

## **CRISES AND SOCIAL MEDIA: A METASTUDY ON PERTINENT RESEARCH AND PRACTICE**

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**Abstract:** *Aiming to structure the academic debate and to demonstrate practical use cases of social media in crisis communication, we present in this metastudy the disciplinary embedment, topical foci, challenges, and research gaps in the literature and application of social media in crisis communication. In particular, our research questions address the characteristics and features of the academic discourse and examine the role of grant givers in steering research foci, as well as the value of research outcomes for crisis communication practice. Therefore, we analyze pertinent academic articles and research projects from the past decade and provide an excursus on the actors and social media communication channels that are used during emergencies and crises. We conclude by highlighting research gaps and practical challenges.*

**Keywords:** *metastudy, social media, crises, crisis communication.*

### **INTRODUCTION**

Social media have begun to play an important role in crisis communication and management in recent years. Accordingly, the academic discourse on the role of social media communication in crisis situations has increased continuously since 2005, as have third-party-funded research projects within the European Union. Meanwhile, the link between social media communication and crisis management has emerged as a key topic and thus has become the subject of numerous

publications, pilot projects, and practical initiatives (Doan, Vo, & Collier, 2011; Johansson, Brynielsson, & Quijano, 2012; Nilsson et al., 2012; Rainer, Grubmüller, Pejic, Götsch, & Leitner, 2013).

The link between social media and crises is not surprising, given the prominence that interactive Web 2.0 services have attained within the past decade. As Grubmüller, Götsch, and Krieger (2013) emphasize, microblogging services, such as Twitter, and social networks, such as Facebook, have taken on an immense role in peoples' daily lives—not only in the developed world. Easy and mobile accessibility has paved the way for the unprecedented success of social media, allowing “many-to-many” communication, and changing our notion of concepts such as sharing, open access, and privacy. As Omand, Bartlett, and Miller (2012, p. 9) pointed out, “We are transferring more and more of our lives onto vast digital social commons.” This is also true for the expression of political opinions, mobilization, and community self-organization:

Web2.0 [*sic*] technologies offer a wide range of possibilities for engagement, participation, communication and collaboration as they allow each and every individual with internet access to publish, share or edit comments, postings, videos, photos etc. This implies new possibilities of interaction, diverse news and opinions, engagement in the form of “one-to-one, one-to-many and many-to-many communications.” (Grubmüller et al., 2013, p. 2)

In terms of crisis communication, social media currently are seen as one type among different information channels ideally combined with conventional mass media (in particular broadcast media) and text messages (Backfried et al., 2013a). Bruns (2014, p. 2) points to the importance of Facebook and Twitter in the “dissemination of information and the coordination of community responses.” In line with other authors, he emphasizes the role of locals in providing first-hand information via social media in the immediate aftermath of a sudden disaster. In addition, he considers locals as human sensors who provide regular updates from the crisis scenes. Often, these eyewitnesses provide more insights than do emergency and media organizations with limited staff and resources (Bruns, 2014). Thus, particular consideration must be given to communities organizing themselves via social media. This has commanded the attention of current pertinent research: The role of individual citizens, as well as local community officials (e.g., civil servants, mayors), as key actors before, during, and after crises and emergencies is now at the center of academic debate (Johansson et al., 2012; Vihalemm, Kiisel, & Harro-Loit, 2012). Furthermore, an important element of practical crisis handling is to build partially upon these outcomes (Rainer et al., 2013).

Resulting from these findings, we seek responses to the following research questions:

- What shape has the academic debate on social media and crisis communication taken within the past decade?
- To what extent do public grant givers consider or value the linkages between social media and crisis communication?
- How do practical-use cases of social media in crisis communication and crisis management evolve as a result of the comparison of academic research to funded research projects?

In order to answer these research questions, we present and summarize two substudies. The result is an overview of the state of academic research in the field of media communication and of the state of funded research projects. The research design is that of a metastudy of relevant

academic articles published in journals, conference proceedings, and periodicals, and of projects funded by the European Commission.

A large and quickly growing number of papers in the academic literature present investigations into the usage of social media channels during crises and citizens' contributions to crisis management in the form of user-generated online messages. In this paper, however, we focus on the metalevel: the research area of social media and crisis communication and the implications of citizens' content contribution in support of the work of crisis practitioners in the field. Therefore, the aim and purpose of this metastudy is to provide a structured overview of the state of academic and funded research, which already has reached a high level of complexity. The structuring of the topic provides an orientation within this fast-growing field of research and the identification of existing research gaps, thus contributing to future steps in enabling local citizens' and communities' resilience in crises.

The first substudy covers academic research publications from the field of media communication in crises; the second comprises research projects that are funded by third parties, notably by the European Commission. In addition, examples drawn from practices in the field offer lessons learned and recommendations from the perspective of all actors involved. In the final section, we summarize the findings of these three approaches and conclude with key recommendations for the future of research on and application of social media in crises.

## **CRISIS AND SOCIAL MEDIA: ACADEMIC RESEARCH IN THE FIELD OF COMMUNICATION AND MEDIA STUDIES (SUBSTUDY 1)**

Although research on crisis communication and social media doubtlessly needs interdisciplinary considerations—such as from information and communication technology (ICT), sociology, economics, and psychology—a number of studies in this area have their academic roots in communication and media studies. Therefore, the following section gives an overview of academic research on crises in the realm of social media published in journals, international conferences proceedings, and professional periodicals within the fields of communication and media studies.

Questions regarding the nature, disciplinary and theoretical background, specific foci, and so forth of the respective publications are addressed, as well as the discourse as a whole. In this section, we aim to clarify, structure, and offer insights on and orientation toward the academic discourse regarding the interplay of crises and social media in terms of topic trends, perspectives used, theoretical and empirical approaches, types of crisis, and analyzed case examples in addition to evaluations of social media in the area of crisis communications.

### **Methods**

In order to gain holistic insights into published research on crises and social media in the fields of communication and media studies, we conducted an exploratory descriptive metastudy of academic texts covering the period from January 2005 to August 2013. We chose to start with the date that the platform YouTube was launched which, in retrospect, gave rise to the popularity of social media and set the path for further services to be developed (e.g., Twitter and Facebook, which followed in 2006 and nowadays count as the

most studied social media platforms). We identified relevant publications using the established and frequently used Communication and Mass Media Complete (CMMC) database, which provides abstracts and full-text versions of publications from a large number of academic journals, international conference proceedings, and subject-relevant periodicals. However, the database primarily focuses on peer-reviewed academic journal articles. Texts published in academic journals are considered suitable sources for monitoring changes in and trends of any topic relevant in mass communication and media studies because most recent studies are published in journals rather than in monographs or anthologies. Furthermore, most journal papers undergo strict evaluations (i.e., peer review) prior to publication, which assures high quality. In this regard, Kamhawi and Weaver (2003, p. 7) stated that most scholars in mass communication turn to journal articles as “the main channel for current research, after convention and conference papers” and that journal articles can be considered a “barometer of research trends and reflect the evolution of communication research.”

In order to gain a holistic picture of academic research regarding crises and social media, we used a number of search terms and search term combinations.<sup>1</sup> Data selection, coding, and data analysis were conducted using the software SPSS,<sup>2</sup> based on a coding manual with 56 nominal- and ordinal-scaled variables. Variables were defined either with coding categories, meaning that concrete categories were assigned to the respective variables in advance, or as string variables. The latter were used when coding categories could not be determined in advance and when we needed to code the data openly first before clustering them into categories. For example, the variables Name of the Journal/Conference Proceeding/Periodical, Topic of the Text, Analyzed Case Examples, and Theoretical Framing were defined first as string variables to allow the identification of relevant text passages covering those items before clustering them into numerically coded categories by detecting common patterns and aspects among the relevant text passages.

In total, 66 papers covering crises in connection with social media and published between January 2005 and August 2013 were considered to be relevant research material for the present meta-analysis. During our selection of articles for analysis, we focused on citizen-generated content, public response, and/or interactivity as important characteristics. Accordingly, texts eliminated from consideration covered issues such as public relations (PR) campaigns using social media for one-way communication purposes, social media crimes (e.g., cyber-mobbing), and maintaining business reputation, as well as texts focusing only on citizen journalism. For pragmatic reasons, only papers written in English were selected. Other than the aforementioned exclusions, no other focus was taken on a particular type of crisis with regard to research material selection, as for example natural disasters or technology malfunctions. Instead, any situation or event defined as a crisis within the academic texts was considered relevant for this metastudy, provided those events or situations were named as crises and related to social media. This broad approach provided a holistic picture of crisis communication in the area of social media.

