
Pedersen et al. (2013)	Conference	75 documents in total	Establish conceptual foundation of crowdsourcing	Conceptual model of crowdsourcing Proposition of a definition of crowdsourcing
Smith et al. (2013)	Journal	12 journal articles	Examine motivational drivers for crowdsourcing	Five recommendations for entrepreneurs using crowdsourcing
Zhao and Zhu (In Print)	Journal	55 papers in total: 22 journal papers 33 conference papers	Conduct a critical examination of crowdsourcing research	Future research direction in the field of crowdsourcing

Table 1. Previous Literature Reviews on Crowdsourcing

A close examination of the systematic reviews presented in Table 1, shows that the relevance of crowdsourcing for emerging and transition economies is yet to be acknowledged, let alone

undertaken by a broad multidisciplinary research community. Encouraged by this initial confirmation of the research gap we are interested in closing, we then proceeded with an independent literature review designed to further confirm it and explore its main aspects.

RESEARCH AIMS AND OBJECTIVES

Our exploratory research, conducted through an in-depth literature review across different disciplines, seeks to contribute to the existing knowledge by finding the answers to the following three research questions:

1. What are the main foci of the current crowdsourcing research?

2. What are the dominant underlying reference theories?

3. What are the most prominent research methods?

By exploring the existing research literature, we aim to develop a better understanding of the research gaps not currently explored by the crowdsourcing community and identify some opportunities for future research, especially in relation to the emerging and transition economies.

RESEARCH METHOD

Analytical Framework

The framework, used in our analysis, was originally constructed by Wiener et al. for analysis of offshoring literature (Wiener, Vogel and Amberg 2010). Even trough it was originally aimed at different domain (offshoring), the main components of this analytical framework are generic enough to be adopted for literature review in other areas and the main concepts such as "Research Focus", "Reference Theories" and "Research Methods" still apply.
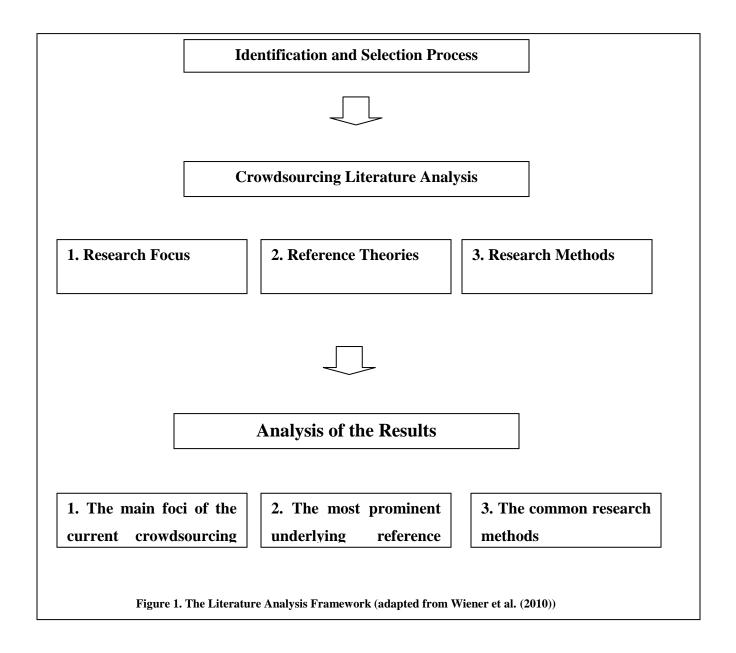
In order to determine the "Research Focus" relevant for the field of crowdsourcing/collective intelligence, we adopted the main dimensions of the "collective genome" by Malone (2010): "What" "Why", "How", and "Who." Recognizing that goals could be different from the outcomes, we added one more dimension, "Outcome", as originally proposed by Wiener et al. (2010). Since there were some discrepancies in the definitions of particular dimensions between

Malone (2010) and Wiener et al. (2010), we adjusted the dimensions for the purpose of our analysis as depicted in Table 2.

