Social Media within Emergency Management Organisations
- A case study exploring Social Media utilisation for Emergency and Disaster Management

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Abstract

Over the last decade, we have seen that social media services have been widely adopted to communicate with friends or family members, and to generate and consume information. It is not a surprise, therefore, that social media services are also used as powerful communication platforms during disasters and other emergency extreme events.

This thesis explores the utilisation and integration of social media services into emergency management organisations (EMOs) for the purpose of day-to-day as well as emergency and disaster management operational modes. EMOs such as fire services, use social media to provide information to, and engage with, the general public and as a source of relevant information to support their situational awareness during an extreme event.

Social media services have been adopted by EMOs as an important additional communication channel during times of emergency and disaster management, where EMOs are central and trusted participants within emerging and dynamic social communication networks. Still, for EMOs, social media is a newly adopted technology which is not yet fully understood for this purpose.

While some research has analysed social media data to learn how EMOs are communicating with the general public and non-government institutions through their social media channels, little is known as to how EMOs embed social media services into their organisational structures and processes.

This research contributes to closing this research gap through an explorative and interpretive case study which highlights how EMOs utilise and integrate social media services into their day-to-day operations, processes and structures as well as into their operational mode during emergencies and disasters.

This study analyses five different EMOs, in two different jurisdictions that have adopted and utilise social media services. This research focusses on the integration of social media services within these EMOs and how these EMOs use social media depending on their mode of operation, i.e. day-to-day or emergency management, for:
1) internal EMO communication;
2) interaction with other EMOs; and
3) communication with the general public and media organisations.

The analysis of these cases is used to develop a framework of social media utilisation in emergency management organisations for emergency and disaster management. It also contributes to our existing body of knowledge about social media utilisation in emergency and disaster management scenarios. The results of this research project further provide EMOs with a basis to improve their existing approaches to social media utilisation.
Acknowledgement

“Writing a book is a horrible, exhausting struggle, like a long bout of some painful illness. One would never undertake such a thing if one were not driven on by some demon whom one can neither resist nor understand”

George Orwell – Why I Write (2014)

A doctoral thesis is never just the product of the candidate who authors and writes the particular piece; Mine was not an exception. Hereby, I would like to thank everybody who helped and supported me during this journey.

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Table of Content

LIST OF TABLES 13

LIST OF FIGURES 14

CHAPTER 1 — INTRODUCTION 16

1.1 RESEARCH MOTIVATION AND BACKGROUND 17
1.2 RESEARCH OBJECTIVES AND QUESTIONS 20
1.3 RESEARCH METHODOLOGY AND APPROACH 21
1.4 RESEARCH FINDINGS AND SIGNIFICANCE 22
1.5 DISSERTATION OUTLINE 23

CHAPTER 2 — BACKGROUND ON EMERGENCY EVENTS, EMERGENCY MANAGEMENT ORGANISATIONS, AND THEIR USE OF SOCIAL MEDIA 26

2.1 INTRODUCTION 26
2.2 INCIDENTS, EMERGENCY EVENTS, AND DISASTERS 27
2.2.1 EVENT TYPOLOGY 30
2.2.2 PHASES OF DISASTER AND EMERGENCY MANAGEMENT 32
2.2.2.1 Disaster Stage Taxonomy 32
2.2.2.2 Prevent, Prepare, Respond and Recover Model 34
2.3 EMERGENCY MANAGEMENT ORGANISATIONS 36
2.3.1 EMERGENCY MANAGEMENT ORGANISATIONS AS HOLONIC SYSTEMS 37
2.3.2 THE TWO MODES OF OPERATION OF EMERGENCY MANAGEMENT ORGANISATIONS 40
2.3.3 PARADIGM SHIFT TOWARDS COMMUNITY ENGAGEMENT AND COMMUNITY RESILIENCE 41
2.4 SOCIAL MEDIA 42
2.4.1 THE CONCEPT OF SOCIAL MEDIA 43
2.4.2 RELEVANT SOCIAL MEDIA TECHNOLOGIES 44
2.4.2.1 Social Networking Sites 45
2.4.2.2 Microblogging Platforms 46
2.4.2.3 Image and Video Sharing Platforms 47
2.4.2.4 Wikis 48
2.4.2.5 Collaborative Maps 48
2.5 SUMMARY 49
CHAPTER 3 - LITERATURE REVIEW AND RESEARCH OBJECTIVES

3.1 INTRODUCTION

3.2 LITERATURE REVIEW APPROACH

3.3 RESULTING LITERATURE REVIEW OF SOCIAL MEDIA IN EMERGENCY AND DISASTER MANAGEMENT

3.3.1 POTENTIAL OF SOCIAL MEDIA IN EMERGENCY AND DISASTER MANAGEMENT

3.3.2 STRUCTURE AND BEHAVIOUR OF EMERGENCY SOCIAL MEDIA COMMUNICATION NETWORKS

3.3.3 GENERAL PUBLIC USE OF SOCIAL MEDIA DURING EMERGENCY EVENTS

3.3.4 EMERGENCY MANAGEMENT ORGANISATIONS USE OF SOCIAL MEDIA

3.3.5 SUMMARY OF THE LITERATURE

3.4 FRAMEWORK – SOCIAL MEDIA IN DISASTER MANAGEMENT

3.5 RESEARCH AIMS AND QUESTIONS

3.6 SUMMARY

CHAPTER 4 - RESEARCH METHODOLOGY

4.1 INTRODUCTION

4.2 RESEARCH APPROACH AND STRATEGY

4.3 ONTOLOGY AND EPISTEMOLOGY

4.4 THE CASE STUDY APPROACH

4.4.1 STRUCTURE OF A CASE

4.4.2 CASE SELECTION AND CASE ORGANISATIONS

4.5 DATA COLLECTION

4.5.1 INTERVIEWS

4.5.1.1 Development of the Interview Instrument

4.5.1.2 Selection of Interview Informants

4.5.1.3 Description of Interview Informants

4.5.1.3.1 Interview Informants - Organisation A

4.5.1.3.2 Interview Informants - Organisation B

4.5.1.3.3 Interview Informants - Organisation C

4.5.1.3.4 Interview Informants - Organisation D

4.5.1.3.5 Interview Informants - Organisation E

4.5.1.4 Interview Process

4.5.1.5 Interview Data

4.5.2 DOCUMENTS

4.5.3 RESEARCH SITE VISITS
6.11.2 FORMALISATION OF TRAINING AND PROCESSES

6.12 SOCIAL MEDIA FOR INTRA-ORGANISATIONAL COMMUNICATION

6.13 SOCIAL MEDIA FOR INTER-ORGANISATIONAL COMMUNICATION

6.14 SUPPORTING SOFTWARE IN USE FOR THE SOCIAL MEDIA OPERATIONS

6.14.1 SOFTWARE FOR SOCIAL MEDIA COMMUNICATION & ENGAGEMENT

6.14.2 SOFTWARE FOR SOCIAL MEDIA INTELLIGENCE

6.15 SUMMARY

CHAPTER 7 – DISCUSSION

7.1 INTRODUCTION

7.2 REVISITING AHMED’S MODEL OF SOCIAL MEDIA IN DISASTER MANAGEMENT

7.2.1 REVIEW OF AHMED’S SOCIAL MEDIA IN DISASTER MANAGEMENT FRAMEWORK

7.2.2 LIMITATIONS OF AHMED’S SOCIAL MEDIA IN DISASTER MANAGEMENT FRAMEWORK

7.3 TWO MODES OF SOCIAL MEDIA OPERATION – NON-OPERATIONAL MODE AND OPERATIONAL MODE

7.4 EXTERNAL SOCIAL MEDIA UTILISATION – AGENCY-TO-COMMUNITY SOCIAL MEDIA INTERACTION DIMENSION

7.4.1 TYPES OF SOCIAL MEDIA SERVICES IN USE

7.4.2 UNDERSTANDING THE MAIN SOCIAL MEDIA COMMUNICATION CHANNELS

7.4.3 SOCIAL MEDIA AUDIENCE GROUPS – WHO IS THE LISTENING COMMUNITY?

7.4.4 SOCIAL MEDIA UTILISATION FOR THE DISTRIBUTION OF INFORMATION

7.4.5 SOCIAL MEDIA UTILISATION FOR ENGAGEMENT

7.4.6 SOCIAL MEDIA AS AN INTELLIGENCE CHANNEL

7.4.6.1 Communicational Social Media Intelligence

7.4.6.2 Operational Social Media Intelligence

7.4.7 DISPATCHING BASED SOCIAL MEDIA INFORMATION

7.4.8 SOCIAL MEDIA OFFICERS

7.4.9 LOCALISATION OF SOCIAL MEDIA – CENTRALISED AND DECENTRALISED UTILISATION

7.4.10 FORMALISATION OF SOCIAL MEDIA UTILISATION FOR EXTERNAL COMMUNICATION – CAPABILITY BUILDING BLOCKS OF SOCIAL MEDIA ALIGNMENT

7.4.10.1 Building Block: “Broadcasting”

7.4.10.2 Building Block: “Engagement”

7.4.10.3 Building Block: “Intelligence”

7.4.10.4 Building Block: “Dispatching”

7.4.10.5 Progression of Capability Blocks and ongoing formalisation
7.5 INTRA-ORGANISATIONAL SOCIAL MEDIA UTILISATION – INTRA-AGENCY SOCIAL MEDIA INTERACTION

7.6 INTER-ORGANISATIONAL SOCIAL MEDIA UTILISATION – AGENCY-TO-AGENCY SOCIAL MEDIA INTERACTION

7.7 FRAMEWORK OF SOCIAL MEDIA UTILISATION IN EMERGENCY AND DISASTER MANAGEMENT

7.7.1 FRAMEWORK COMPONENT - MODE OF OPERATION

7.7.2 FRAMEWORK COMPONENT - COMMUNICATION PARTICIPANTS

7.7.3 FRAMEWORK COMPONENT – ORGANISATIONAL LEVEL

7.7.4 FRAMEWORK COMPONENT – SOCIAL MEDIA CHANNELS

7.7.5 FRAMEWORK COMPONENT – SOCIAL MEDIA CAPABILITIES

7.7.6 FRAMEWORK COMPONENTS: INTERACTION AND INFLUENCE

7.8 SUMMARY

CHAPTER 8 – CONCLUSION

8.1 INTRODUCTION

8.2 METHODOLOGICAL CONTRIBUTIONS AND IMPLICATIONS

8.3 THEORETICAL CONTRIBUTIONS AND IMPLICATIONS

8.4 PRACTICAL CONTRIBUTIONS AND IMPLICATIONS

8.5 LIMITATIONS

8.6 IMPLICATIONS FOR FURTHER RESEARCH

8.7 CONCLUDING REMARKS

REFERENCES
List of Tables

Table 2.1 Emergency Incident Types and Characteristics – reproduced from Bunker (2010) ................... 31
Table 4.1 Selected Case Organisations ................................................................................................. 81
Table 4.2 Sources of Empirical Material .............................................................................................. 85
Table 4.3 The qualitative interview as a drama reproduced from Myers and Newman (2007) .......... 86
Table 4.4 Overview formal Interview within the Case Organisations .................................................. 97
Table 5.1 Overview Organisation A ....................................................................................................... 109
Table 5.2 Overview Organisation B ...................................................................................................... 113
Table 5.3 Overview Organisation C ...................................................................................................... 118
Table 5.4 Overview Organisation D ...................................................................................................... 122
Table 5.5 Overview Organisation E ...................................................................................................... 125
Table 5.6 Comparison of Case Organisations ..................................................................................... 128
Table 6.1 Identified Themes in Dataset ................................................................................................. 133
Table 6.2 Research Questions asked in this thesis .............................................................................. 135
Table 6.3 Organisational Level and Social Media Utilisation ............................................................... 137
Table 6.4 Social Media Utilisation within Case Organisations ............................................................ 145
Table 6.5 Social Media Platforms and utilisation in Disaster Management ......................................... 146
Table 6.6 Social Media Channel in Use – Organisation A ................................................................. 151
Table 6.7 Social Media Channel in Use – Organisation B ................................................................. 152
Table 6.8 Social Media Channel in Use – Organisation C ................................................................. 153
Table 6.9 Social Media Channel in Use – Organisation D ................................................................. 153
Table 6.10 Social Media Channel in Use – Organisation E ............................................................... 154
Table 6.11 Social Media Channels and Perceived Audience ............................................................... 156
Table 6.12 Social Media as an Intelligence Channel within Case Organisations ............................ 182
Table 6.13 Incident Reporting through Social Media across case organisations ............................ 185
Table 6.14 Social Media Officer Type in Case Organisations ............................................................. 198
Table 6.15 Software types for Social Media Communication and Engagement ................................ 209
Table 6.16 Software types for Social Media Intelligence .................................................................... 211
List of Figures

Figure 1.1 Outline Chapter 1.................................................................................................................. 16
Figure 1.2 Seismic Waves reproduced from Munroe (2010)................................................................. 18
Figure 1.3 Sign at Fire Station ................................................................................................................ 19
Figure 1.4 Outline Research Approach ................................................................................................ 22
Figure 1.5 Framework – Social Media Utilisation of Emergency Management Organisations for
   Emergency and Disaster Management................................................................................................. 23
Figure 2.1 Outline Chapter 2.................................................................................................................. 27
Figure 2.2 Simplified phases of an emergency event .............................................................................. 32
Figure 2.3 Disaster stage taxonomy by Powell and Raynor (1952) .......................................................... 33
Figure 2.4 Prevent Prepare Respond Recover (PPRR) Model as sequential phases in emergency
   management ........................................................................................................................................ 34
Figure 2.5 PRRR Model as important aspects of emergency management .............................................. 35
Figure 2.6 Structure of Emergency Management Organisations ............................................................. 38
Figure 2.7 Selection of Different Social Media Technologies ................................................................. 45
Figure 3.1 Outline Chapter 3.................................................................................................................. 52
Figure 3.2 Hermeneutic framework for the literature review process reproduced from Boell and
   Cecez-Kecmanovic (2014) .................................................................................................................... 53
Figure 3.3 Social Media in Disaster Management reproduced from Ahmed (2011) ......................... 67
Figure 4.1 Outline Chapter 4.................................................................................................................. 75
Figure 4.2 Outline Research Approach ................................................................................................ 76
Figure 4.3 Case Boundaries .................................................................................................................... 79
Figure 4.4 Data Analysis Approach ....................................................................................................... 101
Figure 5.1 Outline Chapter 5.................................................................................................................. 107
Figure 6.1 Outline Chapter 6.................................................................................................................. 132
Figure 6.2 In Case Organisations Observed Organisational Levels ...................................................... 136
Figure 6.3 Different Social Media location in operational mode when state control centre (SCC) is
   activated .............................................................................................................................................. 139
Figure 6.4 Types of Social Media Channels .......................................................................................... 144
Figure 6.5 Social Media Audience Groups ............................................................................................ 156
Figure 6.6 Social Media Communication - Operational Mode ................................................................. 162
Figure 6.7 Sources of Information for Social Media .............................................................................. 163
Figure 6.8 Social Media Communication – Non-Operational Mode ....................................................... 168
Figure 6.9 Social Media as an Intelligence Channel ............................................................................. 176
Figure 6.10 BPMN model incident report or emergency assistance request through social media.... 189
Chapter 1 – Introduction

“People today can use social media to organise in ways that were difficult, if not impossible, just a few years ago, which has substantial implications for business, and society” (Kane et al. 2014). In this thesis, I explore the integration and utilisation of social media services within emergency management organisations for the purpose of emergency and disaster management. This exploration is done through an analysis of five Australian emergency management organisations which are utilising social media to supplement their emergency management activities.

However, before I progress to the core argument of the thesis, I would like to provide some background information in order to draw a clear picture of social media and the changes it brings to emergency and disaster communication; this picture highlights the motivation to explore the phenomenon. I outline this research motivation and background in the following section.

Subsequently, in Section 1.2, I explain the research objectives of this study and the research questions this thesis provides answers to. Then I describe the research methodology and approach in Section 1.3, followed by an outline of research findings and their significance in Section 1.4. I conclude this introductory chapter with the outline of this dissertation.

![Figure 1.1 Outline Chapter 1]
1.1 Research Motivation and Background

In western societies, social media services, such as Facebook and Twitter, are highly integrated into the daily activities of individuals (Whiting and Williams 2013). For some of us, these services are the first thing we check in the morning after waking up and the last thing in the evening before going to sleep. Social media is influencing how people communicate with friends and family members (Burke et al. 2011), consume news (Pentina and Tarafdar 2014), or even find their partners (Paul 2014).

The access to social media services appears ubiquitous as it is facilitated by mobile devices, such as smartphones and other lightweight computer solutions; of course, however, this is an illusion. True, in urban areas the Internet and with it Social Media Services can be accessed from nearly everywhere since the necessary infrastructure is established. In these areas, there is a dense cell phone coverage, or accessibility to wireless hotspots, however, in more rural regions and the further out of towns and cities we go the coverage might get more and more patchy until it possibly fully disappears. The necessary underlying infrastructure is just not there, … yet.

Social media services have not just disrupted the social practices in day to day life; these services have influenced social interactions in disaster and other extreme event scenarios, both positively and negatively. There are countless examples where social media has been used for self-organisation of help during or after an extreme event (e.g. Bunker et al. 2013; Procter et al. 2013; Shahid and Elbanna 2015) where people use the medium to mitigate the effects of an event. On the other side of the coin, however, we see countless examples where social media has been used for negative behaviour, such as scams (e.g. Bunker and Sleigh 2016; Subba and Bui 2017), organised lootings (e.g. Procter et al. 2013), or even in the support of coordination of terror attacks (e.g. Oh et al. 2010).

Social media data is created nearly instantly after an extreme event occurs and messages diffuse rapidly through the emerging extreme event communication networks. Figure 1.2 (Munroe 2010) illustrates the active utilisation of social media services during disasters and other emergency events. It illustrates the fast information flow possible through these communication channels, and illuminates how this might even surpass the extent of how the physical effects of an extreme event expand.
While this comic was written without a reference to a real event, the effects described in the diagram can be observed in real events. For example, on August 23rd in 2011 an earthquake occurred at the east coast of the United States which had its origin near Washington DC. Tweets about the earthquake could be read in New York more than 20 seconds before the seismic waves reached the city (Rogers 2011).

![Figure 1.2 Seismic Waves reproduced from Munroe (2010)](image)

The apparently ubiquitous access to social media creates the phenomenon where some witnesses of extreme events tend to share their impressions, photographic and video footage on social media services through the Internet within seconds and minutes after the impact of an extreme event. An example of how fast social media messages emerge after an occurring event is the Boston Marathon Bombing of 2013. Just seconds after the first bomb had exploded the first tweet emerged in the unfolding communication network (Ehnis and Bunker 2013). This Tweet only stated "Holy Shit! Explosion!", however, shortly after Tweets with the first images and videos were circulated which were showing what was happening on the scene of the event.

The modern information and communication technology has growing influence on the dynamics and the media coverage (Reese et al. 2007) of disasters and their management (Bruns et al. 2012; Bunker et al. 2013; Ehnis and Bunker 2013). Social media, and with it particular platforms such as Facebook and Twitter, with their user-generated content (Kaplan and Haenlein 2010), changed how information is created and shared through the Internet. Emergency managers realised that social media could be a powerful tool to communicate directly and engage with the public during emergency and other extreme events and embedded these platforms into the communication structure of their organisations (Latonero and Shklovski 2013).
Emergency management organisations (EMOs), such as the police or fire services, have started to integrate social media services into their operations and structures (Fosso Wamba and Edwards 2014; Heverin and Zach 2010; Latonero and Shklovski 2010; Queensland Police Service - Media and Public Affairs Branch 2011), especially with the intent to use these services during extreme events to communicate with parts of the general public.

![Figure 1.3 Sign at Fire Station](image)

Social media allows one-to-one, one-to-many, and many-to-many communication. For individuals, the one-to-many and many-to-many communication behaviours were not easily accessible before social media, at least not in this form. Communication practices have now been enabled that were difficult if not impossible before social media. Naturally, this has substantial implications for organisations and society (Kane et al. 2014). Initial integration of social media into organisations is rather inexpensive. Past influential information technologies, such as ERP and other Enterprise Systems, were expensive, and in the beginning, only large organisations could afford to adopt them; social media, on the other hand, can be readily used by all kinds of organisations strategically without a large upfront investment (Kane et al. 2014).

Yet, the social media utilisation within EMOs can be classified as a relatively new phenomenon. While several EMOs already used social media prior 2011, the Queensland Floods of 2011 acted as a catalyst in which the social media utilisation of EMOs became part of the consciousness of the general public. In this extreme event the Queensland Police Service (Queensland Police Service - Media and Public Affairs Branch 2011) utilised social media as a part of their communication strategy to communicate with the general public. This
organisation highlighted that social media is a beneficial additional communication channel. After this event, EMOs across the country broadened their social media activities.

So far, EMOs are using their social media services mainly to broadcast information (Ehnis and Bunker 2012; Heverin and Zach 2010). But social media presence is not limited to just being used as “megaphone” to bring information to a large audience; it can also be used to interact with the audience, or to gather information (Artman et al. 2011; Power and Kibell 2017), which makes the social media presence a valuable two-way communication channel during extreme events. Previous research has shown what kind of information EMOs are broadcasting during different phases of a disaster event (e.g. Bruns et al. 2012; Ehnis and Bunker 2012; Ehnis and Bunker 2013; Subba and Bui 2017). Unfortunately, not much is known about how EMOs have integrated and are using social media services to communicate with the general public from a perspective inside the organisations (Heverin and Zach 2010; Procter et al. 2013; Sutton et al. 2012). To date, our knowledge has been limited as to how these services are integrated into the organisational structures or processes of EMOs.

1.2 Research Objectives and Questions
The objective of this research is to create a better understanding of the utilisation and integration of social media services within EMOs for the purpose of emergency and disaster management. This thesis explores, in particular, Australian EMOs. The research focuses on the following research questions:

**RQ 1**: How are Social Media Services integrated into the structures of Emergency Management Organisations?

**RQ 2**: How are Social Media Services utilised within Emergency Management Organisations for the purpose of emergency and disaster management?

**RQ 2.1**: Is there a difference in the Social Media utilisation during the operational mode and the non-operational mode of an Emergency Management Organisation?
RQ 3: How are Social Media Services used as communication platforms in Emergency Management Organisations for the purpose of emergency and disaster management to:

RQ 3.1: interact with the public?

RQ 3.2: interact with other Emergency Management Organisations?

RQ 3.3: interact with their own organisational members?

1.3 Research Methodology and Approach

In order to answer these questions, the research is designed as a case study approach where the utilisation and integration of social media services in five Australian EMOs is analysed. These organisations are operating in two different Australian states. Two of the organisations are responding to bushfire related events; with one of these bushfire response organisations being situated in Case State I and the second bushfire response organisation in Case State II. Two of the case organisations are responding to flood-related events. One of these organisations is situated in Case State I and the other organisation in Case State II. Additionally, a response coordinating organisation has been analysed. This organisation is responsible for ensuring interoperability between EMOs when necessary during larger extreme events. This organisation is situated in Case State II.

The general research approach of this thesis is outlined in Figure 1.4, where the utilisation of this “fluid” communication technology, i.e. social media, in the very hierarchical context of EMOs is explored. The overall premise of the research is theory extension; where a framework has been developed, which can help to better understand utilisation of social media by EMOs
during disaster scenarios. I describe this framework in more detail in the following section and in Chapter 7.

![Figure 1.4 Outline Research Approach](image)

Five EMOs have been analysed as comparative case studies with the level of analysis being at the organisational level. As ontological underpinning, I presume a ‘weak’ social constructivism (Urquhart 2012) and the epistemological approach is within the Interpretivist paradigm.

Critical data sources within these organisations were interview informants. These informants are social media operators within the organisations. Additional data sources include social media data, documents from the organisations, case notes and workplace observations.

1.4 Research Findings and Significance

From a theoretical perspective, the analysis of the data revealed twelve themes which cover different aspects of social media utilisation and integration within EMOs. These twelve themes have been refined into a framework of *Social Media Utilisation of Emergency Management Organisations for Emergency and Disaster Management*. The framework is shown in Figure 1.5. Prior to this study, we had very little knowledge of how social media has been used within EMOs, and this study makes a significant and unique contribution to this body of knowledge.
From a practical perspective, the framework provides a tool through which the social media utilisation of an EMO can be systematically analysed and explained. The framework provides EMOs which have not yet implemented social media into their structure some guidance on how such technology can be used. For organisations which are already utilising social media services, this framework can help to analyse the existing social media processes and help to improve the social media utilisation of the organisation.

1.5 Dissertation Outline
This thesis consists of a total of eight chapters. Chapter 1, this chapter, provides an overview of the dissertation. The research background is introduced, and the motivation for the study is provided. Research questions, the methodological approach used within the thesis, the findings and their significance, and structure of the dissertation are also outlined.

Chapter 2 is intended to provide the necessary background of different concepts used within the thesis. The chapter is not meant as an in-depth literature review, but rather to introduce and discuss the major background concepts used in this thesis as well as the issues at the core of the research motivation. This is done in order to familiarise the reader with the context of the research. Three main concepts are covered: emergency management relevant events, EMOs, and social media.
Within the section of emergency relevant events, a discussion of how emergency management practitioners refer to different emergency events is outlined. Furthermore, the different phases of emergency management and disasters are discussed. In this context, different event classification approaches are discussed along with the Prevent, Prepare, Respond, and Recover Model. This model is a cornerstone of many processes within EMOs, in general, and within the case organisations explored in this thesis in particular.

EMOs and their specific characteristics as a special form of hierarchic systems are also explored within this chapter. Koestler’s concept of holonic systems (Koestler 1967) is used as a framing device to better understand the semi-autonomous and independent structure of such organisations. Special emphasis is made regarding the two modes of operations of EMOs, i.e. the operational mode, and the non-operational mode. The operational mode refers to the mode of operation when an EMO is responding to an extreme event; the non-operational mode refers to the day-to-day operation of an EMO.

In the last part of the chapter, social media in general and its relevance for EMOs is discussed; Specific social media technologies and their application in emergency management are also briefly outlined.

The results of the literature analysis of social media in emergency and disaster management are discussed in Chapter 3. The literature review approach is outlined, and then the body of literature is explained. The literature review is structured in four different parts: Potential of social media in emergency and disaster management, structure and behaviour of emergency social media communication networks, general public utilisation of social media during emergency events, and emergency management use of social media. The framework for social media utilisation in disaster management (Ahmed 2011) was used to frame the initial research and, therefore, this framework is discussed in section 3.4. At the end of Chapter 3, the research aims and questions are articulated from the literature analysis.

The research methodology is outlined in Chapter 4. This description includes the general research approach and strategy, the ontological and epistemological underpinnings, the case study approach, the data collection approaches, and the data analysis approach.
In Chapter 5, detailed case study descriptions of the five case organisations which were analysed for this thesis are provided. The case organisations are situated in two federal states in Australia. Case Organisation A and B are located in Case State I, Case Organisation C, D, and E are situated in Case State II. In the first half of the chapter Case State I and the case descriptions for Case Organisation A, and B are provided. In the second half of the chapter Case State II and the case description for Case Organisation C, D, and E are described. Each case description includes an overview of the organisation, the general structure of the organisation, and the social media utilisation structure.

The results of the data analysis are described in Chapter 6. The analysis of the data revealed twelve themes of social media utilisation and integration into EMO for the purpose of emergency and disaster management.

In Chapter 7, the findings of the data analysis are discussed. Themes identified in the data are used as a basis for the development of a framework of Social Media Utilisation in Emergency Management Organisations for the Purpose of Emergency and Disaster Management.

Chapter 8 provides a summary of this study and its significance. After a brief overview of the findings, the methodological, theoretical and practical contributions are highlighted. Limitations and further research are then explored to conclude this thesis.
Chapter 2 – Background on Emergency Events, Emergency Management Organisations, and their use of Social Media

2.1 Introduction
In order to understand the utilisation of social media in emergency and disaster management, it is important to understand what emergency and disaster events are; to know about the specific characteristics and composition of EMOs; and to understand the concept of social media. In this chapter, I outline these different concepts to embed them into the context of this thesis. The purpose of this chapter is to give the necessary background information and define concepts in order to understand the research performed for this thesis. It is not the purpose of this chapter to explore the current literature on the topics discussed. Chapter three will provide a literature review of social media in disaster and emergency management.

The current chapter is divided into three parts which cover each one of the major concepts: emergency events (2.2); EMOs (2.3); and social media (2.4). In Section 2.2, I describe and define emergency events and disasters; This includes different phases of such events and the phases in their management. Afterwards, I discuss some characteristics of EMOs as a subset of hierarchically structured organisations. The case organisations in this thesis are large-scale volunteer organisations. Therefore, I will focus in section 2.3 on large-scale volunteer organisations as a specific category of EMOs. These organisations have specific characteristics and are structured in relatively autonomous sub-units. Koestler’s concept of holonic systems (Koestler 1967) is introduced in this section as a lens to better understand these characteristics. Section 2.4 of this chapter is used to build an understanding of the concept of social media. I first define what I mean by social media in the context of this thesis, then I provide an overview of specific social media technologies and their current application in emergency and disaster management.
Members of EMOs use specific terms and jargon when they refer to emergency events. In order to have the necessary background to understand the utilisation of social media services within EMOs, it is important to understand what members of these organisations mean when they are referring to a type of an event. The terms range from “incident”, to “emergency event”, and “disaster event”. Sometimes terms are used interchangeably, on other occasions they have a specific meaning within the context. In this section, the meaning of the different types of emergency management relevant events for the context of this thesis are defined. In particular, the focus is on: “incidents”, “emergency events”, and “disasters”.

As the case organisations are situated in Australia, the focus is on the terms utilised in the Australian emergency management sector. However, the essence of this classification can also be transferred to an emergency management context of other countries.
Emergency Management Social Media communication is also often referred to as social media for crisis communication in the literature. Within this thesis, I avoid the term “crisis management” or “crisis communication” as these terms typically refer to operations in commercial organisations (Stieglitz and Krüger 2011). In the context of commercial organisations, these terms usually refer to reputation management, rather than crisis communication performed by EMOs. Crisis communication of EMO focuses on keeping people safe and alive, not on the reputation management of the particular emergency response organisation.

Emergency events are referred to and influenced by (1) the event size, (2) the event characteristics, and (3) the disrupting impact of an event towards the community or environment. These terms build a hierarchy of impact. Incidents, in this hierarchy, are on the smaller scale where the responding organisations are prepared to manage the event, while disaster events are the most disrupting events which might bring the coordinated response of EMOs to failure.

For EMOs, the most common relevant event type is an incident. Incidents are localised events toward which an organisation responds to. The Australian Emergency Management Glossary defines an incident as “an event, accidentally or deliberately caused, which requires a response from one or more of the statutory emergency response agencies” (Koob 1998, p. 64). Members of EMOs usually refer to an event as an incident when it is within the usual responsibilities of the organisation and the organisation is prepared to respond to such an event.

Emergency events are usually more severe in comparison to incidents. An emergency event can be defined as “an event, actual or imminent, which endangers or threatens to endanger life, property or the environment, and which requires a significant and coordinated response” (Koob 1998, p. 38). Members of EMOs utilise the term emergency event when the response to a particular event needs a more coordinated response, especially when more organisations are involved. Furthermore, emergency events have more devastating effects, in comparison to incidents, and might cause casualties.

A disaster or disaster event is the most severe form of an emergency management relevant event. The emergency management sector in Australia attempts to avoid the term disaster when responding to large-scale emergency events (Koob 1998, p. 32). The term disaster is reserved
for the most disrupting extreme events which pushes the coordinated response to potential failure. The Australian Emergency Management Glossary defines a disaster as “a serious disruption to community life which threatens or causes death or injury in that community and/or damage to property which is beyond the day-to-day capacity of the prescribed statutory authorities and which requires special mobilisation and organisation of resources other than those normally available to those authorities” (Koob 1998, p. 32). Such an event is serious enough that it pushes the day-to-day response capacity to failure and a more integrated and organised response is necessary.

A disaster, to be referred to as a disaster, needs to be declared as such by the government through a disaster declaration. The disaster declaration is a statement that the commune or a state cannot respond towards the event without additional assistance (McEntire 2007, p. 471).

A disaster can also be described as “deadly, destructive, and disruptive events that occur when a hazard interacts (or multiple hazards interact) with human vulnerability” (McEntire 2007, p. 22). Hazards are, in this case, natural, technological, or civil incidents. Natural incidents can be floods, earthquakes, or wildfires. Technological incidents can have an industrial, or nuclear character, or can be caused via transportation. Civil incidents are incidents like panic behaviours, riots or terrorism attacks. This reference shows the different potential causes of emergency extreme events.

For social media in emergency and disaster management, several human (civil) caused emergency extreme events are different to natural occurring extreme events in the sense that a potential perpetrator in the human-caused extreme event could change their behaviour based on the social media communication. There are cases where the perpetrators actively utilised social media to coordinate their behaviour. For example, the Mumbai terror attacks in 2010 (Oh et al. 2010) or the London Riots in 2011 (Procter et al. 2013).

EMOs need to structure their social media communication in such events so that they do not accidentally warn the perpetrators about their counteractions (Ehnis and Bunker 2013). On the other hand, they need to inform the general public enough to keep them safe. In natural extreme events, this particular problem does not occur since the event itself does not change through the social media communication. The involved EMOs just need to be careful that they do not accidentally cause additional cascading events such as panics.
This thesis focuses on EMOs that respond to natural emergency and disaster events, such as earthquakes, floods, or bushfire. This particular selection of case organisations makes it possible to exclude organisations such as police forces which use social media to communicate information during human-caused extreme events, such as terror attacks.

To summarise this section, whether an event is referred to as an incident or an emergency event depends on the size and impact of a particular event. Disasters, on the other hand, are a specific type of extreme event which push the usual emergency management procedures and systems to failure, because of unforeseen consequences, or because the procedures and systems are pushed across their limits. Inter-organisational collaboration and coordination above the normal organisational levels of collaboration are central to manage the effects of a disaster event.

### 2.2.1 Event Typology

Not every emergency management event is the same. It could be argued that all of these events have differences. The differences manifest themselves not only through the event severity, as discussed in the previous section; there are various differences caused by characteristics of an event type. The emergency management events exhibit event characteristics through which they can be classified and compared. Table 2.1 shows different event types with some of the relevant characteristics such as medium, agent, elapsed time to full effect of the event, lead time, area, etc.

The characteristics of an emergency event influence how an event can be managed by EMOs. For example, an event such as a bushfire or a flood can have a relatively long lead time from the time the event emerges up to when the full effect on communities or the environment is felt. This lead time gives EMOs the opportunity to warn and prepare communities that might be affected. In other event types such as tsunamis or earthquakes, there is either minimal to no lead time to the full effect of the event. A short lead time potentially results in the inability to warn communities, or a shortened warning period.
Table 2.1 Emergency Incident Types and Characteristics – reproduced from Bunker (2010)

<table>
<thead>
<tr>
<th>Medium</th>
<th>Agent</th>
<th>Elapsed Time</th>
<th>Lead Time</th>
<th>Amplitude</th>
<th>Magnitude</th>
<th>Area</th>
<th>Contri’s Potential</th>
<th>Local/ Social Impact</th>
<th>Plan Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bomb</td>
<td>Various</td>
<td>Explosive</td>
<td>Short</td>
<td>None</td>
<td>High</td>
<td>Various</td>
<td>Small</td>
<td>Good</td>
<td>Local/ Social</td>
</tr>
<tr>
<td>Bushfire</td>
<td>Fire</td>
<td>Natural Activities</td>
<td>Various</td>
<td>Long</td>
<td>Various</td>
<td>Various</td>
<td>Medium</td>
<td>Local</td>
<td>Good</td>
</tr>
<tr>
<td>Earthquake</td>
<td>Earth</td>
<td>Tectonic Activity</td>
<td>Short</td>
<td>Various</td>
<td>Various</td>
<td>Various</td>
<td>Poor</td>
<td>Local</td>
<td>Medium</td>
</tr>
<tr>
<td>Fire</td>
<td>Fire</td>
<td>Electrical/chemical</td>
<td>Short</td>
<td>None</td>
<td>Various</td>
<td>Various</td>
<td>Small</td>
<td>Good</td>
<td>Local/ Social</td>
</tr>
<tr>
<td>Floods</td>
<td>Water</td>
<td>Natural Activities</td>
<td>Long</td>
<td>Long</td>
<td>Various</td>
<td>Various</td>
<td>Poor</td>
<td>Local</td>
<td>Medium</td>
</tr>
<tr>
<td>Hazmat - land</td>
<td>Land</td>
<td>Chemical/organic/radiation</td>
<td>Various</td>
<td>None</td>
<td>Various</td>
<td>Various</td>
<td>Small</td>
<td>Good</td>
<td>Local/ Social</td>
</tr>
<tr>
<td>Hazmat - sea</td>
<td>Water</td>
<td>Chemical/organic/radiation</td>
<td>Various</td>
<td>None</td>
<td>Various</td>
<td>Various</td>
<td>Small/medium</td>
<td>Poor</td>
<td>Local/ social</td>
</tr>
<tr>
<td>Structural failure (transport, building etc)</td>
<td>Structure</td>
<td>Various</td>
<td>Short</td>
<td>Various</td>
<td>High</td>
<td>Various</td>
<td>Small</td>
<td>Medium</td>
<td>Local/ social</td>
</tr>
<tr>
<td>Pandemic</td>
<td>Air/water</td>
<td>Biological</td>
<td>Medium/Long</td>
<td>Medium</td>
<td>High</td>
<td>Various</td>
<td>Large</td>
<td>Poor</td>
<td>Social</td>
</tr>
<tr>
<td>Severe weather events</td>
<td>Air/water</td>
<td>Natural Activities</td>
<td>Various</td>
<td>Various</td>
<td>High</td>
<td>Various</td>
<td>Various</td>
<td>Poor</td>
<td>Local</td>
</tr>
<tr>
<td>Terrorist Act</td>
<td>Various</td>
<td>Various</td>
<td>Various</td>
<td>None</td>
<td>High</td>
<td>Various</td>
<td>Various</td>
<td>Poor</td>
<td>Local/ Social</td>
</tr>
<tr>
<td>Tsunami</td>
<td>Water</td>
<td>Natural Activities</td>
<td>Short</td>
<td>Short</td>
<td>Various</td>
<td>Various</td>
<td>Poor</td>
<td>Local/ Social</td>
<td>Medium</td>
</tr>
</tbody>
</table>

Large-scale emergency events, such as disasters or other extreme emergency events, are dynamic, emergent events that involve diverse stakeholders. Complex decision-making is required by these stakeholders. The disaster response systems, which support the decision-making and coordination of an event, need to account for the different characteristics of the emergency event. (Bunker et al. 2014).

The different emergency event characteristics also result in different requirements for Community Warning and Emergency Incident Response Systems (Bunker 2010), which are operated by different EMOs. As social media establishes itself as an additional communication channel between EMOs and their communities, these platforms are then used as additional community warning channels (Ehnis and Bunker 2012).

There are indications in the social media data of previous events that the event typology influences how EMOs are utilising and can utilise their social media channels to communicate with the individuals from the general public which are following the social media channels of these EMOs (Ehnis and Bunker 2013).
2.2.2 Phases of Disaster and Emergency Management

Large-scale emergency events have different phases in their manifestation. In a simplified form, an emergency event can be split up into the “pre-event” phase, the “event” itself and the “post-event” phase (Brian Houston 2012). Disaster and Emergency Management occurs in all three of these phases. The organised actions of EMOs are different in all of these distinctive phases. In the pre-disaster phase, the Risk Management and the preparation for a potential disaster takes place. In the “event” phase the organisations respond towards the effects of the event. Disaster Relief and the Disaster Recovery Management occurs typically in the “post-event” phase (Shaw and Krishnaumrthy 2009).

![Figure 2.2 Simplified phases of an emergency event](image-url)

2.2.2.1 Disaster Stage Taxonomy

Debate over the stages of an extreme event, such as a disaster, and its management can also be a matter of granularity. Powell and Raynor (Powell and Raynor 1952) identified seven different phases which they combined into a taxonomy. The taxonomy is shown in Figure 2.3. The identified phases are: Warning; Threat; Impact; Inventory; Rescue; Remedy; and Recovery.

The first two phases, “Warning” and “Threat” do not occur during in all disasters. Some large-scale emergency or disaster events could occur suddenly without any visible warning signs. For example, earthquakes or terror attacks. Other event types, such as the frequent bushfire and flooding events in Australia, do have a “Warning” and a “Threat” phase.

In the first phase, the “Warning” phase, there are signs that an emergency extreme event will most likely occur. EMOs prepare the public through information and warnings about the incoming event. In this phase, it is still not entirely clear whether the event will really occur or whether it is in the end much smaller than anticipated or it might not occur at all.
The “Threat” phase is seen as the phase right before an emergency event will happen. While the event has not yet occurred, it is clear that an event will happen. During this phase, the emergency response organisations continue to warn the public about the event and are preparing a specific response to the event.

![Disaster stage taxonomy by Powell and Raynor (1952)](image)

**Figure 2.3** Disaster stage taxonomy by Powell and Raynor (1952)

The “Impact” phase represents the impact of the event itself. Dependent on the event typology, this impact can be sudden or build up over time. Within this typology, there is no management of the event associated with this phase.

The emergency management starts in the fourth phase of the taxonomy, the “Inventory” phase. In this phase, exactly what happened is investigated, and the extent of the damage which was caused by the event is assessed.

The fifth phase (“Rescue”) is the response towards the event. EMOs attend to the effects of the event. In this phase, the visible emergency response takes place.

The following phase is called “Remedy”. In this phase, the non-life-threatening effects are addressed and responded to by EMOs.

The last and seventh phase is the “Recovery” from the event. In this phase, attempts are made to recover from the event to a state similar to how it was before the event. This phase can take a long time and is typically not supported by the organisations which actively responded to the event.
When focusing on the classification of pre-event, event, and post-event, then phase 1 and 2 would fall into the pre-event phase, the event phase would cover phases 3, 4, and 5 of the taxonomy; Phase 6 and 7 would be in the post-event phase. In all of these phases, there are important emergency and disaster management relevant activities. For this thesis, awareness about different phases of a disaster or extreme event is an important concept as social media is used for different purposes during these different phases by EMOs.

The phases in Powell and Raynor’s (1952) taxonomy are not clear cut in most extreme events. One phase does not necessarily end when another phase begins. This is especially the case for events which take place over a large area such as floods or bushfires, or for cascading events which build upon the effects of the event; for example, a potential health crisis caused by a flooding event.

2.2.2.2 Prevent, Prepare, Respond and Recover Model
EMOs typically structure their activities around the Prevent, Prepare, Respond and Recover (PPRR) model (Cronstedt 2002). The PPRR model evolved in the 1970s in the United States and defines a disaster in three phases: pre-event, event, and post-event. In Australia, this model backgrounds many processes of EMOs and their view of the emergency management domain (Bunker and Smith 2009).

Figure 2.4 Prevent Prepare Respond Recover (PPRR) Model as sequential phases in emergency management
The PPRR model is often seen as a sequential model. However, the model is intended as a comprehensive all-hazards approach towards emergency management, which takes into account that it is not enough to just wait for an emergency event to occur and then react towards the effects of the event (Koob 1998). The PPRR model is often represented in a sequential stage model, as shown in Figure 2.4, in which two stages of the model are in the pre-event phase, and two stages of the model take place in the post-disaster phase.

However, the PPRR model is intended to be seen as an integrated approach, or comprehensive approach towards emergency and disaster management. In this view, the PPRR model shows different aspects of emergency and disaster management in order to be effective in the countering of such disrupting events (Koob 1998, p. 24).

![Figure 2.5 PPRR Model as important aspects of emergency management](image)

The first component “Prevent” sometimes also known as “Mitigation”, refers to EMOs putting measures in place to prevent emergency events, or at least mitigate the effects (Koob 1998, p. 89). Such measures can be, for example, community education about different events and how they occur. Or in the case of bushfire prevention, there are back-burning operations in which the plant fuel load is reduced through controlled fires before the main bushfire season starts.
The second component of the PPRR model is “Prepare”. On the one hand, this component refers to the preparedness of EMOs so that all the resources and services which are needed during emergency events are in place to respond towards an event when needed. On the other hand, it refers to measures ensuring that the communities which might be affected by an event are able to cope with such an event. For example, this is supported through community education measures (Koob 1998, p. 88).

“Respond” refers to the classical emergency management. Depending on the event characteristics, the emergency response usually takes place immediately after an emergency event occurs or while such an event is still unfolding. Emergency management response and other EMOs try to counter the effects of an event and minimise these effects on the environment or the affected communities (Koob 1998, p. 94). Furthermore, the EMOs attempt to provide immediate relief towards the members of the community who were negatively affected by an event.

The last component of the PPRR model is “Recover”. This refers to a coordinated process to support affected communities in rebuilding the physical infrastructure back to a level as it was before an emergency event disrupted a community or multiple communities (Koob 1998, p. 92). However, recovery goes deeper than that. It also focuses on the support to ensure regaining emotional and economic wellbeing of communities.

2.3 Emergency Management Organisations
Emergency Management can be defined as “the discipline and profession of applying science, technology, planning and management to deal with extreme events that can injure or kill large numbers of people, do extensive damage to property, and disrupt community life” (Hoetmer 1991).

Emergency management and emergency response organisations are the organisations which perform most of the activities of government-led emergency and disaster management. These organisations are structured hierarchically and have command and control systems and processes in place.

The previous section, outlined some of the activities and responsibilities of these organisations during the different phases of the PPRR model which underlie most of these organisations. In
this section, EMOs are defined and some concepts which are important to understand their specific needs and constraints when it comes to the utilisation of social media for disaster management are described. In particular, large-scale volunteer organisations are outlined, as the case organisations in this study are of this particular type. Large-scale volunteer organisations are defined where a large amount of the members of the organisations volunteer their time to be part of the organisation.

Volunteers in this context are trained volunteers who are affiliated members of the organisation (Ranse and Carter 2010). This form of volunteering is in sharp contrast to untrained spontaneous volunteers who often attempt to provide their help after an emergency incident occurred (Shahid and Elbanna 2015). In the context of EMOs, volunteers are trained individuals who specialise in the core work of their specific organisation, for instance, fighting bush fires.

The EMO volunteers are required to complete a basic training course to become full members of their organisation. Over time and with increasing experience in their extreme event type, the members normally undertake additional specialised training. In order to ensure high training standards, the volunteer members of such organisations meet on a periodical basis to train together in order to stay prepared to respond to emergency events (Ranse and Carter 2010).

In the following three sub-sections, I outline the holonic nature of EMOs, focus on two modes of operation, and provide an introduction to the shift towards community resilience and community engagement.

2.3.1 Emergency Management Organisations as Holonic Systems
EMOs can be seen as hierarchically structured social systems with command and control mechanism in place. The whole organisation consists of several organisational units which in themselves consist of sub-organisational units.
Each sub-system when observed by itself can be seen as a complete and confined system. However, when seen in the context of the overarching organisation, it is just a small part of the organisation and not whole in itself.

To illustrate this, let us observe a simplified fire organisation. The organisation has a brigade which is part of a small rural town or village. A brigade is a fire station with firefighters and fire trucks. This particular brigade responds to the fire events associated with this town. When the fire events are not too big, the brigade responds to these events without support from other brigades of the organisation. From the perspective of the headquarters of the organisation, this particular brigade only receives the order to respond to a particular event. The brigade is thus a completely confined system with firefighters and fire trucks able to respond to emergency events.

To drill down a bit further, the brigade uses a fire truck to respond to the emergency event. This fire truck is also a complete and confined system which can respond to the fire. This system consists of the equipment and the different firefighters trained to fulfil their function. However, when we look at the overarching organisation, the fire truck is just a small part of the organisation, one unit under many. In other words, it is a subsystem of the overarching system. The fire truck belongs to a fire brigade in which a commander commands several fire trucks. The brigade is most likely part of a fire district. Several of these districts are structured into a region. Several regions themselves are then coordinated and controlled through the headquarters of the organisation.
On the other hand, the fire truck is also not atomic and consists of several subsystems. On this fire truck, we have several teams of firefighters, a driver and the truck commander, which are themselves a confined system. At the lowest level of the organisation, we have a firefighter trained in a specific way. So, in the system of a fire organisation, a single fire truck is both a confined system consisting of subsystems, and at the same time a subsystem itself.

The systems are a hierarchically structured emergency response organisation, with command and control patterns in place. The higher up we go on this hierarchy, the more the system has coordinating functions during an emergency event. While at the lower level of the hierarchy, the actual physical response towards a crisis event takes place and the command and control structures are stricter. Arthur Koestler created the term Holonic Systems to refer to systems which are constructed through hierarchically structured sub-systems (Koestler 1967).

Koestler used a parable of the two watchmakers\(^1\), which can be found in the footnote, to illustrate the view that parts of systems are at the same time components of an overarching system.

---

\(^1\) The Two Watchmakers

“There once were two watchmakers, named Bios and Mekhos, who made very fine watches. The phones in their workshops rang frequently; new customers were constantly calling them. However, Bios prospered while Mekhos became poorer and poorer. In the end, Mekhos lost his shop and worked as a mechanic for Bios. What was the reason behind this?

The watches consisted of about 1000 parts each. The watches that Mekhos made were designed such that, when he had to put down a partly assembled watch (for instance, to answer the phone), it immediately fell into pieces and had to be completely reassembled from the basic elements. On the other hand, Bios designed his watches so that he could put together sub-assemblies of about ten components each. Ten of these sub-assemblies could be put together to make a larger sub-assembly. Finally, ten of the larger sub-assemblies constituted the whole watch. When Bios had to put his watches down to attend to some interruption they did not break up into their elemental parts but only into their sub-assemblies.

