



Department of Computing Sciences

**A Social Media Method for
Eliciting Millennials' Worldviews
on the Coastal and Marine Environment**

By

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DECLARATION

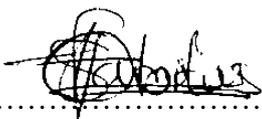
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In accordance with Rule G5.6.3, I hereby declare that the above-mentioned thesis is my own work and that it has not previously been submitted for assessment to another University or for another qualification.



.....
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16 April 2020
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Firstly, I would like to thank my supervisors, Prof Brenda Scholtz and Dr Bernadette Snow, for their immeasurable support during this research. Their knowledge, advice and motherly words of encouragement saw me through this journey. I've never been shown such greater love outside from home.

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ABSTRACT

A lack of involvement by participants with traditional data collection methods for research has led to insufficient data regarding millennials' worldviews on the coastal and marine environment. Understanding millennial worldviews could provide insights for policy interventions for sustainable use of the marine and coastal environment. The aim of this research is to design, develop and evaluate an appropriate social media method to elicit millennials' worldviews on the coastal and marine environment. The methodology used for the research was Design Science Research (DSR), which is a legitimate approach to conducting research in the field of Information Systems. The methods used were a literature review, interviews with social media experts and Social Media Influencers (SMIs), and a focus group discussion with researchers from the field of social sciences.

The proposed artefact (the method) can be used to provide guidance to researchers for engaging and eliciting opinions and worldviews of millennials on social media. The method includes a Social Media Influencer Model that illustrates the relationship between SMIs' characteristics and techniques for engaging the public, and a Social Media Analytics (SMA) Process model that can guide researchers through the steps of eliciting worldviews from the public. Although there are several SMA techniques that can be used, the proposed method uses sentiment analysis as an SMA technique for deriving sentiments from social media data. The method was evaluated by researchers who require a social media method for eliciting millennials worldviews. The findings confirmed some of the techniques identified in literature as well as some additional techniques and processes. It was also evident that using this method could assist researchers for data collection and specifically to obtain worldviews on the marine and coastal environment. The contribution of this study is an artefact that fulfils the need for a social media method for data collection that is more convenient for researchers and millennials and can guide researchers through the steps of eliciting worldviews from the public.

Keywords:

Social Media, Millennials, Environmental Awareness, Facebook, Twitter, Instagram, Social Networking Sites, Social Media Influencers, Pro-environmental behaviours, Social Media Analytics.

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CHAPTER ONE

INTRODUCTION

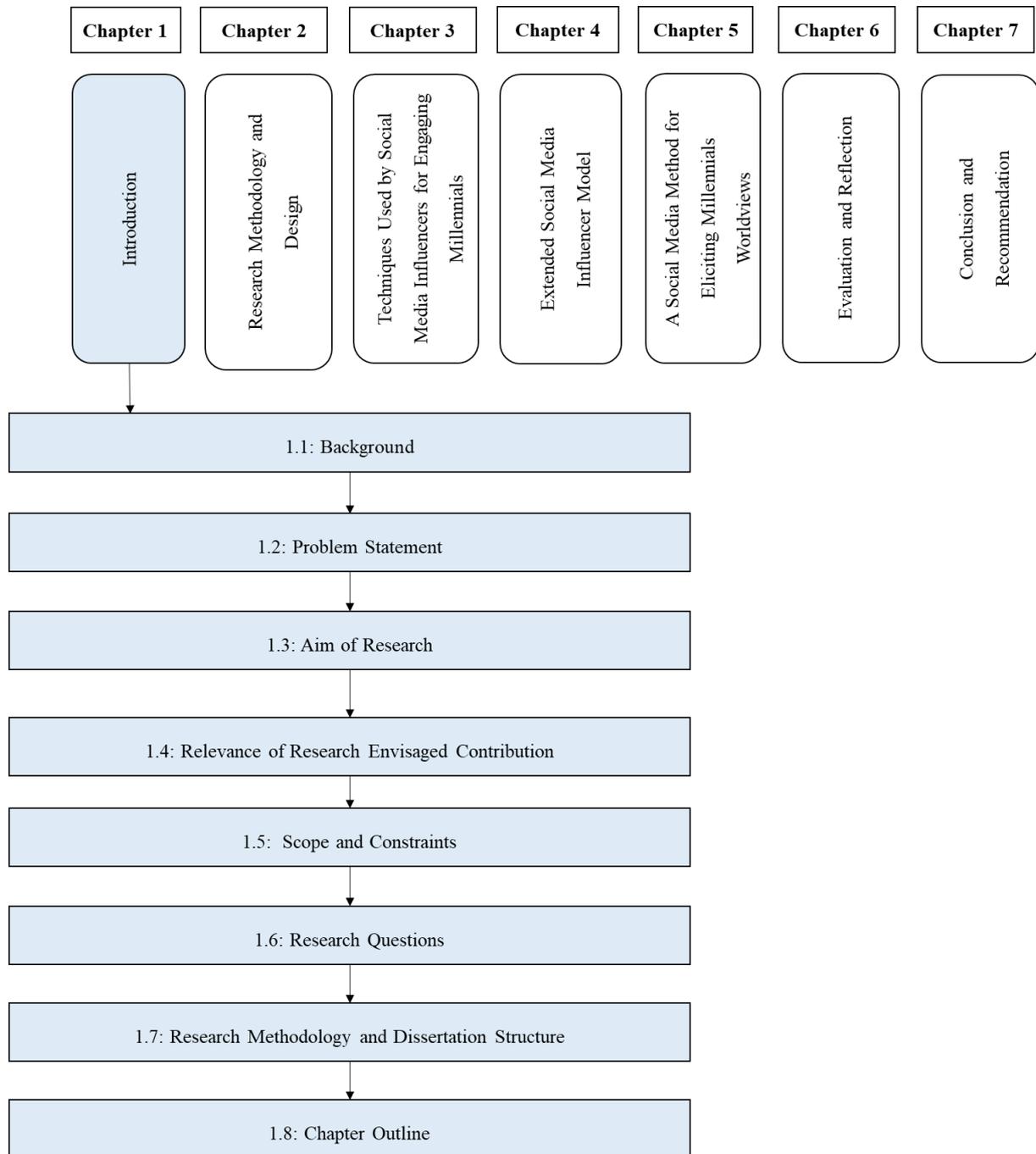


Figure 1-1 Chapter Overview

1.1 BACKGROUND

Millennials are a group of people born between 1980 and 2000, that are technology-savvy and come with their peculiar practices, behaviour and lifestyle (Weber, 2017). They also play a huge role in society given their unique use of technology. Insights into the millennial's personal value orientation can provide a vital dimension to understanding their value system, which leads to decisions and behaviours (Weber and Urick, 2017). According to Weber (2017), little is known about millennials' ethical decision-making processes, values and perceptions in society. Due to the changes they have had in their lives from childhood to adulthood, they have been influenced by world events, social and economic changes as well as technology integration into their day to day lives (Moreno et al., 2017). Millennials are generally creative multitaskers who desire interactive tools and quick answers to solve most of their problems in a timely manner (Johanson, 2012; Mizelle and Beck, 2018; Sanchez, 2016).

The attention span of humans, in general, is approximately 20 minutes but millennials have a shorter attention span than other prior generations due to a variety of demands for their attention (Eichholz et al., 2013). This short attention span has rendered traditional data collection methods such as questionnaires and surveys less effective in data gathering processes. Social media provides a new source of valuable information on the internet that can be analysed to generate useful information and data (Goeldi, 2010). The use of social media has been accepted by millennials as the most important medium of communication (Paulin et al., 2014). Social media is a group of Internet-based applications using the ideology and technological foundation of Web 2.0. It enables the creation and exchange of user-generated content (UGC) (Kaplan and Haenlein, 2010).

Young adults consume and interact with digital technologies extensively daily and this provides reasons to be more active in advocating for social change mostly through social media (Seelig, 2018). Millennials' use of social media for social causes is relevant in this age of digital connectedness (Seelig, 2018). Event organisers now use social media to target millennials to equip them with opportunities for raising awareness, building and sustaining communities (Paulin et al., 2014). Social media provides research opportunities for new ways to deepen engagement among millennials that translates into action (Seelig, 2018).

The growth of social media over the years has given rise to Social Media Influencers (SMIs), who shape the attitude of their followers through blogs, Tweets, wikis and other social networking sites (SNSs) (Freberg et al., 2011). This set of individuals practice self-presentation

on social media, create their own online image, attract attention and have a large number of followers (Chae, 2018). This growth over time has turned SMIs to micro-celebrities (Chae, 2018). In discovering insights and awareness into topic, issues or subjects, SMIs can play a huge role, and due to their huge following on SNSs, can influence decision making (Booth and Matic, 2011). There is a need for inventive strategies to engage with people in fields such as climate change, biodiversity loss and environmental sustainability. SMIs can help support and achieve these strategies (Galetti and Costa-Pereira, 2017).

Environmental issues are becoming a worldwide concern, and many countries and major organisations are working towards being environmentally aware (Rahim and Directorate, 2016). Environmental awareness is a component of environmental education that provides individuals and groups with awareness about environmental issues and sensitivities. Environmental awareness is the behavioural inclination to protect the environment and provide awareness of the human activities affecting it (Altaher, 2013). The provision of information is vital in kick-starting any environmental campaign since this information helps in providing individuals with the proper skills, knowledge and attitudes in tackling environmental concerns (Apil and Okaka, 2013).

The coastal and marine environment is prone to extreme natural events such as coastal erosion, storms and cyclones, and a rise in sea level (Satumanatpan et al., 2017). These events are as a result of the ecosystem degradation, natural disasters and climate change, which are becoming more frequent and devastating (Satumanatpan et al., 2017). Coastal environments are areas with a coastline bordering the open ocean or similar sheltered water bodies that intensively combine both the ecological and the socio-economic forces (Crowell et al., 2007; Felsenstein and Lichter, 2014). The coastal and marine water bodies provide a good source of socio-economic well-being, and valuable socio-environmental amenities (Sutton et al., 2011). The growing number of facilities and human activities along the coastal and marine environment has come with major challenges relating to biodiversity, economic development, land use planning and the degradation of ecological footprints (Papageorgiou, 2016).

There is the need to convince people to adopt pro-environmental behaviours. Therefore it seems intuitive to convince them that it is in their own interest (Evans et al., 2013). Environmental awareness campaigns distribute information to people for the provision of relevant knowledge, attitude and skills to address environmental issues (Talero, 2004). In improving people's environmental awareness and perception, environmental awareness

campaigns play a big role in tackling environmental issues (Mooney et al., 2009). The use of SMIs to stimulate an engaging conversation that influences perception, diagnoses expectation and brings clarity to certain issues cannot be overemphasised (Booth and Matic, 2011). The use of Social Media Analytics (SMA) combined with the influence of SMIs, can provide valuable insight into environmental issues within the coastal and marine environment. SMA provides an inexpensive and fast means of collecting data on social media and it involves techniques for collecting, extracting, analysing and presenting user generated content (UGC) to discover insight into a specific subject (Chang et al., 2017; Lee, 2017). In the context of this study, the term ‘worldviews’ refers to the perceptions, environmental awareness and the future outlook of individuals (Snow, 2018). The term ‘elicit’ means to obtain or extract something, a response or answer (Oxford University Press, 2018) and the term ‘methods’ refers to a series of techniques, steps, algorithms or guidelines that can be used to perform a task (Vaishnavi et al., 2019).

1.2 PROBLEM STATEMENT

Generally millennials are environmentally aware and possess some limited knowledge of environmental matters and ecological processes (Wall, 2017). They are the least investigated because of their peculiar behaviours and lifestyle (Future Challenges, 2016). Traditional data collection methods aimed at engaging with millennials are faced with challenges such as hurried completion of surveys and questionnaires by millennials, which leads to disengaged surveys and satisficing answers (Eichholz et al., 2013).

The research problem of this study is described as follows:

There is a lack of guidance regarding the use of social media analytics for eliciting millennials’ worldviews on the coastal and marine environment.

1.3 AIM OF RESEARCH

The aim of this research is - *To design an appropriate social media method to elicit millennials’ worldviews on the coastal and marine environment.*

1.4 RELEVANCE OF RESEARCH AND ENVISAGED CONTRIBUTIONS

Millennials are the most educated and technology savvy population but researchers know very little about what these individuals believe in or how the world is viewed from a millennial’s

ethical perspective (Weber and Urick, 2017). The use of various traditional data collection methods has been less effective in engaging and connecting with millennials. Millennials drop-out of surveys and questionnaires more often than other generations because they live overscheduled lives and expect a rich experience across all media platforms (Eichholz et al., 2013).

Environmental degradation has been an area of concern over the years and relevant authorities have taken the initiative to educate the public on the need for sustainability (Lakshmi and Shaji, 2016). Research made on the social cohesion towards pro-environmental behaviours in coastal towns encountered difficulties when engaging with millennials to generate insights into their worldviews. These difficulties made it challenging to understand how millennials connect with the coastal and marine environment towards stewardship and environmental behaviour. Various researchers, government and policymakers are currently looking for ways to find appropriate solutions and tools to help increase environmental awareness and concerns, and to help influence environmental behaviour (Asilsoy and Oktay, 2018).

The envisaged contribution for this study is a theoretical method for assisting researchers with using social media for eliciting millennials' worldviews on the coastal and marine environment. From the initial investigation of the relevance of the study and the research problem and questions, the following high-level objectives of the solution (the method) were identified:

- SO1.** To provide processes for using social media as a data collection method. These processes included those for a) engaging with millennials and b) eliciting worldviews from them (links to RQ₂);
- SO2.** To provide techniques for engaging with millennials on topics related to the coastal and marine environment (links to RQ₁); and
- SO3:** Recommendations for selecting SMA tools or platforms (links to RQ₂).

1.5 SCOPE AND CONSTRAINTS

This research will focus primarily on the use of social media and SMA as a medium for collecting and analysing millennials' perceptions of the coastal and marine environment. The use of standard online surveys like survey monkey is out of the scope of this research. Pre-existing SMA tools will be considered and the development of a new SMA tool will be

excluded for this study. Due to cost constraints, only those SMA tools that offer free or relatively cheaper services will be investigated.

1.6 RESEARCH QUESTIONS

The main research question that this research aims to answer is:

How can social media be used as a successful data collection method for eliciting millennials' worldviews on the coastal and marine environment?

The subsidiary research questions are as follows:

***RQ₁**. What techniques are used by social media influencers (SMIs) to engage millennials in awareness campaigns?*

***RQ₂**. What processes exist for using social media as a data collection method?*

***RQ₃**. What criteria can be used for evaluating SMA tools?*

***RQ₄**. How can the success of a social media method for data collection be measured?*

***RQ₅**. What is the expected success of implementing the social media method for eliciting worldviews on the coastal marine environment?*

1.7 RESEARCH METHODOLOGY AND DISSERTATION STRUCTURE

The Design Science Research (DSR) method is made up of the problem and solution statement expressed in the construct vocabulary (Vaishnavi et al., 2019). To answer the research questions of this study, the DSR methodology will be adopted. DSR is an accepted and legitimate approach to Information Systems (IS) research and focuses on the creation of socio-technical artefacts (Hevner and Charterjee, 2010; Kuechler and Vaishnavi, 2008). DSR suits the study due to the fact that it aims to develop a novel solution for a relevant problem and hence the artefact developed should offer utility (Brendel, 2017).

This study adopted the DSR methodology to develop and implement the method (the artefact). Artefacts are models, methods, constructs and instantiations that contribute to existing knowledge (Geerts, 2011; Kao et al., 2016). In this study, the artefact and solution are a social media method for eliciting the worldviews of millennials on the coastal and marine environment. The six DSR activities are iterative and are as follows:

- Problem identification and motivation;
- Define the objectives of a solution;
- Design and development;
- Demonstration;
- Evaluation; and
- Communication.

Problem Identification and motivation – This activity involves defining the specific research problem and justifying the value of a solution (Geerts, 2011; Kao et al., 2016). Defining the problem will provide information for the development of an artefact that can effectively provide a solution (Peffer, 2008). Justifying the value of the solution motivates the researchers to pursue the intended solution (Peffer, 2008). In identifying the problem, the researcher will look at millennials and their characteristics, what makes them unique, and why SMIs provide a good opportunity for engaging and eliciting their worldviews. The relevant problem for this research is first identified and explained in this chapter, and then explored iteratively in Chapters 3 and 4.

Define the objectives of a solution – The problem definition provides a basis for the determination of the solution objectives (Kao et al., 2016). An understanding of what is possible and what is feasible together with methods, theories and technologies will guide the researcher in defining the objectives (Geerts, 2011). The objectives of the solution are first reported on in this chapter, iteratively explored further in Chapters 3 and 4 and then verified in Chapter 5.

Design and development – The design and development activity involves the application of technologies, methods and theories to help with the objective's definition (Geerts, 2011). The artefact designed and developed contains the research contribution embedded in the solution (Peffer, 2008). In Chapter 3, 4, 5 and 6, the iterative process of design and development of the method is explained.

Demonstration – This activity involves demonstrating the process of solving one or more instances of the problem by using the artefact (Kao et al., 2016). This could be through experimentation, case study, simulation or any other appropriate activity (Peffer, 2008). Various components of the social media method developed will be demonstrated iteratively to relevant stakeholders and the findings reported on in Chapters 3, 4, 5 and 6.

Evaluation – In the evaluation activity, the artefact created will be observed and measured to find out if it supports a successful solution to the problem by comparing the results with the objectives (Geerts, 2011; Kao et al., 2016). Evaluation of the artefact could be in the form of comparison of the artefact’s functionality with the solution objectives (Peppers, 2008). In Chapter 3, 4, 5 and 6, evaluation of the various components of the social media method are reported on.

Communication – In the communication activity, the problem, its solution, its novelty and its utility is communicated to researchers and other relevant audiences who understand its importance on the contribution to the body of knowledge (Geerts, 2011; Kao et al., 2016). In this study the research findings and contributions are communicated to key stakeholders through a conference paper (Appendix J) and in the relevant chapters.

Table 1-1 Application of the DSR Activities

Chapter	DSR Activity	Research Deliverables/Contribution
1, 3, and 4	A1 - Problem identification and motivation	Research problem.
1, 3, 4 and 5	A2 - Define the objectives of the solution	Solution objectives.
3, 4, 5, and 6	A3 - Design and development	Design of the Social Media Method for Eliciting Worldviews.
3, 4, 5, and 6	A4 - Demonstration	Criteria for selecting tools for the Social Media Method for Eliciting Worldviews.
3, 4, 5, and 6	A5 - Evaluation	The Social Media Method for Eliciting Worldviews. Techniques used by SMIs for engaging with millennials. The Social Media Influencer Model.
7	A6 - Communication	Conference paper, conclusion and recommendation

1.8 CHAPTER OUTLINE

An outline of the chapters and the related research questions is provided in Figure 1-2.

Chapter 1 – Introduction: This chapter contains the background information on the research topic, and the research problem. The problem statement, research questions, envisaged contribution and the scope and constraints are also presented in this chapter.

Chapter 2 – Research Methodology and Design: This chapter explains the methods and approach taken to achieve the aims of the research.

