# EVOLUTION OF CROWDSOURCING: Potential Data Protection, Privacy and Security Concerns under the New Media Age

# EVOLUTION DEL CROWDSOURCING: Protección de Datos, Privacidad y Seguridad en el marco de la sociedad de la información

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## Abstract

Over the last few years, crowdsourcing have expanded rapidly allowing citizens to connect with each other, governments to connect with common mass, to coordinate disaster response work, to map political conflicts, acquiring information quickly and participating in issues that affect day-to-day life of citizens. This paper aims to provide a basic understanding on crowdsourcing, while it illustrates the use of different types and methods, advantages and disadvantages of crowdsourcing. This paper also provides a brief analysis on potential Data Protection, Privacy and Security concerns under the New Media Age. Lastly, this paper proposes future works to avoid some disadvantages of crowdsourcing process and to protect data, privacy and security of end users.

**Keywords**
Crowdsourcing. Definition and Evolution. Typology. Security. Privacy. Ethical and Legal Aspects. New Media Age.

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## Resumen

En los últimos años, el crowdsourcing ha conocido una rápida expansión, permitiendo que los ciudadanos se conecten unos con otros y que los gobiernos conecten con sus ciudadanos. Esto ha permitido la coordinación de las respuestas a los desastres naturales, el mapeo de los conflictos políticos, la adquisición de información de forma rápida y la participación en los asuntos que afectan el día a día de la vida de los ciudadanos. Este artículo tiene como objetivo proporcionar un conocimiento básico sobre crowdsourcing, mostrando el uso de sus diferentes tipos y métodos, ventajas y desventajas. Este artículo también proporciona un breve análisis sobre Protección de Datos, Privacidad y Seguridad en el marco de la sociedad de la información. Por último, propone evitar algunos inconvenientes del proceso de crowdsourcing para proteger los datos, la privacidad y la seguridad de los usuarios finales.

**Palabras clave**
Crowdsourcing. Definición y evolución. Tipología. Seguridad. Privacidad. Aspectos éticos y legales. Sociedad de la información. Marco de Comunicación.

## 1 Introduction

Over the last few years, the term "crowdsourcing" has become really well known to the interdisciplinary research community. What is 'crowdsourcing' all about? The term "crowdsourcing" is the combination of two words "crowd" and "outsourcing" coined by Jeff Howe and published in a June 2006 *Wired* magazine article "*The Rise of Crowdsourcing*" (HOWE, 2006b). For the first time, the *Oxford English Dictionary*[2], in its June 2013 edition included the word 'crowdsourcing' and defines as 'Practice of obtaining information or sources by soliciting input from a large number of people'. [3] However, I define 'crowdsourcing' as 'the process of finding needed information and service for a common goal from a large number of people'. Different types of crowdsourcing have expanded rapidly allowing citizens to connect with each other, governments to connect with common mass, acquiring information quickly and participating in issues that affect citizens.

[2] Available at: <http://public.oed.com/the-oed-today/recent-updates-to-the-oed/june-2013-update/a-heads-up-for-the-june-2013-oed-release/>. Accessed on: 26 nov. 2013.

[3] Available at: <http://www.senatehouselibrary.ac.uk/2013/07/24/crowdsourcing-and-history-or-crowdsourcing-history/>. Accessed on: 26 nov. 2013.

The increased use of crowdsourcing platforms and the positive development of crowdsourcing help common people to become more active and informed citizens.

There are several examples of crowdsourcing initiatives across various fields such as art (CASAL, 2011), business (BELLEFLAMME; LAMBERT; SCHWIENBACHER, 2010), governance (BOMMERT, 2010), journalism (FITT, 2011) and medicine (NORMAN et. al, 2011). The increased use of crowdsourcing platforms and the positive development of crowdsourcing help common people to become more active and informed citizens. Crowdsourcing methods provide a low cost and scalable way to access ideas that might be difficult or expensive to obtain internally (COX, 2011). There are several crowdsourcing platforms available and usually they are open sourced digital platforms. With the help of those platforms government, crisis response teams, NGOs, business organisations and other individuals can collect data- through the information that the 'crowd' i.e. common mass share- and use those data to develop new policies, innovative idea for new products, help victims of natural calamities to find shelters, medicines and other emergency needs, solve minor technical problems, send collective voice to the authority etc. Apart from these, there are other crowdsourcing initiatives to raise funds for social causes, collect money to set up small business, asking for little money for education or for an innovative project.

