

QATAR COMPUTING RESEARCH INSTITUTE BOOSTS NEPAL EARTHQUAKE RELIEF EFFORTS WITH HIGH-TECH DIGITAL INITIATIVES

Doha, Qatar, May 25 2015: Emergency responders are still dealing with the fallout of Nepal's two devastating earthquakes and using advanced technology and platforms, some of which have been developed in Qatar, to aid the relief efforts and save lives. Nepal suffered its worst earthquake in 80 years on Saturday 25 April 2015, before another tremor measuring 7.3 on the Richter scale struck the Asian country again on Tuesday 12 May, bringing the estimated total death toll from both quakes to more than 8,600.

In place and acting quickly, these emergency responders are using every option available to them in order to ensure their on-going international relief operations remain efficient and effective. Amongst the tools at their disposal include a number of high-tech, digital humanitarian initiatives, developed by Doha based Qatar Computing Research Institute (QCRI), a member of Qatar Foundation for Education, Science and Community Development (QF). The Institute not only supports QF's mission by helping to build Qatar's innovation and technology capacity, it also strives to become a global leader of advanced computing research in areas that will bring positive impact to the lives of citizens and society.

In the aftermath of any disaster, one of the most sought after assets for any emergency responder are facts on-the-ground. Fortunately, in an age of social media, smartphone users can now disseminate vast amounts of information online at the click of a button. Even just a simple 140-character Twitter post can contain valuable information about areas that have been affected, estimated causality numbers and the immediate need for certain resources.

Recognising the potential value of social media posts to disaster responders, in September 2013, QCRI launched its Artificial Intelligence for Disaster Response (AIDR) platform. This state-of-the-art computing initiative uses keywords to identify and collect all potentially relevant social media messages shared online in the critical hours, days and weeks that follow a humanitarian disaster, which are then classified according to specific information needs.

Once activated, AIDR aims to build a fully loaded treasure chest of Twitter posts related to an event for responders to trawl through. Plans to expand data collection from other social media and digital platforms are currently being tested.

However, as many emergency responders have discovered in recent years, the sheer volume of 'tweets' posted online after any disaster can be overwhelming. In the week that followed Hurricane Sandy in the US in 2012, for example, almost 20 million posts were uploaded to Twitter containing the keywords "Sandy" and "hurricane".

Therefore, to help filter out the most relevant tweets from the initial AIDR collection, QCRI uses its MicroMappers platform, developed in partnership with the Standby Task Force and the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) in 2013. This innovative crowdsourcing

platform brings together teams of internet volunteers throughout the world and enables them to assess and categorise content, which is then used to 'train' and automatically categorize new streams of data coming in to AIDR. The MicroMappers platform was developed to not only handle streams of data from Twitter, but the platform also works with SMS, images, videos, satellite and aerial imagery.

In the case of the recent earthquakes in Nepal, one of the main tasks for the MicroMappers community has been to trawl through over 300,000 tweets collected by AIDR since the first earthquake occurred. These committed internet volunteers, 2800 in number, then place each of the collected tweets into a category according to their content. For example, the volunteers may classify a tweet as a 'request for help', 'causality figure or infrastructure damage update', 'offer of help' or 'none of the above'.

Once categorised, efforts are then made to plot the highest-priority tweets onto an interactive map according to their geo-location. Finally, these data maps are then sent to the relief agencies so that they can assess the areas most deserving of immediate attention. In Nepal, where the rough terrain of the Himalayas and a poor transportation system have made it difficult for responders to establish the needs of those living in remote areas, these maps have proven a particularly useful method for plugging the information gap.

Commenting, Dr. Ahmed K. Elmagarmid, QCRI Executive Director, said: "Both earthquakes in Nepal have caused unprecedented devastation and destruction and our hearts go out to the communities continuing to suffer. We are thankful that relief operations are benefitting from the advanced computing initiatives that we have developed at QCRI. In the aftermath of any disaster, we believe that technology has a fundamental role to play and has the ability to save lives. This is why we continue to enhance and develop our platforms in the future, as we look for solutions that can have a meaningful social impact."

This is not the first time that MicroMappers has played a significant role in the aftermath of an emergency situation. Since the launch of the initiative in 2013, United Nations (U.N.) relief teams have relied on QCRI's platforms and the online community of volunteers on several occasions. In recent times, MicroMappers has played a vital role in informing relief operations following events such as the devastating Cyclone Pam that hit Vanuatu in March 2015, Typhoon Hagupit in the Philippines in December 2014, the September 2013 Pakistani earthquake and also Typhoon Haiyan that thrashed the Philippines in November 2013.

According to Dr Patrick Meier, Director of Social Innovation at QCRI, it was MicroMappers contribution to rescue efforts on these occasions that meant it was one of the first systems activated by the U.N. in the aftermath of the first Nepal earthquake.

"Within 24 hours of the first tremors in Nepal, the U.N. were asking us to initiate AIDR and MicroMappers so that we could immediately begin gathering tweets related to the destruction", explains Dr Meier. "This early activation meant we had the opportunity to put together live crisis maps of the most affected areas and then feed these to several relief agencies before they had even arrived in Nepal. This meant that responders had a good picture of the areas that had received the worst of the damage before they had even touched down in Kathmandu."

Naturally, it is difficult in these early stages for the QCRI team to assess how MicroMappers is impacting the disaster response efforts. However, there is anecdotal evidence to suggest that the information is having a lifesaving effect. In the days that followed the first earthquake, MicroMappers volunteers found a tweet from a Nepali doctor who was running low on supplies at his hospital. Prompted by this request for help, a group of online volunteers were able to successfully make contact with the doctor and then send crucial medical equipment in his direction.

