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**Use of video on social media for seismic risk communication:
an explorative study**

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1. Introduction

The objective of the study is to investigate whether video on social media might be the future of seismic risk communication between seismological institutions and citizens.

The study is set on the conjunction among three different fields: risk and crisis communication, social media and video. Therefore, the references in literature will be the ones of these three fields of studies. This thesis can be considered as a pilot study, far from being exhaustive; a first explorative step that can become a basis for further researches.

Social media have deeply changed risk and crisis communication, also from the point of view of seismological institutions, which use daily social media to communicate with citizens. Considering that video communication will probably be the future of social media, a territory that each platform is trying to conquer in different ways, it becomes important to understand how to communicate seismological risk through videos. In the Web 3.0 perspective, video might be used also to collect information. We must consider that nowadays, in case of earthquake the first action of people involved is to shoot a video with their smartphones. The bidirectional nature of social network may therefore be an advantage in order to collect precious eyewitness testimonies. This scenario is inspected in the first chapter: framework analysis – social media and natural disasters.

The thesis then explores how seismological institutions in the World are using videos on social platforms. The aim is to find strengths and weaknesses and to identify possible opportunities or threats. To do so, qualitative methods will be used. In the third chapter, methods are declared.

One of the main feature of web-based inquiries is that the results (for example the statistics on likes or followers) change every day. Especially as far as earthquakes related news is

concerned, the public engagement is very variable, depending on the eventuality of an earthquake having hit a certain area. Of course, data used in this analysis could not be updated every day; therefore, the last update will always be declared when referring to web content.

During the period the author was writing this thesis, an important sequence of destructive earthquakes happened in central Italy. This may be considered as a bias: in fact, the social profiles of the major Italian institution taken into consideration suddenly gained an impressive attention. On the other hand, it furnished a lot of data and case studies on what happened from the point of view of emergency communication through social media.

Chapter 4 is about case studies. First of all, the study will examine the social profiles of five seismological institutions using the publicly available parameters of the different platforms. The seismological institutions chosen (among the list that is reported in the attachments) are: United States Geological Survey (USGS); European Mediterranean Seismological Centre (EMSC); Instituto Nacional de Sismologia, Vulcanologia, Meteorologia e Hidrologia, Guatemala (INSIVUMEH); Istituto Nazionale di Geofisica e Vulcanologia (INGV); Istituto Nazionale di Oceanografia e Geofisica (OGS). The seismological institutions to be analyzed are chosen in order to be representative of the situation in the World: from a very large area of influence (as the USGS), to a local scale (OGS), considering also different realities such as a developing country (INSIVUMEH). The social profiles taken into account are Facebook, Twitter and YouTube, and the number of followers and their engagement are considered. In the second part of the chapter, videos published on social media are analyzed: the number of videos, its length, the average number of likes, the average number of visualizations. Also qualitative considerations are proposed.

The latter part of the thesis reports the analysis and results of semi-structured interviews to four stakeholders: two of them are social media managers of seismological institutions and two are risk communication experts.

The final chapters of the thesis concern results, discussions and conclusions. Complete tables of results and the complete transcription of interviews are reported in the attachments.

2. Framework analysis - social media and natural disasters

Communication technologies have always played a key role for communities' perception of risk and preparedness. Within the Web 2.0 revolution, Internet-based social media have deeply changed the nature of emergency communication, leading to a more interactive and real time standard. "Traditionally, risk and crisis communication has been conceptualized as a one-way stream of information from emergency management organization to the public. New media technologies, however, offer opportunities to change that dynamic toward a greater level of interactivity between emergency management professionals and the public"^[1]. A public that is widely present on the web and on social platforms, mainly through mobile devices. In 2016 nearly one out of two people in the World are using internet, 47% of World population⁽¹⁾. Among them, Facebook registered 1.6 billion users in January 2016⁽²⁾. If we cross this datum with the number of people affected by natural disaster, 141 million in 2014^[2], one can immediately understand that to communicate with those people it is crucial to use also social media networks, in addition to traditional media.

Mobile network coverage and evolving technologies

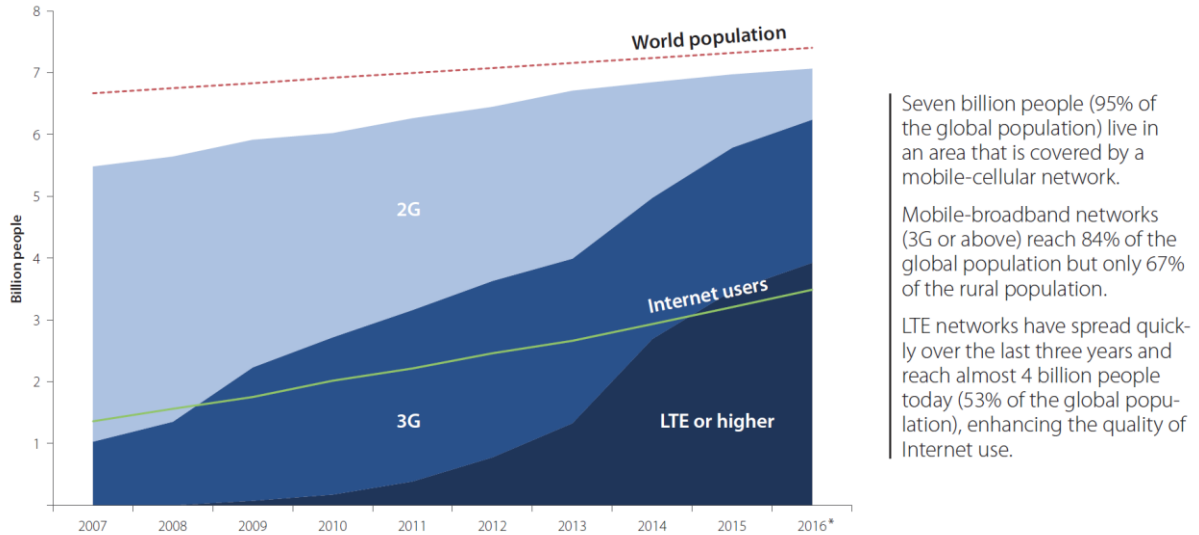


Figure 1 – Mobile network coverage and evolving technologies in the world, updated to 2016⁽¹⁾

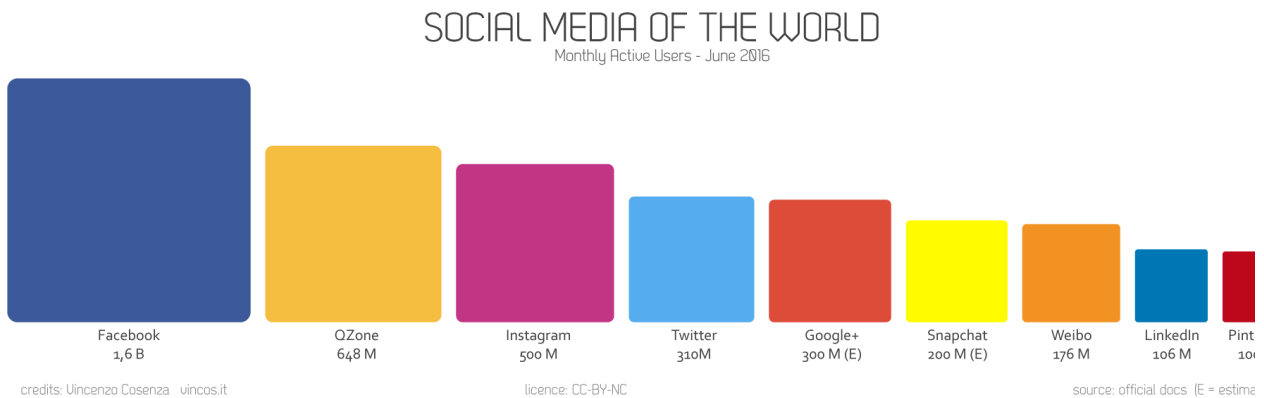


Figure 2 – social media users in the World, credits Vincenzo Cosenza vincos.it, last access 26/08/2016

Social media has become the first, natural space where the citizens look for or exchange information during an emergency. “Current research on public response to disasters or emergencies often ends with a call to action directed toward emergency management organizations for organizing and deploying their crisis and risk communication better, more up-to-date and more interactively”^[1]. The increasingly significant role played by social media in disaster management has been attributed to their five distinct characteristic: collectivity, connectivity, completeness, clarity and collaboration^[3]. On the contrary, traditional media like

radio or television have been defined as “appointment media”, that means that audience must be present at a certain time and connected to a certain challenge in order to get the message. This kind of media is dying, if not already dead^[1].

Moreover, it cannot be ignored that, by its nature, social media are designed to stand the connection of billions of people at the same time without failing. Therefore, social media are usually still working when other modes of communication fail. Social media has thus been widely used in search and rescue, emergency relief, evacuations and recovery.

WORLD MAP OF SOCIAL NETWORKS

January 2016

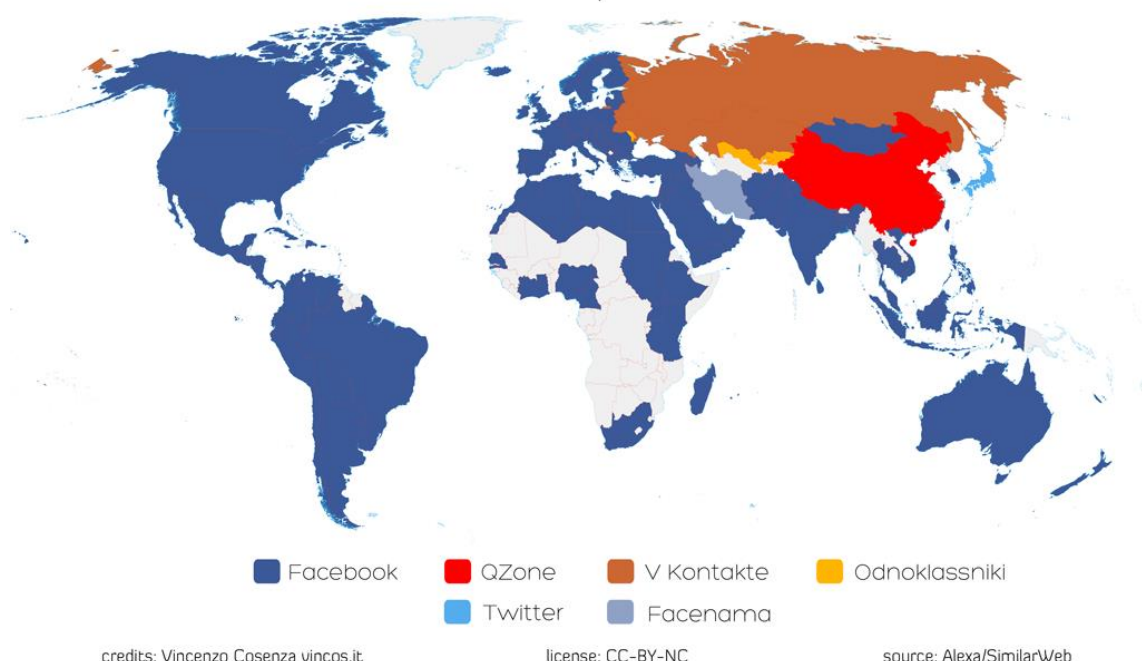


Figure 3 – main social network used around the World – credits Vincenzo Cosenza vincos.it

2.1 Social media scenario

Social media are a very complex system. Different media have different algorithms, different engaging techniques and different connection characteristics (Figure 4).

There are basically four categories of Internet – based social media (excluding the gaming environment)^[4]:

- Social networks sites
- Blogs
- Collaborative projects
- Content communities

This work mainly refers to Facebook (social network), Twitter (microblogging) and YouTube (content communities), even if some other platforms, such as Snapchat, might be briefly investigated.



Figure 4 – action performed by world users on different social platform in one minute – credits SmartInsights www.smartinsights.com; August 2016.

2.2 Videos on social media

“Documentary films and videos have always combined the emotionally involving strengths of narrative storytelling with compelling situations presented by actuality”^[5] and almost every platform has realized that fact. Within the complex social media scenario described, videos are one of the lands that has yet to be conquered. Facebook is putting a lot of pressure on videos: videos that are “native” on Facebook (not visualized through a YouTube link) have a *reach* higher than every other content shared. Nicola Menderlsohn, Facebook VP for Europe Middle East and Africa, declared that in half a decade the network “will definitely be mobile, and would probably be all video”^[6]. Amazon is launching Video Direct, a streaming platform, with the aim of challenging YouTube^[7]. On the other hand, Snapchat is the media to which the Millennials are migrating after closing their Facebook accounts. Snapchat is a platform designed for the mobile that works with short video, mainly live broadcasting, with the characteristic of disappearing within 24 hours. On Snapchat the videos seen have doubled in less than a year, reaching 10 billion visualization per day, for an audience of 150 billion users per day, 10 billion more than Twitter on June 2016^[8]. To avoid Millennials users loss, Facebook itself has incorporated a live video feature, resulting in a much higher engagement (live video receive ten time more comments than pre-recorded videos).

The numbers regarding YouTube are impressive. In June 2016, it had more than a billion users, a third of the World Internet users. Every day, users watch hundreds of millions of hours of videos, particularly on mobile phones (from which comes half of the traffic). YouTube reaches more audience between 18 and 49 years than any other cable network in the United States. The number of people who accedes YouTube is growing of the 40% per year, and the visualization time has a 50% growth per year. The 80% of YouTube visualization comes from outside the United States, and there are local version in more than 88 Countries, with 76 different languages representing the 95% of Internet population⁽³⁾.

Although, also the number regarding Facebook are not so minor: 100 million hours of video watched every day on mobile, with an 800% increase of daily views in a year (from 1 billion to 8 billion). Mendelsohn declared that “the best way to tell stories in this world – where so much

information is coming at us – actually is video. It commands so much information in a much quicker period so actually the trend helps us digest more of the information in a quicker way”^[6]. “If I was having a bet, I would say: video, video, video”, she declared^[9].

In fact, the company is betting a lot on video stream, if we think about the fact that Facebook is even paying news outlets such as the New York Times to use Facebook Live. The increasing demand for videos in order to win this battle, and the limited supply of good quality videos on the other hand, are leading to a leverage shift. Twitter would spend millions to stream live games during 2016 NFL season. Facebook offers \$250,000 for 20 videos per month over a three-month period^[10].

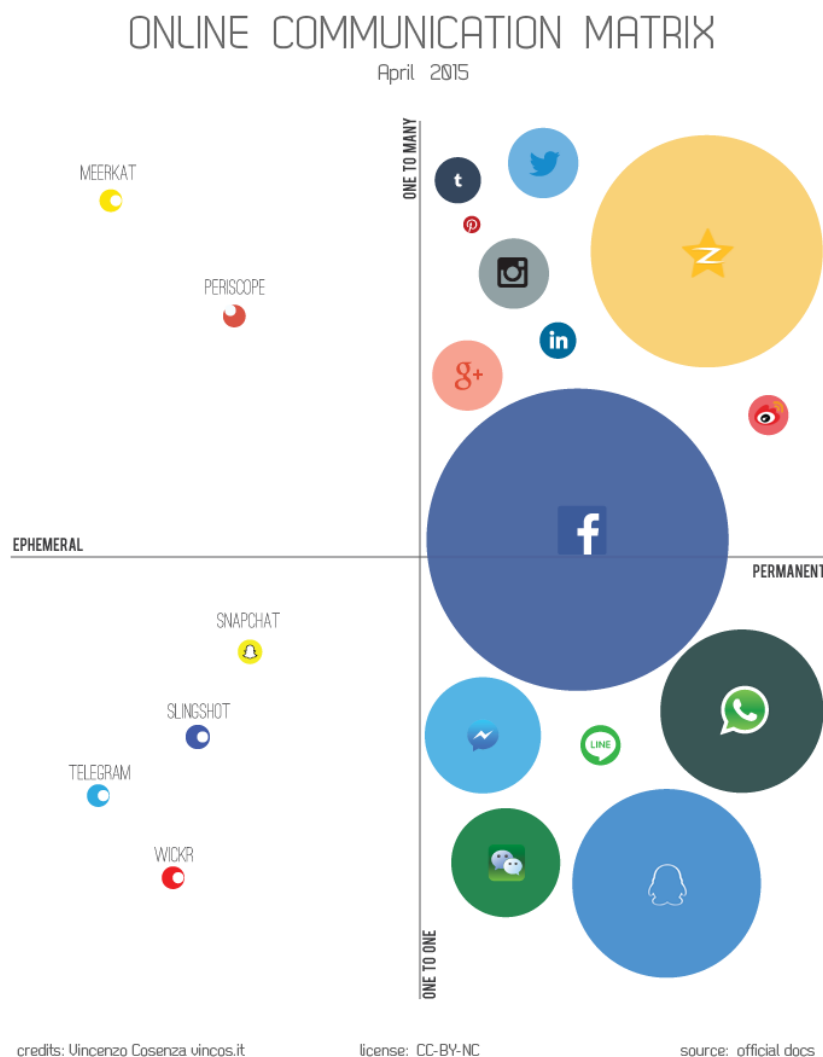


Figure 5 – online communication matrix: divided into ephemeral or permanent and one to one versus one to many. (Credits Vincenzo Cosenza, vincos.it)

2.3 Risk and crisis communication through social media

Risk communication “[...] most often involves the production of public messages regarding health risks and environmental hazards”^[1]. The main purpose is to “inform the public of potential or current events and to persuade the public to adapt their behavior in ways that would improve health and safety”^[11].

There are two sides of emergency communication: crisis communication (managing an emergency before, during and after it happens) and risk communication, or prevention.

As far as crisis communication is concerned, the aim is to “explain the specific event, identify likely consequences and outcomes, and provide specific harm-reducing information to affected communities”^[11]. There are basically three levels: looking for information (before and after); collecting emergency questions; filter function, verifying and spreading correct information.

In this scenario, seismic hazard communication is especially thorny for its innate uncertainty and for the severe consequences that an incorrect risk communication may have over people.

Recent earthquakes have shown the necessity of having a direct connection with people involved in the emergency, but also the will of the population to self-organize collaborative networks in order to help the management of the emergency. This phenomenon is called digital volunteering or civic defence^[12].