Now, the watchmakers were each disturbed at the same rate of once per hundred assembly operations. However, due to their different assembly methods, it took Mekhos four thousand times longer than Bios to complete a single watch.”

*Herbert Simon (adapted from Ghost of the Machine) (Koestler 1967)*
system and a system itself. Koestler argues that this is valid for all systems when we look closely enough, but especially for social systems. Arthur Koestler defined this type of system as an Holonic System.

The word Holon refers to something which is at the same time a part of something and a whole in itself. “Holon” is constructed from the Greek word “holos”, which means whole, and the suffix “on”, which indicates that it is a part of something, as in “proton”.

Koestler argues that a system consists of structured sub-systems. He further argues that the system in itself is part of an overarching system. It only depends on the current viewpoint of the observer whether a system is seen as a complete system or rather as a subsystem. This characteristic of a holon is described by Koestler as Janus-faced. Derived from the Roman two-faced god of beginning and ending who looks up and down at the same time. Similar to Janus, the holon looks up being part of something bigger, and looks down into its sub-systems.

The individual sub-systems are autonomous units that operate independently to some extent. In the example of the volunteer EMOs, we could look at different units or brigades that respond to the effects of an event on the ground without the help of the central organisation. However, holons are still under the control of the overarching system.

When we observe EMOs, the structure of a holarchy is especially evident. Such organisations are typically constituted out of autarkic systems which are structured into the larger organisation. This is especially evident in the large volunteer organisations. For example, the state emergency services or rural fire services in Eastern Australia.

2.3.2 The two modes of operation of Emergency Management Organisations
EMOs operate in two different modes of operation: The day-to-day function, and emergency event operation wherein they respond to an event. The interview informants within the Case Organisations called the modes of operation the (1) operational mode, and the (2) non-operational mode. I am using this terminology when I refer to these two different modes of operation and their influence.
The operational mode refers to the classical emergency management activities necessary when an organisation responds towards an event. The activities would be clustered under the Respond dimension of the PPRR model.

The non-operational mode refers to the normal day-to-day function of the organisation. These include the activities necessary to run the organisation. For example, human resources, asset management, or finance activities, but also training and preparation for emergency events. Most staff members in the headquarters of the organisations have different responsibilities in the two modes of operation. One responsibility is their day-to-day job in the non-operational mode, and then they have responsibility relevant to emergency management during the operational mode.

It is important to highlight that not all parts of the organisation are in the operational mode at the same time. The different sub-systems, or holons, in the organisation operate to a certain extent independently and in autarkic fashion. Therefore, it is not necessarily the case that whole organisations switch from the non-operational mode into the operational mode. With the example of the fictional fire organisation used in the previous section, it is possible that there is a localised fire to which one brigade is responding. In this case, the brigade switches from its non-operational mode into the operational mode. However, the rest of the organisation is still in the non-operational mode. In the case that the fire is expanding and more resources are necessary to counter the event, more parts of the organisation switch into the operational mode.

2.3.3 Paradigm shift towards Community Engagement and Community Resilience

In the recent years, there has been a shift in the Australian Emergency Management sector from seeing the general public as something that needs to be protected to strengthening communities as a valuable resource to mitigate the effects of an emergency event.

In the past, Emergency response organisations in Australia only had a minor role in the recovery phase of emergency extreme events. The traditional role of the EMOs involved containing an emergency incident and reducing the effects of such an incident. Their focus was ensuring the least loss of life and property in emergency events (Bunker and Sleigh 2016). This
view has changed in recent years towards community resilience. A catalysing event to advance this shift of focus were the Black Saturday Bushfires in Victoria in 2009².

The Victorian 2009 Bushfire Royal Commission analysed the event and its management (Victorian Bushfires Royal Commission 2010). The Commission and its report had a significant impact on the Australian Emergency Management sector (Bunker and Sleigh 2016). Following this report, the emergency management paradigm shifted more towards community support for and during emergency extreme events.

This shift resulted in community resilience and education projects in which the community is actively prepared for potential emergency events. It is clear that communities need to lead their own recovery. In addition, the state and EMOs have assisted the communities with financial and other resources as well as with advice (Bunker and Sleigh 2016).

Social media services are one aspect through which EMOs are supporting community resilience. These EMOs are utilising their social media communication channels to educate the community and to provide emergency relevant information and advice (Ehnis and Bunker 2013).

2.4 Social Media
In the previous sections, the background for the concepts of emergency management used within this thesis were provided. This included an outline of emergency events, and characteristics of large-scale volunteer emergency response organisations as a subset of hierarchically structured organisations. In the following section, specifics of social media technology are focused on. Social media is firstly defined, examples of specific social media technologies are provided which could be and are currently in use within the emergency management field.

² The Black Saturday bushfires were one of the most devastating bushfire disasters in Australia. The event brought the existing disaster and emergency management structures to failure and in its aftermath the coordination between emergency management organisations in the state Victoria was reformed. The Black Saturday Bushfires were one of the most devastating bushfire disasters in Australia. The event consisted of a series of bushfires in the state of Victoria in February 2009. The most damaging fire events occurred at Saturday the 7th of February 2009. In total 173 people lost their lives, and 414 people were injured during the fires. More than 2000 buildings were destroyed during the extreme event (Victorian Bushfires Royal Commission 2010).
2.4.1 The Concept of Social Media

Social media as we know it in its current form started to emerge with the shift in thinking from the Internet as a channel to distributed static information, to the so-called Web 2.0 in the early 2000s (O'Reilly 2005) where the user is not a passive consumer, but rather a co-creator of information. Social media in itself is an umbrella term which includes a variety of different technologies and design practices; all of which have their core in the creation and exchange of user-generated content (Kaplan and Haenlein 2010).

The underlying structure of social media is nothing new; as Kane et al. (Kane et al. 2014) outline, it is difficult to clearly categorise social media technologies from pre-descending collaborative Information System technologies such as USENET (Butler 2001), group decision support systems (Poole and DeSanctis 1989), or knowledge management systems (Alavi and Leidner 2001). The core concept of social media technology is user-generated content (Kaplan and Haenlein 2010). The previously mentioned technologies also focus on user-generated content within their core. It can be argued that social media is not a technological advancement, but rather, a specific shift in design principles of how social platforms are designed and used.

The two large platforms which are closely associated with the term social media are the microblogging platform Twitter and the social networking site Facebook; Twitter was established in 2006 and Facebook in 2004. The technologies have been only around for the last decade in these forms, but are largely influenced by how we in western society consume news (Gil de Zúñiga 2012), interact with friends and families (Boyd and Ellison 2008), share information about our personal life's (Boyd and Ellison 2008), interact with people we do not have existing offline relationships such as celebrities (Kane et al. 2014), or create and consume information (Kane and Fichman 2009).

So what do we actually mean when we talk about social media? The term “social media” as we know it emerged with the so-called Web 2.0 in the early 2000s (O'Reilly 2005). It is less a specific technology but rather design principles for internet based platforms (Kaplan and Haenlein 2010). The integral part of social media is the user-generated content (Kaplan and Haenlein 2010).

Social media has been widely adopted, however, the specific understanding of the technological impact for organisational purposes is only still in its infancy (Kane et al. 2014).
Social media technologies, especially with the advent of smartphones and other mobile devices, highly influenced how people communicate in day-to-day interactions and during extreme events (Chew and Eysenbach 2010; Mirbabaie et al. 2014). EMOs have started to integrate social media services (Bruns et al. 2012; Ehnis and Bunker 2013; Latonero and Shklovski 2013; Potter 2016; Procter et al. 2013) into their communication practices. The early adoption in the emergency management sector began after social media services were widely adopted around 2007 (Latonero and Shklovski 2010; Sutton et al. 2008).

In Australia, the early adoption for the case organisations started around 2009. The Queensland Floods in 2011 (Bruns et al. 2012; Ehnis and Bunker 2012) were a defining moment for social media utilisation in the Australian Emergency Management sector. During this extreme event, the Queensland Police Service (Queensland Police Service - Media and Public Affairs Branch 2011) demonstrated that social media is a valuable tool to communicate information towards the general public during times of emergency. Afterwards, the remaining larger Australian emergency response organisations intensified their social media engagement. It is not a surprise that the utilisation of social media services for emergency management purposes is still in its infancy, however, as social media technologies are fast-changing and evolving. We still do not fully grasp or understand the implications for EMOs and their practices on how they respond to extreme events and disasters.

While EMOs are aware of different social media channels, their main utilisation for emergency management are the social microblogging platform Twitter and the social networking site Facebook (Fosso Wamba and Edwards 2014); remaining social media technologies have a supporting role. In the following section, an overview of social media technologies is described and their link to the emergency management field is outlined.

2.4.2 Relevant Social Media Technologies
Figure 2.7 shows different manifestations of social media technologies as particular platforms. Nowadays, it can be difficult to classify a particular social media platform to a specific social media technology. The technological boundaries between platforms are disappearing. As different providers introduce features into their platforms, boundaries showing the core of a social media technology are being blurred (Kane et al. 2014). For example, Twitter has several capabilities which would be associated with social networking sites; Facebook, on the other hand, has broad microblogging capabilities. Both platforms have capabilities for content
sharing, such as the sharing of images and videos. These factors make it more difficult to classify what can be counted as a specific social media technology and what cannot (Kane et al. 2014). Different examples of social media technologies are now discussed and the link to their usage function in the emergency management field is described.

![Diagram of Social Media Technologies]

**Figure 2.7 Selection of Different Social Media Technologies**

### 2.4.2.1 Social Networking Sites

Originally social networking sites referred to websites, but with the ascent of mobile technology such as smartphones, social networking sites extended themselves into integrated platforms which are not bound to the form of a website (Ellison and Boyd 2013).

Social networking sites can be defined in several different ways. It becomes more difficult over time to show what the core functionalities of such social networking sites are since the platforms continue to add additional functionalities. Kane et al. (Kane et al. 2014) build their definition of social networking sites around the definition described by Boyd and Ellison (2008). This particular view defines social networking sites as Internet-based services, which allow their users: to (1) have a unique user profile constructed by the user, by members of their
network, and by the platform; (2) access digital content and protect it from various search mechanisms provided by the platform; (3) can articulate a list of other users with whom they share relational connection; and (4) view and traverse their connections and those made by others on the platform (Kane et al. 2014).

Social networking sites are platforms on which users create a representation of their social network; these social networks do not necessarily represent the offline social networks of the particular users. A participant on a social networking platform can interact with other users of their particular social network through that social networking platform. The connections between users of the platform are normally bidirectional; this means that one user is instigating a connection between two user accounts. The user who receives a request to build a connection between the user accounts needs to agree to it. After the connection is established both users receive the information the other person is sharing on their user profile. This, of course, is ignoring the privacy settings and filtering capacities of the particular social media platform.

Social networking sites often have a second type of user profile intended for organisations, interest groups, or celebrities. On Facebook, this type of user profile is called “Pages”. For simplification, this special user profile can also be described as a ‘page’ in the more general concept of social networking site in general. These types of profiles have a unidirectional connection. When a particular user is interested in receiving the shared information from a page, they can establish a connection with this special user profile. Afterwards, the user who established the connection will receive all shared information from the page, but not the other way around.

EMOs which are active on social networking sites have established one or multiple pages for their organisations. The users who are interested in information which is provided by the EMOs through the social networking site are following the pages of the particular EMO. The users who are following an EMO are referred to as the “listening community” within this thesis since they have actively requested to receive information from the organisation (Ehnis and Bunker 2013).

2.4.2.2 Microblogging Platforms
The intention of microblogging is to share short messages, often restricted in their size. The most famous example of a social microblogging platform is Twitter which is a platform where
users can share short messages with a limit of 140 characters. Twitter also has a lot of capabilities of a social networking site, such as profiles or the ability to connect with other users; however, the platform’s main focus is the sharing of the short messages and can, therefore, be classified as a microblogging service. The other social networking capabilities, such as user profiles, have less dominant roles within this platform (Kwak et al. 2010).

The user connections are often one-way, and not two-way as in several classical social networking sites. On Twitter, users follow another user, which means they establish a one-way connection with this user. When the followed user shares a particular message, then the followers of this user will receive this message on their personal Twitter interface or connecting client. However, the followed user will not see the messages of the following users. If both users want to receive messages of the other user, they need to follow each other.

Twitter data has favourable characteristics for conducting social media research studies (Stieglitz et al. 2014). For example, Tweets are generally visible to everyone on the Twitter platform since Twitter has a much more simplified privacy model than, for example, Facebook. This makes it relatively easy to collect Twitter data and analyse the datasets. Facebook, in contrast, has very detailed privacy settings of who can receive specific messages. For example, “friends” only, or also “friends” of “friends”, or only specific “friends”. This makes it very difficult to collect large datasets for research purposes.

The social microblogging platform Twitter and the social networking site Facebook often build the core of the social media capabilities of EMOs (Ehnis et al. 2014; Fosso Wamba and Edwards 2014; Heverin and Zach 2010; Potter 2016; Procter et al. 2013); as shown in Chapter 6, all the Case Organisations within this thesis are utilising these two platforms as their primary platforms for emergency management. The remaining social media services are seen as supplementary support platforms. EMOs are not focused on the social networking capabilities of Facebook, but rather on the microblogging capabilities to send emergency management relevant messages and other information towards their listening communities (Ehnis and Bunker 2012; Ehnis and Bunker 2013).

2.4.2.3 Image and Video Sharing Platforms
Image and video sharing platforms are platforms which are used to share media content such as photos or video material (Kaplan and Haenlein 2010).
For emergency management, there are broad applications for such technologies. On the one hand these platforms are used by the public to share event relevant images or videos. On the other hand, EMOs are utilising such platforms to share information about their organisations and for emergency management purposes, such as community education.

One of the biggest video sharing platforms is YouTube. Examples for image sharing platforms are Instagram or Flickr.

2.4.2.4 Wikis
Wikis are platforms for knowledge management. These platforms consist of collections of often interlinked webpages, which refer to each other. Users of Wikis can not just access the information which is stored in the wikis; they can also change or contribute to this information. The most famous example for a Wiki is the online encyclopaedia Wikipedia.

For emergency management wikis can be utilised for internal and external knowledge management. Internal knowledge management would refer to information which is shared and managed within the organisations; external knowledge management would refer to information which is shared with other organisations for example the public. EMOs utilised wikis to share knowledge between different organisations during the management of the effects of the Haiti earthquake in 2010 (Yates and Paquette 2011).

2.4.2.5 Collaborative Maps
Collaborative web maps is a crowdsourcing (Estellés-Arolas and González-Ladrón-De-Guevara 2012) approach where users create and annotate maps through specialised social media platforms (Shahid and Elbanna 2015). The Ushahidi project is one the best-known initiative of crowdsourced collaborative mapping (Morrow et al. 2011). This project was initiated during the Haiti earthquake in 2010 (Morrow et al. 2011; Yates and Paquette 2011) in support to provide maps for the emergency response.

Another very successful crowd mapping project was that which was created during the Typhoon Haiyan response. The typhoon hit the Philippines in November 2013. The maps created during this mapping initiative were used in the coordinated response and recovery of the event (Shahid and Elbanna 2015).
Case organisations studied in this project are interested in crowd mapping approaches and data, however, these approaches, or maps resulting from these approaches, are not currently being utilised within the case organisations for emergency management purposes.

### 2.5 Summary

The purpose of this chapter was to provide a background of relevant concepts for emergency management used in this thesis. The chapter was structured in three parts: A section on emergency events and their different phases (section 2.2); a section on EMOs (section 2.3); and a section on social media (section 2.4).

Emergency events are referred to by different names, such as incidents, emergency event, or disaster. How an event is referred to depends on its size as well as on the event typology. Different ways of how the various phases of emergency and disaster management are structured have also been described: Brian Houston’s (2012) three phase model, Powell and Raynor (1952) more detailed disaster stage taxonomy, and the broadly used Prevent, Prepare, Respond and Recover Model (PPRR).

The PPRR model is often seen as a disaster stage model, however, it is actually intended as a comprehensive underlying model addressing the different aspects of emergency management. The PPRR model is used as a basis for most emergency management relevant activities in Australian EMOs.

EMOs are hierarchical organisations with strict command and control systems in place. Koestler’s (Koestler 1967) concept of Holonic Systems was introduced as a lens to highlight the partially independent autarkic sub-systems of such organisations, which are still highly integrated and depended on the overall organisation (system).

Emergency organisations operate in two modes of operation: the ‘operational mode’, and the ‘non-operational’ mode. The ‘operational mode’ is the mode in which the organisation is responding towards an emergency event, and the ‘non-operational’ mode is the mode of the day-to-day operation. The switch from one mode of operation into the other can be fluid, and not all parts of the operation are necessarily in the same mode of operation at the same time.
Social media services are Internet-based platforms with the focus on user-generated content (Kane et al. 2014; Kaplan and Haenlein 2010). These platforms are less specific technologies, but rather, design principles on how to develop internet based platforms (Kaplan and Haenlein 2010). Nowadays, social media platforms are difficult to classify into specific categories as the borders of capabilities of these platforms are getting blurred through the introduction of similar features (Kane et al. 2014). Different social media technology types are used in different ways by EMOs for emergency and disaster management.

In the next Chapter, the results of the literature review about social media in disaster management are described, with the focus on the utilisation of social media services in EMOs.
Chapter 3 - Literature Review and Research Objectives

*The progress of science is strewn, like an ancient desert trail, with the bleached skeleton of discarded theories which once seemed to possess eternal life.*

Arthur Koestler (1959)

3.1 Introduction

In the endeavour to create knowledge, it is inevitable to engage with the existing literature contributing to the relevant body of knowledge; in other words, to know where we are going we need to understand where we are coming from.

In the third section of the previous chapter, the concept of social media is linked to emergency and disaster management operations. In this chapter, the relevant literature describing of what we know about social media utilisation in emergency and disaster management and particular how EMOs utilise social media technologies is outlined. From the literature, a research gap and the research questions are identified, which are later answered in this thesis.

As shown in Figure 3.1, the Chapter is structured as follows. First, in section 3.2 the approach used to analyse the literature is described. Afterwards, in section 3.3 an overview of the current literature of social media in disaster management is outlined. The literature review resulted in four clusters of distinct research areas. These four research areas include: the potential of social media for disaster management (section 3.3.1); structure and behaviour of whole occurring communication networks during disasters and other extreme events (section 3.3.2); the investigation of why and for what the general public is using social media in extreme events (section 3.3.3); and research about social media utilisation of EMOs (section 3.3.4). The intention of the first three clusters is to outline the research context, while the fourth cluster is used to unwrap our current understanding of how EMOs have integrated social media services into their organisations. Furthermore, this fourth cluster also highlights the gap in our current knowledge.

Following the results of the literature review, in section 3.4 a framework of social media in disaster management, which was created by Ashir Ahmed (2011) is closely analysed. This framework was used as an underlying lens during this research, and is extended through the result of the data analysis in Chapter 7.
The last section (3.5) of the chapter highlights the research aims of this thesis and shows the research questions derived from the literature analysis.

**Figure 3.1 Outline Chapter 3**

### 3.2 Literature Review Approach

There are several approaches on how literature review could be conducted (Boell and Cecez-Kecmanovic 2014; vom Brocke et al. 2015). All of these approaches have advantages and disadvantages. For example, in structured literature reviews (vom Brocke et al. 2015), it is possible that the researcher is overburdened by the vast amount of available literature and it is not possible to analyse the collected articles in a meaningful way (Boell and Cecez-Kecmanovic 2015). On the other hand, in a hermeneutic literature review (Boell and Cecez-Kecmanovic 2014) approach it is possible that the researcher misses an important piece of relevant literature.

For this thesis, a hermeneutic literature review approach as described by Boell and Cecez-Kecmanovic (2014) was followed. The basic idea behind this approach is that the literature review is divided into two intertwined iterative hermeneutic cycles, as shown in Figure 3.2. The first cycle is the search and acquisition, and the second circle is the analysis and interpretation.
The researcher already has some idea or preconceived understanding about the research area before a project is started. With these preconceived ideas, the researcher then acquires relevant literature. The initial search for literature is typically done through keyword searches in relevant literature databases. Relevant literature is selected and acquired then more literature is selected as a result of analytical reading of the already selected literature. By analytical reading of the relevant literature, the researcher can switch into the second hermeneutic cycle of analysing and interpreting. There the literature is mapped and classified and critically assessed. With the help of the literature, the argument is further developed, and the research problem is further defined. The researcher switches back into the first hermeneutic cycle to search and acquire more relevant literature to define the argument further. The researcher leaves the hermeneutic cycles when the acquired additional literature becomes no longer helpful in refining the argument.

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The initial literature acquisition was done through keyword searches in the literature databases Scopus and Google Scholar. These searches were repeated on a periodical basis throughout the project to ensure that important literature published while the research was being conducted was included. From this set of literature, a snowballed analysis of the literature was conducted.
following the hermeneutic literature review framework as described above. The results of the literature review are presented in the following section.

3.3 Resulting Literature Review of Social Media in Emergency and Disaster Management

Social media services are already an established component in the emerging extreme event communication practices even though their integration into EMOs is not well understood. Social media in extreme event communication could be already observed on a local scale (Sutton et al. 2008) shortly after Facebook and Twitter established themselves over a decade ago.

On a global scale, interest on social media as a relevant crisis communication media for emergency and disaster management emerged in 2010 through the Haiti earthquake (Yates and Paquette 2011). The defining event for the Australian emergency management sector were the 2011 Queensland Floods which showed that social media services are useful and integral communication channels to communicate relevant event information from emergency organisations towards the public (Bruns et al. 2012; Ehnis and Bunker 2012; Queensland Police Service - Media and Public Affairs Branch 2011).

Social media communication accompanies every major extreme event. Scholars are analysing the communication behaviours around such events. Events in which social media data were studied include, but not limited to, the 2007 Southern California Wildfire (Sutton et al. 2008), Virginia Tech shootings in 2007 (Palen et al. 2009; Vieweg et al. 2008), the 2008 Mumbai Terror Attacks (Goolsby 2010; Oh et al. 2010), the 2010 Haiti earthquake (Starbird and Palen 2011; Yates and Paquette 2011), the 2010 Deepwater Horizon Oil Spill (Sutton et al. 2012), the 2011 Queensland Floods (Bruns 2011; Bruns et al. 2012; Cheong and Cheong 2011; Ehnis and Bunker 2012), the 2011 London Riots (Procter et al. 2013), the 2011 Christchurch earthquakes (Bunker et al. 2013), the 2013 Boston Marathon Bombing (Ehnis and Bunker 2013), Hurricane Sandy in 2012 (Lachlan et al. 2014), the Nepal earthquakes in 2015 (Subba and Bui 2017), or the Brussel Terror Attacks in 2016 (Stieglitz et al. 2017).

The review of the literature resulted in four distinct groups of research areas: (1) the potential of social media for disaster management, (2) structure and behaviour of emerging emergency social media communication networks, (3) research of why and for what purposes the general
public is using social media in extreme events, and (4) research about social media utilisation of EMOs. In the followings sections, these research streams are outlined and discussed.

3.3.1 Potential of Social Media in Emergency and Disaster Management

Overall, there is a broad potential for social media services in EMOs for the purposes of emergency and disaster management. Social media has the possibilities of one-to-many, one-to-one, many-to-one, and many-to-many communication; this is a valuable contribution for the classical communication channel, which is either one-to-one communication or a one-to-many broadcasting channel. Social media is not restricted to be used as a one-way information “megaphone”, but can be as well used as two-way information dissemination and communication channel (Ahmed 2011; Ehnis and Bunker 2012; Palen and Liu 2007; Potter 2016). Furthermore, this information technology has the structure to be used as a peer-to-peer citizen participation platform (Bruns 2011). The crowd-sourced distributed mapping platform Ushahidi (Morrow et al. 2011) is a good example of such a participation platform (Bruns 2011). Social media can contribute to community emergency preparedness and response to emergency events (Palen and Liu 2007). For disaster management purposes, social media technology is not limited to be used for long-term follower relationships, but also to support disaster management as an ad-hoc crisis communication and collaboration platform (Goolsby 2010).

Social media can assist EMOs with the opportunity to gather information from the affected area of the disaster event and evaluate this information outside the disaster zone. This information, which can come from witnesses and first responders, can be available at a very early stage of the disaster response, but possibly may not be fully correct. Nevertheless, this information can give the EMOs an initial detailed impression of the event (Underwood 2010). A threat is that rumours can spread like wildfires over these channels, but research has shown that virtual social networks tend to favour valid information over rumours while suppressing rumours and false information over time (Castillo et al. 2011).

Ashir Ahmed (Ahmed 2011) developed a framework on the use of social media in disaster management. This framework was built with the help of interim results of a research in progress study about the potential of the use of social media in natural disasters in Australia. The view on social media concentrates on microblogging and image and video sharing platforms. Social media is seen as a communication and information dissemination channel. The relevant social
media communication is divided into three communication dimensions: agency-to-agency, community-to-community, and agency-to-community.

The agency-to-agency dimension refers to communication between agencies through social media. The dimension of social media in the community-to-community interaction refers to the communication between the general public. This kind of communication emerges during every major extreme event. The community often interacts in self-organising practices during the extreme event; an example of social media for self-organisation would be the Christchurch Student Volunteer Army, which started to use publicly available social media services as a platform to create an organised volunteer relief after several local earthquake events (Bunker et al. 2013). The third dimension, the agency-to-community interaction, refers to the communication between EMOs and the community. An example for agency-community interaction would be the social media usage of the Queensland police service during the Queensland floods in 2011 (Bruns et al. 2012). In this thesis, the agency-to-community and agency-to-agency communication dimensions are explored. Ahmed’s (2011) framework is used as an underlying lens for this research and is looked at in more detail in section 3.4 and later in Chapter 7.

3.3.2 Structure and Behaviour of Emergency Social Media Communication Networks

There is a broad research stream that investigates the emerging communication networks occurring through social media during extreme events. This research focuses on different interaction patterns of the participating actors and explores why these patterns are in place. As a data source, most of these studies investigate Twitter datasets collected during different extreme events. The reason for using Twitter as a data source is the relatively simple privacy structure of this platform (Stieglitz et al. 2014); Tweets can either be private or public. Facebook, on the other hand, has a very complex privacy structure underneath in which a user can decide what kinds of posts are visible for which user-groups.

Vieweg et al. (2010) analysed and compared Twitter messages broadcasted during two emergency events in 2009; One of the events was a grassfire event, and the other one was a flooding event. The aim of the study was to understand to what extent microblogging data could be used for situational awareness for both EMOs and the general public. Only a small number of tweets have geo-location data added with latitude and longitude; still, the study
showed, that the geo-location in additional tweets could be crudely inferred through information from the message in a tweet itself. The tweets were coded into different situational categories, which indicated that social media messages have a high potential to be used to build situational awareness about ongoing emergency events. Herfort et al. (2014) found that Tweets which were posted geographically close to an emergency event are often more emergency management relevant. While the further away from an event a Tweet is posted, the more it contains only commentary information.

The floods of Eastern Australia in 2011 is a well-studied event. These were serious flooding events that happened in all three Eastern States in Australia (Queensland, New South Wales, and Victoria). The most prominent flood events were the floods in Queensland, which are often referred to as the 2011 Queensland Floods. Social networking analysis techniques were applied to identify active social media actors and their opportunity to disseminate information in order to examine the emerging online networks during the Australian floods in Queensland, New South Wales and Victoria in 2010/2011 (Cheong and Cheong 2011). The study showed that local authorities, especially the Queensland Police Service, were very active in the distribution of relevant information about the emergency event, in contrast to the local authorities in New South Wales and Victoria which were rather inactive. Cheong and Cheong (2011) suggested that social media should be more integrated into EMOs in Australia. The Twitter and Facebook activity of the Queensland Police Service during the Queensland floods showed other Australian EMOs that social media services can be an effective tool to communicate and interact with the general public during an emergency event and was an active driver for further adoption of social media in Australian EMOs.

Content and network analysis techniques were also applied in a study about the Queensland floods of 2010/2011 to understand the shape of the emerging communication network and the communication practices (Bruns et al. 2012). During the time of the extreme event, the Queensland Police Service (Bruns et al. 2012; Ehnis and Bunker 2012; Queensland Police Service - Media and Public Affairs Branch 2011) had an active account, from which messages were extensively shared through the evolving communication network for the entire duration of the extreme event. The study showed that more Tweets were re-tweeted (between 50% to 60%) than original Tweets were created. Members of the general public are tending to share information rather than create it; this pattern can also be found in other studies (Fraustino et al. 2012). A significant amount of Tweets (30%-40%) contained links to information sources
outside of Twitter, and a lot of users tried to act as amplifiers of information actively. These users tried to aggregate and share trustworthy information about the event. In the dataset, media organisations and EMOs were the most visible actors. The mainstream media not only used Twitter as a tool to broadcast its news, but also as a tool acting as a news source.

The online information exchange behaviour of different US state and federal organisations during the 2010 Deepwater Horizon oil spill disaster was analysed by Sutton et al. (2012). The study used an extensive Twitter dataset as a data source (Sutton et al. 2012). The study showed that the re-tweet ratio of information from other organisations was very low, which is an indicator that most of the organisations do not use Twitter to gather information. It could be shown that most of the organisations used their Twitter account to broadcast internally sourced information (Sutton et al. 2012), this is in contrast to what we expect to see from user accounts from the general public who tend to share information from others instead of creating such information (Fraustino et al. 2012) themselves.

Ehnis et al. (2014) and Mirbabaie et al. (2014) analysed the communication behaviour around the 2013 Labour Day marches at the first of May in Germany. This planned public event was studied as a proxy for an extreme event. The study showed that: EMOs and media organisations are the most visible actors during such an event; EMOs are contributing, in comparison to other actors in the network, relatively little content in the communication streams; and that the content they are contributing is then rapidly shared. Media organisations are also contributing and consuming extreme event communication. These organisations use social media communication in their reporting and add additional information, through their reporting messages, towards social media. Media organisations actively distribute the information from EMOs. Social media has the potential to build new user roles, such as citizen journalists, and other hubs of information aggregators, however, traditional roles in a non-digital world are present and highly valued by the users in these communication networks. Swift trust is built through role attributes that emerge from a non-social media presence. The authors are using their analysis as a basis for further research in unplanned extreme events to better understand whether these patterns can also be found in these slightly different types of extreme events.

Another problem with emerging social media communication networks is that rumours and false information can spread like wildfires (Castillo et al. 2011; Mendoza et al. 2010). Over time, these rumours and false information tend to be self-corrected by the different
communities on the social media platforms (Mendoza et al. 2010). However, one aspect of the EMO utilisation of social media services is to correct such rumours and false information (Ehnis and Bunker 2013; Subba and Bui 2017). Since rumours and false information can have devastating effects on the outcome of an emergency event, there are broad research initiatives focusing on the identification of such rumours (Bunker and Sleigh 2016; Gupta et al. 2013; Jin et al. 2014; Jong and Dückers 2016; Liu et al. 2014; Lukasik et al. 2015; Ma et al. 2015; Tanaka et al. 2013; Zubiaga et al. 2015).

3.3.3 General Public use of Social Media during Emergency Events

For the general public, social media has an integral function to satisfy information needs during extreme events. Why the general public uses social media in normal times and times of crisis is highlighted in a report (Fraustino et al. 2012) published by the US National Consortium for the Study of Terrorism and Responses to Terrorism (START). This report reviews the existing literature on the topic. According to the report, there are three different active social media user types: “social media creators”, “social media followers”, and “social media inactives”. The first group creates original content, the second group mainly consumes the available content, and the final group does not use Social Media services during extreme events. Members of the public tend to prefer sharing information from other accounts and sources instead of creating original information in Social Media.

One of the major reasons why individuals use social media during a crisis is to check on their family and friends. For example, after the 9/11 Terror Attacks in 2001, there were attempts to create Wikis by individuals from the public to find missing relatives and friends (Palen and Liu 2007). Also, individuals use social media to fulfil their information needs by seeking information about the on-going crisis event. When the classical media coverage is not sufficient, social media is used to close the coverage gap (Sutton 2010). This could be demonstrated in the case of the 2007 Southern California Wildfire (Sutton et al. 2008) and the 2008 Mumbai Terror Attacks (Goolsby 2010; Oh et al. 2010). The general public seems to not only be passive in receiving information; it appears they also want to engage and contribute in solving crises or disasters. By projecting theory about self-organising to the case of the 2010 Haiti earthquake, behaviours and mechanisms of self-organisation of “digital volunteers” were highlighted in a study (Starbird and Palen 2011). Self-organisation of community groups during extreme events appears to be a common phenomenon. Further examples include the London
Riots 2011 (Glasgow and Fink 2013) and the Student Volunteer Army during the Christchurch earthquakes in 2010 and 2011 (Bunker et al. 2013).

3.3.4 Emergency Management Organisations use of Social Media

Government organisations have developed a social media presence (Alam and Walker 2011; Mergel 2012) to interact with their communities online. This is also the case for EMOs which also have started to adopt social media services (San et al. 2013) as a part of their communication portfolio. This adoption is often only partially voluntary. There are internal and external factors that can drive the decision for such an organisation to adopt social media. An important internal factor is the perceived benefits of utilising social media services; the platforms can be used to communicate directly with a large audience. External factors are factors which the organisation has no influence on, such as when the general public uses Social Media during disasters even without the presence of EMOs. When official information is not available, the public will fulfil their communication needs through other means (Fosso Wamba et al. 2012; Sutton 2010) which can make false information more impactful. EMOs are better able to guide and moderate social media communication through their participation on these platforms since they are seen as a trustworthy source of information.

It can be argued that EMOs have unique features which are absent in commercial organisation using social media services (Fosso Wamba et al. 2012). Therefore, the knowledge of social media adoption in commercial organisations cannot be directly transferred to EMOs. Different types of organisations have different needs and requirements. EMOs are responsible for warning and informing the general public during emergency events, with a particular focus on the trustworthiness of social media information as well as the potential impact. Additionally, social media activity needs to support the aims of EMOs in different phases of the PPRR model. Many larger EMOs, such as the case organisations in this study, have a large volunteer member base. Social media activity needs be moderated to suit the holonic nature of these specific types of organisations.

Social media is seen by many organisations as “an experiment in an unknown problem space” (Mergel 2013) the best practices have not yet emerged, and still need to be explored. Social media activities provide a lot of potential benefits to EMOs, such as the ability to communicate directly with large numbers of the general public or the media, however, there are also many
risks associated with the social media utilisation. EMOs are historically risk averse and view new technologies critically.

We are still in the process of developing our understanding of the impact of social media technology on EMOs; we need to explore how social media technology is utilised in the daily operations of EMOs and during extreme events. San et al. (2013) explored through survey research what knowledge about social media exists in US emergency services organisations and whether these organisations are using social media services in their operations. Most of the respondents of the survey were at least familiar with the concept of social media services for EMOs. Most of the participating organisations had their own social media presence, however, most of these social media activities were built in an ad-hoc fashion, and the organisations had only basic posting capabilities. Social media services as a data source to build situational awareness is rare. In the few cases that it is done, it is a highly manual endeavour and cannot be scaled up for bigger events. Fosso Wamba and Edwards (2014) had similar findings in their study about social media adoption in an Australian EMO.

Artman et al. (2011) argue that EMOs need to adjust their communication strategies towards the medium in order to be effective in the social media domain. Their paper introduces two concepts: dialogical emergency management and strategic awareness. Dialogical emergency management refers to the active monitoring of messages in the social media communication network to actively adjust the communication strategy dependent on these posts. Strategic awareness refers to being aware of the understanding of the receivers of the emergency information available as well as the emergency event itself. EMOs would need to see the receiver of the message, in other words, the general public, as a co-creator of the emergency communication and not just a recipient.

Yates and Paquette (2011) investigated the use of knowledge management technology by EMOs. The study was based on the case of the 2010 Haitian earthquake. The organisations were using Wikis and Microsoft’s SharePoint for internal knowledge management. These tools, when used properly, can be beneficial to build collaborative knowledge that can be shared and reused. This still does not come without significant challenges; the data needs to be constantly validated and checked. With a large amount of data flowing into the systems of EMOs, this can be a difficult task to implement.
Several studies have investigated how EMOs utilise social media by analysing the social media communication of the organisation during extreme events (Bruns et al. 2012; Ehnis and Bunker 2012; Ehnis and Bunker 2013; Procter et al. 2013), or in times of normal operations (Crump 2011; Heverin and Zach 2010). These studies analyse the social media utilisation from outside of the organisation and not from within the organisation. While this helps us better understand how EMOs utilise their social media presence, it gives only a very limited account on how the social media services are embedded within the communication portfolios of the organisation.

In times of normal operation, it was analysed what kind of information police departments share on their Twitter accounts by examining the use of Twitter from different US (Heverin and Zach 2010) and UK police departments (Crump 2011). The organisations share incident information about their specific emergency type, utilise social media to educate and inform the public about emergency events, and they utilise the channels to engage with the public in a two-way communication.

As shown in Chapter 2, EMOs operate in two modes of operation, the operational mode and the non-operational mode. We only have limited knowledge from the literature about how EMOs use their social media channels in the non-operational mode, however, we know more about the operational mode utilisation of social media communication through several studies. In Australia, the communication of the Queensland police service during the 2011 Queensland floods was analysed from different perspectives (Bruns et al. 2012); (Ehnis and Bunker 2012). Bruns et al. (2012) focused on the influence of the Queensland Police Service on the overall communication network on Twitter. A study by Ehnis and Bunker (2012) analysed the specific information dissemination behaviour of EMOs by applying genre analysis as a lens. In a further study, this dataset was compared with the broadcasting behaviour of the Boston Police Department in the aftermath of the 2013 Boston Marathon (Ehnis and Bunker 2013). EMOs utilise social media microblogging services as a distribution channel for information and event specific warnings, to influence the behaviour of the media and the general public, to request specific information from the public, and to fight rumours through providing corrected information. These studies show that EMOs are mostly utilising their social media channels as broadcasting channel to push information to the public. Social media is used predominately as a one-way one-to-many communication channel, which can be compared to a “megaphone” (Ehnis and Bunker 2012; Potter 2016).
Chatfield al. (2014) explored the involvement of government organisations in social microblogging communication during extreme events based on Hurricane Sandy which struck the East Coast of the US in 2012. The analysis was based on Twitter data; their specific focus was on how government organisations actually engage their citizens through microblogging platforms and how the benefits of social media are realised by such organisation’s communications. Citizens are not passively waiting for information from the relevant organisations. They actively co-create and request information if it is not present. Furthermore, it was shown in the unfolding of the event that emergency phone numbers, the relevant channels for the citizens to ask for help, were completely overwhelmed with the numerous requests for help; individuals then turned to Twitter to ask the fire departments directly for help. In response to this phenomenon, the New York Fire Department started to dispatch based on requests for help received from Twitter. The realisation of the potential benefits of social media in government organisations, with their changing communication and information flows, are still seen as a major operational challenge.

These studies observe how social media channels are used by emergency services agencies based on data available on the social microblogging channels of an organisation. These studies say very little about how these social media services are integrated into the operations and practices of the organisations. The following studies specifically focus on the integration of social media services within EMOs, by analysing and observing the social media communication within an organisation.

Latonero and Shklovski (2011; 2013), analyse organisational innovation through the changing role of the Public Information Officer within the Los Angeles Fire Department. The role is changing through the use of the social microblogging platform Twitter and through this facilitated interaction with the general public. The study was conducted in 2009 when the social media utilisation for such organisations was still completely new, and it was still exceptional that such an organisation would use such services and platforms. The utilisation of the social media channel in the fire department was driven by the individuals who pushed for it’s use. The organisation was using Twitter as a one-way communication channel to push information to the general public, as well as to respond to individual comments from the public, and in a minimalistic way to “listen” what the general public had to say. The use was ad-hoc and centred around an individual who drove the adoption of the service within the organisation.
Using the example of the NSW State Emergency Service, Fosso Wamba and Edwards (2014), investigated the factors related to social media adoption used in emergency services operations. The organisation was aware of a broad spectrum of social media services, however, the main focus of the study was on the utilisation of Facebook and Twitter to distribute information to the general public in different phases of the emergency management cycle. While there was a two-way interaction on social media channels, the organisation mainly utilised their social media channels as a one-way push medium to broadcast relevant information to the general public. There was no evidence that the organisation was utilising their social media channels to gather information from the general public.

Potter (2016) explored the social media utilisation of an Australian Fire Response Organisation through two years of ethnographic research. The researcher was embedded in the social media team and supplemented the study with relevant interviews across the organisation. The social media team was situated in the Media and Corporate Communications team. The organisation uses their social media channels mainly to disseminate information to the public, but not to gather information from the public. The study shows the tension between operational members of the organisation on the ground, who actively responds to extreme events, and the members of the communications team who want to inform the public about the event. These two groups have a different focus on how they respond to the disaster. The media team wants to inform the public so that they have the information they need to make good decisions during the emergency event; the responders on the ground intend to remove the threat as quickly as possible.

Mergel (2013) analyse innovation strategies in the public sector through Social Media. They identified, through studying several US government organisations, that these organisations use three different strategies when it comes to the social media utilisation: representation, engagement, and networking. Representation refers to a push strategy, in which information is broadcast through social media channels, but feedback from the public is ignored. Social media in this strategy is used as a one-way communication channel. The engagement strategy refers to a push and pull strategy, in which the organisation actively seeks interaction with the general public. In this strategy, the social media utilisation switches from a one-way communication channel for a large audience to a two-way communication channel in which the audience can communicate with the organisation. Such communication can have many forms, from answering questions to requesting images and anecdotes from the public. However, in this
strategy, social media is still seen as a pure communication platform and not a platform from which information can be gathered. The networking strategy refers to a two-way communication strategy in which the organisation also uses social media as a source of information. This information can then either be used in the operational part of the organisation, or can be used to improve the communication content of the organisation.

Meijer and Thaens (2013) explored how different police departments arrive at their social media strategies. Interview data and social media data from three police departments, with exceptional social media utilisation, were analysed and compared to understand how these government organisations arrive at their social media strategy. All three departments were using different strategies and could be clustered under Mergel’s (2013) taxonomy from push, to push and pull, to a networking strategy. Meijer and Thaens (2013) conclude “Social Media strategies of police departments build upon pre-existing strategic choices in communication strategies and situational differences and therefore, in spite of access to similar technologies, conversion in these strategies is limited.”

Hiltz et al. (2014) investigated how different US emergency managers experience social media services within different US EMOs. The study identified three barriers responsible for the slow adoption of social media in such organisations: lack of personnel resources, lack of policies and guidelines for social media use, and potential issues with the trustworthiness of the social media information. Effective social media utilisation is time-consuming and also requires technical resources besides human resources. This is especially the case when social media is also used as a resource of information for the organisation and not just a channel to provide the public relevant information. The interview informants highlighted that besides the need for more trained personnel, there is a need for more advanced software which can help the emergency managers gather information from Social Media, analyse this information for trustworthiness and credibility and also be able to display this information in a meaningful way.

Disasters and other large-scale crisis events happen infrequently. When they occur, there is a high need for human resources to mitigate the effects of the event. Many EMOs are dependent on trained volunteers to have a large enough force to respond to a high impact event. Some of these organisations are structured entirely with volunteers; others have a core of paid members supported by volunteers. Volunteers cannot be treated the same way as paid staff. It is important for the organisation that these volunteer members stay engaged and motivated. For
such volunteer organisations, social media integration can be accompanied by different obstacles and barriers in training and available human resources. Munkvold et al. (2015) investigated several volunteer emergency response organisations in Norway. The study showed that these organisations are in the early stages of exploring the capabilities of Social Media. The organisations use their social media channels mainly before and after and extreme event, but not during. The channels are used as one-way communication towards the public, or in private groups for internal communication. The organisations do not use social media to gather information from the public, but they monitor the channels of other public organisations, such as the police. The social media utilisation depends on motivated members of the organisation. During an event, the members of the organisation are needed to perform the core business of the organisation and do not have the time to also operate the social media channels.

3.3.5 Summary of the Literature
We have seen from the literature that many EMOs have integrated social media into their organisation for the purpose of emergency and disaster management.

Social media is not only useful as a channel to communicate to the general public, but it can also be used as a channel to engage with the general public in a two-way stream of communication.

Social media includes a vast selection of different technologies; however, EMOs often see social media as just the microblogging platform Twitter and the social networking site Facebook. Other types of social media technologies are known but not integrated into the practices of organisations.

Social media presences are often used as a broadcasting tool to push information towards the general public. The literature indicates that the emergency management sector is also interested in using social media as a channel to gather relevant extreme event information from the public, but these approaches are still in the early stages of development.

We know what EMOs are broadcasting on their social media channels through the analysis of emergency and disaster event social media communication networks. We also have an understanding what these organisations communicate through their social media channels in the non-operational mode. This gives us an outside perspective on their social media
communication only, since this knowledge is derived from analysing communications on these social media channels.

What we are currently lacking information about is how EMOs have actually integrated social media services into their organisations. We need to better understand this perspective, in order to improve the social media practices of EMOs. This research study, is making a contribution to close this particular gap in our knowledge.

In the next section, Ahmed’s (2011) framework of social media in Disaster Management will be revisited as this framework is used as an underlying lens for this study.

3.4 Framework – Social Media in Disaster Management

Figure 3.1 shows Ahmed’s (2011) model on Social Media in Disaster Management. On the one hand, this model shows the potential of social media services in emergency disaster management. On the other hand, this model provides a framework of social media interaction dimensions of different participants in disaster and other emergency extreme events.

![Figure 3.1 Social Media in Disaster Management reproduced from Ahmed (2011)](image)

Social media utilisation is divided into three dimensions of communication interactions (see 3.3.1). These three dimensions are: social media communication and interaction between emergency services agencies (A-A), interaction and communication between an emergency services agency and the community (A-C), and the interaction and communication within the general public, community to community (C-C).
The reviewed literature showed that we know much about the left hand side of the model; we already know how the community utilises social media during disasters and other extreme events (Bunker et al. 2013; Fraustino et al. 2012; Glasgow and Fink 2013; Mirbabaie et al. 2014; Palen and Liu 2007).

From the agency-to-community interaction (A-C) dimension, we know how EMOs are communicating through the analysis of their social media channels (Bruns et al. 2012; Ehnis and Bunker 2013; Mirbabaie et al. 2014; Procter et al. 2013).

What we do not yet sufficiently understand is the right hand side of the model. We need to better understand how social media services are embedded into EMOs and how they influence these organisations (Meijer and Thaens 2013; Potter 2016). For instance, we currently do not know much about how EMOs utilise social media channels to interact with each other during emergency events and disasters (Sutton et al. 2012).

This model is used within this research project as a guiding framework to further investigate the two communication dimensions, agency-to-community (A-C) and agency-to-agency (A-A). This is approached by exploring how the case organisations in this study use social media services within their organisations. In the following section, research aims and questions are explained in more detail.

### 3.5 Research Aims and Questions

The literature shows how social media services in general, and social microblogging services in particular, have had an impact on emergency extreme events and their management. We know that social media has changed the information flow and public information expectations to a shorter timeframe. For the purpose of emergency management, social media technologies in themselves are not intrinsically beneficial or threatening; the technology can support the management of disasters or other extreme events, but it also adds further dimensions of risks and threats to an event. These risks and threats did not exist in times before the advent of social media technologies.

The London Riots in 2011 (Glasgow and Fink 2013) are an excellent example which shows that both aspects, risks and potential benefits are two sides of the same coin. The social media
communication around the event was full of rumours and false information, which rapidly spread through the communication networks; social media services were used by perpetrators to organise riots and looting. On the other hand, social media communication was widely used to fulfil information needs and provide moral support. After the destructive riots, Twitter was used as a platform to self-organise clean-ups and help shop owners who had to deal with the damage caused by the riots.

We know that a majority of the larger EMOs utilise social media channels to communicate and interact with their listening communities for disaster and emergency management. This social media engagement is not always fully voluntary and can be driven by external factors (Fosso Wamba and Edwards 2014); the EMOs are aware that social media communication will happen whether these organisations are participating or not, however, through participation in the communication at least organisations can influence the social media communication.

While social media services as we know them today have been around for more than a decade, these services are relatively new technologies for EMOs. Social media adoption is mainly driven by individuals who operate social media channels in these organisations (Latonero and Shklovski 2011). Social media has the potential to be used as a two-way communication channel. However, the literature reports that organisations are predominantly using it as a push medium to send out information to the public (Ehnis and Bunker 2012; Potter 2016). EMOs thus use social media as a one-way channel for broadcasting information towards the general public. However, EMOs have only started to explore how social media can be used as an intelligence-gathering tool to collect relevant information from the general public and support situational awareness about unfolding events (Power and Kibell 2017).

We understand that EMOs have adopted social media services and why they adopted these services into their practices (Fosso Wamba and Edwards 2014; Hiltz et al. 2014; Potter 2016). What we still insufficiently understand is the integration and alignment (Leonardi and Barley 2010) of social media technologies into EMOs. The alignment of social media in organisations depends on several factors, which include the organisational norms and structures, the norms and structures of the social media communication networks, the technology itself, as well as the members of the organisation who operate the social media channels in their day-to-day work activities.
On one hand technology influences and is influenced by the institutional properties and norms within an organisation. On the other hand, there are properties of norms and behaviour brought through the different adopted social media platforms and their specific user groups. Social media utilisation within an EMO means the alignment of a technology that is alien and in some aspect hostile to the structure and institutional properties of the organisation. This thesis explores this interplay of technology, human participants, and institutional properties in hierarchically structured command and control organisations.

