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Social Media Applications for Disaster Management

Dr. Savita Kumari (Sheoran)

Department of Computer Science & Applications, Indira Gandhi University Meerpur, Rewari, Haryana (India) – 122502

Abstract: ***Disaster is unforeseen catastrophe, either caused naturally or due gaffe human activities. Every year many of such activities have been visage which causes unbearable man and material loss all over the world. In order to handle such redundant situation prior awareness, real-time rescue and fast rehabilitation is required in order avoid such calamities or minimize the casualties in uncontrollable situation. Owing to fast updates, semantic richness and great relationship between wide public, recently the Social Media has emerged as popular media for mass communication. No doubt it involves enormous technical issues but still research have shown that this internet based technology has gain a momentum, which have never been seen with other technology in past. Researchers have shown that Social Media have not only served as mass media rather it has also established as powerful tool for risk mitigation and disaster management. This research paper has explored the innovative application of Social Media by gauging its adaptability and applications based on its penetration among society.***

Keywords: Social Media, disaster Management, situation awareness, technology for disaster management.

1. Introduction

Disaster is an unavoidable situation of our lives either it is a natural or man-made. Thus, emergency management strategies are developed to mitigate the impact of these unfortunate events. It is unpredictable and need to be handling it timely. In this situation generally mass communication media such as TV, Radio, News papers playing very crucial role with the authentications because at the time of disaster the collection of information, sharing and delivering information is very critical and vital [1]. But presently the development of the social media have received much attention for their use as an information sharing tool since last two decades it provides platform to the people to share and to interact each other through internet. In the last few years the use of social media is growing exponentially. Fundamentally Social Media is envisaged through social networking sites which are based on Web 2.0 technology that not only allow surfing but also visualize a live interaction among its user group.

In such situation use of social media tools such as twitter, Facebook, Flicker, Youtube and Google+ etc are playing the key role to interact with family, friends and colleagues etc. Although there are obvious advantages to utilizing social media during emergency situations, because it is fast but there are risks as well. The effectiveness of an emergency response approach that leverages social media is contingent upon the quality and credibility of the information transmitted via social media [2] that's why it took the position the media of communication at the time of disaster, crisis and emergency situations and social media help to retrieve high stream of data at the of time natural disaster and crisis. This data provide the critical information about the situation such as the people who are in the problem can share the exact information and also community responses related to emergency warnings, near-real-time announcement of incidents, and first-hand reports of an incident's impact [3].

When disaster takes place people try to get the information through social media, because at that time phone line and physical commute is not easy. Some time it is very useful and people acquire valuable knowledge over it [4]. After clouting the public's collective intelligence, concern authorities could better understand the problem during critical situations, and can make the best decisions that are possible for deploying relieve, rescue, and recovery operations [3]. Apart from it Social Media have vast applications in training and information sharing. So it has endless opportunities in disaster awareness and alertness. Figure 1 below shows the possible role of Social Media in disaster management.

We have seen many example of extracting the data from social media such as twitter, Facebook, Digg, blogs etc. to generate the information for proper decision, arrangement and rescue in disaster management. The very recent example is Nepal earth quake on 25 April 2015. Saroj Karki arranged a blood donation group with name "Youth for blood". At the time of earth quake in Nepal it was unable to contact the families because of heavy load on the telephone lines, they start a text app to receive the earth quake updates and people get the actual help they really need for it and then authorities and many NGO has become active to fulfill the requirements of the victim of earthquake. Another mapping exercise was followed at Kathmandu Living Labs. It is a Kathmandu-based non-profit tech company, which used open data and tools like OpenStreetMap to track all kinds of development issues in Nepal. They too, swiftly transitioned into relief mode, coordinating a team of volunteers to collect Facebook posts and Tweets into one organized quake map [5].

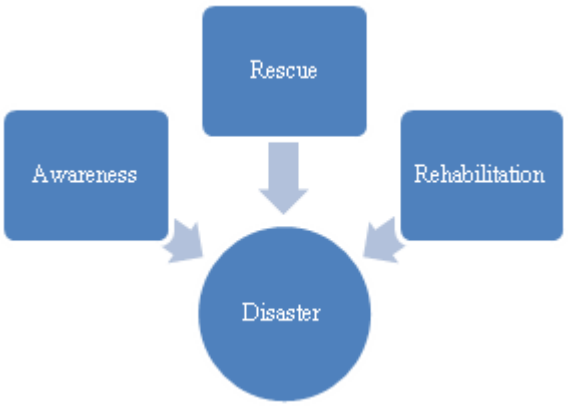

Figure 1: Social Media in Disaster Management

Yet a few researches have already been done in this field but still the exact role of Social Media in disaster management is vague. In various situations like earth quake, tsunami, flood and other natural or man-made disaster it can be helpful by:

- Provide valuable post-disaster information about those entangled in debris or worst situation.
- Awareness drive for those in affected areas.
- Can provide information about unclaimed properties
- Forming groups of volunteers etc.