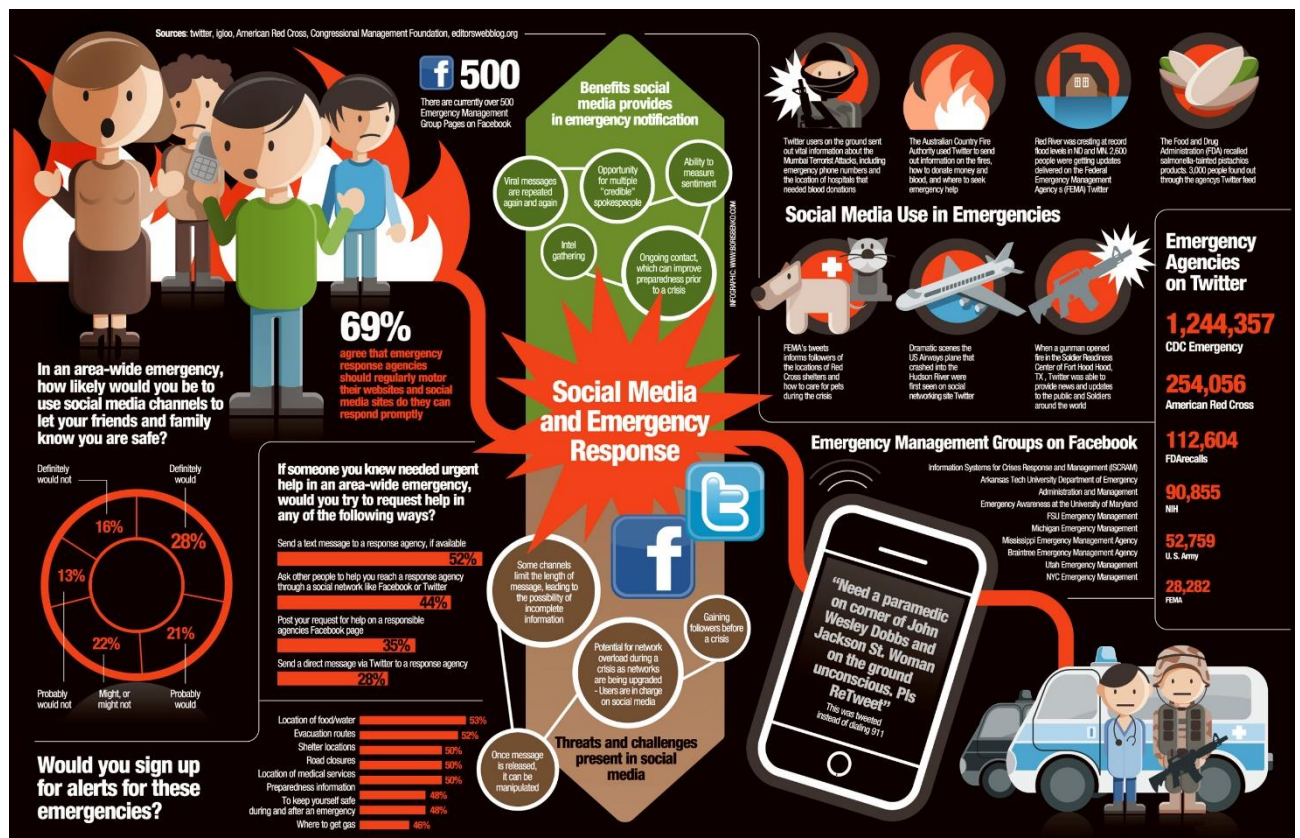


Figure 6 – American Red Cross blog, How Your Use Social Media in Emergencies; 15th February 2011

In order to be an influencer during a crisis communication, it is fundamental to have gained respectability through a long work during quiet times. This can be done by keep citizens informed about scientific research activities and results, so they will be more aware of the risks. A social media strategy is necessary both in time of peace that in time of emergency, when pre-determined procedures, flexible protocols shared with all the stakeholders, must be followed by all the actors in the emergency management. These protocols must be renewed periodically, as the social media scenery is changing continuously. In this way, a very important contribution can be found in the FEMA lessons learned^[13].

But the net can be used also as a source of information. If in the past official media were asking people to send videos and pictures of the situation during an emergency, with social media it is no more necessary to have any mediators. This information can be used by other citizens but also by institutions involved in the crisis management. Nepal 2015 earthquake proved an

extreme efficiency in collecting testimonies within a few tens of minutes after a felt earthquake occurrence, in order to understand where and how the shake had been felt. “Offering rapid information on felt and damaging earthquakes is an effective strategy to engage with eyewitnesses and optimize the collection of eyewitnesses’ observations. The two-way and real-time communication channels that smartphones offer raises eyewitnesses’ expectations in terms of real-time information but also offer an opportunity to improve situation awareness and provide rapid and direct guidance to individuals immediately after shaking to contribute to risk reduction”^[14].

From these statements can be understood how the institutions involved in natural risks management are finally starting to understand how a two-ways communication can be an advantage both for them that for citizens. The focus, in this case, must be on collecting, analyzing and exposing big data, turning them in open data.

This is a tool to be used not only in developed countries; on the contrary, it can be even more useful in under developed ones. In the Philippines, for examples, there are more cell phones than inhabitants and he 92% of people that have access to internet uses Facebook. On this base, during emergencies, information passed through social network, while Google aggregated the data and created an open map^[15].

After the crisis is over, social media instruments can be used also to ensure transparency for reconstruction. For example, it can be used in order to show how much money was collected, whether from Governments or from charity, and to show how this amount of money was spent. In this way, contributors would be much more aware of the usefulness of their money, or even protest if the money was wasted.

Moreover, Institution must have the humility to understand that they have no more the monopoly of information and to recognize some private actors (individuals or NGOs) as actual *hubs*. Private stakeholders or influencers present the advantage of having already a wide audience that can be reached.

Latonero and Shklovski presented the following recommendations in incorporating social media tools in risk and crisis communication in order to harness its optimum potentials:

1. Determine social media engagement as part of the risk and crisis management policies and approaches;
2. Incorporate social media tools in environmental scanning to listen to risk and crisis bearer concerns;
3. Engage social media in daily communication activities;
4. Join the conversation, including rumor management, and determine best channels to reach segmented publics;
5. Check all information for accuracy and respond honestly to questions;
6. Follow and share messages with credible sources;
7. Recognize the media is already using social media;
8. Remember social media is interpersonal communication;
9. Use social media as the primary tool for updates;
10. Ask for help and provide direction; and
11. Remember web 2.0 is not a Panacea.

2.4 Situation in Italy

In Italy in December 2015 23.6 million people was using Facebook, spending in average 12 hours and 20 minutes per month on that platform. On the other hand, only 600.000 people used Snapchat, but with a 150% growth and with an average time of fruition higher than YouTube (2.5 hours per month versus 2 hours per month)⁽²⁾. People belonging to any age range own a Facebook profile (Figure 7), yet females over 55 years old represent the audience that is growing the most. Adolescents, instead, are moving to other platforms (Snapchat, mainly).

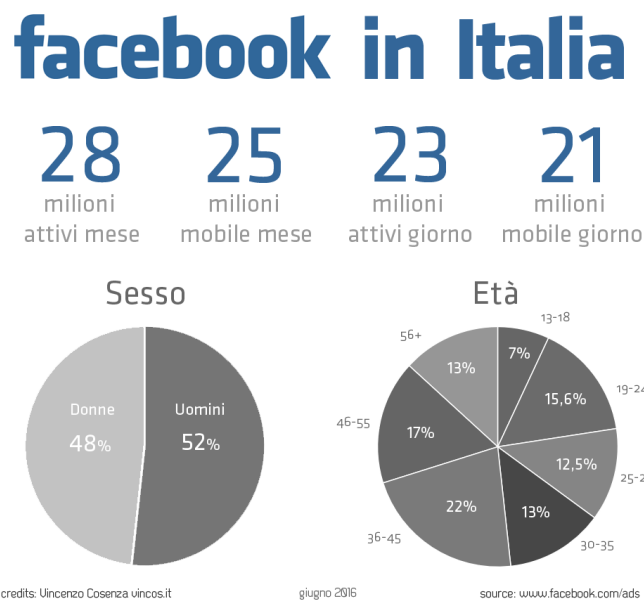


Figure 7 –Facebook numbers in Italy. The graphs represent the percentage of female and males using Facebook (on the left), and the users' ages (on the right). The numbers above refer to millions of active users per month, per month from mobile, per day and per day from mobile respectively. Credits: Vincenzo Cosenza, vincos.it.

Social Media in Italia - Tempo d'uso

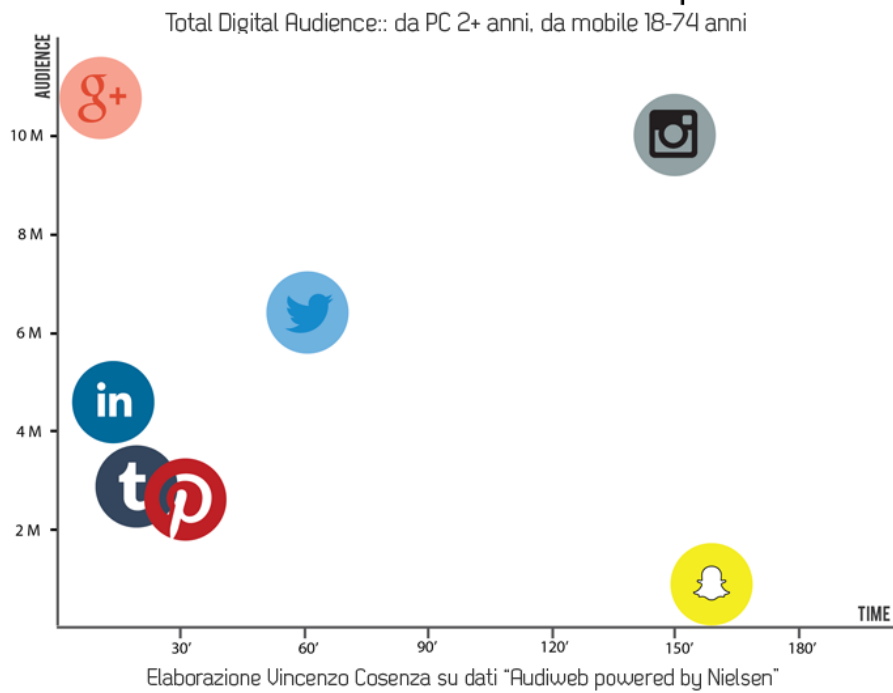


Figure 8 – usage time of social media in Italy, among an audience from PC over 2 years old, from mobile 18-74 years old. On the x-axis minutes of activity, on the y-axis number of users (millions). Credits Vincenzo Cosenza, data from Audiweb powered by Nielsen.

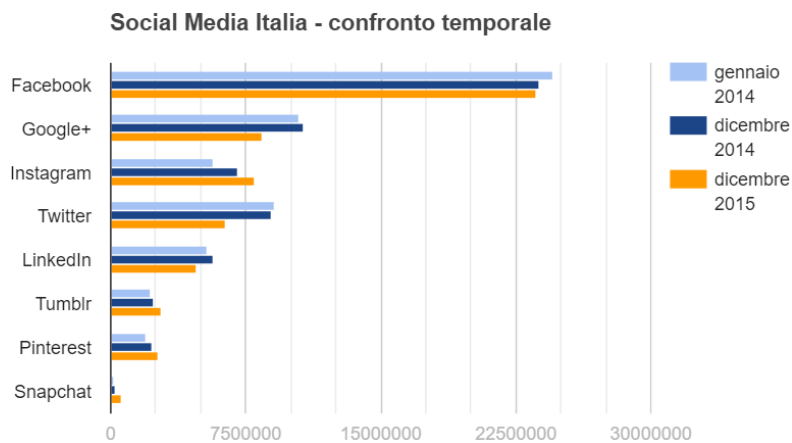


Figure 9 - unique monthly visitors by PC to different social media on January 2014, December 2014 and December 2015. Credits Vincenzo Cosenza vincos.it/osservatorio-facebook/

Yet, Italian public institutions, especially the ones involved in risk management, still see their presence on social media networks as a problem and not as an opportunity. In 2013 the Italian Civil Defence Department organized a workshop with an emblematic title: “Communicating risks, the risk of communicating”⁽⁴⁾.

In Italy, in the 2013, the 65% of the public administration accounts didn't even answer to the questions they received on social platforms: they actually use the media as an extension of the press office^[16]. The opportunity in terms of public accountability and reputation is still not understood. Not to mention crowdsourcing: only the 5-10% of public administrations used it.

The main concerns of the institutions are:

- ✓ To create unmotivated panic;
- ✓ To be put on the same level of any other charlatan;
- ✓ To be put on trial for the declarations done on the web;
- ✓ That non-technicians would not understand the concept of risk assessment and the uncertainty of scientific statements;

Anyway, the institutions are realizing (quite late, actually), that it is not possible to avoid social communication. The next step is, then, to plan their presence on this new media.

The urge is to find a new communication pattern, to inform the community of the risks, at the same time without create panic and in a language that can be understood by everybody. Not only to inform: it is fundamental to create a relationship, based on trust, in which the citizens are themselves actors of their own safety.

Anyway, there are some examples of best practice made in Italy. After the Emilia 2012 shake, 12.000 questionnaires were collected from common people and a website (www.openricostruzione.it) has been created to guarantee transparency in the reconstruction works. Moreover, civil volunteering association have shown their efficiency: “mud angels”, which was the first spontaneous mobilization for helping victims of floods in 1966, during Genoa 2014 flood organized themselves through Facebook. Another example of good practice in crisis management comes from Telecom Italia, the national phone company. During 2012 Emilia earthquake, they twitted to the owners of a Wi-Fi connection the instructions to free

their personal modems from passwords. The aim was to give free access to internet to everybody who had been hit from the earthquake, and lower the pressure on telephonic lines, that are more subject to crash. In these situations, institution can use top brands as hubs, to guarantee the widest spread of information to citizens.

These examples, although, underlines how the most of the time Italian good practice came from a spontaneous drive of citizens and not from a careful planning by institutions, as should be done according by FEMA lessons learned. The last earthquake happened in Italy, on the 24th August 2016, underlined again this phenomenon: institutional accounts posted way after citizens. Although, the number of posts is impressive, reaching a million posts in the first 35 hours, from 360000 accounts, 6.6 million interactions and a possible reach of 5.3 billion users^[17].



Figure 10: Trend of the posts after the Amatrice earthquakes, Blogmeter data, copyright ANSA (Sisma, un milione di post sui social – Blogmeter, contenuti da oltre 360000 utenti italiani.)

3. Methods

3.1 Introduction

Qualitative methods will be used to explore the potentiality of video on social media in the seismological risk field.

First of all, the state of the art about seismic risk communication on social media, with the focus on video, are investigated. To achieve that, a sample of five seismological institutions has been chosen with the criteria explained in paragraph 3.2. Of these five institutions, I analyze the Facebook, Twitter and YouTube channels. I chose those three platforms because they are the most popular ones and the ones on which institutions are present since a long time. In fact, applications like Snapchat are right now not colonized by seismological institutions, therefore data about their activities couldn't be found. Moreover, all these three platforms are pushing for the publishing of videos, as seen in the framework analysis (chapter 2).

The social profiles of the institutions are analyzed taking into consideration different parameters for the three different platforms – parameters are declared at the beginning of each section. A brief, not exhaustive, qualitative analysis is undertaken too, in order to identify differences in their usage of social media. Of course, being the institutions very different by size and culture belonging, it will be interesting to see what they may have in common.

For each social platform, I then scrutinize the number of videos published and the quantitative parameters about each video, such as likes, visualizations, lengths (the complete tables can be found in attachment). For each institution graphics about relationship length-views are displayed as far as Facebook and YouTube are concerned, while on Twitter there's not a specific section for videos, therefore there are only some qualitative comments.

Having acquired all the information about the state of the art, both in the framework that in the institutions' social profile analysis, I chose to perform some interviews to stakeholders. I

interviewed two seismologists who are involved in the management of their institution's social media profiles, with the aim of understanding which may be the motivations, the expectations, the limits and the fears about using videos on social media from the point of view of a seismological institution. On the other side, I interviewed two experts of risk communication, in order to understand which may be the mistakes that seismological institutions do communicating, and the measures they could adopt to empower their strategies.

It's important to recall, as stated in the introduction, that one of the main feature of web based inquiries is that the results (for example the statistics on likes or followers) change every day. Especially as far as earthquakes related news is concerned, the public engagement is very variable, depending on the eventuality of an earthquake having hit a certain area. Obviously, the data used in this analysis can't be updated every day; therefore, the last update will always be declared in charts and tables when using data referring to web content.

3.2 Case studies

Among the 190 Institutions that work in the field of geophysics and seismology, listed in the attachments, the ones that have been chosen as case studies are:

- **USGS (United States Geological Survey)**. Created in the 1879, it is the sole science agency for the United States Department of the Interior: collects monitors, analyzes and provides science about natural resource conditions, issues and problems. They “monitor, assess and conduct targeted science research so that policy makers and the public have the understanding they need to enhance preparedness, response, and resilience”. Its mission is to serve the Nation “by providing reliable scientific information to describe and understand the Earth; minimize loss of life and property from natural disasters [...]”.
- **EMSC (European-Mediterranean Seismological Centre)**. Founded in 1975, EMSC is an international, non-governmental and non-profit association with 84 institutes from 55 countries as members. Among its declared responsibility, there is the one to “transmitting these results [*ed.* epicenters of earthquakes] immediately to the appropriate international authorities and to the members in order to meet the needs of protection of society, scientific progress and general information”.
- **INSIVUMEH (Instituto Nacional de Sismologia, Vulcanologia, Meteorologia e Hidrologia, Guatemala)**. It’s a highly qualified technical and scientific institution that deals with earth sciences (atmospheric, geophysical and hydrological), acting as a government technical advisor in case of natural disasters.
- **INGV (Istituto Nazionale di Geofisica e Vulcanologia)**. Created in the 1999, the institute collects and valorizes competences and resources of five institutes that were operating on the Italian territory. It currently is the biggest European institution in the geophysics field and one of the biggest in the World. Its main mission is the monitoring of geophysical phenomena and the surveillance on the seismicity of the Italian territory. They declare to have a special attention to the diffusion of the scientific culture through its web pages among other communication instruments.

- **OGS - CRS (Istituto Nazionale di Oceanografia e di Geofisica Sperimentale – Centro Ricerche Sismologiche)**. It was founded in the 1989 with the aim of conduct research on seismicity of northeastern Italy, develop and manage the seismic monitoring network for civil protection purposes. CRS is a department of the OGS; its origins are to be fund on the Astronomy and Navigation School, founded by Austrian Empress Maria Teresa on the 1753.

The Institutions were chosen considering first of all their presence on social media: the minimum requirement was to have at least 2 different social accounts between Twitter, Facebook and YouTube. Then, different kinds of institution have been chosen, in order to set the frame of the institutions in the World. Therefore, USGS has been chosen because of its pioneering work on social media, since the very beginning, and because its being huge (nearly 6000 employees); EMSC because it is a non-governmental association of many different institutions; INSIVUMEH because it operates in a developing country; INGV because it is the biggest European geophysical institution; and OGS-CRS because it relates to a restrained territory, at a local scale.

3.3 Interviews

I decided to use the method of semi-structured interviews. Therefore, the structure of the interview was the same for all people interviewed, but some of the questions were changed in relation to the expertise of the person interviewed or to his previous answer.

As introduced before, the choice of the interviewees has been done considering one of the main points of seismological institutions communication through social media: usually the person who uses the profile is a seismologist and not an expert in communication. Therefore, I decided to interview two people who work in the seismological field and two people that work in the communication field. The choice has been based on their curriculum and their past experiences in the field.

The first question was generic about what is, according to them, the state of the art of seismological risk communication through social media, and which are the risks for a seismological institution when communicating through social media. In this context, I asked then more specific questions about the use of videos on social media: if they could be effective in communicating seismological risk, which are the major pros and cons, which content could be conveyed. In conclusion, I tried to investigate also the possibility of interaction with users produced video content on social media, as a tool for citizen seismology.