The research objective is to create a better understanding of social media services within EMOs to communicate and interact with the general public for the purpose of emergency and disaster management. In particular, this thesis explores the integration and utilisation of social media services into the organisational structures and core activities of large-scale volunteer EMOs. As an underlying lens to explore this utilisation and integration of social media services, Ahmed’s model of social media in Disaster Management (Ahmed 2011) has been used. The utilisation of social media in the interaction dimension community-to-community (C-C) is not within the research interest of this thesis. Only the interaction dimensions involving the EMOs: agency-to-community (A-C), and agency-to-agency (A-A) are used to understand the social media integration in EMOs better.

Based on the analysis of the literature and the knowledge of EMOs as hierarchical structured holonic systems, the research questions are driven by our lack of understanding on how EMOs actually embedded social media services into their structures. Therefore, research question 1 asks:

*RQ 1: How are Social Media Services integrated into the structures of Emergency Management Organisations?*

The literature showed what kind of social media services EMOs typically use. However, this knowledge comes predominantly from analysing the communication of the social media channels from a somewhat outside perspective. To get a better understanding of the rationale of EMOs, the second research question asks:

*RQ 2: How are Social Media Services utilised within Emergency Management Organisations for the purpose of emergency and disaster management?*
As shown in Chapter 2, EMOs have two different modes of operation, the non-operational mode and the operational mode. Therefore, research question 2 has the following sub-question:

*RQ 2.1: Is there a difference in the Social Media utilisation during the operational mode and the non-operational mode of an Emergency Management Organisation?*

The third research questions focuses on the utilisation of social media services as a communication platform with different communication participants. From Ahmed’s model, it can be deducted that organisations use social media to communicate with the public and other organisations. Since this study analyses large volunteer organisations, it can be assumed that these organisations utilise social media to also communicate with their volunteers. Therefore, the third research question asks:

*RQ 3: How are Social Media Services used as communication platforms in Emergency Management Organisation for the purpose of emergency and disaster management to:

*RQ 3.1: interact with the public?*

*RQ 3.2: to interact with other Emergency Management Organisations?*

*RQ 3.3: to interact with their own organisational members?*

3.6 **Summary**

This chapter shows the result of the review of current literature about social media in emergency and disaster management. It also outlines the relevant gap in knowledge and shows the research aims and questions addressed in this thesis.

A hermeneutic literature approach as described by Boell and Cecez-Kecmanovic (2014) was used to review and analyse the literature. The results of the literature review are structured into four clusters of different research areas: (1) the potential of social media for disaster management (Section 3.3.1); (2) structure and behaviour of emerging emergency social media communication networks (section 3.3.2); (3) research about why and for what purposes the
The general public is using social media in extreme events (section 3.3.3); and (4) research about social media utilisation of EMOs (section 3.3.4).

The literature showed that social media services influence extreme events with both positive and negative effects. Individuals can fulfil their information and emotional needs with these technologies. Social media is used to find individuals and find out whether friends or family members are safe. It can serve as a platform for volunteers to self-organise during an event. However, it is still possible that rumours and false information spread uncontrollably on social media platforms, which increases the threat of an extreme event rather than mitigate it. Furthermore, the self-organisation of social media is not always a positive thing. For example, during the London Riots in 2011, some of the riots were organised through social media technology. Therefore, social media in itself acts as an information infrastructure; whether it has positive or negative effects towards an event depends on the different user groups and how they utilise the media. It is important to be kept in mind that the majority of social media services were not designed for emergency management and that they are at their core commercial communication platforms. Still, social media has the potential to contribute to the emergency management sector positively but it also brings challenges which need to be acknowledged and managed.

There is active on-going research in the area of social media in emergency and disaster management. We are starting to understand better how social media technology impacts and influences disaster events and specifically, the emergency management sector. However, the research is still in its beginning. Gaps in the existing knowledge need to be better investigated. We know how the general public utilises social media during extreme events and are aware of emerging communication patterns in the social media communication networks created during the progress of an extreme event. However, patterns emerging across different events need to be further investigated.

A substantial amount of the existing research only investigates social media utilisation in single extreme events and reduces social media to one specific platform. For example, the microblogging platform Twitter or the social networking site Facebook. Thus the umbrella term social media is often used as an equivalent for these platforms. Potential interdependencies between different communication platforms are rarely investigated.
We know the patterns of social media utilisation by EMOs in extreme events and in times of normal operations. EMOs utilise social media channels as an additional communication channel to communicate to the general public, however, while social media technology has the potential to be used as a two-way communication channel, EMOs predominantly utilise their social media presence as a “megaphone” to push information towards the general public. It is not well understood, therefore, how social media is integrated into EMOs.

In the following chapter, the research methodology used to answer the proposed research questions is discussed in detail.
Chapter 4 - Research Methodology

Einstein's space is no closer to reality than Van Gogh's sky. The glory of science is not in a truth more absolute than the truth of Bach or Tolstoy, but in the act of creation itself. The scientist's discoveries impose his own order on chaos, as the composer or painter imposes his: an order that always refers to limited aspects of reality, and is based on the observer's frame of reference, which differs from period to period as a Rembrandt nude differs from a nude by Manet.


4.1 Introduction

As shown in Chapter 3, EMOs have embedded social media services within their organisations for the purpose of emergency and disaster management. However, we still do not sufficiently understand how such organisations have actually embedded these social media services into their structures and activities. The aim of this thesis is to contribute to closing this gap in our knowledge. The thesis is designed as an explorative qualitative case study which uses empirical material from five different cases of EMOs, which have embedded social media services into their communication portfolio. The aim of the thesis is to build on the current theory of social media in disaster management in order to extend our knowledge about the phenomena. In this chapter, the research approach and methods that have been applied in order to answer the research questions are outlined.

The structure of this chapter is shown in Figure 4.1. Firstly, the general research approach and research strategy of this research project (section 4.2) is discussed. Afterwards, the ontological and epistemological underpinnings of this thesis (section 4.3) are then outlined. Subsequently, in Section 4.4 the applied case study approach is described, which includes an outline of the structure of each case (section 4.4.1). Further, the different case organisations selection (section 4.4.2) is also explained. In section 4.5, the different data sources used in this research project are discussed. In section 4.6, the chapter closes with a description of how the data was analysed.
4.2 Research Approach and Strategy

Figure 4.2 outlines the general research approach of this thesis. The thesis explores how EMOs implement social media into their organisational structures. The thesis is an explorative qualitative study with the overall premise of building on and extending the current theory of social media in disaster management.

The ontological underpinning of this thesis presumes a ‘weak’ social constructivism (Urquhart 2012). To make claims about the intersubjective meaning systems within social media in disaster management, the epistemological stance is within the Interpretivist paradigm.
I use Ahmed’s (2011) model of social media in disaster management as an underlying framing device. In this framework, the social media utilisation in the case organisations would be described as agency-to-community social media interaction (A-C) and agency-to-agency social media interaction (A-A). The thesis does not focus on how other members, for example, the general public or mainstream media are participating in the emerging social media communication networks during extreme events. The framework would define such interaction as community-to-community (C-C) social media interaction.

The methodological approach is an exploration of the integration of social media technology into EMOs, which act as a specific form of hierarchical command and control organisation. This particular form of organisation is seen in this thesis as a hierarchical structured holonic system (see section 2.3.1).

The specific method to explore the social media technology appropriation is that of a comparative case study of five revelatory cases of Australian EMOs which have embedded social media services in their communication portfolio for emergency and disaster management.
4.3 Ontology and Epistemology

The philosophical underpinnings, both ontological and epistemological, of a research study are essential to understand the researcher’s assumptions. Ontology attends to the questions on how reality is constituted; Epistemology, on the other hand, is concerned with how knowledge about a reality can be acquired. Both philosophical branches are closely intertwined when research about a phenomenon is conducted. The ontological stance underpinning this thesis is a ‘weak’ social constructivism. The epistemological stance is within the Interpretivist paradigm (Urquhart 2012).

The ontological assumption of this study is that social reality is neither given nor can an objective underlying reality be measured, but rather social reality is a construct of the participants within this social reality. The individuals within a social setting create and reproduce their reality through ongoing actions and social practices. This infers that claims about this social reality cannot be made in isolation to its context, because this social reality does not exist independently from the participants who are instantiating this reality (Orlikowski and Baroudi 1991).

Social reality does not exist in isolation from individuals in social settings. Ideas, norms, values, and beliefs drive human action (Leonardi and Barley 2010). The individuals share ideas, norms values, and beliefs which result in intersubjective meaning systems (Urquhart 2012). The thesis explores the shared intersubjective meaning systems of social media utilisation of EMOs.

The epistemological stance to explore and make claims about the phenomena is within the Interpretivist paradigm. Researchers within the Interpretivist paradigm study phenomena within its social setting through an in-depth examination of that field (Urquhart 2012) to construct a representation of how the social participants within the phenomena interpret their social reality.

Within this thesis intersubjective meaning systems around social media utilisation of EMOs for the purpose of emergency and disaster management are explored through how social participants within this system interpret this particular meaning system; i.e. the employees and other members of EMOs. This is done through multiple case studies of EMOs which are utilising social media services.
4.4 The Case Study Approach

To understand how EMOs are utilising social media services, we must study in detail how these organisations integrate these kinds of services into their structures. This can be done through in-depth case studies. Five cases were documented in order to explore the phenomena of social media utilisation in EMOs.

There is a multitude of different approaches and definitions of what a case study is and how such a study is constituted such as Eisenhardt (1989); Piekkari et al. (2009); Walsham (1995); Yin (2013). Some of these case study designs are better used within the positivist research paradigm (e.g. Eisenhardt 1989; Yin 2013), and other case study approaches cater better for interpretive research practices (e.g. Piekkari et al. 2009; Walsham 1995).

A case study can be defined as a “research strategy that examines, through the use of a variety of data sources, a phenomenon in its naturalistic context, with the purpose of ‘confronting’ theory with the empirical world” (Piekkari et al. 2009). This definition is used for this particular research project.

The phenomenon under study in this thesis is the utilisation of social media technology within EMOs for the purpose of emergency and disaster management. The naturalistic contexts are the EMOs within their operational area. Data sources are predominantly interview data which is supported by documents, workplace observations, research site visits, and social media data. The purpose of the thesis is to build a better understanding of the phenomena through extending existing theory of social media in disaster management, and in particular Ahmed’s framework of social media in disaster management (Ahmed 2011).

A comparative multiple-case study design was utilised, in which five cases of EMOs utilising social media services for disaster management were compared and analysed. All of these organisations already have extensive experience in the use of social media for this purpose. ‘Revelatory’ cases were chosen as it was expected that these cases will tell us more about the underlying phenomena (Urquhart 2012).

A common critique against case studies is the lack of generalisability of cases. Generalisability is a concept from positivist research which is not applicable and aimed for in the Interpretivist research paradigm. The underlying ontology for this thesis is a ‘weak’ social constructivism.
This means that social realities are the result of the intersubjective meaning making between the particular members of these realities, in my case the members of the EMOs. The knowledge we can derive from these realities are always highly contextual. This does not mean that the knowledge from this thesis cannot be applied in different organisations. However, it is then a knowledge transfer, and we need to make ourselves aware where the social realities differ, such as in terms of culture and norms.

4.4.1 Structure of a Case
Case boundaries are shown in Figure 4.3. Included within the case boundaries are the EMOs and their interaction with social media channels. The underlying framework (Ahmed 2011), includes the agency-to-community social media interaction (A-C) and the agency-to-agency social media interaction (A-A), but not the social media interaction dimension community-to-community (C-C). The channels used by emergency management are predominantly Twitter channels, and/or Facebook pages, however, it must be noted that the organisations are also utilising other social media platforms.

The social media audience is, as the receiver of emergency management communication, an important social participant in the social media in emergency management communication. Different audiences may interact with social media channels of EMOs or utilise the communication for different purposes, however, the audience is outside of the boundaries of a case; I examine how the EMOs utilise their social media channels, but I do not analyse how the community interacts with this communication.
4.4.2 Case Selection and Case Organisations

Five EMOs in two federal states in Australia were selected for this study. The main selection criteria was that the organisation is involved in the active response to large-scale emergency events in Australia and that the organisation is actively utilising social media services as a communication channel. During the project, it became evident that not all of the organisations which are actively involved in the response to large-scale emergency events, were using social media services in all phases of disaster management. Some of the organisations utilise social media services mainly to prepare the general public for the eventually of emergency events while some other organisations were utilising social media services in all phases of the PPRR model.\(^3\)

In context of this research project, interviews were conducted in a total of nine different EMOs utilising social media services in all phases of disaster management. From these initial nine organisations, five organisations were selected for this thesis. The selection was based on the similarities of responsibilities, members size, structure, and organisational culture of all of the selected organisations. The five organisations selected all have a leading role in the response to large-scale emergency extreme events: two of the organisations are responding predominantly to large-scale fire events; two other organisations are responding to large-scale flood events; and the last organisation has an all-hazards responsibility and acts as an umbrella organisation which incorporates other response organisations during major extreme events to ensure their interoperability.

While all of the organisations use the same microblogging technologies, the five case organisations differ in their social media utilisation and integration patterns. In the following, a brief overview about the case organisations is given and shown in Table 4.1.

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\(^3\) As shown in Chapter 2.2, the Prevent Prepare Respond Recover model (PPRR) is a model that can be used to distinguish between the different phases of disaster management. The model is an underlying framework for most of the emergency management processes and activities in Australian emergency management organisations.
### Table 4.1 Selected Case Organisations

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Member Structure</th>
<th>Emergency Responsibility</th>
<th>Operation Area</th>
<th>Jurisdiction</th>
<th>Organisation type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organisation A</td>
<td>Volunteer members and paid staff members</td>
<td>Bushfire events</td>
<td>Whole state</td>
<td>Case State I</td>
<td>Emergency Response Organisation</td>
</tr>
<tr>
<td>Organisation B</td>
<td>Volunteer members and paid staff members</td>
<td>Flood and storm-related events</td>
<td>Whole state</td>
<td>Case State I</td>
<td>Emergency Response Organisation</td>
</tr>
<tr>
<td>Organisation C</td>
<td>Only paid staff members</td>
<td>All-hazards approach</td>
<td>Whole state</td>
<td>Case State II</td>
<td>Coordinating umbrella organisation</td>
</tr>
<tr>
<td>Organisation D</td>
<td>Volunteer members and paid staff members</td>
<td>bushfire events and structural fires</td>
<td>Outside state capital</td>
<td>Case State II</td>
<td>Emergency Response Organisation</td>
</tr>
<tr>
<td>Organisation E</td>
<td>Volunteer members and paid staff members</td>
<td>Flood and storm-related events</td>
<td>Whole state</td>
<td>Case State II</td>
<td>Emergency Response Organisation</td>
</tr>
</tbody>
</table>

The case organisations in Case State I are Case Organisation A and B. Organisation A is responsible for large-scale bushfire events. The member base consists of highly trained and specialised volunteers and paid staff members, however, the majority of the organisation members are volunteers. The volunteers are responsible for the operations on the ground, while most of the paid staff have coordinating and managing responsibilities. The operational area of the organisation is the whole state. The extreme event social media utilisation is centrally organised.

The responsibilities of Organisation B are large-scale flood or storm extreme events. Like Organisation A, it is also a large volunteer organisation consisting of paid staff members and highly skilled professional volunteers. The trained volunteers operate on the ground, while the paid staff members of the organisation have primarily coordinating and managing responsibilities. The organisation is centrally organised and operates all over the state.

The organisations in the Case State II are the Organisations C, D, and E. Organisation C is different in comparison to the other organisations. It resembles something which could be termed an ‘umbrella’ organisation. The brief of the organisation is to ensure interoperability between different EMOs during large-scale extreme emergency events. In such large-scale extreme events, Organisation C incorporates Organisation D and Organisation E, which then operate and act on behalf of Organisation C.
This practice is in contrast to the organisational structures in Case State I. In Case State I there is a lead organisation assigned based on the event type, for instance, in the case of a bushfire event Organisation A would be leading the response while organisation B may be active in a supporting role. The lead organisation is thus organising the response, and the remaining EMOs support the lead organisation.

Organisation C is relatively young. It emerged as an overarching organisation after a major bushfire disaster in which it became evident that the response organisations were not working as closely together as it would have been deemed necessary in such an unprecedented extreme event. In its beginnings, Organisation C had a sole bushfire focus and was responsible for warning the general public in order to keep them safe. A second disastrous extreme event highlighted that major extreme events have multiple effects on the safety of a community and that a fire-only focus is too short-sighted. The organisation then transformed into an all-hazards focus. Organisation C consists of paid staff in its non-operational mode. In the operational mode, the organisation is supplemented by members of other response organisations. The role of the organisation is to warn the community and to coordinate the response organisations. The organisation itself does not own response units, such as fire brigades.

Organisation D is a large volunteer organisation responsible for fighting bushfires and structural fires in rural areas. The organisation consists of trained volunteers and paid staff members, however, in contrast to Case Organisations A, B, and E, part of the paid staff are also responsible for responding to fire events on the ground. The organisation is centrally organised. When Organisation C is changing into the operational mode based on a fire event, Organisation D suspends its social media activity, and its social media activity is then orchestrated by organisation C.

Organisation E is a large volunteer organisation responsible for responding to the effects of flood and storm events. The organisation has a base of highly trained volunteers and paid staff members. The responsibilities of the paid staff are mainly managing and coordinating responsibilities. The volunteers of Organisation E respond to the effects of extreme events on the ground. Similar to Organisation D, when Organisation C is changing into its operational mode based on an extreme event Organisation E would otherwise be responsible for, then
Organisation E suspends its social media operations, and its social media activity is then organised by organisation C.
4.5 Data Collection

It is common in qualitative research that the phases of data collection and data analysis inform each other. This research project was not any different, the phases of data collection and data analysis often took place at the same time, and there was not always a clear boundary where the data collection phase had ended before the analysis phase started. While the data collection informed the data analysis, data analysis also informed what kind of information that was still missing to build a better understanding of social media in disaster and emergency management.

Within this chapter the kind of empirical material that was collected is discussed and also how this material was analysed. This separation is partially artificial as both approaches informed each other while the study was ongoing.

The main source of data for this study was interview data produced and collected from informants at all five case organisations. The interviews had the form of semi-structured interviews, which were supported with informal interviews with members of EMOs who are responsible or related to the social media utilisation within their organisation.

The interview informants are either actively involved in the utilisation of the social media channels, or are involved in the strategic decision-making about the utilisation of these social media channels.

The interview data was supplemented by information collected directly from the social media channels and profiles of the organisation, and relevant documents created by the organisations. These kinds of documents involve policies, internal case studies, social media manuals, social media training material, and the web pages of each organisation.

Further, except for Organisation D, I visited the site of each case organisation to understand where and how the social media channels are operated by the members of the organisation. The members of Organisation D were interviewed through Skype, and from Case Organisation C sites. Organisation C houses the State Control Centre of this state from which the major emergency events are coordinated.

In Case State II workplace observation were also conducted in the State Control Centre where observations about the social media officers of organisation C, D and E in operation during a
major emergency event could be made. The following describes in more detail how the necessary data was collected and analysed.

4.5.1 Interviews
To get a clear account of how members of EMOs are utilising social media services, visits to these organisations were required to talk to its members in order to reconstruct together with them how they experience the utilisation and effects of social media technology. Therefore, the most valuable data in this study is interview data from the members of the organisation who are operating or are deciding on the utilisation of the social media services. In qualitative research in general, interviews are the most common and arguably one of the most important data gathering methods (Myers and Newman 2007).

A semi-structured interview approach was used to conduct the interviews for this study; an interview guide, which was informed by the literature, gave the interview some general structure, however, the approach was still flexible enough to explore other facets of the social media utilisation which the interview informants were bringing up during the interviews.

Myers and Newman (Myers and Newman 2007) built on Erving Goffman’s work (1961), about face to face interaction, and describe the interview process through a dramaturgical model as drama performance or a stage play. This model is shown in Table 1.
The metaphor of an interview as a stage play is used to describe the interview approach used in this study. In the next subsection, the script, or in other words the interview guide, is outlined. Afterwards the selection of interview informants, or in the words of Myers and Newman, the Actors and Audience, is explained. Then, the overall interview process itself, from preparation, over an entry in the scene, over the main performance, to exit of the scene and preparation of the next performance is outlined. The subsection ends with an overview of the collected data and a description how this data was analysed.

### 4.5.1.1 Development of the Interview Instrument

We already know from the literature that EMOs are utilising social media services for emergency and disaster management. It was shown in preliminary work (Ehnis and Bunker 2012; Ehnis and Bunker 2013) and other studies (Bruns et al. 2012; Potter 2016; Procter et al. 2013) that EMOs are utilising their social media channels to distribute emergency relevant

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**Table 4.3 The qualitative interview as a drama reproduced from Myers and Newman (2007)**

<table>
<thead>
<tr>
<th>Concepts</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drama</td>
<td>The interview is a drama with a stage, props, actors, an audience, a script, and a performance</td>
</tr>
<tr>
<td>Stage</td>
<td>A variety of organisational settings and social situations although in business settings the stage is normally an office. Various props might be used such as pens, notes, or a tape recorder</td>
</tr>
<tr>
<td>Actor</td>
<td>Both the interviewer and the interviewee can be seen as actors. The researcher has to play the part of an interested interviewer; the interviewee plays the part of a knowledgeable person in the organisation</td>
</tr>
<tr>
<td>Audience</td>
<td>Both the interviewer and the interviewee can be seen as the audience. The interviewee(s) should listen to the questions and answer them appropriately. The audience can also be seen more broadly as the readers of the research paper(s) produced</td>
</tr>
<tr>
<td>Script</td>
<td>The interviewer has a more or less partially developed script with questions to be put to the interviewee to guide the conversation. The interviewee normally has no script and has to improvise</td>
</tr>
<tr>
<td>Entry</td>
<td>Impression management is very important, particularly first impressions. It is important to dress up or dress down depending upon the situation</td>
</tr>
<tr>
<td>Exit</td>
<td>Leaving the stage, possibly preparing the way for the next performance (finding other actors – snowballing) or another performance at a later date (e.g. perhaps as part of a longitudinal study)</td>
</tr>
<tr>
<td>Performance</td>
<td>All of the above together produce a good or a bad performance. The quality of the performance affects the quality of the disclosure which in turn affects the quality of the data</td>
</tr>
</tbody>
</table>
information and warning through these channels and as well that social media is utilised to engage with the general public in two-way communication. However, as discussed in Chapter 3, it is currently unclear how social media services are utilised and are actually embedded into EMOs.

Before data collection was conducted in the form of interviews within case organisations, it was known that the EMOs are utilising social media but how this technology was actually integrated within the structure of the organisation was still unclear. It was only possible to infer from observation of the social media channels and the available information from EMOs, such as policy and strategy documents, for what purposes social media was used in emergency management. The social media channels of the case organisations showed evidence that these channels are used as a two-way communication channel and in some of the organisations as an intelligence tool to gather information directly from an event. The literature indicated (Bruns et al. 2012; Ehnis and Bunker 2012; Fosso Wamba and Edwards 2014; Potter 2016; Wukich 2015) that EMOs are utilising social media channels to distribute information towards the general public, but to what extent social media was used beside the form of a distribution channel is still unclear.

The original interview guideline was structured into three sections: The first section included general questions about social media utilisation within the organisation; the second section focused on social media utilisation to distribute information towards the general public; the third section focused on questions in regards to how social media is used as a channel for intelligence within the organisation. These initial sections were derived from the different applications of social media in EMOs and through Ahmed’s framework of social media in disaster management (Ahmed 2011). As the interviews were semi-structured, at times interviews revealed important aspects of social media utilisation within EMOs which were not included in the interview guideline. When that happened, the interview guidelines were reviewed and extended so that relevant questions were asked in future interviews. The interview guide was thus not a static document. It was a document which actively changed during the process of collecting the relevant interview data.

The first section of the interview guideline is intended to gather information about the general utilisation of social media within the case organisation. The first questions thus intended to understand the role the informant occupies within the organisation. Further, there is a question
to understand the involvement of the interview informant with social media and how the informant is utilising social media services to perform some of the tasks which are accompanied by the role of the informant in the organisation. This is followed by questions identifying what kind of social media services are utilised within the organisation and whether there is a difference in the utilisation during the operational phase and the non-operational phase. General questions were also asked about how many members of the organisation are operating the social media channels depending on the organisation's mode of operation. Furthermore, questions were asked to understand the strategy behind utilising social media and as well whether such a strategy is formalised.

The second section of the interview guidelines focuses on how social media is utilised to distribute information towards the audience of these channels. This section was designed to better understand what the process of distributing information through social media to the public is. This included questions to better understand from where the social media officer was sourcing the information which is distributed. The questions were intended to reveal how the social media officer interacts with the information systems within the organisation, such as the dispatching, and warning systems.

It is also relevant whether an organisation has specific aims when providing information over social media. The interview guide thus also includes questions for identifying whether different social media channels are used differently or whether there is one overarching approach on how to treat social media within the organisation. It is of relevance to better understand whether the audience is known and how the organisations interact with different groups, such as members of the general public and members of the media. This section also includes questions for probing how the organisation is interacting with their listening community; whether it is using social media as a one-way communication channel or whether it is utilising social media in a two-way form of communication which engages the listening community. The second section closes with questions for better understanding the perceived benefits and risks of the organisation with their utilisation of social media and the utilisation of social media in the emergency management sector in general.

The third section of the interview guide focuses on how social media is utilised to gather information from the social media channels, in order to use this information to build better situational awareness about emergency events within the EMO. The aim of these questions is
to understand whether the organisation is utilising social media for intelligence purposes and how the process of information gathering is done. Further, how information gathered through social media is verified and used by the organisation. Finally, a question investigating what kind of software the organisation is using to perform these social media intelligence tasks was asked.

As the interviews were semi-structured the interview guideline acted as a frame for the interviews. It was not “set in stone” and changed after an interview was conducted and when new information was uncovered. When interview informants provided information, which was not highlighted in previous interviews, questions about such information were added to the interview guideline to probe about the topic in further interviews. For example, in an early interview, one of my informants outlined that from time to time members of the public request help through the social media channels of the organisation. The informant explained how the organisation is dealing with such requests, but as well indicated that in a large-scale event with many requests, such as it happened during Hurricane Sandy in the US (Chatfield et al. 2014), the current organisational practices might break down. Following this interview, a section about dispatching emergency response resources due to incidents reports on social media, was added to the interview guide.

The second addition to the interview guide related to the utilisation of social media for communication with members within an organisation. Four of the selected EMOs rely on volunteers to respond to emergency events. These volunteers are in units/brigades scattered across the area the organisation is operating in. After this was revealed in an interview, a section was added to the interview guide asking questions about how the organisation is utilising its social media channels to communicate with its volunteer members.

4.5.1.2 Selection of Interview Informants
The informants for the interviews are members of the case organisations who are either operating the social media channels, or members of the case organisations who have an influence on how the social media channels are utilised. In all organisations the social media operators interviewed are also actively shaping the strategy for utilising social media in their organisation.
The selection of informants for interviews was deliberately set up in a way that it would make it possible to trace the actual utilisation of the social media services within the organisation; and not just based on assumptions about these services which many members of the organisation who are not directly in touch with the social media channel, hold about these types of communication services.

The main requirement for the selection of the interview informant was that the informants are members of the organisation who are actively involved in the social media utilisation of their organisation. This involvement could either be in the way that the member of the organisation is operating the social media channels or that the member is participating in the decision process on how to utilise the social media services. All of the interview informants fulfil this requirement.

While locating potential interview informants in the relevant organisation was not too difficult, access to these organisations was not straight forward. Most strategic and operational social media utilisation is centralised within the headquarters of the EMOs. The first approach to attracting interview informants was to “cold call” the relevant members of the organisation via email and this approach was rather unsuccessful. The organisational departments the social media operators are situated was identified and contacted via their department heads using email to request possibility for an interview. These emails were left unanswered.

It was decided to approach these organisations through a range of research activities such as other disaster management research projects with EMOs; and attendance at local and national emergency management conferences; from these industry engagement activities, rapport was built with members of these organisations. Eventually introductions were made to potential interview informants.

A snowballing approach was used to get in contact with further interview informants; one of the last interview questions asked was whether the informant could think about other relevant members in the emergency management field that could be interviewed. Social media is still a small and emerging field within the EMOs; the operators and decision makers know each other and are in contact to learn from each other. This approach helped with recruitment of the remaining interview informants from all five organisations.
4.5.1.3 Description of Interview Informants

Different interview informants from the case organisations who were interviewed for this thesis are described in this section. Not included are the members of the organisations with which informal conversations were had about the topic.

4.5.1.3.1 Interview Informants - Organisation A

In organisation A, one member of the organisation was interviewed and informal talks about social media were had with four additional members of the organisation while visiting the research site. Two formal recorded research interviews were conducted and several informal interviews were not recorded. The informal interviews resulted in case notes. The first of the formal interviews were conducted through Skype; the second interview was conducted on site within the headquarters of the organisation. Furthermore, the interview informant was also informally interviewed on several occasions.

The main interview informant is an online systems officer, who is responsible for the strategic utilisation of the social media services within the organisation and is operating the social media channels. Interview informant’s activities include the development of organisational policy, social media strategies, and coordinating the execution of social media within the organisation. When the organisation is responding to an extreme event, then the interview informant is overseeing the social media cell.

To ensure the quality of the results, the interim results of the research study were presented to members of the organisation on several occasions to ensure that the findings represent the perceived reality of the social media operations within the case organisation.

4.5.1.3.2 Interview Informants - Organisation B

In organisation B, three formal interviews were conducted. Two of the interviews were conducted in the headquarters of the organisation. One interview was a video interview conducted through Skype. In total, three members of the organisation, who are operating the social media channels were formally interviewed. Two of the interview informants are staff members within the headquarters, and the third interview informant is a volunteer who is coordinating the social media activity in one of the units.

The first interview informant is the web and social media coordinator of the organisation at the state headquarters. The responsibilities of the role include the coordination of the social media
presence and the governance of the social media accounts as well as maintaining and governing the web sites associated with the organisation. The role was a new role when the interview informant was recruited (which was about two years before the interview took place).

The interview informant is part of the corporate communication unit within the organisation. In addition to the role of the interview informant, the unit consists of a manager, media officers and public affairs officers.

The second interview informant is a community engagement coordinator for one of the regions in the organisation. The role is situated within the headquarters of the organisation.

In the non-operational phase, when the organisation is not responding to an event, the interview informant is responsible for interacting with the community in order to build resilient communities. This includes helping the volunteer units to engage with their communities through training workshops or by helping to organise events and advertise these events to the relevant communities.

In the operational phase, when the organisation is responding to an extreme event, the interview informant is utilising the region’s social media channels to engage with the public by providing emergency relevant information.

The third interview informant is a volunteer in a unit which is active on social media. As part of the volunteer activity, the interview informant is managing the social media channel of the unit. The unit is using Facebook to inform their listening community about events and about emergency relevant information.

The interim results of the research study were presented to members of the organisation to make sure that the findings represent the perceived reality of the social media operations within the case organisation. This was done once in the headquarters of organisation B, and one time in a workshop where several members of different EMOs were participating.

4.5.1.3.3 Interview Informants - Organisation C

Three interview informants were interviewed in organisation C. Interview informant one was interviewed twice, one time over Skype and one time in person in the headquarters of
organisation C. The second and third interview informant were interviewed at the headquarters of organisation C. During high bushfire risk days, I was an observer in the state control centre of state II, which is situated at the headquarters of organisation C. During this time, I observed the organisation in response to an extreme event. The observations and informal talks were recorded through case notes.

The first interview informant in organisation C was a senior officer in media and communications. The interview informant is participating in the development of organisational policy, social media strategies, and coordinating the execution of social media within the organisation. During the operational mode, the interview informant is often responsible for leading the media cell within the State Control Centre of state II. The interview informant had a background in journalism and was involved in several government projects. I interviewed this particular interview informant formally twice and had several informal conversations about the social media activity with the interview informant. The first formal interview was conducted via Skype, and the second interview was in person at the State Control Centre of the State. Furthermore, I shadowed this interview informant for several hours while I was visiting the State Control Centre of State II during an active emergency event.

The second interview informant was a senior officer in media and communication. Their responsibilities include the operation of the social media channels in both the operational and the non-operational mode of the organisation. Furthermore, the interview informant is involved in the creation of social media policy documents and training material. The interview informant had several roles as a social media officer in other EMOs before the interview informant was transferred to organisation C, and has, therefore, a vast knowledge about how different organisations are operating their social media channels.

I shadowed both of these interview informants for several hours while I was conducting workplace observation in the State Control Centre while it was in full operation.

The third interview informant has a high ranking senior leadership position within the organisation. The informant can be responsible for the coordination of an extreme event when the organisation is in its operational mode. In the non-operational mode, the interview informant is involved in planning the strategic direction of the organisation. The informant is
an advocate for social media and influences the policies and strategies which are used with these platforms within the organisation.

Interim results of this study were presented to the first two interview informants and other members of the organisation while visiting the headquarters of the organisation for fieldwork.

4.5.1.3.4 Interview Informants - Organisation D

Three members of organisation D were formally interviewed. One of the interviews was conducted through Skype and two interviews were performed in the State Control Centre of Case State II. The Skype interview with the first interview informant and the face to face interview with the second interview informant were recorded. The interview with the third interview informant resulted in case notes being taken. In addition to the formal interviews, informal interviews with members of the organisation were conducted during a visit of the State Control Centre of Case State II for the workplace observations during an ongoing bushfire operation.

The first interview informant has a background in journalism and is the digital media manager of the organisation. The responsibilities for this role include the strategic development of new media and web 2.0 capabilities to enhance internal and external communications. When the interview informant started to work for the organisation the main focus of the position was video production and photography; this evolved later into YouTube videos for the organisation and then into the broader social media operations.

The second interview informant has a background in digital marketing and is a long-term volunteer of the organisation. Before the interview informant was hired as a staff member of the organisation, he helped to manage the social media channels of one of the volunteer brigades, and he often helped other volunteers with the social media activities of their volunteer brigades through the organisation's internal social media channels. Through this social media activity, he got hired by the organisation as the senior digital engagement advisor of the organisation. The interview informant is responsible for advising the different departments of the organisation with their digital campaigns, both social media campaigns and non-social media campaigns. Together with the other interviewee from the organisation, he is also responsible for the main social media channels of the organisation; this includes messages during the non-operational mode and the operational mode.
The two interview informants manage the social media activity of the corporate channels of the organisation for both operational and non-operational communication. During weekends and after-hours (after 5pm before 9 am) there is a roster for which days each interview informant is responsible for monitoring the social media channels.

The researcher shadowed both of these interview informants for several hours while conducting fieldwork in the State Control Centre of State II.

The last formal interview informant has a senior role in the management of the organisation. The informant can be responsible for the management of a large scale extreme event during the operational mode of the organisation. The interview informant is not operating the emergency management relevant social media channels of the organisation, however the informant has strategic influence on how these channels can be used for this purpose. The interview informant is supporting the social media activity of the organisation.

Interim results of the research study were presented to members of the organisation while visiting the State Control Centre of Case State II in order to ensure the quality of the results.

4.5.1.3.5 Interview Informants - Organisation E

In Case Organisation E, one member of the organisation was interviewed. The interview informant was interviewed within the headquarters of the organisation and informally in the State Control Centre of State II while fieldwork was conducted.

The interview informant within organisation E is the digital communication coordinator of the organisation. The role is situated within the headquarters of the organisation, and the responsibilities include all of the digital channels. This includes websites and the intranet, as well as social media. The interview informant is developing and extending the online warning and emergency information capabilities of the organisation. Additionally, the interview informant develops the social media strategy of the organisation, and creates the social media training material for the organisation. The background of the interview informant is in media and communication where he worked previously for commercial organisations.

Interim results of the research study were presented to members of the organisation while visiting the State Control Centre of Case State II in order to ensure the quality of the results.
4.5.1.4 Interview Process
There were two types of interviews; Face to Face interviews directly at the organisations, and Skype video interviews. The procedure for both of the interview types was similar. After the potential informant had shown interest in participating in the study, they were provided with information about the interview process via email. An email was sent outlining the interview procedure and highlighting the rights of the interviewee, i.e. consent. Attached to this email was an “Interview Participation Statement” which explained the study and the interviewee rights in more detail; The statement also included the contact details of the Human Ethics Administration so that the participant had means to contact them in case they felt that something was in a breach of ethical procedures. A consent form was also attached for the Skype interviews. For the face to face interviews, a consent form was supplied on the day of the interview.

The interview duration was between 60 and 90 minutes, depending on the social media integration within the organisation and themes the interview informant elaborated on. In addition to the interview there was a 10-15 minutes introduction and a few minutes of conversation and debriefing after the interview. In total, one interview took between 90 to 120 minutes. Before the interview, the interview process was explained to the interview informant including their rights. Questions and concerns were answered. Interview informants were asked if they consent to note taking and audio recording. After the process had been explained, the consent form was read and signed. The Skype interview informants were asked to send the signed form in after the interview took place. When the interview informant agreed to audio recording, the recording was started after all general questions about the interview process were answered.

After the interview, the interview informant was debriefed and asked whether they would provide the contact details of additional potential interview informants within the industry.

An hour was spent after the interview reorganising the notes taken at the interview and combining them with additional information and observations made during the interview process.

The day following an interview the participants were sent an email to thank them for their participation in the research project.
4.5.1.5 Interview Data

Members of more EMOs were interviewed than were actually used in the final thesis (see 4.4.2). Interviews were conducted with a total of 18 informants in nine emergency response organisations. From the nine emergency response organisations, five were selected as case organisations. The remaining organisations were not used in the thesis analysis because the focus and structure of these organisations differed from the profile of the organisations which were the focus for this research (see 4.4.2). For example, their operational area was on a city level in contrast to the operation area of the state; or the type of emergency event the organisation is responding to is very localised or having a short time frame, e.g. structural fires, in contrast to the large-scale floods and bushfires. The interviews were still useful in understanding how social media is used in emergency and disaster management and helped to improve the interview guide used with the final case organisations.

The interview informants of the five case organisations were twelve in total. These interviews resulted in 10 hours and 15 minutes of recorded material as well as interview notes. Table 4.4 shows the number of interviews in each organisation and whether the interview was recorded.

<table>
<thead>
<tr>
<th>Case Organisation</th>
<th># Interviews</th>
<th># Transcribed Interviews</th>
<th># Not Recorded</th>
<th># Interview Informants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organisation A</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Organisation B</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Organisation C</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Organisation C</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Organisation E</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

All recorded interviews were transcribed in preparation for the data analysis. Documentation of unrecorded interviews was done through note taking during and shortly after each interview.

4.5.2 Documents

A further source of data were documents. These documents were either created directly by the case organisations, were legislative documents regulating the emergency management field, or were documents about the case organisation and their social media utilisation. The main documents used within the study are emergency management plans, policy documents, social
media training documents, social media handbooks, and internal case studies about social media utilisation within the organisation.

Each Australian State has legislative documents such as emergency management plans which are sorted by emergency type (e.g. Bushfires, or floods, or storm events). These documents describe the roles each of the emergency response organisation take during specific extreme events and the emergency management related to these events. The emergency management plans related to the case organisations were used to better understand the responsibilities these organisations have during specific extreme events.

All case organisations produced policy documents which are available to the public. These documents include, but are not limited to, social media policies for personal accounts, and the social media policies for official corporate accounts. The social media policies for personal accounts define how members of the organisations (both volunteer and staff members) can and cannot use social media for their personal accounts, since the members of the organisation are always representing the organisation itself. The social media policies for the official accounts of the organisation define how authorised members of the organisation should and should not use these official communication channels.

There are training documents which are used to train members of the organisation in using social media. The majority of the training documents are PowerPoint presentation slides but might include other material as well. There are different audiences for these training documents. Some of the training is targeted towards volunteers, and other training is targeted towards members of the organisation at the headquarters. Not all of the case organisations had training documents. I obtained these training documents from the interview informants of the relevant case organisation.

Some of the case organisations created social media manuals for their social media operators. These manuals explain how different social media services should be utilised during different circumstances. There are social media manuals for social media utilisation to engage with the relevant audience, and as well social media manuals which are focusing on social media intelligence. Not all case organisations created social media manuals.
Several of the case organisations created case studies about social media utilisation during past extreme events. These case studies document how the social media services were utilised by the organisation and what worked well and where there were issues with the utilisation. These case studies were provided by the informants from within the organisation.

4.5.3 Research Site Visits
All of the case organisations were visited, with the exception of Case Organisation D, to conduct face to face interviews at the headquarters of each organisation. Face-to-face interviews with interview informants from Case Organisation D were conducted in the State Control Centre in Case State II, which is located in the headquarters of Case Organisation C.

After each interview, a tour was conducted of each case organisation. The informants showed where they were working during their normal day-to-day activities as well as their workplaces when the organisation switches into an operational mode to respond to larger emergency events. The interview informants explained their general tasks when it comes to social media in both the operational mode and the non-operational mode.

Organisation A and B have a small control centre within their headquarters from which they coordinate their response to larger emergency events. The social media activity is coordinated from these control centres during the operational mode.

The control centre of organisation E is not within the headquarters but at a different location. When the organisation switches into an operational mode, the social media activity is coordinated from the headquarters. When the State Control Centre is activated, the social media activity is then coordinated from the State Control Centre. The same patterns are present in case organisation D.

The observations made during the research site visits were documented in the form of notes in a paper notebook shortly after the visit of the research site. The visits provided valuable information about where and how the social media operators are utilising social media for emergency events in different phases of the emergency management lifecycle.

4.5.4 Workplace Observation
In Case State II, a visit of the State Control Centre was held during a major bushfire event. In the time of the visit, the centre was in full operation. The State Control Centre was observed
over a period of four days as to how the emergency response to a major event is conducted. Organisation C, D and E were involved in the response to this event and were coordinating the response from within the State Control Centre.

The majority of the time activities of the media and communication team were observed; i.e. through shadowing multiple social media officers as they were coordinating the social media communication and observing the activities of other stations. The observations were documented in the form of observational notes within a paper notebook. Informal talks were also conducted about social media with different members of the Case Organisations C, D, and E in Case State II at the State Control Centre.

4.5.5 Social Media Data
We know from previous research how different EMOs are utilising their social media channels during extreme events (Bruns et al. 2012; Crump 2011; Ehnis and Bunker 2012; Ehnis and Bunker 2013; Ehnis et al. 2014; Heverin and Zach 2010; Queensland Police Service - Media and Public Affairs Branch 2011) from the perspective of how the listening community would perceive the social media interaction through analysing the social media channels in isolation. This thesis focuses on how EMOs have integrated social media services into their organisations for emergency management purposes.

While the interview data collected from informants who are close to the social media channels of the organisation is the main source of the empirical data, the social media channels of the EMOs were also an important source of data. The different social media channels that the organisations are using were observed and data collected to better understand the social media practices of these organisations. By observing these channels, it was possible to triangulate and better understand practices and utilisation of social media that was referred to by informants in interviews.
4.6 Data Analysis

As in most qualitative research, the data analysis in this study involved an iterative process. This section outlines the analyses of the empirical data to produce the research results of this thesis. Figure 4.4 illustrates the analysis approach.

![Data Analysis Diagram]

The grey rounded rectangles show the data sources which were introduced in the previous sections of this chapter. The white rectangles show the empirical artefacts. The social media data and documents acted both as empirical artefacts and data sources. The grey arrows show
the flow of the data analysis, while the black arrows indicate the iterative feedback loop. The blue rectangle indicates the theoretical outcome of this thesis which is the revised model of social media in disaster management as shown and discussed in Chapter 7.6.

The data analysis began with the creation of the first iteration of the interview guide. This version of the interview guide was created with the help of the outcome of the literature review on EMO use of social media, as shown in chapter 3.5, Ahmed’s Framework of Social Media in Disaster Management (Ahmed 2011), as shown in Chapter 3.6 and 7.2, my two preliminary studies Ehnis and Bunker (2012) and Ehnis and Bunker (2013), and the social media data from the particular case organisations.

The analysis of the empirical material was iterative and occurred in several phases. The main data sources for the data analysis were the interview transcripts and case notes which were created during and shortly after the interviews. This data was supplemented by relevant documents from the case organisations, the notes from the research site visits, the notes from the workplace observation, and social media data from the case organisations.

The first step of analysing the transcribed interviews involved listening to the interview recordings to become re-familiarised with the specific interview and to ensure the quality of the transcriptions. The notes made during and after the interview, were also re-read.

In a further step, a printout of the interviews was further annotated. These included thoughts about specific sections and broad categories.

A software package called NVivo was then used to organise, categorise and further annotate the interviews and further selected documents, such as social media manuals and guidelines. A bottom-up coding approach (Urquhart 2012) was used to identify specific categories in the data set. Some of these categories were supported by the underlying framework of Social Media in Disaster Management (Ahmed 2011), and some of the categories were new.

In a further step, categories in the dataset were combined into broader themes, these were further supplemented and supported with the help of the additional data sources: social media data, notes from research site visit, notes from workplace observation notes, and other selected
documents about the case organisations. These themes are outlined in Chapter 6 – Analysis and Findings in detail. Throughout the different iterations, these themes influenced the coding categories as more data became available.

As discussed in section 4.5.1.1 aspects of social media utilisation that emerged through the analysis of the interview data lead to a refinement of the interview guide if the analysis revealed areas of social media utilisation by EMOs that needed further probing.

Over time, as the themes became more and more concrete they revealed different aspects of social media (SM in Figure 4.4) utilisation in EMOs (EMO in Figure 4.4). These themes are discussed at length both in Chapter 6 – Analysis and Findings, as well as in Chapter 7 – Discussion. As the research progressed emerging aspects of social media utilisation in different EMOs were used to develop a framework of social media utilisation in EMOs for the purpose of emergency and disaster management as discussed in Chapter 7.6.

4.7 Summary

The purpose of this methodology chapter is to outline the research approach. This research is designed as a case study with five ‘revelatory’ cases of EMOs which have embedded social media services into their structures and emergency management practices. The aim of the research is to understand better how such organisations have appropriated social media technology for the purpose of emergency management and to extend the theory about social media in emergency and disaster management.

Within this study, an Interpretivist research paradigm is followed and the ontological stance of ‘weak’ social constructivism is taken.

The case design and the boundaries of each case were also described and the data collection as well as analysis was explained. Interviews were used as the main data source and informants were generally operators of the social media channels in each case organisation. As supplementing data, documents, notes from research site visits, notes from workplace observations, and social media data were collected from each case organisation. In the last part of the chapter, the iterative process for analysing and interpreting the data was outlined.
In the following chapter, a detailed account of the five case organisations is given and the emergency management context in the two different case states in which these organisations are situated is discussed.
Chapter 5 – Case Study Description

5.1 Introduction

In this Chapter, a more detailed account of the selected case organisations investigated in this study is provided. As established in Chapter 2 and 3, social media services are embedded into the daily lives of individuals, however, for EMOs, these types of services and platforms are still relatively new technologies which are getting more and more integrated into the structures and practices of these organisations.

As stated in Chapter 4, only EMOs that already actively use social media services were selected for investigation. All case organisations thus adopted social media services into their structure and practices to communicate and interact with the public for emergency management purposes. ‘Revelatory’ cases (Urquhart 2012) were chosen under the assumption that organisations with a well-established social media integration will tell us more about the underlying phenomena (see section 4.4 for further detail). Still, all case organisations are in the progress of further exploring how social media technology fits into the practices and structures of emergency management. Thus while all of the selected case organisations adopted social media services into their structures and communication processes, the appropriation and alignment with their structures, practices, and norms are ongoing.

The case organisations will now be introduced and have been selected from two Australian federal states, which are similar in their risks of natural emergency events. Both of the case states experience a seasonal occurrence of bushfires and also storms that can result in large flooding events. The selected response organisations which are situated in these states are large volunteer organisations which are similar in size, and responsibilities. The organisations show similarities in their structure at first glance, however, the two case states have vast differences the organisations are coordinated during larger emergency events.

While the organisations show similarities on various aspects in their social media utilisation, the selected case organisations show contrasting and prominent patterns in their social media activity and structure between these two case states. This allows a comparison of the social media utilisation patterns that emerged in organisations from two different jurisdictions.
Bushfires, flooding, and severe storms are the most common source for extreme events in both federal states. Large response organisations have more resources to explore social media as an additional communication channel for emergency management in contrast to small EMOs. Therefore, it is not a surprise that the larger organisations are more active in using social media. In each of the states, the lead organisation responsible for storms and flooding events, and the lead organisation responsible for large-scale bushfires was selected as case studies.

Case State II shows a different structure of communication with the public and media during extreme emergency events, or disaster events. To account for this different structure, an additional case organisation in Case State II was selected which is an overarching umbrella organisation responsible for the emergency response coordination for all type of hazard events. This organisation coordinates the centralised social media communication during these large-scale extreme emergency events.

The Interview Participation Consent Form promised the interview informants that the case organisations are disguised in this write-up of the study. Furthermore, it was specified that no information about the interview participants would be disclosed in a way that would make it possible to identify the particular interview informant.

Organisational members of the case organisations who coordinate the social media utilisation of their organisations were interviewed. Therefore, in order to disguise the case organisations, the sources for the case descriptions in this chapter are not directly referred to. The case descriptions were written with the help of documents from and about the organisations, the interview transcripts, and publicly available information, such as the websites of the organisations.