## 2 The development of crowdsourcing

The term "crowdsourcing" was coined in 2006, but the process of crowdsourcing was applied as early as 1714. Since then, crowdsourcing has helped creating some of the world's greatest inventions and biggest brands. This part of the paper outlines the history of crowdsourcing and highlights some historical and recent examples that occurred before and after the term 'crowdsourcing' existed. The following examples illustrate how different crowdsourcing processes have been used to invent; to design; to raise funds; to govern and to get crisis update from the ground.

The first known example of application of 'crowdsourcing' concept has found in Britain in the 18th century. The British Government offered a Longitude Prize (WEPSTER, 2010) of £20,000 for a simple and practical method of calculating a ship's longitude in 1714.[4] It was finally awarded in 1765 to John Harrison for his chronometer. The other example of crowdsourcing initiative was in the same century in 1783 in France. The King Louis XVI of

[4] More information available at <http://en.wikipedia.org/wiki/Longitude_prize>. Accessed on: 17 nov. 2013.

France offered a prize for producing alkali from sea salt and Nicholas Leblance took the prize in 1791 (MCGRAYNE, 2001). In the year of 1795, the French government offered a 12000 franc prize to anyone who could devise a cheap and effective method of preserving large amounts of food.

In 1810, French confectioner Nicolas Appert published an article on food preservation and the French emperor Napoléon awarded the 12,000-franc prize to Nicolas Appert for his prize-winning essay (KATZ, 2003). Again in late 19th century the France government offered a prize to anyone who could make a satisfactory substitute for butter, suitable for use by the armed forces and the lower classes. In 1869, French chemist Hippolyte Mège-Mouriès[5] had patented a substance he called 'oleomargarine' and later it became known as 'Margarine'. Another important example of crowdsourcing initiative in late 19th century is related to Oxford English Dictionary (OED). This initiative was taken in 1884. The OED used around 800 volunteer readers assigned to particular books, copying passages illustrating word usage onto quotation slips.[6]

In 18th and 19th century, crowdsourcing initiatives were taken mainly for scientific innovation and were concentrated in Europe only. However, in the 20th century, crowdsourcing initiatives have been taken for different fields such as, art and culture, scientific innovation, social movement, not-for-profit purpose etc and reached all over the world. In 1916, the Planters Peanuts contest[7] announced to develop its logo. In 1936, Toyota announced a logo contest to redesign its logo. Toyota Company received 27,000 entries and the winning logo was the three Japanese katakana letters for "Toyoda" in a circle, which was later modified by Risaburo Toyoda to "Toyota". In 1938, the USA started the Mathematical Tables Project in which they engaged 450 out of work clerks in tabulating higher mathematical functions and the "Handbook of Mathematical Functions" was published (GRIER, 1997). A United Kingdom social research organisation Mass-Observation was founded in 1937. It aimed to record everyday life in Britain through a panel of around 500 untrained volunteer observers who either maintained diaries or replied to open-ended questionnaires. Mass-Observation also paid investigators to anonymously record people's conversation and behavior at work, on the street and at various public occasions including public meetings and sporting and religious events.[8] This project ended

[5] For details visit at <http://www.imace.org/about-margarine/history/>. Accessed on 15 nov. 2013.

[6] More information available at <http://en.wikipedia.org/wiki/Oxford_English_Dictionary> and also available at <http://memeburn.com/2011/09/9-examples-of-crowdsourcing-before-%E2%80%98crowdsourcing%E2%80%99-existed/>. Both Accessed on: 17 nov. 2013.

[7] For details visit at <http://www.ideafinder.com/history/inventions/plantnuts.htm>. Accessed on: 17 nov. 2013.