In zrder to develop a model for Social Media use in disaster management this paper amass some pre/post requisites and challenges keeping peoples' adoptability towards such newer technology at centre. The proposed model and organization of this paper is shown in figure 2.

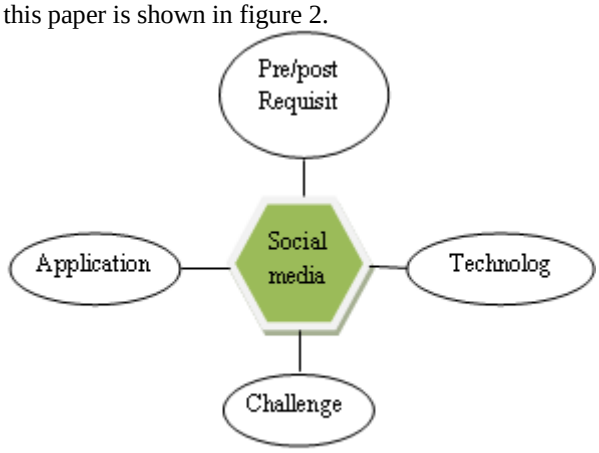

Fig 2: Social Media Disaster Management Model

2. Pre/Post Requisite

When Disaster occurs people and authorities try to get information from social media and other source to recover the calamity disquiet. It will be better for every country or place that are counted as calamity area should be find out the pre/post requisites for disaster management. Many technologies are available there and many researchers are working to handle the calamity situation in better way with minimum loss of properties and life's.

- An indigenous system that can use to early warning at the time crisis so people can aware and the can manage their things in better way to face the calamity problem and authorities can arrange all things that can be required to face the disaster and reduce the negative effect of the crisis. For example June, 2014 there is Tsunami come in India and it was predicated properly by Indian Geographers and managed with minimum loss of the life's and properties. All dangerous area people were shifted at the safe places.
- Support of information bases for disaster risk management; provision of awareness raising and training; and communication of risk and last-mile early warning.
- Effective coordination is very important for post-disaster reconstruction. Still there are very less tool are available for organizations to managing communication and coordination for the post-disaster reconstruction.
- Coordination models for post-disaster reconstruction and management currently lack concrete implementation tools. Opdyke et al addressed this gap by analyzing Twitter as a means of sustained communication that can assist reconstruction managers in working towards better coordination [8].
- Both technologies old and new can help in reducing the effects of disasters in various ways. It is premised that ICTs can play an important role as a medium of information and communication in development and disaster response using social media.

3. Challenges of Social Media

Social Media posse's vast potential to re-define the modern era of communication but still there are some issues and challenges which need to be addressed properly to harness best from this technology. Such issues are:-

- Increasing popularity of social media also lead the information overloads which can be prevent disaster management organizations from processing and using social media information effectively.
- As per survey conducted by the Canadian Red Cross in 2012, find that 63% of Canadians say emergency responders should be prepared to respond to calls for help posted on social media [6]. This is also a challenge for the disaster management community to meet those expectations, but also presents an opportunity to partner with the public to build and leverage their capacity to prepare for, respond to and recover from crisis.
- Another big challenge is social media information is occasionally unreliable. Harmful rumors spread and cause people to panic. For example Aug,2012 Bangalore was hit hardest by rumors that the ethnic violence in Assam, in which nearly 80 people have been killed, would ricochet across Karnataka, where an estimated one lakh people from the North East lives in and around Bangalore. The Karnataka government responded to the exigency with tact and skill - the Police Commissioner and Home Minister visited the train station to reassure commuters there is no cause for panic; the chief minister met with student representatives and told them noting would be done to hurt them on his watch.
- Disaster management organizations are very interested in increasing their interaction with trusted partners as well as with established formal organizations; they are still not entirely comfortable with engaging the public directly. This appears to be mainly attributable to a lack of knowledge of and experience with the technologies and applications for the purpose of disaster management, and is a barrier to embracing more collaborative ways of sourcing and processing information.
- Data privacy aspects are still a concern in cyberspace, and social media in particular, for its international nature remains outside of country-specific legal framework.
- Harmonization of language and terminology is also a great challenge.
- Responder communication from remote area, so it's difficult to reach there.
- Coordination is also a big challenge between the volunteers.
- A specific search involving paying attention regarding to flood preparation can be observed, and measured, through the searching activity of users, and their choices of which

results to click on. But, the analysis and interpretation of such data is sometime a big challenge.