As shown in Figure 5.1, the remainder of this chapter is structured as follows: Section 5.2 introduces the three selected case organisations situated in Case State I, and section 5.3 outlines the case organisations from Case State II. In State I there is Organisation A (section 5.2.1), an organisation focusing on the response to bushfires events, and Organisation B (section 5.2.2) which is responding to storm and flood-related emergency events. Section 5.3 provides an account of the case organisations in State II. For State II, three case organisations were selected: Organisation C, D, and E. Organisation C (section 5.3.1) is an umbrella organisation responsible for the coordination of the response in all kind of hazard extreme events.
Organisation D (section 5.3.2) is responsible for bushfires, and rural structural fires and organisation E (section 5.3.2) is responsible for storm and flood related events.

Each case description is structured following the same blueprint. First, an overview of the organisation with a description of tasks and responsibilities is given. After this, the structure of the organisation is outlined, with a specific focus on the social media utilisation structure. Finally, the actors involved in the social media utilisation are described.

The chapter concludes with a summary of the case organisations in section 5.4.

**Figure 5.1 Outline Chapter 5**
5.2 Case State I
Case State I is a federal state located on the East Coast of Australia. Similar to all Australian states, the case state experiences frequent naturally occurring emergency extreme events. The most frequent event types are bushfire events, which occur almost seasonally, and flooding events, which are caused by storms.

The bushfire season lasts typically from October to the end of March. It is still possible that bushfires occur outside this season. Storms that result in flooding events typically occur in the first quarter of a year.

Within the State I, two EMOs as case organisations were selected. Both of these organisations are large-scale volunteer emergency response organisations, of which member bases consist of both volunteers and paid staff members. Organisation A is a fire response organisation and Organisation B is response organisation which has a main focus on storm, flood, and tsunami-related emergency events.
5.2.1 Case Organisation A

<table>
<thead>
<tr>
<th>Table 5.1 Overview Organisation A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Organisation Name:</strong></td>
</tr>
<tr>
<td><strong>State:</strong></td>
</tr>
<tr>
<td><strong>Size:</strong></td>
</tr>
<tr>
<td><strong>Type of Events:</strong></td>
</tr>
<tr>
<td><strong>Structure:</strong></td>
</tr>
<tr>
<td><strong>Social Media adoption:</strong></td>
</tr>
<tr>
<td><strong>Social Media is used as:</strong></td>
</tr>
</tbody>
</table>

5.2.1.1 Overview – Organisation A

The first case organisation, Organisation A, is responsible for bushfire events in the rural areas of State I. The organisation has more than 75,000 members and is, therefore, one of the largest fire response organisations worldwide. The main member base of the organisation consists of volunteers, and less than one thousand members paid staff.

This organisation is the lead organisation during bushfire events in Case State I. This means that Organisation A coordinates the response to the bushfire events, while the remaining response organisation in the state fulfils support roles during bushfire events.

The organisation explored the potential of social media for emergency management early on. On the corporate (headquarters) level of the organisation, the social media activity on Twitter and Facebook started in 2009. In the early phases, this social media operation consisted of automated messages. The activity was transformed into a more engaging approach in 2011. Now the organisation utilises social media to engage with the general public through all phases of disaster management. Furthermore, the organisation uses social media as a source for intelligence gathering to support the situational awareness during unfolding events.

5.2.1.2 Structure – Organisation A

The organisational structure consists of volunteer roles and paid roles. The majority of the member base consists of volunteers while only a small portion of the organisational members are paid staff. Volunteers in this organisation are trained firefighters. This type of trained volunteer should not be confused with untrained volunteers; For example, spontaneous volunteers who show up after extreme events and offer help. Volunteers in EMO context refer to highly trained individuals who are specialised in the core work of their organisation; in the
case of organisation A, this is the actual extinguishing of bushfires. The organisation also has permanent paid roles responsible for the coordination of the volunteers, training, support, the strategy of the organisation as a whole, communication with the media, and the centralised management of emergency events.

While the organisation has a presence all over the state, it is centrally organised and very hierarchically structured. The organisation operates in all rural areas of State I. The operation area is structured into four main regions. Each of these regions consists of several districts. In total, there are more than 50 districts. Each of these districts consists of several local fire brigades. In total, the organisation has 2032 brigades. A brigade is operated by volunteers and consists of at least one fire truck.

The organisation operates in two different modes. These modes are generally called ‘the operational mode’ and ‘the non-operational mode’ by the organisation and the emergency management sector. Operational mode refers to when the organisation is responding to and managing an emergency event. The non-operational phase is the day-to-day operation in times where there is no emergency event present. The time in the non-operational mode is used to prepare for the next emergency event, which includes planning, training, and other tasks to keep the organisation running and prepared.

5.2.1.3 Social Media Utilisation Structure – Organisation A
In the non-operation mode, the day-to-day operation, there are currently six individuals that have access to the social media channels in the headquarters of the organisation. One person is mainly responsible for operating the different social media channels and creates content on a regular basis.

In the operational mode, activities depend on the size of the event and how many members of the organisation operate the social media channels. In a small-scale event, one person is responsible for the social media channels. In a major event, it can be up to four members. In operational mode, there are two twelve-hour shifts per day. The day shift is often responsible for social media broadcasting and information gathering for intelligence purposes. Since there is less activity on social media during the nights, the night shift is typically smaller than the day shift and is responsible for both social media and updating the web page. Currently, there is not a lot of social media intelligence during the night shifts. The case organisation has a
control centre embedded into its headquarters from which this organisation coordinates the responses to larger bushfire events. The extreme event social media communication is operated from within this centre. There is a dedicated table used by the social media officers. The members of the organisation refer to this table as the ‘social media cell’.

During extreme events, the state activates the state control centre of State I to support the coordination between the involved emergency response and other emergency support organisations. The headquarters-level social media channels of Organisation A are still operated from within the headquarters of Organisation A, even when the state control centre of the state is activated.

The social media section is embedded in the corporate communication unit of the organisation. This unit is responsible for communicating with the media as well as with the general public, however, specific members of other departments have access to the social media channels too.

Social media activity is binding highly trained human resources to operate the social media communication channels of EMOs; these resources are not available for classical emergency management activities of these organisations. There is only a limited surge capacity available when it comes to operating social media channels during the operational mode, as there are only a limited number of officers familiar with this specific type of communication to the public and media. To improve the capacity for large-scale events, Organisation A is currently developing and testing approaches to build volunteer supported capabilities. This approach is based on the VOST (virtual operational support team) concept (Denis et al. 2012). The organisation builds a capacity of volunteers who either come into the headquarters to support the social media activity, or operates the social media channels from where they are based. The VOST concept is in a development and test process at case Organisation A.

Brigades are run by volunteers. The decision if a brigade operates social media channels is made on a brigade level and operated independently from the centralised social media channels operated from the headquarters. The organisation tries to achieve a consistent usage of terminologies of the different social media channels through a policy document; This includes the names of each of their volunteer pages. Before this policy document was in place, the terminology convention was not standardised, and several different naming practices were in place.
If a brigade decides to operate social media channels, then the volunteers within the brigade operate these social media channels. Since the volunteers are needed when the brigade enters into the operational mode, it is not uncommon that these local brigade social media channels cannot provide emergency relevant updates when the brigade is responding to an emergency event.
5.2.2 Case Organisation B

Table 5.2 Overview Organisation B

<table>
<thead>
<tr>
<th>Organisation Name:</th>
<th>Organisation B</th>
</tr>
</thead>
<tbody>
<tr>
<td>State:</td>
<td>State I</td>
</tr>
<tr>
<td>Size:</td>
<td>~ 10,000 members (volunteer roles and paid staff)</td>
</tr>
<tr>
<td>Type of Events:</td>
<td>Storm events; flooding events; tsunami events</td>
</tr>
<tr>
<td>Structure:</td>
<td>17 regions; 200 units</td>
</tr>
<tr>
<td>Social Media adoption:</td>
<td>2011 at the headquarters level</td>
</tr>
<tr>
<td>Social Media is used as:</td>
<td>Communication and engagement channel with the public and the media</td>
</tr>
</tbody>
</table>

5.2.2.1 Overview – Organisation B

The responsibility of Case Organisation B is to provide emergency and rescue services for disaster events. The main response activity of the organisation is storm and flood-related events. Organisation B is the lead organisation in such event types. This means that the remaining emergency response organisation of the state will have a support role during storm and flood events and Organisation B coordinates the response to the event.

The organisation has a member base of about 10,000 members and is, therefore, significantly smaller than Case Organisation A. However, it is still a very large volunteer organisation that is supported and managed by a small core of paid employees.

On the headquarters level, the organisation started using social media microblogging services in the second half of 2011. During this time, there were already several social media channels operated by different volunteer units, which have adopted social media much earlier. Since social media was established at the headquarters level, Facebook and Twitter are actively used, and these channels were more closely integrated into the communication structure of the organisation over time. The organisation primarily uses social media services to communicate with the public. Social media services are also used for internal communication among the volunteers. Currently, the organisation does not have the capabilities to utilise social media as a tool to gather information to support situational awareness during an extreme event.

5.2.2.2 Structure – Organisation B

The operational area of the organisation is the whole state including urban areas. To cover this area, the organisation is structured into regions and units. There are more than 200 different units structured into regions. The units are located in both urban and rural areas. A unit is an operational compound similar to the brigades of case organisation A. A compound of several
units is structured into a region. There are seventeen regions across the state. Some of these regions consist of more units than others. There is a centralised headquarter, which oversees the different regions within the state.

Social media activity can be observed on all three of these structural levels: on the unit level, on the region level, and on a centralised headquarters level. Most of the emergency management related social media activity is centralised at the headquarters and on the region level.

The organisation mostly consists of volunteers, but also employs paid staff members in administrative and senior operational roles. Most of the paid roles are situated within the headquarters or the regional centres. The unit roles are volunteer roles. The volunteers are specially trained for their primary tasks. When it comes to social media, there is no dedicated volunteer role for this task.

5.2.2.3 Social Media Utilisation Structure – Organisation B

The organisation mainly utilises microblogging platforms and social networking sites for their social media activity. Facebook and Twitter are the primary channels. There are also other channels such as LinkedIn, Google+, or YouTube, but these channels are rather static and used as a business card or in-support function to improve the engagement with the general public, but not for the primary tasks of emergency management.

Similar to the remaining case organisations, the organisation operates in two modes of operation that influences how the social media channels are utilised. The first mode of operation is the non-operational mode and the second mode is the operational mode in which the organisation is responding to an extreme event.

During the time the organisation is in the non-operational mode, multiple members of the organisation have the authority to broadcast information through the organisation's social media channels, however, the web and social media coordinator from within the headquarters of the organisation do most of the social media communication.

When the organisation is in full operation and responds to a large-scale emergency event, the corporate social media channels can be operated 24 hours a day. During these times, the
organisation operates in twelve-hour shifts. During one shift, one person within the headquarters is responsible for the organisation’s social media channels and website updates. If necessary, an additional person can support the social media operator in communicating information towards the public and media organisations. The social media channels are generally not used to gather information about extreme events.

The social media section at the headquarters is embedded within the corporate communication unit of the organisation. The responsibilities of this unit include communicating with the general public and the communication with media organisations.

The social media responsibility on a regional level varies, however, generally, the community engagement coordinator for a specific region is responsible for most of the social media activity.

The main accounts are situated at the headquarters level and managed from there. The region level accounts provide information more relevant to the specific regions.

Many of the units operate one or multiple social media channels, but there are also many units who decide not to utilise social media channels at all. The units are run by volunteers, and the decision whether a unit is utilising social media is dependent on the volunteers in each unit. The extent to which social media services are utilised on a unit level varies. Similar to Organisation A, the social media activity of the units is very limited when the unit is responding to an emergency event as the volunteers are needed to perform their primary task of responding to the effects of an event. There is currently no dedicated social media role on a volunteer level. Therefore, most emergency relevant information is provided either through the central corporate social media channels operated by the headquarters or by the region social media channels of the organisation.

The central structure of the organisation supports and advises the units on their utilisation of social media, however, the headquarters prefers if a unit is using social media only for internal communication in closed groups or channels, invisible to the public, and not for external communication. The reasoning behind this is that it would be preferable when the provided information to the public is not too fragmented over a myriad of channels. In addition, so that there is less room for conflicting information provided on the social media channels.
5.3 Case State II

Case State II is located on the East Coast of Australia. The state is a neighbouring state of Case State I and is experiencing similar types of extreme events. The case state mostly experiences bushfires, and storms which can result in severe flooding events. The bushfire events occur under normal conditions during the summer months. The bushfire season typically lasts from early October to the end of March. The storm events resulting in severe flood events also commonly occur during the first quarter of a year. However, it is also possible that such an event occurs outside this time frame.

In Case State II, three EMOs as case organisations were selected. The case organisations are organisation C, D, and E. Organisation D and E are large-scale volunteer emergency response organisations. Organisation D coordinates and responds to bushfire and structural fire-related events. Organisation E is responsible for the coordination and response to storms, floods, and tsunami related emergency events. Both of these case organisations draw on volunteer members and are closely embedded into the social fabric of the communities they are serving.

Organisation C is different in comparison to the other selected case organisations in the sense that it is a relatively small organisation and does not have the large volunteer base. The organisation is an overarching coordinating organisation. The organisation does not have its own response assets on the ground with which it could directly manage an extreme event. It acts as an umbrella organisation with the focus to improve the communication and coordination of emergency response organisations when an emergency event requires extended collaboration either through the size of the event or that the event type needs the response of several different response organisations.
5.3.1 Case Organisation C

**Table 5.3 Overview Organisation C**

<table>
<thead>
<tr>
<th>Organisation Name:</th>
<th>Organisation E</th>
</tr>
</thead>
<tbody>
<tr>
<td>State:</td>
<td>State II</td>
</tr>
<tr>
<td>Size:</td>
<td>Unclear (Between 50 and 200 paid employees)</td>
</tr>
<tr>
<td>Type of Events:</td>
<td>All-hazards approach</td>
</tr>
<tr>
<td>Structure:</td>
<td>Centralised in headquarters; support in regional control centres</td>
</tr>
<tr>
<td>Social Media adoption:</td>
<td>2013</td>
</tr>
<tr>
<td>Social Media is used as:</td>
<td>Communication channel to engage with Public and Media; Intelligence Channel</td>
</tr>
</tbody>
</table>

5.3.1.1 Overview – Organisation C

Case Organisation C differs from the remaining case organisations in several aspects: This organisation is not a volunteer based organisation; the organisation is relatively young and was established in its current form in 2014; and the organisation is not a classical emergency response organisation with own emergency response assets.

Organisation C is a governing body that sits above all other EMOs in State II. Organisation C has the legislative responsibility to warn communities in emergency events. The organisation is, in contrast to the other case organisations, very young and came into being within the last seven years. The organisation does not have its own response capabilities, such as fire trucks and other emergency response assets on the ground, but it is an umbrella organisation supporting state emergency response organisations with communication, coordination, and collaboration capabilities. In a large-scale extreme event, the emergency response organisation in the state such as Organisation D and E, hand over said responsibilities to Organisation C with the objective of improving the event coordination.

The origin of Organisation C is closely linked to a devastating bushfire disaster event that occurred in Case State II. Many lives and properties were lost during this event. In the aftermath of the event, it became evident that there was a problem in the interoperability of the involved organisations. There were multiple breakdowns in communication, collaboration and coordination between the involved EMOs. Without these breakdowns, it might have been possible to respond more effectively to the event and lives may have been saved. The predecessor of Organisation C was established to improve this coordination in bushfire related events.
A mine fire in Case State II showed that emergency extreme events often have multiple cascading risk factors and outcomes. The fire event itself was manageable by the response organisation. Though it was not possible to extinguish the mine fire straight away, the fire could be contained, however, the ongoing smoke from the fire was a serious health risk for the surrounding communities. These problems showed that there is a need for better coordination between the response organisations and the involved support organisations in all types of extreme events, and not just during bushfire events. The predecessor of organisation C was therefore shifted from a fire-centred approach towards an all-hazard approach. Organisation C in the form as it is structured today was established in 2014.

The main focus of this organisation is to support response organisations with their work and coordinate inter-agency collaboration in single and multi-hazard scenarios. Furthermore, the main responsibility of the organisation is to inform and warn the public about emergency events.

5.3.1.2 Structure – Organisation C

In contrast to the other case organisations, the member base of Organisation C consists only of paid employees as the organisation has no own volunteer members or emergency response equipment, such as fire trucks. The organisation is a relatively small organisation as its main activities are to support and improve the communication, coordination and collaboration between the EMOs within the state.

The headquarters of organisation C houses the premises of the state control centre of Case State II. When the state control centre is activated, the relevant organisations coordinate the emergency response towards an event from this state control centre. The state control centre is activated during major extreme events, or in days of a high risk of such an event occurring. For example, the state control centre would be activated in days of a severe bushfire risk.

The state control centre is coordinated by Organisation C. When it is activated, in the response to an event, involved EMOs coordinate this response from the state control centre. All involved organisations send members of their organisations to the centre. Some members are then on secondment in Organisation C to fill specific roles in that organisation, such as the role of social media officers.
5.3.1.3 Social Media Utilisation Structure – Organisation C

The organisation uses social media in both modes of operation. In the non-operational mode, the social media channels are used to communicate information about the organisation. Furthermore, the organisation uses the channels to educate the public about potential emergency events in order to build community resilience.

In the operational mode, the organisation operates social media channels on behalf of the involved organisations in an event. The organisation is in the operational mode when the state control centre is activated. The social media activity of the involved organisations is taken over by Organisation C, which then operates the corporate (headquarters level) social media channels on behalf of the involved organisations. The social media channels on a region, district or unit/brigade level are not operated by Organisation C.

Social media is situated in two different teams, which have different aims and focus when it comes to the utilisation of social media channels. The first team is situated in the “public information and warnings” unit. This unit of the organisation is responsible for informing the media and the public about emergency events and risks related to these events. This team uses social media to distribute information towards the general public and media organisations.

The second team is situated within the “intelligence unit” of the organisation. The responsibility of this team is to use social media to gather and validate relevant information during an extreme event. This information is then used to improve the situational awareness of the organisation and the management of the EMOs involved in the extreme event.

The two units in the organisation are distinct and physically separated organisational units. The social media officers within these units have different skill sets and training. The intelligence unit only gets activated when the operation is in the operational mode. The social media unit within the media team is also operational in the non-operational mode of the organisation, however, it is then only operating the social media channels of Organisation C.

The distribution of information to the public and media organisations is done through the social media team within the public information and warnings unit. When the organisation is not in its operational mode, the team has three members who operate the social media channels.
Besides communicating relevant information to the general public, this team improves and prepares the social media utilisation for disaster management.

When the organisation is switching into the operational mode, the state control centre of State II is activated. In such a case, a shift happens in the social media utilisation of the involved EMOs. Organisation C takes over the coordination of the social media channels of other emergency managing organisations on their behalf. In these cases, the social media activity is coordinated from the state control centre and not from the headquarters of the individual organisations. The involved EMO suspends to use their corporate channels during such times of operation.

Organisation C extends their capacity to operate the social media channels with social media officers provided by emergency response organisations within State II. Which social media officer operates which social media channels is determined by the roster. Through this practice, the organisation has capabilities to respond to sudden surges when there are more social media officers needed.

The allocation of who operates is coordinated through a roster where each potential social media operator of the state is a part of. During the days they are on the roster, they are on call. If the state control centre is activated during a day, the on-call persons will be informed to operate the social media channels from the state control centre.

The specific social media officer for the day can come from, for example, Organisation E, but broadcasts messages for Organisation D. The decision who is in the state control centre is dependent on a predetermined roster which is set active when the state control centre is activated.
5.3.2 Case Organisation D

<table>
<thead>
<tr>
<th>Table 5.4 Overview Organisation D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organisation Name:</td>
</tr>
<tr>
<td>State:</td>
</tr>
<tr>
<td>Size:</td>
</tr>
<tr>
<td>Type of Events:</td>
</tr>
<tr>
<td>Structure:</td>
</tr>
<tr>
<td>Social Media adoption:</td>
</tr>
<tr>
<td>Social Media is used as:</td>
</tr>
</tbody>
</table>

5.3.2.1 Overview – Organisation D

Case Organisation D is a fire response organisation. The organisation’s emergency responsibilities include all fire related emergency events in Case State II, excluding the state’s capital. Organisation D also responds to structural fires, which is a contrast to organisation A which responsibilities only include bushfire events.

Organisation D was an early adopter of social media services for emergency and disaster management within Australia. The corporate (headquarters level) social media channels were established in 2008 and back then included Facebook, Twitter and YouTube. In the beginning, the organisation used two different Twitter channels; One was dedicated for emergency warnings, and one was dedicated to other emergency relevant information and information about the organisation. Now the organisation is only using one Twitter channel at the headquarters level, which is used as both as a warning and as an information channel.

5.3.2.2 Structure – Organisation D

The operation area of the organisation is the whole state excluding the state capital as another fire organisation is responsible for the area of the state capital. The member base of the case organisation consists of volunteer roles and paid staff roles. The paid employees include career fire fighters, support staff, and management staff in senior roles. The main member base of the organisations consists of volunteers. The organisation currently consists of more than 50,000 volunteers and more than 2,000 paid staff members. Most of the volunteers in the organisations are trained volunteer fire fighters. Around 1,000 paid career fire fighters are employed in the denser populated areas of the state where 24-hour a day operated fire stations are necessary. The organisation refers to these fire stations as integrated fire stations as these stations host both volunteer fire fighters as well as career fire fighters.
In contrast to Organisation A, which is also a fire department operating in the rural areas of the state in which it is located, Organisation D is responsible for both structural fire and bush fire events. Different equipment, strategies, and training are necessary to respond to these two different fire types. These fire event types do not behave the same way, and different risk factors are involved when they occur.

The organisation is very hierarchically structured and centrally organised as it typically is for EMOs. The different sub-structures (Holons) of the organisations have still autonomy to some extent and can operate autarkical during events. The operation area of the organisation is divided into five regions with a total of 21 districts. There are several fire brigades in each district. In total, there are more than 1,200 brigades in the organisation.

The social media utilisation shows similar patterns to the other examined volunteer organisations. There is some social media activity on a brigade level, which means that some of the brigades utilise social media services to communicate with the public, however, the emergency-relevant communication is still very centralised and orchestrated through the headquarters level.

The organisation has two major modes of operation; it operates in an operational mode, and a non-operational mode. The social media utilisation in the non-operational mode is more diversified and experimental, while the social media operation in the operational mode shows standardised established practices.

The operational mode shows two major manifestations. The first of these manifestations is the normal operational mode in which the fire events are localised and the risk level of it to transfer into a major disaster event are low. In this case, the organisation coordinates the response within its own structure. The main social media communication is then handled from the headquarters of the organisation.

When there is an intense extreme event present, then the event is coordinated from the state control centre. When the state control centre is activated, the organisation is then also activated as a coordinating organisation. Some of the coordination of the event is then transferred from the headquarters of the organisation towards the state control centre. In such a case, the social
media communication is then completely suspended in organisation D and picked up by organisation C, which then operates the social media channels on behalf of organisation D.

5.3.2.3 Social Media Utilisation Structure – Organisation D

Social media is situated on three levels in the organisation: Centralised at the headquarters: on a district level; and on a brigade level. Not all districts and brigades operate social media channels. Similar to the other case organisations, most emergency relevant information is provided through the headquarters social media channels.

The social media team within the headquarters is situated in the media and communications unit. While more members of the organisation have access to the social media channels, the main social media team consists of two members of the organisation. These two members coordinate the centralised social media channels and also monitor their social media channels.

Outside office hours and especially during the weekend, there is a roster in place that indicates which social media officer is responsible for coordinating the social media channels at this time.

When the organisation is in the operational mode and the state control centre (organisation C) is not activated, the headquarters level social media channels are operated from within the headquarters of the organisation.

When the state control centre is activated, the social media coordination is moved to Organisation C which then operates the headquarters level social media channels of Organisation D from within the state control centre.

Besides the human operation of the social media channels, the organisation uses automated warnings to post on their main Facebook channel and to one of their Twitter channels. The organisation uses two Twitter channels, one for emergency related information warnings and one for organisational updates to the volunteer members of the organisation. The automated warnings are sent out by an internal warning information system.
5.3.3 Case Organisation E

Table 5.5 Overview Organisation E

<table>
<thead>
<tr>
<th>Organisation Name:</th>
<th>Organisation E</th>
</tr>
</thead>
<tbody>
<tr>
<td>State:</td>
<td>State II</td>
</tr>
<tr>
<td>Size:</td>
<td>~5700 members (combined volunteers and paid staff roles)</td>
</tr>
<tr>
<td>Type of Events:</td>
<td>Storm events; flooding events; tsunami events</td>
</tr>
<tr>
<td>Structure:</td>
<td>6 regions; 149 units</td>
</tr>
<tr>
<td>Social Media adoption:</td>
<td>2011</td>
</tr>
<tr>
<td>Social Media is used as:</td>
<td>Communication Channel to engage with Public and Media</td>
</tr>
</tbody>
</table>

5.3.3.1 Overview – Organisation E
Organisation E is specialised to respond to storms, flood, and tsunami related extreme events. Furthermore, the organisations also have the capabilities to provide relief to other event types. The organisation can be compared to Organisation B as it is the correspondent EMO in Case State II. Organisation E is a volunteer organisation supported and coordinated by a small core group of paid employees.

At the headquarters level, the organisation has been utilising social media since 2011. At this organisational level, the organisation uses a Facebook channel and two Twitter channels. One Twitter channel is dedicated to information about the organisation as well as less time-sensitive emergency relevant information. The second Twitter channel is dedicated to warnings and time-sensitive disaster information.

5.3.3.2 Structure – Organisation E
The operational area of the organisation is the whole state. Organisation E is the smallest of the volunteer-centred case organisations with about 5,700 members. The majority of these members are volunteers. The organisation employs between 150 and 200 paid staff members in administrative, senior operational and other support positions.

The language the organisation uses in regards to its structure is similar to case Organisation B. There are 149 units are structured into 6 different regions which are governed by the headquarters. The headquarters is situated in the capital of State II. The operational area of the organisation is the whole Case State II.
When it comes to the overarching patterns in utilising social media, Organisation E has similar practices in place as Organisation D. The organisation works in two operational modes: The non-operational mode, which is the day-to-day operation; and the operational mode, which is the mode when the organisation responds to an emergency event. The operational mode has two forms of manifestation or escalation. In the first form, the social media communication is managed within the organisation. In the second form, the state control centre, and with it Organisation C, is activated.

5.3.3.3 Social Media Utilisation Structure – Organisation E
Case Organisation E uses social media channels on a unit, region, and headquarters level. Volunteers of the organisation operate the social media channels on the unit and region level. A small social media team operates the social media channels at the headquarters level. Critical emergency relevant information is broadcasted through the headquarters social media channels.

Members of the media and communication unit operate the headquarters social media channels. There are four members within the organisation who coordinates the social media channels on a day-to-day basis as one aspect of their role duties.

In the non-operational mode, the social media channels are only operated during office hours, however, there is a roster for an on-duty media officer. The media duty officer is sporadically monitoring the social media channels outside the office hours and during weekends.

The organisation currently uses social media to communicate and engage with their listening community (members of the general public who decide to follow the social media channels of the organisation) and the media. The organisation does not use social media as an intelligence channel to improve situational awareness. This case organisation is relatively small and does not have the resources for such an endeavour.

The organisation uses an internal warning information system which automatically broadcasts warnings at the headquarters level Facebook page and on one Twitter channel.

Similar to organisation D, organisation E has two manifestations of the operational mode. In the case that the state control centre is not activated in Case State II, then the social media
channels are operated from within the headquarters of organisation E by the media and communication team.

The second manifestation of the operational mode would be when the state control centre is activated. In the case that the decision is made to activate the state control centre, then Organisation E suspends its social media communication and the external social media communication is handled centrally through Organisation C in the state control centre of State II.

The social media operators from Organisation E are also part of the roster, which operates social media from within the state control centre.
5.4 Summary

This chapter provided a description of the different case organisations used in this study. Each case description was structured into three parts: An overview about the organisation, which included event types the organisation typically responds to; an overview of the structure of the organisation; and finally, an overview of the social media utilisation structure in each organisation.

The organisations are situated in two federal states with different approaches in emergency management. Case Organisation A, and B are situated in Case State I. Organisation C, D, and E are situated in Case State II.

Table 5.6 shows a comparative overview on the different case organisations in the two case states. In total, four ‘classical’ EMOs, and one ‘umbrella’ organisation were selected. The ‘classical’ EMOs have either a fire focus (Organisation A and D), or a focus on events related to storms and floods (Organisation B and E). Organisation C, the ‘umbrella’ organisation, has the responsibility of warning and informing the public, and ensuring interoperability between organisations in larger extreme emergency events.

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Member Structure</th>
<th>Emergency Responsibility</th>
<th>Operation Area</th>
<th>Jurisdiction</th>
<th>Organisation type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organisation A</td>
<td>Volunteer and paid staff members</td>
<td>Bushfire events</td>
<td>Whole state</td>
<td>State I</td>
<td>Emergency Response Organisation</td>
</tr>
<tr>
<td>Organisation B</td>
<td>Volunteer and paid staff members</td>
<td>Flood and storm related events</td>
<td>Whole state</td>
<td>State I</td>
<td>Emergency Response Organisation</td>
</tr>
<tr>
<td>Organisation C</td>
<td>Paid staff members</td>
<td>All hazards approach</td>
<td>Whole state</td>
<td>State II</td>
<td>Coordinating umbrella organisation</td>
</tr>
<tr>
<td>Organisation D</td>
<td>Volunteer and paid staff members</td>
<td>Bushfire and structural fires</td>
<td>Outside state capital</td>
<td>State II</td>
<td>Emergency Response Organisation</td>
</tr>
<tr>
<td>Organisation E</td>
<td>Volunteer and paid staff members</td>
<td>Flood and storm related events</td>
<td>Whole state</td>
<td>State II</td>
<td>Emergency Response Organisation</td>
</tr>
</tbody>
</table>

The case organisations are actively using social media services for emergency management and have adopted this technology early on.
Except for case Organisation C, the case organisations are predominantly volunteer organisations with a large volunteer member base and a comparatively small ratio of paid staff members in senior leadership and support roles. Organisation C constitutes only of paid staff members.

It is important to highlight that the volunteers in the case organisations are highly trained for the tasks they are expected to perform. It is an ongoing commitment that requires time for meetings and training. These types of volunteers should not be confused with spontaneous volunteers who want to help after an event occurred and typically only have a low level of commitment.

In the next chapter, the results of the data analysis and the findings from the five case organisations are presented.
Chapter 6 – Analysis and Findings

“Look there are always people that are critical of social media. That's because they don't understand it. People talk – use the term dinosaurs – for people who don't understand technology. They exist everywhere. There are some people who view social media purely as this cyber bullying platform and that it holds no weight. There are people who don't understand it, but they know that it is massive and that people use it so it's a good tool. But they don't understand it. There are people who are critical of it because they're fearful of repercussion. What if I do something wrong? What if I get on there and people talk badly about me or my brigade or anything like that? The answer to that is that they can do that anyway. If people want to talk badly about you, the internet exists for them to do that whether you have a Facebook page or not. So the best thing to do is to get on there and control that.” – Social Media Officer – Organisation D

6.1 Introduction

In this Chapter, analysis of the empirical data is outlined. The data analysis resulted in twelve themes which each cover an important aspect of social media utilisation within EMOs. The chapter is structured into fifteen sections, the main ones shown in Figure 6.1. In the following subsection, an overview of the major themes found through the analysis of the data is provided. In the following twelve sections, each of these themes is explored in detail. The chapter is then concluded with a brief summary of the themes.
6.2 Overview about Identified Themes in the Dataset

6.3 Localisation of Social Media in The Organisation

6.4 Social Media Channels in Use

6.5 Social Media Channel Selection and Audience

6.6 Sourcing And Distribution of Information Through Social Media Channels

6.7 Social Media as an Engagement Channel

6.8 Social Media as an Intelligence Channel

6.9 Incident Reporting through Social Media and Dispatching

6.10 Social Media Officers

6.11 Formulation of Social Media

6.12 Social Media for Intra-Organisational Communication

6.13 Social Media for Inter-Organisational Communication

6.14 Supporting Software in Use for the Social Media Operations

6.2 Overview about Identified Themes in the Dataset

6.3 Localisation of Social Media in The Organisation

6.3.1 Headquarter Level Social Media Use

6.3.2 Region And District Level Social Media Use

6.3.3 Brigade/Unit Level Social Media Use

6.4 Social Media Channels in Use

6.4.1 Social Media Channels in Use at the Headquarters Level

6.4.2 Social Media Channels In Use on Region, District, And Brigade/Unit Level

6.4.1 Social Media Channels in Use at the Headquarters Level

6.4.1.1 Main Social Media Channels

6.4.1.2 Supporting Social Media Channels

6.4.1.3 Placeholder Social Media Channels

6.4.1.4 Legacy Social Media Channels

6.5 Social Media Channel Selection and Audience

6.5.1 For External Social Media Communication

6.5.2 For Internal Social Media Communication

6.6 Sourcing And Distribution of Information Through Social Media Channels

6.6.1 During the Operational Mode

6.6.2 During the Non-Operational Mode

6.7 Social Media as an Engagement Channel

6.8 Social Media as an Intelligence Channel

6.8.1 Public Information Social Media Intelligence

6.8.2 Operational Social Media Intelligence

6.8.3 Social Media Intelligence in the Case Organisations
6.11 Formalisation of Social Media

6.12 Social Media for Intra-Organisational Communication

6.13 Social Media for Inter-Organisational Communication

6.14 Supporting Software in Use for the Social Media Operations

Figure 6.1 Outline Chapter 6
6.2 Overview of Identified Themes in the Dataset

As described in Chapter 4.6, the data analysis approach was an iterative process in which themes of social media utilisation in EMOs for the purpose of Emergency and Disaster Management were identified within the dataset. The data analysis resulted in twelve themes emerging. Seven of these themes have sub-themes. To provide a broad understanding of the findings from the data analysis, the themes are presented in Table 6.1. The table is structured as follows. The names of the themes are provided in the dataset. If a theme has a sub-theme, the naming of the subtheme is provided in column two. The third column shows a short description of the exploration of the particular theme. The last column shows the research question to which a particular theme contributes to answer. The research questions are provided in Table 6.2 as a reference.

Table 6.1 Identified Themes in Dataset

<table>
<thead>
<tr>
<th>Theme</th>
<th>Sub-theme</th>
<th>Description</th>
<th>Contributes to answer research question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Localisation of Social Media in the Organisation</td>
<td>Headquarters Level</td>
<td>Explores on which organisational level social media is utilised within an organisation.</td>
<td>RQ 1,2,3</td>
</tr>
<tr>
<td></td>
<td>Region and District Level</td>
<td>Explores the social media utilisation at the Region and District Level of an organisation.</td>
<td>RQ 1,2,3</td>
</tr>
<tr>
<td></td>
<td>Brigade/Unit Level</td>
<td>Explores the social media utilisation at the Brigade or Unit Level of an organisation.</td>
<td>RQ 1,2,3</td>
</tr>
<tr>
<td>Social Media Channel in Use</td>
<td>Main Social Media Channel</td>
<td>Explores which Social Media channels are used by the EMOs.</td>
<td>RQ 1,2</td>
</tr>
<tr>
<td></td>
<td>Supporting Social Media Channel</td>
<td>These are social media channels which are predominantly used for the active emergency management</td>
<td>RQ 1,2</td>
</tr>
<tr>
<td></td>
<td>Placeholder Social Media Channel</td>
<td>These are social media channels not actively used but the organisations registered an account with.</td>
<td>RQ 1,2</td>
</tr>
<tr>
<td></td>
<td>Legacy Social Media Channel</td>
<td>These are social media channels not used any more.</td>
<td>RQ 1,2</td>
</tr>
<tr>
<td>Topic</td>
<td>Description</td>
<td>Research Question(s)</td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>-------------</td>
<td>----------------------</td>
<td></td>
</tr>
<tr>
<td>Social Media Selection and Audience</td>
<td>Explores how a social media channel is selected to communicate with the listening community and whether there are different perceived audiences within the listening community.</td>
<td>RQ 2</td>
<td></td>
</tr>
<tr>
<td>External Social Media Utilisation</td>
<td>Explores the aspects of communicating with the external audiences.</td>
<td>RQ 2, 3.1, 3.2</td>
<td></td>
</tr>
<tr>
<td>Internal Social Media Utilisation</td>
<td>Explores the aspects of communicating with the internal audiences.</td>
<td>RQ 2, 3.3</td>
<td></td>
</tr>
<tr>
<td>Sourcing and Distribution of Information through Social Media Channels</td>
<td>Explores where the information distributed on the social media channels is coming from.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operational Mode</td>
<td>Explores where the information distributed on the social media channels is coming from during the operational mode.</td>
<td>RQ 1.1, 2, 3.1</td>
<td></td>
</tr>
<tr>
<td>Non-Operational Mode</td>
<td>Explores where the information distributed on the social media channels is coming from during the non-operational mode.</td>
<td>RQ 1.1, 2, 3.1</td>
<td></td>
</tr>
<tr>
<td>Social Media as an Engagement Channel</td>
<td>Explores how social media is used to communicate and engage with the general public.</td>
<td>RQ 1, 2, 3.1</td>
<td></td>
</tr>
<tr>
<td>Social Media as an Intelligence Channel</td>
<td>Explores how the social media channels are used to gather information from these channels.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication Intelligence</td>
<td>Explores how the channels are used to gather information relevant to what the organisation distributes through their channels.</td>
<td>RQ 1, 2, 3.1</td>
<td></td>
</tr>
<tr>
<td>Operational Intelligence</td>
<td>Explores how the organisations utilise their social media channels to gather information which influences how the organisations responds towards a particular event.</td>
<td>RQ 1, 2, 3.1</td>
<td></td>
</tr>
<tr>
<td>Incident Reporting through Social Media and Dispatching</td>
<td>Explores what happens when members of the public use the social media channels to ask for help or report an incident.</td>
<td>RQ 2, 3.1</td>
<td></td>
</tr>
<tr>
<td>Occasional Incident Report</td>
<td>Explores the approaches towards an occasional incident.</td>
<td>RQ 2, 3.1</td>
<td></td>
</tr>
<tr>
<td>Extreme Event Help Requests</td>
<td>Explores the aspects of large-scale emergency events.</td>
<td>RQ 2, 3.1</td>
<td></td>
</tr>
</tbody>
</table>
Social Media Operators

Social Media Engagement Officer
An officer who communicates through social media with the listening audience.

Social Media Intelligence Officer
An officer who gathers information from the social media channels.

Integrated Social Media Officer
An officer who both communicates with the listening audience, but also gathers information from the social media channels.

Formalisation of Social Media
Explores how social media activities are formalised within the case organisations.

Social Media for intra-organisational communication
Explores how the case organisations utilise their social media channels to communicate with the volunteer members within the case organisations.

Social Media for inter-organisational communication
Explores how the case organisations utilise their social media channels to communicate with other EMOs.

Supporting Software in Use for Social Media utilisation
Explores what kinds of supporting software the case organisations utilise to operate their social media channels for different purposes.

Table 6.2 Research Questions asked in this thesis

<table>
<thead>
<tr>
<th>RQ Number</th>
<th>Research Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ 1:</td>
<td>How are Social Media Services integrated into the structures of Emergency Management Organisations?</td>
</tr>
<tr>
<td>RQ 2</td>
<td>How are Social Media Services utilised within Emergency Management Organisations for the purpose of emergency and disaster management?</td>
</tr>
<tr>
<td>RQ 2.1:</td>
<td>Is there a difference in the Social Media utilisation during the operational mode and the non-operational mode of an Emergency Management Organisation?</td>
</tr>
<tr>
<td>RQ 3:</td>
<td>How are Social Media Services used as communication platforms in Emergency Management Organisations for the purpose of emergency and disaster management to:</td>
</tr>
<tr>
<td>RQ 3.1:</td>
<td>interact with the public?</td>
</tr>
<tr>
<td>RQ 3.2:</td>
<td>interact with other Emergency Management Organisations?</td>
</tr>
<tr>
<td>RQ 3.3:</td>
<td>interact with their own organisational members?</td>
</tr>
</tbody>
</table>

Each of the following sections is used to unpack one of the themes in the dataset in detail.
6.3 Localisation of Social Media in the Organisation

In this section of the data analysis, organisational levels at which social media is utilised within the case organisations are highlighted. As shown in figure 6.2, three organisational levels in which the case organisations operate in different independent organisational structures are outlined. These organisational levels refer back to the partially independent holonic sub-systems introduced in Chapter 2. Each of the organisational level is a sub-system of the organisation and operates to a certain extent independent of the organisational level higher up in the hierarchy.

![Figure 6.2 In Case Organisations Observed Organisational Levels](image)

Case organisation A, and D operate their social media channels on four organisational levels; The headquarters level, the region level, the district level, and the brigade level. Organisation B, and E operate on three major hierarchical levels: The headquarters level, the district level, and the unit level. Organisation C operates social media at the stage of the study only on the headquarters level or in the state control centre, however, the organisation plans to extend this utilisation in the future.

On a headquarters level, there are usually only paid staff members. On a district/region level, there are usually both volunteer and paid staff members of the organisation. Only volunteers usually operate the unit/brigade level. The term “usually” is used here since there might be some exceptions, especially in the operational mode of the organisations, which renders it necessary that there are, for example, volunteers of the organisation in the headquarters to support in specific roles; Or the other way around where paid staff members are temporally seconded to a region, district, or even unit level to support the emergency response on a more local level.
Furthermore, organisation E shows another exception to the pattern. Organisation E employs career fire fighters on a local level within the organisation. There are integrated fire brigades operated by both career fire fighters and volunteer fire fighters, and brigades only operated by volunteers. The career fire fighters are paid staff members of the organisation.

Organisation C does not have volunteers in its organisation. Organisation C is a coordinating “umbrella organisation” which is instantiated to warn the general public and support the inter-organisational collaboration in the emergency management sector. Subsequently, organisation C does not have its own emergency response resources or volunteer members within its organisation. This case organisation operates both the State Control Centre and regional incident control centres, but does not have a unit/brigade level.

Table 6.3 Organisational Level and Social Media Utilisation

<table>
<thead>
<tr>
<th>Organisational Level</th>
<th>Organisation A</th>
<th>Organisation B</th>
<th>Organisation C</th>
<th>Organisation D</th>
<th>Organisation E</th>
<th>Predominantly operated in mode of operation</th>
<th>Social Media operated by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headquarters</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Both modes of operation</td>
<td>Paid staff members</td>
</tr>
<tr>
<td>Region</td>
<td>X</td>
<td>Not applicable</td>
<td>X</td>
<td></td>
<td></td>
<td>Non-operational mode</td>
<td>Paid staff and volunteer members</td>
</tr>
<tr>
<td>District</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td>Non-operational mode</td>
<td>Paid staff and volunteer members</td>
</tr>
<tr>
<td>Brigade/Unit</td>
<td>X</td>
<td>X</td>
<td>Not applicable</td>
<td>X</td>
<td>X</td>
<td>Non-operational mode</td>
<td>Volunteer members</td>
</tr>
</tbody>
</table>

Table 6.3 provides an overview on which organisational levels each organisation utilises social media. The social media channels are not shared between different organisational levels. There are independent social media channels at each organisational level operated by members of these specific organisational levels. In the non-operational mode, there is social media activity on all three organisational levels.

The data shows that the case organisations utilise social media technology centralised for active emergency management. This is contrary to the potential that social media could be used decentralised on a local level. In the operational mode, the main focus of social media utilisation is at the headquarters level, while the other organisational levels only have a support role. The headquarters channels provide the warnings and the emergency relevant information.
District or Region channels reproduce this information and might provide additional localised information. However, in the case that particular information could help to avoid dangerous situations, the localised information then would also be provided through the headquarters social media channels. In the operational mode, the brigade/unit social media channels are not used.

At the point in time of the data collection, organisation C was only operating social media from the headquarters of the organisation, but not yet from the regional control centres. The organisation was planning to extend the social media utilisation to the regional control centres, however, the necessary human resources were not yet in place. As already shown, organisation C operates the social media channels for organisation D and E on behalf of these organisations when the state control centre is activated (operational mode). Organisation C only takes over the corporate headquarters channels of the organisations, but not the region district, or the unit/brigade channels.

6.3.1 Headquarters Level Social Media Use
On a headquarters level, social media is used in both the operational mode as well as in the non-operational mode. The organisations use their channels on this level for emergency relevant information, as well as for public relations, or organisational member relations relevant information.

All case organisations have dedicated social media officers within the headquarters who coordinates and operates the social media channels during both modes of operation. In the non-operational mode, there are dedicated officers who operate the social media channels as part of their roles. The main coordination in the non-operational mode is done by the team which operates the digital communication channels, such as the public facing websites, the internal facing Intranet, and now also the social media channels. Additionally to this core team, there are the public engagement officers who also contribute towards the social media communication.

In the operational mode, the social media utilisation in each case organisation is very centralised as illustrated through the following quote:
“When it comes to warnings and that critical emergency information it's quite centralised in the sense that it's generally managed either by ourselves at <Organisation D> headquarters or the State Control Centre if there's really bad bushfire days or there's a major emergency happening. The State Control Centre's activated and there'll be a number of agencies in there and they really are responsible for that warning information.” - Organisation D Social Media Officer

Important emergency relevant information, such as warning or information critical for the public to have access to, is distributed centrally through the headquarters social media channels. The social media utilisation at the remaining organisational levels has only a support role during the operational mode.

![Figure 6.3](image)

**Figure 6.3** Different Social Media location in operational mode when state control centre (SCC) is activated

During major emergency events, the states activate a State Control Centre. The state control centre is activated when an emergency event is large enough that a more coordinated approach from a different organisation is necessary to effectively respond towards an event. The two case states show fundamental different approaches to the social media utilisation when the State Control Centre within the case states is activated as shown in Figure 6.3.

In Case State I, the social media utilisation stays within the respective case organisations, which is Organisation A or Organisation B. These organisations operate their social media channels
by themselves. The social media channels are not operated from the State Control Centre but rather, from the headquarters of the respective organisation.

Case State II shows an entirely different approach as shown in the following quote: “When the State Control Centre's activated basically we're no longer acting as our individual agencies. We're acting on behalf of <Organisation C>. So it's a slightly different structure I think than <State I>. So we have all the various agencies like the <naming a list of different involved organisations>” Social Media Officer A in Organisation D

When the State Control Centre is activated in Case State II, then the case organisations involved in an event suspend their social media utilisation, and Organisation C operates the social media channels for the involved organisations on behalf of these organisations. Only the headquarters channels of the organisation are taken over, but not the channels on the other organisational levels.

6.3.2 Region and District Level Social Media Use
Not all regions operate social media channels in the case organisations. Furthermore, the social media utilisation within the regions is predominantly done during the non-operational mode. Social media utilisation during the operational mode has a lower priority on a regional level in all case organisations.

Some regions and districts in the case organisations operate social media channels. That not all regions operate social media channels depends on the resourcing, as the following quote from a social media officer in organisation B illustrates: Basically we have one main page for each region; Not everyone. Only the ones that can resource it. And basically those pages deliver localised information to that area or that patch that they run. And then from there we have some unit pages that also speak to the public in regards what the unit does. Social Media Officer - Organisation B Headquarters

All of the case organisations pointed out that the relevant emergency management use of social media is at the moment very centralised within the organisation. As shown in the following quote, there are concerns that this practice will be unsustainable in the future and might be in conflict with the usage principles of social media.
“One of the things we're involved in this coming fire season this summer is trying to establish more social media roles in the regions at the Incident Control Centre, so that more having people actually out on the ground at Incident Control Centres and Regional Control Centres doing social media, because we don't think that centralised state approach is probably sustainable in the longer term.” Social Media Officer – Organisation D

All of the case organisations plan, for the future, to decentralise their social media utilisation to a more regional utilisation of social media, however, during the time of the study, social media utilisation for emergency management was centralised within the headquarters of the case organisations.

Organisation C operates the State Control Centre and also incident control centres across the state. Incident control centres are regional centres from which an emergency event is coordinated. However, at the current point in time, these regional incident control centres are not yet operating their own social media channels since the state has too few trained social media personal to operate these channels. The organisation draws on the social media officers within the state. However, at the moment there is only a limited amount of social media officers and the resource requirements to operate the social media channels in the incident control centres would be much higher than what can be currently covered. The organisation is training additional social media officers in order to close this capability gap in the future.

6.3.3 Brigade/Unit Level Social Media Use

On the unit or brigade level, the social media channels are entirely operated by the volunteers of the organisation. The approach in all case organisations with volunteers is similar; this means all case organisations except for Organisation C. The volunteers on the unit/brigade level are not required to operate a social media channel, but they are allowed to do so if they want to add this communication channel into their communication portfolio.

“<Organisation D> is made up of just under 60,000 members. You're looking around 55,000-ish volunteers, which is massive. We have around 1,200 different fire brigades state wide. At this stage there are - I believe the last count was about 380 brigade Facebook pages. We actively recommend that they get involved on social media. But being volunteers people come from all different walks of life. They have all very different skill sets. They also have varying amounts of free time. Social media done right takes a lot of time. It does, and even a lot of
planning and preparation if you're just making content.” Social Media Officer 2 - Organisation D Headquarters

The previous quote illustrates the struggles on operating social media channels at this operational level of the organisation. As the volunteers are literally volunteering their time and it can be quite time-consuming to operate social media channels, it is not a surprise that only a fraction of the brigades/units operate their own social media channels. The sophistication of these channels varies highly across the state dependent on the skill level of the particular volunteers in a unit or brigade.