[8] http://en.wikipedia.org/wiki/Mass_Observation

in 1960s but was revived in 1981. The nature of this particular crowdsourcing project clearly illustrates it as a surveillance project. Thus, in that context, the Mass Observation project was the first crowdsourced project for mass surveillance. In 1957, the Australian government arranged a design competition for the Sydney Opera House.[9] A different type of crowdsourcing initiative has been traced in Brazil in 1960s. For the first time in the history of human empowerment, the Brazilian theatre practitioner Augusto Boal used a technique for audience to become a part of the drama. According to this technique, the actors will stop the play in the middle of a performance and ask the audience to continue the performance. This example could also be identified as the first example of active participation for a popular democratic practice. This theatrical practice is known as the 'Theatre of the Oppressed'.[10] The publication of the travel guide Lonely Planet[11] in 1981 was the contribution of independent travelers (LISLE, 2006). The Hollywood Stock Exchange[12] founded in 1996 to buy and sell prediction shares of movies, actors, directors and film-related options. In 1997, the British rock band Marillion[13] raised $60,000 online from fans to fund their U.S. tour. The first major online service marketplace has been launched by Elance[14] in 1999 (KOBA, 2013). JustGiving[15]- the online fundraising platform for charities has been launched in 2000. Also a fan-funding platform named ArtistShare[16] has been launched in the same year (DAWSON; BYNGHALL, 2011).

The Wikipedia launched in 2001. Since then, different companies, brand and institutions have implemented more than 200 crowdsourcing projects.[17] It has also been used for the *NGO sector*. For example, in online micro-finance platform such as www.kiva.org; http://hopemob.org/ that brings caring strangers together to create sudden, yet organized relief and hope all over the world; Violence Against Women Monitoring Map in Bangladesh 2011- www.bijoya.org etc; in *emergency response* work such as- crisis response work for Haiti earthquake, 2010; Uttarakhand Flood Crisis mapping 2013, Typhoon Haiyan in Phillippines 2013 etc. Also during the Hurricane Sandy in 2012, Airbnb

[9] See details at http://australia.gov.au/about-australia/australian-story/sydney-opera-house. Accessed on: 15 nov. 2013.
[10] Visit http://en.wikipedia.org/wiki/Theatre_of_the_Oppressed#Simultaneous_dramaturgy. Accessed on: 21 nov. 2013.
[11] http://www.lonelyplanet.com/
[12] http://www.hsx.com
[13] http://www.marillion.com/
[14] https://www.elance.com/
[15] http://www.justgiving.com/
[16] https://www.artistshare.com
[17] Some examples are Acrobat.com Ideas, Amazon Mechanical Turk, BMW Virtual Innovation Agency, BMW Customer Innovation Lab, BLDG 2.0, Cisco iPrize, Dell IdeaStrom, Innovate with Kraft, Dewmocracy, My Starbucks Idea, Nokia Concept Lounge, Oracle Mix, Hewlett-Packard IT Resource Center, LG Design the Future, Intel/ASUS WePC, Call for investments in Film Industry, India).

(https://www.airbnb.com/sandy) provided a platform to connect those who are eager to offer free housing to those who have been displaced by the storm. Crowdsourcing process has been used in *political crisis response* namely, monitoring post-election violence in Kenya in 2007, Syria Tracker (https://syriatracker.crowdmap.com/) is a platform to report the incidents of missing, killed, arrested, eyewitness; Libya Crisis Map 2011 (http://libyacrisismap.net/) etc. while it has been used in *good governance initiatives*.[18] Another important use of crowdsourcing process is in the fields of *law or policy-making*, such as Constitution amendment in Iceland 2011; Criminal Law amendment in India 2013, Drafting a new UK Constitution, 2013 etc. Wikipedia.org has named more than hundred initiatives that have been taken only in last couple of years. Recently, a newly formed political party in India- Aam Admi Party (AAP) has raised 3.3 million USD for their voting campaign expenses. The AAP has also managed to gather over 15000 volunteers to work for the election in Delhi state of India.

