Book of Full Texts
Afet Yönetimi/Disaster Management

Disasters 3.0: Integrating Sharing Economy Tools for Emergency Management Systems

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Presentation Type: Oral
Presentation Language: English

Abstract
Emergency management requires agility by its very nature. In order to save lives, it is important to manage the process accurately. Emergency activities are divided into four phases that form a cycle. The phases of the cycle are Mitigation, preparedness, response, and recovery. The efficient organization of emergency management is directly proportional to the timely and accurate flow of information. Consequently, the principle of delivering the right product to the right place and the right people in the right amount and in the right conditions, which is established in the field of logistics and adapted to emergency management today, form the basis of the process. In this study, the use of mobile communication tools of people in times of disaster is discussed. It is possible to evaluate these communication tools in three different categories from past to present. The use of phone calls and text messages, which we can call Disasters 1.0, the use of social media tools, which can be defined as Disasters 2.0 and that are created with the effect of Web 2.0. Lastly, it can be grouped as the use of sharing economy tools which can be expressed as Disasters 3.0 which is developing today. The concept introduced in the study with Disasters 3.0 has emerged with the examination of changing communication behavior in today's conditions and is a broad concept that includes its predecessor, Disasters 2.0. The aim of the study is to examine mobile communication and internet tools which help to deliver aid to the related region in natural disaster situations. In addition, there are concrete examples of the use of social media tools that are among the communication tools and the use of tools in the sharing economy. Within the scope of the study, the tweets sent from Turkey via "Twitter" in the 1-week period following the 2011 Van earthquake were analyzed and grouped according to their purpose. It also examined the examples of how leading companies involved in the sharing economy have contributed to the natural disaster moments. Thus, in the event of a disaster, the use of communication tools was revealed, and predictions were made about how they could be interpreted by the authorities in case of a possible disaster.
Keywords: Risk Communications, Disaster, Sharing Economy, Emergency Management System.

1. Introduction
With the increase in the use of web interfaces, communication has also started to be reformed. Literature shows that web tools accelerates interpersonal communication (Subramanian, 2017). Historically, the development of web tools has accelerated with the development defined as web 1.0. web 1.0 covers the process of publishing limited information on the internet and bringing it

online. In such a system, the broadcaster is intended to carry the information he / she wishes to share to the online environment in the form of a text document. The flow of information is unilateral, from producer to society. Visitors to the relevant online content may not provide feedback or participate in any way. Only reading is authorized. Examples of typical websites in the web 1.0 period include personal web pages, dictionaries, and content management systems. The use of web 1.0 systems in natural disaster situations is very limited. Such a system can only mediate news or developments related to natural disasters. Therefore, only those who visit the website at that time can access this information. This situation narrows the target audience considerably (Breeding, 2006).

Web 2.0 is a more advanced system that incorporates web 1.0 features. It would not be wrong to say that Web 2.0 was created according to needs. Especially with the technological transformation that started in the industry, bilateral systems were needed. Inter-organizational communication, inter-organizational communication and the need to accelerate workflows can be listed as some of them. Web 2.0 has changed the way social technology is used. In the past, the unilateral system was shaped in favor of society. Web 2.0 is defined by "the second stage of development of the Internet, characterized especially by the change from static web pages to dynamic or user-generated content and the growth of social media." The most prominent feature of Web 2.0 is that it consists of systems that interact with the content producer and the user. Thus, the person in contact with said internet interface becomes a part of the system at the same time (Naik and Shivalingaiah, 2009).

Web 3.0 is also known as semantic web. With this system, artificial intelligence has come to the forefront. Nowadays, web 2.0 and web 3.0 are common. However, web 3.0 has more efficient results due to its possibilities. Semantic systems perceive the behavior of users and produce special content for them. Artificial intelligence nowadays allows the machines to communicate with each other, to predict events, to respond to variable situations in agile manner (Nath, et al., 2014).

The following examples illustrate the usability of web 1.0, web 2.0, and web 3.0 in emergency management:

- With Web 1.0, announcements about emergencies are no longer paper-based and can be moved to digital media. The freedom to change digital content poses a positive situation for emergency management. However, the difficulty in delivering the relevant content to the targeted audience is a constraint.
- With Web 2.0, interaction has started to take place online. To interpret this in terms of emergency management, people are now able to share information about the emergency situation online. Therefore, they started to give feedback to an announcement on the subject (Panagiotopoulos et al., 2016). This has strengthened the organizations that manage emergency management in times of disaster. A negative aspect of Web 2.0 in terms of emergency management is disinformation Accepting all information transmitted is problematic, as well as accepting it as wrong. Therefore, additional technology is required for the elimination of the information to be obtained through interaction.
- Web 3.0 aims to address the deficiencies of its predecessor technologies. Artificial intelligence plays a critical role in emergency management. Artificial intelligence helps in emergency management in terms of analyzing the information gathered from the relevant region in the event of disaster, comparing it with past disaster data, scheduling aid according to the estimated number of victims, and thus providing inter-agency communication.