However, some of the units or brigades established social media channels before the rest of the organisation adopted social media services into their communication portfolio. Some of the social media officers had concerns with the volunteers communicating directly with the public on behalf of the organisation, as shown in the following quote. “It was really hard for our volunteers, I guess, to understand the difference between; communicating to the public, and as well just communicating between themselves, internally. So we liked them to create closed groups were they could discuss <organisation B> matters internally and that wasn’t available for the public to see. “Social Media Officer - Organisation B Headquarters

Some of the social media officers showed concerns with whether the volunteers understand how the communication between the organisation and the public should look like. This was a theme brought up in several of the interviews with the social media officers in the headquarters of the organisation. This highlighted the very compartmentalised structure of the case organisation where there is a divide between the corporate structure of the organisations and the volunteer structured part of the organisation.

Organisation D shows a contrasting approach to these practices. The organisation has two sets of social media channels, one intended for communication between the volunteers, and one between the volunteers and the central organisation. These channels are open to see for everyone, including the public. The thought behind it is to show some level of transparency of the internal workings of the organisation. Furthermore, it is assumed that the channels are not relevant for somebody who is not part of the organisation.
As volunteers operate the local social media channels, there is a separation with the social media communication when the brigade/unit is in the operational mode, or in the non-operational mode. Brigades/Units operate social media channels when they are in the non-operational mode and generally do not operate social media when they are in the operational mode. The reason for this is shown through the following quote: “Alternatively, in the case of brigades what you'll see a bit of is the brigade, when it's not a busy operational period the brigade will be heavily involved and you know they'll have a, they'll build themselves up a Facebook presence. Then within their local community they become a trusted source of information. Then there is a fire in that area and everybody goes and jumps on a fire truck and suddenly you get this bit of an information black hole.” (Social Media Officer - Organisation A)

When a particular brigade/unit is activated, the volunteers in this particular brigade/unit are responsible for responding to the emergency incident at hand. In the example of Organisation A, they would try to extinguish bushfires. At the point of this study, volunteers of an organisation are trained to respond to the emergency events for which a particular organisation is responsible; these volunteers are needed when the organisational unit is in the operational mode. None of the case organisations established non-traditional volunteer roles in the form of a social media officer yet when this study was performed, therefore, the brigades/units do not operate their social media channels when they are in the operational mode.
6.4 Social Media channels in use
In this section, the kind of social media channels used by the case organisations for the purpose of emergency and disaster management are explored. In the first part of this section, the social media utilisation at the headquarters level is focused on. In the second part of this section, the social media utilisation on the region, district, and brigade/unit level is discussed.

As shown in the previous (Chapter 6.3) section, the main social media utilisation for the communication with the listening community, in Ahmed’s model Agency-to-Community interaction (A-C), takes place at the headquarters level. The social media utilisation on the region level is still developed. The social media utilisation on the brigade/unit level is done by the volunteers and differs from brigade/unit to brigade/unit. Furthermore, social media utilisation in the operational mode “blacks out” on this level since the volunteers are needed to fulfil the main part of their role, which is responding to emergency events. Because of these reasons, the utilisation at the headquarters level is explored in more detail in comparison to the social media utilisation on the other organisational levels.

6.4.1 Social Media channels in use at the headquarters level
There are four different types of social media accounts that case organisations have on different social media platforms: (1) Accounts which are actively used, (2) Accounts which are supplementary used, (3) Accounts which are placeholders in case the platform shows more potential for emergency management in the future, and (4) Legacy Channels which are not used any more. Accounts which are actively used are termed Main Social Media Channels. Accounts which are used in a supplementary manner are termed Supporting Social Media Channels.

![Figure 6.4 Types of Social Media Channels](image)

The analysis of the different cases showed that there is not much difference between the accounts used by the different organisations. All case organisations use very similar social media services. The main focus is to use these channels as communication channels with which the organisation can provide emergency relevant information towards the public.
As shown in the following quote by a Social Media Officer in Case Organisation A, the decision of which social media services are used depends on the expectations of the public and where the organisation assumes the listening audience is: “Our primary channels are Facebook and Twitter. We also use Flickr and YouTube and Vimeo. Then we have a range of other various channels that we have accounts with that we sort of are at the researching whether they work for us or not or are just reserving the appropriate name space in case they sort of take off at a later point. Google Plus is probably sort of something in that space at the moment. We have been playing around as well a bit with Instagram and have started doing some work in that space, but the focus for us is still primarily Facebook and Twitter because that's where the majority of our audience is.” The interview was done early in the study. By the time of the write up, the organisation was not using Flickr any more. The use of Flickr was replaced by the use of Instagram. This also highlights how the use of a specific channel can change relatively fast.

Table 6.4 shows the social media channels used on a headquarters level within each case organisation. The channels indicated with an X are actively used. From these active social media channels, the bold X indicates the primary social media channels of the organisations. The channels marked with (X) are channels which the organisation has registered an account in but are not using. These social media accounts are placeholder channels for potential future use. The channels marked with an (X)* were used in the past but are not used anymore. For example, in Case Organisation A and D, Flickr was replaced by Instagram, which has now a broader user base.

<table>
<thead>
<tr>
<th>Social Media Channel</th>
<th>Organisation A</th>
<th>Organisation B</th>
<th>Organisation C</th>
<th>Organisation D</th>
<th>Organisation E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facebook</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Twitter</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>YouTube</td>
<td>X</td>
<td>X</td>
<td>(X)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Instagram</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>LinkedIn</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Google +</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
</tr>
<tr>
<td>Flickr</td>
<td>(X)*</td>
<td>X</td>
<td>(X)*</td>
<td>(X)*</td>
<td></td>
</tr>
<tr>
<td>Vimeo</td>
<td>(X)*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The organisations operate social media channels with which information or other type of content can be shared with the public, such as social networking sites (Facebook, Google+, LinkedIn), microblogging services (Twitter), video or photo sharing platforms (Instagram, Flickr, YouTube, Vimeo).

### Table 6.5 Social Media Platforms and utilisation in Disaster Management

<table>
<thead>
<tr>
<th>Social Media Service Name</th>
<th>Social Media Type</th>
<th>Mode of Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facebook</td>
<td>Social Networking Site</td>
<td>Non-operational and operational</td>
</tr>
<tr>
<td>Twitter</td>
<td>Microblogging Platform</td>
<td>Non-operational and operational</td>
</tr>
<tr>
<td>YouTube</td>
<td>Video Sharing Platform</td>
<td>Non-operational</td>
</tr>
<tr>
<td>Instagram</td>
<td>Photo Sharing Platform</td>
<td>Non-operational</td>
</tr>
<tr>
<td>LinkedIn</td>
<td>Social Networking Site</td>
<td>Non-operational</td>
</tr>
<tr>
<td>Google+</td>
<td>Social Networking Site</td>
<td>Non-operational</td>
</tr>
<tr>
<td>Flickr</td>
<td>Photo Sharing Platform</td>
<td>Non-operational</td>
</tr>
<tr>
<td>Vimeo</td>
<td>Video sharing platform</td>
<td>Non-operational</td>
</tr>
</tbody>
</table>

The EMOs are utilising a broad selection of social media services. There are two main types of social media use within the case organisations: microblogging, and video or photo sharing. Microblogging is done through dedicated microblogging platforms, such as Twitter, and through different social networking sites. Within the social networking sites, the focus of the organisations is the social microblogging functionality and not the social networking aspects of these platforms. The main social media channels within the case organisations are the social networking site Facebook and the social microblogging Platform Twitter, which are predominantly used for Emergency or Disaster Management.

Additional broadly used social media channels are the video sharing platform YouTube and the Photo Sharing Platform Instagram. These channels are almost exclusively used during times of non-operational mode as a support channel to showcase what the organisation and its members are doing, or as a channel for community education to build disaster resilient communities.

During the operational mode, the organisations fall back to the social media channels Facebook and Twitter. These channels might be supplemented through live videos that can be embedded into these channels. For example, the livestreaming app Periscope.
The interviews showed that the understanding of social media in emergency management sector focuses predominantly on microblogging on Facebook or Twitter. It needed further probing within the interviews to uncover that there are actually more than these two services in active use. These remaining services, such as YouTube or Instagram, are used as auxiliary services during the non-operational mode.

Surprisingly, none of the organisations were using any kind of crowdsourced social media service. For example, crisis mapping.

6.4.1.1 Main Social Media Channels
The main social media channels in an organisation are those social media channels which are primarily used to interact and engage with the different audiences of an organisation. These are as well the channels which are an essential component of the emergency management communication strategy of the case organisations. All of the case organisations utilise the social microblogging Service Twitter and the social networking site Facebook as their main social media communication channels. These channels are both used in the operational as well as the non-operational mode. These two channels are mainly used for the emergency management relevant social media communication. This includes critical emergency event information and warnings.

In the operational mode, these channels are used to distribute information and warnings, to fight rumours, and encourage specific behaviours from the listening audience, such as “do not drive through floodwater”.

In the non-operational mode, these channels are used for public relations purposes. For example, inform the public about the organisations; to distribute Emergency Management relevant information; and to educate the general public about emergency events.

Organisation C, D, and E operate two main Twitter channels. One of these channels is for emergency relevant information, and the other channel is used for information about and around the organisations. The case organisations in Case State I only have one Twitter channel which they utilise for emergency management relevant social media communication and social media communication which is not necessarily emergency management relevant.
6.4.1.2 Supporting Social Media Channels

“YouTube I always think is like this other thing that sits outside and I know it is social media but I don't say that because it's not in my head. It's not the same thing but yes, YouTube” (Social Media Officer – Organisation C).

The quote exemplifies that social media is a broad umbrella term which includes different technologies. The social media officers of the case organisations put their main focus on the main social media channels of the organisations. The remaining social media channels are seen as support channels. These support channels are supplementary communication channels which are used to improve the messaging of an organisation but are rarely used for active emergency management.

There are some support channels indirectly used, such as Video and Photo Sharing Platforms. YouTube and Instagram are used for community education, and to engage the listening community. Furthermore, the support channels are used to share what the organisation and its volunteers are achieving and other PR activities.

The social networking site LinkedIn is used as a “business card” for the case organisation and to advertise vacant jobs for potential applicants.

6.4.1.3 Placeholder Social Media Platforms

“Then we have a range of other various channels that we have accounts with that we sort of are at the researching whether they work for us or not or are just reserving the appropriate name space in case they sort of take off at a later point. Google Plus is probably sort of something in that space at the moment.” As illustrated through the quote from a social media officer in Organisation A, placeholder social media channels are channels where the organisation registered an official user account, but not utilising the channel yet.

The switch whether the organisation uses this channel depends on if the channel would be a good fit for the communication portfolio, if the organisation expect that the intended listening audience would use this channel, and if the platform has a critical mass of users. Google+ is a good example of this type of channel. Or the organisation does not yet have the use in its communication portfolio.
6.4.1.4 Legacy Social Media Channels
Then there are social media channels which case organisations used in the past, but are not used anymore. One example of such a channel is Flickr in Case Organisation A. It was actively used in the past to share photos of bushfires, or photos that showcase the work of the organisation and their volunteer members, however, the use of Flickr was nearly completely suspended; Now the organisation uses Instagram for the tasks they were using Flickr for in the past.

This illustrates that social media channels are in flux and changing. Some of the channels are losing the relevant audience for EMOs; or channels come into existence that are better suited for what the organisations want to achieve.

6.4.2 Social Media channels in use on region, district, and brigade/unit level
The social media channels for active emergency management are managed centrally at the headquarters level in all case organisations. This is particularly valid for the operational mode. There is social media activity on other organisational levels, however, this social media utilisation focuses on the non-operational mode. The reason behind this is that volunteers, who only have limited time and resources to operate these channels, predominantly operate the channels outside the headquarters level.

Not all of the regions or districts utilise social media channels. It depends on individuals in these regions or districts if they want to operate a channel. If a region or district is operating a social media channel, it is predominantly used during the non-operational mode for PR purposes, community education, and to provide emergency relevant information. In the operational mode, the channels are less active than the channels operated at the headquarters level. Relevant localised information from the headquarters level is reproduced on a localised basis. The regions district who decide to utilise social media channels use Facebook and/or Twitter, and a smaller amount also uses Instagram or other channels which they deem to be suitable.

The following quote from an interview indicates that social media is seen as an amplifier for spreading information. The social media audience is not only seen as the people who actively follow the social media channels of the organisation; the social media audience is also seen as people who also get information indirectly from the social media channels. “Potentially
excluding someone else. So maybe someone who's in the United States who has parents living in a bushfire area in Victoria and they might see that information in the States and tell their parents about it; whereas if we targeted just that specific area in Victoria those people's children may not see that if they're located in the States or overseas or whatever.” (Social Media Officer - Organisation D)

However, there is the fear that information is not received by somebody who needs that particular piece of information if it is only shared locally on a region/district or brigade/unit level. Therefore, the case organisations are reluctant to share information only on a local level and not also on the state level.

As already established, the volunteers of the case organisations operate the social media channels on a brigade/unit level. All of the case organisations that have volunteer members show the same patterns. Only a fraction of the brigades or units utilise social media to communicate with their listening communities. The units/brigades mostly use Facebook; some also use Twitter, or Instagram; a smaller number of brigades/units utilise YouTube or other platforms. Some brigades/units use multiple different channels while some only use one.

It is common that the social media channels are almost entirely used in the non-operational mode of the brigade/unit and not in the operational mode at all. One reason behind this is shown in this quote from a Social Media Officer in Organisation A: “when it's not a busy operational period the brigade will be heavily involved and you know they'll have a, they'll build themselves up a Facebook presence. Then within their local community they become a trusted source of information. Then there is a fire in that area and everybody goes and jumps on a fire truck and suddenly you get this bit of an information black hole.” The volunteers are needed for their core responsibilities in the operational mode and there are currently not additional volunteer roles who could operate the social media channels when a brigade/unit is in operation. In the non-operational mode, the channels are used for community education and to inform the listening community about what the brigade/unit is doing.
The Tables 6.6 – 6.10 give an overview on which social media channel are used in which case organisations; on which organisational level the social media channels are used; and how many followers the organisation has at the headquarters level for this particular channel. The “Direct Follower Reach” gives an indication of how many individuals can be directly reached by the case organisation, excluding all sharing activity by any followers. Organisation C, D, and E have each two Twitter Channels and show therefore two numbers for “Direct Follower Reach” on Twitter.

Table 6.6 Social Media Channel in Use – Organisation A

<table>
<thead>
<tr>
<th>Channel Name</th>
<th>Social Media Type</th>
<th>Level of use in Organisation</th>
<th>Modes of Operation</th>
<th>Use of Channel</th>
<th>Direct Follower Reach (State Channel)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facebook</td>
<td>Social Networking Site</td>
<td>State / Districts / Brigades</td>
<td>Non-operational mode and operational mode</td>
<td>Warnings and Information Broadcasting all phases of PPRR</td>
<td>348266</td>
</tr>
<tr>
<td>Twitter</td>
<td>Microblogging Platform</td>
<td>State / Districts / Brigades</td>
<td>Non-operational mode and operational mode</td>
<td>Warnings and Information Broadcasting all phases of PPRR</td>
<td>74326</td>
</tr>
<tr>
<td>YouTube</td>
<td>Video sharing platform</td>
<td>State</td>
<td>Non-operational mode</td>
<td>Community Education and PR</td>
<td>1594</td>
</tr>
<tr>
<td>Google+</td>
<td>Social Networking Site</td>
<td>State</td>
<td>Non-operational mode</td>
<td>Used as Placeholder</td>
<td>64</td>
</tr>
<tr>
<td>LinkedIn</td>
<td>Social Networking Site</td>
<td>State</td>
<td>Non-operational mode</td>
<td>Business Card Recruiting</td>
<td>3643</td>
</tr>
<tr>
<td>Flickr</td>
<td>Photo Sharing Platform</td>
<td>State</td>
<td>Non-operational mode</td>
<td>(Not used any more)</td>
<td>32</td>
</tr>
<tr>
<td>Vimeo</td>
<td>Video Sharing Platform</td>
<td>State</td>
<td>Non-operational mode</td>
<td>(Not used any more)</td>
<td>-</td>
</tr>
<tr>
<td>Instagram</td>
<td>Photo Sharing Platform</td>
<td>State / Brigades</td>
<td>Non-operational mode</td>
<td>Community Education and PR</td>
<td>9107</td>
</tr>
<tr>
<td>Channel Name</td>
<td>Social Media Type</td>
<td>Level of use in Organisation</td>
<td>Modes of Operation</td>
<td>Use of Channel</td>
<td>Direct Follower Reach (Main Channel)</td>
</tr>
<tr>
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</tr>
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<td>Microblogging Platform</td>
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<td>Warnings and Information Broadcasting all phases of PPRR</td>
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### Table 6.8 Social Media Channel in Use – Organisation C

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<tr>
<th>Channel Name</th>
<th>Social Media Type</th>
<th>Level of use in Organisation</th>
<th>Modes of Operation</th>
<th>Use of Channel</th>
<th>Direct Follower Reach (Main Channel)</th>
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### Table 6.9 Social Media Channel in Use – Organisation D

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<th>Modes of Operation</th>
<th>Use of Channel</th>
<th>Direct Follower Reach (Main Channel)</th>
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<td>Direct Follower Reach (Main Channel)</td>
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<td>Community Education and PR</td>
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6.5 Social Media Channel Selection and Audience

EMOs utilise several social media channels to communicate and interact with the public for emergency and disaster management. Within the case organisations, this emergency relevant utilisation of the social media channels is centralised within the headquarters of each case organisation, as presented in the previous sections. The literature indicated that there are distinct user groups on different platforms, which have different approaches in using these platforms to receive information and form particular audiences. In this section, it is explored in detail whether there are distinct approaches towards the selection of social media utilisation and whether the case organisations are taking the various audiences in their social media channels into account.

The case organisations utilise social media channels to inform the public, which is external to the organisation. This communication would refer to, in Ahmed's current model, the agency-to-community interaction dimension (A-C). The case organisations also use their social media channels to communicate with the volunteer members of the organisation, this communication is intra-organisational and is not shown in Ahmed's model. In the first part of this section, the social media channel selection and audience groups for external social media communication are described. The emergency relevant information distributed through the headquarters level of the organisation is then focussed on. In the second part of this section, intra-organisational social media communication is outlined.

6.5.1 Social Media Channel Selection and Audience for external social media communication

The focus of this analysis is the social media utilisation at the headquarters level, where most of the emergency relevant social media utilisation is centrally coordinated. In Section 6.4, Social Media Channels in Use, it is shown that emergency relevant information is provided through the main social media communication channels, Facebook and Twitter. The support channels are only used in exceptions for particular emergency management activities.

The interviews and their analysis revealed that the messages on these communication channels are partially targeted to different audiences. The relevant social media audience is termed the listening community, since these are the social media communication participants who are listening or receiving social media communication from EMOs. As shown in Figure 6.5, the interview revealed that the case organisations divide their listening audience into two major
groups, members of the general public, and into members from the media. Across all case organisations, Twitter was seen as a channel where the media can effectively be reached, while Facebook can be seen as a channel to engage with parts of the audience that can be considered as the general public.

Figure 6.5 Social Media Audience Groups

EMOs utilise a broad range of communication channels to provide emergency relevant communication to the public. For example, radio and TV broadcasts, their websites, text messages for serious warnings, community briefings, or social media to just name a few. Social media is seen as an additional channel to extend the communication portfolio and reach, not as a channel to replace existing communication channels. This is illustrated in the following quote: “Some people have preference for Twitter to find their emergency information, some people have preference to radio. We’re not about saying that one is more important than the other we're about catering for the needs of different people about the way that they want to get information during an emergency.” Social Media Officer 1 - Headquarters Organisation C

<table>
<thead>
<tr>
<th>Social Media Channel</th>
<th>Audience</th>
</tr>
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<tr>
<td>Facebook (Social Networking Site)</td>
<td>Predominantly General Public</td>
</tr>
<tr>
<td>Twitter (Microblogging Service)</td>
<td>Media and General Public</td>
</tr>
<tr>
<td>Instagram (Image Sharing Platform)</td>
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</tr>
<tr>
<td>YouTube (Video Sharing Platform)</td>
<td>Predominantly General Public</td>
</tr>
</tbody>
</table>

A reoccurring theme within the dataset was that the social media channels are selected to provide the relevant information on the channels where individual members of the public were choosing to receive this kind of information. Emergency relevant information is broadcasted through all relevant communication channels. The information is specially adjusted to fit the requirements of the specific communication channel.
All case organisations are using Facebook or Twitter as primary communication channels for emergency management relevant communication. This information includes emergency relevant information and warnings.

Warnings about an event are shared through both Facebook and Twitter. Warnings can be published manually through the social media operators, or published automatically through an IT system. The warnings in Case State II are automatically broadcasted through the relevant social media channels by the warning information system within this state. This warning system is the backend to several communication channels towards the public. For example, text messages, media, sirens and others. When a warning is created in this system, all relevant channels are automatically informed. These channels include internal communication as well as communication towards the public. The organisations within Case State I also use Facebook and Twitter as warning channels, however, the warnings in Organisation A and B are manually created and posted through social media. The social media officers source this information from the internal Warning Information System.

The supporting channels are generally not selected for emergency information or warnings. The following quotes illustrate, with the example of Instagram, that support channels are selected to engage and show the work and capabilities of the organisation. “Instagram offers no benefits when it comes to warnings. It doesn't. Because we can't have automated feeds saying, hey be careful there's a fire here and there. But we utilise it because it showcases the organisation. It's imagery. People like big red trucks. People love seeing fire-fighters getting dirty and doing their job. So the engagement is huge on Instagram. But technically it offers nothing to the core service that we offer which is putting out fires.” Social Media Operator Organisation D. As the quote illustrates these types of channels are predominantly selected for public relations and to show the public what the volunteers within the organisation are providing to keep their communities safe.

This does not mean that the supporting social media channels are not selected for emergency management purposes at all. A further use of the support social media platforms is for not time-critical messages in the prevention, preparedness, and recovery stages of the PPRR model, not only for the response aspects of the model which correlates with the operational mode. In these stages of the model, the channels are selected for community education and other forms of community resilience building.
The targeted audience groups of the supporting social media channels are members of the general public. The organisations do not view the general public as a homogenous group, but rather as a diverse group with different aims and agendas. This is in the following quote from a social media officer in organisation C which describes that different demographics have a different perception on the use of social media communication channels: “It's interesting to look at different demographics and where people go to find that information. So my boss ran an awesome national review last year, that you should look up, and it talks about for my generation we are more likely before calling 000 we would rather post a picture of what we're seeing on social media. So it's a big changing beast I suppose in terms of demographics about what people go to find where and how they communicate with authorities during an emergency incident. So you're catering for a very wide group of people.”

The social networking site Facebook and the social microblogging platform Twitter are used in the operational mode to communicate emergency management relevant information during the operational mode of emergency management. As shown in section 6.4 Social Media Channels in Use, the case organisations have a bigger audience on Facebook than on Twitter.

“Facebook has got a little bit more of a critical mass and mainstream acceptance I suppose amongst the general public. Twitter obviously still has some really good usage numbers just amongst the general public, but then it's also a sort of a focus area for journalists and news type sources.” (Social Media Officer - Organisation A) The quote illustrates that the organisation identified two different audience groups for their emergency relevant information: members of the general public, and members of media organisations. Members of the media are perceived to monitor Twitter activity of the organisations actively.

The following quote by a social media officer in Organisation A shows that Twitter is used as a channel to communicate with members of the media and Facebook is more seen as a channel to communicate and engage with members of the general public. “If I had to get a message and I had to choose one channel and I was going to and I had to get the message to the media I would use Twitter. If I had to get the message to the general population I would use Facebook.” (Social Media Officer - Organisation A)
All organisations, but especially Case Organisations C, D, and E, select Twitter when they want to send information towards media organisations. Facebook, on the other hand, is seen by all case organisations as a communication channel to communicate with members of the general public.

There are significant differences between how the social media officers in the two different case states view the social media channels. The social media officers in Organisation A and B view social media more as a tool to communicate with the public. Whereas the social media officers in the case Organisations C, D, and E perceive social media channels as an efficient tool to also communicate information towards the media. These differences might be explained through the backgrounds of the social media coordinators within the case organisations. The social media coordinators in organisation C, D, and E all have backgrounds in journalism, while the main social media coordinators in organisation A, B not.

6.5.2 Social Media Channel Selection and Audience for intra-organisational social media communication

The social media channel Facebook is used for intra-organisational engagement with the volunteers of the relevant case organisations, which are all case organisations except of case organisation C. Intra-organisational social media communication happens predominantly in the non-operational mode and not in the operational mode of an organisation.

The audience for intra-organisational social interaction are the volunteers of the organisation situated in their units or brigades away from the headquarters of the organisation.

"We have primarily Facebook groups. We have at the corporate level, we have a <Organisation A> members group which is open to all members of the service and they can discuss issues, ask questions, raise concerns. We also have a number of more targeted groups based on - so, for instance, the social media administrators group. We have similar groups for our trainers, learning and development, community engagement. That one's actually a page, not a group because there's historical reasons for that. Then as you get down to the district level, a lot of districts will have district level groups to send information out to their membership and a significant number of our brigades also have typically Facebook groups for intra brigade communication." As illustrated through the quote there are intra-organisational social media
channels on all levels of the organisation. More generally the social media channels are in this context used to reduce the information divide between the centralised headquarters and the units or brigades.

However, the organisations also use the channels for a more targeted audience, such as social media operators in the districts or brigades/units, or for general training and engagement purposes.
6.6 **Sourcing and Distribution of Information through Social Media Channels**

In the previous sections the organisational level on which social media is utilised, what kind of social media channels the case organisations use, for what kind of information different social media channels are utilised, and whether this information is catered for a specific audience is explored. In this section, how information is sourced within the case organisation and then distributed on the social media channels for the purpose of emergency management is discussed.

Again, the main focus is on the main social media channels Facebook and Twitter as these channels are the preferred channel for the active emergency management.

6.6.1 **Sourcing and Distribution during the operational mode**

In the operational phase, “the overriding goal is to keep people safe and to give them the information that they need to be able to make an informed choice about what they’re going to do” (Social Media Officer – Organisation A). The aim of the case organisations is that the general public has the necessary information to make an informed decision about their behaviour in an emergency event; this can include helping an individual make the decision to stay at their properties, or whether it would be better to self-evacuate early.

All the case organisations operate in natural disasters. Natural disasters have the slight advantage, in contrast to intentional human caused events such as terror attacks, that there is no perpetrator who could be warned through the broadcasted social media messages. The social media officers in the different case organisations stated that they try to provide the general public as much information as they can. The decision to act on this particular information is then with the members of the public.

In this operational phase, the case organisations use their social media channels most prominently to disseminate information and emergency warnings. They use these communication channels as well to educate the community about specific risks of the ongoing emergency events, and for community or media navigation. With community navigation, they encourage a specific behaviour from the community; A prominent example would be to not drive through floodwater during floods, or to prepare the property accordingly with a risk of an upcoming bushfire. The decision to actually act on the information is with the individual, as
the organisation cannot force the behaviour. Another aim of the social media utilisation is to correct rumours and false information circulating the social media channels, since these can lead to another dangerous dimension in the emergency management activities.

**Figure 6.6 Social Media Communication - Operational Mode**

The social media channels are seen as distinct channels with specific audiences. All case organisations try to avoid relinking from one channel to the other. Such a practice of relinking to a different channel is seen as telling the audience they are on the wrong communication channel and should switch. “We should wherever possible provide the information that they need in a format that’s applicable to that channel. If we can’t then we need to do our job better.” (Social Media Officer – Organisation A).

When there is additional information which cannot be brought to the audience through the channel, the organisations tend to link these messages back to their own website where they then have more information provided. As for example, Twitter has currently a 140-character restriction.

The websites are seen as a single source of truth for the organisations. On this communication channel, they provide fire updates and warnings. The websites are regularly updated during emergency events; Regularly means about every thirty minutes. “Now that gets updated regularly, but probably not regularly enough for a, when we’re looking at it from a social media perspective. So, you know it might get updated every half an hour for a fire that's had

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4 The listening community of that channel.
emergency warning, but for people - at the speed at which social media moves, half an hour is an awfully long time. ” (Social Media Officer – Organisation A). It is likely that the social media channels show more up-to-date information during emergency events.

![Diagram showing sources of information for social media]

Figure 6.7 Sources of Information for Social Media

The main amount of information broadcasted through social media is sourced from the internal information systems of the organisations; These include the warning information systems, and the job-tracking information systems. “We use our operational management system and it has an intelligence feature so - the districts that are looking after the fires will put information in about what the fire is doing, where it's at, what road, you know various pieces of information. We use that information a lot in pushing out our social media messages. So, you know, the fire has crossed this road or the fire is here or here is a photo” (Social Media Officer – Organisation A).

Another source is information from within the organisation. Organisation A found that maps where the fire is at the moment are well received and create engagement with information from the public. “One thing that we've found really really popular is some of the mapping tools, so we have a specialised aircraft that will fly over the fire grounds twice a day and do what's
called a line scan. So basically it does an infrared line scan so it shows exactly where the fires are at that point. Then we'll map those up and put major, well put all of the towns in that area around there and we'll put those sort of mapping products up.” (Social Media Officer - Organisation A) The organisations source and share their information from several internal units of the organisation.

A further source of information are the public social media channels themselves. The organisations receive photos from the public and use these photos for their social media messaging as shown in the following quote: “If we get some good photos from members of the public we will repost those so that they can see this is what it actually looks like at this point in time” (Social Media Officer – Organisation A).

In addition to information sourced from the public, the case organisations also use material sourced from within the own member base, especially when it comes to photographic material. This material is mostly sourced from the internal membership groups.

The social media channels are used to distribute community and media briefings. These briefings are either in text form or in the form of live videos where a high-ranking representative of the organisation provides updates about the emergency situation.

One major difference between Case State I and Case State II is that the Case Organisations in Case State II use automated warnings on their social media channels and Case Organisations in Case State I not. All of the case organisations use their internal warning information systems as a source for the warnings they distribute through social media.

In Case State II, the warning systems are under the control of Organisation C and operate for different organisations. The following is a description from the social media coordinator in Organisation D on how warnings are entered into the system in Case State II and how they are distributed: “There is distributed authorship in the incident control centres, so there's hundreds of warnings officers around the state who can enter information into our warning system. Once they enter that information and get it verified or get it authorised by an incident controller, it's distributed through various mediums. So initially it was emails to the media published onto the website, your standard mediums, but then back in 2011 we got that system - we automated it so that that system also published warnings to our social media channels to Facebook and Twitter.
So there's an automated process in place that automatically publishes those official warnings. That's not every incident we're attending; it's just the ones that require a warning. The ones that the incident controller decides requires some kind of advice or watch and act or emergency warning to the community. So those are official warnings, advice, watch and act and emergency warnings are automatically published to Twitter and to Facebook.” The distributions of warnings are also done in night time in both modes of operation in the case organisations from Case State II. These automated warnings normally do not receive too much engagement and attention from the listening community.

The important warnings are picked up by the social media team and augmented with additional information. This information includes maps of the area and answers potential questions that might arise from the warning. “Advice level warnings happen quite often and really there's no rest to the community with an advice level warning, so we would just leave that to itself. But if there was a watch and act or an emergency warning then our media team and social media people would be activated and would be monitoring and responding to questions and adding additional information. Because what we have seen is that that automated warning system is great for that 24/7 coverage and for getting the information out there initially, but it's just a text warning and obviously in social media that doesn't really grab much attention. So we'll often just try and add value to that by finding images or identifying the most interesting aspects of the warning that we think as social media professionals that we know will grab the attention of the community and increase its reach.”

The case organisations in Case State I also provide warnings through their social media channels. However, they do not use an automated warning system. The warnings which seem to be important are posted through the social media channels by the social media officers.

In the next section, it is shown how information is sourced and distributed through the non-operational mode as there are different requirements in this mode of operation than in the operational mode of operation.
6.6.2 Sourcing and Distribution during the non-operational mode

The messages and information distributed through the operational mode are intended to keep the public safe. These messages focus on the active emergency management in the Response phase of the PPRR model. The message focus in the non-operational mode is broader than the pure emergency management. The background aim is still to inform and prepare the public for potential emergency events, however, it is subtler than during the operational mode. In the non-operational phase, the focus is to raise interest and to engage the public about emergency management, the EMO, and emergency events.

In the operational mode the communication channels which are used across all case organisations are the main social media channels in these organisations; In the non-operational mode, the case organisations utilise their main communication channels as well as their supporting channels to distribute messages and information towards their listening communities as illustrated in the following quote: “I feel very fortunate in my role at <Case Organisation D> that I am given this platform for <Case Organisation D>, this huge audience, to push these messages out and have fun, because that's what social is all about. You've got to be having fun. If it's all about the sale, if it's all about the safety messaging that is so boring. The higher ups at <Case Organisation D>, I said very early on, if all we do is fire safety information, it's boring. I'm going to be perfectly honest with you. I love the <Case Organisation D>. But if it's just constant messages - don't do this, don't do that - who's going to - there's no engagement there. It's got to be fun. So the organisation as a whole understands the importance of social media and we're able to keep exploring that. Instagram as an example is something I use heavily. Instagram offers no benefits when it comes to warnings. It doesn't. Because we can't have automated feeds saying, hey be careful there's a fire here and there. But we utilise it because it showcases the organisation. It's imagery. People like big red trucks. People love seeing fire-fighters getting dirty and doing their job. So the engagement is huge on Instagram. But technically it offers nothing to the core service that we offer which is putting out fires” (Social Media Operator Organisation D). There is less focus on the emergency messaging and more emphasis on raising interest in the listening community about what the organisations are providing.

The aims what the case organisations want to achieve with their social media communication is slightly different in the non-operational mode. “When we're non-operational I suppose there are a couple of goals. It's then we switch to a lot more - depending on the time of year, a lot
more preparation helping people to prepare for the fire season and what they should be doing. Encouraging people to have a bushfire survival plan. We'll also do some more I suppose PR type stuff, just for us to show various things that our brigades have been doing and they've been active and what they've been doing in their communities, sort of goodwill, good news stories. This time of year, for instance, we've often got a lot of hazard reduction work going on. So we'll do posts around hazard reduction and where they're happening and why they're happening and often sort of fielding questions and answering questions around why that kind of thing is important. Some people get quite upset when they're inundated for smoke for three or four days. So it's explaining why we're doing it and what that means for them” (Social Media Officer – Organisation A) As shown in the quote, the social media channels are used to fulfil several distinct goals during the non-operational mode. One aspect of the social media channels is to use them as a public relations tool in which the organisation wants to show the general public what the organisation and especially the volunteers are providing in their activities to support the different communities. The channels are then also used to engage the communities to be more interested in emergency management.

During the non-operational mode the social media channels are still used to provide information, broadcast warnings, or correct false information, as shown in Figure 6.8, however, the emphasis is more on community education and to encourage the behaviour to prepare for a potential future emergency event. Such a preparation could have the form to prepare a plan when living in a bushfire prone area. Additional to this, the social media channels are much more used for public relations purposes, such as informing about the organisation or to provide and promote information about what the volunteers in the organisation are providing for their communities. Furthermore, the channels are utilised to inform the listening community about ongoing operations, such as in the example of the bushfire organisations hazard reduction burns.
The information about the volunteer work is sourced directly from the volunteers within the organisations. In case organisation D, for example, the social media officer uses the social media channels and Facebook groups of the different brigades as a source for this kind of information as shown in the following quote: “Okay so in the mornings when I monitor the brigade Facebook pages I get stuff from there. So I'll be scrolling through and I'll find a great photo. I'll save it. I'll put it away. I'll take some details. That's done. That's how I find content for Instagram, from all the brigade Facebook pages. So I troll through them. We have our official photographer who is part of the team, Keith, I mentioned before. He goes to a lot of fire calls. So I'll get stuff from him. We have a few other photographers around the state who are very good. They attend a lot of calls and they send us their photos when they've got them. The other thing is the social media group.”

The social media channels are used as a tool to educate the listening communities about potential emergency risks and how to prepare themselves as communities for a potential event. The case organisations focus more and more on community resilience. One important component to foster this community resilience is the social media communication of the organisations. The source for this kind of messaging comes from different sides within the organisation, such as teaching material, created video material, or current events amongst some other sources.

In this section on how information is sourced for the social media channels and how and where it is distributed is highlighted. This utilisation of social media is still that of a push medium, or a “Megaphone” to distribute information towards the listening communities. In the next
section, how the social media channels are used to engage with the listening community and how the case organisations actually use social media as the two-way communication channel to interact with their listening communities is discussed.
6.7 Social Media as an Engagement Channel

The social media services are not just used as a channel to disseminate information from the EMOs towards the listening communities (see Chapter 6.6), but as well as a channel to engage and interact with these listening communities. The difference between these two types of communication is that the dissemination of information works as a one-way communication channel in which information is pushed to the audience; the engagement, on the other hand, is using the social media channels as a two-way type of communication. All of the case organisations use their social media channels for engagement purposes in both operational modes. As the two operational modes have an influence on how the case organisations are utilising their channels this section is split into two sub-sections: First, it is explored how the social media channels are utilised to engage with the listening community in the operational mode and then how the channels are used to engage in the non-operational mode.

6.7.1 Social Media as an Engagement Channel during the Operational Mode

During the operational mode, the social media engagement focuses on answering questions from the public through social media and to enhance the broadcasted information. The aim with enhancing broadcasted information is to make it more accessible and relevant for the listening communities; The information needs to be provided in a way that the members of the listening audience interact with messages. The interaction ensures that the information is circulated in a wider community and not just the immediate listening audience.

The following quote from a Social Media Officer in Case Organisation D indicates the response to questions when the organisation is in its full operational mode. It needs to be highlighted again that this means that the social media activity is then operated from within the State Control Centre under the review of Case Organisation C. “You could argue - and some of the - we were talking before about the dinosaurs that don't agree with social media - because people are asking for help on social media - oh well they shouldn't be doing that. But they are. Because it's the world's best communication channel and they have a question to ask. So we're going to answer it. During a large scale incident and the state control centre is activated the amount of messages that come through, and when I say messages I mean people commenting on a Facebook post or tweeting us, the numbers are staggering - huge. They're saying what do I do? Where do I go? What does this mean? What does that mean? I thrive on the - you know when it gets really busy - you're just absolutely focused on that screen, you see them come through and you just bang bang bang bang bang bang <Interview Informant indicates typing> and
you just get through to them. The media team have key messages. This is what we know. There are this many trucks. The fire is this big, heading that direction. This many houses lost, dah dah dah.” (Social Media Officer – Case Organisation D)\(^5\). Help requests in the context of this quote refers to questions, not to immediate emergency assistance; incident reporting and requests for emergency assistance is covered in Chapter 6.9. The social media officers respond to public and to private questions through their social media channels. The public questions are visible to the broader listening audience, the private messages, on the other hand, are only visible to the sender of the message and the receiver, which is in this case the EMO. The social media officers have key messages which are provided by the media team. These key messages include information about ongoing operations. Key messages include typically where the event is, whether people are at risk, how many responders are involved in the operation and advice on how to behave when in the risk zone. The later includes information which covers whether it would be advisable or safe to self-evacuate or if it would be safe to stay in the area.

All case organisations are utilising their social media channels to answer questions. In Case State II the response to questions is very standardised. Organisation C is using a software product which is targeted for customer relationship management. This software package shows the on duty social media officers which messages from the public towards the organisation were checked or were not yet checked. In case that a message was already checked then the software indicates as well who checked it. In case that a message was a question and needed a response the software package then records as well who responded towards the message. The answers from the case organisation in Case State II have a very strict standardised form: The message starts with “Hi” followed by the name of the sender of the question; Following this comes the actual answer to the message, and afterwards the social media officer is signing the message off with their name.

The case organisations in Case State I are as well answering questions through their social media channels, however, they do not have such a standardised approach in how an answer to a specific question needs to be structured. The need for a strict standardised approach is lower in the organisations in this state since only social media officers from within one organisation are operating the social media channels of an organisation. In Case State II, Case Organisation

\(^5\) Bold text stressed by author.
C is operating the social media channels of the remaining case organisations in the state when it is in its operational mode.

The following quote illustrates that the questions from the public are used as an indicator for the social media officers whether the information they are providing towards the general public is sufficient or if there is a need for additional information. “Occasionally we'll get questions that we can't answer or that I go hey there could be something that's worth investigating what's going on here and then I'll liaise directly with our state Public Liaison Officer and they will sort of chase up the information and get back to us and then we can sort of give a reply. So if we all of a sudden find that we're getting a heap of questions about access to a particular school for instance, that's a trigger I suppose for us that we should be providing some more information and that what is actually happening at that school, is that something we should be worried about? How does that all play out and work into what we're doing?” (Social Media Officer – Organisation B)

The two-way communication ability of social media channels is seen as highly supportive for emergency management. “One of the other major benefits is that ability to get that feedback from the community to find out what the sentiment is normally. Often it's really just we get an idea if people aren't understanding the warnings or if they feel they aren't getting the information that they need. So the community will ask questions and will complain and criticise if there's a gap that we haven't identified, so then it helps us then to try and fill that gap with more information or better information” (Social Media Officer – Organisation D). The quote from the social media officer from Case Organisation D highlights this aspect of the social media utilisation. All of the case organisations are eager to know what the public thinks about the information they are providing, in order that they can provide the information that the public needs to stay safe.

The case organisations are not just answering questions from the public, when the social media officers assume that information is insufficient or misunderstood they then provide more detailed information through the social media channels. This has a major relevance in the warnings. In Case State II the warnings are provided through the internal warning information systems, and then they are automatically shared through the social media channels. These automatic warnings include all the necessary information but are not very engaging as shown in the following quote: “The answers are always in there but they don't read it. That's fine.
That's probably human nature. So a watch and act message will go out. We'll then repost with an image showing the affected area. If you're in this area you need to - you need to heed this message. They'll automatically see it and say oh I'm there right now. What do I do? What do I do? Is my house going to burn down? As quickly as you can you would reiterate whatever is in that message. If you are in the affected area your safest option is to leave right now. For further information, click here. You would link again to the warning which has all the info. We address them by their name and we sign off with our name so that they know they're talking to someone” (Social Media Officer - Organisation D). The important automated warnings are used as a basis for an enhanced manual social media message. All of the case organisations are providing enhanced social media messages when the social media officers in the organisation have the feeling that a particular important message was not well understood by the listening communities.

All of the case organisations are using their social media channels in the operational mode to engage with the general public and not just as a one-way communication channel. The engagement in this operational mode has the form of answering questions and to provide tailored and enhanced information when there is the assumption that there is additional need of information.

6.7.2 Social Media as an Engagement Channel during the Non-Operational Mode

As established, the main aim of the social media communication during the operational mode is to support that the general public is safe. In the non-operational mode, there are several different aims why social media is used to support the emergency management activities. Social media is used for purposes which support and might increase community resilience, such as education around emergency events, encouragement to prepare for emergency events, or fostering interest about how to keep safe during such events. Furthermore, social media channels are used for public relations purposes, such as showcasing what the organisation is, awareness raising about what the volunteers in the organisation provide to their communities, or social media is used as well as a channel to raise interest in volunteering for the organisations.

The channel selection is in the non-operational mode much broader than in the operational mode. In the operational mode, the organisations typically only utilise the main communication
channels, in the non-operational mode they additionally as well use their supporting social media channels (see Chapter 6.4). The supporting social media channels often provide no particular benefit when it comes to the core tasks of an EMO, of mitigating the effects of a particular emergency event type. However, the case organisations are using a portfolio of different social media channels to foster the interest of and the engagement with the general public as illustrated in the following quote: “Instagram offers no benefits when it comes to warnings. It doesn't. Because we can't have automated feeds saying, hey be careful there's a fire here and there. But we utilise it because it showcases the organisation. It's imagery. People like big red trucks. People love seeing fire-fighters getting dirty and doing their job. So the engagement is huge on Instagram. But technically it offers nothing to the core service that we offer which is putting out fires” (Social Media Officer – Organisation D).

During the non-operational mode the organisations can try new approaches with their social media utilisation as they have more time at hand and a misunderstood message has no potential negative influence on the physical wellbeing of members of the listening audience. The social media channels are utilised actively for community education. An example of how the engagement for the community education might look like. Organisation C is promoting the utilisation of smoke alarms. If there is a news story about how a smoke alarm helped to keep occupants from a house with a fire incident safe then organisation C might use this information as a basis for social media messages about the benefits of smoke alarms. The message might be locally supported as a paid social media message. Such a campaign is not started if people got hurt in the fire incident. The remaining case organisations use as well current events for their social media community education.

The social media channels are as well highly utilised for the showcasing of an organisation. This includes sharing relevant pictures of emergency or training events as shown through the quote at the beginning of this section. Furthermore, as all case organisations, except for organisation C, are large volunteer organisations the social media channels are utilised to showcase the volunteers within the organisation as shown in the following quote:

“It can help our stakeholders and our campaigns with other organisations. But it shows that we have 60,000 people working hard all across the state showcasing brigades of towns that people have never even heard of. They didn't even know that they existed.” Social Media Operator Organisation D
It is possible through the social media channels to show the listening community what the volunteers are providing for their communities and as well that the members of the listening audience could be one of the volunteers in an organisation.

The case organisations have managed to build up a significant follower base, which refers to individuals from the general public which are receiving the social media messages of the case organisations. This listening community acts as well to actively help answer questions or correct information which was posted on the social media channels of an organisation by a member of the public. The social media channels with their self-correcting communities are seen as valuable in both the operational mode as well as the non-operational mode. Altogether the social media engagement of the case organisation supports their main activities which is keeping the public safe.
6.8 **Social Media as an Intelligence Channel**

Social media can also be used as a tool to gather information from the social media channels to improve the awareness of EMOs. The informants of the case organisations were reporting about two different types of social media intelligence. These two types are classified into: (1) ‘Communicational Social Media Intelligence’, and (2) ‘Operational Social Media Intelligence’. The first type uses social media for gathering of information which helps to better communicate and engage with the public; the second type refers to the more classical form of intelligence gathering, where social media is used as a source of information to improve the situational awareness of an organisation. This information is then used to influence the operational response of said organisation.

The Communicational Information Intelligence was split into two different forms: ‘Strategic Awareness’, which refers to social media intelligence that double checks whether the information distributed was understood; and ‘Dialogical Social Media Intelligence’, which refers to a form of Intelligence which makes sure that the Information distributed towards the public is what the public needs at a particular point in time.

![Diagram](image.png)

**Figure 6.9** Social Media as an Intelligence Channel

Some form of Communicational Information Intelligence is performed by all of the case organisations. The organisations monitor their social media channels to understand how their listening audience perceives their messages. This type of social media intelligence is then used to improve the messaging in order to keep the public safe.

Operational social media intelligence is only used by organisation A, C, and to a smaller extend by organisation D. Organisation B, and E currently do not have the expertise and necessary resources to use their social media channels as an intelligence tool.
6.8.1 Communicational Social Media Intelligence
The Communicational Social Media Intelligence refers to gathering information to improve the communication practices of the organisation.

Social media officers within the case organisations monitor social media channels of the organisations to make sure that their listening audience understands the message that the organisation intents to distribute. “So in the media unit public information section we'd be looking at trying to make sure that from the comments and the feedback that we're getting people are understanding what we're trying to communicate to them. That they understand the warnings, and that they are interpreting the warnings correctly. So we'd be looking at that from an intelligence point of view.” (Social Media Operator - Organisation D).

Linking back to the work of Artman et al. (2011), I refer to this type of social media intelligence as ‘Strategic Awareness Social Media Intelligence’. The social media channels are monitored to check for questions and misunderstandings. Case Organisation A, C, and D, use commercial CRM social media software for this purpose. Organisation B and E are much smaller organisations with less financial resources, therefore the social media teams do not have the budget to utilise such commercial CRM software packages. The interview informants in these organisations stated that they directly check the social media channels.

Social Media Officers who operate the social media channels to engage with the listening community and distribute messages towards these communities use some type of Strategic Awareness Social Media Intelligence in all case organisations. The social media officers probe and double check whether their messaging was understood or if there are questions or comments which indicate a misunderstanding on the social media channel the particular social media officer is responsible for.

Social media officers from Case Organisation A, C, and D reported a further form of social media intelligence used to improve the communication with the listening audiences on social media. In reference to the work of Artman et al. (2011), this second type of social media intelligence can be referred to as ‘Dialogical Social Media Intelligence’.

This form of Communicational Social Media Intelligence is characterised through an active monitoring of the social media channels in order to gather information for the organisation.
However, in contrast to the Operational Social Media Intelligence, it has no influence on the actual physical operations of the organisation, rather it is used to improve the communication with the listening audience. The following vignette from Case Organisation A illustrates the Dialogical Social Media Intelligence:

“The other thing to remember as well though is a lot of the time the information may be operationally inaccurate, so it's no good from a send a fire truck there perspective, but from a public information perspective that incorrect information can be as valuable if not more so than stuff that is right.

A really good example of that, in those same <specific region> fires, it was just before I knocked off on a shift one night and we had, suddenly Twitter just lit up with people in this little town called <specific town> were going door to door knocking on the neighbours saying that they had to evacuate, that there was - over Twitter they had been told that they needed to evacuate, the fire was about to impact the town and everyone needed to get out now and head towards <specific other town>.

I was sort on shift and using some of our monitoring tools I saw this big spike all of a sudden and sort of had a look at it and we knew exactly where that fire was. We knew that under the fire conditions that we had there was absolutely no way that this town of <specific town> could be under threat at that point in time. But driving to <specific other town> would actually take people directly through the fire's path. I had to stop that happening.