## 3 Definitions, methods and different domains of crowdsourcing

There are numbers of crowdsourcing definitions have been found in the literature. Estelles-Arolas & Gonzalez-Ladron-de-Guevara (ESTELLÉS-AROLAS; GONZÁLEZ LADRÓN-DE-GUEVARA, 2012) found 40 different definitions of crowdsourcing and after considering some specific aspects of the crowd, the initiator and the underlying process proposed an integrated definition of crowdsourcing. Jeff Howe, who coined the terms 'crowdsourcing' in 2006, describes that 'crowdsourcing' is the combination of 'crowd' and 'outsourcing'. He defines crowdsourcing as,

> [....] the act of taking a job traditionally performed by a designated agent (usually an employee) and outsourcing it to an undefined, generally large group of people in the form of an open call (HOWE, 2006a).

For the first time, the *Oxford English Dictionary*, in its June 2013 edition included the word 'crowdsourcing'. Several authors and experts e.g. Howe, Brabham, Kleeman et al., Grier, Vukovic, and Whitla have defined the term 'crowdsourcing' more than once in different articles published between 2006 and 2011. After analysing 40 different definitions, and after considering some specific aspects of the crowd, the initiator and the underlying process Estelles-Arolas & Gonzalez-Ladron-de-Guevara (ESTELLÉS-AROLAS; GONZÁLEZ LADRÓN-DE-GUEVARA, 2012) have proposed an integrated definition of crowdsourcing. However, this researcher finds the definition has a limitation. This

[18] For example, e-Purjee service, Bangladesh; RapidSMS, Ethiopia; MedAfrica; JobMatch.

researcher does not consider that crowdsourcing is just an online activity but an offline activity as well. Thus, very simply this researcher defines 'crowdsourcing' as the process of finding needed information and service for a common goal from a large number of people. In De Vreede et al. (2013), Triparna de Vreede and others have rightly identified some confusions in identifying which applications are crowdsourcing and which are not[19]; whether Web 2.0 and other social networking are crowdsourcing platforms and whether 'user innovation' is corwdsourcing. However, Peter van der Windt describes 'user innovation' as 'Crowdseeding' and not 'Crowdsourcing' (WINDT, 2011).

Jeff Howe- the expert who coined the term 'crowdsourcing' has pointed out some possible categories of web-based crowdsourcing that can be used well in the business world. Some of these crowdsourcing initiatives include crowdfunding, wisdom of the crowd, creative crowdsourcing, crowdvoting, microwork, and inducement prize contests.[20] However, these categories may not be the complete list of different types of crowdsourcing (HOWE, 2008). To perform different types of tasks, people use other ways of crowdsouring as well. Henk van Ess explains,

> [....]Crowdsourcing is exploiting nice people…the crowdsourced problem can be huge (epic tasks like finding alien life or mapping earthquake zones) or very small ('where can I skate safely?'). Some examples of successful crowdsourcing themes are problems that bug people, things that make people feel good about themselves, projects that tap into niche knowledge of proud experts, subjects that people find sympathetic or any form of injustice (ESS, 2010).

In his book 'Crowdsourcing for Dummies', David Alan Grier identifies five major forms of crowdsourcing i.e. Crowdcontests, Macrotasks, Microtasks, Crowdfunding, Self-organised Crowds. Each form involves a crowdsourcer or manager, a crowdmarket and a crowd of people. By choosing the right form of crowdsourcing, someone can manage huge jobs with thousands of workers or do small jobs that require just a single person. Someone can create jobs that he can carefully monitor and control, or he can let the crowd organise itself and decide how it should do the work (GRIER, 2013). Daren C. Brabham, in his book, Crowdsourcing, published in 2013 puts forth a problem-based typology of crowdsourcing approaches (BRABHAM, 2013). These four problem-based typologies are i). Knowledge Discovery and Management; ii). Distributed Human Intelligence Tasking; iii). Broadcast Search and iv). Peer-Vetted Creative Production.

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[19] For example, Huberman et al. (2009 apud De Vreede et al., 2013) consider YouTube as crowdsourcing, while Kleeman et al. (2008, De Vreede et al., 2013) do not consider YouTube as crowdsourcing platform.