Dimension	Explanations
What	Goal
Why	Incentives
How	Structure/Process
Who	Staffing
Outcome	Results

Table 2. Research Focus Dimensions

The other two components ("Reference Theories" and "Research Methods") are also adopted from Wiener et. al. (2010). Regarding the "Reference Theories" component, we examined all the papers in our sample for the main theory, framework, or model that guided the particular research. For "Research Methods" component, we used the Classification of MIS Strategies framework proposed by Alavi and Carlson (1992). This framework provides a clear guidance for classification of work into non-empirical and empirical along five subcategories: conceptual orientation, illustrative, applied concept, objects, and events/process. For good definitions about research aims, reference, theories refer to Dibbern et al., pages 13-14 (2004). Figure 1 outlines our literature analysis framework and procedure while the next section describes our literature search.

Figure 1. The Literature Analysis Framework (adapted from Wiener et al. (2010))

Identification and Selection Process

Our identification and selection procedure followed typical literature review approach (see for example (Wiener et al. 2010)) and consisted of three major steps: establishing inclusions and exclusions criteria, search process, and inclusion into the final sample.

For purpose of this research project, we decided to use the following two inclusion criteria: the paper should focus on crowdsourcing as well as be published in a journal. We decided to

investigate only papers published in the journals, so our sample would be more consistent and include more mature work. Consequently, we decided not to include in our sample working papers, student thesis and conference publications.

The actual search process was conducted in Winter of 2012/2013. During the search process, we utilized different library databases and conducted key word search. Using queries, we searched for articles that had included crowdsourcing in the title, abstract or/and keywords.

After we identified potential papers, we examined their validity to our research using the previously established inclusion/exclusion criteria. After a paper was included in the final sample, we examined its reference section for other potentially relevant articles. We also examined articles that cited the articles already included in our sample. Thus, in essence, we followed the backward and forward search process as described by Webster and Watson (2002). All papers in the final sample were independently reviewed by both authors.

Sample description

Using our search methodology, we were able to identify eighty-three papers. (The list of papers with full references could be obtained from the authors upon request.) Distribution by the year of publication is depicted in Table 3 while the distribution by journal is depicted in Table 4.

Year	Number
2008	5
2009	11
2010	21
2011	24
2012	12
In press	10
Total	**83**

Table 3. Paper Distribution by Year

	Journal	Count
1	Academy of Management Review	1
2	ACM Transactions on Computer-Human Interaction	1
3	Advanced Engineering Informatics	1
4	Annals of Emergency Medicine	1
5	Archival Science	1
6	Bell Labs Technical Journal	1
7	Business Information Review	1
8	California Management Review	1
9	Communications of AIS	1
10	Communications of the ACM	7
11	Computers & Geosciences	1
12	Data & Knowledge Engineering	2
13	Decision Support Systems	1
14	Economics & Management	1
15	Energy Policy	1
16	Environmental Modelling & Software	2
17	European Journal of Surgical Oncology	1
18	Expert Systems with Applications	1
19	Government Information Quarterly	1
20	IEEE Communications Magazine	1
21	IEEE Internet Computing	1
22	IEEE Network	1
23	Information Processing & Management	1
24	Information Sciences	2
25	Information Systems	1
26	Information, Communication & Society	1
27	International Journal of Digital Earth	1
28	International Journal of Electronic Commerce	2
29	International Journal of Entrepreneurship & Innovation Management	1
30	International Journal of Human-Computer Studies	1
31	International Journal of Industrial Ergonomics	1
32	International Journal of Information Management	1
33	International Journal of Innovation Science	1
34	International Journal of Networking & Virtual Organisations	1
35	International Journal of Product Development	1