- Data disperse is also a big problem because a machine cannot understand the image, text, video. The idea behind the data sparseness problem is that as more features are extracted from the data, more dimensions are added to the classification space.

4. Role of Social Media in Disaster Management

Whenever we talk about technology it is playing great contribution with the usage of ICT and social media have greatly expanded the overall scope of communication in calamity management. Various concluded research have uncovered that after math of disaster have changed drastically due to Social Media. It operate through sculpt shown in figure 3 while its novel characteristics are shown in figure 4, below.

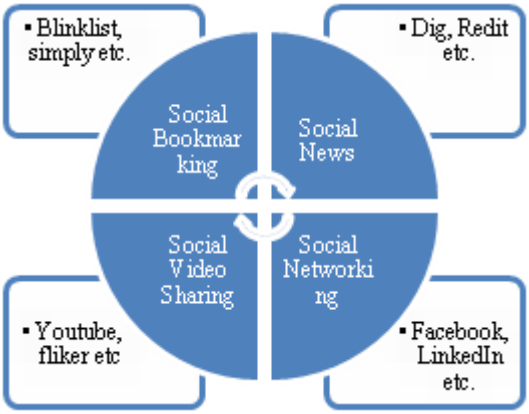

Figure 3: Social Media Operations

The main applications of Social Media in disaster management are as follow:-

✓ The ICT is providing the best access particularly when using mobile and wireless technology any time anywhere.

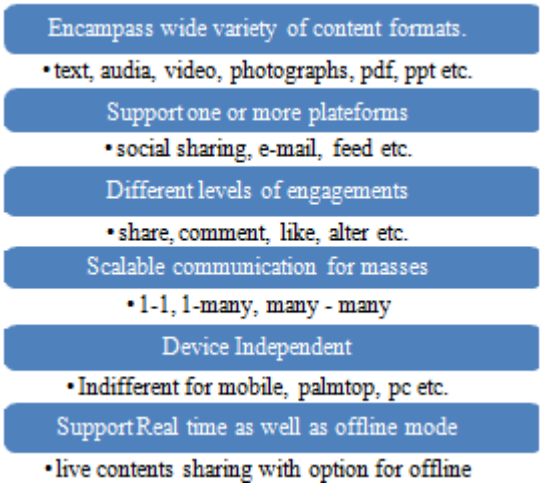

Figure 4: Characteristics of Social Media

✓ It provide the all type of functionalities including audio/video as well all type of multimedia content using web and sensors for geographical location using GIS in mobile.

✓ With help of technology we can get intentional acts of communication, with examples including voice calls, and text messages on social media.

✓ With the usage of technology it is become very easy to identify the individuals' need to priorities urgent safety messages, and organizations' need to work of a helpline during a calamity.

✓ To analysis and access the information from social media many technology are available that provide the required information such as big data analytics, data mining, cloud etc.

✓ Twitter is considered better for emergency communication use, because of its growing ubiquity, communication rapidity, and cross platform accessibility, during and after natural disasters. In most urban areas, different types of networks, such as fixed-line, Wi-Fi, cellular, and WiMax, can provide overlapping coverage for Internet connectivity. So, during times of calamities, when a one of telecommunication infrastructure is disturbed, people can use other to keep in touch via social media.

5. Application for Disaster Management

There are great availabilities of the technology for analysis and access the accurate information from the use of social media in disaster management. ICT can enhance social capital in community as they can improve communication and exchange of information and knowledge, thereby strengthening and creating new social and economic networks between the societies. Basically the following applications are used for the disaster management.

a) Social networking
b) Web tool
c) Crowd Sourcing

The names of social media that follow above application are (Twitter, Facebook, Google public alerts, Google maps, YouTube etc.

6. Conclusion

This paper has theoretically studied the impact of Social Media on disaster and crisis. Social media is very important means of communication to retrieve information for transmission and liking the people in the ubiquitous environments as well as in calamity environment. Greater breadth of technologies will become increasingly important for communication in disaster management because they will extensively impact it, without all of these technologies being communication technologies themselves. The effectiveness of social media is greatly influenced if it uses appropriate communication with society at the time of crisis and disaster with proper time and technology use. Its proper use can also reduce the negative effect of the calamity on the life's material losses with openness, fairness and quickness. Yet Social Media can't replace traditional disaster management strategies but can bolster current system in disaster awareness, rescue and rehabilitation. As a future work I am planning to develop a practical tool for crisis specific

situation. Such tool can be helpful in particular situation with expendability in variety of situations.

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