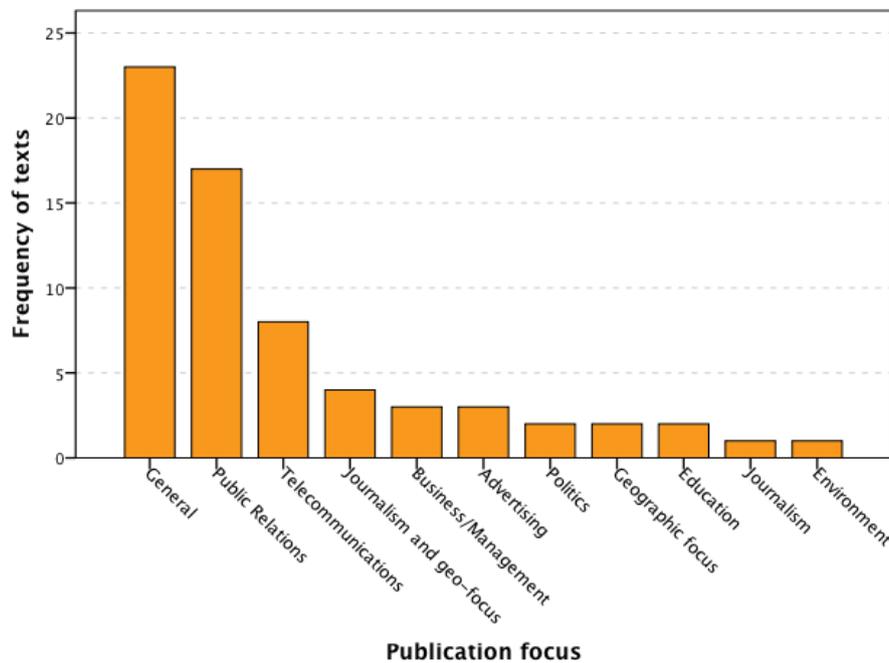
## **Overview of the Research Material**

Although one-way PR campaigns were excluded from the research material in advance, 17 (25.8%) of the 66 relevant journal and periodical texts contained an explicit PR focus, which indicates that crisis communication via social media generally has a strong connection to PR in communication and media studies, as well as to interactive PR purposes involving citizens and a

large social media audience, respectively. The largest number of academic texts (23 texts; 34.8%), however, were published in journals, conference proceedings, or subject-relevant periodicals with no special focus but covering issues of information, communication, and media in general. Figure 1 gives an overview of the disciplinary focus of the publication platforms (journals, conference proceedings, and periodicals) in which the research materials were published.

Only 8 (12.1%) of all analyzed papers published in the journals, conference proceedings, and periodicals had a tool-oriented approach, meaning that they focused on concrete social media tools for crisis communication, whereas 57 texts were related more to the social sciences and the economy, and 1 paper was coded as “both at the same level.” This is not surprising in that the fields of communications and media studies are associated more often with the social sciences and thus use those respective research approaches and methods. Because a mass-communications-focused database was the source of the collected research material, it becomes self-explanatory that the majority of analyzed texts focused on communication and media (55 texts; 83.3%), whereas sociological (2 texts; or 3.0%), economic (2 texts; 3.0%), computer-scientific (4 texts; 6.1%), and explicitly interdisciplinary (3 texts; 4.5%) foci are the clear minority, even though crisis communication is unquestionably an interdisciplinary field of interest.

The analysis also demonstrated that the number of texts dealing with the linkage between crises and social media (focusing, in particular, on the microblogging service Twitter) has been increasing since 2005. This finding was expected because the first prominent social media

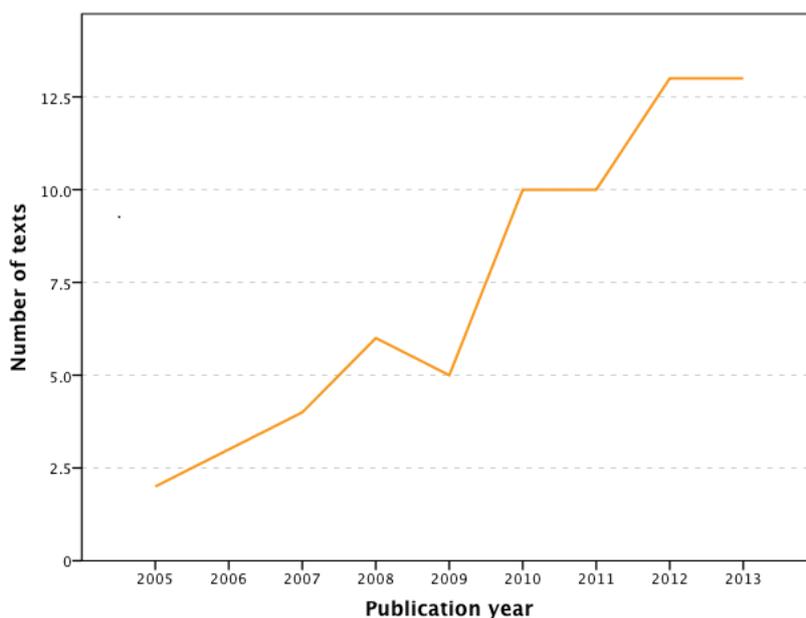


**Figure 1.** Frequency of texts by disciplinary focus of the journals, conference proceedings, and periodicals collected from the Communication and Mass Media Complete database between January 2005 and August 2013 ( $N = 66$  texts).

platforms emerged only in the 2000s (Boyd & Ellison, 2008) and needed time to become part of the academic mass communication discourse. Figure 2 shows the increasing number of publications focusing on crises connected with social media from 2005 until August 2013. Although the number of papers published per year shrank slightly in 2009, this general upward trend appears to be ongoing because as many texts were published by August 2013 as in the whole of 2012.

We collected research material via the CMMC database, which provides access to primarily academic journals. It includes, as well, other periodicals and some conference papers. Consequently, our collection includes a large number of topic-relevant texts that were published in academic journals (51; 77.3%), whereas only 10 (15.2%) were published in conference proceedings and 5 (7.6%) in subject-relevant periodicals. When categorized by text genre, most texts (59; 89.4%) were research articles (49, 74.2%, were published in journals and 10, 15.2%, were published in conference proceedings); 4 of the periodical texts (6.1%) were news articles, 2 (3.0%) were editorials, and 1 (1.5%) was classified as essays.

Table 1 shows the publication platforms within the area of crises and social media, listed in alphabetical order. Publications listed in the Social Science Citation Index (SSCI), which indicates established high-impact academic journals in the social sciences, are noted. Of the 66 articles, 15 (22.7%) were published in nine SSCI-ranked journals, thus appearing to have an impact in the field of mass communication. Notably, 15 (22.7%) papers were published in the *Public Relations Review*, which indicates that crisis communication in association with social media is often PR-related within the mass communication discipline. Another noteworthy platform is the proceedings of the annual conference of the International Communication Association, which published 9 (13.6 %) of the analyzed articles.



**Figure 2.** Academic texts linking crises management with social media identified in the Communication and Mass Media Complete database published per year, January 2005–August 2013 ( $N = 66$  texts).

**Table 1.** Number of Articles by Publication Platform (i.e., Journals, Conference Proceedings, Periodicals), with SSCI Ranked Journal Noted ( $N = 66$  texts).

<b>Name of publication</b>	<b><i>n</i></b>	<b>%</b>
Advertising Age	3	4.5
American Journalism	1	1.5
Bulletin of Science, Technology & Society	1	1.5
Business Communication Quarterly	1	1.5
Communications News	1	1.5
Communication World	1	1.5
Conference Papers – International Communication Association	9	13.6
Conference Papers – National Communication Association	1	1.5
Ecquid Novi: African Journalism Studies (SSCI-ranked)	2	3.0
Environmental Communication	1	1.5
Global Media Journal: Canadian Edition	1	1.5
Information, Communication & Society (SSCI-ranked)	2	3.0
Information Society	1	1.5
Intermedia	1	1.5
International Journal of Communication (SSCI-ranked)	1	1.5
International Journal of Mobile Communications (SSCI-ranked)	1	1.5
International Journal of Press/Politics (SSCI-ranked)	2	3.0
Journal of Applied Communication Research	1	1.5
Journal of Business Communication	1	1.5
Journal of Communication (SSCI-ranked)	2	3.0
Journal of Computer-Mediated Communication (SSCI-ranked)	3	4.5
Journal of Current Issues in Media & Telecommunications	1	1.5
Journal of Public Relations Research	2	3.0
Management Communication Quarterly	1	1.5
Mass Communication & Society	1	1.5
Media International Australia	2	3.0
Nieman Reports	1	1.5
Nordicom Review	1	1.5
Pacific Journalism Review	1	1.5
Public Relations Review	15	22.7
Social Education	2	3.0
Telecommunications Policy (SSCI-ranked)	1	1.5
Television & New Media (SSCI-ranked)	1	1.5
<b>Total</b>	<b>66</b>	<b>100.0</b>

*Note.* Because of decimal rounding, the percentage total may not equal 100.

## Content Analysis of Academic Texts in the Area of Crises and Social Media

After an initial analysis of the research material, the above-mentioned open-coding process revealed several topics covered in the respective academic texts. The identified topics were then clustered into categories; concretely, all of the texts fit into five overarching themes. They are provided in Table 2 with the associated number of texts assigned to each topic.