	Journal	Count
36	ISPRS Journal of Photogrammetry and Remote Sensing	1
37	Journal of Business Forecasting	1
38	Journal of Business Management	1
39	Journal of Information Science	2
40	Journal of Machine Learning Research	1
41	Journal of Management Information Systems	1
42	Journal of Marketing	1
43	Journal of Network and Computer Applications	1
44	Journal of the American Academy of Dermatology	1
45	Journalism Practice	1
46	Knowledge-Based Systems	1
47	Libri: International Journal of Libraries & Information Services	1
48	Long Range Planning	1
49	M@n@gement	1
50	Management Science	1
51	Mathematical and Computer Modelling	1
52	Medical Image Analysis	1
53	MIS Quarterly	1
54	Neurocomputing	1
55	Phi Delta Kappan	1
56	Planning Theory	1
57	Procedia Computer Science	1
58	Psychological Review	1
59	Public Manager	1
60	Public Relations Tactics	1
61	R&D Management	1
62	Research Technology Management	2
63	Santa Clara Computer and High - Technology Law Journal	1
64	Science & Public Policy	1
65	Social Science & Medicine	1
66	Social Science Computer Review	1
67	Spatial Statistics	1
68	Technological Forecasting and Social Change	1
69	The Journal of Strategic Information Systems	1
70	Transactions of the Royal Society of Tropical	1

	Journal	Count
	Medicine and Hygiene	
71	William Mitchell Law Review	1
	Total	**83**

Table 4. Paper Distribution by Journal

ANALYSIS OF THE RESULTS

Research Focus

The assignment of paper, according to the focus of investigation, reveals that the great majority of the papers in our sample (46 out of 83) focus on issues related to structure and process of crowdsourcing. Significantly smaller portion of papers focus on outcome (16) and goals (14). Seven papers deal with the incentives for members of the crowd. In contrast, none of the papers in our sample deals with staffing or participants in crowdsourcing. The classification of papers in depicted in Table 5.

Dimension	Explanation	Count	Paper(s)
What	Goal	14	Afuah and Tucci [2012]
			Albors et al. [2008]
			Anttiroiko and Savolainen [2011]
			Armstrong [2010]
			Bernstein et al. [2010]
			Doan et al. [2011]
			Epaminondas [2008]
			Gray [2009]
			Heipke [2010]
			Linders [In press]
			Martinez [2010]
			Millard [2011]
			Schweisfurth et al. [2011]
			Scott [2010]
Why	Incentives	7	Brabham [2010]
			Frey et al. [In press]
			Huberman et al. [2009]
			Mannes [2009]
			Marjanovic et al. [2012]
			Sun et al. [2012]
			Zheng et al. [2011]

Dimension	Explanation	Count	Paper(s)
How	Structure/Process	46	Agarwal et al. [2010]
			Agerfalk and Fitzgerald [2008]
			Alonso and Mizzaro [In press]
			Bazilian et al. [2012]
			Bojin et al. [2011]
			Bridge and Healy [2012]
			Brito [2008]
			Bucheler and Sieg [2011]
			Chanal and Caron-Fasan [2010]
			Corney et al. [2010]
			Dalal et al. [2011]
			Davis [2011]
			Ebner et al. [2009]
			Estelles-Arolas and Gonzalez-Ladron-de-Guevara [2012]
			Euchner [2010]
			Fan and Krishnamachari [2010]
			Feller et al. [In press]
			Fienen and Lowry [In press]
			Fitt [2011]
			Fraternali et al. [2011]
			Govindaraj et al. [2011]
			Gyorffy [2010]
			Hellerstein and Tennenhouse [2011]
			Hill and Ready-Campbell [2011]
			Hoffmann [2009]
			Hsieh et al. [2009]
			Hudson-Smith et al. [2009]
			Ivanov [2009]
			Kameda et al. [2011]
			Kuan-Ta et al. [2010]
			Lee and Chang [2010]
			Leimeister et al. [2009]
			Lutz [2011]
			Lykourentzou et al. [2010]
			McKenna et al. [In press]
			Muhdi et al. [2011]
			Muthukumaraswamy [2010]
			Robson and Rew [2010]
			Rossen and Lok [2012]
			Schall [In press]
			Skopik et al. [2010]
			Stieger et al. [2012]
			Svobodova and Koudelkova [2011]