Commenting on the success of MicroMappers and AIDR so far, Dr Jaideep Srivastava, Research Director of Social Computing and Social Innovation at QCRI, said: “At QCRI we pride ourselves on developing advanced technologies that result in meaningful social change both nationwide and globally as part of our continued support of the Qatar National Vision 2030. In response to the two earthquakes that have devastated Nepal, our efforts to fulfil this mission were made possible not only through the contributions from the broad network of digital humanitarians and on-going interaction with our humanitarian aid partners, but also by our team of software engineer experts who ensure the platforms remain operational during actual crises.”

Of course, another important area of concern for relief agencies that turn to social media after a disaster is the validity of the content shared online. In recent years, social media has often been criticised for facilitating the rapid spreading of misinformation after several high-profile news events. In 2012, for example, following Hurricane Sandy, a picture that claimed to show sharks swimming in a flooded New Jersey subway station went viral online. Of course, the picture was eventually debunked as a myth by members of the online community, but not before several news organisations and journalists had embarrassed themselves by re-tweeting the image to their followers.

Therefore, to ensure that all information passed onto responders is credible, QCRI worked with researchers at Masdar Institute and the University of Southampton to develop Verily. This crowd-surfacing platform works similarly to MicroMappers, in that online volunteers are tasked with determining the status of a social media post.

However, unlike MicroMappers, members of the Verily community are generally more specialist in their abilities and are even offered training guides to ensure they can rapidly verify information posted on social media. In determining the veracity of the content, members of the Verily community are asked to make a critical judgment on each Tweet or image and explain why it should be seen as either true or false. In a humanitarian disaster scenario such as the earthquake in Nepal, the integrity of the information becomes critical.

Heather Leson, Program Manager, Social Innovation at QCRI explains: “The MicroMappers community acts to ensure that the most high-impact tweets are filtered through, while Verily ensures that these tweets are credible before being passed to the rescue teams. Verily is an evidence platform giving users a space to ‘verify’ images or text with proof. There have been numerous occasions when responders have mistakenly used inaccurate information from the internet to plan their operations, only for this to have disastrous consequences. Data quality control is critical and Verily has a growing reputation as one of the premier tools towards ensuring this.”

Meanwhile, it is not only tweets that members of the MicroMappers and Verily online communities are being asked to review. In recent times, both sites have been handling an increasingly diverse amount of content related to a disaster – including newspaper and TV coverage, YouTube videos and even footage shot from drones.

Since the first earthquake struck Nepal, it is estimated that thousands of unmanned aerial vehicles (UAVs) have flown over the disaster zone, in an effort to build up visual data related to the earthquakes and to map out the destruction.

The drones have been coming from all around the world. India, for example, has been sending hundreds of UAVs to Nepal in support of its geographical neighbour, meanwhile drones from Canadian relief charity GlobalMedic, Hong Kong, the US and Mexico have also been flying into the disaster area.

Some of the more high-tech vehicles flying over the country are even equipped with thermal cameras to help locate survivors by detecting their body heat, as well as cameras that can detect the details of human faces at 1,000 feet away.

The teams are being coordinated and organised by the Humanitarian UAV Network organisation, known as the 'UAViators'. This pioneering initiative, which is another initiative of QCRI, has become a central organising point for drone pilots looking to use their technological skills to help rescue efforts in the wake of a disaster.

Since the first earthquake struck in Nepal, members of the UAViators community have also been sharing their footage with MicroMappers. This in turn has enabled the site's volunteers to review its content, categorise the destruction of buildings and districts, and then share its findings with relief agencies. The hope is that this visual information shot from the drones can complement the tweet data maps and build a comprehensive and complete picture of the situation on the ground, enabling responders to save as many lives as possible.

ENDS

Qatar Foundation – Unlocking Human Potential

Qatar Foundation for Education, Science and Community Development (QF) is a private, non-profit organisation that is supporting Qatar on its journey from carbon economy to knowledge economy by unlocking human potential, for the benefit of not only Qatar, but the world.

Founded in 1995 by His Highness Sheikh Hamad bin Khalifa Al Thani, the Father Amir, QF is chaired by Her Highness Sheikha Moza bint Nasser.

QF's work encompasses education, research and community development. World-class universities are brought to Qatar to help create an education sector in which young people can develop the attitudes and skills required for a knowledge economy. At the same time, QF builds Qatar's innovation and technology capacity by developing and commercialising solutions through key sciences. The Foundation also works to foster a progressive society while enhancing cultural life, protecting Qatar's heritage and addressing immediate social needs in the community.

For a complete list of QF's initiatives and projects, visit <http://www.qf.org.qa>

About Qatar Computing Research Institute

Qatar Computing Research Institute (QCRI) was established in 2010 by Qatar Foundation for Education, Science and Community Development and is a part of Hamad bin Khalifa University.

As a national research institute, QCRI supports Qatar Foundation's mission to build Qatar's innovation and technology capacity by focusing on large-scale computing challenges that address national priorities for growth and development, supporting Qatar's transformation from a hydrocarbon-based economy to a knowledge-based economy.

In doing this, QCRI conducts world-class multidisciplinary computing research that is relevant to the needs of Qatar, the wider Arab region, and the world. It performs cutting-edge research in such areas as Arabic language technologies, social computing, data analytics, distributed systems, cyber security and computational science and engineering.

The research conducted at QCRI is aligned with the Qatar National Research Strategy and supports the strategic priorities outlined in the Qatar National Vision 2030. For more information, please visit www.qcri.qa.