The largest proportion of texts (39.4%) dealt with the use and emergence of social media during crises and respective message strategies, followed by the functions, potentials, limitations, and risks of social media in crisis situations (24.2%). Intersections and comparisons between traditional media sources and social media were addressed as well. Evaluation studies and the elaboration of models and concepts related to social media and crisis communication occurred less frequently.

Within the present metastudy, the analyzed texts were also classified to micro-, meso-, and macrolevels as differing levels of societal reflection. Concretely, the macrolevel presents a general societal focus, whereas texts on the mesolevel focus on certain communities or organizations and microlevel texts address an individual perspective. Of the 66 texts, 32 (48.5%) reflected the macrolevel, and 29 (43.9%) had a mesolevel focus; texts reflecting the microlevel are clearly the minority (5 texts; 7.6%). Table 3, *inter alia*, highlights that the macrolevel is predominant in papers with a user-, citizen-, or recipient-centered perspective, suggesting that this perspective is often dealt with in the realm of crisis communication in society as a whole. The few articles focusing the microlevel, and individual perspective respectively, take the user-, citizen-, or recipient-perspective as well, in this study without exception. In contrast, mesolevel texts are viewed particularly from a stakeholder or communicator (e.g., the public sector or authorities) perspective and rather not from a user-, citizen-, or recipient-centered perspective, which, when considering that mesolevel papers focus on entities such as organizations, communities, and other groups of people, suggests that community resilience and the empowerment of citizen responders are not emphasized in media communication research on crises and social media. In general, however, the frequency of papers addressing a communicator and stakeholder perspective and of texts with user-centered approaches is almost balanced.

In addition to the general (societal) text level and perspective taken, we categorized the text content by its geographical focus level (global/international, national, regional/local, or at multiple levels). Table 4 demonstrates that the distribution of the research material among those three levels is almost balanced, with only a slight prevalence of texts dealing with social media

**Table 2.** Topics Within Social-Media-Related Crisis Communication Research in Data ( $N = 66$  texts).

<b>Text Topic</b>	<b><i>n</i></b>	<b>%</b>
Use and emergence of social media during crises (e.g., message strategies)	26	39.4
Evaluating/shaping “good” crisis communication/management/responses	8	12.1
Functions/potentials/risks/limitations	16	24.2
Elaborating (new) models/theories/concepts	5	7.6
Traditional vs. social media/relationships/intersections/strategies/crisis coverage	11	16.7
	<b>Total</b>	<b>66</b>
		<b>100.0</b>

**Table 3.** The Perspective and Focus Level Within Social-Media-Related Crisis Communication Research Data ( $N = 66$  texts).

Perspective of Texts	Focus Level in the Text Texts, $n$ , (%)						
	Microlevel (Individual)	Mesolevel (organization/ Community)	Macrolevel (society)	Total			
Communicator/stakeholder	0 (0.0%)	19 (65.5%)	4 (12.5%)	23	(34.8%)		
User/public/recipient/responder	5 (100.0%)	5 (17.2%)	15 (46.9%)	25	(37.9%)		
Content	0 (0.0%)	3 (10.3%)	5 (15.6%)	8	(12.1%)		
Multiple perspectives	0 (0.0%)	2 (6.9%)	8 (25.0%)	10	(15.2%)		
<b>Total</b>	<b>5 (100.0%)</b>	<b>29 (100.0%)</b>	<b>32 (100.0%)</b>	<b>66</b>	<b>(100.0%)</b>		

*Note.* Multiple perspectives were coded if more than one of the perspectives above occurred within one text. Also, because of decimal rounding, the percentage totals may not equal 100.

**Table 4.** Geographical Level of Texts ( $N = 66$  texts).

Geographical level of texts	$n$	%
Global/international	14	21.2
National	18	27.3
Regional/local	14	21.2
Multiple levels	5	7.6
Subtotal	51	77.3
Level not identifiable	15	22.7
<b>Total</b>	<b>66</b>	<b>100.0</b>

and crises on the national level. A few papers incorporated more than one geographical level, for example, combining global social media communication perspectives and incidences affecting a certain region. However, the geographical text level was not identifiable in 15 (22.7%) of the texts.

Crises and crisis communication generally run through and address various phases. As reflected in Table 5, the specific phases of a crisis can be grouped into crisis prevention measures, crisis response measures, and postcrisis management.

**Table 5.** Crisis Phase Covered in Texts ( $N=66$  texts).

Crisis Phase Covered	$n$	%
Crisis prevention	2	3.0
Crisis response	39	59.1
Postcrisis management	4	6.1
Multiple phases covered	21	31.8
<b>Total</b>	<b>66</b>	<b>100.0</b>

Most texts (59.1%) dealt with the crisis response during the respective situations in association with social media, and 21 texts (31.8%) covered more than one of the three phases, mostly crisis response in combination with postcrisis management. Crisis prevention and postcrisis situations rarely were addressed alone. Table 6 shows that the crises discussed within these papers were varied, although the most common dealt with natural disasters.

Among analyzed papers linking social media and crises, natural disasters (e.g., earthquakes, tsunamis) and social protests and violence prevailed as frequently cited case examples. Table 7 provides an overview of the cases covered within the research material.

Academic papers typically are based on theories and respective perspectives. Therefore, theoretical frames were first coded openly and clustered into categories afterwards. Again, in no text were more than three theoretical frames identified. Table 8 indicates that behavioral perspectives clearly predominated in the papers linking social media and crises. In this regard, models and theories—such as planned participatory behavior, reasoned action, human interaction, Coombs' situational crisis communication theory, risk communication approaches, and the social-mediated crisis communication model—were used (see, e.g., Chakravartty & Downing, 2010; Cooley & Jones, 2013; Freberg & Palenchar, 2012; Liu, Jin, & Austin, 2013; Stephens, Malone, & Bailey, 2005). Systemic approaches, such as those applying networked crisis communication theory and socioeconomic knowledge and participation gaps, appeared less often than did constructivist perspectives, such as those focusing on framing theory and the construction of meaning (see, e.g., Bressers & Hume, 2012; Hamdy & Gomaa, 2012; Martin, 2013; Utz, Schultz, & Glocka, 2013). The functionality of social media services, for example, in context with crowd sourcing, emergency management tools, and the question of channel complementarity, rarely was broached in the research material (see, e.g., Jung & Munehito, 2012). Likewise as rare were articles with a general approach to social media use and crisis communication, for example, the aspect of crisis as a basic driver for communication.

Similar to theoretical approaches, the academic papers often presented results from empirical research. Table 9 demonstrates that quantitative approaches prevailed in case papers presenting empirical research. Quantitative content analysis was the most frequently used

**Table 6.** Discussed Topics of Crisis in Texts ( $N=66$  texts).

<b>Topics of crisis</b>	<b><i>n</i></b>	<b>%</b>
Natural disaster	16	24.2
Social movements/protests	9	13.6
Health crisis	6	9.1
Terrorism/criminal act	6	9.1
Technology malfunctions	4	6.1
Human error	2	3.0
Multiple types	4	6.1
Other	3	4.5
Subtotal	50	75.7
No case specified	16	24.3
<b>Total</b>	<b>66</b>	<b>100.0</b>

**Table 7.** Case Examples of Crises Addressed in the Study (*N* = 66 texts).

<b>Crisis cases</b>	<b><i>n</i></b>	<b>%</b>
<b>Natural disasters</b>		
Floods (Pakistan 2010)	2	3.0
Hurricane (Katrina 2005, Irene 2011, Sandy 2012, all in the US)	6	9.1
Earthquake/tsunami (Pakistan/Kashmir, 2005; Haiti, 2010; East Japan, 2011)	7	10.6
Bushfires (Black Saturday bushfires in Victoria, Australia, 2009)	1	1.5
<b>Health Crises</b>		
H1N1/flu pandemic, various, 2009	4	6.1
Food safety and chemical threats (general)	2	3.0
<b>Terrorism/criminal acts</b>		
Terrorist attacks (9/11, USA, 2001; London, UK, 2005)	4	6.1
Shootings (Tucson, AZ, USA, 2011; Virginia Tech University, USA, 2007)	2	3.0
<b>Technology Malfunctions</b>		
Nuclear disaster (Fukushima, Japan, 2011)	4	6.1
<b>Human error</b>		
Human stampede (German Love Parade, Duisburg, 2010)	2	3.0
<b>Social movements/protests</b>		
Social protests and violence (Arab Spring in Egypt, 2011; ongoing Israeli-Palestinian conflict in Gaza; postelection crises in Ethiopia, 2005, and Kenya, 2008; G20 London Summit, UK, 2009; antigovernment protests in Xinjiang, China, 2009; election protests in Tehran, Iran, 2009–2010)	9	13.6
<b>Multiple types</b>	4	6.1
<b>Other</b>	3	4.5
<b>Subtotal</b>	<b>50</b>	<b>75.7</b>
<b>No case specified</b>	16	24.3
<b>Total</b>	<b>66</b>	<b>100.0</b>

**Table 8.** Theoretical Frames and Perspectives (*N* = 66 texts).

<b>Theoretical frame</b>	<b><i>n</i></b>	<b>%</b>
Use of social media (general)	2	3.0
Crisis communication (general focus)	2	3.0
Behavioral perspectives	19	28.8
Constructivist perspectives	7	10.6
Systemic perspectives	10	15.1
Functionality of social media services	3	4.6
Multiple frames identified	2	3.0
No frame identifiable	21	31.8
<b>Total</b>	<b>66</b>	<b>100.0</b>

*Note.* Because of decimal rounding, the percentage total may not equal 100.