The stakeholders' representatives chosen are:

- ✓ **Rémy Bossu:** experienced seismologist, general secretary of the EMSC. In 2007, he was awarded the IRIS prize for innovative risk education and risk awareness initiatives.
- ✓ **Carlo Meletti:** geologist and head of the Center for Seismic Hazard of INGV. He is managing the INGV's Facebook account.
- ✓ **Giancarlo Sturloni:** risk communication teacher and consultant, is at the moment the communications coordinator at Greenpeace Italia.
- ✓ **Marco Boscolo:** Science and technology writer, multimedia producer, video shooter and data journalist.

Interviews took place between September and November 2016, in the order in which the names are listed above. All interviews have been held in Italian, but the one to Rémy Bossu that was held in English. The interviews to Rémy Bossu and Carlo Meletti were face to face; the others two have been done at the phone. All interviews were recorded and transcribed entirely, then translated to English. The complete English transcriptions can be found in the attachments. The complete Italian transcriptions, as the recordings, are conserved by the author, available upon request.

Chapter 5 is dedicated to interviews analysis. In this chapter, the answers obtained from the interviews will be used to validate or disprove the outcome of the previous analysis. As a matter of fact, the examination of the state of the art can't tell much about the reasons behind a certain effect. The interviews will provide a better focus on the future perspective of risk communication through video on social media and will lead to an enhanced understanding of the whys and wherefores behind the gap between the ideal condition and reality. The inquiry will be helpful to draft a (realistic) list of best practices on the use of video for seismic risk communication, which could be included in the social media policy of seismological institutions.

4. Case studies

4.1 Social profiles

The first step of the analysis of their social profiles has been to search for them on the social platforms selected. All the institutes chosen had a Facebook, Twitter and YouTube account. The screenshots of their account appearance are reported.

Certain cases were a little peculiar, requiring taking some choices. The USGS has at least 16 Facebook profiles, some of them relating to a local scale (USGS Nebraska, USGS Science in Nevada, ...), while some others focus on peculiar topics (USGS Volcanoes, USGS News: Water, ...). Among these, it has been chosen to analyze the general and major profile, US Geological Survey (USGS), even though part of its content is not about earthquakes (floods, hurricanes, tsunami, ...). The reason is that it has a huge number of followers, so we can analyze institutions that are acting at different scales. In any case, the fact that so many different Facebook profiles appear when searching the word "USGS" on the Facebook searching bar can be quite confusing. The Seismological Research Centre of the OGS has its own Facebook and Twitter profiles but not its own YouTube channel. Therefore, the channel of the OGS has been taken into account, even if it has to be considered that the content is not limited to earthquakes. Anyway, the same is true for the INSIVUMEH accounts that concern also climate and hydrological information.

In Figure 11 the timeline with the subscription data to YouTube and Twitter is displayed for each institution. Unfortunately, this datum is not available for the Facebook pages.

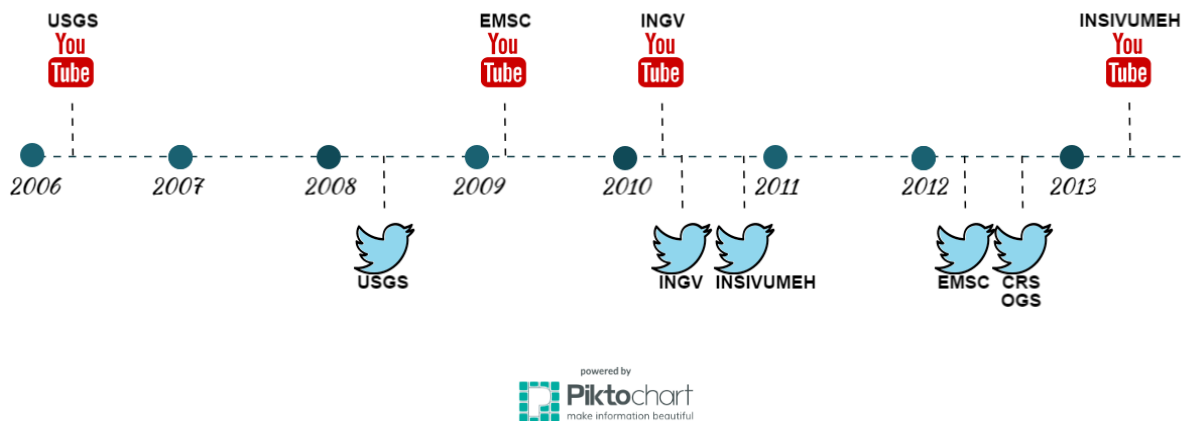


Figure 11 - timeline about the date of subscription to YouTube and to Twitter of all the five institutions.

From the timeline, it can be seen that the USGS can be considered an “early adopter” of the new media, at least in the seismological institutions landscape. Surprisingly, the EMSC YouTube channel was activated before the Twitter one (even if the EMSC declares to rely more on Twitter and Facebook than on videos). The INGV, instead, started approximately at the same time to use both Twitter and YouTube. The OGS-CRS has been the last to subscribe to Twitter, few months after EMSC in 2012, while INSIVUMEH is the last to open a YouTube channel (2013). It is quite clear as European institutions took much time to adopt new media, and Italian ones even longer.

In the next chapters, both a qualitative and quantitative analysis will be performed on these profiles. Different parameters will be taken into account in relation to the different platforms and their characteristics; parameters considered will be declared in each section.

4.2 Qualitative analysis

Some qualitative considerations and comparisons can be done. I will mainly consider the appearance of the profiles.

4.2.1 Facebook

All Facebook profiles have as profile picture the logo of the institution, with the acronym of the name of the institution (Figure 12). All the cover photos are somehow related to earthquakes, with the exception of the INSIVUMEH's one that is instead just the picture of the institution's building. The OGS-CRS profile is the only one that has a human presence on its cover picture, in which an employee is talking to a visitor. From one side this makes it feel more personal, but on the other way the image, being two Caucasian middle age males talking, may not be attractive to certain categories of the public (women, young adults, families, foreigners).

As far as the "About" section, the ones of the USGS, INSIVUMEH, INGV and OGS-CRS are complete with physical address, phone number, email contact, opening hours, mission, story and website. The USGS has also declared many milestones. The EMSC profiles has a mission (in two languages, English and French), general information, products (the app) and story, but not any phone or mail contact but the website address. On the other hand, the OGS-CRS mission is not well defined and probably confused with the story.

The USGS makes a large use of notes (10 in more or less one year), while all the others institutions have never published notes. By the way, it has to be considered that Facebook notes recently spread in the United States, while are not yet spread in Europe, neither we know if they will.

The other sections that may be accessed through the left bar in the Facebook pages concern: external links, YouTube for the INGV, Twitter for the EMSC, the others have no external links; photos, which every page has; videos, that every page has with the exception of INGV that links their YouTube channel; events, only for USGS and EMSC, even if the latter has just one

event scheduled. The INGV page has an interesting section which is FAQ, although it doesn't work at the time the author's writing.

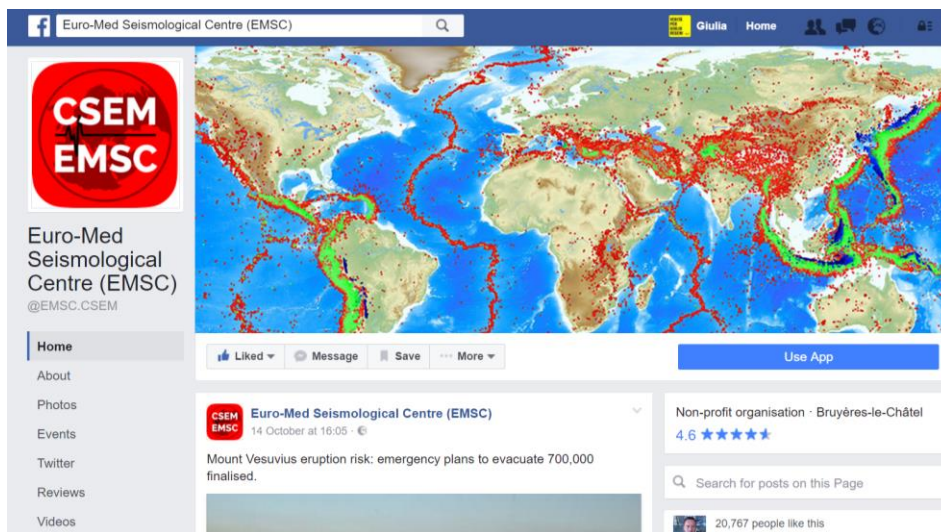
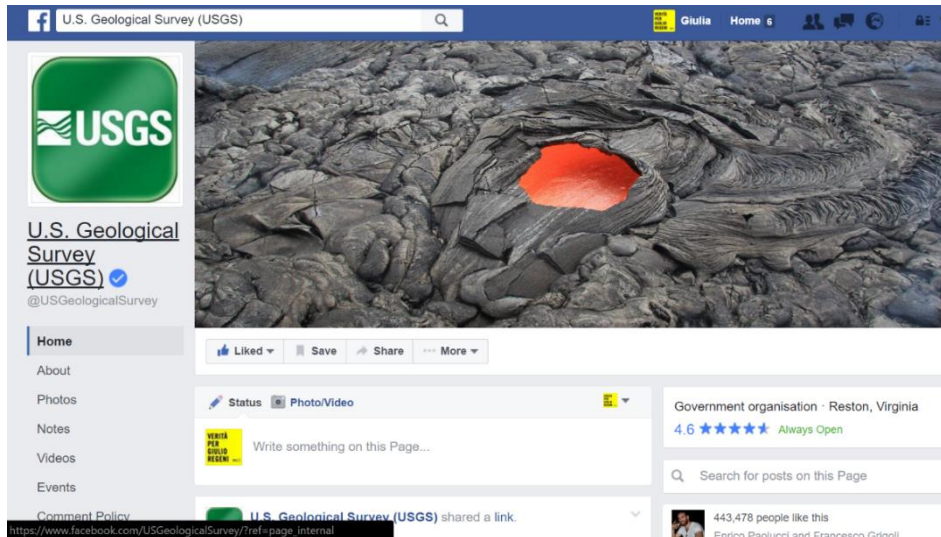




Figure 12 – screenshots of the Facebook page for each institutions – update 16th October 2016 ^{(5),(6),(7),(8),(9)}

4.2.2 Twitter

All the institutions have the same profile picture for Twitter and Facebook, the logo with the acronym (Figure 13). The cover photo is instead different for everyone except for the INSIVUMEH. For the USGS the cover photo is of a volcano in both profiles, but with different pictures; for the EMSC the picture is representing the earthquake distribution in the Mediterranean basin, while on Facebook there was the distribution in the entire world; for the INGV in both pictures there are seismograms, but digital ones on Facebook and traditional seismograms in the Twitter account; for the OGS – CRS the picture until October was of a male middle age man looking at a monitor with seismograms, while in October it has been replaced by an employee that is explaining the structure of the earth to an heterogeneous group of people. Again, the OGS is the only one in which people appear in the cover picture.

The most of Twitter profiles are explicitly meant to give real-time earthquakes warning: the majority of posts is automatically published. Most of Twitter profiles don't have any interaction with other users, private individuals nor institutional profiles or other stakeholders.





Figure 13 - screenshot of the Twitter profiles for each institution – updated to the 31st October 2016^{(10),(11),(12),(13),(14)},

Some brief considerations about the short bios:

- ✓ USGS: “Science is only a tweet away. Tweets do not = endorsement: on.doi.gov/pgwu0Y (Contact: usgs.gov/ask)”. The first part of the sentence is very endearing. The second part looks like a declaration of non-responsibility, that sounds quite strange. The link referrers to an Information Policies and Instruction page, in which one can find their policy about public release information, copyright, visual identity, ... Interesting one of the last sentences of the document: “Neither the U.S.

Government, the Department of the Interior, nor the USGS, nor any of their employees, contractors, or subcontractors, make any warranty, express or implied, nor assume any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, nor represent that its use would not infringe on privately owned rights.”.

- ✓ EMSC: “Independent Scientific Organization and provider of real-time earthquake warning. Share information with us through our app: emsc-csem.org/service/applic...”. A clear declaration of intent: they state what the followers can expect from them and, on the other hand, what they expect by citizens. They invite their follower to use their application for smartphone to collect testimonies of earthquakes.
- ✓ INSIVUMEH: “National Institute of Seismology, Volcanology, Meteorology and Hydrology. Ministry of communications, infrastructures and housing.” A very institutional sentence in which nothing is said about what they do with their Twitter profile and why somebody should follow them. Unattractive and confusing.
- ✓ INGV: “24h INGV service (experimental) – values calculated by seismologists in nearly real time. – UTC hour (in Italy UTC+2 hours if legal hour or UTC+1 if solar hour).” Clear statement about what they will do on their Twitter profile. Not very attractive, though, also because of the information about UTC hours, that makes it seem targeted to an expert audience.
- ✓ OGS-CRS: “Monitoring of seismicity in the North-East of Italy”. Not very appealing, but clear and concise. Tough, it is not declared the reason why a person should follow the profile. The fact that not all characters available have been used makes it seem less curate.

An interesting feature about the Twitter USGS account is the alert (Figure 14) saying that the account will share critical information in case of emergency. Clicking on “be prepared”, the user would be readdressed to a page in which he or she can activate alerts by an highlighted Tweet, a text message or an app notification (Figure 15). None of the other accounts has this feature.

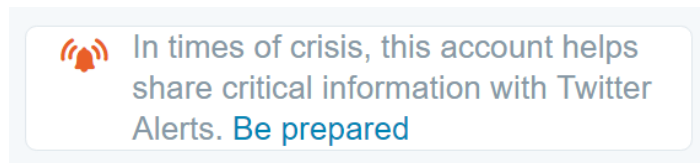


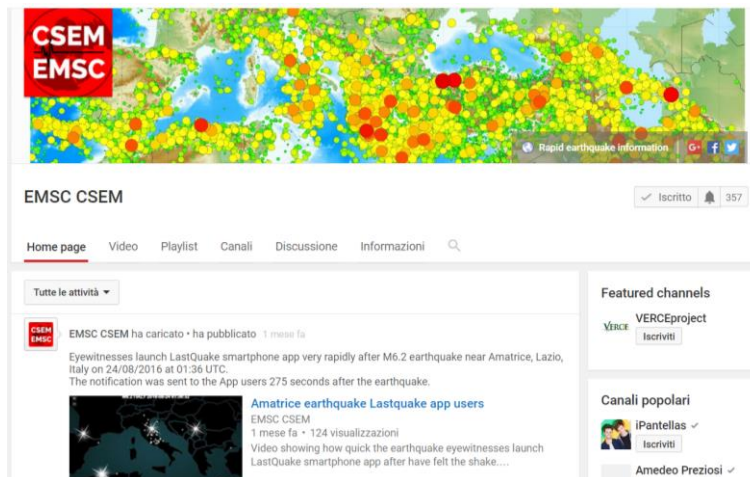
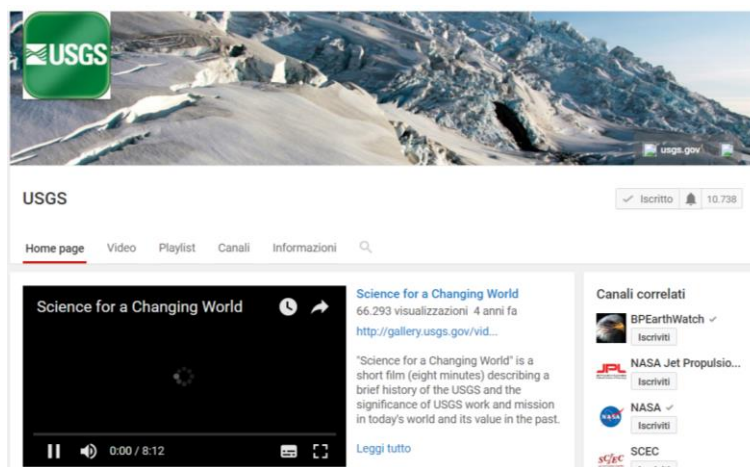
Figure 14: crisis alert appearing in the Twitter USGS account



Figure 15 - activation page for the USGS alerts

4.2.3 YouTube

All the institutions but the EMSC have different cover pictures for the YouTube account. The USGS hasn't a volcano as on Twitter and Facebook but a mountain; the INSIVUMEH just a blue sky with some clouds; the INGV an interior of their offices instead of accelerograms; the OGS, as stated before, refers to the channel of the main institution and not only the Seismological Research Centre. Again, every institution has its logo as profile picture. INSIVUMEH and EMSC have the link to their Twitter, Facebook and even Google+ profiles.



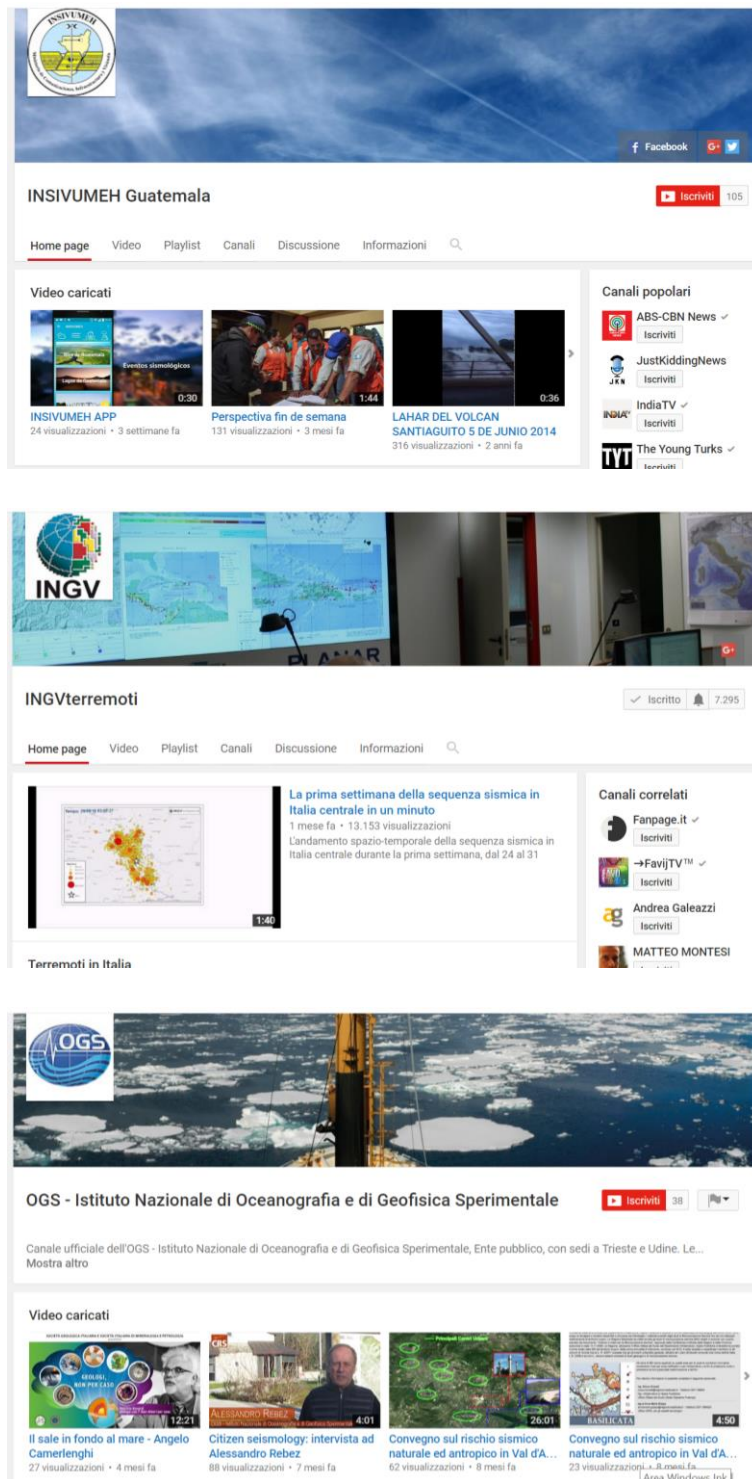


Figure 16 – screenshots of YouTube channels per each institution, update 16th October 2016^{(15),(16),(17),(18),(19)}

4.3 Quantitative analysis

4.3.1 Facebook

The quantitative parameters that have to be taken into account as far as Facebook is concerned are:

- Number of likes: people that follow the news on the page. It has to be reminded that Facebook uses algorithms for which not all posts published on the public pages are seen in the users' newsfeeds. The percentage depends mainly on the engagement that the posts are able to produce. That's the reason why it is advisable not to publish many posts a day, and to use a call to action in the posts published.
- PTAT: stands for People Talking About That and is a parameter much more important than the page likes number. In fact, it represents the engagement that the page can reach, and therefore, as explained above, the percentage of posts that will be seen on the users' newsfeeds.
- Reviews: recently Facebook introduced the possibility to review public pages. The review system has been proven to be very effective in the engagement (as shown by TripAdvisor).
- Average review: the average vote that has been given in the review.