Dimension	Explanation	Count	Paper(s)
			Vivacqua and Borges [In press] Wang et al. [2012] Zuk [2010]
Who	Staffing	0	
Outcome	Results	16	Adams [2011] Armstrong et al. [In press] Blohm et al. [2011] Brabham [2009] Busarovs [2011] Fritz et al. [2012] Goodchild and Glennon [2010] Goodchild and Li [2012] Greengard [2011] Hirth et al. [In press] Kalfatovic et al. [2008] Raykar et al. [2010] Roman [2009] Schweitzer et al. [2012] Stothard et al. [2011] Tang et al. [2011]
Total		83	

Table 5. Research Focus

Given the multidisciplinary nature of this field, as demonstrated by different domains publishing the crowdsourcing work, apart from work by Malone et al. (2010), our literature analysis did not show any papers that could be classified as multidisciplinary. We argue that "a big picture" view across different domains and disciplines would be very useful for knowledge sharing and reuse. Even more, a multidisciplinary approach is required to tackle complex, multi-faceted problems, where crowdsourcing and collective intelligence are especially needed.

We also envisage that a multidisciplinary perspective would enable the researchers to identify "patterns of good practices" and study their possible adoption across different disciplinary domains. In this way, it would not only be possible to "spread good ideas" but also to help organizations and groups better understand if these patterns are suitable in their contexts and for their purposes.

Our literature review also confirmed a lack of research related to critical success factors of the reported initiatives. Yet, this is very important to facilitate the envisaged knowledge sharing. Apart from studying individual examples of crowdsourcing initiatives from a multi-disciplinary perspective, studying them in their own context, we posit that this "big picture" focus is likely to create a very interesting avenue for future research as well as possibly lead to new research methodologies required to conduct such research.

Reference Theories

Since crowdsourcing is based on the assumption that parts of jobs could be delegated to an intelligent crowd, we have excluded from our analysis the "Wisdom of Crowds" idea proposed by Surowiecki (2004). Overall, after reading and analyzing all papers in the final sample (beyond simple content analysis), we were able to identify seventeen papers that used eighteen references theories as outlined in Table 6.

Paper	Theoretical Background (Reference Theory)
Agerfalk and Fitzgerald [2008]	Psychological contract theory
Bernstein et al. [2010]	Social loafing/ Knowledge sharing dilemma
Bojin et al. [2011]	Creative community typology
Brabham [2009]	Deliberative democratic model
Brabham [2010]	Uses and gratification theories
Chanal and Caron-Fasan [2010]	Collective action model
Dalal et al. [2011]	Condorcent's jury theorem
Ebner et al. [2009]	Stage model of innovation.
Frey et al. [In press]	Expectancy theory
Ivanov [2009]	Decision theory
Kameda et al. [2011]	Game theory model
Leimeister et al. [2009]	Motivation theory
Martinez [2010]	Howard Gardner's hypothesis
Raykar et al. [2010]	Item-response theory
Schweisfurth et al. [2011]	Theory of innovation
Skopik et al. [2010]	Fuzzy set theory
Zheng et al. [2011]	Intrinsic motivation theory and job design theory

Table 6. Reference Theories

In order, to compare the reference theories identified in our paper sample, as depicted in Table 5, with the theories listed on the "Theories Used in IS Research Wiki," we used a website that was established as an ongoing project of the Information Systems Ph.D Preparation Program of the Marriott School of Management of Brigham Young University (http://istheory.byu.edu/wiki/Main_Page).

Only one reference theory identified in our sample: game theory is used widely in the IS field. In contrast, seventeen other theories are hardly used in the IS research field. This may, to some extent be explained by the fact that many of the papers in our sample were published outside the traditional IS publication outlets (See Table 4). It is also quite possible that many IS researchers are not familiar with theories that are able to explain a complex phenomenon of crowdsourcing. Indeed, most papers in our sample (66 of 83) did not make any attempt to use a theory.

Moreover, we were not able to identify any paper that systematically tried to build a theory. This again may indicate that the field of outsourcing is lead by practitioners while academic research still lags behind.