[20] http://en.wikipedia.org/wiki/Crowdsourcing

Marta Poblet, Esteban García-Cuesta, and Pompeu Casanovas proposed four different types of 'crowdsourcing roles' based on two variables:[21] a. low/high involvement of crowdsourced agents on processing the data and b. passive/active participation of crowdsourced agents. They have identified four categories i.e. Crowds as sensors, Crowds as social computers, Crowds as reporters and Crowds as microtaskers (POBLET; GARCIA-CUESTA; CASANOVAS 2013).

As the definition of crowdsourcing by Jeff Howe (HOWE, 2006a) captures the most important characteristics of crowdsourcing i.e. a crowdsourcing initiative should have the following three elements: (1) Users are producers, not only consumers; (2) The number of participants is undefined and (3) Users' contributions are towards completing a specific task. De Vreede et al. (2013) differentiate three sub-crowdsourcing models - virtual labor marketplace, closed collaboration, and open collaboration. After analyzing several definitions of crowdsourcing, Hetmank has identified four components (i.e. user management, task management, contribution management, and workflow management) of crowdscourcing (HETMANK, 2013). Every crowdsourcing component has several functions like register user, evaluate user, design task, enable coordination etc. Thus, experts have proposed different types of crowdsourcing. However, based on the intention of the crowdsourcing coordinator, this researcher proposes a further division of crowdsourcing: i) Crowdsourcing for Crisis Response Management: (Natural crisis / Man-made crisis); ii) Crowdsourcing for Public Governance; iii) Crowdsourcing for Business; iv) Crowdsourcing for Innovation / Contest; v) Crowdsourcing for Opinion gathering i.e. Opinion poll etc.; vi) Crowdsourcing for Fund Collection i.e. Crowdfunding and vii) Crowdsourcing for general purpose.

The use of crowdsourcing in different domains not only makes it possible to mine, aggregate and classify data but also helps in preparedness to face a particular situation, response during the situation and recovery after the situation. Crowdsourcing initiators can connect individuals and communities to gather data or to complete one or a set of easy tasks, such as measurements, identifying disaster prone areas or to guide someone who is in need etc. Crowdsourcing process allows individuals and organizations take part in several types of initiatives. Out of different crowdsourcing domains (e.g. art, business, political, scientific research, governance, health service, software development, and natural disaster related etc.), contributors to the political crowdsourcing initiatives are most vulnerable to the security and privacy threat. Crowdsourcing platforms allow common citizens and

[21]They have proposed in their paper titled Crowdsourcing Tools for Disaster Management: A Review of Platforms and Methods. The article has been shared with the author in October 2013.

organizations to install, deploy, and manage crowdsourcing platforms in response to social issue, health issue and sudden outburst emergencies ranging from natural disasters, to the political conflict in any geographical region. They can also communicate with other crowdsourcing initiators with whom they can share different outcomes on similar issues. Another option can also work the other way round: experts can contribute their expertise to a particular problem.

To further improve the understanding of crowdsourcing, the attention has been drawn on some main domains of crowdsourcing. As a result from the literature review, the researcher identifies four main areas of crowdsourcing, i.e. i) Art (Design competition, literature competition etc); ii) Science (Scientific Innovation); iii) Finance (Crowdfunding for social causes, business / investment) and iv) Social science (Opinion gathering, Opinion Poll etc), while every main area has several sub-areas or sub-domains e.g. design / logo contest, scientific innovation, crowd-investment, crowdfunding, crisis response etc.

A thorough analysis has been carried out on i). Seventeen crowdsourcing communities, tools and platforms that contributes to the crisis response management work (i.e. Ushahidi, SwiftRiver, Crowdmap, Eden–Sahana, PyBossa, CrisisTracker, OpenIR, ArcGIS, Recovers, PADDDtracker.org, Google Crisis Map, GeoChat, Souktel, InaSAFE, Geofeedia, Geo-pictures and CrisisCommons); ii). Three crowdsourcing innovation challenges platforms e.g. Knight Foundations Challenges; MIT IDEAS Global Challenge and Mass Challenge that are being used to find innovative ideas or develop innovative tools to tackle different social issues or empower the mankind and lastly iii). Four crowdsourcing platforms used for Miscellaneous Purposes e.g. InnoCentive; Innoget; Inpama and SolutionXchange.