**Table 9.** Methodological Approaches Identified in Selected Research by Applied Method ( $N = 66$  texts).

Applied Method	Methodological Approach									
	Quantitative		Qualitative		Both		None		Total of $N$	
	$n$	%	$n$	%	$n$	%	$n$	%	$n$	%
Meta-analysis	1	3.7	1	12.5	0	0.0	0	0.0	2	3.1
Interview/questionnaire	1	3.7	1	12.5	0	0.0	0	0.0	2	3.1
Content/discourse/text analysis	18	66.7	6	75.0	0	0.0	0	0.0	24	36.9
Multiple methods/triangulation	1	3.7	0	0.0	3	100.0	0	0.0	4	6.2
Experiment	6	22.2	0	0.0	0	0.0	0	0.0	6	9.2
No empirical method	0	0.0	0	0.0	0	0.0	27	100.0	27	41.5
<b>Total of <math>n</math></b>	<b>27</b>	<b>100.0</b>	<b>8</b>	<b>100.0</b>	<b>3</b>	<b>100.0</b>	<b>27</b>	<b>100.0</b>	<b>65**</b>	<b>100.0</b>
<b>Total of <math>N</math></b>		<b>41.5</b>		<b>12.3</b>		<b>4.6</b>		<b>41.5</b>		<b>100.0</b>

*Note.* Applied method could not be identified within one text. Also, because of decimal rounding, the percentage totals may not equal 100.

approach. However, a large number of the papers presented literature only and did not contain any empirical analysis. While quantitative approaches and literature studies without empirical research generally predominated among the analyzed papers and quantitative methods often occurred within all text topics, qualitative methods were used less often. The topics of functions, potentials, risks, and limitations of social media in context with crisis communication appear most often as literature studies only. Table 10 summarizes the frequency of methodological approaches used by topic.

**Table 10.** Specific Methodological Approach Used in Selected Research by Topic ( $N = 66$  texts).

Text Topic	Methodological Approach									
	Quantitative		Qualitative		Both		None/Literature Only		Total of $N$	
	$n$	%	$n$	%	$n$	%	$n$	%	$n$	%
Use and emergence of social media during crises (e.g., message strategies)	12	44.4	5	55.5	1	33.3	8	29.6	26	39.4
Traditional versus social media/relationships/intersections/strategies/crisis coverage	6	22.2	1	11.1	1	33.3	3	11.1	11	16.7
Evaluating/shaping “good” crisis communication/management/responses	4	14.8	1	11.1	0	0.0	3	11.1	8	12.1
Functions/potentials/risks/limitations	2	7.4	2	22.2	1	33.3	11	40.7	16	24.2
Elaborating (new) models/theories/concepts	3	11.1	0	0.0	0	0.0	2	7.4	5	7.6
<b>Total of <math>n</math></b>	<b>27</b>	<b>100.0</b>	<b>9</b>	<b>100.0</b>	<b>3</b>	<b>100.0</b>	<b>27</b>	<b>100.0</b>	<b>66</b>	<b>100.0</b>
<b>Total of <math>N</math></b>		<b>40.9</b>		<b>13.6</b>		<b>4.5</b>		<b>40.9</b>		<b>100.0</b>

*Note.* Because of decimal rounding, the percentage total may not equal 100.

In the course of the present metastudy, the results of the analyzed academic papers were coded openly. However, due to their abundance, they could not be clustered into numerical categories in a meaningful way. Yet, we could identify the tendency of the evaluation of social media with regard to crises and crisis communication for each analyzed paper. Table 11 demonstrates that most publications evaluated social media positively or somewhat positively in terms of crises and crisis communication. An ambivalent attitude towards social media, highlighting positive as well as negative aspects, appeared in 15 texts. In 13 texts, no explicit evaluation of social media in context with crises was given on a descriptive analytical level.

Linked to Table 11, Figure 3 addresses the development of the frequency of social media evaluation with regard to crises from the beginning of 2005 until August 2013. It demonstrates that negative or generally negative attitudes towards social media were rarely seen, whereas an upward trend of ambivalent evaluations is evident from 2008 until 2012. On the other hand, a positive or generally positive evaluation reached its peak in 2010 and decreased afterwards. Therefore, a more differentiated attitude toward media in the area of crises and crisis communication in the coming years can be expected.

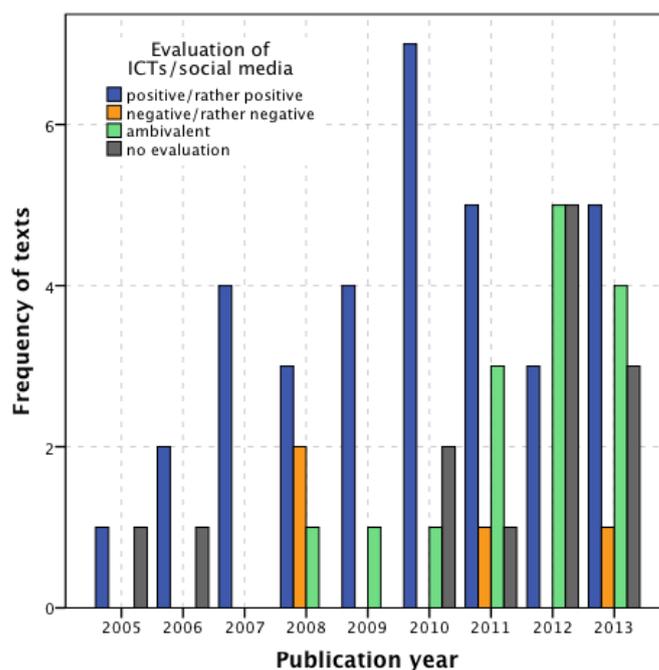
### Authors of Academic Texts in the Area of Crises and Social Media

Being an internationally established and vitally discussed issue of wide societal interest, crises and crisis communication topics are expected to be elaborated by scholars worldwide. More than half the authors of the analyzed texts, however, are based in the United States of America (65.0%), and a further 23.9% are located in Europe. Table 12 summarizes the location of authors and also indicates that few authors were based in Africa, Asia, Oceania, and the Americas (especially Canada). Europe-based authors were located in the Netherlands (9), Germany (7), the United Kingdom (5), Sweden (4), and Finland (3). Authors on the African continent were located in Egypt (2), Kenya (1), and South Africa (1). The three Asia-based authors were located in Japan. As for the Americas beyond the USA, only Canada was represented in this study. Another point of interest is that cross-continental collaboration among authors did not take place within the analyzed papers.

A large number of scholars who published papers on crises in the area of social media, not surprisingly, are affiliated with universities. Few authors were identified as associated with research organizations, nongovernmental organizations (NGOs), enterprises, or political organizations, as Table 13 shows.

**Table 11.** Evaluation of Social Media as a Crisis Communication Tool in Selected Research ( $N = 66$  texts).

<b>Evaluation of Social Media</b>	<b><i>n</i></b>	<b>%</b>
Positive/somewhat positive	34	51.5
Negative/somewhat negative	4	6.1
Ambivalent	15	22.7
No evaluation	13	19.7
<b>Total</b>	<b>66</b>	<b>100.0</b>



**Figure 3.** Frequency of social media evaluation by publication year ( $N = 66$  texts published from January 2005 until August 2013).

**Table 12.** Geographic Locations of Authors in Analyzed Papers ( $N = 118$  authors of 66 texts).

Location of Authors	Authors		Texts	
	<i>n</i>	%	<i>n</i>	%
USA	76	65.0	41	62.1
Europe	28	23.9	15	22.7
Asia (spec. Japan)	3	2.6	2	3.0
Africa	4	3.4	3	4.5
Oceania (spec. Australia & New Zealand)	5	4.3	4	6.0
the Americas (spec. Canada)	1	0.9	1	1.5
<b>Total</b>	<b>117</b>	<b>100.0</b>	<b>66</b>	<b>100.0</b>

*Note.* For multi-authored works, at most the first three authors were coded. Fifteen texts had three or more authors, and location was not identifiable in one text/for one author. Because of decimal rounding, the percentage total may not equal 100.

As mentioned above, the communication- and media-focused database CMMC was used for identifying the academic papers relevant to the present metastudy, and the author information was drawn from the affiliation that accompanied the authors' name on the papers. Due to the communication and media focus of the used database and included journals, it is not surprising that more than half of all coded authors worked in communication and media departments at the time of text publication followed by scholars in the field of computer science, as Table 14 shows.

