# Social Media-Based Event Detection for Crisis Management in the Al Za'atari Refugee Camp

**Maximilian Walther**
AGT Group (R&D) GmbH
mwalther@agtinternational.com

**Sven Schaust**
AGT Group (R&D) GmbH
sschaust@agtinternational.com

**Michael Kaisser**
AGT Group (R&D) GmbH
mkaisser@agtinternational.com

## ABSTRACT

Social Media data allows for profound analyses of user-generated content in order to predict or manage disasters and crisis situations. In this paper, we present an analysis of tweets from and about Al Za'atari, a refugee camp in Jordan close to the Syrian border. Our results are based on the analysis of location-tagged tweets by our "Avalanche" system in order to support an accurate situational awareness picture for on-site and off-site operators from relief organizations on evolving events and challenges.

### Keywords

Social Media Analytics, Event Detection, Crisis Management, Refugee Camps

## INTRODUCTION

In recent years, Social Media has made its way into society and today heavily influences decision making in fields like politics or marketing. In this paper, we share results of how we use Social Media Analysis to improve the understanding of evolving crisis situations. We concentrate on an analysis for the Za'atari refugee camp in Jordan. The following section presents insights on how we have retrieved and analyzed relevant data. We also present which events we have been able to capture with our in-house Social Media analytics & event detection system "Avalanche".

## SOCIAL MEDIA-BASED EVENT DETECTION IN THE AL ZA'ATARI CAMP

Al Za'atari camp is located 15 kilometers south of the Syrian border. It has a size of about 220 hectares and consists of more than 5,000 shelters (Chappelle and Collier, 2012) and around 500 infrastructure and support buildings. At the time of writing (February 2013), more than 70,000 Syrian refugees live in the camp. Providing infrastructure for such a large number of people is a difficult undertaking and complaints by the refugees have frequently been recorded, e.g., about limited food and water resources, insufficient electricity, and communication possibilities or about the fact that authorities were not allowing refugees to leave the camp. It is important for the responsible decision makers, e.g., at relief organizations, to receive information about such issues in a timely manner. In the following, we describe how we have used our in-house technology to monitor Twitter throughout a 10-day period at the end of October 2012 in order to create a situational awareness picture.

For this task only tweets tagged with location information (i.e., GPS coordinates) have been taken into account. This includes tweets with GPS tags as well as tweets from users which set their home location to be in the area of interest. In addition, a filtering routine used a set of keywords to extract tweets which were relevant for the Al Za'atari camp. About 9,000 tweets have been captured in total. Based on the incoming content, we generated a heat map that provides an overview of the hot spots concerning Al Za'atari-related tweets. The heat map is normalized based on the overall tweets coming from each sub-region. Figure 1 provides an overview of the geographical origins for the analyzed tweets through the previously mentioned heat map.

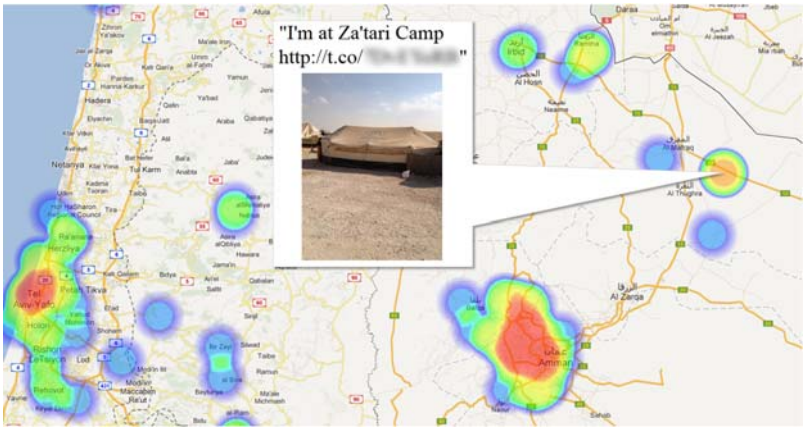


**Figure 1. Geographical distribution of Al Za'atari-related tweets.**

As can be seen, only a small amount of tweets actually come from within the refugee camp. This is due to the lack of communication means for the refugees themselves as well as the prohibition for the relief organizations' employees to share camp-related information with the public. However, we found that the second hand information mostly shared from urban areas in the region was in most cases timely and accurate as well. In many cases, such tweets originate from people personally connected to persons in the camp, e.g., family members of refugees or aid workers. We have been able to collect actionable information, including security-relevant events taking place at the camp. Some of the captured events are:

- October 10, 2012: Tuberculosis spreads in the camp.
- October 18, 2012: King Mohammed VI of Morocco visits a field hospital in Al Za'atari.
- October 18, 2012: Two families use a bus to escape from the camp.
- October 22, 2012: Catherine Ashton, EU representative for foreign affairs and security policy, visits the camp.
- October 23, 2012: Syrian refugees burn down their tents to protest against living conditions in the camp.

- The detected events have been verified by THW experts who had been on-site during that time. Technical details of systems involved in this analysis can be found in (Walther and Kaisser, 2013).

## CONCLUSION

Today's Social Media sources provide a continuous information flow that can be useful in cases where crises need to be detected, understood, and managed. In the Za'atari refugee camp, access to modern communication means is limited and thus the majority of information shared on Social Media is second hand. We were still able to accurately depict the situation on site with only a few hours delay by using Social Media sources only. In addition, an understanding of the general sentiment and its change over time can be deducted from the data. Finally, additional information sources linked from within the Social Media stream, e.g., shared newspaper articles on the topic, can be helpful information for decision makers that they otherwise might miss.

Currently, we are working on an automatic summarization module for our system that gathers this information and makes it available to decision makers either on demand or in the form of a daily report. The system will also be able to push alerts to subscribers in the case it detect unexpected incidents.

## REFERENCES

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