Chapter 3 - Techniques Used by Social Media Influencers for Engaging Millennials: This chapter provides answers to RQ1 by investigating SMIs and their various techniques used for engaging with their followers.

Chapter 4 - Extended Social Media Influencer Model: This chapter verifies the techniques of SMIs that were identified from literature and proposed in the model by reporting on the interviews conducted with SMIs and social media experts. In this chapter, answers to RQ1 were further verified using interviews with SMIs and social media experts.

Chapter 5 - A Social Media Method for Eliciting Millennials Worldviews: This chapter provides answers to RQ2 and RQ3. It contains guidance on using social media and SMA for data collection. The social media method proposed in this chapter will assist researchers in eliciting the worldviews of millennials on the coastal and marine environment. Also, discussed in this chapter are SMA tools for discovering insights from social media data.

Chapter 6 - Evaluation and Reflection: This chapter provides answers to RQ4 and RQ5 by reporting on the evaluation of the social media method and its potential success, which is conducted through focus group discussions with the relevant stakeholders.

Chapter 7 – Conclusion and Recommendation: The conclusions from the research are discussed in this chapter. The limitations of the research and recommendations for future study are also provided.

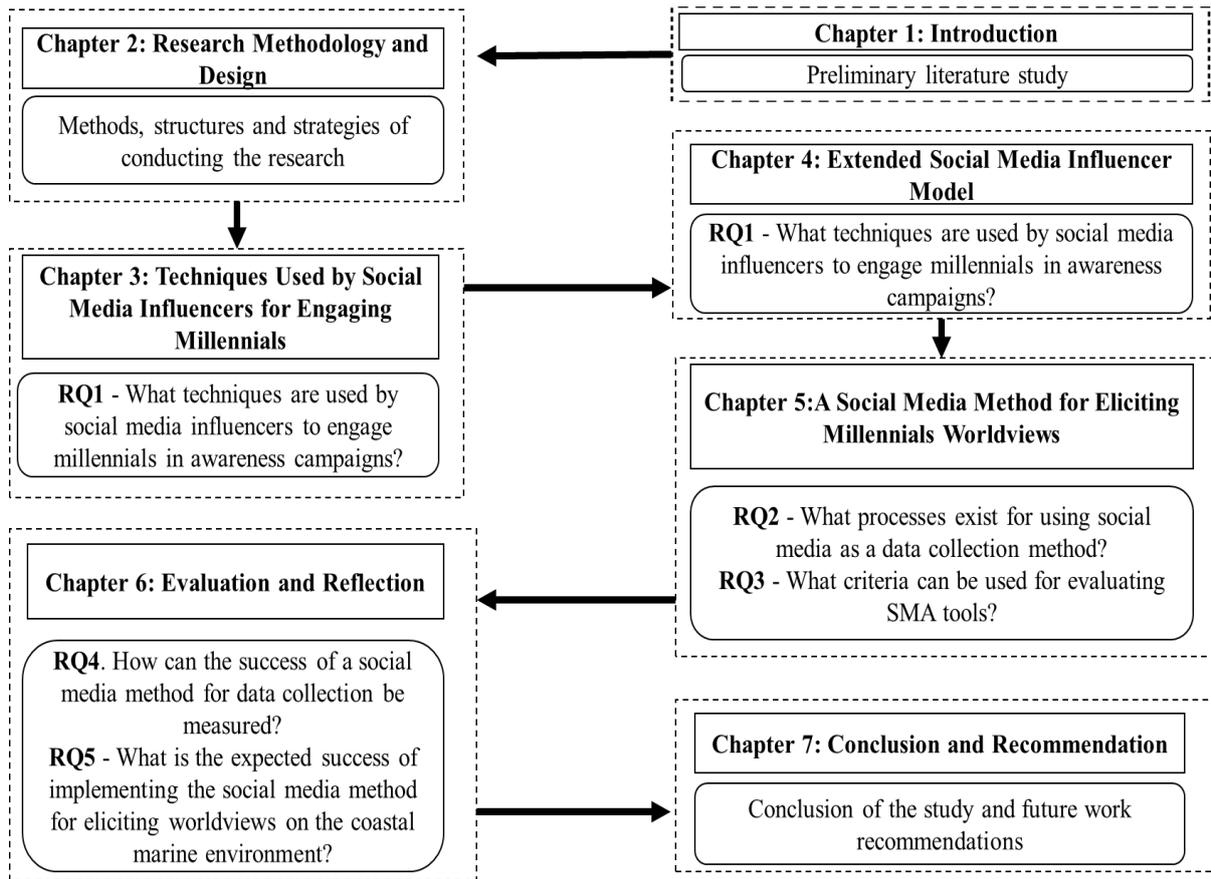


Figure 1-2 Dissertation Structure

CHAPTER TWO

RESEARCH METHODOLOGY AND DESIGN

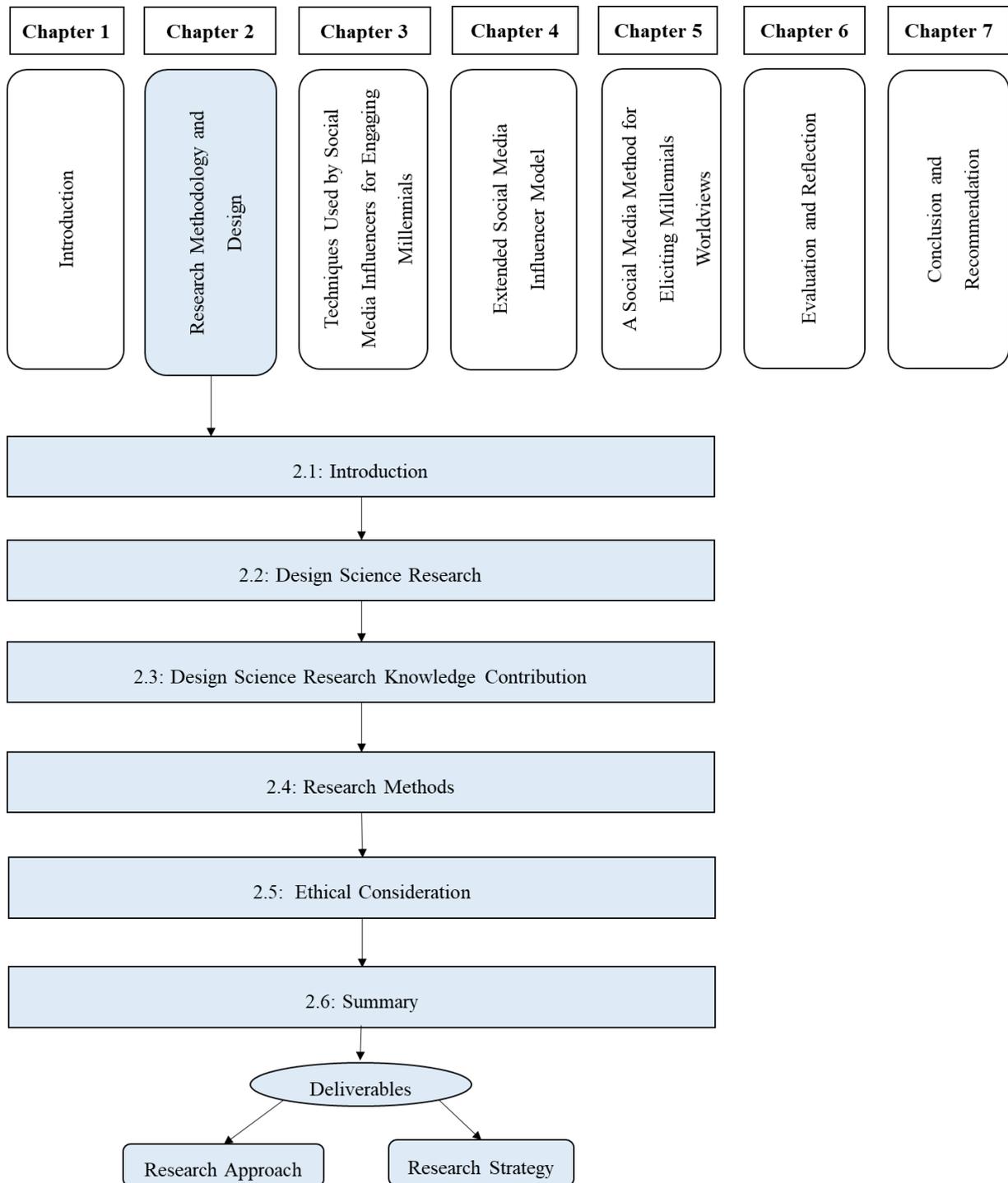


Figure 2-1 Chapter Overview

2.1 INTRODUCTION

The previous chapter discussed the background and the aim of the research. This chapter is concerned with the methods and approaches taken to achieve this aim. The research design is the conceptual structure in which a research is conducted. It provides a blueprint for the collection, measurement and analysis of data. The research design is defined as a master plan for the selected methods, structure, and strategy of a research. This master plan helps in finding alternative tools to solve research problems and to minimise variances (Mohajan, 2017).

This research would contribute to existing theory by making a scientific contribution. There are no research questions to be answered on this chapter however, this chapter aims to provide an insight into how this research will be conducted to give answers to all the research questions discussed in Chapter 1.

As shown in Figure 2-1, this chapter discusses the research methodology and design. The research methodology selected for this study is discussed (Section 2.2). The Design Science Research knowledge contribution is identified (Section 2.3). The research method utilised for addressing each of the research questions is discussed (Section 2.4). Ethical clearance was required for participants' participation in the data collection process (Section 2.5). Thereafter, a summary of the chapter followed (Section 2.6).

2.2 DESIGN SCIENCE RESEARCH

The acceptance of DSR as a legitimate approach to IS research is growing (Gregor & Hever, 2013). DSR focuses on the creation of socio-technical artefacts such as modelling tools, decision support systems, methods for IS evaluation and IS change interventions (Gregor & Hevner, 2013). The design purpose of DSR is to change existing situations into preferred ones (Geerts, 2011). According to Geerts (2011), DSR was developed with three objectives in mind:

- To provide a nominal process for the conduct of design research;
- To build upon prior literature about design science in IS and reference disciplines and
- To provide researchers with a mental model or template for a structure for research outputs.

The DSR methodology focuses on improving the production, presentation and evaluation of DSR while being consistent with DSR principles and guidelines (Geerts, 2011). Constructs, models, methods and instantiations are all possible outcomes of using DSR (Amrollahi and

Rowlands, 2018). The goal of this research is to develop a method which could be considered as an artefact and therefore DSR is a suitable research methodology for this study. Figure 2-2 shows the six DSR activities to be followed as discussed in Section 1.7.

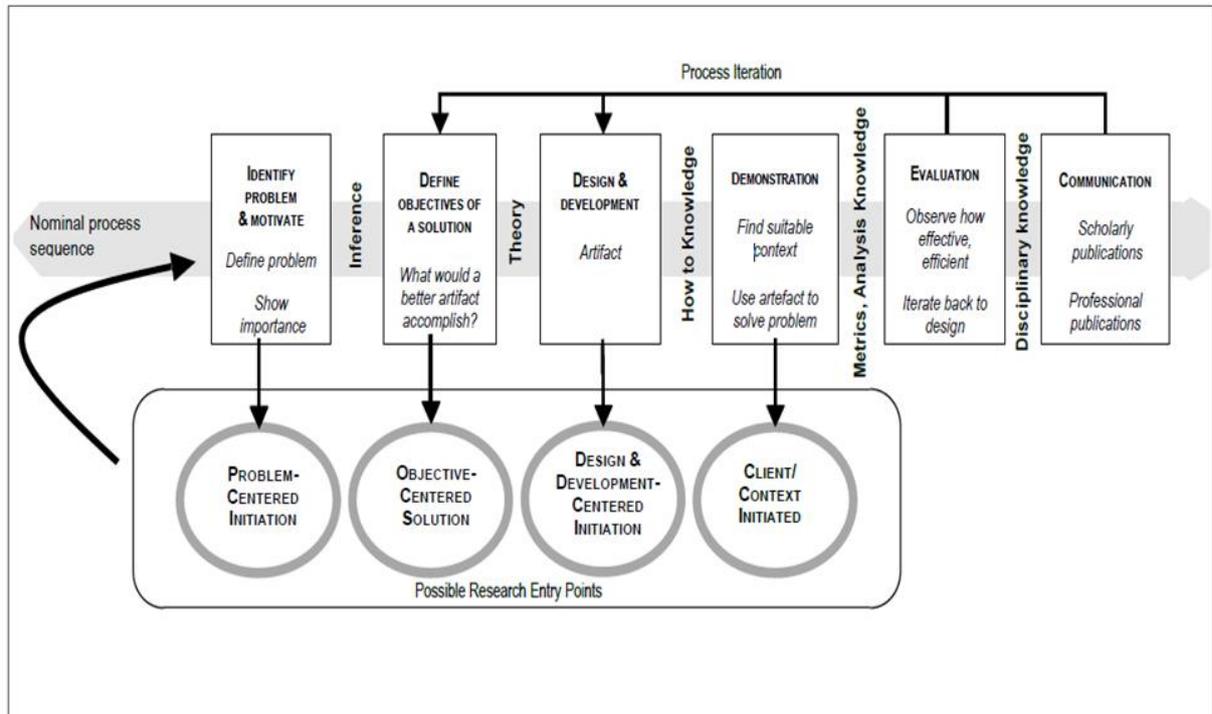


Figure 2-2 Design Science Research (DSR) Methodology Process Model (Peppers, 2008)

In Section 1.7, the DSR activities were explained and applied to each of the chapters in this dissertation. In Figure 2-2, the DSR methodology process model describes each DSR activity and showcases the process iteration during the evaluation and communication activities. Iteration occurs during the evaluation activity because the stakeholders evaluating the method will need to ensure that the objectives to the solution are defined in the design & development activity. In communicating findings, an iteration back to the objectives of the solution and the design and development activities are necessary. This helps in communicating to the relevant stakeholders on how the proposed method aims to provide a solution to the research problem.

2.3 DESIGN SCIENCE RESEARCH KNOWLEDGE CONTRIBUTION

The contribution of knowledge in DSR is not as easy as it seems, and it depends a lot on the nature of the artefact being designed, the audience whom it is communicated to as well as the state of the field of knowledge (Gregor and Hevner, 2013). The DSR knowledge framework documented in Henver and Gregor covers insights on how best to understand and position the contributions of using DSR in research. One key information to take note of is the fact that

nothing is really “new”. Everything that is so called “new” information is made from something else or builds on previously known ideas.

In Figure 2-3, the DSR knowledge contribution framework is shown, which consists of four different quadrants: Improvement, Invention, Routine Design and Exaptation. The x-axis represents the application domain maturity from high to low. The application domain maturity represents the current maturity of the problem context. The y-axis represents the solution maturity from high to low. The solution maturity represents the current maturity of the artefacts or solutions that exist to serve as starting points for solutions to the research question. This research falls under the Exaptation quadrant since the contribution is a well-known solution (social media analytics) to a new problem (collecting data from social media for research on environmental awareness). Exaptation in the context of DSR knowledge contribution refers to extending known solutions to new problems. In Figure 2-3, Exaptation has a high solution maturity which means that the solution to the problem is known. The application domain maturity is low because the problem context is new. Exaptation allows researchers to extend or refine existing design knowledge from one field to another or to a new application area (Gregor and Hevner, 2013).

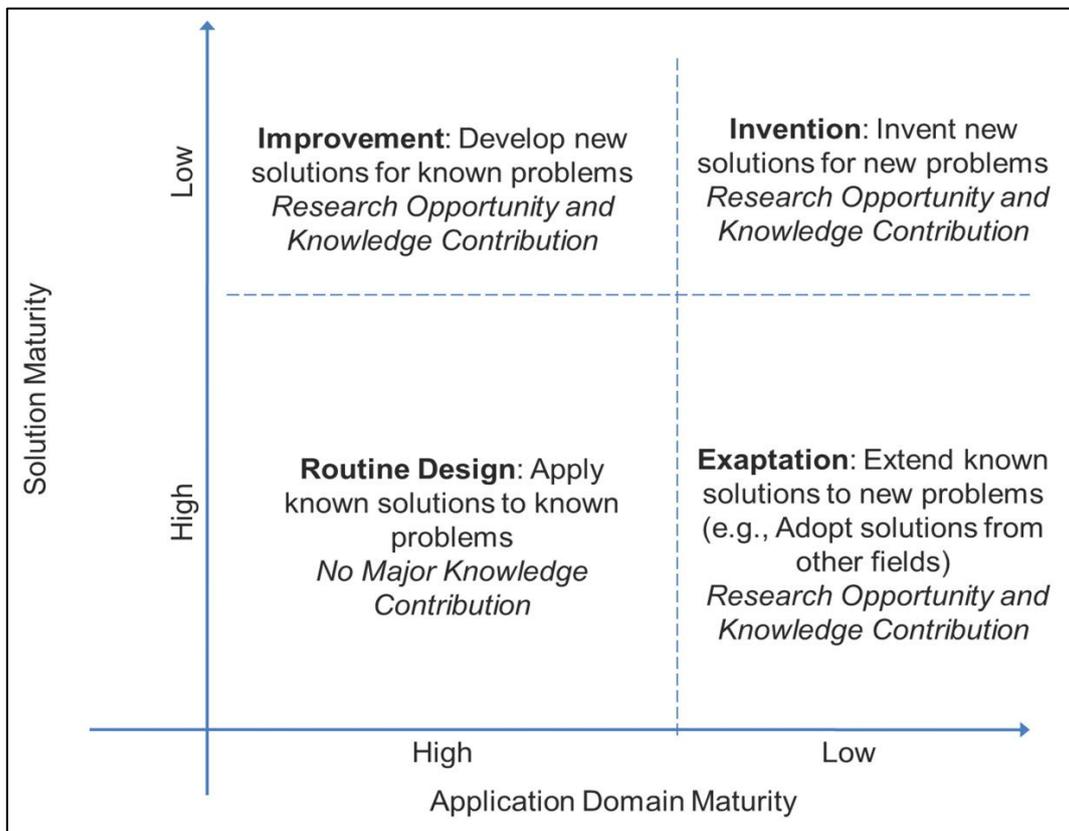


Figure 2-3 DSR Knowledge Contribution Framework (Gregor and Hevner, 2013)

Exaptation as a type of contribution is very common in IS where technological advances often require new applications. Technological advances provide room for opportunities for the exaptation of theories and artefacts to new fields. There has been lots of issues with data collection practices and SMA provides a more viable opportunity to tackling this problem. SMIs and SMAs have been used a lot in marketing to engage with customers but are yet to be used in other application areas. This research would investigate the use of SMIs and SMA to develop a method for engaging with millennials and to elicit their worldviews on the coastal and marine environment.

2.4 RESEARCH METHODS

This section provides the details regarding the research methods used for this study, which are summarised in Table 2-1.