**Table 13.** Authors' Affiliation in Selected Research ( $N = 118$  authors of 66 texts).

<b>Authors' Affiliation</b>	<b><i>n</i></b>	<b>%</b>
University	99	83.9
Research organization	6	5.1
NGO	1	0.8
Enterprise	4	3.4
Political organization	3	2.5
<b>Subtotal</b>	113	95.7
Not identifiable	5	4.2
<b>Total</b>	118	100.0

*Note.* For multiauthored works, at most the first three authors and their affiliation were coded. Fifteen texts had three or more authors listed, and the affiliation of five authors was not identifiable. Also, because of decimal rounding, the percentage total may not equal 100.

**Table 14.** Authors' Disciplinary Expertise of Research Selected for Study ( $N = 118$  authors in 66 texts).

<b>Authors' Subjects</b>	<b><i>n</i></b>	<b>%</b>
Communication and media	53	44.9
Political science	2	1.7
Psychology	1	0.8
Sociology	5	4.2
Informatics/ICT/programming/computer science	8	6.8
Economics	3	2.5
Education	2	1.7
Medicine	3	2.5
Other	2	1.7
Discipline not identifiable	39	33.1
<b>Total</b>	118	100.0

*Note.* For multiauthored works, at most the first three authors and the respective subject area were coded; 15 texts had three or more authors listed). Also, because of decimal rounding, the percentage total may not equal 100.

### **Academic Discourse on Crisis Communication Associated with Social Media**

The present metastudy demonstrates that academic research in media studies on crisis communication in the area of social media are generally manifold, covering diverse topics and perspectives and addressing several theoretical frameworks and various methods and methodological approaches. However, it also makes obvious that some research gaps do exist. First, in contrast to the use of quantitative methods, few papers linking crisis communication and

social media employed qualitative approaches or investigated the ways individual persons (microlevel) deal with crises via social media. In addition, communities were viewed most often from a stakeholder and communicator (e.g., the public sector and/or authorities) perspective, rather than from a citizen- or user-centered perspective. Such a perception suggests that community resilience and the empowerment of citizen responders are not being emphasized in communication and media studies research on crises and social media. Moreover, the limits and potentials of social media in crisis situations are not issues that are addressed empirically. These research gaps might be interesting areas to be explored in the future.

Furthermore, the academic discourse on crises in connection with social media seems to take place most often in the United States, followed by Europe. Countries in Africa, Asia, Oceania, and Latin America are hardly represented, if at all, in the international academic discourse on this issue. Moreover, cross-continental collaboration among authors never occurred within the research material. Therefore, the involvement and collaboration of authors based in all regions of the globe are important future goals so that research can provide appropriately diverse perspectives on crises in association with social media.

## **CRISES AND SOCIAL MEDIA IN THIRD-PARTY-FUNDED RESEARCH PROJECTS (SUBSTUDY 2)**

Although pertinent journal articles constitute a rich source of insights into general academic research regarding the debate on the linkages between crises and social media, this field also is active in the form of numerous research projects. The substudy at hand is meant to bring third-party-funded projects into focus. In doing so, attention is given indirectly to public funding agencies that play a powerful role in shaping the research landscape for several reasons. First, all over Europe, universities and other research institutions, as well as private research companies (notably small and medium enterprises), are increasingly dependent on external research funding. Moreover, research funding agencies (and their mostly external experts) play a double role in designating the direction of current research by demanding a certain research focus in their calls for project proposals, on the one hand, and by financing those projects that best represent this focus, on the other. In this regard, for the metastudy in this article, we investigate whether the linkages between social media and crises, which are debated intensely in academic research, appear on the research agendas of public grant givers, and, if so, which aspects.

### **Methods**

In order to answer the questions posed immediately above, we chose to conduct a qualitative content analysis, combined with a frequency analysis. The sampling strategy was determined by a pragmatic approach. Although we identified several suitable national funding schemes in various member states, we faced numerous challenges that made it impossible to involve many of these schemes in this study in a systematic manner. Two such challenges were the language barrier and the widely differing accessibility to information about the funded projects throughout the European member states, which is due, in large part, to differing set ups and procedures in the national funding agencies. Thus, we set aside national funding schemes and

focused instead on the European Commission's Framework Programme for Research and Technological Development.

Among the European Commission's key focuses, security and ICT topics have been very prominent. Based on a first cursory screening of a number of project abstracts, we concluded that most of the relevant projects in the area of crises and social media were to be found, naturally, within the security and ICTs funding schemes. The project abstracts were accessed through the CORDIS system,<sup>3</sup> where the abstracts of all Commission-funded projects can be found in English (which is the working language in CORDIS as well as for the funded projects). Furthermore, CORDIS allows for a systematic advanced search, which enabled us to use the same search terms (and various combinations thereof) as were used in the first substudy. Thus, for consistency with the first substudy, we also limited the search to projects submitted for calls that were launched in 2005 and later. Otherwise, we applied no additional restrictions in regard to funding schemes or programs.

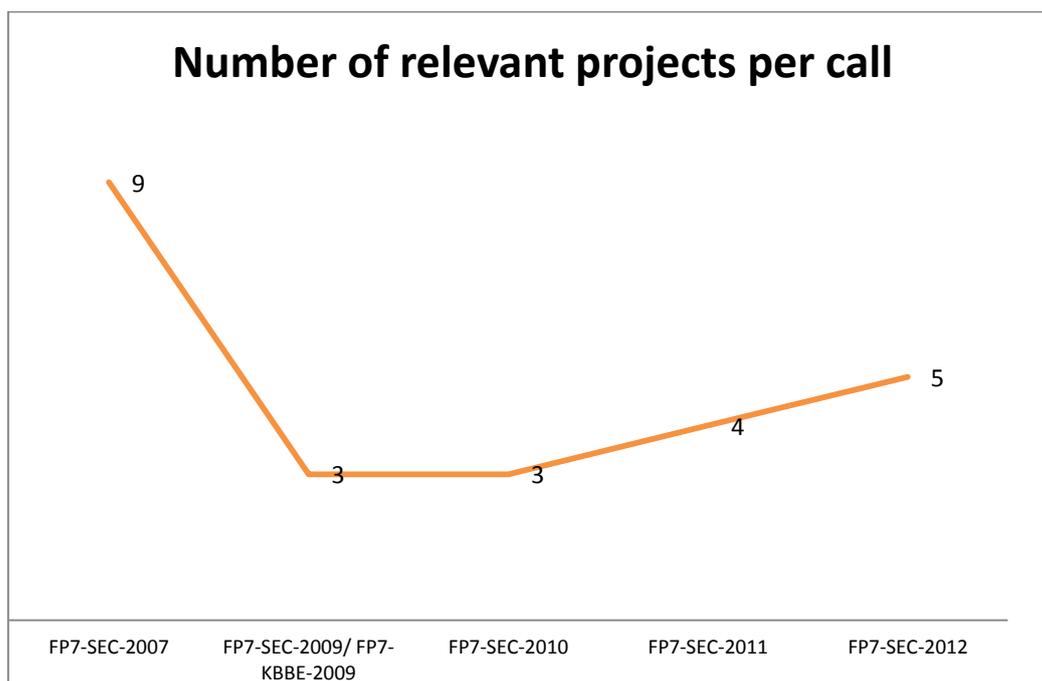
In applying these search terms, we found 24 relevant projects that matched the requirements of this study. The resulting project abstracts were collected and analyzed with the Atlas.ti qualitative analysis software. Categories were built inductively first, which resulted in an initial set of codes referring to both administrative aspects and topics of the projects. In a second step, the categories obtained through the content analysis were compared to the characteristics found in the first substudy of this paper. To make the two substudies comparable in terms of topics, the categories referring to project topics arising from the content analysis were subsumed under those found in the academic research study in a deductive manner. Next to this subsumption, no new categories arose from this analysis. A frequency analysis of the results revealed the first insights into the projects, which are presented below.

## Overview of Results

In spite of the defined search period of projects starting from 2005 onwards, the earliest research project dealing with the linkage between crises and social media started in February 2008. This fits the academic research study findings that showed little, but steadily growing scientific activity on social media and crises until reaching a small peak in 2008 and then rising steadily after 2009. Just as Boyd and Ellison (2008) referred to the time that it took for social media to enter the academic discourse, it is not surprising that the first applied research in this field also reflect a delay. Moreover, quality project proposals require extensive preparatory time. This is in addition to the time before and after the grant award decision. This "time to grant," the period of time between proposal submission and grant award, averages about a year. Thus, the onset of the funding program, less the time to grant period, represents a more accurate indicator of the genesis of the project idea.

In regard to the funding programs, all 24 projects have been funded under the Seventh Framework Programme (FP7): 23 by the Security Research budget and one under the European Knowledge Based Bio-Economy program. Counter to our expectations, no relevant project was found within the ICT program.