So because we were able to identify that, we were able to get on Twitter, we were able to correct that misinformation, calm everyone down and instead of having you know dozens and dozens of people driving through a fire, they stayed where they were where they were safe.

I suppose that's just a bit of a good anecdote on how that operational intelligence can be useful from a public information perspective when operationally [technical difficulty] bad information.” (Social Media Officer - Organisation A)

The information in question which was gathered from social media was based on rumours and did not reflect the situation of the event. The information had the potential to put individuals in danger who might would have acted on this information. The information gathered through
social media can be used to create targeted social media messages, which can help counter misinformation or promote a specific behaviour in the communities as in the shown example.

This kind of social media intelligence is hardly possible without additional software in use; The social media officers in the case organisations who use social media as a dialogical intelligence channel use similar monitoring software packages. The following quote describes how such software packages are used within the organisations: “we use basic monitoring tools like Sprout Social with keyword searches and if there's an incident happening in a particular location we'll set up key word searches to try and monitor what other traffic is happening in relation to that incident. So we do a bit of that but it's not very sophisticated; it's just really around keyword searches and less of following the people that we know that do share a lot of emergency information. So the influencers and so on, we monitor those channels and we set up keywords during incidents.” (Social Media Officer Organisation D) The intelligence activities are still in the early phases and need to be further developed.

The interview informants see using the public as partially trusted information as a paradigm shift in EMO. In the past, organisations saw the public as something that purely needed to be protected, but not as a party who co-creates valuable information or actively supports the Emergency Management. “But certainly a big shift for the emergency services because - and that's where the whole verification stuff comes in. In the past emergency services here would only - wouldn't really be - not interested in what the community were saying because they didn't feel that the community knew what they were talking about basically. They'd only believe if it was one of our own members that passed information back and there only were the structures to get that information from our members. But now there is an acceptance - more of an acceptance that there is useful intelligence to be gathered from the community via social media.” (Social Media Officer Organisation D) The practices and processes still need to be developed how the case organisations can properly process and utilise this information. Currently, the processes are still on an ad-hoc basis. The information from social media channels is seen as something valuable, however, the verification processes need to be further refined.

The members in the organisation see information from the social media channels to be valuable for two different purposes; communication relevant information and operational relevant information. In this section, social media intelligence for communication relevant information
was described. In the next section, social media intelligence for operational social media intelligence will be discussed.

### 6.8.2 Operational Social Media Intelligence

Operational Social Media Intelligence refers to the gathering of information to improve the situational awareness of the organisation and to influence the operations on the ground. Using social media services for operational intelligence is still developing. Within the case organisations only Organisation A, C, and indirectly D have the capabilities to utilise social media as a source of operational intelligence. Most of the information is collected through Twitter, as Twitter data is data more transparent and easier to collect in contrast to Facebook.

“Operational intelligence gathering so actually identifying information that could be useful in the actual response to the emergency, so like where a fire might be, how many points of ignition, the size of fire, that sort of thing. (Social Media Officer Organisation D) As shown in the quote with the example of a bushfire, the organisations try to collect information relevant to the event.

Organisation A has several bushfire behaviour analysts who can predict the behaviour of a specific bushfire from different data sources such as weather forecasts, or image material from the fires. For example, these specialists can predict the behaviour of the fire amongst others on the smoke plume. Social media data can highly support the bushfire behaviour analysts since it provides valuable image material shared by individuals from the general public during the bushfire events. Photos are seen as the most valuable information source social media can provide and is seen as relatively easy to falsify.

The case organisations check the information they gather through social media in an attempt to verify it. The photos are checked for prominent landmarks easy to identify and are put through the Google Reverse Image Search to verify if a photo is recent or if it is from a previous event. The social media informant in Case Organisation A stated that after their initial verification process the accuracy of the information is between 80-85% which is seen by the organisation as more than acceptable. It needs to be stated that emergency organisations do not rely on one particular source of information but triangulate the information to build their situational awareness.
The interview informants stated that information in the control centres is often requested from the social media intelligence cell about a specific event. These active information requests are common in the early phases of the response when the traditional information sources are not yet fully in place. The traditional sources are organisational members on the ground, information from partner agencies, or in bushfire event the fire reconnaissance aeroplanes.

Not all information passively gathered through social media can provide the needed information. The informant in Organisation A stated that sometimes the organisation would favour to request additional photos from members of the general public. In this case, the social media officer actively asks for particular information about an event. Nevertheless, most information gathering through social media is passive. The organisation is afraid to steer the public perception in a direction where the public thinks the organisation is not well equipped to respond towards the current emergency event. Such doubt in the capabilities could lead to mistrust towards the organisation and difficult outcome of the emergency event. “It is a fine line that you’ve got to kind of play between seeking the information that we need but also not undermining the faith that the public has in us and our ability to be able to know what’s happening”.

In Case Organisation A, the main interview informant of the organisation performs the social media intelligence. During the operational mode, this informant has an integrated role in which the interview informant is responsible for social media intelligence as well as operating the social media channels to engage with the public.

Organisation C has a different structure. Organisation C has a social media cell in the Media and Communication unit, which is responsible to communicate with the public, and a social media cell within the Intelligence Unit. The social media cell in the Intelligence Unit is responsible for gathering information through social media.

This social media intelligence cell is still in an early phase as shown in the following quote: “That isn't particularly well developed yet and certainly in <Case State II> we have an intelligence unit that now has a social media person as well in the State Control Centre, but we're just trying to establish some tools and some training that will help people in that more specific intelligence gathering role.” Member 1 Organisation D
There are established verification processes but how social media information is gathered is still in an ad-hoc basis. Organisation C and D are currently in the progress to advance this form of social media unit and train the necessary human resources.

At the moment, Organisation A, C and D are all in the progress of formalising the intelligence gathering through social media further. These organisations are gradually building up an operational function of social media intelligence gathering for the operational mode of operation.

6.8.3 Social Media Intelligence within the Case Organisations

Table 6.12 shows how the case organisations utilise social media as an intelligence tool. All of the case organisations utilise Social Media as a Strategic Awareness tool in order to understand whether the messages they are providing towards their listening audience is understood. This form of social media intelligence can be counted as part of the social media engagement with the listening audience. The Social Media Officers who operate the social media channels to distribute information perform these functions (Social Media Engagement Officers).

<table>
<thead>
<tr>
<th>Intelligence Type</th>
<th>Organisation A</th>
<th>Organisation B</th>
<th>Organisation C</th>
<th>Organisation D</th>
<th>Organisation E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communicational Intelligence</td>
<td>Strategic Awareness</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Dialogical Intelligence</td>
<td>X</td>
<td>X</td>
<td>(X)</td>
<td></td>
</tr>
<tr>
<td>Operational Intelligence</td>
<td>X</td>
<td>X</td>
<td>(X)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Case Organisations A, C use their social media channels as a channel for dialogical intelligence in order to cater their social media communication strategies to exactly what kind of information the public needs at a current point in time.

Organisation A and C actively utilise social media for Operational Intelligence. The two organisations have different approaches to the Dialogical Intelligence and the Operational Intelligence. In Case Organisation A, the distribution of information and the intelligence are combined in the same role. In Case Organisation C, the roles that perform the messaging on Social Media and the roles that perform Social Media Intelligence are separate roles, physically separated in different rooms. However, the Intelligence Officers update the Engagement Officers about their findings.
Organisation D has the capabilities to use social media for Operational Intelligence, and also for Dialogical Social Media Intelligence. However, these two forms of social media intelligence, are performed only when the organisation switches into its full operational mode. When the organisation is in the full operational mode, then the social media channels are operated from the State Control Centre.
6.9 Incident Reporting through Social Media and Dispatching

“Something that you're seeing increasingly in the United States for instance is people reporting incidents via social media and that opens a whole bucket of worms for us.” - Social Media Operator - Organisation A

New patterns of behaviour emerge on how individuals and groups engage with EMOs, which are facilitated through social media. Some of these behaviour and interaction patterns were not possible before EMOs adopted social media services as communication channels into their organisations. Help requests and incident reports through social media are some of these emerging patterns. For EMO, this is disruptive and potential dangerous.

In Australia, incident reports and requests for emergency help is being gathered through the emergency hotline Triple Zero (000). This is an organisation that responds to and coordinates the emergency calls for all EMOs in Australia. Triple Zero’s structures and procedures are set up in a way that it can process the relevant information through phone calls but not through other means such as email, text messages, social media, or other forms of text transferred information. Furthermore, EMOs themselves do not have the practices and procedures in place to allow incident reports through social media.

However, not responding to a request for help, which the organisation is aware of, could have lethal consequences. For EMOs, it is of highest priority to keep the public safe. The interviewed informants expressed that it is a moral responsibility for members of EMOs to follow up on incident reports when they are aware of them. Nearly all case organisations report some form of reporting of emergency incidents in the past as shown in Table 6.13.

In this section, it is expanded upon how social media is used when members of the public report incidents, or request emergency assistance through social media. For EMOs, this opens up the problem on how to react to such behaviour and how to integrate social media services within the dispatching processes of the organisation. The processes and procedures to accompany incident reporting and emergency assistance through social media as an official service offered by EMOs are currently not properly developed. The informants of the case organisations identified a struggle with the current structure of the organisations, the established processes, the norms of the organisation and the moral responsibilities of members within the organisation, and the expectations of the public.
Informants outlined two types of incident reports and emergency requests through social media: (1) Occasional incident reports by individuals who are not able to, or decide not to call the official emergency hotline (000), (2) incident reports when the official emergency reporting infrastructure is not reachable. The official emergency reporting infrastructure can break down. For example, an overload in an extreme event or when the physical infrastructure is damaged. The first part of this section focuses on incident reports where members of the public decide to not go through the official reporting channel. The second part of this section will focus on the possibility of the social media structures not being reachable.

On the surface, both reasons for incident requests through social media seem to bring the same risks and problems for EMOs, however, through the different setup in the operational and the non-operational mode, incident reports bring different struggles and risks for EMOs in these different organisational modes.

Incident reporting through social media channels are currently a rare occurrence, however, as shown in Table 6.13 except for the informant from organisation E, the case informants operating the social media channels in the headquarters of the organisations stated that incidents were reported through social media in the past. The fire response organisations experienced incident reporting of serious issues more than the remaining case organisations (Organisation A, and D).

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**Table 6.13 Incident Reporting through Social Media across case organisations**

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Process</th>
<th>Experienced in Past</th>
<th>Social Media monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organisation A</td>
<td>Informal</td>
<td>Occasionally</td>
<td>Operational Mode and during Office-hours</td>
</tr>
<tr>
<td>Organisation B</td>
<td>Informal</td>
<td>Occasionally</td>
<td>Operational Mode and during Office-hours</td>
</tr>
<tr>
<td>Organisation C</td>
<td>Formalised</td>
<td>Occasionally</td>
<td>Operational Mode (sign on and sign off)</td>
</tr>
<tr>
<td>Organisation D</td>
<td>Semi-formalised</td>
<td>Occasionally</td>
<td>During Office-hours (Extended in Operational Mode)</td>
</tr>
<tr>
<td>Organisation E</td>
<td>Informal</td>
<td>No</td>
<td>During Office-hours (Extended in Operational Mode)</td>
</tr>
</tbody>
</table>
6.9.1 Occasional Incident Report through Social Media

The first type, incident reporting when an individual is reporting through social media because they are not able to call or decide not to go through the established emergency reporting channels, happen occasionally. The main risk of such a report is the possibility that it might not be noticed by the organisation since the social media channels are not constantly monitored. This is a higher risk outside of the operational mode. If and when an incident report is noticed, the case organisations can cope with it as long as it does not occur too frequently.

In all of the examined organisations, incident reporting through social media is seen as a critical issue for which the organisations are not prepared. Only Organisation C established formalised processes that specify how to integrate help request through social media into the official response and dispatching processes. Organisation D established semi-formalised processes within its structure. The remaining case organisations have unofficial processes in place which outline how the social media officers respond to incident reports through social media. Subsequently, a lot of knowledge is within the social media officers and not formalised within the processes of the EMOs. These unofficial processes have the same form and manifestation as the formalised processes within organisation C but they are not documented within the process structure of the organisation.

A common theme within the different interviews was tension and struggles between the organisational manifestation of the EMO and the individuals within the system. “If you've got people going ‘help my house is on fire, I'm trapped’, and they're writing you this on Twitter, you want to be able to do something about that.” (Social Media Officer - Organisation A)

Generally, the interview informants across all organisations were outlining the struggle between the moral responsibilities of: the individuals within the system, the organisations as EMOs, the procedural struggles within the organisations, and the fear to set public expectations.

The quote from a social media officer in Organisation A is a good example of the moral responsibility the social media operators are feeling. This sentiment towards dispatching through social media was a shared perception of the informants across all case organisations.

The social media officers made it clear that the structures and resources within the EMOs are currently not there to allow incident reports and requests for emergency assistance through
social media. The concern of the informants is that when the public expectation is set up to a specific extent, then the organisation cannot go back to a stage before this.

“So we didn't want to be in a position where - on the one hand there's the risk of almost approving that sort of method of asking for help. If you make it obvious that you're going to help people, they do that. Do you know what I mean? You establish an expectation in a way. So there was a bit of concern of that - that was really the concern and because there are no official processes in place to actually manage that. So we need to be really careful about setting that expectation, but at the end of the day we weren't prepared to just do nothing if someone was asking for help and we thought that was a genuine request. (Social Media Officer 1 - Organisation D Headquarter)

The interview informants indicated that it is a very thin line between avoiding to build a public expectation for which the organisations are not yet prepared and to follow the moral responsibility to mitigate the effects of an emergency event. The quote showed this struggle between moral responsibility and the risk to set a public expectation the organisation is not yet prepared to meet.

The social media units within the organisations actively try to avoid situations where individuals ask for emergency assistance through the social media channels. To manage the expectation of the public that social media would be a valid reporting channel, the social media profiles of the organisations show a disclaimer that these channels are not reporting channels and are only operated through the normal office hours. These disclaimers also indicate that the channels are used as an information channel from the organisations towards the public. Social media in general, and Facebook and Twitter in particular, are seen as additional broadcasting channels from the organisation towards the public.

When an incident report or the request for emergency assistance is made through the social media channels of an organisation, the social media officers follow a similar procedure across all the case organisations. As mentioned above, only organisation C has formalised processes embedded into the training material and the social media manuals for social media officers within the organisation. Organisation D established a semi-formalised process not embedded into the official structure and procedures of the organisation, but is followed amongst the social media officers within the organisation. The remaining case organisations do not have
formalised processes in place. However, the interview informants indicated the same steps when asked how such an occurrence was handled in the past, or how they would handle such an occurrence.

The following quote outlines the establishment of the semi-formalised process in Organisation D on what to do when individuals request help through social media.

“In our - one of our first - one of the first drafts of our guidelines that was one of the issues that we raised and we had quite a long discussion, thinking process, through this. At the end of the day there was no real organisational structures in place to handle that sort of thing, so it wasn't like there was a requirement from our employment perspective we felt to actually respond to that or do anything with that, but at the end of the day it was more of a moral responsibility.” (Social Media Officer 1 - Organisation D Headquarter)6

Again, the quote shows the struggle between the moral responsibility of the individuals within the organisation and the lack of organisational structures that could accompany reports through social media. Especially in the non-operational mode, the social media channels cannot be monitored closely all the time because the organisations currently don’t have the necessary resources. EMOs are structured into different units and departments, which can be very siloed.

When it comes to incident reporting and the necessary dispatching of emergency response resources it can change to an inter-organisational response, which makes it even more complicated. For example, in a fire event it could easily happen that multiple organisations need to be involved: Fire service to fight the fire, police to navigate the traffic and close roads or to start criminal investigations, and ambulance services if there are potentially injured people. The emergency hotline Triple Zero has the responsibility to make sure that all necessary organisations are involved when an incident is reported through the emergency hotline. Because of this, the social media officers usually report the incidents to the Triple Zero hotline when they are aware about an incident reported through social media.

The processes, which the social media officers follow, have the same form across the case organisations. The simplified process flow is shown through the BPMN model in figure 6.10. If an incident is reported through social media, the social media officer will respond and tell

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6 Bold text stressed by author.
the sender that it is not possible to report an incident through the social media channel and that an incident needs to be reported through the official emergency reporting channel (which is the phone number 000, the nationwide emergency telephone number in Australia). If the social media officer is convinced that the incident report is genuine, the social media officers will report the incident themselves by calling Triple Zero or the dispatching unit within the organisation to make sure that the organisation responds to the potential incident. The social media officers need to go through the official reporting channels themselves as they do not have direct access to the dispatching system of the organisation and need to make sure that all relevant organisations are involved in the response to the reported incident.

![Figure 6.10 BPMN model incident report or emergency assistance request through social media](image)

The model shows the three different involved entities (through the pools in the BPMN model): At the top, a member of the general public reports an incident; the middle represents an emergency response organisation in which the social media officer is situated; The bottom represents the Triple Zero (000) call centre where the emergency hotline officer processes the response and starts the official emergency response. As shown through the different pools in the model, there are multiple organisations. Not shown in the model are the multiple distinct organisational units within the emergency response organisation, which are then involved in a
response when they are activated through the Triple Zero (000) hotline. A report through social media might influence different organisations and in each organisation, different organisational units. When the emergency hotline officer starts the response, potentially multiple organisations are informed and within these organisations the traditional processes of an emergency response are set in motion.

When the organisation is in the operational mode, the social media channels are actively monitored. Hence, a low quantity of incident reporting is seen as a minor problem. If there are not too many incident reports, the organisations can cope with them within the current setup. During the non-operational mode, case organisations do not continuously monitor the social media channels and only operate during normal office hours. During this mode, it is highly possible that an incident report is not noticed for some time. The following quote by a social media officer within organisation A shows that it would be especially critical if an incident would be reported at night time. “The issue that we would have then is, if at 2 am tonight somebody reports a fire, we might not see that until six or seven o'clock tomorrow morning.” (Social Media Officer - Organisation A)

The following quote from a social media officer in organisation D describes the procedure the organisation follows outside of their office hours in monitoring and responding to social media messages on the headquarters Facebook and Twitter channels. “There is a disclaimer saying it's not monitored 24 seven. You hope common sense plays a role in that as well. Over the weekends myself and <name of Informant 1 of Organisation D> take it in turns, and at the evening we'll have a quick look at Sprout <monitoring software in use>. Is anything major happening? Are there big issues? Do I need to action anything? Is it all just normal stuff and I can deal with it on Monday? So we do keep an eye on it over the weekend and public holidays for those reasons but generally it's pretty good.” (Social Media Officer 2 - Organisation D Headquarter)

This procedure is similar in the remaining case organisations. Outside of the normal office hours, there is a social media person on-call who sporadically checks the social media channels. This structure provides the risk that an incident report at night time or during the weekends might not be noticed on time, which may result to the organisation not being able to respond to it within an appropriate time frame, however, the perception within the organisation is that it is clear for the public that the social media channels are not reporting channels and that the
reports through social media are a rare occurrence: “But as I said, it's only happened half a dozen times really over the years so it's not a major concern. I don't think we are at risk at the minute anyway of creating any expectation that that's a legitimate way to request assistance.” (Social Media Officer 1 - Organisation D Headquarter) The risk that incident reporting through social media could lead to a critical situation for the organisations, outside of the operational mode, is generally seen as low.

Incident reporting through social media is not seen as a technical issue, but more that the procedures and processes are just not yet in place; The processes will not be put in place in the near future either. “The interesting thing was that the argument against accepting requests for help from social media was that you couldn't verify the information, and yet by us just phoning up with that information the emergency dispatchers were quite happy to dispatch help on that basis. So it's not - the information isn't more or less verified; it's just coming through a different medium because they came to them on a phone, they can handle that, but there obviously still aren't any official processes in place to handle that request through social media.” (Social Media Officer 1 - Organisation D Headquarter) It is not the fear that social media is more prone to false or misinformation than information which is processed through phone calls; It is a problem in the setup of processes on how information can be processed within an organisation. The processes within the emergency response hotline (000) are set in a way that this organisation needs to receive information through phone calls and is not prepared to process information through alternative forms of communication other than the phone calls, therefore, all of the processes and procedures are structured around phone calls.

A general fear is that false incidents are reported through the anonymity of social media. This anonymity is similar to a phone call. Especially on Twitter or Facebook, it is possible through the profile setup to determine whether a profile seems to be genuine or a fake profile. This already helps determine how to judge the information sent through. This does not mean that there are no false reports sent towards the organisation through social media. “We have had one false report so a girl who maliciously reported a fire at her neighbour's house. That was interesting because we had suspicions about whether or not this was genuine, and we did make it clear to her that it was an offence to falsely report an emergency, but then she still insisted that it was a genuine emergency. So we called 000 and that information was passed onto the police and I think the police have dealt with her.” (Social Media Officer 1 - Organisation D
Headquarter) Similar to false reports through the official emergency report hotline, the available information would be sent to the police.

“If I saw someone asking for help on social media and thought it was genuine then I would phone 000. Not because I'm a <name of organisation> member or not because I'm acting on behalf of the state or anything, but just because I'm a concerned citizen. So that's the basis on which we would do that in the State Control Centre or anywhere else.” (Social Media Officer 1 - Organisation D Headquarter)

As shown in the quote for the social media officers within the organisations, it is again more of a moral responsibility to keep their communities safe. Therefore, the social media officers process incident reports through social media when they are aware of them, however, the organisations do not have the resources or the current strategy for social media channels to be monitored at all time. It could easily happen that an incident report is not noticed by the organisation.

The case organisations can cope with an occasional incident report or the request for emergency assistance through social media, as long they are aware of the report. During the operational mode, it is more likely to happen that the organisation notices such a report because the social media channels are actively monitored during this time and not just sporadically checked. Therefore, incident reports and request for emergency assistance through social media are less of an operational risk during the operational mode than during the non-operational mode.

6.9.2 Extreme Events and Help Requests through Social Media
During an extensive extreme event, it is possible that the emergency reporting infrastructure is impaired. The infrastructure is either unreachable through to damage of the infrastructure or in extreme events it is possible that the emergency hotline is overloaded. For EMOs, it is another problem area resulting in organisational risks.

“One of the things that we are looking at and that we need to address as an organisation and a bit of an organisational risk for us: there is some good research that the American Red Cross did on this and that's supported by anecdotal stuff from various agencies that have had the situation happen, is that where the major reporting system, where the major incident reporting phone number goes down - so 911 or 000 becomes unavailable for whatever reason, something like 86 per cent of people, their first fall back option is to then go and report the
incident on the agency's social media channels. - Now we aren't set up for that.” (Social Media Officer - Organisation A)

A systematic failure of the emergency hotline Triple Zero (000) through infrastructure failure or an overloaded hotline would most likely result in the public to resort to alternative reporting channels, such as the social media channels of the emergency response organisations. The current social media setup and structures are not prepared to respond to an event in which social media would become incident reporting channel. The social media structures in the organisation are still largely seen as an alternative broadcasting channel to distribute information to a large audience.

Internationally, such a behaviour was observed during Hurricane Sandy in the US (Chatfield et al. 2014). The emergency hotline was overburdened and affected members of the public where requesting help through the social media channels of the New York Fire Department. The fire department resorted to dispatch based on the information they received through their social media channels. The social media operators within the case organisations are aware about the possibility of such an event happening, however, none of the case organisations currently have the structures in place or are prepared to dispatch based on social media information during an extreme event when a large amount of lives would be at risk.

“In Australia the closest I can think of is during the storm events, the flooding events that we had a couple of months ago, the organisation were just overwhelmed with the number of requests and you had people reporting incidents and the <Organisation B> social media team were basically saying please go and ring this number. People were going well we've been ringing this number for six hours this is why we're trying to tell you.” Social Media Operator - Organisation A

The previous quote shows that to a small extent, such an event happened in Australia. Organisation B operates a hotline for non-live threatening flood, storm, and tsunami related reporting and assistance requests. This reporting hotline was overburdened during a storm event that resulted in major flooding in urban and rural areas. Callers who wanted to report an incident or needed emergency assistance were unable to report through this number due the large volume of calls. The social media team was not prepared to respond to the inevitable

7 Bold text stressed by author.
request through social media. As outlined in sub-chapter 6.3, the social media channels are operated from within the media and communication team and are perceived as a broadcasting channel. With the current setup and role structures, it is not feasible to use this channel to feed the social media information into the operations structure of the organisation that is organising the response to an extreme event.

This is not just a potential problem in case organisation B as the following quote shows: “What we don't have, and as far as I'm aware no Australian agency really has, is a process, a procedure in place to deal with that major event type failure and the resources and the what would need to be put in place rather rapidly. I don't think it's necessarily something that you could do on the fly. You need to have a plan for this beforehand otherwise it could end up very messy very quickly.” Social Media Operator - Organisation A

Organisation A has structures in place to use their social media channels and an intelligence channel from which information can also be fed into the operational structures of the organisation during the operational mode, however, they do not have the necessary procedures, resources, and structures in place necessary to dispatch based on social media incident reporting during an extreme event in which the emergency reporting infrastructure would be disrupted. The remaining case organisations are not prepared for such an event either. While the interview informants from the headquarters of the organisations responsible for corporate social media channels mentioned that they are aware of the possibility that such an event could happen, they also indicated that none of the case organisations had procedures in place which would be necessary to dispatch based on social media information when it would be on a large scale.

The social media officers highlight that such an extreme event would be very rare and unlikely to happen, as shown in the following quote from a social media officer in Organisation A. However, in the case that such an extreme event would happen, the impact on the organisation and the affected communities would be seen as high. “Yeah look and just - I suppose the important thing to note here as well is we're talking extreme events in this case. It probably will only happen in one per cent of major incidents, but it's the type of major incident where if we don't have a plan and there in place, you're going to be potentially looking at major loss of life.” Social Media Operator - Organisation A
The two fire response case organisations, Organisation A and D, and the all-hazards Organisation C have more capabilities when it comes to the utilisation of social media than the two flood and storm response Organisations B and E. This difference in capability might depend on the size of the organisations and that Organisation A and D have more resources as well as funding at hand to explore the utilisation of social media. Organisation C has a different status since it can draw on the knowledge of all the emergency response organisations in the respective state it is located.

To conclude this section, incident reporting and emergency assistance request are potential risks the social media officers in the organisations are aware of but it is not a risk that has a high priority for the organisation to mitigate. All organisations, except organisation E, experienced cases where individuals from the public used a social media channel of the organisation to report incidents. The social media channels are not reporting channels for the organisations, however, when the social media officers are aware of a report through social media, they will follow up on it. The organisations are able to respond to low amounts of requests through social media as long as these requests are within the normal office hours or during the operational mode when the social media team is monitoring the social media channels. In the non-operational mode, or outside office hours, the social media channels are only sporadically monitored, and therefore, it is likely that a social media message is not seen for a long time.

The case organisations are not prepared for incident reports through social media in large amounts when the traditional reporting infrastructure is disrupted. For example, Hurricane Sandy in the US (Chatfield et al. 2014). As shown in the first part of this section, the case organisations, except for organisation C and D, did not have established formalised processes in responding to incidents and requests for emergency assistance reported through social media in the first place. None of the organisations has the structures, resources, and processes in place to dispatch based on social media information in case the traditional reporting infrastructure would be impaired during a large-scale extreme event. Social media incident reporting is a potential organisational risk, which might be covered by the organisations when the social media integration further matures in the organisations.
6.10 Social Media Officers
For the case organisations which are emergency response organisations (Organisation A, B, D, and E), social media is established on three organisational levels: on the brigade or (unit) level, on the region (or district) level, and at the headquarters level. Organisation C currently only established social media in the State Control Centre, which also functions as the headquarters of the organisation.

In all of the case organisations, social media is used at the headquarters level in all phases of the PPRR model. Most social media activity in the operational mode focuses on social media channels coordinated centrally by the organisations. All of the case organisations established specific roles, which have the responsibility to coordinate and operate the emergency management relevant social media channels. In this section, a closer look is taken at the different types of social media officers used as established roles across the case organisations.

![Diagram](Figure 6.11 Types of Social Media Officers)

As shown in Figure 6.11, there are three types of social media officers present in the case organisations: social media engagement officers, who are responsible for the broadcasting of information and to engage with the listening community; social media intelligence officers, who use social media to gather emergency relevant information; and integrated social media officers, who use social media for both intelligence gathering and engagement with the listening audiences.

6.10.1 Social Media Engagement Officer
The first type of identified Social Media Officer is the Social Media Engagement Officer, this Social Media Officer is responsible for communicating with the listening Audience on the Social Media Channels. The responsibilities are to distribute information through social media; answer questions the organisation receives through their social media channels; and to monitor the social media channels of the organisation. The monitoring is to ensure civility on the
channels; and to ensure that the information distributed is understood by the members of the public, which includes aspects of Social Media Intelligence for Strategic Awareness.

The Social Media Engagement Officers in Case State II often have a background in Journalism. This is particularly valid for Case Organisation C, and D. These specific Social Media Officers have less specific domain knowledge about Emergency Management, but have detailed knowledge on how to interact and manage media organisations. The social media officers who have Journalism background emphasised during their interviews more that social media is utilised to provide media organisations information about emergency events. These particular Social Media Officers also have extensive knowledge in handling difficult PR situations.

When Case State II switches into the operational mode, and the State Control Centre is activated, the Social Media Coordination for the involved EMOs is coordinated centrally from the State Control Centre. The Social Media Engagement Officers are sourced from EMOs across the State. The responsibilities are standardised and who is operating when is coordinated through a roster.

**6.10.2 Social Media Intelligence Officer**

The main focus of the social media intelligence officer is to gather relevant information from the social media channel in order to improve the situational awareness of the organisation. The Social Media Intelligence Officer is responsible for Operational Social Media Intelligence as well as for Dialogical Social Media Intelligence.

Currently, Case Organisation C, and D have this type of Social Media Officer. The intelligence officers from Case Organisation D operate from the State Control Centre when the organisation is in its full operational mode.

The Social Media Intelligence Officer has extensive domain knowledge about the relevant emergency events. The role is gathering information for the organisation, but not feeding information back to the community. In the State Control Centre of Case State II, the Social Media Intelligence Officers are physically separated from the Social Media Engagement Officers as they operate from different rooms.
6.10.3 Integrated Social Media Officer

Organisation A shows a hybrid form of Social Media Officer, which is termed the Integrated Social Media Officer. This role is responsible for using the social media channels to interact and engage with the listening communities, but also to use the social media channels for intelligence purposes in order to gather relevant information from their social media channels.

The Social Media Officers who perform this role within Case Organisation A have a background in emergency management which provides them with detailed knowledge about this domain. However, they are not trained journalists which might provide a small disadvantage when it comes to interact with Media organisations.

6.10.4 Social Media Officers within the Case Organisations

The case organisations still have a relatively small pool of social media officers they can draw from. The social media officers established in the headquarters of the case organisations have a high influence on how the social media channels are operated and used. The social media officers in the different case organisations can still be classified as mostly evangelists (Latonero and Shklovski 2013) who ‘preach’ the social media utilisation to the different case organisations. Formalisation of the roles is in progress, however, when the members of the organisation who are currently operating the social media channels would leave the organisation, the social media utilisation would most likely drastically change.

<table>
<thead>
<tr>
<th>Social Media Officer Type</th>
<th>Organisation A</th>
<th>Organisation B</th>
<th>Organisation C</th>
<th>Organisation D</th>
<th>Organisation E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engagement Officer</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Intelligence Officer</td>
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<td>X</td>
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<tr>
<td>Integrated Officer</td>
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Table 6.14 gives an overview about which types of social media officers are in the different case organisations. Organisations A, B, C, D, and E have the Social Media Officer role which can be classified as the Social Media Engagement Officer. They are focused on communicating information towards the listening communities.

8 Case Organisation D uses social media for some social media intelligence (See Section 6.8.3), despite having neither dedicated Social Media Intelligence Officers nor Integrated Social Media Officers.
The Social Media Engagement Officers in Case Organisation C and D have a background in Journalism; they use the social media channels highly to distribute information towards the media in order to take the pressure off the media telephones operated by the organisations.

The Social Media Officers in Organisation B and E have not indicated such a strong aim to target the media with their messages during the case interviews. Their focus is more to distribute relevant information towards the listening community.

Organisation A has a few Social Media Engagement Officers, and Integrated Social Media Officers. The focus of the messaging in this organisation is more to distribute information towards the general public, but also distribute information towards the media during emergency events.

The Integrated Social Media Officers are both operating the social media channels to distribute information to the listening community and is using the social media channels as well as a source of intelligence. The organisation is using their social media channels for both for public information intelligence, and operational intelligence.

Organisation C has dedicated Social Media Intelligence Officers. These social media officers monitor the social media channels to improve the situational awareness of the organisation as well as to gather operational relevant information. The social media intelligence officers are only activated in the operational mode and operate from the State Control Centre.
6.11 Formalisation of Social Media
The early social media utilisation in the case organisations was an ad-hoc adoption of the technology. Since then the services were more and more appropriated into the structures, and progresses of the case organisations. By now the majority of members of the case organisations recognise social media as a communication channel which is beneficial for emergency and disaster management. In this section, the ongoing formalisation approach of social media into the case organisations is explored. Two different aspects are looked at: The ongoing formalisation of roles and structures; and the formalisation of processes and training.

6.11.1 Formalisation of Roles and Structures
The social media coordinators in Organisation A, B, and D are still first generation social media officers. They substantially influenced how the organisations see and use social media services. The social media coordinator of Case Organisation B describes their initial role responsibilities as something they could form and decide what was included and what was not: “I was hired as the Web and Social Media Coordinator, at the state headquarters. Basically that role at the time was coordinating the social media presence and the governance around social media. As well as maintaining and governing the websites associated with the organisation. It was sort of a new role and I got to make it into mine a little bit” (Social Media Coordinator – Organisation B)⁹. Back then the role was something new and a first attempt to formalise the social media utilisation in this Case Organisation. Social media was already used in different parts of the organisation, such as in several units. The social media coordinator had to find a way to integrate this shift in using social media into the broader aims of the organisation. The social media coordinators in Case Organisation A, and D reported similar experiences. These social media coordinators formed the social media activity as it is in their organisation today.

When Case Organisation C was founded, there was already some experience how EMOs can utilise social media services. The social media coordinator of organisation D gave input into the necessary structures and responsibilities of how social media can be used in such an organisation. Since the organisation was designed to foster inter-organisational collaboration and coordination the processes which were used in this organisation were formalised and structured.

⁹ Bold text stressed by author.
However, even in this case organisation the roles are evolving and emerging influenced by the greater understanding of social media technology by relevant members of the organisation. The social media intelligence officer (see Chapter 6.10) in case organisation C is a new role which is using social media technology to gather information for the organisation. The requirements for the role are still not fully clear and are better understood while the organisation is appropriating the social media technology into its processes.

The social media coordinator of case organisation E took over the role requirements from their predecessor. The social media coordinator drew on the experience of the case organisation D and C, but still shifted the social media utilisation within the organisation.

The social media officers in all case organisations expressed that the technology and public expectations are moving much faster than the structures and processes within the case organisations, as expressed in the following quote: “social media is a responsible role. It has to be part of the chain of command and this is the issue that we have where our technology and our channels have moved so much quicker than what our processes are” (Social Media Officer – Organisation C). EMOs are highly hierarchical structured. The hierarchical structures implicate a strict command and control structure, in which the social media operators need to be embedded. The organisations are still exploring what the responsibilities of the social media officers are and how properly embed them into the command and control structure.

The social media officer roles are in a progress to be formalised with clearer responsibilities what the role includes. Organisation C has embedded role structures and responsibilities. The processes in this organisation are formalised, and the social media officers who are sourced from different organisations in the operational mode use these formalised processes to perform their role duties, however, in the remaining organisation, there is not yet such a formalised structure. The knowledge on how to operate social media channels within EMOs is internalised within the social media officers. If the social media officers would leave the organisation the social media practices and processes within the organisation would change, as illustrated in the following quote: “Look, primarily I suppose I do a lot of our work. Our media team all have some capacity, but as far as developing our social media and growing it, that's sort of one of my main roles. We would have some issues; if I was to get hit by a bus tomorrow, we would have some resourcing issues to a degree and that's a risk that we've identified and that we're trying to resolve at the moment” (Social Media Officer – Organisation A).
Outside of the headquarters, the roles are not yet formalised. Especially on the volunteer basis there are not clear responsibilities what it involves if a brigade/unit is utilising social media. All of the case organisation have standardisation and training approaches planned to improve the average standard of the social media utilisation of the brigades and units which are actively utilise social media.

6.11.2 Formalisation of Training and Processes
When social media was introduced into the case organisation the utilisation was ad-hoc without predefined processes. Since then there is an ongoing process of formalising the social media activities within all of the case organisations.

All of the case organisations started to formalise their social media training activities. This includes handbooks which describe the roles of the social media officers, manuals on how to operate social media (both for social media communication, and in the relevant organisations for social media intelligence), guidelines and policies, and training programs. The training programs are directed by social media officers who operated the centralised social media channels, and there are other programs which are targeted to the volunteers within the case organisations.

Case organisation C has the most standardised processes when it comes to the social media activities. The social media operators are seconded from the different EMO of Case State II, when Case Organisation C is in the operational mode. They established clear guidelines and manuals on how to communicate through social media. The remaining case organisations have established a less strict communication guidelines and process steps, however, all of the case organisations started to formalise their social media activities. The social media processes could be split up in social media broadcasting, social media engagement, social media intelligence, and dispatching based on social media.

All the case organisation established their guidelines and somewhat standardised processes within their organisation for social media broadcasting and social media engagement. In addition, the case organisations A, C, and D established formalised processes, or are establishing these processes, when it comes to social media intelligence. Interview informants from several organisations indicate that they are planning to establish more formalised guidelines around dispatching based on social media in the future.
In all case organisation the social media coordinators have an influence on how they structure the social media utilisation for the organisations.

The social media alignment with the organisation is still in progress and processes are standardised designed for the activities for the organisation. The social media officers are still evangelists (Latonero and Shklovski 2013). If these social media officers would leave the organisation the social media utilisation would change as significant amount of knowledge is tacit knowledge which is not documented.

6.12 Social Media for Intra-Organisational Communication

The case analysis revealed that the organisations are not only utilising their social media channels to interact with communication participants external to the organisation but as well to communicate with the volunteer members and other members within the organisations. In this section, social media utilisation for the intra-organisational communication is discussed; In particular, the social media channels which are used for communication with the volunteer members of an organisation. This section is not relevant for Case Organisation C as this organisation does not have volunteer members and is not using social media channels to communicate with other members of the organisation.

Social media for intra-organisational utilisation, refers to microblogging and social networking sites. Other social media channels are not utilised from the headquarters level to particularly communicate with the volunteer members or other organisational units. Private tools or platforms such as messengers were not looked at in the context of this study.

Except for Case Organisation C, One characteristic of the case organisations is that they are large volunteer organisations with volunteer brigades/units distributed across the operational area of the organisations. Through their setup and the holonic structure of the organisation, the volunteer members within these brigades or units mostly interact with members of their own brigade or unit. There is not much interaction across different brigades/units or the headquarters, outside of specialised training courses or extreme events.

The interviews revealed that the case organisations use social media services to reduce the separation between the centralised (corporate) structure of the organisation in the headquarters
with the volunteer-based brigades/units. "It helps to break down some entrenched cultural stigma of, we sit here in a crystal palace and have no real idea how the world works and we're faceless bureaucrats that by our volunteers' behaviour, engage directly. It helps address that” (Social Media Officer – Organisation A).

The structure of the organisations specially separates the senior officers in the headquarters from the organisations with the volunteers of the different units and brigades. The commissioners of the case organisations all have Twitter and/or a Facebook Accounts used to communicate with the public and to communicate with the internal member base. The following quote from a Social Media Officer in Organisation D illustrates how the organisation is using regular “ask me anything” (AMA) events to break down the separation between the senior manager level of the organisation with the volunteers:

“we have a regular AMA - a Q&A but I like the idea of the popular thread AMA on Reddit - ask me anything. I think that says a lot more, just that title. There is a monthly AMA on our members' Facebook page. There is a lot of uncertainty in <Organisation D> environment at the moment. So it's really good. It's a really really positive thing that you've got the hierarchy taking on these new age channels and communicating with people one on one through them.”

The other case organisations have similar structures. There are internal groups in Case Organisation A,B,D, and E where the senior manager level communicates with the volunteers on an ongoing basis. “We get a lot of manager level staff who will - some of them choose to actively engage, but a lot of them will keep an eye on it and see what's going on. We've got a few that will actively engage and answer questions proactively without us having to come and suggest that they do, which is great. Our commissioner doesn't engage through that group, but he has a Facebook page and it's - it's a Facebook page and a Twitter account. The primary market for that would be our volunteers. Obviously the content there is also suitable for general consumption, but a lot of it is where he's at, volunteers he's visiting. The focus is on our volunteer activities. So he has that and members engage with him via those channels quite well” (Social Media Officer – Organisation A).

The social media channels are also used for other purposes, such as dissemination of information within the Case Organisations. As shown in the following quote, the information flow in the holonic organisations can be slow and important information can get lost:
“We are a very hierarchical organisation, which means that it can take a very long time for information to get from here to the coal face. A piece of communication may be sent out from here, go via a regional office, the regional office then sends it to their districts, the districts then sends it to the brigade, the brigade then tables it at the brigade meeting whenever they hold a brigade meeting next, and through that, we find that there's often a filtering process. So the district will go, well, I don't think this is relevant to our members and the brigade secretary goes, oh yeah, I don't think this is interesting. So the information doesn't always get where we need it to get because of that filtering process. So certainly social media is a very good way for us to be able to directly engage” (Social Media Officer – Organisation A). The relevant case organisations use the internal social media channels to distribute information towards their member base.

All of the case organisations are rather large organisations; it is not unusual that there is confusion about the specific positions of the organisations. The social media channels are utilised to clarify these positions. This can be through active questions from the member base, as shown in the following quote: “Another thing that it's quite useful for is clarifying service positions on things. Volunteers will ask questions on, what does the service think of this or that or whatever else, and we can put out a response” (Social Media Officer – Organisation A).

Social media is as well used for internal communication in the case that an organisation is aware that there are internal rumours. In these cases, the social media channels are utilised to fight rumours within the organisation as shown in the following quote:

“Because of the history of the organisation, and not too long ago in the greater scheme of things, there was 150 odd different bushfire services in <Case State I>. They are now our districts, but districts will often have district specific rules of how they do things. The way that one district does something can be very different to the way that another district does it, or people are taught, this is the way that they do it and they are under the assumption that that's the standard across the state, when it may just be a district specific quirk. Social media is quite useful for us in helping to - and just sort of clarify that and where people are under false assumptions of, this is the way we do it, or they've been told by their captain, this is how it is. It provides us the opportunity to be able to correct that. So it's kind of myth busting in a way, but on a larger scale."
There are significant differences between the two Case States whether these internal social media channels should be open to the public or not. The case organisations in Case State I have their internal social media channels as private closed groups. The internal volunteer social media channels in the case organisations in Case State II are generally open to the public; It is assumed that the channels are not relevant for the public and therefore not followed, as illustrated through the following quote: “They’re completely open. There was a consideration that do we lock them down because they're only for members. But the fact is, the public can view them, yes. But the content is irrelevant. So if they want to continue to like the page and engage with the content that's fine but it's not relevant. It's not private, it's just not relevant.” (Social Media Operator Organisation D) For the member communication, Case Organisation D and E each have a dedicated Facebook channel and a dedicated Twitter channel. The channels are completely open and accessible for the general public. The goal of the organisation is to be transparent about their communication; the organisations are under the assumption that the communications within the member channels are just not relevant for the general public.

In Case State I, the internal social media channels of Case Organisation A and B are closed groups. The process to get access to the channels is similar to the process described by the Social Media Officer from Organisation A:

"It's a closed group. We check the applications against our member database and approve based on that. It's not perfect because if you've got a name like Peter Smith, all I can tell you is that there is a Peter Smith in the service."

Organisation B had concerns about the behaviour of their members and how it might be perceived by members of the public as indicated in the following quote: “It was really hard for our volunteers, to understand the difference between; communicating to the public, and as well just communicating between themselves, internally. So we liked them to create closed groups were they could discuss <Organisation B> matters internally and that wasn’t available for the public to see” (Social Media Officer – Organisation B). Therefore, the centralised organisation desires that their internal social media channels be outside of the view of the general public.

There were thoughts in Case Organisation A to have the internal social media channels open for non-organisation members, however, it was a problem to coordinate the channels and keep them on a necessary standard. "But we’ve had to go down that path, spamming was an issue at one point, but we were also getting a fair bit of trolling and stuff. There are other community
run firefighting interest groups as well that we keep an eye on. Some of those are quite antagonistic between members of the <Organisation A> and members of <City Firefighter Organisation>” (Social Media Officer – Organisation A)

All of the case organisations monitor the internal social media channels and moderate these channels when it is necessary. The following quote illustrates the moderation approach in Case Organisation A, the moderation approaches within the remaining case organisations are similar: "We certainly don't restrict posts. We haven't gone down the path requiring a moderator approval before posting or anything like that. That said, we do monitor quite closely. We are quite active in the community moderation, community management stuff. So removing offensive posts, personal attacks, sorting out disputes between members and the carry on and posting inappropriate content. With the content itself, it will depend on the content. If it's something that we feel requires an official response, we'll talk with the relevant subject matter experts and provide them an official - this is the official position of the service. But we also - we'll let members be, if a discussion's going on and you can see that the person's question has been answered by other members accurately, then we may not interfere. We sort of step in for that myth busting stuff or if it's a very technical question or something, that they're asking something quite specific, or if there's myth busting stuff or it's a significant issue that needs some sort of approach from us. As I mentioned earlier, we've got after hours on call officers. One of the things that the online communication - on call officers does is to monitor those core groups in the evenings and such. But it's fairly self-organising. We encourage respectful discussion. It's not uncommon that they are quite critical of a service policy or the way something's being done or the way that their district does things. If that's done in a respectful manner, we generally - we're not trying to stop them saying things or that it has to be very pro <Organisation A> or anything like that" (Social Media Officer – Organisation A).

To summarise, in this section it was outlined how the case organisations utilise their social media channels to communicate within the organisation. Case Organisation A, B, D, and E utilise social media channels to communicate with their own member base. The main reason for this utilisation is to break down the separation between the different Holons in the organisations. In the next section, the inter-organisational social media utilisation between different organisations for the purpose of social media in emergency and disaster management will be expanded upon.
6.13 Social Media for Inter-organisational Communication
Ahmed's model suggested that social media could also be utilised for coordination and collaboration between EMOs (Ahmed 2011), however, there was no evidence in the data that showed that the case organisations utilise social media channels for such coordination and collaboration purposes for the traditional emergency management. The case organisations already have established channels in place, which are used for this inter-organisational emergency management coordination.

In the non-operational mode, there is some social media interaction between the social media officers from different organisations. There are a few Facebook groups where social media officers from different organisations share their knowledge and show what works well and, on the other hand, which tactics and practices were not successful.

In the operational mode, the interview informants stated that there is no social media interaction across different organisations. EMOs work closely together in emergency events. Incidents are usually coordinated within the involved organisations. There are established lines of communication through which the different organisations coordinate their collaboration to counter the emergency events effectively. The State Control Centres of the different states are placed to facilitate such collaboration.

The State Control Centres are activated during larger emergency events or emergency extreme events. The different organisations within a state have delegates from their organisations within the State Control Centre who are responsible for that collaboration and coordination between the organisations is taking place.

Therefore, social media is not used for inter-organisational communication within the observed case organisations for the active emergency management. The case organisations have well-established communication channels through which this communication is performed, and collaboration is facilitated.
6.14 Supporting Software in use for the Social Media operations

The entry requirements to use social media in an emergency management setting are low. This is especially valid if social media is just used to communicate with the listening communities. The utilisation of the social media platforms is on a basic level free of charge and uncomplicated to set up, however, the interview informants indicated that they are utilising specialised software in their social media activities. In this section, this software utilisation is explored in two aspects: First what types of software are used for social media communication and engagement, and then secondly the software support necessary for social media intelligence.

6.14.1 Software for Social Media Communication & Engagement

There are several types of software in use to support the social media efforts of EMOs. As shown in Table 6.15, not every case organisation is using software packages to support their social media activities. Different types of software are outlined and then how the relevant case organisations integrated them into their social media activities is explained.

<table>
<thead>
<tr>
<th>Software type</th>
<th>Organisation A</th>
<th>Organisation B</th>
<th>Organisation C</th>
<th>Organisation D</th>
<th>Organisation E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channel Monitoring</td>
<td>X</td>
<td>(X)</td>
<td>X</td>
<td>X</td>
<td>(X)</td>
</tr>
<tr>
<td>Keyword monitoring</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Trend detection CRM</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>Graphical</td>
<td>X</td>
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<td>X</td>
<td>X</td>
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</tbody>
</table>

The first type of software which is used to monitor different channels on social media. These types of software artefacts are used to monitor the different channels which an organisation operates. The social media officers are using this software to check what happens on the different channels and if everything is appropriate. This is especially relevant since the case organisations have several pages outside the direct control of the centralised social media officers, such as brigade or unit pages. Organisation A, C, and D are using software to monitor their social media channels. Organisation B and E have access to such a software package, however, the social media officers tend to not use it for their social media activities.

The second type of software are keyword monitoring tools. These tools show for specific predefined keywords the social media activity around this keyword. Some of the software
packages can then as well show the keyword activity for geographical areas. Again Case Organisation A, C, and D are using these types of software.