From the results, exposed through the infographics of Figure 17 and Figure 18, it can be seen that the PTAT index is very small in comparison to the number of likes on the page. Therefore, it can be seen that the engagement with the public is not enough, especially during "peace times", when no earthquakes occur.

From the reviews data, it can instead be seen that although the number of reviews is not high, the average value of the review is instead very good, expressing a general good reputation of the institution.

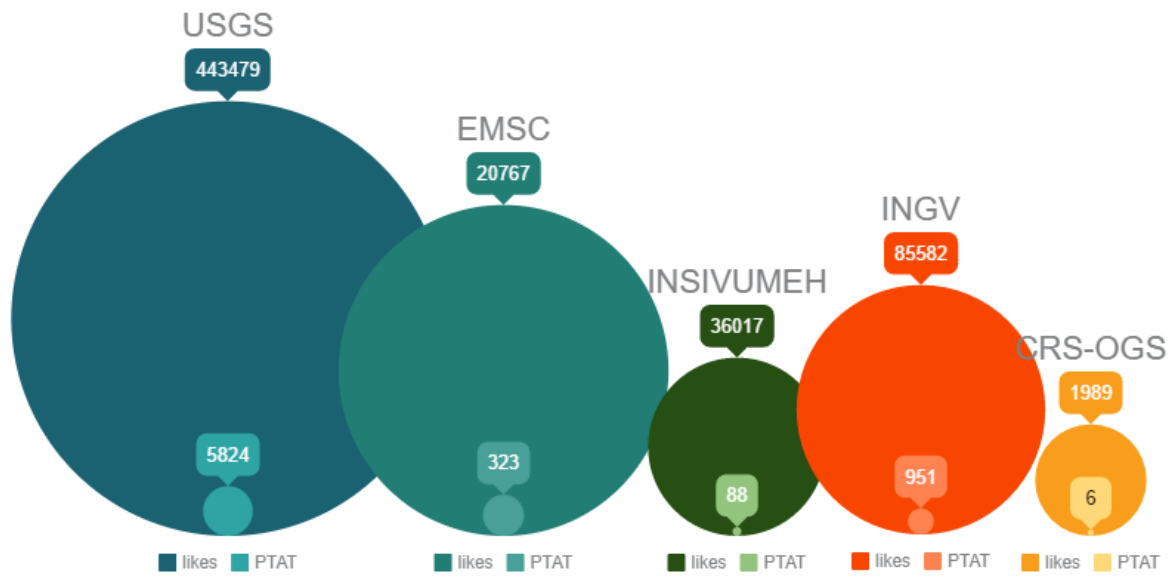


Figure 17 - number of likes in relation with the PTAT (People Talking About That) for the Facebook page of each institution; updated 16th October 2016.

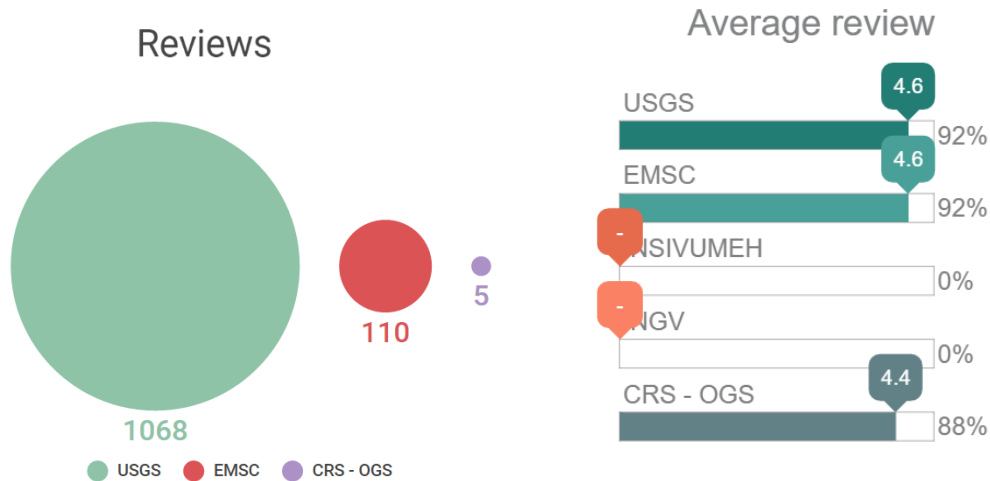


Figure 18 - a) number of reviews for each institution; b) average value of the reviews; updated 16th October 2016.

4.3.2 Twitter

The quantitative parameters that have to be taken into account as far as Twitter is concerned are:

- **Joined:** the date in which the institution started using Twitter. It is essential to weight differences in followers or in the number of Tweets. This parameter can be seen in the timeline of Figure 11.
- **Tweets (number of):** represents the activity of the profile. Twitter is a conversation and if a profile is inactive it loses importance.
- **Following and followers:** the number of followers in relation to the profiles followed represents the position in Twitter hierarchy. A big number of followers and a little number of followed pages mean that the profile is an influencer. On the other hand, a very low number of profiles followed means that the profile is not engaging in the conversation, is just using Twitter to provide information but not to contribute to an exchange.
- **Likes:** contrary to Facebook, the number of likes on Twitter means the number of Tweets the page put the like on. Is another parameter that assess the engagement in the conversation: does the page look at other users Tweets or not?

The results of the analysis are exposed in the infographics of Figure 19. It can be seen that none of the institutions, with the exception of the EMSC, is actually engaging a conversation on Twitter. Another interesting point is that although the USGS has been the first to subscribe a Twitter account, it is not the one with the highest number of Tweets. As far as the EMSC is concerned, the results show how, even if they are the ones with the highest number of following and likes on others' tweets, they have surprisingly few followers. The OGS-CRS is quite out of the discussion, probably because it acts on a regional scale and in an area that is not very active on Twitter, as usually big economic centers are.

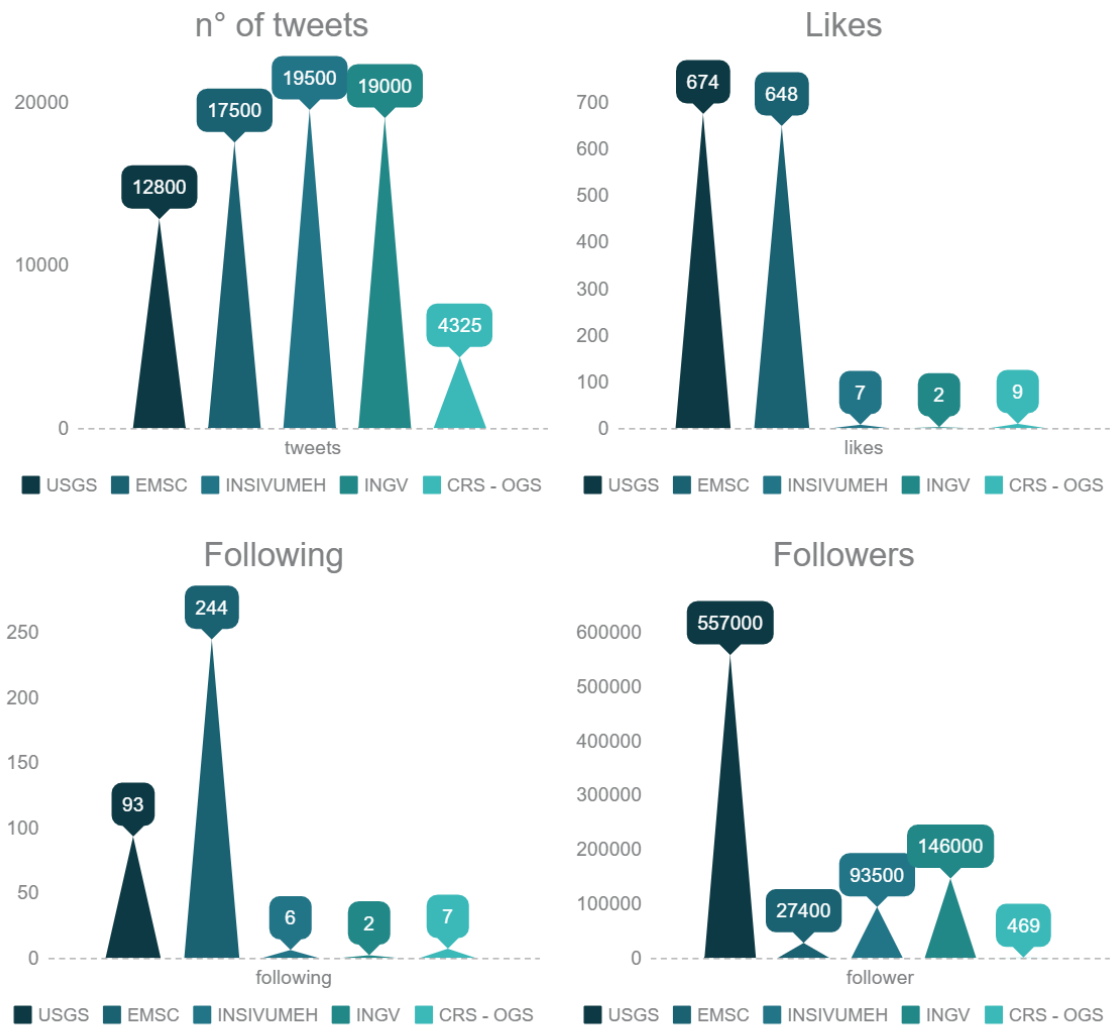


Figure 19 - number of tweets, number of likes, number of followers and number of followed profiles for each of the five institutions; updated 16th October 2016.

4.3.3 YouTube

The quantitative parameters that have to be taken into account as far as Twitter is concerned are:

- Number of videos: the number of video published by the channel;
- Subscribers: how many people are actually following the channel.
- Las time active: gives an idea on the frequency with which the channel releases new videos.

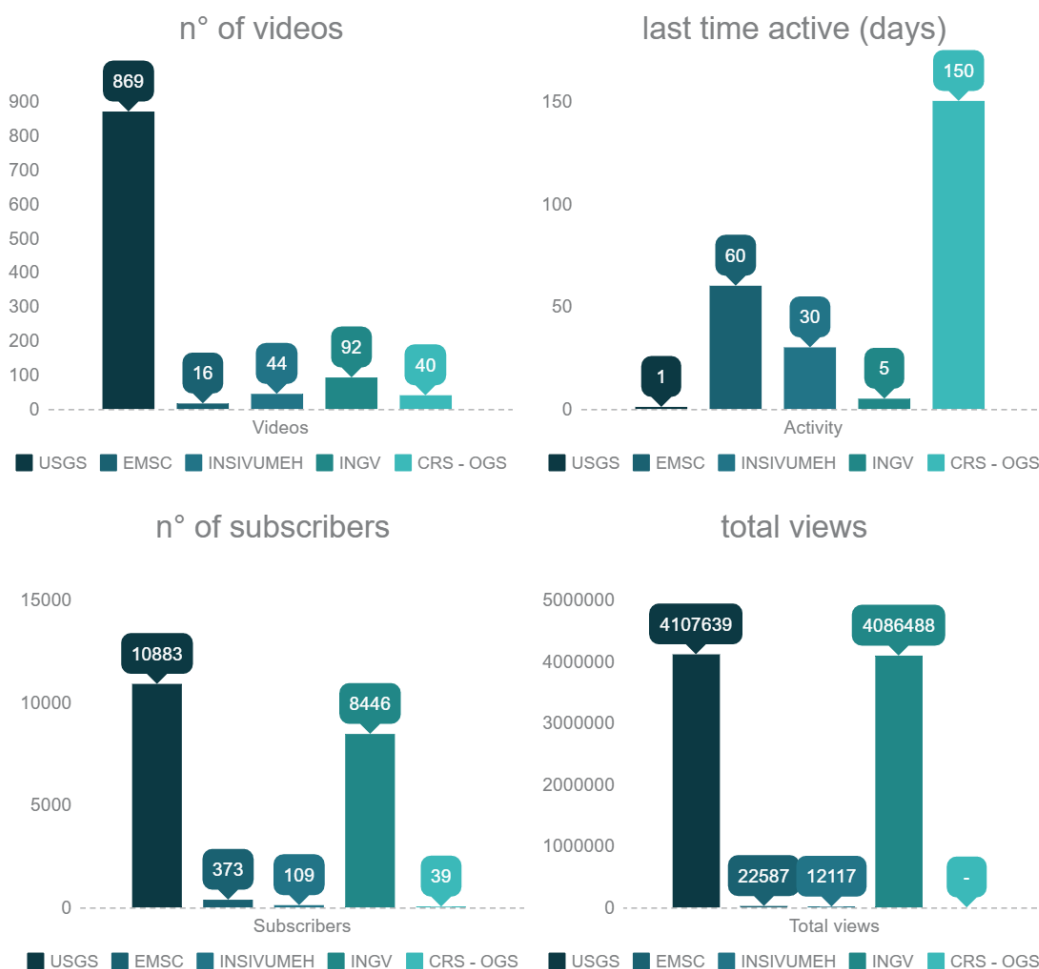


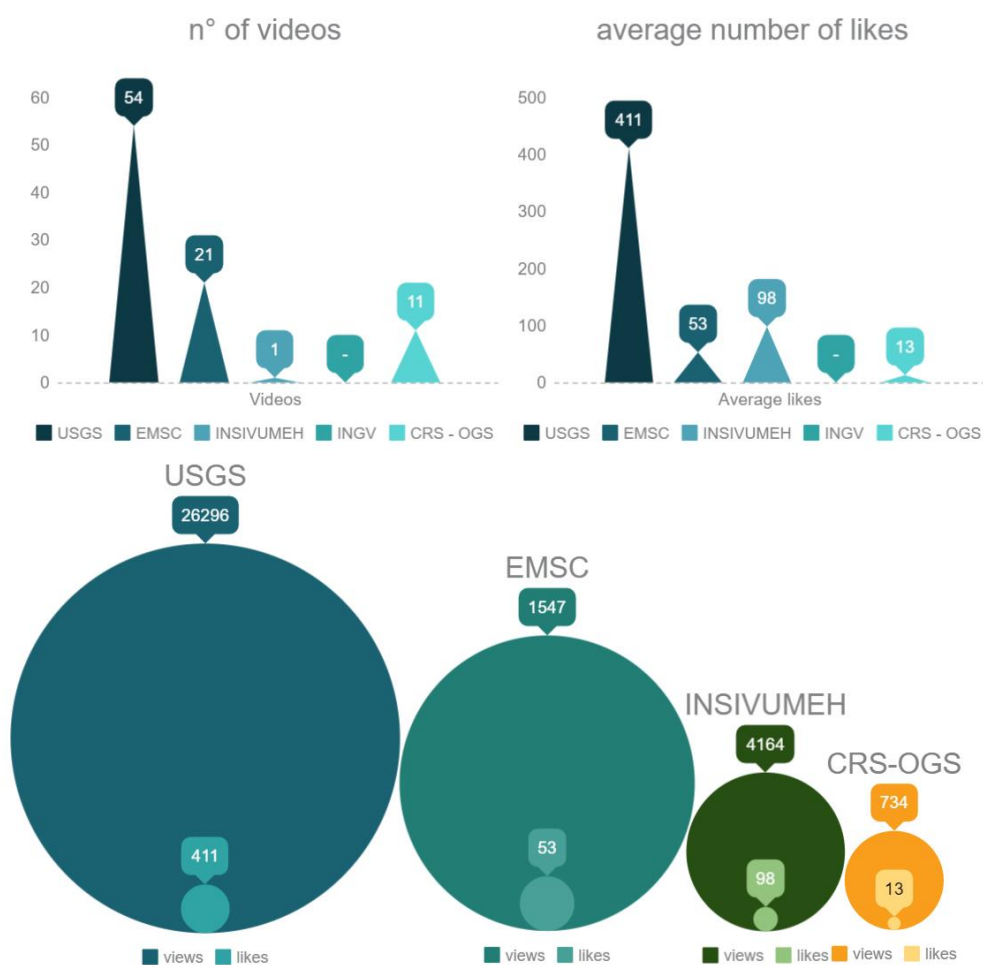
Figure 20 - number of videos, days of inactivity, number of subscribers and total view on the channel for each of the five institutions; updated 5th November 2016.

One of the interesting comparisons that can be made about YouTube channels is that the USGS and the INGV have approximately the same number of total views, and a comparable number of subscribers. This is surprising, given that the catchment area of the INGV is much lower than the one of the USGS, and, above all, that the number of videos published on the USGS channel is almost 10 times higher than the one of videos published on the INGV channel (Figure 20). In the interviews (see attachments) the Facebook page manager of the INGV declares that actually they have a very good feedback from videos published on YouTube, that are basically animations. Except the USGS, each institution has a quite long period of inactivity (the INGV has been quite active because of the Amatrice earthquake), indicating the lack of resources for video making.

4.4 Videos usage analysis

4.4.1 Facebook

The number of videos published on Facebook from each institution is very low, even for the USGS, which is considered an early adopter. Moreover, for every institution, the number of likes is low, especially in comparison to the number of visualizations (infographics of Figure 21).



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Figure 21 – a) number of videos published on Facebook; b) average number of likes; c) comparison between average number of visualizations and average number of likes for each institution, updated to the 17th October 2016. Complete statistics in the attachments.