Table 2-1 Research Questions and Methods

RQ	Research Question	Research and Data Collection Methods	Chapter
1	What techniques are used by social media influencers to engage millennials in awareness campaigns?	<ul style="list-style-type: none"> Literature review with grounded theory SMIs and social media experts' interviews 	3 and 4
2	What processes exist for using social media as a data collection method?	<ul style="list-style-type: none"> Literature review 	5
3	What criteria can be used for evaluating SMA tools?	<ul style="list-style-type: none"> Literature review Focus group 	5
4	How can the success of a social media method for data collection be measured?	<ul style="list-style-type: none"> Literature review Focus group 	6
5	What is the expected success of implementing the social media method for eliciting worldviews on the coastal marine environment?	<ul style="list-style-type: none"> Focus group (including an SMA tool demonstration) 	6

Literature Review with Grounded Theory – One of the research methods used in answering RQ₁ is a literature review with grounded theory. The grounded theory is an inductive technique used in interpreting a vast set of qualitative data about a social phenomenon to build theories about that phenomenon (Bhattacharjee, 2012). The grounded theory allows for a well-rooted connections between variables (Wolfswinkel et al., 2013). The five stages of the grounded theory approach to literature reviews are define, search, select, analyse and the present stages.

The grounded theory approach is described in detail in Section 3.2. This method will be used to review existing literature on the techniques used by SMIs.

Interviews - Semi-structured interviews will be used as the second research method for answering the first research question (RQ₁). A semi-structured interview is a verbal exchange between a person and an interviewer where the interviewer attempts to elicit information from the other person by asking questions (Matthews and Ross, 2010). These interviews will be carried out via Skype. The purpose of these interviews will be to verify the techniques used by SMIs that were found in literature. The targeted participants for the interviews are:

- *Social media experts* – Social media experts are specialists, not necessary an authority but people who have thorough knowledge and skills in the area of social media (Singh, 2017). Social media experts will be interviewed to provide feedback on techniques used and to clarify on those identified from literature. Social media experts considered for this study will include researchers from the Department of Computing Sciences at the Nelson Mandela University.
- *Social Media Influencers (SMIs)* – SMIs are social media users who have gained a huge following and have attained some level of credibility which can lead to impact or persuasion in interaction with their followers (Pestek and Alic, 2018; De Veirman et al., 2017). SMIs will be interviewed to identify techniques used to engage with millennials.

The snowball approach will be used for gathering participants for the interview. The snowball approach is a non-probability approach for studying hard-to-reach, or equivalently hidden populations (Biernacki and Waldorf, 1981). It is difficult to sample this population because standard statistical sampling methods require a list of population where a sample can be drawn; but for a hidden population, using methods such as a household survey is infeasible when the population is small relative to the general population (Sudman and Kalton, 2003). The snowball sampling approach is also known as Chain-referral sampling which begins with a convenience sample of initial subjects who serve as “seeds” that help in recruiting wave one subjects who in turn then recruit wave two subjects (Heckathorn, 2011). The sample gradually grows wave by wave like a snowball growing as it rolls down a hill.

The first step taken by the researcher will be to approach various SMIs and social media experts by email and via direct messages on their social media pages. SMIs from the social media niche

of travel, lifestyle, beauty and fitness will be approached. In approaching the participants, an introduction explaining the aims of the research and the intended approach of this study will be made.

The interview process will start with the researcher introducing himself and providing a description and purpose of the study. The time duration of forty-five minutes will be communicated to the participants. A consent form will be sent to the participants by email to sign and to state that they had the right to withdraw from the study at any time. The anonymity and confidentiality of the interview will also be stated. The interviews will be conducted on Skype and would be recorded using a voice recorder.

Literature Review – A literature review will be used as the research method for answering RQ₂, RQ₃ and RQ₄. A literature review comprises of summaries and explanations of the current state of existing literature on a topic from academic books and journal articles (McLaughlin Library, 2015). For RQ₂, the literature review will be used as the research method for reviewing information on guidance for using social media as a data collection method. For RQ₃, a literature review will be used for reviewing existing literature on possible SMA tools for adoption in this study. For RQ₄, a literature review will be conducted to investigate the IS success factors and how they can be applied to the social media method to determine success.

Focus groups - A focus group will be used as a research method for RQ₃ and RQ₅. The purpose of using focus group discussions for RQ₃ and RQ₅, is to allow people to form opinions within a social context by interacting with each other (Preece et al., 2015). The focus group discussions will be used to identify the criteria and metrics for selecting and evaluating SMA tools and for measuring the potential success of the proposed social media method.

A focus group is a data collection method that brings together a group of people who are connected to the research area to participate on the discussion of the research topic, which is usually facilitated by the researcher (Matthews and Ross, 2010). Focus groups are semi-structured groups of 4 to 12 people where they can discuss and explore specific sets of issues (Tong et al., 2007). The participants considered for the focus groups are researchers from the field of social sciences. Identifying researchers from the field of social sciences was through a purposive study and snowball sampling, where participants are selected based on their knowledge and experience related to the research project and social media. These participants would in-turn recommend a friend or colleague with relevant knowledge and experience.

In identifying participants for the focus group discussion, these questions pre-defined by Gläser and Laudel, (2010) will be used: Who has the relevant information? Who can provide the most precise information? Who might be willing to provide the necessary information? Which of the informants are available?

The time duration of the discussion will be communicated to the participants and a consent form will be given to the participants to complete. Participants will be notified that the discussion will be recorded using a voice recorder and the recorded discussion will be transcribed.

Social Media Analytics (SMA) – SMA involves techniques for collecting, extracting, analysing and presenting user generated data to aid decision making (Chang et al., 2017). An SMA technique will be used during the focus group discussion to demonstrate how the proposed social media method can provide a solution to the research problem. In answering RQ₅, the SMA solution embedded in the method will be demonstrated to assist in measuring the potential success of the proposed social media method.

2.5 ETHICAL CONSIDERATION

This study will require the participation of human subjects and hence, an approval from the university's Research Ethics Committee: Human (REC-H) was needed. An application was made to the research committee and an ethical clearance was granted. The ethical clearance number reference number is H19-SCI-CSS-003, and this study was classified as a medium risk study. The ethical clearance letter is provided in Appendix A. During the data collection process, consent will be sought from all participants of this research, ensuring the participants that their data will be kept confidential. The anonymity and privacy of participants will be ensured by using assigned numbers during publication of the research.

2.6 SUMMARY

This chapter discusses the DSR methodology and how it is adopted in this research. DSR was chosen for this research because it is a widely accepted legitimate approach to IS research and also because it focuses on the creation of socio-technical artefacts (Gregor and Hevner, 2013). The six activities of the DSR methodology discussed in Peffers (2008) will be applied to this study for the design, development and evaluation of the proposed solution or artefact, which in this case is the method. The research contribution falls under the exaptation quadrant of the

DSR knowledge contribution framework. Exaptation was chosen because it extends well known solution to new problems. The next chapter will discuss the techniques used by SMIs for eliciting millennials' worldviews on the coastal and marine environment.

CHAPTER THREE

TECHNIQUES USED BY SOCIAL MEDIA INFLUENCERS FOR ENGAGING MILLENNIALS

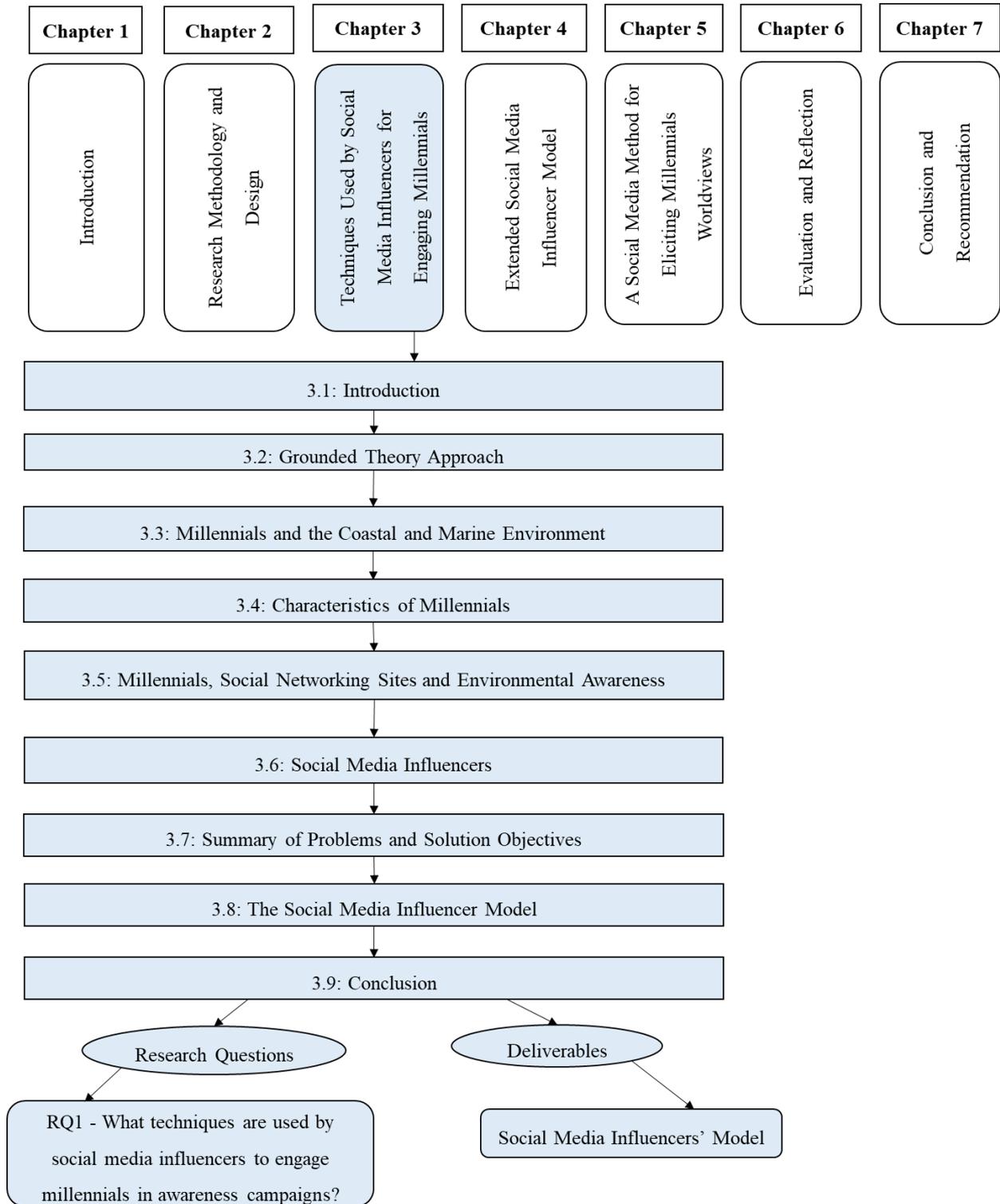


Figure 3-1 Chapter Overview

3.1 INTRODUCTION

The previous chapters introduced the research problem, research questions and research design. An overview of the structure and the research questions addressed in this chapter is shown in Figure 3-1. The DSR activities conducted and reported on in this chapter were identifying the problem (A1) and then defining the objectives of the solution (A2). The following research question is addressed in this chapter:

RQ₁: What techniques are used by social media influencers to engage millennials in awareness campaigns?

In addressing RQ₁, a grounded theory approach was used to analyse the literature on the techniques used by SMIs (Section 3.2). In identifying the problem (A1), literature on millennials, the environment and SNSs' usage was reviewed (Section 3.3, 3.4 and 3.5). In defining the objectives of the solution (A2), an investigation of SMIs techniques for engaging with their followers was performed (Section 3.6). Several problems in the research context were identified and objectives for the solution proposed (Section 3.7). The first part of the solution (the social media method), is the Social Media Influencer Model (Section 3.8). Some conclusions from this literature review were identified (Section 3.9).

3.2 GROUNDED THEORY APPROACH

The grounded theory approach was used for reviewing the literature to provide a thorough and theoretically relevant analysis of RQ₁. The aim of the grounded theory is to point to well-rooted connections between variables (Strauss and Corbin, 1990, 1998; Wolfswinkel et al., 2013). The grounded theory approach of Strauss and Corbin (1990) for literature reviews consists of five stages and were adopted in this research. These five stages are summarised in Figure 3-2 and are discussed in the following sub-sections.

Define	Search	Select	Analyse	Present
<ul style="list-style-type: none"> • Criteria for inclusion or exclusion • Fields of research • Appropriate sources • Specific search terms or keywords 	<ul style="list-style-type: none"> • Search 	<ul style="list-style-type: none"> • Refine the sample 	<ul style="list-style-type: none"> • Open coding • Axial coding • Selective coding 	<ul style="list-style-type: none"> • Represent and structure the content

**Figure 3-2 The Five Stage Grounded Theory Method for Reviewing Literature
(Adapted from (Wolfswinkel et al., 2013))**

3.2.1 Define

In the define stage, one must decide what criteria need to be included and excluded from the study. This stage allows the mapping out of the scope and criteria to be included in the research (Wolfswinkel et al., 2013). The define stage comprises of four steps (Figure 3-2) and are detailed in the following sub sections.

- Criteria for inclusion or exclusion;
- Fields of research; and
- Appropriate sources.

3.2.1.1 *Criteria for inclusion or exclusion*

The criteria to be included for this review are:

- Studies within the last five to eight years;
- Studies that focused on social media use mostly by millennials;
- Studies on interactions with the coastal and marine environment;
- Studies on social networking sites excluding those that cannot be used efficiently for engaging with millennials on environmental issues; and
- Studies that focus on SMIs' attributes, techniques and characteristic.

3.2.1.2 *Fields of research*

The fields of research to be included in this review are:

- **IS** – The scope of this research falls mainly under the IS field because it involves the application of technological applications to manage and improve economic and social welfare.
- **Social Science** – The research is interdisciplinary and hence would make use of IS intervention for engaging with millennials on the coastal and marine environment.
- **Marketing** – In answering RQ₁, research would be carried out on SMIs' techniques, and marketing possesses a wide pool of resources since SMIs in marketing is very popular.

3.2.1.3 *Appropriate sources*

To review literature, a variety of sources were utilised for finding relevant articles. The outlets and databases included in the research were:

- Google Scholar;
- Sage;
- Scopus;
- EBSCOhost;
- Emerald;
- ResearchGate; and
- ScienceDirect.

3.2.1.4 *Specific Search Terms/Keywords*

The search terms and keywords used, and the related sections where the results were discussed are summarised in Table 3-1.

Table 3-1 Search Terms and Keywords

Section 3.3 and 3.4	Section 3.5	Section 3.6
Millennials	Social Networking Sites	Social Media Influencers
Millennials AND Social Media	Facebook	Social Media Influencers' Characteristics
Generation Y	Instagram	Social Media Influencers Techniques
Environmental Awareness	Twitter	Top Social Media Influencers
Tourism	Social Media	
Pro-environmental Behaviours		

In searching for literature on the millennial population, keywords such as ‘millennials’, ‘generation y’ and ‘millennials AND social media’ were used. In conducting searches on social media, keywords such as ‘social networking sites’, ‘Facebook’, ‘Twitter’ and ‘Instagram’ were utilised. The keywords utilised for searches on articles that relate to the environment were ‘environmental awareness’, ‘tourism’ and ‘pro-environmental behaviour’.

3.2.2 Search and Select

In the search and select stage, the actual search through identified sources is done. This stage can be time-consuming, and it often involves the researcher revisiting related criteria for inclusion into the research study (Wolfswinkel et al., 2013). In the select stage, the sample is refined. In this research, the researcher was able to filter and remove variables that do not fit the criteria of the research. This process is shown in Figure 3-3. The articles found from the databases were loaded into a qualitative research tool, ATLAS.ti, where duplicates were removed, and relevant articles were selected by first looking at the title and abstract to see if they referred to SMIs or environmental awareness. Inspection of 398 articles using ATLAS.ti were carried out based on the specific search terms and keywords. Only 70 articles met the desired criteria for inclusion into answering this research question. Backward and forward citation was necessary to enrich the sample by doing iterations until no new relevant articles were discovered (Wolfswinkel et al., 2013). While doing the iterations, 13 new articles were discovered hence a total of 83 articles were included for answering RQ₁

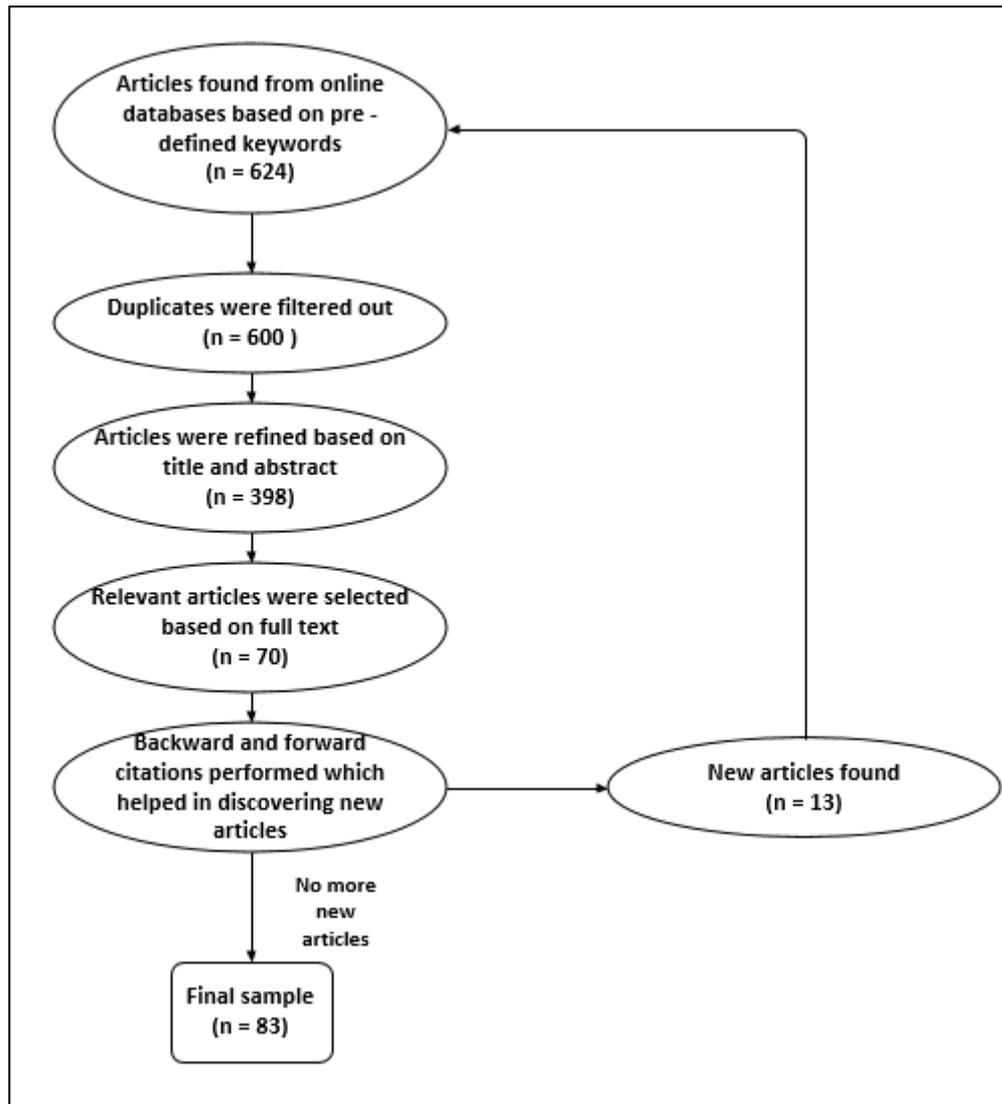


Figure 3-3 The Search and Select Stage Conducted (Author’s own source)

3.2.3 Analyse

In the analyse stage, the key principles of grounded theory are applied for analysing the text of a carefully selected set of individual studies (Wolfswinkel et al., 2013). For this research the ‘analyse’ stage was also carried out using the ATLAS.ti software. This stage consisted of three steps as proposed by Corbin and Strauss (1990) as:

- Open coding;
- Axial coding; and
- Selective coding.