Trend detection software packages are designed to identify trends in the social media communication and bring awareness about these trends. These software packages can often be integrated with keyword filters and keyword searches. Organisation A is using this software for its social media communication and engagement activities.

Organisation C and D are using CRM software packages originally intended for commercial organisations. The software package supports the organisations with the monitoring and answering process of social media messages. The software shows which message needs answering or which social media officer responded to the request. This kind of software is as well used to improve the scheduling of social media messages which will be distributed at a later time.

All case organisations are using different software packages to create graphics and infographics for their social media communication. The organisations in Case State II have a repository of graphics which is shared across the different case organisations.

Organisation B and E are using much less software support in comparison to the remaining case organisations. The main reason behind this is that these organisations are much smaller and the social media teams currently do not have the financial resource to acquire licences for specialised software packages.

6.14.2 Software for Social Media Intelligence
Social media for intelligence gathering purposes is in higher need to be supported by software. All of the case organisation who are using social media for intelligence gathering implemented a broad selection of specialised software, as shown in Table 6.16. Organisation D only uses these software packages indirectly since their social media intelligence officers are operating from the State Control Centre of Case State II when activated. The social media activity of the organisation is supported by professional social media software.

Channel monitoring, keyword monitoring and trend detection tools have already been explained in the previous section. Therefore, these tools will not be discussed in this section in
The software helps in the early stages of an incident to identify where an incident is happening and what is going on. In the later stages of an emergency event, the benefits of such software are rather marginal.

Sentiment analysis tools are utilised to better understand the emotional sentiment of the social media communities within the emergency-affected areas. These tools are at the moment relatively basic since they are only indicating a positive or a negative sentiment.

The processes of validating the collected information are supported by software. Image material is sent through Google image searches and as well specialised image validation software to identify whether the picture was tampered with or whether it appears to be trustworthy.

<table>
<thead>
<tr>
<th>Software type</th>
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<td>X</td>
<td></td>
<td>X</td>
<td>(X)</td>
<td></td>
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<tr>
<td>Keyword monitoring</td>
<td>X</td>
<td></td>
<td>X</td>
<td>(X)</td>
<td></td>
</tr>
<tr>
<td>Trend detection</td>
<td>X</td>
<td></td>
<td>X</td>
<td>(X)</td>
<td></td>
</tr>
<tr>
<td>Sentiment Analysis</td>
<td>X</td>
<td></td>
<td>X</td>
<td>(X)</td>
<td></td>
</tr>
<tr>
<td>Image Validation</td>
<td>X</td>
<td></td>
<td>X</td>
<td>(X)</td>
<td></td>
</tr>
<tr>
<td>Integrated Intelligence platforms</td>
<td>X</td>
<td></td>
<td>X</td>
<td>(X)</td>
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The case organisations are utilising as well different integrated social media intelligence platforms. However, the interview informants who are utilising social media services for intelligence purposes pointed out that the activities surrounding social media intelligence are very manual and currently labour and knowledge intensive and the software is providing only minimal support. Software is in the process of getting developed; however, there is still a substantial need for software packages and analytical techniques which help EMOs to achieve what they want to achieve.
6.15 Summary
In this chapter, the results of the data analysis were provided. The data analysis identified twelve distinct themes each which explores an aspect of social media utilisation for emergency management within the case organisations. The main findings of each of the themes will now be described.

The first theme explores on which organisational level social media is utilised within the case organisations. The organisational levels in this context are linked to the holonic structure of EMOs. It was identified that social media is utilised for emergency management on the headquarters level, the district and region level, and on a brigade/unit level. All of the case organisations use their social media channels in very centralised manner. In the non-operational mode, there is social media activity on all of these organisational levels. In the operational mode, most social media communication is coordinated from the headquarter level of an organisation. The social media coordinators on this level are paid staff members who have dedicated social media roles. On the district and region level, the social media use is less structured. Not all of the districts or regions operate social media channels, and there are no dedicated social media roles. The social media channels are managed by volunteers on the brigade/unit level. Not all brigades/units are using social media, and their activity on social media varies. In the operational mode, volunteers are needed for core tasks which means that the social media channels are not operated when a brigade/unit is operational.

The second theme explores what kind of social media channels are utilised in the case organisations. These social media channels are very similar, and there is not much variation. The main social media communication channels, which are in all organisations were identified i.e. Facebook and Twitter; Support social media channels, which are channels which support the social media presence but are barely used during the operational mode; placeholder channels, which are social media platforms which might get further traction but do not have a relevance for social media utilisation in disaster management yet; and legacy channels, which are channels which were used in the past but which now have no activity by the case organisations any more.

The third theme highlights the different audience groups among the listening communities and then the selection of the social media channel to communicate with a specific audience group. The term listening community describes social media users who are receiving social media
messages from EMO; In order to receive information, this audience needs to subscribe to the social media channels of an EMO. There are three major audience groups to which the interview informants within the case organisations referred to, the media, the general public, and the volunteer members of an organisation. The media and the general public are audiences which are external to an organisation, while the volunteer members are an internal audience group. Information which is targeted specific to members of the media is in general provided through Twitter since Journalists are actively using this medium. Messages which are intended for the general public are shared through all social media channels. Facebook is the main channel which is used to communicate with the volunteer members from within the organisation.

The fourth theme identifies the distribution approach of information through social media and where this information is sourced from. The approaches are different in the operational mode and in the non-operational mode. Case organisations are utilising their social media channels for the broadcasting of information, and warnings, for community education, to encourage a specific behaviour from the media and the public, to fight rumours and false information, and for public relations purposes. Most of the information is sourced internally from the case organisations and their different information systems, e.g. warning information system or the operational management system.

The fifth theme focuses on the utilisation of social media as an engagement channel. All case organisations are trying to use their social media channels as an interactive communication channel and not just as a broadcasting medium. In the operational mode, this takes the form of answering questions from the public and clarifying messages when it seems that these messages are misunderstood. In the non-operational mode, this engagement includes as well linking messages to relevant events and raising awareness for emergency management by showcasing the organisation.

The sixth theme explores the utilisation of social media as an intelligence channel. Social media intelligence refers to the practice of utilising different social media channels as a source of information which is used internally in the organisation for the purpose of emergency management. There are two different types of social media intelligence used within the case organisations; 1) Communicational Social Media Intelligence, and 2) Operational Social Media Intelligence. Communicational Social Media Intelligence refers to using the social media
channels to improve the communication with the public. This type of social media intelligence can be separated into Strategic Awareness and Dialogical Social Media Intelligence. Strategic Awareness refers to the awareness of whether the listening audience understood the messaging from the case organisations. The case organisations are monitoring their social media channels to check for questions or misunderstandings in order to sharpen their emergency relevant messages. All of the case organisations use their social media channels to some extent for this type of social media intelligence. Dialogical Social Media Intelligence refers to an active monitoring of the social media channels in order to give an organisation the necessary knowledge to influence the ongoing social media communication. The information is gathered to create targeted social media messages, which can help counter misinformation or promote a specific behaviour in the communities. Amongst the case organisations only organisation A, C, and D currently have the necessary capabilities to use their social media channels for this purpose. Operational Social Media Intelligence refers to using the social media channels as a source for situational awareness which might influence the active operations of an organisation. This type of social media intelligence requires advanced resources and only case organisation A, C and D are now starting to use their social media channels for this purpose.

The seventh theme identifies the phenomena of incident reporting through social media by members of the general public. Emergency resources may be dispatched based on these reports. Dispatching processes and approaches undertaken by the case organisations are also highlighted. Interview informants indicated two different types of incident reports. The first is incident reports from individuals who decide to not go through the traditional reporting channels. Such types of reports were experienced by the case organisations infrequently. While there is no official process in place, the social media officers see it as a moral responsibility to react to such reports. The members of the public are advised that social media channels are not a reporting channel and are not monitored 24 hours a day, however, when a social media officer is aware of a report they will follow up on it and organise the necessary dispatching of emergency management resources when deemed necessary. The second form of incident reports is when the official reporting structures i.e. the telephone line is overloaded or for other reasons not reachable. The interview informants raised concerns about potential social media reporting when the necessary emergency reporting infrastructure is not reachable. Past emergency events show that the public tends then to report incidents and ask for emergency assistance through social media. The case organisations are not prepared for such cases of large scale incident reports.
The eighth theme explores the different types of social media officers observed within the case organisations headquarters. There are social media engagement officers, social media intelligence officers, and integrated social media officers. The social media engagement officers are responsible for communicating with the listening audience through the social media channels of an organisation. This type of social media officer is present in all case organisations. The social media intelligence officer is responsible for utilising the social media channels for Operational Social Media Intelligence. This type of social media officer is observed in case organisation C. The integrated social media officer has both social media intelligence responsibilities as well as social media engagement responsibilities. Organisation A operates social media with integrated social media officers within their social media team.

The ninth theme highlights the formalisation of social media adoption and ongoing appropriation within the case organisation. Most of the social media coordinators and many of the social media officers are still the first generation social media officers in their organisation. They are the social media evangelists (Latonero and Shklovski 2013), who have actively shaped the adoption of the social media technologies within the organisation. The formalisation of social media activities is an ongoing process. On the headquarters level, all of the case organisations have established formalised social media officer roles, which have clear, distinct responsibilities during the operational as well as the non-operational mode. On the district and region as well as the brigade/unit level there are no formalised social media roles established. This is especially the case on the volunteer level of the organisations, where social media activity is coordinated in an ad-hoc fashion. This might contribute to the phenomena that the social media channels of brigades or units cannot be actively coordinated when the particular unit is in its operational mode. The case organisations started to establish formalised social media training for both their professional staff members as well as the volunteer members. These training approaches are being refined on an ongoing basis.

The data analysis revealed that the case organisations are utilising their social media channels for intra-organisational social media interaction in order to communicate with the volunteers within their organisations. In the tenth theme, this intra-organisational social media communication is explored. Volunteers units are physically distributed across the operational area of an organisation. These units operate to a certain extend independently. The holonic structure of the case organisations results in a certain extent in a divide between the centralised
core of the organisation and the volunteer units. Social media services are used to communicate with the volunteers in an organisation and to counter the hierarchical divide within the organisations.

The eleventh theme explores social media utilisation for inter-organisational communication and interaction. The case organisations are not utilising their social media channels to communicate and interact with other EMOs for the purpose of active emergency management. These organisations are already well connected, with well-established channels for this kind interaction and coordination.

The twelvth theme looks at what kind of software is used in the case organisations to support the tasks of the social media officers. All organisations have access to some kind of channel monitoring software, yet, the social media officers in organisation B and E rarely use these tools. Organisation A, C, and D are utilising keyword monitoring software to detect what the social media communities are communicating about. Organisation A is also using a trend detection software to analyse social media communication. Organisation C and D are using an advanced CRM software package to help with the response to messages on their social media channels. All case organisations are utilising some graphical software packages to help to create appealing and engaging social media content.

In the following chapter, the themes in context of the literature and broader emergency management are discussed. Based on this discussion, a framework of *Emergency Management Social Media Utilisation for Emergency and Disaster Management* is outlined and discussed, which is the main contribution to knowledge from this research project.
Chapter 7 – Discussion

7.1 Introduction
The data analysis has revealed distinct patterns and themes of social media utilisation and integration in EMOs for operational and non-operational purposes. In this chapter, these patterns, in the context of a broader integration of social media within EMOs, are discussed to answer the research questions underlying this thesis. As a result of this thesis project, a framework of Social Media Utilisation of Emergency Management Organisations for Emergency and Disaster Management has been developed. This framework helps explain social media utilisation by EMOs and also contributes to the design of advanced social media utilisation approaches.

Ahmed’s (2011) framework of Social Media in Disaster Management was used as a starting point for this research project, especially in the early phases. Findings have revealed that as time has moved on, social media has evolved in a way that important aspects of current social media utilisation in EMOs are not covered or represented within Ahmed's model.

To better explain and represent the current situation, data has been gathered and analysed from five EMOs. The themes identified in this data was used to develop the framework.

This chapter is structured to explain how components of the framework have been constructed from the data analysis and is organised into six sections.

In section 1, Ahmed’s model of social media utilisation of disaster management (Ahmed 2011) is revisited and discussed. Its value and limitations based on current findings in the literature and results of the overall project data analysis are also discussed. In section 2, the themes identified in Chapter 6, are discussed. This assists us to better understand “How are Social Media Services integrated into the structures of Emergency Management Organisations?” (Research Question 1), and “How are Social Media Services utilised within Emergency Management Organisations for the purpose of emergency and disaster management?” (Research Questions 2).

In section 3, different themes that emerge from the analysis of the organisational mode of operation are explored, as these themes influence most actions and decisions within the
organisation. This analysis assists us to better understand “Is there a difference in the Social Media utilisation during the operational mode and the non-operational mode of an Emergency Management Organisation?” (Research Question 2.1). In section 4, findings regarding external social media utilisation are discussed which give us insight into, “How are Social Media Services used as communication platforms in Emergency Management Organisations to interact with the public for the purpose of emergency and disaster management?” (Research Question 3.1). In section 5 intra-organisational social media utilisation is explored to assist in our understanding of “How are Social Media Services used as communication platforms in Emergency Management Organisations to interact with their own organisational members for the purpose of emergency and disaster management?” (Research Question 3.3). Finally, inter-organisational social media utilisation analysis is explored to answer “How are Social Media Services used as communication platforms in Emergency Management Organisations to interact with other Emergency Management Organisations for the purpose of emergency and disaster management?” (Research Question 3.2).

From this understanding, a framework of Social Media Utilisation of Emergency Management Organisations for Emergency and Disaster Management is constructed which can be used to better understand the actual social media utilisation within EMOs or the potential social media use within such organisations.
Figure 7.1 Outline Chapter 7
7.2 Revisiting Ahmed’s Model of Social Media in Disaster Management

The literature review (see Chapter 3) introduced a framework of Social Media in Disaster Management (Ahmed 2011) which informed this research project, especially in the early phase. Ahmed’s framework in the context of emergency management, shows different social media participants and their use of social media for disaster management. While the framework is valuable, it has limitations which restrict our view of the phenomena over time. This section is split into two parts: First, a review of Ahmed’s framework is presented and explained as to what the framework provides. Afterwards, the model is critically re-examined for its limitations and how it restricts our view of Social Media in Emergency Management, on the basis of what we have learned since the model was proposed.

7.2.1 Review of Ahmed’s Social Media in Disaster Management Framework

Ahmed’s framework (Ahmed 2011) is shown in Figure 7.2; it divides social media utilisation in disaster management into three different dimensions of social media communication interactions. These dimensions outline the types of communication of particular social media communities. The three dimensions are social media communication and interaction between emergency services agencies (A-A), interaction and communication between an emergency services agency and the community (A-C), and the interaction and communication within the general public, community to community (C-C).

![Figure 7.2 Social Media in Disaster Management reproduced from Ahmed (2011)](image)

These three communication dimensions have different participants and a different focus which impact on how the social media services are and can be used. The framework provides
suggestions on how different participant groups use social media services during a disaster event.

The main amount of messages during an extreme event are created by members of the general public or what Ahmed refers to, the community. Subsequently, the dimension of community-to-community (C-C) interaction has high levels of interaction with a high amount of social media messages. Ahmed sees this interaction as an important communication dimension in all phases of disaster management, before, during, and after. From the literature we know that the general public uses social media services in a different way during extreme events than in their normal day-to-day life (e.g. Fraustino et al. 2012). In the initial model, Ahmed sees the main interaction in the community as communication about the event; the use of social media technology as a platform to send and receive moral and emotional support; as well as a platform to not only interact with the local affected communities, but with the rest of the world.

The second interaction dimension is the social media communication of emergency management agencies with emergency management agencies (A-A). The framework does not make a difference between intra-organisational or inter-organisational interaction. Ahmed outlines that social media can be used for coordination and collaboration within and between the organisations as this is a major challenge of involved organisational participants in an extreme event (McEntire 2007).

The third dimensions, the Agency to Community Interaction (A-C), refers on how EMOs are engaging with the general public for the purpose of emergency management and vice versa. The interaction of EMOs with the general public is seen as an important aspect of the emerging extreme event communication. Research shows that EMOs are central and influential actors in the emerging extreme event communication networks (Mirbabaie et al. 2014).

Members of the general public are actively searching for credible and trustworthy information during extreme events (Fraustino et al. 2012). In case that official information is not available, other sources are chosen to close the information gap. Ahmed’s framework describes the purpose for utilising the social media communication in normal times of operation as a channel to educate the community about potential emergencies. Before and during extreme events, social media is also seen as a channel to disseminate information and issue warnings. This view of social media sees the direction of the communication is predominantly from the EMO
towards the community, which represents the “megaphone” approach described in different studies (e.g. Ehnis and Bunker 2012; Potter 2016).

This framework was developed when research in social media in emergency and disaster management was still in its early stages. Back then, emergency response organisations were just starting out to explore the potential of utilisation of social media services as part of the official response towards disasters and other large-scale extreme events. The utilisation approaches of EMOs matured, and so did the research.

The framework is still highly relevant and gives us an important and useful reference about social media in the domain. The framework shows a very high-level view on the social media interaction which needs to be further unpacked and refined. In the next section, a critique of the shortcomings of the model based on what was found in the literature and within the data from the case organisations is outlined.

7.2.2 Limitations of Ahmed’s Social Media in Disaster Management Framework

The current model has a narrow view of what social media is; social media is seen as the social microblogging Platform Twitter, the social networking site Facebook, and the Video Sharing Platform YouTube. While presumably these channels are only seen as an example of social media in disaster management, it needs to be broadened what is counted as social media for these purposes. In Chapter 2.4, it was outlined what social media services are as well as types of social media technologies. Social media is an umbrella term for a myriad of different technologies and platforms. Some of these social media services are and can be used as powerful platforms and tools in Disaster Management. Social media services can become outdated and not be used any more by the relevant audience as shown in Chapter 6.4. The demand for specific social media channels can change; some social media channels lose their communities, or other social media channels emerge which could be relevant for disaster management. The current representation of the model of social media in disaster management is not flexible enough to take this change of landscape into account.

The current framework focuses on the community, the technology, and EMOs. A previous case study (Ehnis and Bunker 2013) argued that Actor-Network Theory (Latour 2005) is a suitable methodology to better understand these three involved “actors”. Actor-Network Theory is not the underlying methodology for this thesis; still, it can help us take a closer look at the involved
participants ("actors") which are touched upon by the model. As shown in Figure 7.3, the social media communication of EMOs is influenced by four main participants or actors: the EMO itself, their listening community (or better communities) the disaster event with its typology, and the social media technology.

![Figure 7.3](image)

**Figure 7.3** Actors in Disaster Social Media Communication reproduced from Ehnis and Bunker (2013)

The communication strategies in different disaster types can vary as the typology of the event influences how an organisation can respond to an event. For example, some events, such as flooding events, have a long lead time which allows for a warning period. Other events, such as earthquakes or terror events, can happen suddenly and therefore have a very short or no warning period at all. Furthermore, terror attacks in contrast to natural disasters have the problem that the committer can be warned and influenced by the communication on social media while they perform the event; therefore, a response organisation needs to be much more careful with what kind of information they are releasing during such an event compared during a natural disaster event where the information can only be used by the listening community.

The “listening community” in an extreme event is not a homogeneous group. It consists of, amongst many others, individuals who are directly affected by an event; individuals who are indirectly affected by an event, such as friends and family members who want to know whether their affected loved ones are safe or in danger; individuals who are interested in the event. And as shown in Chapter 6.5, another important partner within the section of what the current model refers to as the community, is the media. Journalists and media organisations are actively
monitoring social media to report on unfolding events. All these different members of the “listening community” have different information and communication needs, use social media for different purposes, and have different expectations towards the communication from EMOs.

A limitation of Ahmed’s current framework is that it treats the community as a homogenous group and focuses on a specific type of social media technology. The Media is one communication participant group which needs to be separated from the “Community” participant group. Media organisations have an essential role in emergency management. The literature, e.g. Mirbabaie et al. (2014), shows that media organisations, similar to the non-social media communication in the “real” world, are one of the most influential actors in the emerging extreme event communication networks. Media organisations interact closely with both the public they want to inform and the EMOs which act as sources of some of the information. Since the media has different targets and different approaches in their social media utilisation during extreme events, they can be seen as separate from the listening community in the emergency management communication. This brings then three main participant groups in the extreme event communication, as shown in Figure 7.4: EMOs, the listening community, and the Media.

![Figure 7.4 Central Actor Groups within Disaster Management](image)

The agency-to-agency interaction (A-A) refers to both inter-organisational and intra-organisational social media interactions within the model. Within the data collected from the case organisations, there was no evidence that social media is utilised for interaction between different EMOs for active emergency management. There is some indication that there is some interaction for knowledge transfer during the non-operational mode. However, social media was highly used to communicate within the case organisations, as shown in Chapter 6.12. As
described, the case organisations except for organisation C, all have a relatively small core of
paid staff members and many volunteer members which are distributed all over the operational
area for which an organisation is responsible (state). Some social media channels are used by
members of an organisation to communicate amongst themselves as well as to interact and
communicate with the headquarters of the organisation.

The main focus of this thesis is the utilisation of social media within EMOs which affects the
dimension agency-community interaction (A-C) and the agency-agency interaction (A-A)
dimension. For the agency to community interaction, the model suggest that it is used for
education, to issue warnings, and to provide updates about the event. Not considered are other
communication behaviours, such as correcting false information (fighting rumours), requesting
information from the public (appeal for information), or to encourage a specific behaviour from
the public or media (Ehnis and Bunker 2013).

Social media is more considered as a broadcasting channel towards the public and not as a
channel where information can flow back towards the organisations. Chapter 6.7 showed that
social media is highly used to engage with the public and to as well gather information from
social media to improve the quality of messages being sent out. Furthermore, as shown in
Chapter 6.8, social media is increasingly used as an intelligence channel, with which
information from the public is gathered to improve the situational awareness within the
headquarters of an organisation during the operational mode.

Chapter 6.9 showed that members of the general public use social media to report incidents or
to request emergency assistance. Such behaviour is not represented in the model.

In the next three sections, the found patterns in the data set are discussed in light of Ahmed’s
model of Social Media in Disaster Management. In section 7.4, the Agency-To-Community
Social Media Interaction Dimension is looked at. In section 7.5, the Intra-Agency Social Media
Interaction Dimension is discussed. In section 7.6, the Agency-To-Agency Social Media
Interaction Dimension is focused upon. In section 7.7, Ahmed’s current model is used as a
basis for a framework of Emergency Management Organisations Social Media Utilisation in
Emergency and Disaster Management.
7.3 Two Modes of Social Media Operation - Non-Operational Mode and Operational Mode

As established throughout the thesis, EMOs operate in two modes of operation: The case organisations refer to these modes as to the non-operational mode and the operational mode. The non-operational mode relates to the day-to-day operation when there is no emergency event present, and the operational mode refers to the modus of operation in which an organisation is responding to an emergency event. The mode of operation has an influence of external, internal, and intra-organisational social media utilisation. In this section, the operational mode in context of the social media utilisation in EMOs is discussed.

In Chapter 2, EMOs are described as holonic systems; the organisations are hierarchically structured, and parts of the organisation are able to operate independently to a certain extent. Applied to the operational mode, this means that not all levels and units of an organisation (Holons) are necessarily in the same mode of operation at the same point in time. It is possible that parts of the organisation are in a non-operational mode, while other parts of the organisation are responding to an extreme event and are in full operational mode. Regarding the operational modes, this results in that the shift from the non-operational mode possibly being fluid. Furthermore, not the whole organisation is necessarily in the same mode of operation at the same point in time.

The PPRR Model (Cronstedt 2002) has an influence on most emergency management relevant activities in an EMO. It is not a surprise that it has an influence on the utilisation of social media for emergency management. In the non-operational mode, social media is more utilised for activities which are associated with Prevent, Prepare, or Recover. While in the operational mode, the social media activities are focused on activities associated with Respond and also, to some extent, with Recover. During the non-operational mode, the social media channels are
used to support community preparedness and community resilience. In the operational mode, the social media channels are used for information and warnings around and supporting the emergency response. When focusing and analysing the social media activities within an EMO, it is important to keep in mind that the organisations have a holonic nature and operate in two very different forms of operation. Furthermore, the principal objective of these organisations is to keep the public safe during emergency events. All these aspects underlie the social media activity in EMOs.

7.4 External Social Media utilisation – Agency-to-Community Social Media Interaction Dimension

The main reason that EMOs utilise social media services is to directly communicate and interact with the public for the purpose of emergency and disaster management. The data analysis revealed several distinct patterns and themes of social media utilisation and integration in EMOs. In this section, the patterns of social media utilisation with the external listening audiences are discussed.

7.4.1 Types of Social Media Services in use

The analysis showed that social media channels are used as additional channels to contribute to the communication portfolio of the case organisations (see Chapter 6.4). Amongst others, the communication channels referred to Telephone, Media, and TV. Social media is not regarded as a channel to replace other communication channels but as an addition to reach a broader audience. The difference to the remaining communication channels is that social media can be used as a one-to-one communication channel, a one-to-many communication channel, or a many-to-many communication channel. Further social media is flexible enough to be used as a broadcasting channel, which would reflect in a one-way communication channel; or an engagement channel, which would reflect in a two-way communication channel.

The social media channels in use in the case organisations corresponded with the social media channels that are reported in the literature. The case organisations operate four different types of social media channels: (1) Their Main Social Media Channels, (2) Supporting Social Media Channels, (3) Placeholder Social Media Channels, and (4) Legacy Social Media Channels.
The Main Social Media Channels are, in the case organisations of this study, the social networking site Facebook and the microblogging platform Twitter. The channels are used in both modes of operation. Furthermore, the channels are utilised for information dissemination, and two-way communication with the listening audiences, as well as for social media intelligence.

The supporting channels are predominantly used during the non-operational mode and are channels used to engage with the public, PR, community education, and fostering of community resilience. However, the channels are also used by some organisations, such as Case Organisation D, to gather information which can be distributed through the own social media channels. Supporting social media channels, in the case organisations, are in the case organisations currently image sharing platforms and video sharing platforms.

Placeholder channels and legacy channels are channels where an organisation has a user account but is not using this channel actively. The placeholder channels are for platforms in which the organisation is not yet sure whether it would be worthwhile to use this channel for emergency management; the legacy channels are channels which were used in the past by an organisation, but are not relevant anymore.

Social media services can be short-lived, and the trends might change, which results in the movement of relevant user groups. For EMOs this means that they always need to review the channels which they are using and need to determine whether the channel is still relevant or not. Furthermore, it can mean adding another communication channel towards the communication portfolio of the organisation.
7.4.2 Understanding the Main Social Media Communication Channels

Facebook and Twitter are both used as a channel to disseminate information, engage with the public and by Case Organisation A, C, and D as well as a channel to gather valuable information from the social media networks. Nevertheless, these two social media channels are perceived and used differently, depending on the restrictions of the technology, the expectations of the listening community on each channel, and as well the goals of the emergency response organisation.

Walsham (1993) used metaphors to understand information systems within organisations better. The same is done here to increase our understanding of the use of social media channels in EMOs.

Facebook is utilised as a clearing house of information by all of the case organisations. The listening communities actively visit the respective Facebook channel of an organisation to receive the information they want. The majority of the listening community are members of the general public. All of the case organisations see the general public as the main audience for this channel. However, the members of the public are still a diverse community with different intents for receiving information: They could be individuals directly affected by an event; individuals who are indirectly affected, such as friends or family members who want to know what happens; or individuals who are just interested in what the EMO has to say. Of course, this is just a small selection, and there are other user groups.

On the other hand, Twitter could be seen more as an ongoing dinner reception in an extreme event. The communication participants are mingling at this reception and interacting with other participants. There is a continuing conversation about the event which might be loosely linked, or may not be linked at all.
EMOs are participating in the event communications, but are not the main reason why the audience is there. The organisations are an important (Mirbabaie et al. 2014) participant in the extreme event communication who can steer the communication in a particular direction. However, they are just one participant amongst others. On Twitter, there are also journalists who utilise the social media information as a source. The EMOs reported that they are using Twitter when they have information which they want to distribute amongst journalists.

7.4.3 Social Media Audience Groups – Who is the listening community?

EMOs have a broad audience of social media users which are interested in what EMOs have to say during emergency events and in times of normal operation. In this thesis, the audience is referred to as the listening community or audience, since there must be an active interest of an individual to receive emergency management relevant information during an emergency event or a disaster. The individual who wants to receive the emergency relevant social media messages needs to either follow a relevant EMO, or at least the social media communication around an extreme event.

The listening audience is not a homogenous group; it is a heterogeneous group with different members (Ehnis and Bunker 2013) who all have different aims and intentions during an emergency event (Subba and Bui 2017).
The case organisations identified two major groups of listening social media users which are their audience (see Chapter 6.5). The first group consists of members of the general public; The second group consists of members of the Media, such as journalists (see Figure 7.9).

These groups are not homogenous within. The general public, for example, might consist of members who are directly affected by an event, are friends of family members of somebody who is directly affected by an event, or are individuals from the general public who just interested in the particular emergency event (Ehnis and Bunker 2013).

Journalists and media organisations are well-connected in social media and are central participants in extreme event communications (Mirbabaie et al. 2014). These individuals and groups act as hubs and aggregators and are transferring the information towards other communication media, such as TV, radio, websites, or Newspapers.

The identification of different audience groups is relevant since it can help better understand who is using social media during emergency events and understand for what reasons they are using these social media channels. EMOs can then tailor their messages to a particular audience group they want to reach.

When focusing on the current social media landscape in the case organisations, it can be said that the supporting social media channels, such as Instagram or YouTube, are targeted to the general public audience group from the listening audience. The main communication channels are also generally targeted towards the members of the general public. However, all case organisations identified that Journalists and other members of the media also actively use Twitter as a basis for their reporting. Twitter is used as a main communication channel to send information towards the Media.

**7.4.4 Social Media Utilisation for the Distribution of Information**

EMOs use their social media presence as an additional communication channel to distribute information to a broad audience. Other communication channels, amongst others, include: print media, TV, radio, or community meetings. In contrast to media releases, they are in direct control on what is communicated through these mediums; Of course, it is outside the control what is done with the information by the audience. EMOs have the potential to communicate with their audience directly through social media. Furthermore, it has the potential to be used
as a two-way communication channel in which there can be a direct feedback loop towards an organisation. Still, social media is often used as a one-way communication channel to just broadcast information (Ehnis and Bunker 2013; Potter 2016) to the social media audience.

The emergency management case organisations approach the utilisation of their social media channels differently depending on the operational mode the organisation is operating in (see Chapter 6.6). During the operational mode, the organisations distribute emergency relevant information and warnings. Warnings can be automatically posted from the warning information systems within the organisation. The interview informants across the organisations have different views on automated messages. On the one hand, it is a technique to make sure that relevant information is distributed, but, on the other hand, this information receives a low engagement in the form of social media metrics (e.g. post clicks, shares, etc.). Some of the case organisations only provide handcrafted warning messages (e.g. Case Organisation A), others rely on automated warnings which are afterwards supplemented manually with an additional information (e.g. Case Organisation C).

Warnings and emergency management relevant information is provided in both modes of operation. In the non-operational mode, there is a focus on community education as well as PR around an organisation. These patterns confirm what can be found in the literature (Bruns et al. 2012; Ehnis and Bunker 2013; Potter 2016; Subba and Bui 2017).

What is not yet discussed in the existing literature are the selections of the audience groups. The informants in the case organisations indicated that they are selecting the social media channel depending on audience groups they want to reach. For example, Twitter is predominantly used when information is intended for media organisations, while Facebook is used when information is intended for the general public.

7.4.5 Social Media Utilisation for Engagement
Social media is not just used to distribute or broadcast information towards the listening audience, but also to engage and interact with the social media audience. This engagement takes place in all phases of the PPRR model and in both modes of operation. The case organisations use their social media channels for information and warning dissemination, community education, to encourage a specific behaviour and to fight rumours, this is consistent
with what can be found in the literature (Ehnis and Bunker 2012; Ehnis and Bunker 2013; Subba and Bui 2017).

Broadcasting of information works in most instances as a “megaphone” (Ehnis and Bunker 2012; Potter 2016) where information is pushed towards the audience. Social media in these instances work as a one-to-many communication channel. Social media engagement, on the other hand, adds the ability of a many-to-many communication. The audience can then directly interact with the EMOs. Of course, this requires additional resources and communication techniques.

**Figure 7.10** Areas of Social Media Engagement

Social media engagement can be a part of Information and Warning Dissemination (Broadcasting), where the organisations answer questions or add engaging content for the relevant audience.

For community education, it is important to engage the relevant audience, and this is done through interactive approaches and different media (e.g. images or videos) relevant for the particular audience. The organisations attempt to make the audience an amplifier for their information, in that either the information is shared online through social media, or in the physical offline communities.

The encouragement of behaviour refers to the attempt to make the audience behave in a specific way. For example, prepare their property for a potential disaster, or not to drive through floodwater. There, the organisations also try to build their online communities. They answer questions and provide interactive and relevant material.
False information tends to be corrected by social media communities over time (Webb et al. 2016). However, EMOs play a critical role in providing trustworthy and credible information as a source. To fight rumours, EMOs provide information and interact with their audience. The interview informants pointed out it is important to build an audience who helps answer questions or fight rumours.

7.4.6 Social Media as an Intelligence Channel

As shown in Chapter 6.8, social media platforms are not only used as a channel to provide information for the listening audience, but also as a channel to gather valuable information during emergency events. Social media data is not necessarily reliable data. However, it is quickly available when an emergency event unfolds and provides a view into what people are experiencing on the ground. Before social media data can be utilised within an EMO, it needs to be processed and verified which is a task that requires knowledge about social media and as well domain knowledge about emergency management. As social media data is produced in high quantity, these steps might need to be supported by technology.

As identified through the analysis of the interview data, Social media utilisation for intelligence purposes can be separated into two different types: collecting of information which can be used to improve the communication with the public or media, and gathering of information which is relevant for the operations of the organisation and increases the situational awareness of the organisation. The first type of information refers to Communicational Social Media Intelligence and the second type of information to Operational Social Media Intelligence.

![Figure 7.11 Social Media as an Intelligence Channel](image)

These two forms of social media intelligence have different purposes within the organisation; depending on the organisation, they are performed in different departments, when performed
at all. Because of these reasons, firstly, Communicational Social Media Intelligence will be discussed, and then Operational Social Media Intelligence will be looked at.

7.4.6.1 Communicational Social Media Intelligence

Communicational intelligence in social media is used to collect information from social media channels which can be used to improve the communication with the public. All of the analysed case organisations check in some extent how the messages they are broadcasting are perceived by the public. This means all observed case organisations are using their social media channels for some limited form of Communicational Social Media Intelligence. However, this form is reduced on the organisation’s own social media channels and is more of a form of social media engagement. Organisations can use Communicational Social Media Intelligence as well broader. For example, Case Organisation A, where the social media communication around an event is analysed to improve the communication towards the own social media listening community. This form of social media intelligence is more proactive and more resource intensive.

Artman et al. (2011) refers to the two different forms of Communicational Social Media Intelligence as ‘Strategic Awareness’ and ‘Dialogical Intelligence’. Strategic awareness refers to being aware of the receiver's understanding of the emergency information available as well as the receiver’s understanding of the emergency event itself. The first part, trying to be aware of the message receivers’, or referred to as the listening audience’s, understanding of the provided messages was covered by all the EMOs. However, in most organisation it is basic and ad-hoc. Some of the case organisations use social media CRM (customer relationship management) software to support this task. However, not all of the organisations have the budget for commercial software which then results into labour intensive manual tasks to build the understanding. To gather information about the receivers’ understanding of the emergency event itself is more difficult to collect information about, and might need to go further than the social media channels which are provided by the organisation, e.g. an organisation’s Facebook or Twitter Account. Being aware of the public’s understanding of an emergency event is important for EMOs, as one central aspect of the social media activity is to provide the public with information which they then can use to make informed decisions about their behaviour in an emergency event to stay safe.
Dialogical emergency management and the for this necessary ‘Dialogical Social Media Intelligence’ is more resource and time-consuming for an organisation. The EMO is monitoring the social media streams and actively creates their messaging around what is perceived on the social media channels. This can be valuable for countering rumours and false information. It refers to the active monitoring of messages in the Social Media communication network to actively adjust the communication strategy dependent on these messages shared by the public. This type of Communicational Social Media Intelligence can be valuable to diffuse information on the ground and help that the public stays safe. However, not all, especially not smaller EMOs, have the necessary resources, knowledge and budget to use social media for Dialogical Social Media Intelligence.

7.4.6.2 Operational Social Media Intelligence

Operational Social Media Intelligence is used to build a better situational awareness about an event for an EMO. The collected data is used within an EMO for decision-making to improve the actual response of the organisation on the ground. Therefore, it has an influence on the actions of EMO. At the time this research was performed, EMOs in Australia do not have the widespread capabilities to use social media for this purpose and just started to explore the possibilities to utilise social media for this particular purpose (e.g. Power and Kibell 2017).

As this form of social media intelligence is resource intensive, only Case Organisation A, C, and D have the capabilities to use their social media channels as a source for Operational Social Media Intelligence. On the other hand, all of the analysed case organisations are utilising their social media channels for some form of Communicational Social Media Intelligence.

Information from social media cannot be used directly in the operational information systems of an organisation as it might be of poor quality or information which is not related to a particular emergency event (Power and Kibell 2017). The information needs to be processed and validated before it can be used for decision-making (Power and Kibell 2017). This highlights the issue of an additional need of human resources who can perform these tasks which take them away from other needed tasks during an emergency event.

A common critique which is expressed from emergency managers is that the information might not be credible or trustworthy. However, similar to the distribution of information to the public, emergency response organisations are not just relying on one data source, but rather multiple
lines of evidence which can be used to triangulate the information. Social media information is seen as any other information which an organisation is gathering in the sense that the organisation is not blindly relying on it but takes caution. This is necessary for emergency management; EMOs are hierarchical and typically centralised in structure. Emergency event coordination is organised from some kind of control centre. This control centre is often away from the actual scene where the response personnel is responding to the effects of an event. For an effective response, information gathering is unavoidable.

Social media information might not always be the most reliable information, but it is often quickly available since it is shared almost instantly after an event occurs. It does not always matter that the social media information might not be completely reliable. The social media officers expressed that it helps them to build situational awareness especially in the early phases of an event.

The most preferred information is image- or video material. The image material needs to go through a verification process first, which includes reverse image search and rudimentary checks whether it was tampered with. After this material is put through a verification process, it can be passed on to the relevant specialists. Image and video material can help emergency management experts to make an assessment about an event. The bushfire organisations expressed that with the analysis of the smoke plume prediction about the progression of a fire can be made.

There is a difference between passive and active social media intelligence. Passive social media intelligence refers to that social media is used as a source of information but that the organisations do not actively request information from the public. Active social media intelligence means that the organisation requests specific information, for example through social media. The case organisations who utilise social media as an information source prefer passive information gathering and only request information in special circumstances. The reasoning behind this practice is that they do not want to provide the impression that the organisation is not in control over the event. The organisation carefully considers an expectation management with the general public.
When social media is utilised for intelligence gathering, additional software and IT infrastructure is required. The software helps with analysing the social media streams; however, there is human judgement involved which is stressing the available resources.

The interview informants indicated that social media intelligence is not used in more organisations due to that it depends on the available technology, especially software, which may not yet be there to make it meaningful and that the organisations do not have the necessary budget in the area to advance their resources, both technical and human.

Further, the informants discussed that more, for EMOs, innovative approaches could support the capabilities of these organisations when it comes to social media intelligence. Approaches would include crowd-sourcing (Geiger et al. 2011; Shahid and Elbanna 2015) and virtual operational support teams (VOST) (Denis et al. 2012). With these approaches, the vast amounts of data could be analysed in more detail, and a surge capacity of human resources could be made available during larger extreme events.

7.4.7 Dispatching based Social Media Information

Chapter 6.9 explored the phenomena of individuals utilising social media channels to report incidents or request emergency assistance from emergency response organisations. This social media incident reporting phenomenon was separated into two different types: Individuals who are reporting through social media instead to go through the traditional channel, which would be in Australia the emergency reporting hotline Triple Zero (000); and social media incident reporting when the traditional reporting infrastructure would be impaired through either overload or a failure of the infrastructure itself.

Ahmed’s model (2011) does not include dispatching based on social media information. During the time the model was developed, social media was most dominantly seen as an additional broadcasting channel with the potential to be used as well as a possible channel for intelligence to gather information to improve the situational awareness for EMOs. By now the social media utilisation within EMOs further matured and we need to also take social media incident reporting into account. As it was shown in Chapter 6.9, the case organisations are not able to reliably respond to emergency help requests which come in through the social media channels.
Social media dispatching is not something unrecognised in the literature. Social media dispatching could be observed during Hurricane Sandy in the US where the reporting hotline was overburdened with the vast amount of calls. Subsequently, individuals who needed assistance from EMOs resorted to the social media channels of the New York Fire Department. The New York Fire Department decided to dispatch their emergency response units based on that information (Chatfield et al. 2014).

Organisations in Australia had also experience with social media incident reporting during extreme events. Organisation B experienced reporting of incidents through social media during a major flood event in which a hotline for not life-threatening emergency reports was overburdened with calls from individuals from the general public who wanted to request flood and storm-related assistance. The members of the general public were disappointed with waiting for a free phone operator and resorted to the social media channels of the organisation. Due to the organisational structure of where social media utilisation is embedded in the organisation, it was not possible to dispatch based purely on the received social media information.

None of the case organisations has the resources, procedures, and processes in place which would be necessary to add incident reporting through social media as an official service into the structure of the organisation so that members of the general public could use the social media channels as emergency reporting channels. Only organisation C has formalised processes in place which describe how a social media officer should react when they are aware of a request for emergency assistance or an incident report on the social media channels. Organisation E has a semi-formalised process within the social media team. The remaining organisations have no formalised process, but the informants in all organisations described the same approach on how they reacted in the past to such an occurrence or how they would react.

Social media incident reports are a rare occurrence and are not the norm. Still, they could have potentially devastating consequences for affected members of the general public when they should decide or would need to report an incident through social media.

The official stance of the organisation is that the organisation will not react based on emergency reports which are sent to the organisations through the social media channels. However, the
individual social media officers see it as a moral responsibility to respond to an emergency report when they are aware of it.

In the non-operational mode, the social media channels are only sporadically monitored, and even more so outside of normal office hours (9am-5pm) or during the night. During the operational mode, there is, in all of the case organisations, a closer monitoring of the social media channels. Still, it can take some time from posting the incident or emergency request on social media until a social media operator becomes aware of the report. Since incident reports and emergency request are often time critical, this can result in a dangerous situation for the individuals who are requesting emergency assistance.

Furthermore, incidents reports might require an inter-organisational response. Incident reporting through Triple Zero (000) ensures that when necessary, an inter-organisational response is initiated. The social media officers call the emergency hotline on behalf of the person who reported the incident.

The processes around Triple Zero are set up so that they require information through phone calls. It is not the case that they would not trust textual information or that there would not be an option to verify the information to questions back to the sender; It is more the case that currently the structures and processes do not allow to accompany textual information, such as text messages, e-mail, or social media messages. Additional research is required that help requests through social media can be integrated into the current structure and processes. This would allow for a backup channel in large scale incidents when the traditional help requests channels are overburdened.

7.4.8 Social Media Officers

The adoption of social media services in the case organisations influenced the creation of new roles which were not existent before social media was relevant for emergency management. These new roles assisted with integration and alignment of social media services into the practices and structures; On the other hand, these roles aligned as well the organisation to the structure and practices of social media communities.

Some of the case organisations transformed the role requirements of the existing roles, such as organisation A, where the person who was responsible for the website received additional
responsibilities through the adoption of social media channels. Other organisations, such as organisation B, established entirely new positions with specific social media requirements. The first generation of social media officers, the members of the organisation who were filling or establishing these roles were seeing themselves to be a part of actively shaping these roles, the social media utilisation, and the view of it in the organisation. As illustrated in the following quote: “Two years ago I was hired as the Web and Social Media Coordinator; ... It was sort of a new role and I got to make it into mine a little bit” (Social Media Officer - Organisation B).

In the existing literature we have the changed role of the PIO (public information officer) which is a uniformed member of the organisation (Latonero and Shklovski 2013). The public information officer in the existing literature took on additional responsibilities with using social media to better communicate the key messages and other relevant information towards the general public and the media.

The literature speaks of social media evangelists (Latonero and Shklovski 2010; Latonero and Shklovski 2011; Latonero and Shklovski 2013) who champion the social media utilisation in their organisations. They are actively involved in how the organisation uses social media and the development of strategies. The social media officers who are coordinating the social media channels from the headquarters in the non-operational mode are such social media evangelists. Social media technology can be still seen as in an early phase of adoption and alignment in the case organisations. A formalisation of the roles is in progress, however when the members of the organisation who are currently operating the social media channels would leave the organisation, the social media utilisation would most likely drastically change. There is currently a very small pool of available social media officers in each case organisation.

![Figure 7.12 Types of Social Media Officers](image-url)
The analysis of the case organisations revealed three different types of social media officers as shown in Figure 7.12: Social Media Engagement Officers, Social Media Intelligence Officers, and Integrated Social Media Officers.

The social media engagement officer generally is supporting the role of the public information officer. The social media operators in case organisation C, D, and E have a strong background in journalism. These officers also have a strong emphasis on using social media as a channel to communicate with the press to take pressure of the media officers. The communication with the media often includes to share the often-asked key messages of an event, e.g. how many incidents, how many people affected, how many responders on the ground, etc. The social media engagement officers in organisation A and B use social media as well to communicate with the media, but they have a bigger emphasis on using social media to communicate and engage with the general public part of the listening audience.

To use social media to communicate with the public and to use social media as an intelligence tool to collect information to build situational awareness requires two completely different skill sets. The organisations which started to use social media as well as an intelligence tool established the role of a social media intelligence officer. This social media intelligence officer is part of the intelligence unit and utilises the social media channels to gather relevant information for the operations of the organisation.

The third type of social media officer combines the skill sets of the social media engagement officer and the social media intelligence officer. This integrated social media officer utilises social media to engage with the listening audiences and to gather relevant information from the social media channels.

All of the organisations have in common that the role responsibilities change when the organisation changes from their non-operational modus of operation into the operational modus of operation. The social media engagement officer and integrated social media officer need to switch into a pure emergency management type of communication. The social media intelligence officer is typically not observing the social media channels during the non-operational mode but is very active during the operational mode.
7.4.9 Localisation of Social Media - Centralised and Decentralised Utilisation

Social media is often seen as a medium that can help break up hierarchies in organisations (Riemer et al. 2015b) and that supports the possibility to decentralise. This seems for the emergency management case organisations only partially the case. Social media services are utilised on several levels in the organisation: On the headquarters level, on the district/region level, and as well on the brigade/unit level. On the headquarters level, all of the observed organisations have dedicated social media officers, which are responsible for social media utilisation in both the operational mode as well as during the non-operational mode. On the remaining levels, the social media channels are operated either by volunteers or as an additional responsibility for a staff member. During the non-operational mode, there can be social media activity on all of these organisational levels. It could have been expected that a similar pattern is visible during the operational mode, that the social media communication for active emergency management is decentralised. For example emergency relevant information is posted locally from the scene by members of the organisation who are close to the physical response to an event. Such behaviour could be observed during the Boston Marathon Bombings in 2013 (Ehnis and Bunker 2013) where a police officer was contributing to their Twitter channel directly from the scene of the event, however, all of the case organisations showed that emergency management relevant information is almost exclusively, distributed centralised from the headquarters of the organisations, during the operational mode.

The emergency management case organisations broadcast their social media messages in the operational mode through the headquarters or the centralised state control centre. In the non-operational mode, social media is utilised on all of the described organisational levels in the case organisations.
As illustrated through Figure 7.13, there are three organisational levels in which the social media communication occurs. On a brigade or unit level, on a district or region level, or on the headquarters level. The organisational members on the unit level are typically volunteers of an organisation (except for case organisation D which as well employs careers firefighters in selected brigades); on the region level the coordination is performed by volunteers and paid staff members; on the headquarters level, there are currently exclusively paid staff members.

In the case organisations with volunteers, only a fraction of units and brigades are active on social media. For the brigades and units which are operating a social media channel, the activity varies highly. This is influenced by the skill levels of the different volunteers. All of the case organisations started to develop approaches to support their volunteers on utilising social media channels, however, the approaches are differently matured. At the current stage, there is no formalised training for the volunteers in how to utilise social media, and therefore there is no standard in how well the volunteer units are using their social media channels. The organisations are still exploring on how they need to standardise the social media utilisation.

A further challenge on the unit level is that some of the brigades or units are building a very great local social media listener community with their social media activity, but when there is an emergency event they need all of the volunteers responding to the event, and the social media communication drops off since there is nobody left who could operate the channels. The listening community who would in cases of an emergency event need the information from their trusted channel cannot get the information when they would need it the most.

**Figure 7.14** Centralised Social Media utilisation across all case organisations
This pattern is linked to how such an organisation sees their volunteers and what a volunteer is in the norms and the structure of an EMO. The volunteer is a fit and highly trained specialist who can respond to the emergency types for which the organisation is responsible. The organisational practice, structure, and self-understanding does currently not have the ability to allow for volunteers who do not fit into exactly this pattern. The specialised volunteers are a scarce resource during an emergency event and are highly needed. The case organisations in specific, and EMOs in general, could broaden their view on what a volunteer is and allow for broader specialists who are not responsible for the core activities the volunteers are performing at the moment. Through such a practice there could be volunteer roles created which are responsible to purely operate the social media channels.