Depending on the developing technologies, sharing economy tools have led to new initiatives on the internet in order to provide people's needs more easily, more practical and more reasonable. The sharing economy, of course, was not a newly emerging concept. Sharing of goods, exchanging of goods and making them with family, friends and close acquaintances is a situation that exists in the nature of human. the Sharing Economy has been defined to include the renting, bartering, loaning, gifting, and swapping of assets that are typically underutilized, either because they are lying unused or because they have not yet been monetized (Felländer et al., 2015). Such assets include a wide variety of tangible and intangible assets. Different terms which are being used for sharing economy are access-based consumption, connected consumption, peer economy, peer-to-peer rental, peer-to-peer markets, collaborative economy, collaborative consumption, the circular economy and, the peer-to-peer economy (Basselier et al., 2018) (Nguyen and Llosa, 2018). In this study, sharing economy tools are covered under the definitions mentioned above.

Sharing economy tool worked as to provide free boarding during Hurricane Sandy in 2012. The company Airbnb, which aims to provide people with rooms or residences they do not use with those in need, has set an example in this regard. With Airbnb application Floridians could find free rooms when all hotels were full. According to the company, 1,400 hosts in New York opened their doors during Hurricane Sandy in 2012 (Vice, 2016). Uber, a sharing economy site that specializes in transportation, announced that they would not make high transport charges in times of disaster. Thus, it is aimed to make the services more accessible. In the same way, we see that food service companies do similar practices (Rstreet, 2016).

The dramatic acceleration of interpersonal information transfer has led to the need for a greater investigation of awareness of the issue. One of the situations where speed and efficiency comes to the fore is natural disaster times. Share economy tools combine with the artificial intelligence technologies that web 3.0 allows to create Disaster 3.0.

In this context, Disaster 3.0 will be determined according to the following new emergency management methodology (Luna and Pennock, 2018).

- Rapidly developing scenarios
- Increased numbers of participants
- Adoption of new technologies
- Large amounts of data to be collected and analyzed

In our study, the transformations made by the use of social media on the basis of natural disasters, the analysis of the usability of social media tools in the government and public relations in the context of natural disaster moments will be made. As part of the research, Twitter was examined with tweets posted in the 1-Week process following the Van earthquake in 2011. Web 3.0 tools and developing social media tools to use earthquake times is mentioned in the current examples and the concept of disaster 3.0 is tried to explain.

2. Materials and Methods

Van earthquake of 2011, also called Erciş earthquake or Van earthquake, a serious earthquake that hit in eastern Turkey close the towns of Erciş and Van on 23 October 2011. Over 570 individuals have been murdered and thousands of constructions have been demolished in Erciş, Van and other neighboring cities. Jordan and southern Russia felt the earthquake as far away. The earthquake was recorded as moment magnitude of 7.2 (Brittanica, 2011).

The tweets that were published on twitter between 23 October 2011 and 30 October 2011 were subject to the study. Using the advanced search feature on the Twitter tweets written between these dates containing the keywords "earthquake", "help", "van" in Turkish were filtered. All tweets were examined and grouped according to Comunello et al. study (Comunello et al., 2016). The results are presented as frequency distribution.

3. Discussion, Conclusions, and Future Research

Tweets are grouped as follows: “First-hand information, Second-hand information, Emotive, Comments, Irony, Useful information, Media”. In total, 1112 tweets were grouped. The frequency distributions as a result of the analysis are respectively 3%, 7%, 15%, 15%, 12%, 14%, 34%. According to the results, we see that the news shares made by the media organizations take the first place. The other shared information about the earthquake disaster by people living in Turkey, has a rate of 66 percent in total. This shows us that it constitutes an important information worthy of investigation at the time of the earthquake. It is very difficult to filter out tweets at the time of the event. The use of a hashtag to be determined by government agencies in times of disaster will facilitate access to information. This is why it is important to introduce the hashtag to be determined in the community and to spread the intended use. Today, we see that technology is being used more in times of disaster. Artificial intelligence technologies that came into our lives with Web 3.0 also play a major role in the collection and analysis of scattered data. In this context, disaster data can be analyzed in social media tools and artificial intelligence can be utilized in future disasters. Thus, assistance and actions to be taken to the disaster area can be realized more efficiently. The tools of sharing economy can be used efficiently for social solidarity in the post-disaster. Thus, possible temporary housing and transportation problems can be reduced. The use of online tools in disaster situations can be varied.

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