## 4 Pros and cons of crowdsourcing

As it is proved that crowdsourcing process brings some real advantages to business organisations, NGOs, governments and individuals to complete a range of tasks nicely. It also helps to attain the best job with affordable price. Some important reasons for attraction of using crowdsourcing are to have better solutions in terms of price, product and quality. For business organisations, 'it has been fairly lower price, compared to the price for hiring a dedicated professional. Also the best thing with the low price is the high number of people who are ready to work for you anytime' (STEVENS, 2011). For the not-for-profit sector, crowdsourcing has been absolutely the best option to engage common people. It has been used successfully in crisis management - either man-made or natural; helping victims of natural crisis to find a safe place (ROBERT, 2011). It is a great way to

engage the community and to gather the accurate real-time information from the ground. Thus, it helps to manage any crisis properly and promptly. Crowdsourcing has also been used in public governance. Crowdsourcing is also very convenience in gathering public opinion to amend laws e.g. in Iceland in 2011 and in India in 2013 (HALDER, 2013), informing citizens about a potential storm or helping poor farmers to find the best market to sell the products (FISHER, 2012) etc. Like other professionals, health professionals also are using crowdsourcing as a faster alternative to traditional methods for predicting and monitoring infectious disease outbreaks. For example, in Haiti in 2010, informal sources like groups discussions in social media including facebook and twitter revealed a cholera outbreak's in the country two weeks before the health ministry issued its report on the cholera situation (CHUNARA; ANDREWS; BROWNSTEIN, 2012).

However, there are disadvantages of crowdsourcing as well. Interestingly in the business sector, the main disadvantages mirror the main advantages: cheap labour means less credible output, compared to professionals. Sometimes, the issue of management become more crucial. In most cases, the initiator of a crowdsourcing project has to manage a large scale of workers, which pretty much waste more of his time for management instead of solution. Also it is difficult for collaboration between old and new crowd members as they compete with each other. Sometimes crowd members do not take their job so seriously. So, for all these reasons, crowdsourcing could not be the best option for a branded business organisation. In the context of not-for-profit initiative, disadvantages are more crucial. Governments, different security agencies, multinational corporations[22] and also terrorist organizations are able to virtually spying on any person if they wish to. Especially in the context of 'political crisis' (e.g. Crisis in Libya and Crisis in Syria etc.) governments can avail GPS / GPRS- based data provided by citizens and misuse those to oppress oppositions. Using crowdsourcing in public governance is a potential threat to the privacy and protection of personal and sensitive data of users. As millions of data can easily be gathered, governments and others could have very detailed information of who we are, our mobile numbers, IP address of our computers, geographical location etc. Sometimes secret agencies collect different types of information using crowdsourcing method and they can easily guess what type of person we are. This assumption can lead a problem if they are used to target on the ground of assumed health status, age, gender, race, religion, political ideology, sexual orientation, etc. The situation gets even more serious when governments, with the help of their 'muscle power' want to gain access to this personal and sensitive personal information and other data with the intent to dominate over opposition voices. Sometimes governments itself initiate collecting data using different crowdsourcing means

[22] See the news NDTV (2012).

to oppress those individuals or groups who are against governments (ACCESS, 2013). Thus, the contributors of crowdsourcing initiatives become potential victims of human rights violations by the secret agents of governments, multinational companies or even by oppositions or terrorist organizations sometimes.