On a district and region level, social media channels are either operated by volunteers or as an additional part of another role. Similar to the brigade/unit level of the organisation, not all districts or regions are operating social media channels. If they are operating them, they are not necessarily as active as the headquarters level since it is a lower priority. It can be an issue that the social media channels are not adequately aligned and coordinated and that there is different information distributed through the headquarters level: “We have had cases where you know the messages that the brigade is pushing out may differ from what's getting pushed out at the state level or the district is saying something a little bit different” (Social Media Officer – Case Organisation A). This can be counteracted through training approaches and more integrated social media strategies.

The centralised utilisation of social media brings a tension between the social media utilisation in operational mode and non-operational mode when it comes to the distribution of information towards external parts of the organisation. Not all units of the organisation are necessarily in an operational mode during an emergency event. To illustrate this, the responding operational units are distributed over a large geographical area and some of the districts, regions brigades/units might be in full operational response to an extreme event, while in other areas there is not an extreme event present, however, since the social media services are operated centralised, and most of it is presented on the social media channels on the state level (headquarters), it brings a tension with relevant information for the listening communities. Since their volunteers are needed to respond to an event very localised information can with the current structure not be provided.
To summarise this section, social media is utilised on all organisational levels in the non-operational mode to interact with social media audiences. However, in the operational mode, the social media operations are mostly centralised within the headquarters of the organisations.
7.4.10 Formalisation of Social Media utilisation for External Communication – Capability Building Blocks of Social Media Alignment

Not all of the case organisations established the same capabilities in their social media channel utilisation. All case organisations utilise their social media channels as a broadcasting medium to disperse information to the public and the media. All of the case organisations use their social media channels to engage with the general public in a form of interaction. However, only Case Organisation A and C use social media services as an active intelligence tool to improve the situational awareness within their organisations during an emergency event. This helps extract further insights from the communication around an unfolding event. Organisation D is in the progress of exploring social media for intelligence purposes and has some social media intelligence capabilities. Organisation B and E are not using social media as an intelligence tool; these two organisations are only using social media to communicate and engage with the general public or members of media organisations.

The case organisations adopted social media services in a similar progression. In the early phase of social media adoption they were using their social media channels purely as a broadcasting tool to push information towards the general public. Afterwards, the organisations developed the capabilities to engage with the general public in a two-way communication approach. At the time of the study, three of the case organisations are now exploring the possibilities of utilising social media as an intelligence tool. The case informants also outlined the potential of using social media for structured additional reporting in further adoption. However, this would require additional resources to make it reliable.

In the previous sections, the different forms of social media interaction with the social media audiences were discussed. The EMOs are utilising their social media services for different functions to interact with their particular listening community, which are shown in Figure 7.15. The organisations provide information, distribute warnings, educate their listening community, influence the behaviour of different participants in their audience, and use social media as an intelligence tool to gather emergency relevant information. These five pillars of social media in disaster and emergency management can be condensed into three different capabilities of social media utilisation: (1) broadcasting of messages, in which social media is used as an one-way communication channel to push information to the public; (2) engagement with the listening community, through which there is an interaction with the listening community to foster a two-way communication practice; and (3) social media intelligence gathering, through
which information from the social media services is embedded into EMOs. Furthermore, it was revealed through the interview process that some individuals also use social media as a reporting channel (see Chapter 6.9 and 7.4.7). Currently, the response to these reports is ad-hoc, involuntary and therefore not part of the official offerings of the organisations. This is indicated in the figure through the dashed and greyed outline. However, the informants indicated that this could change in the future and it is a risk the organisations are exploring. An additional fourth capability is therefore (4) dispatching. These four capabilities can be seen as building blocks of social media utilisation in EMOs. In the following, I refer to these building blocks as: “Broadcasting”; “Engagement”; “Intelligence”; and “Dispatching”.

![Figure 7.15 Emergency Management Organisation Social Media Utilisation for Community Interaction](image)

When exploring the temporal dimension of how these social media capabilities were adopted and aligned into the case organisations a similar pattern emerges; all of the observed organisations were first using social media as an additional broadcasting medium to broadcast or push information towards the general public, or to media organisations. Social media services were used as a “megaphone” (Ehnis and Bunker 2012). Some of this ‘push utilisation’ of social media is automated as in the form of the automated warnings which can be seen in Case Organisation C, D, and E. Organisation A was also using automated warnings in the beginning of its social media activity but then abolished this practice as they deemed these types of messages not engaging for their listening community. All of the case organisations are now using their social media channels to engage and interact with their listening community. This means the organisations do not only want their listening social media community as a passive receiver of information, they want that their social media community is actively sharing and responding to the information. The engagement from the organisations can have different
forms, from answering questions, to asking questions, or fostering that their community is helping each other through social media.

The analysis of the interviews indicates that the formalisation on what an EMO is able to do through their social media channels is linked to the maturity of integration of the communication channels into the organisation. In the observed EMOs, which are mainly responsible for the management of natural disasters, three stages were prominent: “Broadcasting”, “Engagement”, and “Intelligence”. The additional stage “Dispatching” was mentioned by the case organisations but none of the organisations were actively or voluntarily using their social media channels for this purpose. Within the case organisations, it appeared that the adoption capabilities followed this particular order in stages. However, this most likely does not need to be the case; an organisation which would adopt social media now would use the knowledge from organisations already utilising social media for emergency management. In the following section, the capability building blocks are described in more detail.

7.4.10.1 Building Block: “Broadcasting”

![Figure 7.16 Social Media as a One-Way Communication Channel](image)

Broadcasting in this sense refers to a one-directional utilisation of social media where messages from the EMO are pushed towards their listening communities. Information and warnings are posted through the social media channels, but no or not much interaction takes place on the social media platforms with these pieces of information. Social media, and in particular microblogging, works as an additional communication channel with the public, amongst the more traditional mass broadcasting channels of Print Media, TV, and Radio. To communicate with this additional channel towards the public, the same approaches are used as with the traditional channels.

As shown in the following quote from the social media manager in Organisation D, the ability of social media as a mass broadcasting tool can serve as the initial attraction for EMOs to utilise social media services. “So initially the big attraction, the big benefit, was just the reach - the ability to reach so many people so quickly including the media. I mean a lot of it was - often in the State Control Centre when there’s a major emergency happening the phones are going
crazy, the media phones are going crazy with journalists trying to find out information, and obviously that's one-on-one conversations” (Social Media Officer - Organisation D).

Little to no interaction with members of the audience can be observed and the channels are mostly used for a passive one-way communication to the listening audience. A suitable metaphor, which would reflect this type of social media utilisation, would be that of a “megaphone”.

### 7.4.10.2 Building Block: „Engagement“

![Image](image.png)

**Figure 7.17 Social Media as a Two-Way Communication Channel**

The second building block refers to the “engagement” capabilities of the organisation. It is present when the organisation is actively using social media channels to interact and engage with their listening community. This frequent interaction can be, amongst others, in the form of answering specific individual questions or through active requests for information from the community. Individuals from the listening community, as well as the traditional media, seem to be actively managed by the emergency services agency organisation. The social media channels are not only used as a broadcasting channel but also as a two-way communication and interaction channel. This capability is present in all of the observed case organisations.

### 7.4.10.3 Building Block: “Intelligence”

![Image](image.png)

**Figure 7.18 Social Media as an Intelligence Channel**

Social media online communications can accurately discuss about ongoing events, but can also include rumours and false information. Furthermore, these discussions can turn into “witch-hunts”. Therefore, the gathered information can be about the event progression in the physical world, but can also include critical information from the virtual world that the organisation needs to have knowledge about or might need to react to.
The “intelligence” building block refers to cases that the social media channels are not necessarily only used as a communication channel but are also used as an intelligence tool to gather relevant disaster or crisis information from the community. This process requires technical resources (see Chapter 6.14) and can increase the need for further human resources (see Chapter 6.10).

Through an “intelligence” capability, social media platforms are actively used to feedback information into the operations of the organisation. The social media services are becoming more embedded into the operational structure of the organisation and the tactical use of these services changes.

Currently, Case Organisation A, C, and to some extent D, have the capabilities to use their social media channels as an intelligence tool. However, the organisations use these capabilities in different approaches. Organisation A integrates the social media engagement role with the intelligence role as an Integrated Social Media Officer. Organisation C and D have separate units for social media intelligence and social media engagement. Each of these units has specialised social media officers with different skill sets and requirements.

### 7.4.10.4 Building Block: “Dispatching”

![Figure 7.19 Social Media as a Dispatching Channel](image)

All the observed EMOs experienced that individuals requested help through social media channels or wanted to report an incident that occurred. EMOs are not prepared for this kind of incident reporting since their processes currently cannot allow it. However, some interview informants pointed out that it is a moral responsibility to react to an incident report when they are aware of it. Social media officers in each of the observed EMOs have informal ad-hoc processes about how to follow up on a report through social media. The response to such an occurrence at the moment is not standardised.

As established in Chapter 6.9 and 7.4.7, there are two patterns of reporting: Individuals who decide not to call the traditional channels, and a large number of individuals who are deciding to report incidents and help requests through social media because the traditional channels are not reachable. Since outside the operational mode social media is only operated from 9-5 in
most organisations or even less on the weekend, there is a high risk that an incident report through social media is currently not observed in time. Furthermore, in the operational mode, there are only a number of social media officers who could operate social media channels. This raises the issue that a continuous operating of social media channels can currently not be ensured.

This building block has a more future-looking and speculative component. The interview informants pointed out that this would be future adoption steps of social media utilisation. This building block would be the formalised inclusion of social media channels into the incident reporting structure. It would need to be ensured that social media channels are continuously monitored so that no reported incident is missed. On the other hand, it needs to be ensured that enough surge capacity is available that large amounts of reports can be processed in times that there is a large-scale response and the traditional channels are at capacity.

With this building block as indicated in Figure 7.19, information would flow from individuals from the public into an EMO. The information would actively influence the operation of an organisation since an organisation needs to react on it with its emergency management resources.

7.4.10.5 Progression of Capability Blocks and ongoing formalisation

The four capabilities can be separated from each other and to some extent integrated independently into an EMO. While the case organisations adopted them in a similar temporal progression, it does not necessarily mean that they need to be adopted in this way. The integration of these social media capabilities into the structure of an EMO does not necessarily mean that the progression is linked to the temporal process of adopting social media services into the structure of an organisation. Further, it does not indicate that some of these phases cannot be “leapfrogged” by learning from what other organisations in the field are able to achieve with social media. Furthermore, the case organisations were utilising social media early on and were selected on the basis that they have an active social media program, in other organisations the adoption might look rather different. The case organisations started using social media services as a broadcasting tool, but in the second phase of adoption, the organisations began to interact and engage actively with the general public through their social media channels.
The utilisation in the case organisations suggests that the capability stages build on each other. This would mean an organisation first needs to establish the capabilities of a previous building block before it can commence the subsequent building block. At the current point in time this is speculation and a descriptive observation based on the case organisations and not a general pattern of how EMOs necessarily adopt social media services.

![Figure 7.20 Capability Progression in Case Organisations](image)

There were two different patterns in the organisations which developed the capabilities for social media intelligence in the different Case States. Case Organisation A established progression similar to a staircase in which the current capabilities are in the same department of the organisation and performed by an Integrated Social Media Officer (see. Chapter 6.10). This progression of capability blocks is shown in Figure 7.21.

![Figure 7.21 Capability Progression in Case State I](image)

Organisation C in Case State II showed a different pattern again. This organisation has one department in which social media is utilised for the communication with the listening community, and one department in which social media is utilised as an intelligence channel. This progression is shown in Figure 7.22.

These are the different capability blocks and progression of adoption of this block which could be observed in the case organisations. Whether similar patterns can be observed in other EMOs needs to be investigated through further research.
The formalisation in all case organisations is an ongoing progress. The early adoption of social media was rather ad-hoc. The knowledge about social media and the progresses which were used to utilise the channels was in the heads of the social media officers. This pattern is consistent with the literature and the experience in other EMOs (e.g. Latonero and Shklovski 2013).

The organisations developed guidelines, strategy, and policy documents to formalise this social media utilisation over time. The early guideline documents indicated what members of the organisations are allowed to do with social media and what not. Now the focus is much more on how to use the technology strategically to achieve the aims of the organisation.

All of the organisations are now using or developing formalised training approaches with which they can train social media officers and volunteer in using the social media channels appropriately for emergency management.

The organisations in Case State II established formalised processes in how they respond on social media. This is a necessity as a team consisting of members from multiple organisations operate the social media channels when the state control centre and with it organisation C is activated. The practices within the case organisations in Case State I are still more ad-hoc and based on the experience of the social media operators.

However, a lot of organisational knowledge is hidden in the experience of the social media officers and coordinators in all case organisations. If these key social media participants would leave their organisations a lot of the knowledge would disappear with them.
7.5 Intra-Organisational Social Media utilisation – Intra-Agency Social Media Interaction Dimension

The interviews revealed that the public facing social media channels are not just used to interact with external entities, but as well with members within an organisation. There was not much evidence that organisations are using social media to communicate across departments within the organisation in the form of Enterprise Social Networking (Riemer et al. 2015a). However, it is used as a channel to communicate with the more isolated members of the organisation, which are the volunteers.

Volunteer members are physically separated from the centre of the organisation. Not only are they spatially separated, but also emotionally seen as something different than a paid staff member of the organisation. Volunteers have different careers outside of emergency management, yet are still trained specialists for the tasks they are required to do. The volunteers undergo ongoing training. They are an integral component for community preparedness and awareness raising for potential emergency events.

The barriers between volunteers and central organisation can negatively influence emergency management. For these organisations, it is difficult to find members of the public who want to volunteer for these organisations (McLennan and Birch 2005). Social media is one channel which is used or can be used to break these barriers and separations down. The case organisations use social media channels to interact and engage with their volunteer members and the volunteer members are utilising social media to communicate amongst themselves (see Chapter 6.12).

The volunteers represent the majority of members in the volunteer organisations (see Chapter 5). The information flow from the central organisation towards the volunteers can be slow and only one-directional. Social media channels are used to support this dissemination of information with the ability to receive direct feedback from the volunteer members. Several of the heads of the organisations are participating in questions and answer sessions (or “ask me anything sessions”) in which they explain decisions about the direction of the organisation or discuss with the volunteers current events. This is used to break down silos and barriers, in addition, to distribute the relevant information to the volunteers.
There are different “philosophies” on how to approach such an approach within the organisations. Some of the organisations have private social media groups for this activity which cannot be seen by the public. There the idea is to keep a space where the organisational members can speak freely without having to worry how the public could perceive this particular communication. Other organisations have these channels open to the public as well. The thinking behind this is on transparency and the channels are just not seen as relevant to the public.

Different volunteer groups, which are as well spatial separated, are utilising social media for communication and knowledge transfer. This training and knowledge transfer goes from volunteer groups across to other volunteer groups and as well from central organisation to the volunteer groups.

This thesis focuses on the social media utilisation for emergency and disaster management. The volunteer interaction of organisations is part of it. The organisations are not utilising social media to interact with their volunteers during the operational mode, which would be the active emergency management, however, social media is used in the non-operational mode for various aspects of interaction with the volunteers; this social media interaction is an additional component for organisations to break down hierarchies and separations within their organisations. Particularly in times of reducing numbers of volunteers, such intra-organisational social media communication appears to be currently outside of the focus in social media research when it comes to emergency and disaster management. How in particular social media is used as a channel to bring volunteers together is an area of research which needs to be extended.
7.6 Inter-Organisational Social Media utilisation – Agency-to-Agency Social Media Interaction Dimension

Ahmed (2011) suggests that EMOs can use social media services for inter-agency communication. The assumption is that there are EMOs using these channels as coordination and collaboration tools. As shown in Chapter 6.13, there was no support in the data that the case organisations are utilising their social media channels to interact with other EMOs for emergency management. This is in contrast to the model of Social Media in Disaster Management (Ahmed 2011), which suggested such organisations are using social media channels for coordination and collaboration purposes during disasters.

The lack of social media utilisation during the operational mode can be explained through the already established channels, formal and informal, with other EMOs who are involved in a response to a particular extreme event. The channels are well established, and there is, therefore, no additional need to extend this collaboration with additional communication channels.

The literature does not show much support that microblogging is used for coordination and collaboration purposes either, however, some studies show evidence that there is some limited social media utilisation during extreme events when there are no prior existing communication channels. For example during the Haiti crisis in 2010, Microsoft SharePoint and internal wikis were used to support collaboration and knowledge management (Yates and Paquette 2011) and were used by EMOs and NGOs. Furthermore, maps created through crowd-mapping were used by response organisation during the Hurricane Haiyan in the Philippines in 2013 as a shared artefact (Shahid and Elbanna 2015). In both cases, the response was supported by international organisations which do not have a standing response establishment within the affected country. This indicates that on an international level at least some EMOs are utilising social media channels for collaboration and coordination purposes when there are no established communication channels. It might be possible that organisations which have no established channels are open to using social media channels to collaborate with other organisations in an ad-hoc response; this needs to be investigated with further research to establish whether such patterns exist.
The analysis of the data revealed that there is some inter-organisational social media interaction during the non-operational mode. These interactions have the form of Facebook groups which are used to share knowledge about particular topics. In the case of the social media operators, the main purpose of the Facebook groups is to share knowledge about the operation of social media channels for the purpose of emergency management. In the non-operational mode, there is some social media interaction between the social media officers of different organisations. There are a few Facebook groups where social media officers from different organisations share their knowledge and show what works well and, on the other hand, which tactics and practices were not successful. Therefore, it can be deduced that social media can be utilised as a knowledge management tool during the non-operational mode of an organisation.
7.7 Framework of Social Media Utilisation in Emergency and Disaster Management

This chapter has discussed aspects of social media utilisation and integration within EMOs and has been organised into a framework of Social Media Utilisation of Emergency Management Organisations for Emergency and Disaster Management. This framework, which is shown in Figure 7.23, represents the perspective of an EMO which is utilising social media services for emergency and disaster management (The EMO is depicted in Figure 7.23 in the bottom right corner). The framework has five major components: The “Mode of Operation”, the “Social Media Capabilities” of an EMO, the utilised “Social Media Channels”, the “Organisational Level”, and the different “Communication Participants”.

The framework is intended to provide a lens to better understand and analyse the social media utilisation within an EMO for the purpose of emergency and disaster management. In the following subsections, each of the five components of the proposed framework are expanded in detail. All of the framework components interact and influence each other, and this is reflected in Section 7.7.6, where the integration and interaction of the different framework components are discussed based on an example.
7.7.1 Framework Component - Mode of Operation

EMOs operate in two different modes, the operational mode and the non-operational mode (see Chapter 2.3, and 7.3). The mode of operation, as indicated throughout the thesis, influences different aspects of social media utilisation within EMOs. Therefore, it is not a surprise that the operational mode has a major influence on how an EMO is using its social media channels.

Most processes within Australian EMOs are designed around the principles of the PPRR model (Bunker 2010), either deliberately or implied. The activities aligned with the components Prevent, Prepare, and Recover are predominantly performed during the non-operational mode; while other activities that align with Respond and aspects of Recover are performed within the bounds of the operational mode. As illustrated in Figure 7.24, this influences the social media utilisation within the EMOs.

The phase changes between Response into Recovery is fluid in emergency events and is often not a clear cut. The holonic structure of EMOs plays a central role. While some of the holonic sub-systems of an organisation are already focusing on recovery others can still be focussed on the response phase of an event. Disaster prevention, supporting preparedness, and recovery takes place under normal conditions in the non-operational mode of an EMO.

The operational mode in combination with the other components of the framework can help understand and explain social media utilisation in an EMO. EMOs have different social media capabilities during the operational mode and non-operational mode; organisations have their focus on different social media channels at a specific point in time depending in which mode of operation they are in; they also interact in different ways with different communication partners and audiences depending on the mode of operation. The operational mode is an
important factor to take into consideration when analysing the social media utilisation in EMOs or designing new processes and procedures for these types of organisations.

7.7.2 Framework Component - Communication Participants
The relevant communication participants in the social media utilisation in emergency and disaster management are: The Public (see Figure 7.23 top left); the Media (see Figure 7.23 bottom left); (3); the communicating EMO (see Figure 7.23 bottom right); and (4) other involved EMOs (see Figure 7.23 top right).

The interplay of these communication participants brings the potential of seven different social media interaction dimensions. Three of these interaction dimensions are already known from Ahmed’s (2011) framework: the interaction between the community (C-C); the interaction between the community and EMOs (A-C); and the interaction between EMOs (A-A), which would refer to inter-organisational social media utilisation. The holonic nature of EMOs, with internal communication to the volunteers, adds the communication dimension of intra-organisational social media interaction (Intra-A). The three remaining interaction dimension are the interaction between the community and the media (C-M), the interaction between media organisations (M-M), and the interaction between EMOs and the media (A-M).

The interaction dimension community-community (C-C), media-community (M-C), or media-media (M-M), are outside of the scope of this thesis. However, these interaction dimensions can be deducted through an analysis of the literature, e.g. Fraustino et al. (2012), Mirbabaie et al. (2014), or Stieglitz et al. (2017) and are indicated through the data analysis (see. Chapter 6.5). The influence of these communication dimensions on emergency management or the social media utilisation of EMOs needs to be explored through further research.

The main communication dimensions that are relevant for EMOs are the interactions with the public and the media, and respectively the communication dimensions agency-community (A-C) and agency-media (A-M). When discussing EMO social media utilisation, these two interaction dimensions are the main focusses. The majority of social media utilisation of EMOs happens currently with the intention to communicate with these two particular communities.

The intra-agency (Intra-A) communication dimension focuses on the internal social media utilisation within an EMO. In the bounds of this thesis, this is especially relevant for volunteers
within the organisations. The holonic nature of large-scale volunteer organisations physically and mentally separates volunteers from the centralised core of these organisations. This might be shown through an organisational culture divide between paid staff members and volunteer members in the organisations. Social media can be used and is used to remove and mitigate this divide.

Agency-agency interaction (A-A) refers to how social media is used for this type of communication. A closer look at the case organisations revealed that most communication interaction between different EMOs is done through established communication channels and not through social media at all. Social media is not used in the operational mode for inter-organisational collaboration. In the non-operational mode, social media is used for some degree of knowledge transfer between organisations. Further research needs to be conducted in order to better understand whether social media could improve the interaction between different EMOs. This could also include a joint utilisation of resources.

The framework component “communication participants” with the resulting interaction dimensions helps to highlights what kind of other entities an EMO is communicating with, and how this communication is facilitated.

7.7.3 Framework Component – Organisational Level
This framework component focuses on which organisational level social media is being utilised at within an EMO. The holonic nature of EMOs allows social media utilisation at different organisational levels. In the case of the analysed organisations, this is at a brigade/unit, district/region, or on the headquarters level of the organisations, as illustrated in Figure 7.25.

![Figure 7.25 Levels of Social Media utilisation](image)

The case organisations are using social media services in a very centralised way when it comes to the active emergency management, and the operational mode (see Chapter 6.3 and 7.4.9).
There are two reasons which might explain this pattern. First, the necessary resources and training are still missing to fully utilise social media in a decentralised manner on the regions, districts, or brigades/units level. For example, social media services are operated by volunteers on the Brigade or Unit level, and these volunteers are needed on the ground to counter the effects of an emergency event during the operational mode and therefore do not have the time or opportunity to operate the social media channels. The other major reason why social media channels are not utilised more actively during the operational mode on a local level are the audience groups. The organisations assume that audience groups which are not local would acquire their information from the centralised headquarters social media channel. The organisations do not want to exclude audience groups based on the social media channel they are following.

During the non-operational mode, social media channels are operated at all organisational levels. However, the standards and practices are quite different in the various brigades/units, districts or regions. Many of the social media officers on these levels are volunteers and have other responsibilities as well as different levels of training.

In combination with the remaining components of the framework this component allows us to understand better where social media is utilised in an EMO and where utilisation is absent.

7.7.4 Framework Component – Social Media Channels

Social media is an umbrella term that can refer to entirely different technologies. It is relevant to understand exactly what kind of social media channels an organisation is using so that it can be used effectively. Since social media channels can be short-lived and are changing depending on users who are frequenting these channels, the framework does not focus on particular instances of social media channels, but rather on types. The social media channels can be separated into the following four types: Main Social Media Channels, Supporting Social Media Channels, Placeholder Social Media Channels, and Legacy Social Media Channels (see Chapter 6.4 and 7.4.1).
Main social media channel are the channels which an organisation considers central to their social media practices. Currently, main communication channels are often the social networking site Facebook and the microblogging platform Twitter. Supporting social media channels which are in support of the social media strategy. These channels are rarely or not used at all for the main social media activities, distribution of warnings or emergency relevant information, but rather for supporting activities such as community education (e.g. YouTube videos) or creating positive engagement with the organisation (e.g. photos on Instagram). Placeholder social media channels are channels which are at a point in time not yet used to full effect but have a potential to be relevant for the organisation in the future. The organisation may not be using the channel yet but has registered a presence on the channel. Legacy social media channels were relevant for the organisation in the past, but through changing platforms or user groups, the channels are not relevant for an organisation anymore. An organisation still has a registered account for a legacy channel but is not actively using it further.

Social media services can change in priority in an EMO; A communication channel which is nowadays considered a main communication channel within an organisation, can at a later point in time be considered as a supporting channel or even a legacy channel. This framework component helps to understand what the relevant social media channels for an organisation are and how they are currently utilised in the organisation. It also helps to understand the dynamic nature of social media channels.

### 7.7.5 Framework Component – Social Media Capabilities

This framework component focuses on the different social media capabilities an organisation has developed. These different capabilities show how an EMO could utilise or is utilising their social media channels. The case analysis showed four different social media capability “building blocks”: “Broadcasting”, “Engagement”, “Intelligence”, and “Dispatching” (see Chapter 7.4.10). These are the capabilities used in this framework as shown in Figure 7.27.
The broadcasting capability means that the organisation is able to utilise a social media channel to distribute information. It is a one-to-many communication in which a particular channel is used to send information to the audience on this channel.

![Image of Social Media Capabilities: Broadcasting, Engagement, Intelligence, Dispatching]

**Figure 7.27** Social Media Capabilities

Engagement refers to a social media channel that is not only used to distribute information to the audience but also to interact and engage with this community. When a social media channel is used as an engagement channel, it has the form of a one-to-many and many-to-one communication channel. Questions from the audience are answered, and community building approaches are put into place.

The intelligence capability means that a social media channel is used to gather information from the social media community. There are two forms of information which can be collected through social media, which are Communcational Social Media Intelligence (see Chapter 7.4.6.1) and Operational Social Media Intelligence (see Chapter 7.4.6.1). The Communicational Social Media intelligence is utilised to improve the communication with the public but does not have a direct influence on the operational side of emergency management. Operational Social Media Intelligence is used to improve the situational awareness within the organisation and the response towards an emergency event.

The dispatching capability refers to the case that social media can be utilised as a channel where the audience can request emergency assistance and report incidents. None of the case organisations was officially able to utilise their social media channels for this purpose because they did not yet establish the relevant processes and infrastructure.

Within the case organisations, there is some evidence which makes it appear that their capabilities might follow the same temporal integration within an organisation. Nevertheless, it is likely that capabilities can be leapfrogged and be adopted in a different temporal sequence.

The capabilities are not binary; they can be implemented gradually. Further to that, it might depend on the social media channel an organisation is using. An organisation could, in one
channel, have different social media capabilities than in another channel. For example, the organisation would be able to utilise “social media channel A” as a source of information, which would indicate that it has the capability of Social Media Intelligence in this channel, however, they could use “social media channel B” as a pure broadcasting medium, which would indicate a “Broadcasting” capability.

7.7.6 Framework Components: Interaction and Influence  
The framework components do not work in isolation; Each of the framework components is like a puzzle piece, as shown in Figure 7.28, which is interlinked with another. Each component influences and interacts with the other components. While we understand how each of the components fit into the framework (See Figure 7.23) they interact and influence each other depended on the organisation context as well as the incident context. This interaction and influence is illustrated in the following through an example.

![Framework Components are Interlinked](image)

**Figure 7.28 Framework Components are Interlinked**

Imagine a fictional EMO which is responsible for responding to bushfire related emergency events is utilising social media services for the purpose of emergency management. The operational area of the organisation is the federal state it is operating in. Furthermore, the organisation consists of volunteers and paid staff members.

Each component of the framework is now applied to this scenario to illustrate how it helps as a frame to understand the social media utilisation within this fictional organisation. This is done by looking at (1) the organisational level, (2) the social media channels, (3) the communication participants (4) the mode of operation, and finally (5) the social media capabilities (See Figure 7.29).
Figure 7.29 Social Media Overview of Fictional Fire Organisation

(1) Organisational Level:
This fictional organisation is utilising social media services on two organisational levels: centralised on the headquarters level and, in addition, in several fire brigades across the operational area of the organisation. Only small number of the brigades are utilising social media channels. The different regions and districts of the organisation are not utilising social media at all. This indicates that there is centralised communication and some localised communication by some parts of the organisation.

(2) Social Media Channels:
The social media channels provide a general overview about the social media communication portfolio of an organisation. On the headquarters level, the organisation is using the social media channels Facebook, Twitter, and Instagram to support their emergency management activities. Furthermore, it previously utilised Flickr before it started to use Instagram. The main communication channels are Facebook and Twitter. Currently the organisation is utilising Instagram as a supporting social media channel. There are no placeholder channels. However, Flickr is a legacy social media channel which is not used any more.

Some of the brigades are utilising Facebook as their main communication channel and Instagram as a support channel.
(3) Communication Participants
From the headquarters level, the organisation uses their social media channels to communicate with the general public and the media. The brigades which are utilising social media channels are targeting their local communities as a communication participant.

Therefore, from a headquarters level, the main communication dimensions with the relevant listening audiences are the communication dimensions agency-community (A-C) and agency-media (A-M). In these two dimensions the mode of operation, the social media capabilities, and the social media channels are closely interlinked and can explain how an EMO uses or could use their social media communication channels. Facebook is used in the organisation to interact with the public. Twitter is also used to interact with the public, but also to communicate with the media. Messages which are intended to reach media organisations are shared through the communication channel Twitter. Instagram is only targeted to communicate with the public (A-C interaction).

The brigade level is only communicating with the public which results in the relevant communication dimension agency-community (A-C).

(4) Mode of Operation
The operational mode impacts the aims and goals of an EMO’s social media utilisation. In the operational mode it is relevant to provide information warnings to the general public and to support the active response. In the non-operational mode, the organisation has other aims which are preparing an organisation towards the response to emergency events. The main communication channels are on the headquarters level and used in both modes of operation. In the operational mode, social media is used to distribute information and warnings to the public and in the non-operational mode to inform and educate the community. The supporting channel Instagram is only utilised in the non-operational mode.

On the brigade level the social media channels are used in the non-operational mode, but not in the operational mode. The reasons behind this is that the volunteers are needed to respond to the effects of the emergency event when they are in the operational mode and there is no time or additional resources to also operate the social media channels.
(5) Social Media Capabilities

The social media capabilities describe whether the organisation can use their social media channels as a one-way communication channel to just broadcast information to the listening audience, or as a two-way communication channel to engage with the general public. Or even further, to use social media as an intelligence channel or as a basis for dispatching resources based on social media information. The fictional organisation has different capabilities with their social media channels. On both relevant organisational levels (headquarters and brigade) the organisation is able use their main social media channels for broadcasting and engagement capabilities. The supporting communication channel Instagram is currently only used for engagement capabilities. The organisation has no intelligence capabilities with their social media channels or dispatching capabilities. Generally, the social media utilisation of the fictional organisation is rather basic.

This short example has provided an overview of how a fictional organisation has integrated social media services into their organisation. It highlights which areas need to be more closely investigated to improve the social media utilisation within the organisation. Furthermore, the short example has showed that the framework is interconnected and that the different framework components influence each other. Each of the different components could have been taken as a starting point to analyse the fictional organisation.
7.8 **Summary**

In this chapter, social media utilisation in EMOs for emergency and disaster management is discussed based on the empirical findings from the data analysis shown in Chapter 6 and the literature. The discussion explores different aspects of social utilisation for the purpose of emergency and disaster management (see Chapter 7.3-7.6), which has resulted in the development of a framework of *Social Media Utilisation in Emergency Management Organisations for Emergency and Disaster Management* (see Chapter 7.7). This framework is the main contribution of this study and thesis.

Ahmed’s (2011) framework (See Chapter 7.2) on Social Media in Disaster Management was a valuable input for this research. However, the model developed as part of this thesis reflects the recent evolution in social media tools and their utilisation. In applying this framework, we can additionally explain aspects of social media utilisation in disaster management which were not possible with Ahmed’s model.

My developed framework consists of five components:

- Mode of Operation (see Chapter 7.7.1)
- Communication Participants (see Chapter 7.7.2)
- Organisational Level (see Chapter 7.7.3)
- Social Media Channels (see Chapter 7.7.4)
- Social Media Capabilities (see Chapter 7.7.5)

These components can be combined to understand, analyse, explain or develop specific aspects of social media utilisation in a particular EMO and situation.

Throughout the chapter, answers are provided to the research questions underlying this study. Research Question 1 “How are Social Media Services integrated into the structures of Emergency Management Organisations?” and 2 “How are Social Media Services utilised within Emergency Management Organisations for the purpose of emergency and disaster management?” are answered in the following way.
EMOs can be seen as holonic systems with a clear hierarchy. Holons can operate independently of each other, to some degree independently. Social media is integrated at different organisational levels, (in the instance of the case organisations on the headquarters level, the district/region level, and the brigade/unit level) for emergency management.

The analysis of the case organisations revealed that social media is a central additional communication channel with their external audiences during extreme events (see Chapter 7.4). The audiences include, amongst others, the general public and the Media. A central reason why EMOs utilise social media services is to use these channels to directly communicate and interact with the public for the purpose of emergency and disaster management, but also as an Intelligence channel through which information can be gathered from the public. Furthermore, the analysis of the case organisations revealed that social media potentially needs to be used as a channel through which the public requests emergency assistance or reports emergency incidents (social media dispatching). Public social media channels are not used to interact with other EMOs for inter-organisational collaboration (see Chapter 7.6). However, the data analysis showed that social media is used in the volunteer EMOs to interact with volunteers for intra-organisational interaction in order to reduce hierarchical and spatial barriers (see Chapter 7.5).

Research Question 2.1 “Is there a difference in the Social Media utilisation during the operational mode and the non-operational mode of an Emergency Management Organisation?” is answered as well throughout the chapter. The short answer is yes; Social media is used for different purposes and with different approaches during the operational mode, and the non-operational mode.

Research Question 3 “How are Social Media Services used as communication platforms in Emergency Management Organisations for the purpose of emergency and disaster management to?” consists of three sub-research questions.

Research Question 3.1 “… interact with the public?” is answered throughout Chapter 7.4. The interaction includes distribution of information, engagement with the audience, social media intelligence, and social media dispatching.
Research Question 3.2 “…to interact with their own organisational members?” is answered in Chapter 7.5. Social media can be used in EMOs to interact with volunteers to reduce hierarchical and spatial barriers and include the volunteers closer into the organisation.

Research Question 3.3 “…to interact with other Emergency Management Organisations?” is answered in Chapter 7.6. From the case analysis, we see that it is not used as a platform for collaboration and coordination. However, there is some evidence in the data that individual social media officers are sharing their social media practices with social media officers in other EMOs.

So, what are the implications and contributions to theory and practice? In the following chapter the contributions to the methodological approach, theory, and practice are outlined as they relate to this study.
Chapter 8 – Conclusion

8.1 Introduction
My analysis of five cases of EMOs explored the integration and utilisation of social media services within EMOs for the purpose of emergency and disaster management.

The case EMOs are hierarchical organisations which consist of different units and departments which can operate to some extent independently. I used Koestler’s concept of holonic systems (Koestler 1967) to better understand this semi-autonomous and independent structure of EMOs. Social media is utilised in the organisations on several organisational levels, but for active emergency management, its use is centralised.

The operational mode refers to whether an organisation is responding to an emergency event or whether an organisation is in its normal day-to-day operation. This factor showed itself as a major influence on how and for what purpose emergency organisations utilise their social media channels to communicate with their audience.

An interpretivist perspective was taken in order to explore the utilisation of social media within the case organisations. Data sources were interview data, workplace observations, observations from research site visits, documents, and relevant social media data. The main data sources were interviews with social media operators and coordinators in the case organisations.

The iterative analysis of the empirical material revealed twelve themes which each describe an aspect of social media utilisation in the case EMOs. These themes then were used to develop a framework of Social Media Utilisation of Emergency Management Organisations for Emergency and Disaster Management. This framework can help us to understand the social media utilisation in EMOs better, and to develop approaches of social media utilisation for such organisations.

Within this last and final chapter, the methodological, theoretical, and practical contributions are outlined. Furthermore, the limitations of the study are discussed, followed by implications for further research and some concluding remarks.
8.2 Methodological Contributions and Implications

The individual components of the methodology are on their own general approaches of case study research. The main methodological contribution is how the method was applied.

Social media studies typically consist of an “outside perspective” where social media data is collected and analysed. From the data analysis assumptions are made about the stakeholders. In this study, both knowledge from social media data and an “inside perspective” are applied where social media practitioners within the organisations provide their perspective on the utilisation of social media within their organisation.

The focus of this study is on utilisation of social media by EMOs rather that general social media use in emergency events. This means that identification of key and relevant organisations and informants was critical to the success of the study. This was achieved by way of association with agencies through their “communities of practice” rather than the traditional “cold calling” techniques of organisational sampling.

The study consists of technology-in-use cases which meant a sensitivity to and understanding of 1) organisational context and 2) emergency event context as a driver for social media adoption and utilisation. This was key to the development of the resulting framework as a dynamic interaction of key components which have an influence on each other and the emergency and disaster management adoption landscape within and across EMOs.
8.3 Theoretical Contributions and Implications

The main theoretical contribution is to knowledge about social media utilisation and integration in EMOs for emergency and disaster management. Before this study we knew from the literature what EMOs communicate via their social media channels through the analysis of social media communications in different extreme events (e.g. Bruns et al. 2012; Ehnis and Bunker 2012; Ehnis and Bunker 2013; Ehnis et al. 2014; Heverin and Zach 2010; Procter et al. 2013; Subba and Bui 2017; Sutton et al. 2012). What we did not know was how social media is actually integrated into emergency response organisations. In this thesis, the integration and utilisation of social media services is explored within EMOs for the purpose of emergency and disaster management. By analysing five case organisations, different integration approaches were highlighted. It is still too early to say whether one type of integration is better than another, however, the data shows that with a specific type of integration some utilisation possibilities are enabled, and some are inhibited. The developed framework of Social Media Utilisation of Emergency Management Organisations for Emergency and Disaster Management thus helps as a framing device to explore the integration and utilisation of social media services in EMOs. The five components of the framework help us to understand the phenomena better and include several theoretical contributions: (1) importance of operational mode; (2) hierarchical but semi-autonomous structure of EMO; (3) existence of a diverse group of communication participants; (4) importance of different types of communication channels; (5) the social media capabilities of EMOs; (6) the integration and interaction of the components within the developed framework.

(1) The “Mode of Operation” takes into account the specific nature of EMOs. Social media is used for different purposes during the operational mode when an organisation, or parts of the organisation, is responding to an emergency event to the non-operational mode when no emergency event is present. Furthermore, emergency and disaster management, and the accompanying social media communication does not only happen during the response phase of an emergency event but all phases of the PPRR model (Cronstedt 2002).

(2) The “Organisational Levels” takes into account the holonic nature of EMOs, in which different sub-units of the organisations can operate independently to one another, to some extent at least. Social media is used on several levels of the organisation to communicate with the audience, but when it comes to active emergency management, social media is used in a centralised manner from the headquarters of an organisation. This of course is also influenced
by the fact that large-scale volunteer organisations were used as case organisations for this study. So as a theoretical contribution it is important to point out that social media is used for different purposes at different organisational levels.

(3) The framework highlights the existence of different “Communication Participants” in the social media utilisation. These communication participants include but are not solely limited to EMOS (A), the General Public (C), and the Media (M). These communication participants lead to social media interaction dimensions which were not covered by earlier models. In particular this study points to the communication dimension of Organisation – Public (A-C), Organisation – Media (A-M), Intra-organisational social media interaction (Intra-A), interaction between different organisations (A-A), interaction between the Public and the Media (C-M), social media interaction between the Media (M-M), and the social media interaction between different groups within the public (C-C). The interplay between these communication participants results in different forms of social media utilisation within EMOS.

(4) The research showed that “Social Media Channels” are constantly reviewed by EMOS and changed when necessary. The focus is not on particular instances of social media services (e.g. Facebook or Twitter), but on the audience and the use for an EMO. Channels which were once relevant might be not used anymore, and additional channels might be added to the communication portfolio of an organisation.

(5) EMOS have different “Social Media Capabilities” with their social media channels. The identified capabilities were broadcasting, engagement, intelligence, and dispatching. Broadcasting refers to distributing information through social media, engagement refers to engagement and interaction with the audience, intelligence refers to the utilisation of social media channels as well as a source of information for the organisation, and dispatching relates to the utilisation a social media channel as the basis to dispatch emergency resources to respond to an event. It is important to point out that these social media capabilities relates to a particular social media channel. EMOS might have different capabilities for their various social media channels.
(6) The framework components do not exist in isolation they are interlinked and influence each other. The framework helps to analyse, understand and explain the social media utilisation within an EMOs. Furthermore. It can be utilised to develop new approaches of social media utilisation and integration.

8.4 Practical Contributions and Implications
The research also has practical contributions which are outlined in the following way. The framework of Social Media Utilisation of Emergency Management Organisations for Emergency and Disaster Management can help EMOs to analyse their social media utilisation more effectively and assist them in improving their processes. Furthermore, the framework can help EMOs which have not yet adopted social media services within their organisations to commence the adoption of social media services. Some of the practical contributions are highlighted through each component of the framework.

The "Mode of Operation" shows that social media utilisation for emergency and disaster management is not only relevant when an organisation is responding to an emergency event, but around all phases of the Prevent, Prepare, Respond, and Recover model. Most social media channels work well when an organisation has already established a "listening audience" which is actively following the organisation. It takes time to establish such an audience, and it cannot easily be done when a disaster event suddenly happens.

The analysis of the data showed that the case organisations are utilising social media at different "Organisational Levels", however, for active emergency and disaster management, social media is centralised at the headquarters level. The remaining relevant holons in the organisations are using social media outside the operational mode for support activities, but not for active emergency management. Localised information could be valuable for affected communities and for intelligence gathering purposes within an EMO. By highlighting these aspects, this research is relevant for EMOs to rethink their social media utilisation on different organisational levels. For example, EMOs can think about forms of non-traditional volunteers. EMOs often have a basis of highly skilled volunteers which are involved in the groundwork of the organisation. These volunteers are essential for the operation of the organisations, however, the EMOs could start to train and establish skilled social media volunteers on all levels of the organisation; i.e. state and local level. These types of volunteers could prevent the effect that
social media channels “going silent” when the traditional volunteers are in the operational mode.

This research also showed that it makes a difference in the information flow from where the social media officers are operating their social media channels. The organisations which have their social media officers within the command centre while they are operational have a different information flow in comparison to the social media officers which are operating the social media channels from outside the command centres.

There are different “Communication Participants” in the social media audiences. The identification of different audience groups can help emergency management practitioners to foster their social media communication towards the relevant audiences.

Social media is more than just the service Facebook or Twitter; there are different "Social Media Channels". The research identified main social media communication channels; support social media communication channels; placeholder social media channels; and legacy social media channels. The research can help organisations which utilise their social media channels to reconsider whether they are utilising relevant channels for the task they are trying to achieve.

Furthermore, there are different “Social Media Capabilities” for a social media channel. The capabilities identified in this research are broadcasting, engagement, intelligence and dispatching.

In the case organisations, the majority of social media operators are still social media evangelists (Latonero and Shklovski 2013) and knowledge is retained within the experience of these social media officers. Formalisation is in progress. This research is relevant because social media is of increasing importance to EMOs, however, so far the practical processes or routines are lagging behind as social media operators are still in the stage of learning what is effective. Formalisation is relevant to train more social media operators as a surge capacity when there is the need for increased social media communication during a disaster.
8.5 Limitations

All research is set in a particular background and has, therefore, limitations about which the researchers and the audience need to be aware of. Amongst others, the main constraints of this research are based on the research design, selection of case organisations, domain, access to participants, and also the temporal constraints of PhD studies.

The research design of this study is the interpretivist exploration of social media technology appropriation in EMOs for emergency and disaster management. As a method, five comparative case studies were approached. A common critique of case studies is the lack of generalisability of cases (Walsham 1995). Generalisability is a concept from positivist research which is not suitable and aimed for in the interpretivist research paradigm (Lee and Baskerville 2003). The underlying ontology for this thesis is a ‘weak’ social constructivism (Urquhart 2012). This means that social realities are the result of the intersubjective meaning making between the particular individuals within these realities, in the case of this thesis the members of the EMOs. The knowledge we can derive from these realities is always highly context bound. This does not mean that this knowledge cannot be applied in a similar setting, however, in such a knowledge transfer one needs to make oneself aware of the different social realities, such as culture or norms.

The selected case organisations are situated in Australia and this brings with it several implications which are not necessarily transferable to EMOs in different countries. There is the geographical surrounding of Australia which results in the specific event types, such as frequent bushfires, and organisations operating across geographically large areas. Furthermore, there are implications which come with norms and culture, both organisational and country specific.

This research focuses on EMOs which are responding to natural emergency and disaster events, such as earthquakes, floods, or bushfire. This particular selection of case organisations makes it possible to not focus on some of the problems, which organisations, such as police forces, have that are utilising social media to communicate information during human-caused types of extreme events, such as terror attacks. In human-caused events where there are perpetrators, social media might need to be operated with a different approach, since the communication might directly influence the strategy and approaches of the actors.
The case organisations consist of a very specific type of EMO which are large volunteer organisations. The majority of members in the Case Organisation A, B, D, and E are trained, specialised volunteers. When transferring the findings to a different context, these constraints need to be taken into consideration.

Further limitations result from the access to interview participants. As highlighted through this research the group of social media operators and coordinators in each organisation are very limited.

Social media in emergency management has a volatile and fast-changing nature as highlighted throughout this thesis. This means that social media undoubtedly will change over time. This might have an influence when applying the framework or other findings of this thesis.

A fully embedded longitudinal multiple-case study design would be optimal to identify and analyse the different aspects of social media utilisation in emergency management for emergency and disaster management, however, this was not feasible through resource and time constraints of a PhD journey.

8.6 Implications for further Research
Research, in general, raises more questions than it answers. This is also the case for this particular thesis. I answered relevant questions, but on the way to achieving this objective, the research opened up a myriad of further questions which need to be answered in further research.

The framework needs to be transferred to an additional context in order to increase its relevancy. In this research, the case organisations were large-scale volunteer organisations (except for Case Organisation C) we need to explore whether similar patterns can be found in non-volunteer organisations.

Furthermore, the events were limited to natural disaster events. The research can be extended to all forms of emergency events, including human-caused events, such as terror attacks, as these events do show different characteristics which might require a different form of social media utilisation.
The context of this thesis were organisations in Australia; the research could be extended to different countries which of course include different forms of infrastructure and culture.

This thesis does not provide a longitudinal view of the social media communication system within the case organisations; Rather it gives a snapshot and explores how the current members of these organisations are viewing their social media channels for their normal day to day operations (non-operational mode) and when the organisations are presented with a crisis (operational mode). Over time these practices will change, and this change can be explored through a longitudinal exploration on EMOs.

Through this research, we now know much more about how EMOs have embedded and integrated social media services into their organisations. In further research, we need to learn more about the other perspective; how does the public and the media perceive social media services when they are interacting with EMOs during disasters and other extreme events.

The study highlighted that social media is used to communicate with volunteers within an organisation. Further research can explore how this interaction can be improved and how volunteers can be better integrated into the social media activities for emergency management.

The study showed that the case EMOs are struggling to use social media channels as a source to gather meaningful information from the emerging social media communication networks during an extreme event. Further research can explore how social media can be integrated into EMOs for meaningful social media intelligence gathering.

The study showed several preconceptions within the literature and in the case organisations which guide what it means to utilise social media in EMOs. There is a research opportunity to challenge some of these preconceptions in future work as the usage of particular language and concepts influence how a technology can be used. One example is the concept of the “operational” and “non-operational” mode. This language guides the importance of the social media operations within the operational mode, when an active emergency event is present, and indicates that social media utilisation in the non-operational mode might be less important. However, the key goal of EMOs, keeping the public safe, is something that happens in both operational modes and all phases of the PPRR model. Another example is the concept of the “listening audience” and “listening community”. This terminology keeps the unidirectional
connotations from traditional mass media and downplays an active community that is “interacting”, “contributing” and “co-producing”. We need to challenge these existing preconceptions in future research which will help EMOs in a long-term shift in seeing the value of social media in all modes of operations, as well as the public as an active participant in mitigating the effects of extreme events.
8.7 Concluding Remarks
Social media influenced the communication around emergency and disaster events with beneficial but as well with negative consequences. EMOs, in general, are still learning and experimenting on how to utilise these services to support their efforts to keep the communities they are serving safe. This study might help to contribute to the development of new approaches in the emergency management domain or to better understand the existing social media utilisation within such organisations.

Social media with its ability to enable one-to-many and many-to-many communication with a minimal cost is a relatively recent phenomenon which will further influence our societies over time when new technology is developed. Already now it is the case that “people today can use social media to organise in ways that were difficult, if not impossible, just a few years ago, which has substantial implications for business, and society” (Kane et al. 2014).
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290