Open Coding involves the “breaking down, examining, comparing, conceptualising, and categorising data” (Corbin and Strauss, 1990, p. 61). In selecting data for open coding, a form

of theoretical sampling known as open sampling is used (Sarker et al., 2001). In answering RQ₁, open sampling will be used to code any line of data that is important or relevant to the study. Open sampling involves identifying certain parts or portions of an article that can lead to or provide greater understanding of the categories and their properties.

This step was carried out using ATLAS.ti by simply highlighting sections of text and assigning codes or categories to them. This step is important at the beginning stage of coding because it allows for proper concept building that will assist with the second and third steps of coding (Lewis, 2016).

Axial Coding involves finding the relations between identified categories and its sub categories, by reassembling fractured data using a coding paradigm that takes the conditions, context and strategies of this research into account (Corbin and Strauss, 1990; Sarker et al., 2001). This is achieved by merging codes that are similar or related (Lewis, 2016). Using ATLAS.ti, codes that were barely used or irrelevant were eliminated. The codes were then categorised into code groups to show sub-categories.

Selective coding involves singling out the core category or phenomenon that would lead to the development of a theory. This allows the researcher to theorise and structure the research in ways he or she deems fit (Sarker et al., 2001; Wolfswinkel et al., 2013). ATLAS.ti can be used to create a network diagram comprising of chains of multiple codes (Lewis, 2016). The network diagrams derived from the chain of multiple codes are a qualitative visual representation of the data (Lewis, 2016).

3.2.4 Present

Information gained from the 'Analyse' stage provides ideas on ways of structuring and presenting the content, findings and insights discovered (Wolfswinkel et al., 2013). In the present stage, the context is represented and structured. The findings from the literature review were analysed according to RQ₁ and the results from ATLAS.ti are illustrated in Figure 3-4 and 3-5 and are discussed in section 3.3 to section 3.6.

3.3 MILLENNIALS AND THE COASTAL AND MARINE ENVIRONMENT

The coastal and marine areas are unique in nature and their supply of coastal land is limited partly because certain forms of socio-economic activities are coast-dependent. A port's location, power plants, desalination and marinas all compete with hotels, residential and ecological interests (Felsenstein and Lichter, 2014). Other activities such as those for recreation, military, nature reserves and fishing are also carried out in coastal and marine areas. The competition for coastal land is as a result of the opportunity cost of forfeiting a coastal location due to limited alternatives (Felsenstein and Lichter, 2014; Min et al., 2016). Environmental degradation caused by developments along the coast has been a major concern, which has resulted in pollution and destruction of the ecosystem (Satumanatpan et al., 2017).

Over the years, marine and coastal spaces have been home to a growing number of facilities and human activities. This growth in human activities has come with major challenges relating to biodiversity, economic development, land use planning and the degradation of ecological footprints (Papageorgiou, 2016; Ro, 2014). Marine exploitation and the construction of resilient sea infrastructure have been the major cause of environmental degradation at sea. A resilient sea infrastructure and the facilities constructed has led to the development of various economic activities, such as aquaculture, energy production etc. (Hall, 2001; Papageorgiou, 2016; Rennie, 2010). Lately, tourism has had the most interactions with the coastal and marine environment, which has contributed to freshwater scarcity, and inefficient waste management systems.

Coastal and marine environments have seen an increase in attraction as places to live or to holiday in, resulting in new types of dwellers called tourists. Tourists occupy productive marine spaces with consumptive 'play spaces' (Rennie, 2010). The disturbance of productive marine spaces has led to the destruction of rare and endangered species as a result of trampling or interference of breeding habitat (Lakshmi and Shaji, 2016). According to Papageorgiou (2016), "Tourism activities are growing at an alarming rate with a multidimensional nature and growing tendency to overwhelm coastal and marine space, which is a fragile ecosystem". Millennials have been recognised as the fastest growing segment of tourism users (Alcakovic et al., 2018). Millennials now constantly seek coastal destinations to visit, which has led to an increase in the construction of tourist facilities and infrastructure in the fragile coastal environment (Papageorgiou, 2016; Satumanatpan et al., 2017).

Millennials are environmentally aware in a general sense; they possess limited knowledge of environmental matters and ecological processes (Wall, 2017). Although they are the least investigated, the fact that millennials are peculiar in practices in terms of behaviour and lifestyle should not be ignored. Millennials are in search of special environments characterised by innovation, creativity, smart and social mobile technologies (Future Challenges, 2016).

Environmental awareness is a component of environmental education that provides individuals and groups with awareness about environmental issues and sensitivities. It is the behavioural inclination to protect the environment and awareness of the human activities affecting it (Altaher, 2013). The provision of information is vital in kick-starting any environmental campaign since this information helps in providing individuals with the proper skills, knowledge and attitudes in tackling environmental concerns (Apil and Okaka, 2013; Tlebere et al., 2015). A huge concern on environmental issues and societal pressure to create environmental awareness could, in turn, influence people's behaviour by informing them about the effects of environmental hazards and global warming (UNESCO, 1997). A concept known as Earth Stewardship has been developed where individuals and organisations bear the responsibility of being environmentally responsible and promoting sustainable practices (Haşiloğlu et al., 2011).

Millennials connect with the environment differently from older generations. In order to encourage people to achieve a sustainable future, environmental awareness can be created by developing a personal exploration of their surroundings (Talero, 2004). Addressing environmental awareness is therefore important due to the world population increase and high standard of living, which produces a larger environmental burden and impact (Haşiloğlu et al., 2011). In increasing environmental awareness and concerns, insights into millennials' worldviews on the coastal and marine environment is required.

3.4 CHARACTERISTICS OF MILLENNIALS

Millennials are defined as a generation of individuals born between the early 1977s and early 2000s, who form a vital part of the digital revolution that saw social media become a source of information (Mangold and Smith, 2012; Mizelle and Beck, 2018). This group of individuals, also known as generation Y, were born for technology and brought technology into the economic and cultural focus and hence would struggle to live without it (Alcakovic et al., 2018). Millennials are currently between the ages of 17 and 37, and according to geographical

location, this age may vary. Due to the changes they have had in their lives from childhood to adulthood, they have been influenced by world events, social and economic changes as well as technological integration in their day to day lives (Moreno et al., 2017). Millennials are generally creative, multitaskers who desire interactive tools and quick answers to solve most of their problems (Johanson, 2012; Sanchez, 2016).

Millennials are different from other generations when it comes to social media usage. They have been exposed to interactive technologies and have had mobile access at a very early age (Radzi et al., 2018). Social media has been integrated into many aspects of millennials' daily lives and they are adopting new online communication technologies (Jost et al., 2014). Social media can be used to support environmental campaigns and millennials are very likely to gather support for community-based initiatives that would improve society or the global environment through social media. Despite the continuous usage of social media in marketing practices, there still remains limited studies done on millennials' engagement on social media (Radzi et al., 2018). Social media enables interacting and building connections with other entities to allow for the sharing and exchange of multimedia updates (Newman et al., 2016).

3.5 MILLENNIALS, SOCIAL NETWORKING SITES AND ENVIRONMENTAL AWARENESS

The relationship between millennials and social media are deemed inseparable (Radzi et al., 2018). Social media is a group of web-based software and services that allows its users to share, exchange, communicate, discuss and engage in an online social interaction (Sago, 2010). Social media interaction could be through text, audio, video and other media which can be used individually or as a combination for social interaction (Sago, 2010). Various social media technologies include blogs, picture sharing, vlogs, wall postings, email, instant messaging and many others (Sago, 2010). Social media can be used for social dialogue because it supports the human need for social interaction, and it allows for the democratisation of knowledge by continuously transforming people from content consumers to creators (Sago, 2010).

3.5.1 Social Networking Sites

Social Networking Sites (SNSs) are a key subset of social media and are websites that provide a virtual community for those individuals interested in a topic or want to interact and meet up with new people (Sago, 2010). Users are allowed to create a profile containing biographical data as well as pictures, likes, dislikes and any other information they would like to post (Sago,

2010). SNSs allow its users to communicate using voice, instant message, chat, videoconference and blogs, and its services allow friends of friends to be connected (Sago, 2010). Millennials utilise SNSs to promote causes they believe in and there have been many campaigns carried out using these sites as a platform. SNSs have been used to foster environmental behaviour, to provide news, sign petitions, and to create more awareness and motivations (Kaur, 2015; Muoio, 2017). Millennials use a lot of digital social networks and seventy-seven percent of this generation uses SNSs (Sago, 2010).

Over the past decade, a variety of SNSs have grown to be a necessity in the everyday lives of individuals around the globe and are replacing previous modes of data collection, social interaction, information or opinion sharing as well as self-expression (Choi and Sung, 2018). Amongst the SNSs, Facebook remains the most popular with Instagram and Snapchat displaying an uptrend in terms of daily active users (Choi and Sung, 2018). Some of the SNSs used by millennials according to a research done by the Pew Research Centre in 2019 are as follows (Perrin and Anderson, 2019; Phua et al., 2017):

- Facebook;
- Instagram;
- Snapchat;
- Twitter; and
- YouTube.

Facebook has a massive number of users as compared to other SNSs like YouTube, Twitter and Instagram (Choi and Sung, 2018; Nasliza et al., 2013; Rahim and Directorate, 2016). According to Statista (2018), 88% of online users within the ages of 18-29 are on Facebook and 84% of online users within the age of 30-49 utilise Facebook. The millennials are within the ages of 17-37 and fall under the most active users of Facebook which is an indication of the need to investigate and understand the millennial generation. Facebook allows its users to share content of various types such as text, links, images and videos to their network of contacts.

According to Fatma (2014), Facebook has been an effective medium for keeping projects alive, to generate valuable perceptions and to create an engagement about the area of discussion. Facebook provides an efficient, productive and measurable communication channel for implementing social responsibility and awareness campaigns. The communication channels of

Facebook allows the generation of millennials' opinions on environmental issues, for visualisation of the current issues and the provision of support for actions or campaigns (Göksu, 2014). Questionnaires or surveys on Facebook can be created to obtain opinions quickly. These surveys can be based on a variety of topics and can provide useful knowledge for educational and research purposes (Oltulu et al., 2018). Environmental conservation discussions can be carried out using Facebook where its users can share their opinions, and create awareness of environmental issues (Scholtz et al., 2016)

Instagram is an online mobile photo-sharing, video-sharing and SNS that allows its users share media on its own platform as well as on other SNSs (Dan Frommer, 2010). Currently, it is the fastest growing SNS globally (Fiallos et al., 2018; Sheldon and Bryant, 2016). It attracts up to 150 million active users and posts made daily amount to an average of 55 million pictures (Manikonda et al., 2014). In 2012, a survey done by the Pew Research Centre highlights that young adults between the ages of 18 and 29 are the major users of Instagram (Pew Research Center, 2015). Although Instagram is one of the most popular SNSs, there is limited academic research regarding its use as compared to the likes of Facebook and Twitter (Lay and Ferwerda, 2018).

Nowadays, individuals communicate visually and interact by sharing images on social media (Choi and Sung, 2018; Shah, 2016). One characteristic of Instagram, similar to Twitter is its ability to allow users to share photographs and videos by using hashtags (#). The use of hashtags can allow other users find photographs (Sheldon and Bryant, 2016). The user might be trying to communicate his or her intent behind posting a picture with the use of some hashtags. Several researchers suggest that hashtags carry some emotional information, which is not directly related with the context in which they appear (Fiallos et al., 2018; Giannoulakis and Tsapatsoulis, 2016; Kunneman et al., 2014).

Snapchat's usage has been increasing among the millennials and currently trails behind Facebook and Instagram are the third most popular SNS (Perrin and Anderson, 2019; Utz et al., 2015). Snapchat is a photo-sharing app that allows users send snaps (photos or videos) to friends (Utz et al., 2015). One unique feature of snaps on Snapchat is the ability for it to disappear after few seconds. Snapchat has been a successful medium for brand engagement among the millennials (Adams, 2015). Snapchat's "my story" location based feature allows users to broadcast content from events to others who were not able to experience it first-hand (Adams, 2015). Among its many features includes live video chatting, messaging, creating

caricature-like Bitmoji avatars and a “Discovery” area for showcasing content from major publishers (Tillman, 2019). Snapchat is used as an antithesis of traditional social network, instead of it being a repository of memories, it is more spontaneous and doesn't sentimentalise (Bates, 2019).

Twitter is an online SNS that allows its users to write Tweets. Tweets are a combination of 280 (formally 140-word combination) characters that describe the user's thoughts (Oltulu et al., 2018). Twitter is a SNS for following and building friendships online (Abdelsadek et al., 2018; Oltulu et al., 2018). The five main features of Twitter are Tweets, reTweets, hashtags, @-messages and followers' relations (Kayser and Bierwisch, 2016). According to Brenner (2013), the most likely users on Twitter are those under 50 years old, especially the millennials. Although Twitter profiles do not possess an age attribute that can extract the ages of the user, the information on their online profiles can be analysed to identify words and phrases peculiar to certain age groups (Sloan et al., 2018).

The functionalities of Twitter depend on its Tweets or reTweets rather than the number of followers one has accumulated (Oltulu et al., 2018). Twitter remains a very powerful medium for networking and sharing information (Kayser and Bierwisch, 2016; Oltulu et al., 2018). Twitter has attracted attention over the years for its provision of real-time news and a broad spectrum of topics discussed which provide many opportunities for scholarly research and observation of online communications during a crisis (Kayser and Bierwisch, 2016). Twitter provides a free detailed analytic tool for its users to obtain analysis on Tweets, replies, impressions, and follower network. In order to utilise this analytic feature, the user must first give authorisation for Twitter to track analytic data on their account (Oltulu et al., 2018). Twitter possesses the functionalities to create environmental campaigns to measure public participation and opinions among the millennials (Kayser and Bierwisch, 2016).

YouTube - YouTube is a popular video sharing platform and the second largest online search engine after Google. Billions of contents have been posted on the platform since it was founded in 2005 (Moreau, 2019). These contents range from Hollywood movie trailers and music videos to vlogs (video blogs) and random videos. YouTube is currently driven by two types of users, the video creators and video viewers (Moreau, 2019). YouTube's audience appeals to both young and old, it is more popular among millennials who prefer a wide variety of interactive content and instant gratification over traditional television (Adparlor, 2019; Moreau, 2019).

3.5.2 Social Networking Sites for Environmental Awareness

The most important challenge in the path to sustainability is inducing pro-environmental behaviours in individuals (Kaur and Chahal, 2018). In promoting environment friendly behaviours, there is a need for communication on environment related issues, but it encounters problems such as lack of significant awareness. SNSs are utilised by environment friendly groups to spread information and awareness on environmental issues through the use of environment related posts and environment protection fan pages (Kaur and Chahal, 2018). Due to the potential reach of social media to a wide audience, SNSs can act as an effective medium encouraging and motivating users to develop pro-environmental behaviours by participating in environment friendly activities. In communicating and educating the public on environmental awareness and issues, researchers are taking the initiative to utilise SNSs (Kaur and Chahal, 2018; Koteyko et al., 2015; Newell and Dale, 2015).

3.6 SOCIAL MEDIA INFLUENCERS

Social Media Influencers (SMIs) are social media users who have gained a huge following and have attained some level of credibility that can lead to impact or persuasion in interaction with their followers (Pestek and Alic, 2018; De Veirman et al., 2017). SMIs are also known as opinion leaders, who possess a great amount of influence on the attitudes, behaviours and decisions of people (Casaló et al., 2018). According to Freberg *et al.*, (2011) SMIs are an emerging type of third-party endorsers that aim to shape and influence the attitude and perception of people through social media. In the field of marketing, SMIs have had great impact on customer retention and relationships. Marketers have been able to track SMIs whose social media content is attractive and interesting as a means of reaching their target audience in a genuine way (Pestek and Alic, 2018).

Technological advancements and the growth of digital services for monitoring and recording activities has opened a window for research into human behaviours (Lay and Ferwerda, 2018). Statistics have shown that humans spend most of their time on SNSs, which have provided a good avenue for studies on human behaviour and personalities (Lay and Ferwerda, 2018). The growth of SNSs over the years allowed the rise of SMIs, which provides unexplored potential for engagement. The ability of users of SNSs to grow their following and generate influence and trust among followers has become a source of capacity for reach to target audiences in a credible and effective way (Pestek and Alic, 2018). A large number of followers accumulated over time has made these SMIs micro-celebrities (Chae, 2018). Influencers on social media can

range from would-be or unknown actresses and models, fitness trainers and musicians to wealthy people who love luxury (Chae, 2018).

3.6.1 Top 10 Social Media Influencers

Amassing a huge following on a social networking site is one thing but the ability to diversify across multiple SNSs enables SMIs to attain a new level of success. This allows for influencers' campaigns to cut across through a vast network of SNSs. This section outlines the top 10 most followed SMIs in 2019 across four primary SNSs including YouTube, Instagram, Facebook, and Twitter. The list of SMIs are discussed in decreasing order of total followers.

- PEWDIEPIE – 147.5 Million Total Followers;
- WHINDERSSON NUNES – 90.4 Million Total Followers;
- DUDE PERFECT – 74.5 Million Total Followers;
- EL RUBIUS – 66.7 Million Total Followers;
- LELE PONS – 57.7 Million Total Followers;
- LOGAN PAUL – 56.8 Million Total Followers;
- MARKIPLIER – 47.5 Million Total Followers;
- CAMERON DALLAS – 46.4 Million Total Followers
- LIZA KOSHY – 40.84 Million Total Followers; and
- ZOELLA – 23.9 Million Total Followers.

1. PEWDIEPIE – 147.5 Million Total Followers

Pewdiepie also known as Felix Kjellberg is the biggest of the YouTube stars. He makes videos on a mix of video-game narrations, humorous rants and commentary (Herrman, 2017). These videos have been viewed billions of times and he has more than a 100 million people subscribed to his YouTube channel (Herrman, 2017; Mediakix, 2019). He is also quite popular on Instagram, Facebook and Twitter reaching nearly 120 million across the four platforms. He has leveraged his online fame to launch a limited-edition apparel line. The statistics of his following are;

- YouTube – 101 Million Subscribers;
- Instagram – 20.3 Million Followers;
- Facebook – 7.4 Million Page Likes; and

- Twitter – 18.8 Million Followers.