Research Methods

The analysis of research methods, using the classification framework proposed by Alavi and Carlson (1992), reveals that most papers in our sample were empirical. Case studies were the most common approach in the empirical studies. In the sub-sample of non-empirical studies, illustrative papers dominated. Table 7 depicts the results of our examination.

Empirical		Paper(s)
Secondary data	8	Adams [2011] Bernstein et al. [2010] Estelles-Arolas and Gonzalez-Ladron-de-Guevara [2012] Hill and Ready-Campbell [2011] Huberman et al. [2009] Linders [In press] McKenna et al. [In press] Schweisfurth et al. [2011]
Case study	20	Agerfalk and Fitzgerald [2008] Bojin et al. [2011] Chanal and Caron-Fasan [2010] Corney et al. [2010] Feller et al. [In press] Fienen and Lowry [In press] Fritz et al. [2012] Goodchild and Glennon [2010] Goodchild and Li [2012] Heipke [2010] Hellerstein and Tennenhouse [2011] Hirth et al. [In press]

Empirical		Paper(s)
		Hudson-Smith et al. [2009]
		Kalfatovic et al. [2008]
		Leimeister et al. [2009]
		Lykourentzou et al. [2010]
		Marjanovic et al. [2012]
		Muhdi et al. [2011]
		Muthukumaraswamy [2010]
		Vivacqua and Borges [In press]
Experiment	4	Agarwal et al. [2010]
		Alonso and Mizzaro [In press]
		Bridge and Healy [2012]
		Schweitzer et al. [2012]
Field study	1	Blohm et al. [2011]
Survey	4	Ebner et al. [2009]
		Frey et al. [In press]
		Sun et al. [2012]
		Zheng et al. [2011]
Field experiment	4	Armstrong et al. [In press]
		Mannes [2009]
		Stieger et al. [2012]
		Stothard et al. [2011]
Interviews	1	Brabham [2010]
Subtotal empirical	**42**	
Non-empirical		
Conceptual Orientation	15	Afuah and Tucci [2012]
		Albors et al. [2008]
		Armstrong [2010]
		Busarovs [2011]
		Doan et al. [2011]
		Fan and Krishnamachari [2010]
		Fitt [2011]
		Fraternali et al. [2011]
		Gray [2009]
		Gyorffy [2010]
		Kameda et al. [2011]
		Raykar et al. [2010]
		Schall [In press]
		Skopik et al. [2010]
		Wang et al. [2012]
Illustrative	19	Anttiroiko and Savolainen [2011]
		Bazilian et al. [2012]
		Bucheler and Sieg [2011]

Empirical		Paper(s)
		Dalal et al. [2011]
		Davis [2011]
		Epaminondas [2008]
		Euchner [2010]
		Govindaraj et al. [2011]
		Greengard [2011]
		Hoffmann [2009]
		Lutz [2011]
		Martinez [2010]
		Millard [2011]
		Roman [2009]
		Rossen and Lok [2012]
		Scott [2010]
		Svobodova and Koudelkova [2011]
		Tang et al. [2011]
		Zuk [2010]
Applied Concepts	7	Brabham [2009]
		Brito [2008]
		Hsieh et al. [2009]
		Ivanov [2009]
		Kuan-Ta et al. [2010]
		Lee and Chang [2010]
		Robson and Rew [2010]
Subtotal non- empirical	41	
Total	83	

Table 7. Research Methods

As depicted in Table 7, the most common research method in empirical papers is the use of case studies. Contrary, surveys and interviews, data collection methods frequently used in IS research, are used in only four papers. This may again indicate the early stage of academic research in this field.

However, our most important observation is related to the absence of Design Research (DR) and Action Research (AR) methods.

DR is an applied research method that relies upon an application of rigorous methods in the construction and evaluation of a design artifact, aiming to contribute both to the theory and practice (Hevner, March, Park and Ram 2004). Possible contributions include the *foundation concepts* (such as new theories, frameworks, instruments, models and methods) and *methodologies* (such as data analysis techniques, formalisms, measures and validation

criteria) and systems (such as IT applications). In the related work, March and Smith (1995) identify four possible design outputs (artifacts): constructs, models, methods and instantiation.