Figure 22 shows the length and view for each video published by the institutions. We can see that the videos that for the USGS the shorts videos have a very high number of views, while the longer ones don't. Unpredictably, the EMSC has instead a good number of visualizations even for videos longer than 30 minutes. The OGS hasn't published any video longer than 4 minutes, anyway showing a higher number of visualizations for longer videos. The INSIVUMEH is not present in that analysis because it has only one video published on Facebook (as shown in Figure 21), while the INGV, as anticipated, publishes on Facebook videos only through a link to YouTube, and thus cannot be considered.

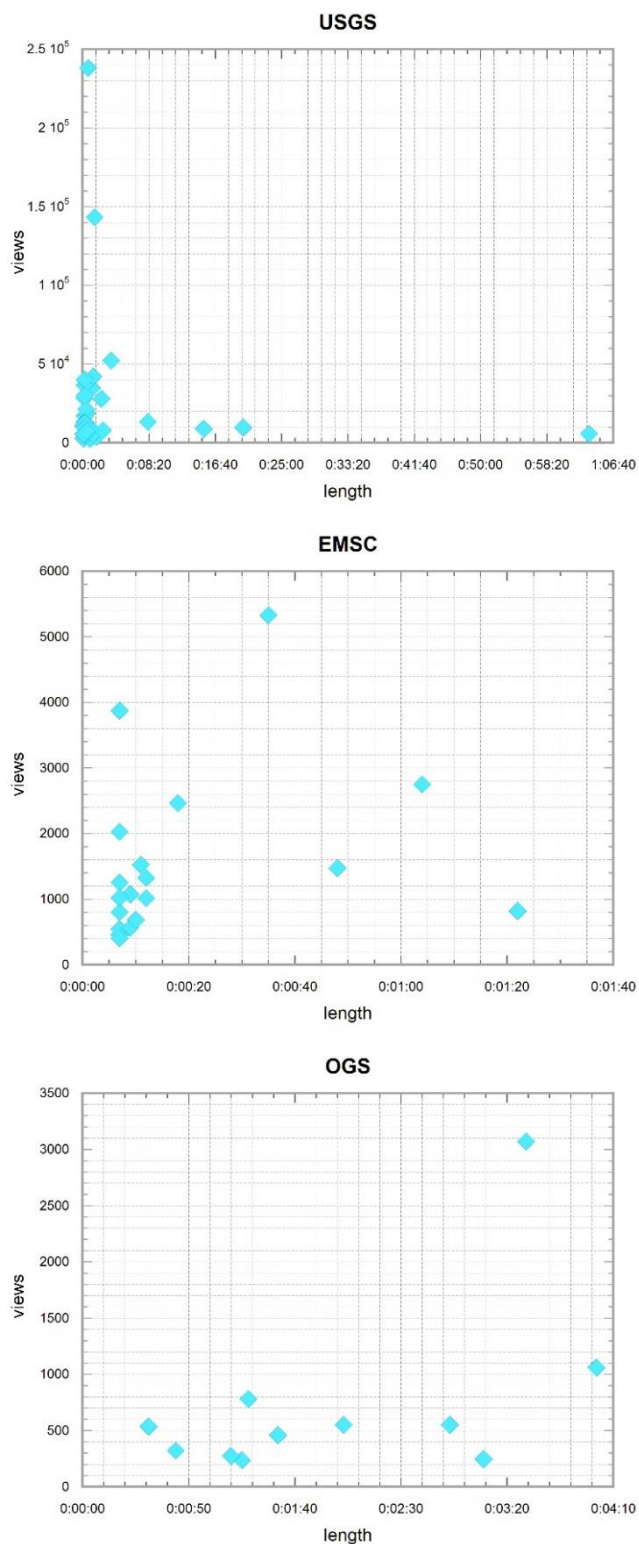


Figure 22 - length and views for each video published on the USGS, EMSC and OGS Facebook page. INGV is missing because, as stated before, they publish videos only on YouTube and then recall them; INSIVUMEH is missing because they have only one video published on their Facebook page. (Update 17th October 2016)

4.4.2 Twitter

For Twitter it's more demanding to have complete statistics on the number of videos, since they are mixed with pictures, hence reaching a very high number of Tweets among which the author would have to investigate.

INSIVUMEH has an impressively high number of pictures (Figure 23) because it publishes mainly automatic Tweets that contain a text in capital letter – “THE COMMUNICATION MINISTER INFORMS THROUGH INSIVUMEH” – followed by an image, usually quite technical. Also on the INGV account there're mainly pictures, the majority of which have an automatic map with the earthquake location; the only videos are a link to the video on their YouTube channel. The USGS publishes only picture also, mainly about earthquakes or volcanoes, but also some artistic or popular ones. The OGS has only few pictures and one video.

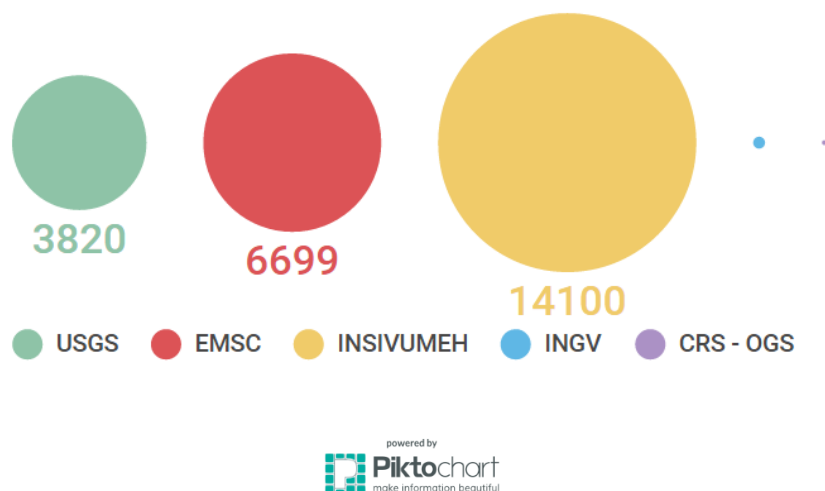


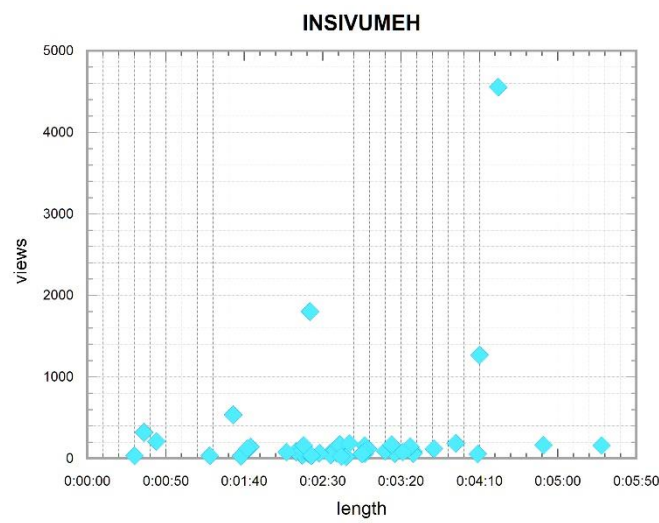
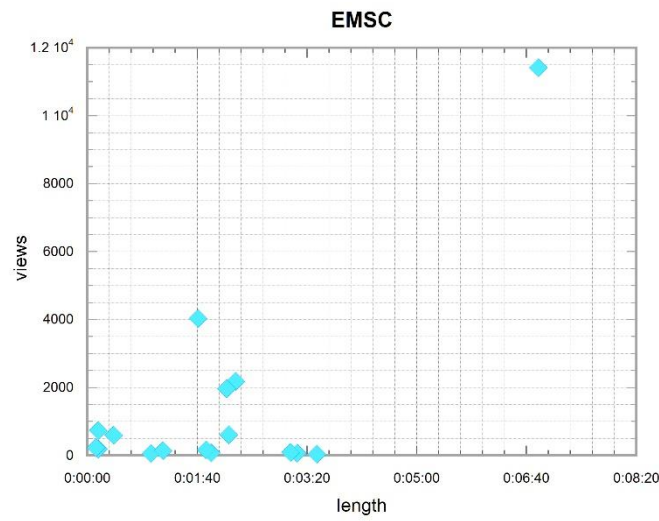
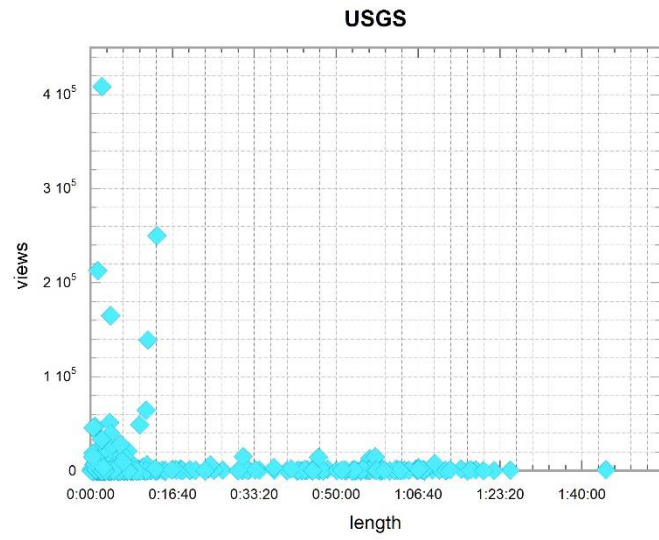
Figure 23 – comparison between the number of photos and videos published on Twitter by the different institutions, updated to the 31st October 2010.

4.4.3 YouTube

Some qualitative considerations will be exposed first, about the typology of videos found in the YouTube channel.

- ✓ USGS: only more or less the 1% of the videos are about earthquakes; all the others are about climate changes, water, wildlife monitoring.
- ✓ EMSC: the majority of videos is about interviews to researchers in their offices, few are animations or didactic explanation. The target is the general public.
- ✓ INSIVUMEH: the absolute majority of videos is about meteorological forecast; few are about volcanoes. Just one of the videos included earthquakes, the tutorial of the INSIVUMEH app.
- ✓ INGV: many videos are animations, some are testimonies, there's even a cartoon spot. The target is very wide, videos are popular, not dedicated to experts.
- ✓ OGS-CRS: only three of the 39 videos on the channel are not about seismology, even if the channel is the one of the institution, which works also on oceanography and other aspects of geophysics. The majority of the videos are about meetings talks, therefore the target is very specialist and the setting is the one in which there's a person talking with a Power Point presentation behind.

Figure 24 shows the relation between the number of views and the length for each video published by the institutions on their YouTube channels. Again, the USGS channel shows a higher number of visualizations for the shorter videos (under 15 minutes), while for the other institutions it can be seen that the situation is quite spread, depending also on the target of the video and on its content.



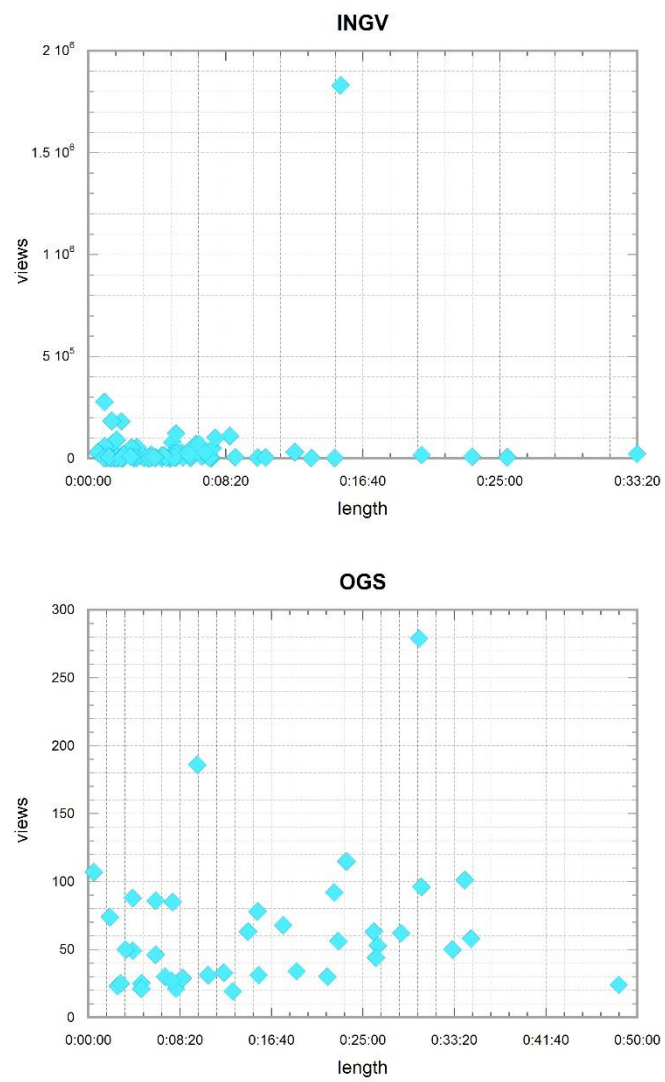


Figure 24 - length and views for each video published on the institutions' YouTube channel. (Update 17th October 2016)

5. Interviews analysis

5.1 Introduction

As already introduced in paragraph 3.3, I decided to interview four people, two working in seismological institutions (Rémy Bossu – EMSC and Carlo Meletti – INGV) and two working in the communication field (Giancarlo Sturloni – Greenpeace and Marco Boscolo – Formicablu).

The aim of the interviews is to understand which may be the difficulties and the opportunities in the use of video on social media for a seismological institution.

The analysis of the interviews has been divided into three parts. The first one is more general, about the state of the art and the risks of communicating seismological issues on social media. Then, there's a part in which a SWOT analysis (Strengths, Weaknesses, Opportunity and Threats)¹ is performed on the use of videos on social media. The last part of the chapter will open to a possible future scenario. This investigation, together with the one of the state of the art described in chapter 4, will help to develop a social media policy proposal for the use of videos that may be helpful to seismological institutions.

As three of the four people that have been interviewed are Italians, many of their answers concern the disruptive sequence of earthquakes that hit Italy since August 2016 and that is still ongoing at the time the author's writing. Another very common reference in the respondents' answers was the L'Aquila earthquake (2009) that is considered a milestone case study in seismological risk communication in Italy.

¹ SWOT Analysis is a tool generally applied in a business context to assess a project or an organization.

5.2 State of the art

As seen in Chapter 1, social media are a vital tool in seismic risk communication and emergency management, though the latter is actually the most investigated aspect, probably because of its intrinsic struggles. Indeed, the most of the respondents have been focusing on crisis communication aspects, referring to the time of the seismic emergency, maybe also as a consequence of the latest Italian earthquake experience – which is still a mainstream topic inside and outside seismological community. Doubts even emerged about the usefulness of risk communication as a prevention tool. Anyhow, both communicators and seismologists are conscious that it is imperative to be present on social network always, not only when an earthquake hits. This point was underlined by Marco Boscolo too, as a weakness of seismological institutions: clearly they are aware that they need to be present, but probably they should reconsider their strategy during peace times with the building of a new narrative.

The opinion of seismologists is that they must avoid to cross the line between seismological communication and civil protection role: seismologists provide scientific information and no more, while in the opinion of risk communication experts this division of roles was not so unblemished. All the Italian respondents complained about the absence of the Civil Defence figure on social media: although many meetings and workshops have been promoted, almost nothing changed in the years and still in 2016 they haven't been available on social media to give information and support.

Anyway, all respondents agree on the fact that citizens have expectation on finding information on social media from experts, and that institutions can't ignore anymore these expectations. People can understand an evolution of information as time passes from the first release, but the thing they can't accept is the lack of information. In that case, there would be a total loss of credibility.

As already stressed in the definition of the methods, information released by seismological institutions gains an enormous attention, also on traditional media, in case of earthquake, while the attention drops to zero when no earthquake occurs. The reason for that may be found in a lack of curation of the context in which scientific data are spread, a lack of

communication strategies during “peace times”, and, above all, the absence of risks prevention culture. Also in debunking of hoax which spread very easily on social media, the intervention of institutions is insufficient. «Correct information release is not enough, there’s also the need of curate the construction of a narrative for the audience», Marco Boscolo states.

Summing up, all institutions are becoming aware of the necessity of being present on social media, although most of the times they are still struggling to find an appropriate strategy.

5.3 Risks

The question about risks that institutions have to face when communicating through social media was asked on purpose, since from the analysis of framework (Chapter 2 of this thesis) it emerged that institutions have a form of mistrust towards social media.

Unexpectedly, the interviewed seismologist didn’t express any form of skepticism or fear about the consequences of their presence on social media, even if this sentiment is rather perceived by the communication experts, who actually think that the insufficient presence on social media is to be attributed to a general distrust. According to communicators, institutions are worried about losing control and reputation, through the exposure of their limits if they’re found not able to answer some of the questions they receive (not from a scientific point of view but from a communication one). Instead, surprisingly, both seismologists and communicators interviewed agree that the main risk of social media communication is: not being there. In that case, people find information elsewhere – the conversation goes on anyway, with or without you. Therefore, it really is important to be there, provide information and join the dialogue.

Anyway, subsequently to the prosecution of the Big Risks Commission members in Italy after L’Aquila earthquake, seismologists are aware that communicating is a risk. Nevertheless, they

are also conscious about the fact that also to avoid communication is a risk itself, as underlined by Giancarlo Sturloni: «also not being there [on social media platforms] is a form of communication, and the worst one».

Besides, the psychological effects on a population involved in a seismic event is a key issue in communication strategies. About this aspect, it has been demonstrated that providing information during a crisis reduces the stress of the experience. On the other way round, the emotional aspect has to be taken into account when designing a video, which may undertake deepest unconscious layers that need to be controlled as much as possible. One of the risks that is ignored by the most is the eventuality of an unhealthy obsession about catastrophic images, even though they actually give a principle of reality. Anyway, this is a very discussed risk in traditional journalism also.

From the analysis of the social accounts of the institutions (chapter 4) emerged that the different channels were used in different ways. This might be seen as a risk: it becomes really important to give coherent messages on each channel, and a strong team work is needed if different persons manage one channel each.

5.4 SWOT analysis

Strengths

To the question “videos on social media could be an effective way to communicate seismological risk”, the answer of all the respondents was mainly: yes. From the communicators’ point of view, the concept that emerged was that every possible channel should be used to convey the message to the wider possible audience. Moreover, younger generation are proven to be more used to visual communication than to written one.

From the point of view of seismologists dealing with communication on social media, the effectiveness of videos is supported by their own experience. Videos are a wise long term investment: those made during peace times have a lot of impact during emergencies, when there’s no time to make new ones. Meletti, for example, is quite enthusiast about the performances of their videos, which are made during peace time and often visualized after an earthquake occurs, when people look for information about seismological issues.

To sum up, videos are seen as an interesting and desired instrument to be used in risk prevention more than in crisis management.

Weaknesses

Videos are very effective, but are also complex objects, which needs different expertise to be done professionally. Therefore, they are not suitable to be used during emergencies, also considering that during a crisis there's usually problems of bandwidth and videos are heavy. Moreover, during an emergency people involved wouldn't take the time to watch a video. In all the respondents' testimonies these aspects emerged very clearly.