2. WHINDERSSON NUNES – 90.4 Million Total Followers

Whindersson Nunes is a Brazilian influencer and a man of many talents. He started his career at the age of 15 and has amassed a huge following that is nearly one-fourth the size of his home country (Mediakix, 2019). He is a jokester and posts hilarious photos on Instagram and Facebook. He also publishes music parodies on YouTube. The statistics of his following are;

- YouTube – 36.9 Million Subscribers;
- Instagram – 34.2 Million Followers;
- Facebook – 6.8 Million Followers; and
- Twitter – 12.5 Million Followers.

3. DUDE PERFECT – 74.5 Million Total Followers

Dude Perfect is a sports entertainment company that was started by five friends and former high school basketball players (Mediakix, 2019). Their rise to fame was after publishing a viral basketball trick shot video on YouTube back in 2009. After amassing a huge following across different SNSs, the group started an online merchandise store, their own television series and multiple mobile apps. The statistics of the group's following are;

- YouTube – 46 Million Subscribers;
- Instagram – 9.8 Million Followers;
- Facebook – 18.3 Million Page Likes; and
- Twitter – 410 Thousand Followers.

4. EL RUBIUS – 66.7 Million Total Followers

El Rubius also known as Ruben Gunderson is one of the most famous influencers in Spain. Ruben created his YouTube channel elrubiusOMG in 2011 and his videos are mostly on gameplays and vlogs occasionally (Mediakix, 2019). Ruben started recording his video games at age 16 for amusement through his humorous commentary (Kate Samuelson, 2016). Ruben expertly leverages different SNSs for different purposes. On Instagram, Ruben offers a sneak peek into his personal life while on Twitter, he features hilarious memes. The statistics of his following are;

- YouTube – 35.8 Million Subscribers;
- Instagram – 10.9 Million Followers;
- Facebook – 6.9 Million Page Likes; and
- Twitter – 13.1 Million Followers.

5. LELE PONS – 57.7 Million Total Followers

Lele Pons is a 22-year-old Venezuelan-American and a comedian who frequently incorporates slapstick comedy into the comedy skits she films (Mediakix, 2019). She has her largest following on Instagram where she regularly shares funny short skits with friends. She started as a 16-year-old on Vine and has now amassed a huge following on various SNSs. She made it into the Forbes' 30 under 30 list two years in a row and now concentrates on her music career hoping to utilise her large following to push her musical career further. The statistics of her following are;

- YouTube – 15.1 Million Subscribers;
- Instagram – 36.8 Million Followers;
- Facebook – 3.9 Million Page Likes; and
- Twitter – 1.9 Million Followers.

6. LOGAN PAUL – 56.8 Million Total Followers

Logan Paul is a 24-year-old who was first a Vine sensation before transitioning to YouTube in 2015. One unique trait Logan Paul possesses is that he can diversify across SNSs (Mediakix, 2019). He has maintained equally large audiences on Facebook, Instagram and YouTube. The statistics of his following are;

- YouTube – 19.8 Million Subscribers;
- Instagram – 16.4 Million Followers;
- Facebook – 15.6 Million Page Likes; and
- Twitter – 5 Million Followers.

7. MARKIPLIER – 47.5 Million Total Followers

Markiplier better known as Mark Fischbach is one of the internet's favourite video game players. His gaming content on YouTube has a lot of humour and entertainment (Mediakix,

2019). Although YouTube is his main channel, he leverages on other SNSs such as Instagram, Facebook and Twitter for more focus on his personal life. Mark Fischbach is also known for his funding and charitable causes. He is involved in causes such as children’s rights and causes relating to access to clean water. The statistics of his following are;

- YouTube – 24.4 Million Subscribers;
- Instagram – 7.4 Million Followers;
- Facebook – 3.3 Million Page Likes; and
- Twitter – 12.4 Million Followers.

8. CAMERON DALLAS – 46.4 Million Total Followers

Cameron Dallas is a 24-year-old internet star. He is currently on a Netflix reality show “Chasing Cameron”. He has over 46 million followers across YouTube, Instagram, Facebook and Twitter where he posts humorous videos (Mediakix, 2019). He has also ventured into modelling and now has a clothing line. The statistics of his following are;

- YouTube – 5.57 Million Subscribers;
- Instagram – 21.2 Million Followers;
- Facebook – 3.6 Million Page Likes; and
- Twitter – 16.1 Million Followers.

9. LIZA KOSHY – 40.84 Million Total Followers

Liza Koshy built a reputation on Vine as a hilarious actress and personality. She transitioned into YouTube and now has over 16 million subscribers (Mediakix, 2019). Among her impressive list of accomplishment, her comedic precision granted her an interview with President Obama. The statistics of her following are;

- YouTube – 17.3 Million Subscribers;
- Instagram – 17.9 Million Followers;
- Facebook – 2.9 Million Page Likes; and
- Twitter – 2.74 Million Followers.

10. ZOELLA – 23.9 Million Total Followers

Zoe Sugg also known as Zoella is the second most successful UK vlogger outside of music vlogging (Jerslev, 2016). Zoella started a fashion blog at the age of 19 which quickly turned into a YouTube channel. Her honesty and candour with her followers have contributed immensely to her success. She discusses critical and sensitive issues in the context of her experiences across SNSs (Mediakix, 2019). The statistics of her following are;

- YouTube – 11.6 Million Subscribers;
- Instagram – 9.7 Million Followers;
- Facebook – 2.4 Million Page Likes;
- Twitter – 209 Thousand Followers.

3.6.2 The Role of Social Media Influencers in Environmental Awareness

Recently, the possibilities of forging alliances with SMIs in promoting brands and products has been recognised (Freberg et al., 2011). In engaging with millennials about the coastal and marine environment, there is a need for new inventive strategies to communicate to the public on particular subjects such as climate change, biodiversity loss and sustainability (Galetti and Costa-Pereira, 2017). SMIs can have a strong social and cultural impact over a large audience to spread important messages (Galetti and Costa-Pereira, 2017). There are instances where environmentalists and conservationists have taken a marketing approach by using SMIs for launching eye-opening campaigns. The World Wildlife Fund (WWF) once launched a campaign targeting Generation Z and millennial audiences to showcase the effects of environmental destruction (Brand Communications, 2018). The WWF partnered with nine travel SMIs using the hashtag #TooLatergram to launch its own #TooLatergram campaign on Instagram. Users on social media swiped through images posted and saw landscapes that have been affected by pollution and climate change. The caption under these images reads “Unfortunately, you won’t be able to see these places anymore” (Brand Communications, 2018). But there are still places that need our help to be saved”. Instagram users all over the world participated and kept the conversation going by sharing, liking and leaving their personal opinions on the comment sections.

The Brazilian president, Michael Temer was once convinced not to sign a decree reducing the Amazon protected areas. This incident occurred when scientist, environmentalist, and well-

known governmental organisations learnt about the president's decision through a post by an SMI named Gisele Bundchen on social media. Due to a huge uproar, the president rejected signing the decree (Galetti and Costa-Pereira, 2017). If people can be influenced on what to eat and how to dress by SMIs, then SMIs can be utilised to inspire people to make more rational and environmentally conscious decisions. In devising a means to effectively engage with millennials on issues facing the marine and coastal environment, environmentalists can work with SMIs, especially those who have an interest in environmental awareness.

3.6.3 Characteristics of Social Media Influencers¹

There are common characteristics among successful SMIs. SMIs possess a sense of humour and their own perspective but most importantly they exhibit what their followers adore and wish they had (Abidin, 2016). SMIs can be identified by examining their follower network through a social network analysis (Stieglitz et al., 2018). Technological advancement can also help in identifying influencers that are relevant to a brand, cause or organisation (Freberg et al., 2011). The ability of influencers to form a strong bond with like-minded individuals on SNSs cannot be overemphasised. This connection or bond is fortified with valuable and meaningful interactions (Solis and Webber, 2012). In marketing, an SMI's direct voice and the trust possessed by consumers for these individuals influences the brand through a two way conversation on the product via SNSs (Booth and Matic, 2011; Morgan Glucksman, 2017).

The capacity for an SMI to influence other people can range from a variety of factors such as a substantial following on SNSs, notable structure or an authority within a community, and the size and loyalty of an audience (Solis and Webber, 2012). Although the size of followers of a SMI is a factor when discussing the capacity to influence, this is not always the best indication of the success of an influencer. Studies have shown that even mid-level influencers on SNSs can hold more engagement and power than those SMIs with a huge following (Pestek and Alic, 2018). The reason for this lies in the fact that SMIs with a smaller following may hold a stronger loyalty among their followers (Pestek and Alic, 2018). According to Ruiz-Gomez (2019), these influencers with a small following are known as micro-influencers, and based on the world of practitioners bar regarding audience size, micro influencers' following should be in the range of 5,000 to 50,000 followers. The range is, however, not standard across all platforms.

¹ The results discussed in this section were published in SAICSIT '19 Proceeding of the South Africa Institute of Computer Scientists and Information Technologists 2019. A Grounded Theory Analysis of the Techniques Used by Social Media Influencers and their Potential for Influencing Environmental Awareness. Brenda M. Scholtz and Bernadette Snow. Skukuza, South Africa — September 17 - 18, 2019 (Appendix J)

YouTube for example, only allows content creators to join its partner program when subscribers sit at a minimum of 1,000 subscribers and 4,000 watch hours (Ruiz-Gomez, 2019). Micro-influencers on Instagram should be capped at a minimum of 5000 followers (Weinstein, 2018).

According to Solis and Webber (2012), the ability to influence is a measure of social capital, which is made up of several pillars that contribute as characteristics that SMIs must possess to influence and build engagement with their followers successfully. In Figure 3-6, these characteristics will be based on the three pillars of influence to clarify the attributes SMIs must possess in measuring the capacity to cause change. The three pillars are:

- Reach;
- Relevance; and
- Resonance.

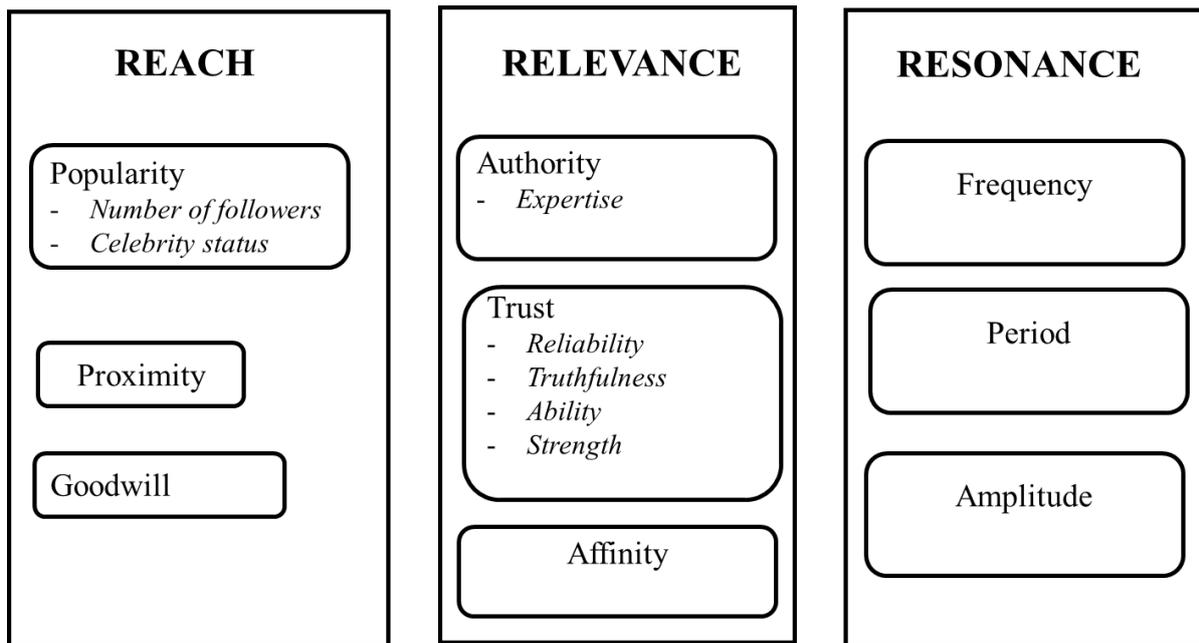


Figure 3-6 Framework: Pillars of Influence adapted from (Solis and Webber, 2012)

Reach is the first pillar of influence and defines how far information can travel across the SNSs and the communities at large. It is a measure of popularity, affinity and goodwill (Solis and Webber, 2012).

- Popularity – This is the state of which the SMI is being followed by many people.

- Proximity – The location of the SMI can also be taken into consideration because this can influence the subject matter.
- Goodwill – In order to increase appreciation, goodwill should be invested into the social network community to increase the probability for collaboration and action.

Relevance is the second pillar and it refers to how individuals are aligned through the subject matter (Solis and Webber, 2012). One of the keys to successful engagement is that the subject matter and content of social media posts should be interesting and attention grabbing. Relevance helps build relationships among like-minded individuals. Relevance is a measure of authority, trust and affinity.

- Authority – The SMI earns a level of authority for investing on a subject or topical relevance over time. Respect is earned from having authority in a subject or topic. This is a reward for expertise or specialty.
- Trust – Trust refers to the assurance of the SMI's reliability, truthfulness, ability and strength.
- Affinity – Affinity refers to the liking of someone or something. In marketing, customers possess liking of a certain brand, which helps in establishing connections with a community.

Resonance is a measure of the duration, frequency and level of interactivity around content or posts on a SNS (Solis and Webber, 2012). More people will see each post or update if the resonance is high, which would in turn influence the reach and the duration of content on followers' timelines. In increasing interactivity, SMIs need to have a proper commitment and involvement with their followers. An uninteresting and disregarding SMI can severely damage effects on their capacity to reach followings (Solis and Webber, 2012). The three elements of resonance are:

- Frequency – refers to the rate at which a subject or topic materialises on social media.
- Period – refers to the length of time a post remains visible after it was initially posted.
- Amplitude – refers to the level of engagement on a SNS.

3.6.4 Techniques Used by Social Media Influencers to Engage with Followers²

The influence SMIs have over their followers, media coverage and organisations cannot be overemphasised. The followers of SMIs are influenced by issue-relevant opinions that meet their information and emotional needs on specific issues. Through “word of mouth communication”, these followers can in turn influence non-followers (Pang et al., 2016). There are certain instances where awareness campaigns generated by SMIs affect media coverage and as a result; journalists source and repackage SMIs’ content and disseminate them to news audiences (Pang et al., 2016). The credibility of SMIs lies in their ability to affect media coverage, improve the public’s awareness on key issues and to persuade their followers to assume certain courses of action (Freberg et al., 2011 as cited in Pang et al., 2016). There are a variety of techniques used by SMIs to engage and get people talking on social media. The most commonly reported five techniques are as follows:

- Direct Engagement;
- Collaborative Tagging and Hashtags;
- The Use of Emojis;
- Social Timing;
- Content Curation; and
- Incentive Appeals.

Direct Engagement – Users on SNSs can express their thoughts and opinions online (Khalid et al., 2018). Proper commitment and involvement with followers is one of the most important techniques utilised by SMIs (Pestek and Alic, 2018). The comment section provides a great avenue for SMIs to engage the public on awareness campaigns. The comment section is the cornerstone of all interactions on SNSs, because this is where users interact and express their opinions on an SMIs’ content (Pestek and Alic, 2018). An SMIs’ followers feel listened to when an influencer pays attention and reacts to the voices in the comment section, this would in turn help the SMI generate insights on the views of its followers (Pestek and Alic, 2018).

² The results discussed in this section were published in SAICSIT ’19 Proceeding of the South Africa Institute of Computer Scientists and Information Technologists 2019. A Grounded Theory Analysis of the Techniques Used by Social Media Influencers and their Potential for Influencing Environmental Awareness. Brenda M. Scholtz and Bernadette Snow. Skukuza, South Africa — September 17 - 18, 2019 (Appendix J)

Collaborative Tagging and Hashtags – Collaborative tagging allows users to annotate webpages or other online resources using tags. This appears to be among one of the most successful techniques on SNSs (Zeng et al., 2010). Tags can be shared amongst users and allows the exploration of a wide range of information for retrieval or for recommendation purposes (Zeng et al., 2010). In marketing, tagging allows SMIs’ followers to go directly to the source of the product tagged if one is interested (Morgan Glucksman, 2017). SMIs utilise collaborative tagging on SNSs to direct its followers to other influencers’ pages or blogs (Khalid et al., 2018). Hashtags are mostly used on SNSs and are tags for marking a topic of a text. They comprise of 2 to 3 words or an abbreviation (Murzintcev and Cheng, 2017). Hashtags always starts with the “#” hash sign and are used as a strategy to lead users of certain interest to find out more if others have posted using the same hashtags (Khalid et al., 2018; Murzintcev and Cheng, 2017). The large number of posts by users on certain hashtags allows the content to be regarded more trustworthy and sparks up personal thoughts and conversation on social media (Khalid et al., 2018). The #BeatPlasticPollution movement was supported by the United Nations in 2018 during the World Environment Day (United Nations (UN), 2018). This hashtag was used to support a global awareness campaign to discourage the use of disposable plastic products. Collaborative tagging and hashtags maximise exposure and make content more visible to social media users.

The Use of Emojis – In creating content aimed at influencing peoples’ awareness and ultimately pro-environmental behaviour, the style and idea should be engaging. In awareness campaigns, SMIs can engage with the public by using stylistic features that are superficially attractive and entertaining (Thompson et al., 2011). The content should be easy to process, interesting, mentally stimulating and emotionally arousing. Emojis have emerged as an integral part of social media marketing, and retail marketers have embraced the use of emojis to engage with potential and repeat customers in order to increase sales (Ge and Gretzel, 2018; Lee, 2018). Emojis can also be referred to as picture-words. They are a form of a standard language that is used across various platforms and cultures (Ge and Gretzel, 2018).

Emojis are used for illustration, or in some cases, replace words sent digitally, and they add depth to messages by providing electronic gestures that convey the warmth of a face-to-face communication (Lee, 2018). According to Ge and Gretzel (Ge and Gretzel, 2018), SMIs make use of ‘verbal moves’ when initiating or engaging with social media followers. Verbal moves in the context of social media are “speech conveyed through text, emoticons, non-standard

orthography, and/or emojis that serve a particular communicative purpose” (Ge and Gretzel, 2018, p. 8). Influencers utilise emojis in various ways to initiate verbal moves, such as expressing emotions and opinions, delivering information, and asking their followers for input (Ge and Gretzel, 2018). Emojis enable creativity and engagement with users when communicating, and are opening new opportunities for innovative ways to make information more engaging and playful (Lee, 2018). SMIs utilise single or mixed rhetorical appeals in their moves by using one or multiple emojis to engage with followers or to create an ongoing conversation on their posts (Ge and Gretzel, 2018). In order to cause change in peoples’ environmental awareness and pro-environmental behaviour, the presentation of content by SMIs should be personally involving and relevant so that the receivers can relate to them as applicable to their situation and needs. The message being presented by the SMI should be simple, explicit, sufficiently detailed, comprehensive, and comprehensible (Thompson et al., 2011).