Although the number of relevant academic articles has risen almost constantly since 2005 (see Figure 2), successful FP7 projects relevant for our study could only be found from the SEC-2007 call onwards, which produced the highest number of relevant projects (almost 40% of all projects considered in this substudy, as shown in Figure 4). This was, at the same



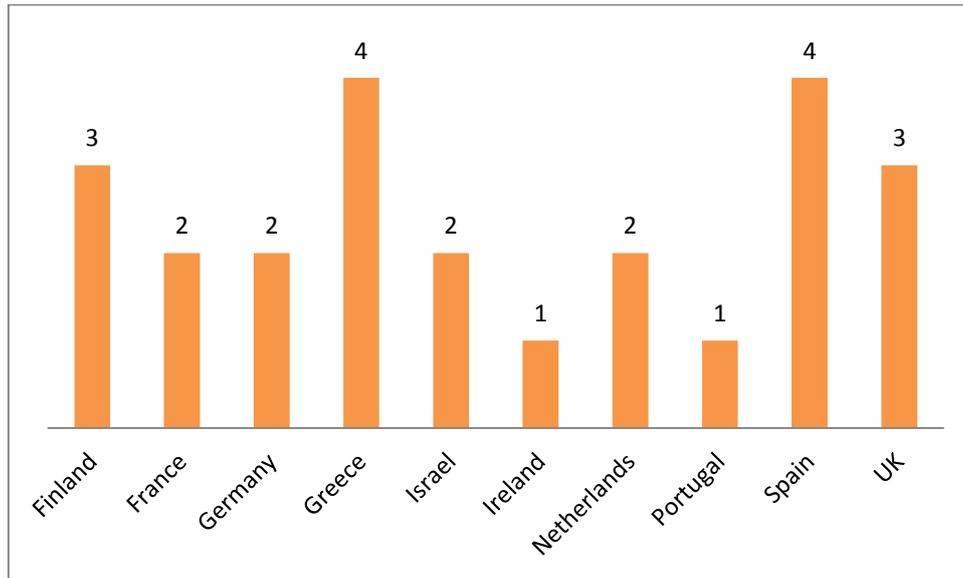
**Figure 4.** Number of relevant projects per European Commission Seventh Framework Programme (FP7) call ( $N = 24$ ). The abbreviation SEC refers to Security Research and KBBE to European Knowledge Based Bio-Economy. No appropriate projects were granted funding in any of the calls in 2005, 2006, or 2008.

time, the first FP7 call that led to projects debating the linkage between social media and crises. In 2008, no appropriate projects were granted funding. From the 2009 project calls onward, a slight but steady rise in the number of relevant FP7 projects was observed, though on a lower level (from 3 to 5 per year). Of the relevant funded projects, the most frequent project duration was 3 years, and the majority (13) lasted 3 years or longer. The maximum project duration among the relevant projects for this article was 48 months; the minimum was 15 months (see Table 15).

Figure 5 shows the consortia of the projects, all comprising partners that can be classified as multisectorial (involving universities, public bodies, and private entities) from several European Union (EU) member states and/or associated states. To define the geographical location of the projects, we looked at the origin of the project coordinators and found that these 24 projects are distributed among nine EU-member states and Israel. The most prominent coordinator states were Spain and Greece, with 4 projects each, followed by Finland and the United Kingdom (3 projects, respectively).

**Table 15.** Duration of FP7 Projects Analyzed in Study ( $N = 24$ ).

Duration in months	15	18	24	25	30	33	36	39	41	44	48
Number of projects	1	1	3	1	4	1	5	2	1	2	3



**Figure 5.** Geographic location of coordinator for projects studied (in alphabetical order;  $N = 24$ ).

### **Focusing the What: Content Analysis of Research Projects in the Area of Crises and Social Media**

For analyzing the content of the relevant projects, the project abstracts were subjected to open coding, which resulted in several main categories. To make the results comparable to the academic research study, the categories that emerged from both analyses were compared and, where possible, the wording was standardized.

#### **Project Aim**

In comparing the categories that were developed during the academic research study, we discovered that the general aims of the investigated projects differed to some extent from the core topics in the analyzed academic articles. Although the most frequent focus of the latter is what we have summarized under the category Use and Emergence of Social Media During Crises (at nearly 40%; see Table 2), only 12.5% of the investigated projects can be subsumed under this category.

As shown on Table 16, the most prominent project aim within the applied research projects was Shaping “Good” Crisis Communication/Management/Response, with 45.8% frequency, followed by Enabling Information Gathering for Decision Making/Service Provision, at 29.2%. Both categories appeared equally frequently in all the relevant FP7 projects.

Projects grouped in the Shaping “Good” Crisis Communication/Management/ Response category dealt primarily with improvements in the information and communication flow and examined the role that social media, in particular, could take. A very prominent aim pursued by 4 of the 11 projects in that category was to connect existing communication systems, to improve the interoperability of communication means, and to develop a standardized environment. Others

**Table 16.** Topics Within Social Media-Related Crisis Communication Projects ( $N = 24$  projects).

<b>Project Aim</b>	<b><i>n</i></b>	<b>%</b>
Shaping “good” crisis communication/management/response	11	45.8
Enabling information gathering for decision making/service provision	7	29.2
Use and emergence of social media during crises	3	12.5
Fostering citizen participation	3	12.5
<b>Total</b>	<b>24</b>	<b>100.0</b>

aimed to establish effective communication and collaboration strategies or to develop communication guides and support for policy makers.

Projects in the Enabling Information Gathering for Decision Making/Service Provision dealt mainly with data-mining techniques and social media monitoring or analytics that allow policy makers to gather user- and citizen-generated information that supports decision-making processes in various aspects of disaster and crisis management. On a more operational level, these techniques also were meant to facilitate emergency alerting systems.

A category that appeared only in projects submitted for the SEC-2012 call was Fostering Citizen Participation. Projects under this category aimed at using social media specifically for involving and empowering citizens as “in situ first responders.” This is a relatively new, though very popular, approach.

### Phases and Types of Crises

Regarding the crisis phases covered in the projects, we found that most projects were very specific and directed toward one particular crisis phase (see Table 17). Only 3 of the 24 projects addressed more than one crisis phase. Similar to the focus of the academic articles that composed the data set for the previous substudy, approximately 60% of the projects covered the crisis response phase. Both crisis prevention and postcrisis aspects were covered explicitly by 3 of 24 projects, respectively.

As shown in Table 18, the projects were less specific concerning the nature of the crisis. The largest portion of the projects covered more than one crisis type, and referred rather broadly to natural and man-made crises, followed closely by crises that were not identified or identifiable within the project. Other projects were even less specific, simply referring to *crises*, without further elaborating the type. The most prominent individual crisis type, classified as Terroristic/Criminal Acts, was covered by five projects; however, surprisingly, all were submitted for the SEC-2007 call, even though crime and terrorism were called for in

**Table 17.** Crisis Phases Addressed in the Projects Studied ( $N = 24$  projects).

<b>Phase Relation of Projects</b>	<b><i>n</i></b>	<b>%</b>
Crisis prevention	3	12.5
<b>Crisis response</b>	<b>15</b>	<b>62.5</b>
Postcrisis	3	12.5
Multiple phases covered	3	12.5
<b>Total</b>	<b>24</b>	<b>100.0</b>

**Table 18.** The Nature of Crisis Covered in Analyzed Projects ( $N = 24$  projects).

<b>Nature of Crisis</b>	<b><i>n</i></b>	<b>%</b>	<b>% of identifiable nature</b>
Health crisis	1	4.2	5.6
Technology malfunctions	4	16.7	22.2
Terroristic/criminal act	5	20.8	27.8
Multiple Nature types	8	33.3	44.4
None/not identifiable	6	25.0	
<b>Total</b>	<b>24</b>	<b>100.0</b>	<b>100.0</b>

each of the SEC calls. In contrast, studies categorized as Technology Malfunctions occurred throughout the entire period, with 4 of the 24 projects focusing on this topic, mainly dealing with aspects of critical infrastructure.

### Target Groups

Because all the projects were aimed at practical application, they had clearly defined target groups, as outlined in Table 19. The most frequent aim (9 of the 24 projects) was to support first responders with ICTs and social media technologies. One project was directed toward police, although not in their role as potential first responders but rather as a presence within social media (“virtual police station”) and therefore was not included in this category. More recent projects were aimed at involving and empowering citizens as de facto and in situ first responders (e.g., the Alert4All project;<sup>4</sup> Johansson et al., 2012).

On a more strategic level, decision-making authorities were designated as the target group of 5 of the 24 projects. All five were aimed at supporting decision-making processes in the area of security policy, which, following tradition, was found on the national or EU-level only.

### Comparing EU-funded Research Projects with Academic Publications

This second substudy, focusing on third-party-funded projects, reveals a number of interesting aspects. The foci of the research projects in the sample differ to some extent from those in the investigated academic publications: For example, the Use and Emergence of Social Media During

**Table 19.** Target Groups Within the Projects Studied ( $N = 24$  projects).

<b>Target Group</b>	<b><i>n</i></b>	<b>%</b>
First responders	9	37.5
Police	1	4.2
Decision-making authorities (national- and EU-level)	5	20.8
General public	5	20.8
Citizens as in situ first responders	4	16.7
<b>Total</b>	<b>24</b>	<b>100.0</b>

Crises category turned out to be the top focus in the academic research study, whereas the selected research projects most often fell into the Shaping “Good” Crisis Communication/Management/Response category. However, similarities were found with regard to the crisis phases, where the crisis response phase was dominant in both substudies. In terms of the nature of crises dealt with in the research projects, Terroristic/Criminal Acts were very prominent in the projects of the SEC-2007 call, though absent in the subsequent years. In total, almost 21% of the selected research projects dealt with terrorism and criminal acts, whereas this is only true for a bit more than 9% of the analyzed academic publications. We assume that this difference is due to the promotion of the topic in the different SEC-calls, while a similar motivational factor does not exist for academic articles. Regarding the particular popularity of the topic through the SEC-2007 call and its decline afterwards, our findings do not provide any clear explanations.