Moreover, it has to be considered the emotional and evocative imaginary, also at an unconscious level, that visual communication intrinsically brings in. From the communicators point of view, before publishing videos on social media it is important to deeply investigate the digital identity of the institution. It is necessary to keep in mind that social media have characteristics different from traditional media, and also video making have to take into account those characteristics.

Again, the main point of discussion seems to be: given that videos are an advantageous channel, it has also to be considered that they are very complex to be packaged without a professional expertise. On this issue, we have seen that one of the main problem is actually the fact that communication on social media is made by seismologists and not by communication experts. The financial impossibility of having employees in charge of social media communication is a limit to be kept in mind.

Opportunities

Videos are easy to distribute on social media: the algorithms of Facebook and Twitter incentive video publishing, as they're seen as quality content. Therefore, in this moment in the history of media, to have videos to publish is a great opportunity as far as their distribution is concerned and also for the visibility of the institution itself.

Another advantage is that of having a material that can be re-used in case of emergency, when (as stressed by all the respondents) there's not time to make a brand new video. It is not clear the reason why almost none of the respondents have thought about the feature of live videos that almost each platform is implementing, to reach the population easily also in case of seismic emergency. Anyway, the problem might be that live video feature is very new in Italy and still need to spread (supposing that it will, which is not meant at all).

Threats

Social media are a meritocratic space. If videos are not well done, they are not visualized nor shared on social media; essentially, they're totally worthless, if the quality is not high enough.

Probably one of the biggest threats regards the fact that institutions don't have enough resources to hire experts in social media management. Not either they can easily turn to an external consultancy for the realization of risk prevention campaigns, since they need to make a call for bids, so the timing becomes too long, also considering the speed at which social media are constantly changing.

One of the main difficulties is to keep the attention of the followers also when no earthquake occurs. Earthquakes are phenomena for which a huge amount of attention is given for more or less one month after an occurrence, and then drops dramatically to zero. As pointed out by Marco Boscolo, it is essential to create a narrative, through a long term strategy and the definition of a clear digital identity.

5.5 Content

There seem to be no specific limits about content to be conveyed through video on social media, especially if there are nice images to be shown, and earthquakes have huge potential in this sense. In the testimony of Meletti, the INGV obtained very good results with animations, particularly with 3 dimensional ones, probably for its being different from usual.

The videos required are mainly about risk prevention culture. Considering that videos usually work if they are one-minute-long, they have an emotional tone and they contain a call to action (as pointed out by Sturloni), it would be useful to produce some video-pills during peace time with instructions and training about what to do in case of earthquake. Boscolo also suggests that some videos regarding construction heritage can be done, the aspect on which it is pragmatically possible to act in order to reduce risk. Moreover, videos that tell about history of earthquakes in the territory can be a useful way to change social perspective, to make population aware about the seismological hazard of the place where they live, so taking action on what is possible to change, to finally avoid telling the same story of disruption over and over again.

Of course, after the production of videos it is also compulsory to build a distribution strategy, especially during peace. Otherwise, those videos may only be useful to answer to citizens' worries in the circumstance of a seismic sequence that may forerun a main shock.

5.6 Future perspective

Stakeholders were asked how they imagine the presence of seismological institutions on social media, given that all social platforms will probably be soon filled with videos.

None of the respondents denies that social media are - and increasingly will be - the core of the interaction between seismological institutions and citizens. Information in the future is going to be almost exclusively on social media and therefore every respondent agrees on the importance of being considered reliable, trustworthy and have a clear digital identity. Nonetheless, institutions avoid as much as possible the interaction with the followers on Facebook and especially on Twitter, using mainly those channel as traditional media just to release information – or distribute videos in the case of YouTube. Even worst, seismologists stated that their institutions are not planning their presence in a long time period through the publication of a social media strategy and/or policy document. Very few institutions take the time to debate appropriately how to work on different communication languages rather than on information accuracy, although its importance in reaching different targets and different communication objectives. They essentially go on with a trials-and-errors technique, and anyway videos are not the core of their communication approach. Videos, in fact, are not fast enough for their purposes, which mainly concern real time seismological alerts. Rémy Bossu is actually skeptical about the future of videos on social media. He states that «at the moment Twitter is the key for real-time communication, and until now it is still used twitting “mamma mia, terremoto!” and not posting videos. I can’t see it happening in the next years». Moreover, it is interesting the fact that institutions aren’t taking advantage of the good index Facebook and Twitter are giving to primarily published videos, deciding instead to use only YouTube as a video container.

From a communicator point of view, the main problem of institutions in the future will probably be the need of specific expertise in the field of social media managing. Many institutions actually believe that a communicator can do everything concerning communication; instead, it has to be very clear that also in this field there are specific expertise. Therefore, they must learn what to ask to communication experts and have a clear

idea of how to manage the production process, keeping in mind a vision and specific objectives. In the case of videos, this is even highlighted, since videos require a minimum level of quality that need professionals to be achieved. Besides, after the video is made, it has to be spread with certain criteria, as Sturloni underlines in his testimony.

On the other hand, respondents were asked whether they could imagine video as an instrument to collect information about earthquake from the population. To this question, there's accordance on the fact that it might be a possibility if it wasn't for the big issue of validation. The problem is the collection, analysis and validation of huge amount of data in real-time after a disaster, given the compelling necessity of a quick communication. Right now, it is already difficult to do that with written testimonies or pictures, often the work of volunteers is needed (VOST projects are cited by Bossu). Anyway, videos can be collected beside the emergency, in peace time, for example with multimedia museums exhibits. This would be important to preserve the historical memories of the earthquakes, which otherwise is proven to be lost in two generations time, as recalled by Meletti. Museums exhibits, although, would implicate a low involvement of seismological institutions, not being among their missions.

The possibility of live streaming during emergency management emerged only by the answer of Marco Boscolo, despite the framework analysis showed how this actually is the main trend on social platforms. In this field, Boscolo confirms that institutions might become an authoritative voice in the media scenario, obviously without the presumption of deposing traditional media. Moreover, the positive impact of videos and live streaming testimonies by institutions may have its own weight in public debates and in hoax spreading. Nevertheless, communicators are aware of the fact that, in that case, part of the effort on the territory would be devoted to communication, that may not be a priority in the moment of emergencies.

6. Conclusions

6.1 Future perspective for the use of videos on social media by seismological institutions

From the framework analysis performed in chapter one it emerged that the use of videos on social media to communicate seismological risk is undoubtedly promising. In fact, there's a junction of different factors: on one side the will of social platform to push on video publishing, as considered quality content; on another side, the population thirst of first-hand information to be found immediately on social media; from a communication point of view, videos have been proven to be ways more effective than written text.

Despite these signals, there's a general skepticism from seismological institutions' point of view about using videos on social media. The difficulties that emerged were mainly the possible consequences of an erroneous communication, the difficulty of making a (good enough) video and, last but certainly not least, the lack of resources (time, money, employees).

The problem of videos seems to be almost independent from the "size" of the institution. In fact, as seen from the quantitative analysis of the YouTube channels of the institutions analyzed, the interaction (number of views, likes, comments) was quite low, despite the number of video published. Probably, the main reason for unsuccessfulness is the fact that the videos published are often very technical, for experts only, and without any narrative or storytelling.

Given all these reflections, one of the most suitable way of using videos on social media in the future will probably be through live streaming. Live videos have now a very high rate of interaction on social platforms. Moreover, in this way it's not anymore important the technical

quality of the videos itself: the value is given by the fact that it's happening right now and it's authentic. In this way, even seismologists not experts in communication techniques (but with at least a bit of passion about that) can obtain good results. The added value is that of being the scientist itself telling the story, with no filters at all. In any case, for this to work there's the necessity of setting a frame, building a narrative, especially during peace time, when no earthquakes occur. Unfortunately, often institutions are the last to adapt to new form of communication: therefore, it seems that they still haven't even considered the idea of communicating through live streaming.

Understandably, the gap between theory and practice is always bigger than desired. Therefore, even though videos on social platforms would be a profitable media, it might not become the future of communication between citizens and seismological institutions, mainly because of the difficulties abundantly exposed in the chapters before. In this case, the terms for the presence of seismological institutions on social media will be defined mainly by the changes that will happen in the social platforms policies.

In the seismological field, the engagement of population is an important factor in seismic risk reduction. Keeping a high level of attention of the population living in a seismic prone area, and make them aware of the risk they're undertaking in a certain territory together with good practices of prevention, should be one of seismologists' accomplishments. Recent seismic events have highlighted the unavoidable changes in the social contract among citizens and seismologists, and it's obvious that social media have a primary impact on it. Therefore, seismological institutions should reinvent their presence on social media, to empower their communication techniques. In this regard, video would be a useful tool to be considered. In any case, the most valuable recommendation for seismological institution is to give up their inertia in adapting to the ever changing world of communication.

6.2 Proposal for a video social media policy of a seismological institution

The major defect of seismological institutions' communication seems to be the lack of a strategical plan. There are basically two reasons why it is important to have a social media policy: to tell the population which can be the expectations they can have on the behalf of the association and to prevent possible abuse from employees or followers. Last but certainly not least, the writing of a policy is helpful to set a target, to identify their own digital identity and the clarification of a framework and a narrative. In the case of a seismological institution, it's even more vital to have a policy in order to be able to manage crisis communication, when an earthquake hit. As shown in the framework analysis, it is fundamental to prepare a code of conduct before the earthquake in order to avoid possible consequences of an erroneous or absent communication which, as demonstrated by L'Aquila case, might be really heavy.

Internal and external social media policy

It's given for granted that each institution has – or at least knows that should have – a social media policy, both internal and external. In this policy, it is important to declare the code of conduct of employees on social media (disclosure, spread of confidential data, ...). It would be a good idea, seen the thorny situation of emergency management, to train a team of employees who will manage or help to manage the institutional social profiles. As far as the external social media policy is concerned, it must include the right to delete dishonourable content, and to edit or amend content found to be not accurate, false or not updated. Generic information should also be included, such as which are the research fields, working hours, mission and vision, legal responsibility.

Video social media policy

A part of the social media policy should be dedicated to the use of videos, such as: what kind of video content can be published on the institutional channels, how often video should be released, which video technique can be adopted and on which channels videos will be distributed. Also the targets of video communication should be clearly identified, together with Key Performance Indicators (KPI) characterization – such as total number of visualization or audience retaining. Video performances should be measured at regular intervals, to report the results obtained and consequently set new goals or enhance possible weaknesses in the outcomes.

It is very important to decide exactly how to behave on social media in case of seismic emergency and to declare in advance which actions will be undertaken, so that followers know what they can expect from the institution when looking from experts' material on social media. Some very short video-pills (30 seconds) with clear and easy instructions to follow should be prepared during peace time, in order to distribute them to the population in case of earthquake or seismic sequence occurrence. The video pills can be kept as a draft on the social media accounts, so that in case of seismic emergency it won't take much time to just click on the bottom "publish", given that researchers have many primary duties in this situation.

To look for grants or funding in order to be able to pay an expert (preferably a team of experts) for the development of social media strategy should be a priority of the institutions' summit. An incisive and effective strategy will have a massive payback in terms of reputation, beyond the efficacy of results in risk prevention dissemination. Moreover, a team of experts would be able to create a narrative capable to keep the attention on the seismic risk issue also when no earthquakes occur in a certain area.

The social media policy can be a video itself. An example of video social media guidelines is the one published by the KPMG (a global network of professional firms providing Audit, Tax and Advisory services) for the use of their employees⁽²⁰⁾. An interesting side effect of publishing the social media guidelines on YouTube is the fact that it is very easy to check how

many people are informed about it (number of views and length of views). Different video-policies can be made for the different channels on which the institution operates, and for the two different targets (internal and external).

Tips for an effective use of videos on social media to communicate seismological risk

- ✓ When possible, find a call to action for your videos, to be recalled also in the description. In the case of seismic risk reduction, it can be an earthquake training or an invitation to join a conversation about their own past earthquake experience.
- ✓ Always use subtitles: people usually watch videos in public spaces, the majority of them doesn't turn on the mobile volume, therefore, they will understand something only if there are captions. Which is more, in this case the video will be usable also by deaf people.
- ✓ In the post on which the video is published, write a short but complete textual description of the video itself, so that people can decide whether they are interested or not. At the same time, in this way also blind people will be able to know something about that. In case you are publishing a video-pill about what to do in case of earthquake, write it down entirely in the video description. It might be useful to people who might not have the time or clarity of mind to watch a video.
- ✓ Try to have a gender and/or ethnical balance among people appearing in the videos. Even if at the moment the majority of prominent seismologists are Caucasian males, this will help minorities to get close to seismology, otherwise they will feel rejected.
- ✓ In each video keep the focus on just one single concept that is important to convey. Be sure that this concept is clear. Be concise but complete.
- ✓ Find a narrative or a trick for the video to be attractive and to relate the videos one another.

Things to avoid in using videos on social media to communicate seismological risk

- ✘ Never deny or minimize seismic risk. People have the right to be informed about the hazard of their own territory, together with seismic risk reduction measures they can undertake. Don't underestimate the consequences of your statements (L'Aquila docet).
- ✘ On the other hand, it is important not to create unmotivated panic, especially in populations that have already experienced a catastrophic earthquake or are at the moment experiencing a seismic sequence. Videos work if they have an emotional content, yet consider the possible significances that every word or gesture may have for your audience.
- ✘ Keep in mind the emotive condition of the population involved in an earthquake. Avoid to be cheerful or cold, don't seem insensitive neither too much worried. Yet, try not to be boring.
- ✘ Avoid technical language and don't talk fast.
- ✘ Be truly honest, even if you don't like what you have to say or you don't know the answer: it will pay back in credibility.

6.3 Future investigations

After this exploratory study, further investigation in the field would be needed. First of all, it would be interesting to deeply examine one case study where to apply the strategy about video on social media. Of course, social media panorama is constantly changing, day by day; so, every study becomes old quite soon after its publishing. Anyway, many step forward could be done analyzing the results obtained through the application of the principles resulted by this preliminary analysis. Seismological institutions must struggle to find a satisfying compromise between research commitments and communication needs. Also, they should try to clearly define the border of their competences in the risk communication field, not to cross into the ones of Civil Defence. Anyway, also Civil Defence institutions could take advantage from the principles emerged in this thesis, to empower the efficiency of their communication before, during and after a seismic event.

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- (5) USGS Facebook page: www.facebook.com/USGeologicalSurvey/
- (6) EMSC Facebook page: www.facebook.com/EMSC.CSEM/
- (7) INSIVUMEH Facebook page: www.facebook.com/insivumeh/
- (8) INGV Facebook page: www.facebook.com/INGVterremoti-436853586390357/
- (9) OGS-CRS Facebook page: www.facebook.com/ogscrs/
- (10) USGS Twitter account: twitter.com/USGS
- (11) EMSC Twitter account: twitter.com/LastQuake
- (12) INSIVUMEH Twitter account: twitter.com/insivumehgt
- (13) INGV Twitter account: twitter.com/INGVterremoti
- (14) OGS-CRS Twitter account: twitter.com/crs_rts
- (15) USGS YouTube channel: www.youtube.com/user/usgs
- (16) EMSC YouTube channel:
www.youtube.com/channel/UC_DwbHPMKSU41Qn9HgbNIJg
- (17) INSIVUMEH YouTube channel:
www.youtube.com/channel/UCIlgawHgsbqN6Nuok7ds-Szw
- (18) INGV YouTube channel:
www.youtube.com/channel/UCWcyIY2YDfioFmDAULj3vgA
- (19) OGS YouTube channel:
www.youtube.com/channel/UC0EyV59VxlyBwwgjjWTNY2A
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www.youtube.com/watch?v=gr34T2Tlloo

Attachments

Geophysics Institutions Throughout the World

(source USGS <http://earthquake.usgs.gov/monitoring/institutions.php>)

Africa

- Council for Geoscience, Republic of South Africa
- European Mediterranean Seismological Centre
- Organisation of African Geological Surveys
- See also entries for Algeria, Djibouti, Egypt, Morocco, Namibia, South Africa and Tunisia.

Albania

- European Mediterranean Seismological Centre
- Institute of Geosciences, Energy, Water and Environment

Algeria

- National Earthquake Engineering Center of Algeria
- European-Mediterranean Seismological Centre
- Mediterranean Very Broadband Seismographic Network - MEDNET

Argentina

- Instituto Nacional de Prevención Sísmica (INPRES)

Australia

- Geoscience Australia
- Geological Society of Australia

- University of Queensland ESSCC Seismological Observatory
- Seismology Research Centre
- Australian Earthquake News
- Seismology & Geomagnetism Group, Australian National University
- The Australian Earthquake Engineering Society
- University of Western Australia - Earth and Geographical Sciences
- South Australia Earthquakes

Austria

- Austrian Association for Earthquake Engineering and Structural Dynamics
- Zentralanstalt für Meteorologie und Geodynamik (ZAMG)

Azerbaijan

- Republican Seismic Survey Center of Azerbaijan Academy of Sciences
- European Mediterranean Seismological Centre

Azores

- Observatório Vulcanológico e Sismológico da Univ. dos Açores
- See also entries for Portugal.

Belgium

•Royal Observatory of Belgium - Seismology

Bolivia

- Learning from Earthquakes: Bolivia
- Observatorio San Calixto, La Paz

Brazil

- Observatório Sismológico, Universidade de Brasília
- Instituto de Astronomia, Geofísica e Ciências Atmosféricas

Bulgaria

- Geophysical Institute - Bulgarian Academy of Science

Canada

- Natural Resources Canada - Earthquakes
- Southern Ontario Seismic Network

Caribbean

- Caribbean Geology and Tectonics Website
- Seismic Research Centre, The University of the West Indies, St. Augustine, Trinidad and Tobago
- See also entries for Cuba, Jamaica and Puerto Rico.

Central America

- See entries for Costa Rica, El Salvador, Guatemala, Nicaragua and Panama

Chile

- Departamento de Geofísica, Universidad de Chile
- Seismological ServiceDepartamento de Geofísica, Universidad de Chile
- Centro Sismológico de la Universidad de Tarapacá
- Servicio Nacional de Geología y Minería (SERNAGEOMIN)

China

- China Seismograph Network Data Management Center (Chinese)
- Seismological Society of China

•Hong Kong Observatory

Colombia

- SGC - Servicio Geológico Colombiano
- SGC - Red Sismológica Nacional de Colombia (RSNC)

Costa Rica

- Laboratorio de Ingeniería Sísmica, Universidad de Costa Rica
- OVSICORI-UNA: Observatorio Vulcanológico y Sismológico de Costa Rica
- Red Sismológica Nacional (RSN)

Cuba

- Centro Nacional de Investigaciones Sismológicas (CENAIIS)

Czech Republic

- Geophysical Institute, Academy of Sciences of the Czech Republic
- Charles University - Department of Geophysics
- Masaryk University Brno - Institute of Physics of the Earth

Denmark

- Geological Survey of Denmark and Greenland (GEUS)

Djibouti

- Observatoire Géophysique d'Arta
- European Mediterranean Seismological Centre

Ecuador

- Instituto Geofísico, Escuela Politécnica Nacional

Egypt

- National Research Institute of Astronomy and Geophysics (NRIAG)
- European Mediterranean Seismological Centre

El Salvador

•Servicio Nacionales de Estudios Territoriales
- SNET

Europe

- European Geosciences Union
- Observatories and Research Facilities for European Seismology - ORFEUS
- Centre Sismologique Euro-Mediterraneen - CSEM
- European Seismological Commission
- See also entries for individual countries.