Social Timing and Frequency – Interactivity on content shared on social media defines the level of engagement achieved by a SMI, but building interactivity requires social timing. Social timing in the context of social media engagement refers to posting at the right day and time to increase likes, shares and clicks (Patel, 2017). Dan Zarrella (2013) conducted an extensive research on the content posted by 10,000 SMIs on Facebook. The likes, comments and shares on each post were investigated by analysing the day of the week the content that was posted.

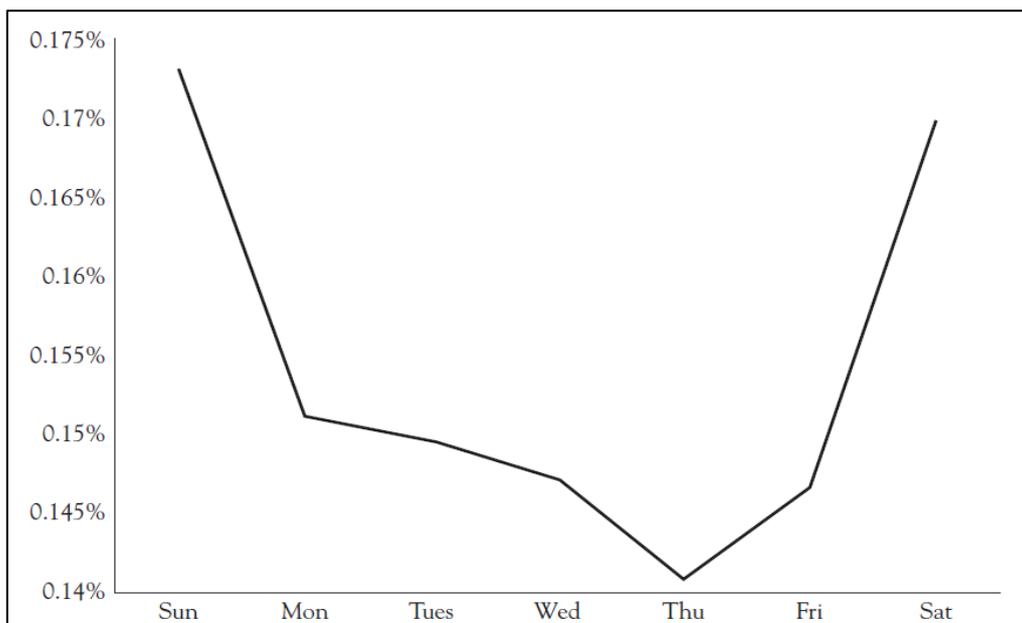


Figure 3-7 Relationship between the Day of the Week and Likes Obtained

Figure 3-7 shows the relationship between the day of the week and the number of likes on a post. The like rate was calculated by dividing the number of likes on a post by the total number of likes on the SMI's page. Figure 3-7 showed that content posted on Saturdays and Sundays got more likes than content posted during weekdays (Zarrella, 2013).

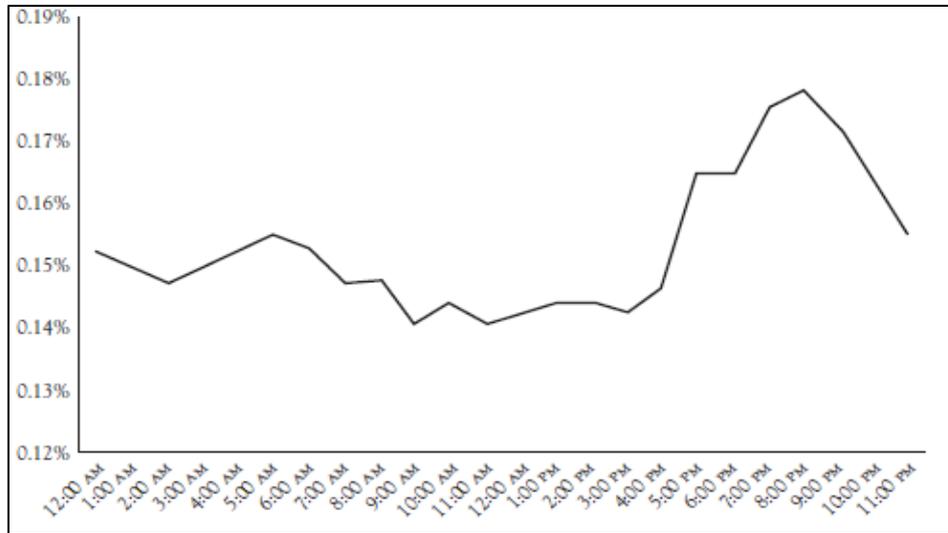


Figure 3-8 Relationship between Time of Day and Likes Obtained (Zarrella. 2013)

Figure 3-8 shows that content posted in the evening between the hours of 5pm and midnight got more likes compared to content posted other times of the day. This could be because Facebook usage at work or school is frowned on and most Facebook activity happens at home immediately after work or school. This data shows the importance of posting content to engage with users outside of the workday and also to remind marketers and SMIs that they compete not only with work schedule but also with real life activities such as dinner, family time, and television (Zarrella, 2013).

In terms of frequency, it varies according to SNSs. Three Tweets per day is about right for Twitter and data suggests that after the third tweet, engagement slightly decreases (Spark Staff, 2016). Despite this suggestion, it is best to have conversations as they come up because this will help in engaging followers better than scheduling a tweet. A good Facebook approach to posting frequency is about once or twice each weekday and once over the weekend. This way would prevent bombarding people's feeds, although users love interacting with their favourite brand or SMI, posting too often could cause the loss of page likes (Spark Staff, 2016). Instagram unlike Twitter and Facebook doesn't come with any clear best practices. The frequency of post depends on the goals of engagement an influencer or a brand aims to achieve.

Content Curation – Content curation is the act of searching, categorising and organising relevant online content that addresses a specific issue (Fotopoulou and Couldry, 2015). In social media, curation can be defined as the process of remixing social media content for further consumption (Duh et al., 2011). Social media users can curate existing content by searching for a collection of posts from diverse sources, reorganise them to fit the given context or perspective, and publishing the final story to their followers (Duh et al., 2011). Due to the information overload on social media, curation provides a promising way to interact and engage on social media (Duh et al., 2011). Twitter provides information in real time, which produces an unstoppable wave of content; curation is vital here because it helps to filter out unnecessary information (Ingram, 2011). The ability for an SMI to curate and link other people's content not only refers its followers to recommended sources but also allows its followers to interact and network with the original content creator (Jain, 2013). People care a lot about their content on social media and when someone else promotes their content through content curation, they are most likely to reciprocate by retweeting or sharing the post with their followers (Akinlabi, 2017). In awareness campaigns, rather than create new content every time, SMIs can curate existing content and share this with the public to shed more light on the topic and aid pro-environmental behavioural adoption. Curation is based on the assumption that the best collection of hashtags and keywords would enhance the communication with the social media followers in mind, that needs to be converted (Chaudhri, 2018).

Incentive Appeals - In creating persuasive messages on social media posts, SMIs utilise the power of incentive appeals. In directing efforts to influencing people to adopt pro-environmental behaviour, SMIs are often faced with decisions between motivating people with content that shows the consequences of actions that are desirable or undesirable (Dillard and Shen, 2013). There are two types of appeals used in persuading people to adopt certain changes. These are the negative appeals and the positive appeals. A negative appeal arouses fear and motivates behavioural changes by communicating to the audience about the harmful outcomes from initiating or continuing an unhealthy practice (Thompson et al., 2011). A positive appeal in an SMI's message could present a mirror image positive outcome that can be achieved for performing a healthy alternative (Dillard and Shen, 2013). The most prevalent strategy involves creating an environmental awareness campaign that showcases the strength of losses from environmental degradation and promises of gains from being environmentally cautious (Dillard and Shen, 2013).

3.7 SUMMARY OF PROBLEMS AND SOLUTION OBJECTIVES

The rise in SMIs on SNSs has been a credible source for engaging and influencing social media users. Brands have utilised SMIs to push their products and elicit opinions from social media users, but this strategy is still new in communicating environmental issues. Hence most of the techniques researched were used mostly in marketing campaigns but can be applied to environmental awareness campaigns. There is still very few researches done on the use of SMIs for environmental awareness and for data collection.

In conducting a search for the top ten influencers in Section 3.6.1, there were lots of celebrities who have a large following and could have easily been on the top ten list. These celebrities with large following were not considered on the top ten list because they built their following through other channels, unlike SMIs who built their following through creating content on SNSs. Celebrities gain their large following because people admire their talent while SMIs on the other hand gained their following in a specific niche by creating content that is relevant to that niche.

As a result of the first two DSR activities conducted (A1 Problem identification and A2 Define the objectives of the solution) the initial objectives of the solution (Section 1.4) were elaborated on to include the key research themes identified in this chapter. From the literature review findings conducted during A1 and A2, it was evident that the solution should include SMIs for eliciting worldviews from millennials. The updated solution objectives are therefore:

- SO₁.** To provide processes for using social media as a data collection method. These processes included those for engaging with millennials and eliciting worldviews from them (links to RQ₂);
- SO₂.** To provide techniques for engaging with millennials on topics related to the coastal and marine environment (links to RQ₁); and
- SO₃:** Recommendations for selecting SMA tools or platforms (links to RQ₃).

3.8 THE SOCIAL MEDIA INFLUENCER MODEL

In order to meet solution objective SO₂, a theoretical Social Media Influencer Model is proposed. The Social Media Influencer Model was developed from the findings of the grounded theory analysis of studies and applications selected (Figure 3-9). The grounded

theory method was used to code, analyse and present the data in terms of the constructs and the relationships. These are illustrated in the conceptual model in Figure 3-9. The conceptual model shows the relationships between the SMIs’ characteristics and the techniques for engaging with the public. SMIs should possess these characteristics for them to be able to use these techniques effectively. An analysis of the characteristics of SMIs and the techniques used by these SMIs revealed that there is a relationship between the characteristics and the techniques used. These relationships are reflected graphically in Figure 3-9. The characteristic “reach” can be considered as related to the technique of direct engagement and incentive appeals because for an SMI to engage directly and incentivise the public, the SMI must have reach (i.e. be popular and be able to impact the community). The second characteristic of “relevance” is related to the techniques of collaborative tagging and content curation because an SMI needs to be relevant to successfully use these two techniques. By being relevant, he or she needs to have authority in a subject or topic for curated content and collaborative tags to achieve set objectives. Since resonance is defined as measuring the duration, frequency and level of interactivity around content or post (Solis and Webber, 2012), it can be deduced that the third characteristic of “resonance” is needed for the successful use of the techniques, both 1) emojis and 2) social timing and frequency. To utilise these techniques effectively an SMI needs to have proper commitment and interactivity with his or her followers.

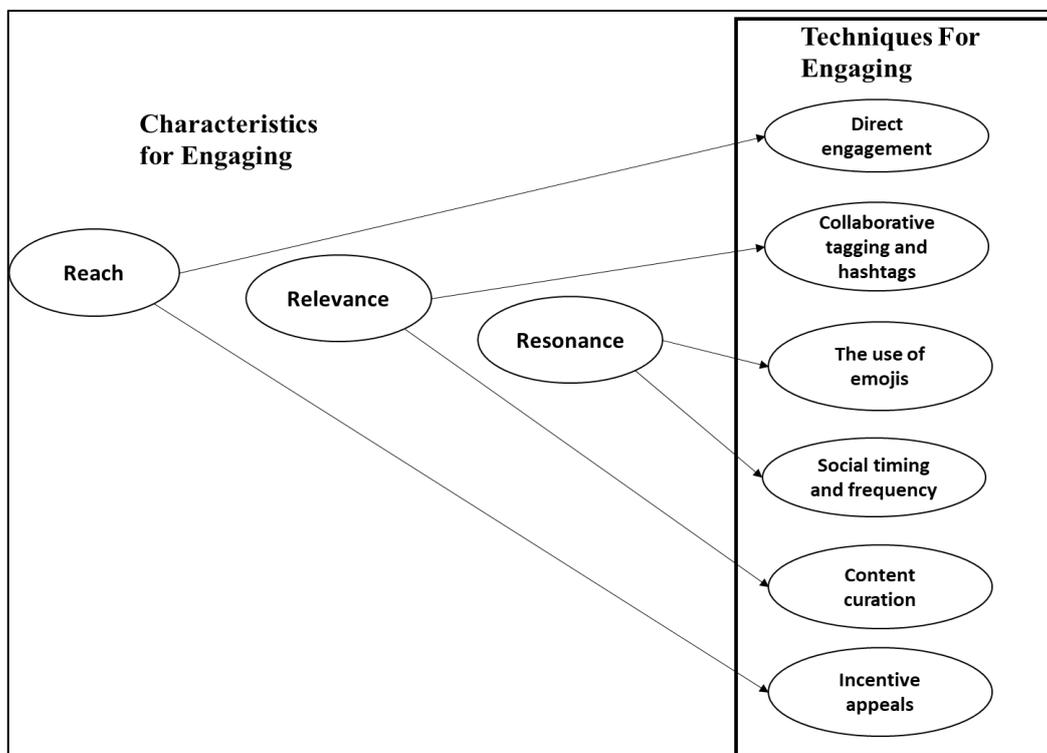


Figure 3-9 Social Media Influencer Model (Author’s own source)

3.9 CONCLUSION

The coastal and marine environment has been faced with issues that relate to biodiversity loss, pollution, environmental degradation and a host of other environmental issues. These issues have been brought about by human activities and the urbanisation of coastal towns. The millennials are part of the demography whose actions are contributing to environmental degradation. Among a host of other issues, millennials are a growing segment of tourism users which has led to the increase in construction of tourist facilities and infrastructure in coastal towns. In engaging and eliciting millennials worldviews on the coastal and marine environment, SNSs provides a suitable medium for reaching this generation who desire interactive tools for getting things done. Among other SNSs, the likes of Facebook, Instagram, Snapchat, Twitter and YouTube are the most sought after SNSs for millennials' interaction (Section 3.5.1).

SIMs are opinion leaders who possess a great amount of influence on peoples' attitudes, decisions, and behaviours. The capacity of an SIM to influence depends on various factors with having a large following on SNSs being one. The ability for an SIM to influence depends on three pillars (Figure 3-6). These pillars are reach, relevance and resonance which are the characteristics an SIM must possess in measuring their capacity to cause change. A trait among the most successful SIMs involves being able to diversify across multiple social networking sites. This allows an SIMs' content to cut across a vast network of SNSs. Recently, alliances have been forged with SIMs to launch eye-opening environmental campaigns. The World Wildlife Fund (WWF) launched campaigns using SIMs on the effects of environmental destruction. The Singaporean Ministry for the Environmental and Water Resources (MEWR) also forged alliances with SIMs to engage the public on climate change and what can be done to help (Section 3.6.2).

In this chapter, the techniques utilised by SIMs for engaging and eliciting opinions of SNSs users were identified. The techniques identified from literature were direct engagement, collaborative tagging and hashtags, the use of emojis, social timing, content curation and incentive appeals. The second objective of the solution SO₂: To provide techniques for engaging with millennials on topics related to the coastal and marine environment (links to RQ₁) was therefore achieved. The next chapter will report on the interviews with SIMs to verify the techniques identified from literature, and also on other techniques used by SIMs.

CHAPTER FOUR

EXTENDED SOCIAL MEDIA INFLUENCER MODEL

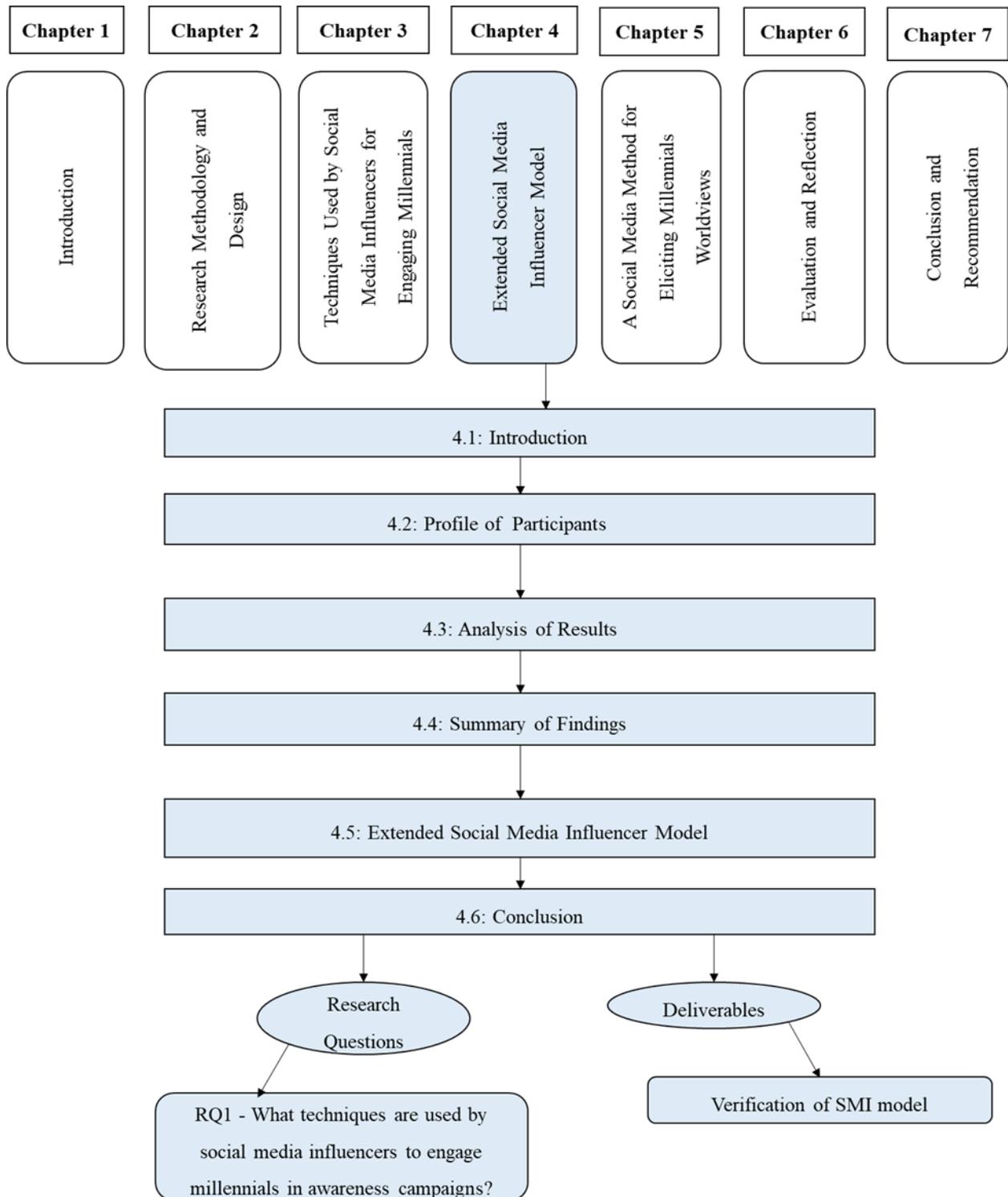


Figure 4-1 Chapter 4 Overview

4.1 INTRODUCTION

The aim of this chapter is to verify and provide further answers to RQ₁:

RQ₁: What techniques are used by social media influencers to engage millennials in awareness campaigns?