AR uses an intervention into a problematic situation as a means to develop scientific knowledge. AR is fundamentally "a change-oriented approach in which the central assumption is that complex social processes can be best studied by introducing change into these processes and observing the effects" (Baskerville and Wood-Harper 1998). AR links theory and practice in a highly cyclic process where "the main intention is to create a synthesis with specific knowledge that provides actors in the situation, with the capability to act and the general knowledge that is suitable for similar situations (Baskerville and Wood-Harper 1998). In general, an action research cycle consists of the following generic steps: diagnosing, action planning, action taking and specific learning.

Therefore, both DR and AR research methods could help the researchers add to the existing theory while solving practical problems, and thus making a research-based contribution to their practice. They both have a potential to increase the relevance of IS research while providing a rigorous method to guide and inform researchers/practitioners. We argue the emerging area of crowdourcing calls for DR and AR research, enabling IS researchers to design new solutions, and at the same time, contribute to the emerging body of knowledge. However, our research shows that this has yet to be achieved.

FURTHER OPPORTUNITIES FOR RESEARCH

Our research confirms a rapid expansion of the crowdsourcing research with the research papers started to be published by journals in 2008. Number of published papers doubled in three years (2008-2010), reaching over 20 papers per year. Therefore, the area of crowdsourcing research is less than 10 years old.

Furthermore, it is an area led by practice. As shown, it took academic researchers two years to "catch-up" with this new phenomenon with the 'crowdsourcing" mentioned by Howe in 2006 and the first academic papers published in 2008).

It is also possible to observe a wide distribution of the 83 papers over 71 journals, with the exception of the *Communications of the ACM* that published seven papers. This shows that the crowdsourcing research field is still largely segmented and spread across disciplines.

We also observed important opportunities to expand the current crowdsourcing research, taking into account what is already known by the research community interested in ICT-enabled global collaboration.

Most importantly, we were able to confirm a research gap related to crowdsourcing research and practice in the context of emerging and transition. Based on the prior research such as (Roztocki and Weistroffer 2009) we argue that this particular research context (transition and emerging economies) is highly suitable for the future applications of crowdsourcing due to several reasons. For example, in many of these economies there is a large number of knowledge workers who choose not to work for a company but prefer to keep freelancer status. One explanation for this trend is that many, especially highly educated top-notch experts, are dissatisfied with the compensation level and promotion opportunities. In addition, many companies in emerging and transition economies hesitate to hire new permanent employees due to the resource and other constraints, so we envisage new opportunities where the needed work could be conducted through more flexible crowdsourcing involving freelancers. It would be also interesting to investigate how crowdsourcing may result in crowdfounding, where members of the crowd by providing small financial contributions create solid financial base for their activities – this could be one of many possible forms of the future crowd-entrepreneurship. These are just some of many interesting research and practical scenarios that will continue to emerge for many years to come, thanks to global innovation efforts as well as now widely available crowdsourcing platforms, making these new forms of ICT-enabled collaboration possible and within the reach of anyone with a reliable Internet access.

CONCLUSIONS AND FUTURE RESEARCH

In spite of the growing number of papers on crowdsourcing and collective intelligence, published in very recent time, this is still an emerging research area. Research efforts and contributions so far, are very much isolated within disciplinary boundaries. Yet, "The real world does not always present its problems and opportunities conveniently aligned with traditional academic disciplines so mechanisms are needed to facilitate interactions and collaborations between researchers working in widely different field" (Bammer 2012).

Our research confirms an existing research gap related to crowdsourcing in emerging and transition economies and envisages this to be an important new research direction possibly informing new practices.

"There is now a historic opportunity to marshal human skill, ingenuity, and intelligence on a mass scale to reevaluate and reposition many of our institutions for the coming decades and for future generation" (Tapscott and Williams 2010). Based on the research presented in this paper, we argue that this opportunity should be extended to the emerging and transition economies.

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APPENDIX – LIST OF THE PAPERS IN OUR SAMPLE

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