## 5 Legal and ethical aspects involved in privacy, security and data protection issues in crowdsourcing

In the context of political crowdsourcing, the contributors reporting on abuses or speaking out against these forces have found themselves targeted for attack by the forces themselves or their proxies - with consequences ranging from harassment to imprisonment and death (CHAMALES; BAKER, 2011). For example, during the election monitoring effort of Ushahidi in Egypt encountered regular harassment by members of Egyptian Security Services (STECKLOW; SONNE; BRADLEY, 2011). It has also been noted that the volunteers with fair local knowledge have left the crisis mapping work for Libya in 2011, as they are likely to be the most sensitive to the possible security concerns (MORROWS et al, 2011). The 'Libya Crisis Map' was private initiative. When the United Nations Office for the Coordination of Humanitarian Affairs (*UN OCHA*) decided to make the map public, every Libyan volunteer left (ROBERT, 2011). This fact of driving away the most important members in the Libya Crisis Map initiative has also raised the question of proper coordination along with the security and privacy concerns of using the Ushahidi crowdsourcing software. The privacy issue in the context of disaster response crowdsourcing initiatives is not really potential threats to life of the contributors. Here, the privacy issue is very much linked with personal data of individuals. Not all contributors want to publicize their mobile number, name, sex, place etc. During the Haiti earthquake all contributors said to have used the messages would have been able to access them through private channels. Partners in this initiative did not have permission to publish the messages received in the emergency mobile number 4636 on a public-facing map (by their own conditions for publication). This action clearly resulted the privacy breach. Such type of privacy breach in a more high-risk conflict situation would have serious consequences for those contributors whose identities were exposed (ROBERT, 2011). The 'Grand Round Table'[23]- an online platform - is being used to find possible help from a secure, intimate group of colleagues in health service sector. In this platform physicians can post difficult cases to seek help. Sometimes, it is being used for diagnosis and medical treatment.

[23] More information available at <http://www.grandroundtable.com/>. Accessed on: 23 nov. 2013.

Medical transcription[24] process based on the crowdsourcing methods has created a wider base for medical transcriptionists who can be trained at home and online, and, ultimately, perform the work on a more cost-effective basis (STROHMEYER, 2013). Another mobile-based crowdsourcing platform, 'MedAfrica[25] mobile application' is a Medical Services Content Platform (MSCP) that seeks to create health awareness among citizens from the comfort of their mobile phones. This extraordinary mobile system seeks to increase interactions and purposeful engagements between health practitioners and common people of their services (WORLD BANK, 2012). Generally, service users are a bit reluctant to share their private information e.g. name of diseases, sex, age etc. in a public forum. In terms of mobile-based crowdsourcing health service platforms, the biggest privacy concern with the use of cell phones in healthcare is lost or stolen phones that contain unencrypted patient data (GALLAGHER, 2013). Even the World Bank has identified that 'the health sector remains both complex and challenging' and the 'Privacy and security concerns' is one of 'the most relevant challenges to the greater uptake of mobile-based health service (WORLD BANK, 2012). Contributors in any crowdsourcing initiatives would look for high level of privacy, security, anonymity and guarantee for data protection (KARNIN; WALACH; DRORY, 2010). Unfortunately, not all crowdsourcing platforms could provide the same but high level of security, privacy and private data protection. These three aspects of crowdsourcing are really vital in making sure the security of contributors. These are also important in terms of security information that integrated with different crowdsourcing platforms.

In spite of different crowdsourcing systems, platforms and the method of interaction there may be some level of security and privacy risk linked with contributors. In one hand, there are some platforms that facilitate anonymous contributions that may pose low risk, and in the other sending various levels of personally identical information that may pose higher risk to contributors. Similarly, opportunistic systems may pose a high level of security risk than participatory systems where users manually control data collection (WANG; HUANG; LOUIS, 2013). The Ushahidi platform deployed in Haiti by the Fletcher team[26] had the potential to provide hyper local information on the security situation through the population but did not capture enough reports with specific information to make better decision (HEINZELMAN; WATERS, 2010). In the age of 3-G phones, citizens have further opportunity to participate in crowdsourcing process- not only because of their

[24] A process where written records and notes are translated into an electronic form, entered into a database, and used in the wider-spread arena of documenting the occurrence and frequency of specific illnesses.

[25] More information available at <http://medafrica.org>. Accessed on: 23 nov. 2013.