Figure 4-1 provides an overview of the chapter. An interview study was conducted to address RQ₁ as the primary research method (Section 2.4). The interview conducted with the participants was used to verify the techniques identified from literature (Section 3.6.4).

The DSR activity conducted in this chapter involves defining the objectives of the solution (A2), where interview participants were used to verify the SMI techniques that are incorporated in the proposed theoretical Social Media Influencer Model. The participants selected for this study were SMIs and social media experts (Section 4.2). The interviews results (Section 4.3), and the analysis of findings (Section 4.4) confirmed several of the techniques and identified some additional ones. The findings were used to confirm and extend the model (Section 4.5). Several conclusions can be made from the findings (Section 4.6).

4.2 PROFILE OF PARTICIPANTS

The SMIs approached were users on SNSs with 5000 or more followers. In total seven participants (six SMIs and one social media expert) were interviewed. The researcher contacted the participants to set up dates for the interview as soon as their participation was confirmed. The seven participants will henceforth be referred to as P1, P2, P3, P4, P5, P6, and P7 respectively (Table 4-1).

Among the six SMIs interviewed, two were influencers in the creative arts industry, two were influencers in the fashion industry, one was an influencer in the blogging and lifestyle industry, and one was an influencer in the music industry. All participants had the majority of their followers in the 18 to 40 years old age category. This signifies that the majority of the SMIs' following are millennials. Most of the participants were all influencers on Instagram except for one (P3). It was noted that of the seven participants, P5's influence was across the highest number of SNSs. The ability for an SMI to diversify his or her influence across various SNSs is one of the attributes of the Top 10 SMIs discussed in Section 3.6.1.

Table 4-1 Summary of Participants' Profiles

Participant	Followers age category		Num of years as SMI	Industry or niche	Motivation	SNSs
	18-40 (Years)	>40 (Years)				
P1	65%	35%	5 Years	Creative Arts	The love for making and sharing art	Instagram
P2	90%	10%	1 Year	Creative Arts	To promote graphic content and build connections	Instagram
P3	95%	5%	3 Years	Music	Passion	Twitter
P4	70%	30%	6 Years	Fashion	Compliments on fashion sense and Promotional offers	Instagram
P5	90%	10%	8 Years	Blogging and lifestyle	Life experiences	Facebook, Twitter, Instagram, and Pinterest.
P6	80%	20%	4 Years	Beauty and fashion	Love for make-up and beauty	Instagram
P7			Social Media Expert			

4.3 ANALYSIS OF RESULTS

The recorded interviews were transcribed and can be found in Appendix K. A qualitative data analysis tool called ATLAS.ti (Version 8) was employed to organise the data, facilitate coding and identify themes. The transcript was coded using the three steps from the grounded theory analyse stages explained in Section 3.2.

4.3.1 Confirmation of Theoretical Techniques

During the interviews, the participants were asked to rate each of the six techniques identified from literature and explained in Section 3.6.4. As shown in Table 4-2, each technique was rated by the participants on how successful these techniques have been with regards to engaging with their followers. Direct engagement had the highest mean score ($\mu=4.43$) followed by social timing and frequency ($\mu= 4$).

Table 4-2 Ratings of SMIs' Techniques (n = 7)

SMIs' Technique	Rating (1 – 5)							Mean (μ)
	P1	P2	P3	P4	P5	P6	P7	
Direct Engagement	5	3	4	5	4	5	5	4.43
Collaborative Tagging and Hashtags	5	3	4	3	4	1	4	3.43
The Use of Emojis	2	1	5	3	3	3	3	2.86
Social Timing and Frequency	4	4	5	4	3	3	5	4
Content Curation	5	5	4	4	3	1	3	3.57
Incentive Appeals	2	4	4	2	3	4	4	3.29

4.3.2 Summary of Themes Identified

The techniques used by SMIs identified in the literature review formed the basis of the interview questions and served as *a_priori* themes. The two parts of the initial proposed Social Media Influencer Model (Figure 3-9) are characteristics and techniques. The analysis of the interview answers revealed no new characteristics and it was evident that all of the six *a_priori* themes were confirmed by participants as relevant. Additional themes and sub-themes were identified during the axial coding stage. The interviews conducted with SMIs therefore supported the findings from the literature review and also revealed additional themes and sub-themes. Four new techniques were mentioned by the participants as shown in Table 4-3, which provides a summary of the findings of the analysis of the qualitative data. The sub-themes on SMIs' techniques were identified from literature and the interview data. Those identified from the interview data are represented in italics to indicate that they were new themes. In addition to the new techniques identified from the interviews, a new theme emerged relating to the challenges faced by SMIs. The sub-themes on SMIs' challenges were all identified from the interview data hence they are all in italics.

Table 4-3 Themes Discovered from SMIs' Interviews and literature

Theme	Source	Sub-themes
SMIs' Characteristics	Literature	Reach
	Literature	Relevance
	Literature	Resonance
SMIs' Techniques	Literature	Direct engagement
	Literature	Collaborative tagging and hashtags
	Literature	Emojis
	Literature	Social timing and frequency
	Literature	Content curation
	Literature	Incentive appeals
	<i>Interview</i>	<i>Support groups</i>
	<i>Interview</i>	<i>Stories</i>
	<i>Interview</i>	<i>Themes from the comment section</i>
	<i>Interview</i>	<i>Live sessions</i>
SMIs' Challenges	<i>Interview</i>	<i>Time consuming</i>
	<i>Interview</i>	<i>Ethics and values</i>
	<i>Interview</i>	<i>Algorithm changes</i>
	<i>Interview</i>	<i>Fake followers (Bots)</i>
	<i>Interview</i>	<i>Remuneration</i>

A network diagram showing the relationships between the themes and sub-theme codes is provided in Figure 4-2. The network diagram visualises the themes and how each of the sub-theme codes were connected while analysing the interview data. Each sub-theme was given relationships that applied to its respective theme codes and this assisted the researcher in structuring the result findings. From Figure 4-2, the main theme codes were SMIs' characteristics, SMIs' techniques and SMIs' challenges. All sub-themes identified were all 'a part of' its respective theme codes. The details of each of the themes are provided in the following sections.

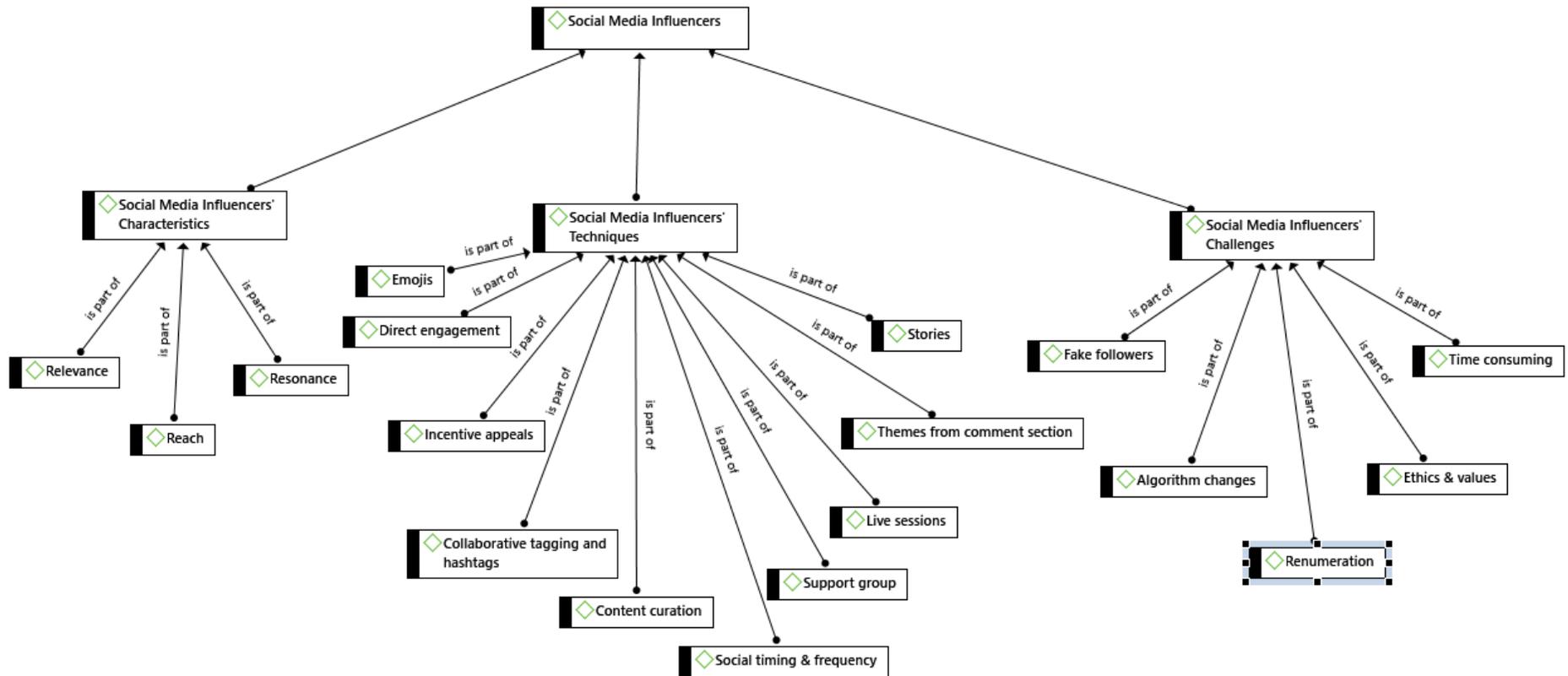


Figure 4-2 Network Diagram Showing Themes, Sub-Themes Codes and Relationships

4.3.3 Characteristics of Social Media Influencers

The findings regarding the characteristics of SMIs are summarised in Table 4-4. Quotes explaining key points raised by SMIs during the interviews will be presented in each of the subsequent sub-sections.

Table 4-4 SMIs' Characteristics

Participant (SMI)	Number of Followers	Influencer Type	Country of Origin	Country with Most Influence	Level of Authority Attained	Post Frequency
P1	31,178	Macro-Influencer	South Africa	United States of America	When we started seeing it as a Business	Once or twice daily
P2	6800	Micro-Influencer	South Africa	South Africa	Follower count increase and Recognition in public	At least once weekly
P3	6000	Micro-Influencer	South Africa	South Africa	Calls for promotions and marketing agencies	Five daily
P4	88,000	Macro-Influencer	South Africa	Brazil	Brand recognition and promotions	Once or twice daily
P5	59,000	Macro-Influencer	South Africa	South Africa	Follower count increase and calls from promotions	Two to three times weekly
P6	4,920	Micro-Influencer	South Africa	South Africa	Follower count increase	At least once weekly

Reach – All SMIs interviewed had more than 5000 followers on SNSs and from the data collected, the researcher categorised them as micro or macro influencers. According to Gottbrecht (2016), there are three types of influencers namely:

- Mega-Influencers;
- Macro-Influencers; and
- Micro-Influencers.

Mega-Influencers - These are actors, artiste and social media users with a minimum of 1 Million followers.

Macro-Influencers – Executives, bloggers, and journalist with a following of 10,000 to 1Million followers.

Micro-Influencers – Social media users with a following of 500-10,000 followers. However, some other authors refer to micro-influencers as social media users who have a minimum of 5,000 followers on an SNS (Ruiz-Gomez, 2019; Weinstein, 2018).

According to these definitions, three participants were macro-influencers and three were micro-influencers. Regardless of their number of following, all participants had the ability to reach thousands of individuals at a time. They hold a large amount of influence in certain countries than others. P4 for example, is a South African fashion influencer who has more following in Brazil than South Africa.

To increase appreciation, it was discovered that all SMIs interviewed have in one way or the other invested into the social network community by doing goodwill or community outreach projects. For example, P5 stated *“I’ve done quite a few things for milk matters. That’s where people donate breastmilk to babies that obviously need breastmilk. And I’ve done a couple of campaigns for the shoebox one”* – (Interview Transcript, p.5) indicating that she supports various charity organisations and campaigns.

Relevance – The participants interviewed all felt that they gained a level of authority on a subject matter when they started gaining more followers, were approached by brands to promote products and when they started gaining recognition in public places. For example, P5 stated that she knew she had attained recognition, when people and brands started contacting her through her page and website to help promote products.

“Yeah and I think it’s when people start contacting me personally as well and not just on my page, but they start contacting me through my website and that’s also part of the way that I got to be an influencer. I wasn’t offering influencer packages, I was trying to promote my own online store and people contacted me and said could you please promote this, could you please promote that, and I am like, hey there’s a bit of money” – (Interview Transcript, p.5).

P2 also stated that she started getting recognition in public about her work.

“Yeah, when my followers started growing but then I started getting recognised as this person in public places or when people would come to me for work, that’s when I realised that there’s something, I can use to benefit others” – (Interview Transcript, p.2).

Resonance – The level of interactivity and engagement around content is vital to keep followers interested (Solis and Webber, 2012). The SMIs interviewed all make sure they provide content weekly and engage with their followers frequently. They also stated that the frequency of posts might increase if there's a trending or relevant topic. For example, P3 stated that he usually posts five Tweets per day but if there's a trending issue, then he does about eight Tweets per day.

“It depends. If it's something of my own, then pretty often so like maybe 5 Tweets a day from my own and then if it's something that's trending or apparently relevant then it's maybe about 3 more Tweets a day” – (Interview Transcript, p.3).

P2 stated that she makes sure she makes posts at least once weekly.

“One, once a week, even if it's just a picture or portrait or an art or whatever, but I make sure that at least I post something” – (Interview Transcript, p.2).

4.3.4 Techniques Used by Social Media Influencers

This section explores the techniques utilised by SMIs that were identified from literature (Section 3.6.4).

Direct Engagement – All participants interviewed agreed that this technique is a successful approach to driving engagement on their platforms. They engage with their followers through the comments sections, direct messaging (DM), and visiting followers' profile to drop comments. Although engaging with followers is not always possible, SMIs try to respond and interact with their followers when they can. The following statements were made by the participants in response to the questions asked on direct engagement.

“Yes, most definitely. On all my channels I try and respond to everyone one-on-one. Not always possible but that's my goal” – (Interview Transcript, p.5).

“We reply to all questions. We sometimes reply to an emoji only comment and we leave thoughtful messages on the image of those who tag us or use our hashtag” – (Interview Transcript, p.1).

“I also engage by engaging physically on their profiles so not just on my profile and also in the messages. I also engage by DM” - (Interview Transcript, p.4).

Direct messaging, engaging physically on followers' profiles and responding to tags made to an SMI are some of the means identified by the participants for engaging with followers.

Collaborative Tagging and Hashtags – All participants interviewed agreed that this technique is very useful for making their content more visible. From the interviews, the participants identified that collaborative tagging and hashtags can be researched to discover insights into trending topics on SNSs. The following statements were made by the participants in response to the questions asked on collaborative tagging and hashtags.

“Yes, most definitely. Specifically, on Instagram, hash tagging is huge, well depending on what the topic is, I obviously go and research some hashtags. I've got a number of different tools that I use. I might go to some of my competitors and see what hashtags they are using. Yeah so I would actually go online and search about topic that I am writing on and see what other hashtags people are using and then kind of research those hashtags and come up with whatever mix I'm going to use” - (Interview Transcript, p.5).

*“We use #**, which now has 62.3k posts. We encourage members to use it, and it has become one of the top hashtags in our niche” - (Interview Transcript, p.1).*

“I try to use it if I am working on a campaign because that's what the campaign requires you to do. If I have time and I am leading up to realising something that has to be engaging, then I would hashtag about these more engaging trending topics so that my Tweets are seen beyond my Twitter following region” - (Interview Transcript, p3).

As stated by P3, hashtags allow for more engagement on contents and allows content to be discovered beyond an SMIs' followers. Also, P5 stated that using a hashtag is an important technique that can be researched to identify key areas for creating content.

The Use of Emojis - Although this technique is a useful way of adding depth and conveying emotions to content, not all SMIs interviewed uses emojis as a technique. One concern with using emojis involves its diverse meaning. It was discovered that emojis' meanings are not standardised, and a harmless emoji can be deemed offensive to another follower. The following statements were made by the participants in response to the questions asked with regards to the use of emojis.

“You know. I think it's really good to use emojis in that sort of thing. I find that very effective and also, I think at times, especially when you are writing about kind of emotional topics or something that's controversial, it's not always easy in writing to set the tone of your message. It's adding a crying face at the end or a happy face or something that can really get across what the actual emotion is that you are trying to convey, which I think is very helpful” - (Interview Transcript, p.5).

“It does, I think it does because it gives it a bit of character and it also allows people to see a little bit of your personality” - (Interview Transcript, p.4).

“I see a lot of people use it and I think the world that we are in today, a lot of people are about emojis and gifs so if you know how to use them then it might make you popular with certain people. You also have to know what they mean because you find out that a lot of these emojis have a second meaning to them so if you use the wrong one in the wrong context then you actually put yourself in trouble. So, you have to be very aware of what they mean and use them in the right context” - (Interview Transcript, p.7).

Social Timing and Frequency – The researcher discovered that social timing and frequency is important but is relative. For instance, SMIs that target stay at moms would get more engagement on their content during the evenings when kids have been put to bed and less during the weekends. Another discovery is that timing of engagement is different across SNSs and certain types of content can get more engagement at certain days of the week than others. The following sample of statements were made by the participants in response to the questions asked with regards to social timing and frequency.

“I think that's very relevant. I've noticed, for example, my niche is moms and you can see exactly when the kids are sleeping, when the kids are driving their moms crazy running around and when it's school holidays, the whole works, I can literally see that through my engagement. You know like if I post something on a Friday at like 3 o'clock, I may as well not waste my finger energy typing that thing out because it's not going to go anywhere. Basically, Fridays to Sundays is dead for me, mornings are busy and after 8 in the evenings, literally when moms put their kids in bed, those 2 hours from 8 to 10, I can see exactly when I need to post. And there is a difference in each social media channel as well” - (Interview Transcript, p.5).

“So, there's some content that will get more engagement on a Friday evening on a particular subject. It's the subject that you are addressing. So, if it's a Friday evening and you are talking about politics, you are not going to get likes. You know what I mean. If you post a picture with, for example, a Savannah then you are more likely to get more on a Friday night. Where if you are posting more pictures, gifs and emojis about 9 to 5 on a Monday and complaining then you will get more likes because that's what people are mostly doing” - (Interview Transcript, p.3).

Content Curation – The participants agreed that that content curation is mostly used to create interesting and engaging content. Curating content is done by collecting and reorganizing relevant content to create one's own perspective. As stated by P1 and P5, through research and curating existing information, content tends to be more trusted when shared on SNSs. The following statements were made by the participants in response to the questions asked with regards to content curation.

“Yeah, no I definitely do make use of it. So basically, you know we live in a mean world where people get bored of seeing the same thing so they want to see something different so if you find something relevant you can tell your network so you can engage and for example, to get the word out now, we have a whole lot of different techniques and strategies

that we use and the same things applies for your content, using reposts and reTweets are basically affirmations of what you stand for” - (Interview Transcript, p.1).

“and then a lot of Google searching and a lot of research for my posts, but I mean yeah, that's definitely one technique that I use” - (Interview Transcript, p.5).