Finland

- Institute of Seismology, University of Helsinki

France

- Le Bureau Central Sismologique Français
- Centre Sismologique Euro-Mediterraneen - CSEM
- GEOSCOPE
- SISMALP - French Alps Seismic Network
- Reseau National de Surveillance Sismique, France - ReNaSS

Germany

- GEOFON Program, Potsdam
- Seismic Data Analysis Center - SDAC
- Department of Geophysics, Ruhr University Bochum
- Seismological Central Observatory (SZGRF) Graefenberg

Greece

- Aristotle University of Thessaloniki
- National Observatory of Athens, Institute of Geodynamics
- National Observatory of Athens
- University of Athens, Department of Geophysics-Geothermal
- I.T.S.A.K.
- Laboratory of Seismology, University of Patras

Guatemala

•INSIVUMEH - Instituto Nacional de Sismología, Vulcanología, Meteorología e Hidrología

Hungary

- GeoRisk Earthquake Research Institute

Iceland

- Icelandic Meteorological Office, Physics Department

India

- India Meteorological Department
- India Meteorological Department - Seismology
- Geological Survey of India
- Regional Meteorological Centre, Mumbai: Earthquakes
- National Geophysical Research Institute

Indonesia

- Badan Meteorologi, Klimatologi, dan Geofisika
- ASEAN Earthquake Information Center
- Volcanological Survey of Indonesia

Iran

- Geological Survey of Iran
- International Institute of Earthquake Engineering and Seismology, Iran
- Earthquake Research Center - EQRC
- Iranian Seismological Center, Online Databank
- Building & Housing Research Center

Ireland

- Irish National Seismic Network
- Dublin Institute for Advanced Studies - Geophysics

Israel

- The Geophysical Institute of Israel
- The Geophysical Institute of Israel: Seismology Division

Italy

•Friuli Experimental Seismic Network, Venezia
Giulia, Italy

•Istituto Nazionale di Geofisica e Vulcanologia
(INGV)

•Dipartimento di Geoscienze, Università degli
Studi di Trieste

•Istituto Nazionale di Oceanografia e
Geofisica Sperimentale (OGS)(Italian)

•Gruppo Nazionale per la Difesa dai Terremoti
(National Group for the Defence against
Earthquakes)

Jamaica

•Earthquake Unit, The University of the West
Indies, Mona

Japan

•Earthquake Research Institute, University of
Tokyo

•Geological Survey of Japan - GSJ

•Japan Meteorological Agency - JMA

•Meteorological Research Institute - Japan
Meteorological Agency (JMA)

•National Research Institute for Earth Science
and Disaster Prevention (NIED), Japan

•Kyoshin Network (K-NET) - strong motion

•F-Net - broadband

•Hi-Net - short period

•Earthquake Prediction Research Center

•Geospatial Information Authority of Japan
(GSI)

•Japan Marine Science and Technology Center

•International Institute of Seismology and
Earthquake Engineering - IISEE

•Coordinating Committee for Earthquake
Prediction, Japan - no website?

•Disaster Prevention Research Institute,
Kyoto University

•Research Center for Earthquake Prediction

•Sakurajima Volcano Research Center

Kazakhstan

•Kazakhstan National Data Center (KazNDC)

Malaysia

•Malaysian Meteorological Service

Mexico

•Servicio Seismológico Nacional - UNAM,
Mexico

•Instituto de Geofísica, UNAM

•CICESE - Departamento de Sismología

Montenegro

•Montenegro Seismological Observatory,
Podgorica

Morocco

•Institut National de Géophysique du Maroc

•European Mediterranean Seismological
Centre

Namibia

•Geological Survey of Namibia

Nepal

•National Seismological Center, Nepal

•National Society for Earthquake Technology

•Government of Nepal Ministry of Industry-
Department of Mines and Geology

Netherlands

•ORFEUS Data Center

•Network of Autonomously Recording
Seismographs - NARS

•Royal Netherlands Meteorological Institute

New Zealand

•Institute of Geological and Nuclear Sciences

•Victoria University, School of Geography,
Environment and Earth Sciences

•GeoNet

•Geological Society of New Zealand

•New Zealand Earthquake Commission

Nicaragua

•Instituto Nicaraguense de Estudios
Territoriales - INETER

Norway

•Norwegian Seismic Array (NORSAR)

•University of Bergen, Geodynamics

Oman

•Sultan Qaboos University, Earthquake
Monitoring Center

Pakistan

•Geological Survey of Pakistan

Panama

•Instituto de Geociencias de la Universidad de
Panama

Papua New Guinea

•Mineral resources Authority of Papua New
Guinea

Peru

•Instituto Geofísico del Perú

Philippines

•Philippine Institute of Volcanology and
Seismology: PHIVOLCS

Poland

•Instytut Geofizyki, Polskiej Akademii Nauk

Portugal

•Instituto Portugues do Mar e da Atmosfera

•Instituto Geofísico Infante D Luiz

•Observatório Vulcanológico e Sismológico da
Univ. dos Açores

Puerto Rico (including Virgin Islands)

•Red Sísmica de Puerto Rico (RSPR)

Romania

•National Institute for Earth Physics,
Bucharest

Russia

•Russian Academy of Sciences, Geophysical
Survey (Russian)

•Russian Academy of Sciences, Geophysical
Survey (English)

•Baikal Branch Geophysical Survey, Siberian
Branch Russian Academy of Sciences, Irkutsk
(Russian)

•Kola Branch, Geophysical Survey, Russian
Academy of Sciences, Apatity

Saudi Arabia

•Saudi Geological Survey, Jeddah

Serbia

•Seismological Survey of Serbia, Belgrade

Slovakia

•Department of Seismology, Geophysical
Institute, Slovak Academy of Sciences

South Africa

•Geological Survey of South Africa

South America

•See entries for Argentina, Bolivia, Brazil,
Chile, Colombia, Ecuador, Peru and
Venezuela.

Spain

•National Geographical Institute, Madrid,
Spain

•Institut Cartografic de Catalunya

•Instituto Andaluz de Geofísica, Universidad
de Granada

Sweden

•Swedish National Seismological Network

Switzerland

•Swiss Seismological Service

Taiwan

•Central Weather Bureau

•National Center for Research on Earthquake
Engineering

•Institute of Earth Sciences, Academia Sinica

•Broadband Array in Taiwan for Seismology -
BATS

•Central Weather Bureau - Earthquakes

Trinidad and Tobago

•Seismic Research Centre, The University of the West Indies, St. Augustine

Tunisia

•Institut National de la Météorologie

Turkey

•Kandilli Observatory and Earthquake Research Institute, Bosphorus University, Istanbul

•AFAD, Earthquake Research Department, Ankara

•AFAD, Strong Ground Motion Network, Ankara

•Tubitak MRC Earth Sciences Research Institute

United Kingdom

•British Geological Survey - BGS

•British Geological Survey Earthquake Home Page

•Earthquake Engineering Research Centre, University of Bristol

•International Seismological Centre - ISC

•Department of Earth Sciences, University of Oxford

Uzbekistan

•Institute of Seismology of the Academy of Sciences, Tashkent

Venezuela

•Laboratorio de Geofísica de la Universidad de Los Andes, Venezuela

•Fundación Venezolana de Investigaciones Sismológicas – Funvisis

Complete statistics on the social profiles

16/10/2016	likes	PTAT	Reviews	Average review
USGS	443479	5824	1068	4.6/5
EMSC	20767	323	110	4.6/5
INSIVUMEH	36017	88	-	-
INGV	85582	951	-	-
CRS - OGS	1989	6	5	4.4/5

Table 1 - parameters taken into account for each Facebook page of the five institutions considered: number of likes, PTAT (People Talking About That), number of reviews and average value for the reviews; updated 16th October 2016.

16/10/2016	Joined	tweets	following	follower	likes
USGS	April 2008	12800	93	557000	674
EMSC	April 2012	17500	244	27400	648
INSIVUMEH	October 2010	19500	6	93500	7
INGV	March 2010	19000	2	146000	2
CRS - OGS	June 2012	4325	7	469	9

Table 2 - quantitative analysis for the Twitter profile of the five institutions taken into consideration: date of subscription, number of tweets published, number of account followed, number of followers and total likes on others' tweets; updated to 16th October 2016.

5/11/2016	n°video	Subscribers	Last time active	Subscription	Total views
USGS	869	10883	1 day	April 2006	4107639
EMSC	16	373	2 months	February 2009	22587
INSIVUMEH	44	109	1 month	April 2013	12117
INGV	92	8446	5 days	February 2010	4086488
CRS - OGS	40	39	5 months	-	-

Table 3 - YouTube quantitative analysis: number of videos, number of subscribers to the channel, last time active, date of subscription and total number of views for the five institutions taken into consideration.

17/10/2016	Videos	Average views	Average likes	Average length
USGS	54	26296	411	01:47
EMSC	21	1547	53	00:19
INSIVUMEH	1	4164	98	03:26
INGV	-	-	-	
CRS - OGS	11	734	13	02:00

Table 4 - average number of views, likes and length of the videos on the USGS Facebook page updated to the 17th October 2016. (see attachments for the complete statistics).

USGS (17/10/2016) -

Facebook

8869	353	15:13	1.00	0.00
9688	208	20:12	1.00	0.00
5734	286	01:03:38	1.00	0.00
12819	171	00:22	0.00	0.00
16962	702	00:17	0.00	0.00
28382	632	00:14	0.00	0.00
5072	166	00:32	0.00	0.00
8359	360	00:49	0.00	0.00
2709	140	00:08	0.00	0.00
52104	829	00:03:35	0.00	0.00
2340	136	00:56	0.00	1.00
3643	141	01:43	1.00	0.00
7506	210	01:24	1.00	0.00
6074	171	00:31	1.00	0.00
5020	202	00:22	1.00	0.00
10308	351	00:15	1.00	0.00
5984	217	00:12	1.00	0.00
5334	202	00:08	0.00	0.00
34610	833	01:10	0.00	0.00
5366	145	01:17	0.00	0.00
41989	828	01:18	0.00	0.00
18380	420	00:31	0.00	0.00
10554	231	00:06	0.00	0.00
21379	738	00:26	0.00	0.00
238002	971	00:41	0.00	0.00
12987	516	00:15	0.00	0.00
27860	818	02:24	0.00	0.00
12574	446	00:15	0.00	0.00
36570	817	00:15	0.00	0.00
9399	244	00:15	0.00	0.00
7620	242	00:38	1.00	0.00
7866	182	02:34	1.00	0.00
13196	364	08:12	0.00	0.00
143242	630	01:29	0.00	0.00

29935	611	00:15	0.00	0.00
7797	179	00:58	0.00	0.00
7400	355	00:32	0.00	0.00
40297	465	00:16	0.00	0.00

average views	average likes	average length	number of men	number of women
24314	408	01:47	11	1

INSIVUMEH

views	likes	length
4164	98	03:26

EMSC (17/10/2016) -

views	likes	length	n° videos: 21
459	17	00:07	
539	17	00:07	
1527	61	00:11	
2027	95	00:07	
1324	41	00:12	
804	23	00:07	
404	22	00:07	
564	28	00:09	
5328	141	00:35	
2462	87	00:18	
687	27	00:10	
2748	64	01:04	
1471	51	00:48	
1251	48	00:07	
821	41	01:22	
3875	102	00:07	
1072	52	00:09	
1024	45	00:07	
1015	47	00:12	

average views	average likes	average length
1547	53	00:19

OGS-CRS - Facebook (17/10/2016)

views	likes	length
551	13	02:53
236	8	01:15
458	10	01:32
3072	37	03:29
322	9	00:44
551	11	02:03
781	29	01:18
534	8	00:31
274	8	01:10
1060	8	04:02
245	6	03:09

average view	average likes	average length
734.9090909	13.36363636	02:00

31/10/2016	Photos and Videos
USGS	3820
EMSC	6699
INSIVUMEH	14100
INGV	30
CRS - OGS	5

Table 5 - number of tweets containing a picture or a video published on Twitter by each institution, updated to the 31st October 2016.

Transcription of the interviews (translated)

Rémy Bossu

Experienced seismologist, general secretary of the EMSC. In 2007, he was awarded the IRIS prize for innovative risk education and risk awareness initiatives.

According to you, what is the state of the art in Europe as far as risk and crisis communication through social media are concerned?

First of all, risk and crisis communication when regarding earthquakes is very specific because it is a phenomenon that happens in a very short time, whereas others phenomena, like floods for example, have a slower evolution which can somehow be predicted.

The real thing that changed with social media in an emergency context is that people expectation is to have information immediately after the event. Bruxelles attack showed us that few minutes after the disaster the information was already spread on the web. People can understand that information evolves and changes during time, what they cannot understand is the lack of information: you lose credibility. That's the reason why we at EMSC have a very specific policy which is to give information immediately, even if not definitive.

In our experience at EMSC we saw that the most efficient communication is the one during the crisis, not the one before. That is because earthquakes are very rare events in the life of a person. Psychological studies prove that during an emergency the brain turns to another status, people usually forget everything they know from before. Therefore, the important thing is to offer people information they need when they need it. That's the reason why with our app we provide geo-targeted information in real-time: we know where people are, we know they may have been involved in an earthquake, we provide them information few minutes after the shake.

At the time of Nepal earthquake, we saw that our app had been extremely successful. But how people from Nepal came to know our app? We made a survey six months later, among our users in Nepal, and it came out that there had not been media coverage, people went to know our app just through viral spread. So, if you provide information people will be able to find you. Moreover, the first question of the survey was: "what do you want us to do after an earthquake?". And the answer was, mainly: "tell us how we should behave". That's the reason why the information we provide

immediately after the shake is what to do and what not to do. You might have given this information thousands of times in the past, but in that moment the majority of people won't remember it. We even have testimonies in which seismologists themselves couldn't behave properly during an earthquake.

Another aspect important to underline is that people are interested in the experience, not in the earthquake itself and neither in seismology. For example, in Zagreb we were able to locate a 0.5 magnitude earthquake, that had only been felt in same part of the city. The magnitude is not important: the experience is. The key to engage with people is to provide information about their experience.

In your experience, which are the risks that seismological institutions have to face when communicating through social media?

Well, I think that after L'Aquila the risks are very clear and seismologists are aware of that. But, apart for that, I again have a very specific opinion. People after an earthquake do expect information in real-time. The main risk, therefore, is not providing information.

The example of Oklahoma earthquake last Saturday is evident: for the USGS it took 25 minutes to locate the earthquake. We located it in two minutes. Usually we watch the internet traffic on our website and app, we look at IP addresses and we locate the earthquake in one or two minutes. We write on the website "possible earthquake felt in Oklahoma, please confirm", and we collect testimonies. People cannot understand why seismologists take so long time, when they have tons of information in real-time on their smart-phones. In that period of time, people already found information somewhere else.

The rapidity of information is not a value in itself. It might not be enough to save lives. But it may prevent some dangerous behavior. And, which is also very important, it has been demonstrated that providing information during a crisis reduces the stress of the experience.

Anyway, about risks in communicating, maybe for us [seismologists, ed.] is easier. We have to be careful not to cross the line between our role and civil protection role, we just have to say something after the earthquake occurs, not to tell people in advance what to do. For example, I don't know if in Indonesia the safer thing to do would be to go under the table, because of the quality of

constructions. We [seismologists, ed.] don't have this problem because we only provide information after the shaking.

So, the main risk in my opinion is that you may lose credibility if you take too long to answer to people expectations. Us, seismologists, we have to listen to public expectations. People are not interested in seismology, the only point is: they feel something, they want to know how to behave until the end of the event. That's it. Amateurs are just not meaningful.

But apart from that I don't see other risks.

Do you think that videos on social media would be a good way to communicate seismological risk? What kind of content could be conveyed?

I appreciate IRIS – EPO videos on Twitter, but the interactions they have on Twitter are very few [1900 followers, ed]. Their videos are mainly produced to provide background information, not in real-time situations. During an emergency, one of the main problems is the bandwidth, and videos are heavy. In fact, we invite people not to use the telephone for calling, but to use text messages instead. After the last quake that hit Italy [24th August, ed], we noticed a drop of connections from Italy probably due to internet malfunctioning – while in the rest of the World it was ok, so it was not a problem of our website.

On the other hand, for sure the written form is not an appropriate way to provide information during an emergency: it is proved that people involved in disasters only read one out of three words. That's the reason why we are switching to visual communication: we have started to use cartoons in our app. This also solves the problem of translation, that in these contexts may be a big deal. But videos are complex objects, and I don't know if a person would take time to watch them during a crisis.

Citizen seismology: do you think videos could be effective in collecting information from citizens in case of earthquake?

Yes, videos could be a good way to collect info from citizens, we saw that during last terroristic attacks. You don't even need to ask them to do that, they do it spontaneously. Right now we have a lot of examples of dangerous situations in which people are taking pictures or videos and posting on the web. The big problem is: how to verify that those videos are both right (made by eyewitnesses and without inconvenient contents) and informative, in real-time? The only way we can check web information is by hand. VOST [Virtual Operations Support Team, ed.] projects are doing exactly that – collecting and checking info by hand, and give them to civil protection, but of course it cannot be

done in real-time. The appropriate question, then, is not if videos could be a good media: videos are there anyway, data are there. The point is: how to collect and analyze huge amount of data in real-time after a disaster.

Anyway, at the moment Twitter is the key for real-time communication, and until now it is still used twitting “mamma mia, terremoto!” and not posting videos. I can’t see it happening in the next years.

All major social platforms are declaring that in the future our news feeds will be filled up with videos. How do you imagine the presence of seismological institutions, in this scenario?

I don’t know. We don’t plan our presence in the remote future. We usually have a trials and errors approach. What I can say is that right now videos are not the core of our communication strategy.

On EMSC Facebook page there are basically animations, while on YouTube there are some videos. Why so few? Why you didn’t continue? How did you choose to distribute the videos on one platform instead that on another?

As far as our videos are concerned I must say we don’t have a policy. Our aim is to engage with eyewitnesses. The problem with communicating earthquakes, is that you don’t know where and when your public (eyewitnesses) will be. So our policy is to be present on all major social media, in order to be immediately recognizable. But for real-time publishing we use Twitter.

I actually think that the main point is not which media should be used. The important point is to act in the first two hours after the earthquake. After two hours, people will receive information from other actors (such as traditional media). We have to be really fast, it’s our added value: to collect a lot of information and to have better and reliable info and awareness. Now the civil protection is starting to use drones. It’s clear that after their drones are flying, you have no way to be more informative than them. As Patrick Meier wrote on his blog iRevolutions, the value of information in the internet society decreases with time. We need to focus on the point where there’s not value, on the information gap, where the information is lacking, when there’s no other way to know something about the earthquake. Under these circumstances, we engage with eyewitnesses since they are the first to know and the ones who care the most.