[26] To know more about the Fletcher team, please check <http://blog.ushahidi.com/2010/01/18/ushahidi-fletcher-situation-room-update/>. Accessed on: 29 nov. 2013.

portability and easy access to the Internet but also because of other functionalities like GPS / GPRS, cameras, and accelerometers etc attached with 3-G phones or smart phones (WILLIAM, 2011). While all these functionalities and other 3-G mobile applications are being considered as highly productive in different context, they may also expose users to latest types of security and privacy concerns. In such circumstances, the World Bank observes, 'citizens often express concern about the security of their private and confidential information, possible surveillance, and anonymity'. In the report it suggests, 'without strong protection or the quick resolution of any breach, citizens will be wary of sharing their information with the government, and efforts to connect and interact would quickly be undermined' (WORLD BANK, 2012, p. 99).

Recent emergence of ICTs, some platforms including social media networks and other web 2.0 tools have changed the perception about privacy and it is becoming increasingly confusing (GRUBMÜLLER; GÖTSCH; KRIEGER, 2013). It looks that users really do not care about to sharing personal information about him / herself, about one's friends or networks in digital environments. Sometimes it becomes really confusing for the user to distinguish between what is public and what is private (OMAND, 2012). Users act in the same way when it comes contributing in crowdsourcing initiatives. Even sometimes some energetic contributors become desperate to share confidential, sensitive and personal information in crowdsourcing initiatives. In the crowdsourcing process all data received from contributors store on a centralized server and 'storing the preference information on a centralized server can expose the users to security and privacy breaches, and in any case requires a great deal of trust' (TOCH, 2012). Despite the potential use of mobile or web based crowdsourcing platform for natural disaster, conflict resolution, health and diseases related issues, experts say they worry about the added risks of security breaches, privacy violations and other concerns that come with the increasing use of different crowdsourcing processes.

The issue of data protection in crowdsourcing initiatives is very important. Starting from general crowdsourcing to business crowdsourcing; from disaster response work to political conflict response work; from campaigning work to research (EKINS; WILLIAMS, 2010) - in every crowdsourcing initiatives, data protection is the key. From the relational perspective, privacy and security, both are closely linked with data protection. As the scope of crowdsourcing is becoming wider, people are using it for different purpose. In the context of crowdsourcing efforts for pharmaceutical research, people need to be aware of some challenges like tissue handling (VAN, 2008), handling patients of infectious diseases with rare etc. The International Organization for Migration has developed 13 data protection principles which are: 1. Lawful & Fair Collection, 2. Specified and Legitimate

Purpose, 3. Data quality, 4. Consent, 5. Transfer to Third Parties, 6. Confidentiality, 7. Access and Transparency, 8. Data Security, 9. Retention of Personal Data, 10. Application of the Principles, 11. Ownership of Personal Data, 12. Oversight, Compliance & Internal Remedies and 13. Exceptions (MARTENS, 2010, p. 11-12).

However all these principles cannot be applicable in crowdsourcing process. For example, the first principle states, "Personal data must be obtained by lawful and fair means with the knowledge or consent of the data subject." "What does this mean when the data is self-generated and voluntarily placed in the public domain? This question also applies to a number of other principles including "Consent" and "Confidentiality" (MEIER, 2012). Thus, from the above-analysis, it is clear that there is a need for some relevant data protection principles especially for 'New Media' as the character of crowdsourced dataset is not similar to other types of dataset those do not necessarily fall under 'New Media' dataset category.

## 6 Conclusion and future work

The implication of crowdsourcing has been so far positive for the society. No serious disadvantages that originated from crowdsourcing have been identified yet. However, the recent disclosures by NSA contractor Edward Snowden established the fact that the privacy of common people is really in danger. These would have huge impact on our society and also on different communication platforms and communication tools. So, an exceptional attention with innovative approach is needed when developing new communication tools and platforms, as users will look for guaranteed quality, high level of anonymity, privacy, and security. So, at this present scenario, it will not be wise to continue as we used to do. Research institutions, governments, NGOs, business organisations should take initiative to handle those threats from ethical, legal and technological context. Finally, a universal framework for 'New Media' communication should be developed to address the security, privacy and data protection issues.

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