In contrast to the first substudy, in the second one we paid particular attention to the target groups of the research projects. Although first responders were the top target group throughout the entire investigated period, projects aimed at citizens were on the rise as of 2012. This matches with the finding that, in terms of topics, projects under the category Enabling Information Gathering for Decision Making/Service Provision mainly dealt with data-mining techniques and social media monitoring or analytics that allowed policy makers to gather user- and citizen-generated information to support decision-making processes in different aspects of disaster and crisis management.

Summing up, we conclude from Substudy 2 that the European Commission’s Framework Programmes influence to a great extent the research focus of the funded projects. However, the major academic debates in this field that we find in the scientific publications from Substudy 1 are, to some extent, reflected in the research projects, which is proved by a number of similarities that were presented above. As a matter of fact, the EU-funded research projects are of a more practical character and therefore have a clear focus toward measurable impact and target groups. At the same time, we find it worthwhile concluding our studies with a glimpse towards actual practical use cases in order to find out where research can enrich practice and vice versa.

## **PRACTICAL USE CASES OF SOCIAL MEDIA IN CRISES**

In addition to investigating academic research in the fields of communication and media studies and funded projects related to the broad and evolving field of social media use in crisis situations, this study rounds off with a focus on exemplary nonproject use cases. The aim of this overview is to illustrate the potential of the research to be transferred into practice and, as well, to highlight well-integrated examples of crisis management. This final step allows for the integration of these academic findings and project results into the strategic development of crisis management.

In the course of iterative systematic reviews (Petticrew & Roberts, 2006) of relevant Web sources and personal communication attained by the authors through their participation in several projects in this field (e.g., QuOIMA and SMD4Austria both government funded,<sup>5</sup> the EC funded FP7 project CAST, and others), relevant practical use cases were identified. In the course of those projects, open source information was retrieved through selected English and German search terms<sup>6</sup> from Web sources, such as organization-created Web sites and the

social media presence of governmental agencies and NGOs, emergency first-response organizations, and disaster management platforms. Through our screening of the cases and our first-hand knowledge of the critical discussion processes taken by the cases' respective project teams, we were able to deduce the strengths and weaknesses of each case, as well as potential links to further research approaches. We rated only a few use cases, with their broad approach, as sustainable and self-enhancing. The examples presented here, which are focused on the management of natural or man-made disasters and conflicts, clearly leveraged social media in crisis communication and interaction for enhanced resilience and participation of the community. These three use cases, all from the SMD4Austria project—identified from among 147 initial findings and selected because of their predefined practical relevance for an end user organization (Rainer et al., 2013)—demonstrate the representation and impact of academic research and project solutions in practical use and reflect the geographical findings of the substudies.

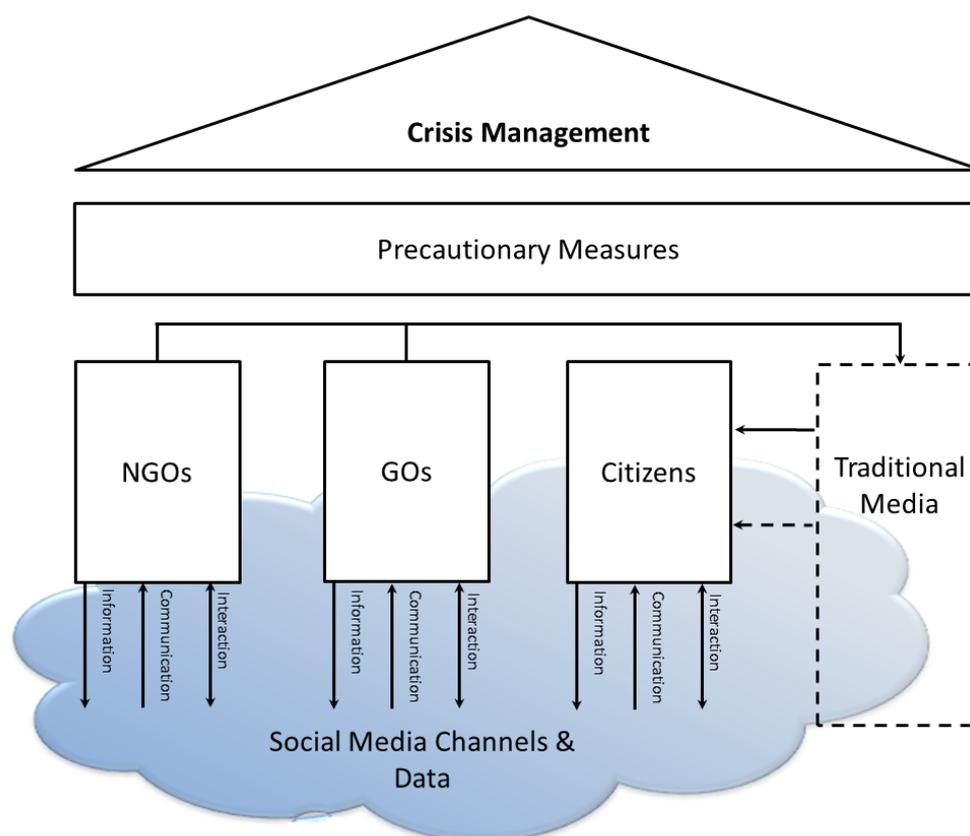
The EU, as the rest of the world, is confronted with increasingly complex and highly difficult-to-predict crises involving large numbers of directly and indirectly affected people. Thus, efficient emergency management is more challenging than ever, and national and transnational organizations are facing nearly identical, but growing, quandaries. Whereas the procedures and the coordination among first responders typically are efficient, the potential for improving external communication in emergency situations remains a significant component of crisis response. This stance is taken also by the Council of the European Union, which pointed out that

emergency and crisis communication is essential in the field of civic protection in order to make citizens safer and more secure, by enabling them to recognise risks, to take precautionary measures to avoid risks, and to react swiftly to minimise risks; and [thereby] limiting the consequences of emergencies. (Council of the European Union, 2011, p. 1)

The term *communication*, in this respect, cannot be restricted solely to imply the provision of the public with one-way information. As stressed by the Council of the European Union and necessarily going further, this complex response must include supplying emergency managers, directly and indirectly affected NGOs, governmental organizations, and private persons with information concerning the dynamic progression of the crisis as well as the requirements for support throughout all stages of crisis management, including preparation, mitigation, and recovery.

Personal communication and distribution of relevant and often time-critical, factual information should work as a two-way process, shown as “Interaction” in Figure 6. In line with the concept of this kind of “dialogical emergency management” that was defined, for example, in the course of the aforementioned EU FP7 project Alert4All, eliciting information from the public is a substantial part of successful emergency communication (Artman, Brynielsson, Johansson, & Trnka, 2011).

One central challenge is that emergency communication needs to deal with rapidly changing circumstances, such as the diverse needs, abilities, and characteristics of the involved actors (Artman et al., 2011, p. 3), making it difficult to receive reliable and real-time data. As stated before, there are different categories of crises, each having its own characteristics. Some of the most basic differentiations, in addition to the model depicted in Figure 6, include man-made



**Figure 6.** The traditional model of information, communication, and interaction in crisis situations enriched by the new social media layer (Rainer et al., 2013, p. 121; Used with permission).

versus natural, expected versus unexpected, long-term versus short-term, and geographically widespread versus localized crises (Gundel, 2005, p. 106). Because contemporary critical situations are becoming more complex, with many interrelated aspects, crisis management has become more challenging than ever. Hence the need for timely and accurate information rises to particular importance. At this point, Web 2.0 technologies, social media, and media mining constitute new ways to consider the affected population's information in effective and efficient ways (Backfried et al., 2013a).

As was made clear through our substudies on academic research and on third-party-funded projects, media studies researchers and practitioners have witnessed in recent years the remarkable rise in popularity of Web 2.0 technologies and social media, through which millions of users communicate, participate, and collaborate in and about countless current events, including natural disasters and conflicts. Driven by these new models, technologies, and applications, the Internet has enabled average citizens to become more social and interconnected. This reality can be exploited in multiple ways in practical crisis management. Social media, such as Facebook, Twitter, YouTube, blogs, and Web communities, are important sources for the next generation of emergency management planning and practices. An important aspect in this regard is the phenomenon of social webs and the wisdom of crowds (Surowiecki, 2004).