That’s the main reason why I think that right now we don’t have place for videos: because they are not fast enough.

Carlo Meletti

Geologist and head of the Center for Seismic Hazard of INGV. He is managing the INGV's Facebook account.

According to you, what is the state of the art in Italy as far as risk and crisis communication through social media are concerned?

In Italy risk communication has been accelerated – or actually it started to be done with modern communication techniques – especially after 2009 L'Aquila earthquake, which caught the whole community not prepared from this point of view. It is also true that in 2009 there was only one social network, Facebook. Twitter in Italy was unknown and not spread. Now we have many instruments and is possible to do a more efficient communication.

It may be the case to talk about Civil Protection's communication strategy, rather than research institutes one: we tried to get the Civil Defence Department involved in these activity, but with very few results...

In your experience, which are the risks that seismological institutions have to face when communicating through social media?

In our experience, of course I speak for INGV which is the institute that I know, the first thing to keep in mind is that it is necessary to be present on social media always, not only when an earthquake occurs. In this way, you create an audience, your own public, that knows that you are present and where they can find information.

The second risk is the one of giving different messages on different platforms. For example, writing on Twitter different information that on Facebook. It's important that this kind of information has to be managed in parallel. Then, one can specialize the message: we speak in different ways through Facebook and Twitter, but the information is the same, without contradictions.

The main problem that INGV has, as other research institutes, is that the communication is not made by communication experts but by researchers, which may be passionate about and have some experience, but are not experts. It is something they are learning to do and they do that after research commitments. Maybe a big institution may have its own staff, in other institutions like ours there isn't the financial possibility to pay somebody to do only that.

Do you think that videos on social media would be a good way to communicate seismological risk?

Absolutely yes. Video is a kind of communication that offer many advantages: the use of images and animations, that are for sure more effective that the static image or the text alone. We have been using them also to make researchers speak for themselves, talking about their job and showing directly what is it about. We discovered, through our YouTube channel, that videos made during “peace times” [when there are no earthquakes, ed.], simply to inform, when there’s a seismic emergency are found by who is looking for information, and they watch them again. Some of our videos had a visualizations peak after big seismic events. For example, an educational video that talks in a very didactic way about tsunami had an impressive number of visualizations after Japan 2011 - I think it is still the most viewed video of our YouTube channel.

When Rome was worried about Bendandi prediction on the 11 May 2011² I did a series of videos talking about seismic hazard in Italy, to be presented in the context of an open day at INGV. That video has been then watched a lot again after Emilia earthquake on 2012. Who wanted to know what seismic hazard is, could open YouTube and find out. It is a work that gives results even during emergencies, when you of course don’t have time for making videos.

In your opinion, which may be the major pros and cons in communicating seismic risk through videos on social media?

The main pro is that they are very effective. The video can be “recycled” and spent on Twitter or Facebook, it’s really easy and quick to spread. Another advantage is that of having a material that can be re-used in case of emergency.

In my opinion, a big risk is if these videos are not well done. Personally, if I see a bad video I don’t watch it to the end. The appearance is important; it has to be well done to be enjoyable.

So it should be done by experts?

Yes, for example some INGV videos have the audio taken with the portable camera, most of the times you can’t hear anything. And it would be really simple to avoid that, just a microphone...

What kind of content could be conveyed through videos on social media?

² in 2011 a hoax was spread about Bendandi having predicted a destructive earthquake in Rome on the 11 May of the same year, even though the “La Bendandiana” association denied the piece of news.

Absolutely all kind of content, the only important thing is to have clear idea, nice images or figures. I believe that in particular for seismic risk (or anything related to earthquakes and volcanoes) would be really important to do animations, to visualize the fault that breaks, liquefaction, ground shaking. That would be outstanding, even though it needs other kind of professionalism. Animations are really effective, you can use them also with children, in schools, ...

All major social platforms are declaring that in the future our news feeds will be filled up with videos. How do you imagine the presence of seismological institutes, in this scenario?

I believe that, in general, but not only for videos, for all kind of content, what is important is that the institution is known for what it is, for what it has to offer. It must have a strong image, so that if somebody's looking for information about earthquakes he or she knows to look immediately at INGV website, not to unreliable websites. Since information in the future is going to be almost exclusively on social media it is important to be characterized and easily recognizable as somebody that has something to say, trustworthy. Much of the game is played on the institution's image.

Citizen seismology: do you think videos can be a good way to collect citizens testimonies?

For sure. There have been some experiments in the past, with audiodoc first. I know an historian who 20 years ago interviewed all the survivors of Garfagnana earthquake. She went there and asked those people – who at the time were very old, 70 years after the earthquake – to tell her about the earthquake. Thanks to the testimony of a lady who was a child when the earthquake hit she went to know about a church in the woods that had been destroyed by the earthquake, that no one found before. It surely is crucial, can help to build the historical memory of a place. We know that in two generations the historical memory of the earthquake is lost. The Friuli region has been the first to make a museum about the earthquake, and now many others are being built. Last year one was opened in San Mango del Calore, about the earthquake that struck in the 80s, and there are all the video-testimonies of the survivors.

The INGV has a social media policy and/or strategy, as far as videos are concerned?

No, we don't, and that is one of the difficulties. At the beginning, and after the Emilia earthquake of 2012, there has been a great enthusiasm, leading to the production of many videos. Then, it decreased and now we don't have many new videos, with the exception of the ones for Amatrice. There's the risk that being researchers and not experts in communication, it becomes very difficult to go after these things. Anyway, the idea is that we have some main topics and we try to make

some new videos in the context of those topics with a certain regularity. For example, we have a section in which we publish animations on the seismicity trend in Italy, or another section in which we interview researchers about a peculiar aspect of their work... After the Amatrice earthquake two or three videos have been published, about the shaking and about the fault. Then, we published an animation on the aftershocks, with the dots on the maps that turn on day per day, but in my opinion it is not very good, is clear that it isn't made by experts.

Do you have a positive outcome?

Yes, a lot. The one with the 3D animation of the fault has a number of shares really high, maybe because it is something different from the usual ones.

How do you decide on which channel you release the videos?

All our videos are on YouTube; other social platforms just share the link. Twitter essentially only has the earthquakes locations. Now, for the Amatrice earthquake, we tweet also the links to the blog's posts. On Facebook there's everything. Essentially, it is the box in which we collect all the contents published on the others platforms: blog posts, earthquake locations, videos... it doesn't have any autonomy, any content it publishes as first. We differentiate the content we share on the different platforms. Facebook is the only one in which we interact with the public. On Twitter we don't answer, also because if we look at how many mention we get it is a huge number, it is impossible to follow without a person that works only on that, 24/24 hours. On Facebook, we answer to private messages (if not aggravating) and we always have a positive feedback – they answer us and thank us. We intervene rarely on comments, since we have seen that if somebody writes an annoying comment there's a faithful community that answers on our behalf – it is really fun for us to stay back and watch them argue.

Giancarlo Sturloni

Risk communication teacher and consultant, is at the moment the communications coordinator at Greenpeace Italia.

According to you, what is the state of the art in Italy as far as risk and crisis communication through social media are concerned?

As an observer, the last example of the Amatrice earthquake – many people complained about that – showed very clearly that there's an absence on social media of the institutions that are in charge of managing the risk. It is clear that Civil Defence is taking into account the problem, establishing guide lines, meeting and boards, but actually after the earthquake was not there in a visible way. It is a double problem, since you're not there to control a debate that exists anyway, even without you, and you're not there to give information on vital matters, manage the crisis in a place where nowadays everyone expects to find the information in first place. If I want to know about something happened 15 minutes ago, I open Twitter app. If you're not on Twitter and you're not able to give information in real time, if you're not on Facebook, you're not able to be there to manage the crisis, also from an emotional point of view, giving answers or suggestions. Whether you're there or somebody else will do that in your place.

I know that INGV has a Facebook profile, I haven't see it on Twitter, but what I know is that after the earthquake neither the home page of the Civil Defence web page was working. I went there to find information and it wasn't working: that was quite surreal, that the web site of an institution whose purpose is to face emergencies is not working during a crisis. On social network they were totally absent. If you were searching the word "earthquake" they didn't appear among the results. Even if you do have a channel but it is not visible or it doesn't give useful information, to manage the crisis, you might even be there but it is like you're not. Whether you're reachable and visible or you're not reliable.

The situation in Italy is still very poor, even though we are in a country with a high seismic hazard, and even though the situation is being discussed since 2009 L'Aquila earthquake, yet not much has changed.

Which might be the risks that seismological institutions have to face when communicating through social media?

Actually negligible compared to the risk of not being there. Also not being there is a form of communication, and the worst one. The idea of refraining not to lose control is foolish and it is not a justification. It is a fear that I found in many institutions, not only in Civil Defence and INGV, but it is an idea that persists even about topics that are far from the emergency management problem. To me it happened to find resistance even for the creation of a Twitter account that was supposed to talk about oncological screening ... I mean: what could possibly go wrong?

I can understand the resistance due to lack of culture and the difficulty to have specific figures inside the staff, or even the difficulty to hire external figures... but if your role is to communicate risks and you're not on social media at the time of the emergency it is surreal.

Do you think video on social media would be a good way to communicate seismological risk?

What I do think is that an efficient communication has to comprehend all the instruments available. In a case in which you're forced to communicate to everybody, not to a target group as in advertising, there's not a single mean or language that is able to reach everybody. Therefore, it is essential to use all possible instruments, to reach the wider possible audience. Now we have video on social media and they should be used.

What do you think might be the major pros and cons in communicating seismological risk through video on social platforms?

During an emergency videos are not much useful, something more quick to produce is needed. To reach some kind of audience during peace times it might be a good way. It depends also on which kind of video it is. On social media videos only work if their length is of 30 seconds – one minute, typically they have an emotional tone and they are used for mobilization, as a call to action. In the case of seismology, a call to action might also be just a training day on what to do in case of emergency.

Remains the fact that during peace time it might be useful to prepare an explanatory video on what to do in case of emergency. It is easily spread among population and it is a kind of communication that can be done even in a 30 seconds clip. It may be possible to think about video-pills on what to do in certain situations. Obviously the problem about earthquake is that they're not predictable, therefore it is difficult to prepare and spread videos before it happens. For sure, in case of a seismic sequence they might be used to spread good practice among the population at risk.

All major social platforms are declaring that in the future our news feeds will be filled with videos. How do you imagine the presence of seismological institutions on social platforms in the future?

Doubtless the problem of competence can't be neglected. When I have to make a video at Greenpeace I need at list three competences: a person that shoots, one that writes the storyboard and texts, one for the editing. Sometimes these figures coincide, but it is not meant – and usually it is better if they don't. Then, it would be necessary a person that manage the video on the social networks, and that mean it would be necessary also a person that promotes the video on social media, buying advertising and having a strategy on how it might be spread – the idea that if I produce a cute clip it will get viral is so naïf that it not even worth of being discussed. I know few institutions that have all these figures at a sufficient high level to produce a high quality product.

At the same time, it is also a problem to commission it to somebody external, since you have to do a call for bids, it takes a long time. It may be possible to do think of doing it during peace time but for sure during emergencies you can do it only if you have internal employees.

Therefore: there are not internal experts, nor the opportunity to use external resources in a reasonable time. These are for sure important limits.

If it was possible to find just one person able to do all that, well done, but I know nobody that could. Often institutions have the idea that a communication expert must be able to do that, but it's not like this, there are specific expertise also in this field. Another difficulty is that often institutions don't know what to ask to communication experts: they have not a project vision or the capability to manage the production process. There's the necessity to help them define a communication strategy, because it is not in their background. Of course there are also some virtuous institutions, it is difficult to talk in general. But surely it is not easy to find these things.

Do you think video could be effective in collecting info from citizens in case of emergency?

I don't know if an institution could be able to manage a stuff like this, I don't know any good or bad example in this field yet. Everything might be useful from the communication point of view, the important thing is to have a communication integrated between channels and means to reach different audiences. By the way, it is necessary to have a strategy: managing time, resources and having a vision is not given for granted. We are talking about things that only a big institution can manage, as the Civil Defence that has a structure which involves even city majors, institutions at regional or national level at least.

Marco Boscolo

Science and technology writer, multimedia producer, video shooter and data journalist.

According to you, what is the state of the art in Italy as far as risk and crisis communication through social media are concerned?

It's complicated. I see that an enormous importance is given, also by traditional media, to the activities of the INGV on social media, with the spread of seismological data almost in real time. Not considering the difficulty about being able to read that data, I see a big openness and an easy access to first hand data. From the INGV point of view, I think it is fantastic.

On the other hand, in their case there's not so much curation on the context in which those data are spread. I would expect, as far as risk communication is concerned, that on social media they would try to spread a communication during peace times in which they talk about a risk prevention culture and not about scientific data.

The Civil Defence, instead, has difficulties from the point of view of risk communication on social media. The Civil Defence Journal has a Twitter account but also in this case there's much attention on the crisis moment while more work should be done during peace times, trying to build a more effective narrative also when there's not great attention from the media on the topic. From one side there are big efforts of the institutions to release reliable information, but actually a low presence with contextual materials or voices other by data. There's the lack of a wider strategy on what may be the needs of a society like the Italian one, which lives on a territory at high seismic risk.

My critique is made thinking about the things that should be done, but actually for what I know of the people working there they're doing a good job in trying to make a step forward in comparison to the situation few years ago.

Anyway, speaking about what happened in Amatrice, a lot of false information were spreading around and I had the impression that institutions were not intervening on social media. Correct information is not enough, there's also the need of curate the construction of a narrative for the audience.

Which might be the risks that seismological institutions have to face when communicating through social media?

The risk, simply, is that their limits may be exposed. It's true for every institution that is taking the challenge of a direct communication, without the filter of the press office. There's the risk to receive questions which you're not prepared to answer, not because you don't know the scientific answer but because it may be challenging from a communicative point of view. The typical question that is really easy to answer is "why you can't foresee earthquakes", it is a question you expect. Instead, if you are asked specific question on a peculiar earthquake, there's the worry of losing credibility if you're not able to answer. It undermines the idea of the institution of what being authoritative means. In those cases, the important thing is to build a permanent dialogue, having a faithful community that helps you manage the conversation. There's the fear of losing control of information and of not being able to manage your own reputation.

Do you think video on social media would be an effective way to communicate seismological risk?

I think so: latest studies on communication have shown how especially younger generations prefer all that is communicated visually, but it's important also to see how you make that content. To see a lot of images about the effects of earthquakes in those days³ on one side gives you a principle of reality, but the risk of porn is around the corner, there's the possibility of inducing an unhealthy obsession about catastrophic images. It depends on how you build your content, how you want to take part in the conversation. In my experience, when you talk with somebody working in the communication office they often don't even think about the problem of digital identity. Social or digital channels are often seen just as another way of communicating to people, as newspapers or television. But it has different characteristics: mainly, the fact that's it is a dialogue and not a top-down communication, there's a community. I feel that from a strategic point of view those characteristics are not taken into consideration, the awareness of the different communication tool is missing. People often think that the same video that goes on the evening news can go also on social media but it's not always like this.

There's another point that has to be considered. As far as risk communication is concerned, what is the imagination, also visual, emotional and evocative, that you want to give? People often don't even think about this question. Usually they stop at the level of the accuracy of information, but

³ after Amatrice sequence, 24/08 – October 2016

they don't take into consideration the fact that seismic risk communication activates a series on unconscious levels, deep and emotional.

What do you think might be the major pros and cons in communicating seismological risk through video on social platforms?

Among the pros, as I stated before, I would mention the reality principle and the fact that your public can better understand concepts through images because it developed a better capacity understanding videos than written texts. Potentially, social media, for how they are structured – I think mainly about Facebook and Twitter – they reward the existence of a video inside your communication, they have better index because in their opinion they have a higher communicative value, so they are easier to spread. Therefore, who wants to communicate on social media has to take into account this aspect.

Among the cons there may be the fact that images contain symbols, sometimes unaware, evocative significances on other levels, that you may not be able to control completely, as in written texts. With videos there's the risk of losing control on the result you want to obtain. Is one of those things like dynamite: it's not harmful by itself, but you have to be very careful in using it.

What kind of content could be conveyed?

First of all, it could be done a good communication on what is hazard and what is risk – these concepts are far from the common sense we give to these words. Beyond scientific aspects of earthquakes, the thing that I believe it could be told more is the role of the construction heritage of our country, that is the only aspect on which you can actually do something about. The other thing that is not often used is the seismic history, very old and well documented. To tell stories about big and small earthquakes, positive and negative examples, may make us understand more our own territory. My education is about history of science: to look at the past in order to understand the present and forecast the future is an aspect that is very interesting for me. When you find a situation in which last earthquakes are so similar to the past ones, also from a political, social and media point of view, you ask yourself: when are we going to be fed up with the same old story? In this sense history is important; a bunch of identical stories is a knife that hits always on the same weak point. That may change the social perspective of the problem and could lead on acting on what we can change: building heritage, public and private responsibilities in earthquake management (before and after), an awareness of the role of institutions and of all the actors involved.

All major social platforms are declaring that in the future our news feeds will be filled with videos. How do you imagine the presence of seismological institutions on social platforms in the future?

In my opinion, institutions could be an authoritative voice – using also the instrument of live videos – that could bypass the problem of authority, often found in traditional media. So, the possibility to be there immediately and describe the situation with very simple instruments may be a point of advantage. They could never depose traditional media, they will always have their own role, but could be an influential source of information – also videos – granted by the institution. That may have a positive impact on public debates that often follow earthquakes, helping in clarifying things.

Of course, that would mean that part of the effort on the territory is devoted to communication, that maybe is not a priority in the moment of emergencies... but at least potentially there's this opportunity.

In my experience, what has been lacking in the past years is a series of short videos able to illustrate the correct behaviors and possible precautions that might be taken during the emergency, when social media are almost the only channel that can be used to talk to affected population. It might be an efficient way also during peace times, not only during emergencies. Videos of one or one and a half minute, with subtitles, that can be seen without audio, so that can be seen on the phone, on the bus or metro... it's a model that has been used by everyone because it is very effective. It is very powerful because it's possible to concentrate a lot of information in a very short time and in an incisive way.

Another option is that of using animations, or animated infographics: they allow to visualize number and abstract concepts, so to be usable. There's a lot of space in this field, very few times institutions sat on a table and decided to work on different communication languages. They have always been concerned about information accuracy, and I understand that, but there are languages which can reach different targets and to have other communication objectives, although a compromise on contents is needed. I think especially about data communication: if you expose me data on a boring table full of numbers, it's difficult to find somebody passionate about understanding it. With an animated infographic it's much easier that the message will arrive.

Do you think video could be effective in collecting info from citizens in case of emergency?

In my opinion, yes. The fundamental problem, is that of the validation of information the institution endorses. This is a problem of every form of communication based on citizens or volunteers' contribution: it is crucial to check that the data haven't been manipulated, that the time and space references are correct... many times it happened they were wrong. I think it would be an interesting thing but institutions have necessarily to be very careful, especially because they are so concerned with information accuracy. It is important to have information from citizens on the territory, but at the same time it's important to verify that information and I don't know if during a crisis it is possible to have enough lucidity to do that.

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