Today the Web is no longer a mono-directional communication channel. Every user is an active part of the whole sphere and easily can become an author, publisher, or media distributor. As a result, this current evolution exerts a strong influence on situations in which quick reactions and efficient decision making are necessary, but also where forecasting socially made crises is important. Therefore, the need to integrate social media into practical emergency management is stressed in research and by governments, as illustrated above (see also Artman et al., 2011, p. 8).

Events such as the earthquake in Haiti in 2010 and the riots in England in 2011 show that people use social media extensively for various purposes during critical situations. Regardless of the availability of institutionalized and/or public social media tools and platforms for the exchange of information and so forth, directly and indirectly affected persons took advantage of these new means of exchange. NGO and governmental organizations also leveraged it, but with a more focused approach on relief and coordination measures (Backfried et al., 2013a, p. 144).

The 2010 earthquake in Haiti provides a prime example of the successful use of social media during an emergency. Open-source software, such as Ushahidi<sup>7</sup> and LRA Crisis Tracker,<sup>8</sup> helped to match suppliers with health-care providers in need of those supplies (Backfried et al., 2012). Unfortunately, cases like the 2011 nuclear disaster in Fukushima show that the potential of social media is not always employed.

In contrast to already successful application in the impact phase, a lack of implementation at the governmental or institutional level in the preparatory actions and prevention activities is clearly detectable. This supports our findings that very little academic research and few funded pilot projects in this field deal with the prevention and preparation phases of crisis management. In the case of the Fukushima incident, social media was not used sufficiently as a channel for informing the disaster-stricken population, let alone as a means of gathering information (Kwang-Hoong & Mei-Li, 2012). These developments underscore the need of governments to use social media for the prevention and management of crisis situations, particularly at the onset.

How social media interaction works before and during emergencies remains poorly understood, including how it could be used more widely to support emergency services, fire brigades, police forces, and other civil protection units. The same applies to the efforts of strategic departments. Regardless of the existing scientific research and the completed third-party-funded research projects analyzed in this paper, effective use of social media in crisis still needs to be developed in more detail and implemented more widely than in single-use cases (Backfried et al., 2013b). It remains crucial to purposefully transfer these scientific and project-derived findings into everyday practice of crisis prevention and management.

It is important to note that the risks of social media use in disasters and conflict situations also have been revealed. For example, citizen-generated content, on the one hand, provides essential information, but also may spark and fuel rumors and misinformation amid highly dynamic developments if integrated crisis management is not implemented at an early stage (Mendoza, Poblete, & Castillo, 2010). Therefore, research into and the implementation of best practices regarding the growing importance of social media within a diversity of disaster and conflict situations is needed for the various phases of crisis management. The current landscape of existing applications for crises is characterized by deficiencies. Despite some isolated appropriate applications, to our knowledge no tool offers the extensive functionalities that emergency managers need for effective information, communication, and collaboration before, during, and after crises. Our research confirms that “to date no uniform approach to

integrating social media as part of emergency management strategies” (Tyshchuk, Hui, Grabowski, & Wallace, 2012, p. 818) has been identified in the literature.

## **DISCUSSION OF RESULTS AND CONCLUSION**

In the course of this metastudy, existing research on social media in crises has been analyzed from different perspectives and contrasted with practical use cases. In the first substudy, we surveyed pertinent academic texts that were published between January 2005 and August 2013. A corpus of 66 scientific papers, mainly from peer-reviewed academic journals, was coded and analyzed according to a set of manifold closed and open categories within themes, such as the academic context of the publications; their main topics, target groups, focused level (from individual, community to societal perspective or local, regional, global geographic level), and shapes of crises; and the authors’ origin and affiliation. This survey highlighted a strong focus on natural disasters (earthquakes, tsunamis, etc.), on the one hand, and social movements and protests (Arab Spring, Gaza, etc.), on the other. We found that the majority of academic research in communication and media studies on the various aspects of social media and crises originates in Western countries, with the United States leading the debate with 65% of all analyzed texts, followed by Europe (23.9%). Regarding the covered phase of crises in the scientific publications, we found that the majority (59.1%) were focused on crisis response. The same is true for publically funded research projects analyzed in the second substudy, where 62.5% of all identified projects dealt with crisis response, whereas other phases, such as prevention and postcrisis, were treated to a lesser extent.

Moreover, we can see from Substudy 2 that, in recent years, the role of individual citizens as crisis responders has come increasingly into the focus of funded research projects: The data showed an increase in the emphasis on fostering citizen participation beginning in 2012, although, in principle, the topics of shaping “good” crisis communication, management, or response and enabling information gathering for decision making or service provision remain dominant, with 45.8% and 29.2% of the covered projects, respectively. These percentages indicate that crisis management continues to be viewed and administered primarily from the perspective of public stakeholders (e.g., government ministries) and official communicators. Only recently has this top-down approach been challenged to some extent, and thus a new emphasis places citizens and communities at the local level as the center of interest. However, as we have shown, huge potential still exists for advancing the topic and practices from a bottom-up approach. Such a perspective would aim not only at improving information gathering or effective communication in crises, but also would pursue the goal of empowering citizens and communities and of enhancing resilience on the local level.

In the presentation of data on the practical use of social media in crises, additional gaps and risks are identified that impose challenges and threats in the actual application of social media and social media analyses in practice. One is the issue of obtaining and maintaining certain quality standards in order to use citizens’ information efficiently and effectively for crisis management and to prevent the spread of misinformation and rumors. The second challenge identified is the implementation of social media analyses in existing emergency management systems in the institutional context of governmental first-responder organizations. Therefore, we stress that the actual and deliberate transfer of scientific and practical findings

into the everyday practice of individual and institutional actors before, during, and after crises is still deficient and needs to be addressed.

The overall findings of this metastudy suggest a variety of shortcomings in crisis prevention and preparation as well as citizen participation in these processes. Particularly in the case of natural disasters, recurring incidents in disaster-afflicted regions demand future-oriented strategies involving an integration of efforts by (a) citizens (as essential providers of social media content during crises), (b) governmental institutions, and (c) first-responder organizations. A stronger collaboration is necessary, not only between and among the different actors but also between and among researchers from western and northern regions, such as Europe and the United States, and from the southern areas, including African, Asian, South Pacific, and Latin American countries. A culturally diverse collaboration presumably could enhance research and practices equally. Although the latter-mentioned countries are affected to a greater extent by the crises covered in this metastudy, they do not appear to be represented correspondingly within the international academic discourse on social media communication in crises. Whether this is due to discrepancies between the regions' institutional, programmatic, and financial research environments, to aspects of the digital divide (Chen & Wellman, 2004; Organisation for Economic Co-operation and Development, 2001; United Nations, 2012; etc.), or to other factors cannot be answered by this metastudy.

In conclusion, we identified three the main desiderata regarding the field of crisis communication in association with social media: (a) a stronger focus on the role and participation of individual citizens and local communities (as providers and receivers of information and as actors); (b) the inclusion of, and collaboration with, researchers and practitioners from other, strongly crises-affected continents; and (c) the actual transfer of research and know-how into practice.

Although the present metastudy approach offers a broad insight into pertinent research, it comes with some limitations. We focused mainly on academic journal publications, third-party-funded project abstracts, and conference papers. Therefore, the present metastudy cannot be generalized towards other forms of publications, such as books and book chapters. Moreover, we only focused on English-language publications occurring in two databases, one focusing on media communications. Future metastudies on the interdisciplinary field of crises and crisis communication in context with social media will need to be broader with regard to the language of relevant publications and the variety of databases, academic disciplines, and forms of publication, in order to further gain orientation in the relatively new but complex topic area of crises and social media. In regard to the content analysis of research project abstracts, of note is that these are exemplary results from a qualitative research approach that was undertaken with a very limited sample, resulting in a frequency analysis. First conclusions can be drawn in regard to the focus of the European Commission as grant giver; however, to approach the topic more in depth, further metaresearch will need to be conducted applying qualitative and quantitative approaches.

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## ENDNOTES

1. The following search terms and search term combinations were used for research material collection: social media–crisis; social media–crisis communication; social media–humanitarian; social media–

disaster; social media–emergency; crisis–ICT; crisis–digital; crisis–technology; crisis–online; crisis–network; crisis–mobile; social media monitoring; social media analytics; social media analysis.

2. While all authors of this article contributed to data collection and selection, all texts ( $N = 66$ ) were coded by Irmgard Wetzstein only (one coder). Nevertheless, intercoder reliability using Holsti's (1969) formula was measured within numerical categories (variables with predefined categories) with 2 coders (.89). Intracoder reliability (2- week interval) was conducted successfully.
3. Information is available on Cordis from [http://cordis.europa.eu/home\\_en.html](http://cordis.europa.eu/home_en.html)
4. More information can be found at <http://www.alert4all.eu/>
5. QuOIMA and SMD4Austria were both funded by the Austrian Ministry of Transport, Innovation and Technology (bmvit) within the Austrian Security Research Program KIRAS.
6. Due to the bilingual character of some of the projects (e.g., those mentioned in endnote 5), both English and German search terms were used.
7. See <http://www.usahidi.com/> for more information.
8. Further information is available at <http://www.lracrisistracker.com/>

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