Incentive Appeals – This technique allows SMIs to influence their followers’ emotions to take certain actions. The analysis of the interview data revealed that SMIs use incentive appeals but prefer using either the positive incentive appeal or the negative incentive appeal but not both at the same time. The following statements were made by the participants in response to the questions asked with regards to incentive appeals.

“I've used the positive side and I've used the negative side, but I haven't actually done a comparison of the two in one post before” - (Interview Transcript, p.5).

“Yeah, I understand the concept. I do not do positive and negative connotations with my posts. I either address something positive or I address something negative” - (Interview Transcript, p.4).

“We’ve only used positive, e.g. “look at all the art you could be making if you joined our membership”” - (Interview Transcript, p.1).

4.3.5 Additional Techniques Discovered

The additional techniques were mentioned by each participant and are unique to that participant. These techniques were not reflected in the literature (Section 3.6.4) and were mentioned by participants during the interview. The additional techniques are shown in Table 4-5, together with evidence from the interview transcript. The first technique identified was that of support groups, which are formed by SMIs where they share each other’s content to gain more reach and followers. As stated by P6, joining a support group allows content to be shared around by other members. Each member of the support group supports each other by sharing each other’s content, this helps members to gain more reach and followers on their individual SNSs’ pages.

Another technique is stories, which is a feature on SNSs that allows users to capture and post related images and video in a slideshow format. Stories on SNSs can boost reach, engagement as well as increase the potential of gaining new followers. P4 mentioned stories as a technique he uses for engaging with his followers. He does this by creating a poll, where followers can ask questions and answers are made public. P6 also uses stories as a technique for engaging

with followers across multiple SNSs, this helps P6 convert followers from his other SNSs' pages.

SMI also identify popular themes from browsing through the comment sections on their posts. This provides the SMI with ideas on content that followers are likely to engage on. P5 stated that she checks the comment section to find out themes or questions asked. This technique helps P5 to create content that followers want and would engage to.

Another technique identified for building engagement and connecting directly with followers are live sessions. Live sessions can be carried out mostly on Instagram. Live videos are placed at the head of followers' feeds, which allows for content to be top preference when fans open Instagram. Live sessions increases engagement and build relationships, because the more an influencer engages in authentic face to face interaction with followers, the more engagement the influencer earns (Carter, 2018). As stated by P3, a live session is one of the easiest means for engaging with his followers.

Table 4-5 Additional Techniques

Theme	Evidence from Interview Transcript
Support groups	<p><i>“Yes, and for you to get featured you actually have to support each other so that you can get featured. So that whenever you post something and tag them, they can just repost your content because that is how it works with them. If you are not engaging with other YouTubers’ content, then you are not going to get featured.” - (Interview Transcript, p.6).</i></p>
Stories	<p><i>“I have different techniques, so I do the questions in my stories where anyone can ask me a question and then I make the question public and I also answer the question publicly” - (Interview Transcript, p4).</i></p> <p><i>“So, what about making it your story? Like, sometimes I post stories. You do see stories on Instagram, Facebook and what so ever, so sometimes I just post it there and it automatically shows on my Facebook page because I also have a lot of friends on Facebook. So, when I post it on Instagram, it also shows on Facebook” - (Interview Transcript, p6).</i></p>
Themes from the comment section	<p><i>“another way is through the engagement that people give me. So, comments on social media and comments on my website. So if I've written an article but I see that there's a theme where a lot of people are asking the same question in response to that but I haven't answered on that content then I will create a whole new campaign around that” - (Interview Transcript, p.5).</i></p>
Live Sessions	<p><i>“I mean on Instagram I go more live so that's an easier way” - (Interview Transcript, p.3).</i></p>

4.3.6 Challenges Faced by Social Media Influencers

Interviews with SMIs highlighted various challenges they face when engaging with their followers. Each challenge is unique to the SMI. These challenges were classified into several sub-themes.

The first challenge theme related to **ethics and values**. Each individual holds certain values and ethical conducts that they live by. Doing brands' promotions that do not align with an SMI's moral conduct can be quite challenging most especially when the advertising commission is huge. As stated by P5, taking on promotional offers that are unethical have huge consequences. One possible consequence is damage to an SMIs' authority. The following statements were made by the P5 with regards to the challenges faced.

"Yeah, I'm in the process of having a tiff with somebody because they want me to promote their product which is not in line with my beliefs and they are getting angry with me and they are fighting. I will give you an example, I actually want to go vegan and this woman has got a goat farm and she makes cheese and milk and stuff and I said that I do eat feta so I can link to you in a post with a recipe but she wants me to promote the fact that it's humane. And I said to her but it's not humane, you are impregnating goats year after year against their will, you are then removing their babies, stealing their milk and slaughtering the babies. And it's not humane. She says that she's not slaughtering any animal on her property. "I get what you are saying, I'm not an animal rights activist, I do not want to fight with you, I'm just not prepared to promote in the way that you want me to promote and I'm not prepared to use the word humane". I can use organic; I can use free-range and I can use feta. It's not going to go onto my channel in relation to dairy, you know. She says, "Oh well I'm paying you" and I said "but that's it, it's blood money"."

That's exactly it and the difficulty comes in and I've see a lot of bloggers that clearly take money for anything and everything but for me, I believe the reason that I've come so far is because I've got my boundaries down and because I say I'm sorry I'm not prepared to do that because it's against my beliefs. So, if I do promote something, it's always exactly in line with who I am. And people can unlike me, and people can unfollow, I'm not going to get upset about that but the people that do follow me, trust me. And this is what I said to her, "You can offer 10 000, 20 000, 30 000 rand but if I take the job, I'm damaging my company, I'm damaging my authority" - (Interview Transcript, p.5).

The second sub-theme related to the **time-consuming** nature of engaging with followers and maintaining pages on SNSs. As stated by P2, making social media content requires critical thinking which takes lots of time and effort. P5 and P6 also stated that engaging with followers on published content can also be time consuming. The following statements were made by P2, P5 and P6 with regards to time.

“I think people often don't see being an influencer as a real job that takes time and effort and thought, and it really is a time-consuming job that takes up a lot of effort. You know the thought process behind it is a lot more than what people understand when it comes to building your channels and maintaining your engagement” - (Interview Transcript, p.5).

“So, I have that, how can I put it? Time” - (Interview Transcript, p.6).

“I think plateauing, where I'm not really reaching anyone or the target that I want to reach because of all the things that come, you know, management of time and content so I think that is quite difficult” – (Interview Transcript, p.2).

Another challenge relates to **algorithm changes**. SMIs often utilise SNSs algorithms to increase reach and engagement on their content but this isn't always easy because these algorithms can change frequently. The use of algorithms on social media involves ways in which SNSs sort posts in a users' feed, which is based on so many factors and prioritises content that users want to see. Algorithms are often based on factors such as hashtags, social timing, tags, engagement on content and a host of others (Barnhart, 2019). As stated by P4, SNSs often change their algorithms and it takes quite a while for an influencer to know just how the new algorithm works. Hence engagement usually drops for those periods until he finds out about the new algorithm.

“Yes, the algorithm changes are my biggest challenge because I've seen my engagement drop by about 80%. That's a massive drop, which is not good for branding and things like that. Yeah so I've seen mine drop by 80% so algorithm changes are quite often so, you never know what you are going to get, because you know if you scroll down Instagram now you notice that you don't see some of your friends' posts, which tells you that you haven't caught up with everything and instead you will see adverts of other products or people who are paying for their things to be seen” - (Interview Transcript, p.4).

Remuneration was another challenge identified by one participant. SMIs often charge a fee before doing promotions for brands on their pages. As stated by P4, it becomes a problem when brands underestimate their influence by offering low remunerations for an SMI's services.

“Yeah, I think that another challenge is that I get a lot of people contacting me and saying, they just inbox me on Facebook and say, "put this on your page", "Oh my God, you charge what?". And I'm like "if you want to just post it, post it on your own page” - (Interview Transcript, p.4).

Fake Followers (bots) are a challenge to SMIs. Bots are services which allow an SMI to gain more followers on a SNSs. These followers are often fake and they “like” content and flood the comment section with irrelevant comments. The comments made by bot accounts are most

often related to internet scams. As stated by P4, fake followers make a SMI's follower count look more than they really are, and it makes it difficult to know the true number of real followers on an SMI's page.

“For example, Instagram once had a massive cleanout on bots. Bots is something where you have fake followers and things, fake likes and that was interesting to see because you could see people who thought they are following, and it was not real. None of it was real, it was all a facade. So, it was interesting to see and one of the biggest celebrities that was targeted was Justin Bieber. Yeah so I've dropped by 3 000 because I had sent Instagram an email to ask them to remove some of the bots because you don't know who's real.” - (Interview Transcript, p.4).

4.3.7 Future of Social Media Influencers

Information analysed from the interviews highlighted new themes related to growth, analytics and environmental awareness.

Growth – Three of the participants interviewed stated that they are working towards growing their follower base and brand. They aim to grow on a bigger scale by diversifying their influence across other SNSs and make more money in the process. The following statements were made by the participants.

“So, I would say definitely on a bigger scale. I definitely want to grow on YouTube. I've already bought equipment for that.” – (Interview Transcript, p.4).

“Our goal is a \$1 million / R15 million per year company” – (Interview Transcript, p.1).

“Where would I like to be, I would like to earn a lot more off a lot less work” – (Interview Transcript, p.5).

Analytics – Two of the participants interviewed stated that they track their analytics regularly. They do this to understand their growth rate, engagement rate, countries of influence and level of interactivity around content. The following statements were made by the participants.

“Instagram Analytics is very good. So is Facebook insights. We use Google Analytics for the site and Intercom for user tracking.” – (Interview Transcript, p.1).

“I do track it via Instagram. Instagram has an engagement rate. Their things are very simple, they already set it out for you and you see your result growing, which for example, I would never have known that I needed to grow in South Africa because I buy goods from them but I only started growing recently.” – (Interview Transcript, p.4).

Environment Outlook - With regards to creating content on environmental issues, most of the SMIs interviewed agreed that it's an issue that needs to be addressed and that they will consider making content addressing environmental issues. The following statements were made by the participants with regards to questions asked about creating content on environmental issues.

“Yeah, I think people need to change their attitudes, they need to look at the way that they look at meat products. There's so much, pollution, the throwaway society, I mean there's so much stuff. You know and I think that the biggest problems are the attitude of people, we're all living with blinkers on” – (Interview Transcript, p.5).

One participant interviewed wouldn't consider making content on environmental issues simply because the concept of environmental issues doesn't match her target audience.

“No. It doesn't match our audience” – (Interview Transcript, p.1).

4.4 SUMMARY OF FINDINGS

The analysis of the interview data highlighted that the participants gained authority when their follower count grew, and when they started gaining recognition from brands on promotional offers. In building engagement and interactivity, SMIs ensure they post regularly. The frequency of posts made by SMIs tend to increase when there is a trending topic or issue.

The SMIs' techniques identified from literature were discussed with the participants. The participants supported direct engagement as a successful approach to engaging with users on SNSs. Interacting with followers on the comment sections, visiting followers' profiles to drop comments and direct messaging were some of the ways highlighted by the participants on how to directly engage with followers on SNSs. Collaborative tagging and hashtags allow for more visibility of content and the participants highlighted that using hashtags helps in making their content seen beyond their following. The participants also highlighted that social timing and frequency as a technique is relative because certain types of content gain more engagement on certain days of the week than others. The participants stated that content curation allows for research and reorganising of relevant content to create trust and validity for content posted. Incentive appeal is another technique that was confirmed for creating engagement around content.

The participants also identified various other techniques used for engaging with their followers. The first technique was support groups formed by SMIs, where content is shared with each other's following to boost reach and engagement. The use of stories as a technique allows

followers to be more connected with an SMI and prevents an SMI from clustering the feeds of followers with content. Themes identified from the comment section is another technique identified. In creating content that followers want to see, an SMI can browse through the comment section to identifying themes and questions asked around a topic or issue. The use of live sessions was also identified as a technique used by SMIs to engage with followers in a face to face conversation online. It helps build connectedness and engagement with followers.

Various challenges with being an SMI were identified by the participants. Promotional offers by brands that do not align to an SMI's moral conduct can be tempting most especially when the remuneration is very good. The time and thought process it takes to create content on SNSs can be exhausting, hence making time for creating content is a challenge. Algorithm changes on SNSs is also a challenge that SMIs deal with. SMIs utilise the algorithm to increase engagement on their content but when the algorithm changes, engagement levels drop until the influencer is aware of the new algorithm. Being an SMI can be a full-time job, where SMIs make a living from remunerations paid by brands for services rendered. It becomes a challenge when brands offer low remunerations for promoting products on their pages. The last challenge identified by the participants has to do with fake followers otherwise known as bots. Bots can prevent an influencer from knowing who their true followers are and can also spam the comment sections with irrelevant comments.

The participants highlighted that growing their following and diversifying across multiple SNSs is part of their future plans. They utilise various analytics platforms to understand their influence and engagement levels across location and demographic. With regards to using their platform for environmental awareness, SMIs agreed that they might consider that only if the message on environmental awareness applies to their niche.

4.5 EXTENDED SOCIAL MEDIA INFLUENCER MODEL

The extended Social Media Influencer Model was developed from the findings of the literature review and the interviews conducted. In the previous version of the model (Figure 3-9), the extended model shows the relationships between the SMIs' characteristics and the techniques for engaging with the public. An analysis of the characteristics of SMIs and the techniques identified revealed that there is a relationship between the characteristics and the techniques used. SMIs should possess these characteristics for them to be able to use these techniques effectively. The extended model is shown in Figure 4-3. The characteristic "reach" relates to

the technique of live sessions, direct engagement and incentive appeals because for an SMI to engage directly and incentivise the public, the SMI must have reach (i.e. be popular and be able to impact the community). The second characteristic of “relevance” is related to the techniques of collaborative tagging, support groups and content curation because an SMI needs to be relevant to join an SMIs’ support group, and for curated content, and collaborative tags to achieve set objectives. Since resonance is defined as measuring the duration, frequency and level of interactivity around content or post (Solis and Webber, 2012), it can be deduced that the third characteristic of “resonance” is needed for the successful use of the techniques, 1) the use of emojis, 2) themes from the comment section, 3) stories, and 4) social timing and frequency. To utilise these techniques effectively an SMI needs to have proper commitment and interactivity with his or her followers.

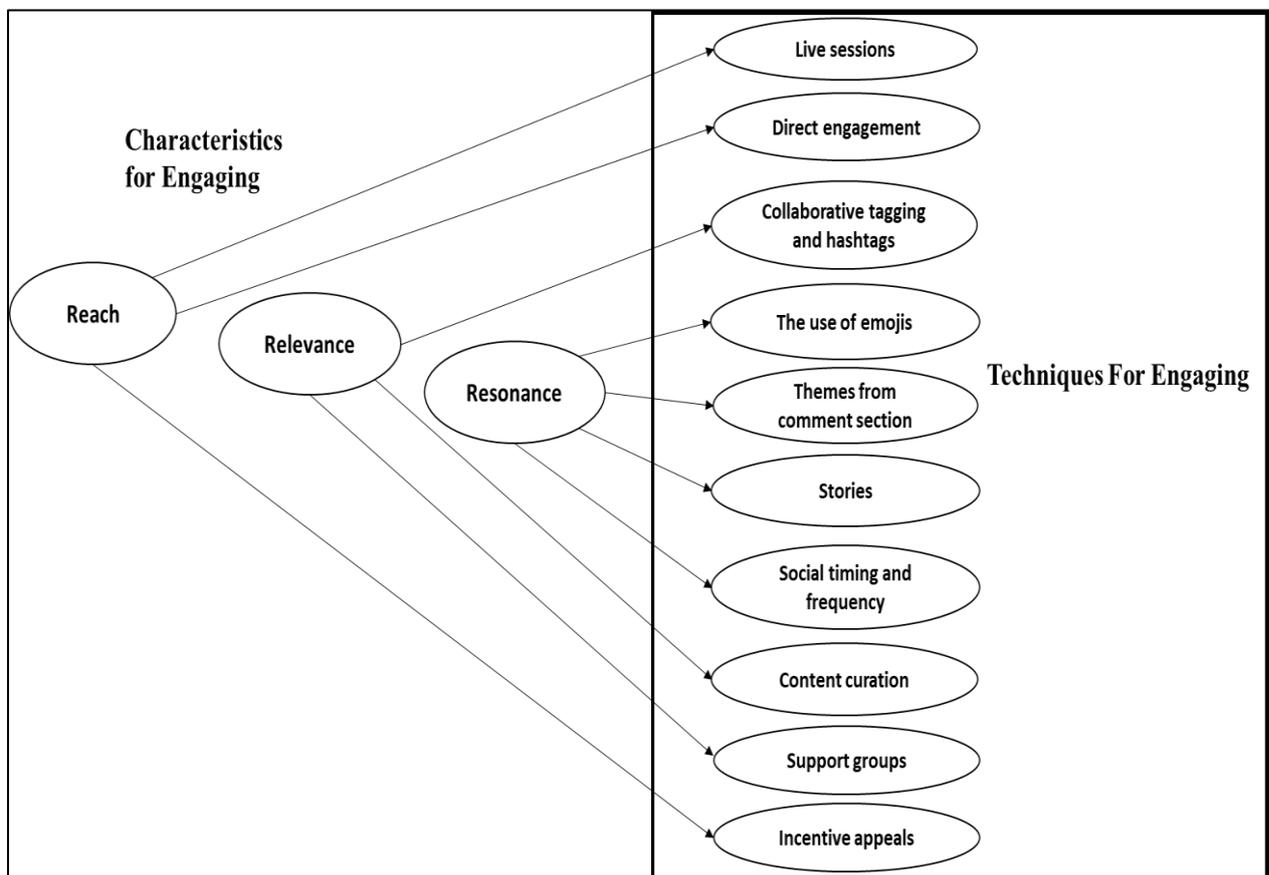


Figure 4-3 Extended Social Media Influencer Model (Author’s own source)

The extended model shows the six original techniques identified in literature plus the four additional ones mentioned by participants in the interviews.

4.6 CONCLUSION

In this chapter, the techniques utilised by SMIs for engaging and eliciting opinions of SNSs users were identified. The six techniques identified from literature were direct engagement, collaborative tagging and hashtags, the use of emojis, social timing, content curation and incentive appeals. The other techniques identified from the interviews were support groups, stories, themes from the comment section and live sessions. Other themes were identified from the SMIs' interviews, these themes discussed on the challenges faced and the future of SMIs (Section 4.3.6 and 4.3.7).

The contribution of this chapter is an extended Social Media Influencer Model (Figure 4-3), which was conceptualised using the SMIs' characteristics and techniques identified from literature and the interview data and were analysed to reveal the relationships between them. The extended Social Media Influencer Model forms a part of the proposed solution (the "method") of this study. This chapter provides answers to the second solution objective (SO₂) related to techniques for engaging with millennials. The next chapter reports on the design of a social media method for eliciting the worldviews of millennials from social media data.

CHAPTER FIVE

A SOCIAL MEDIA METHOD FOR ELICITING MILLENNIALS WORLDVIEWS

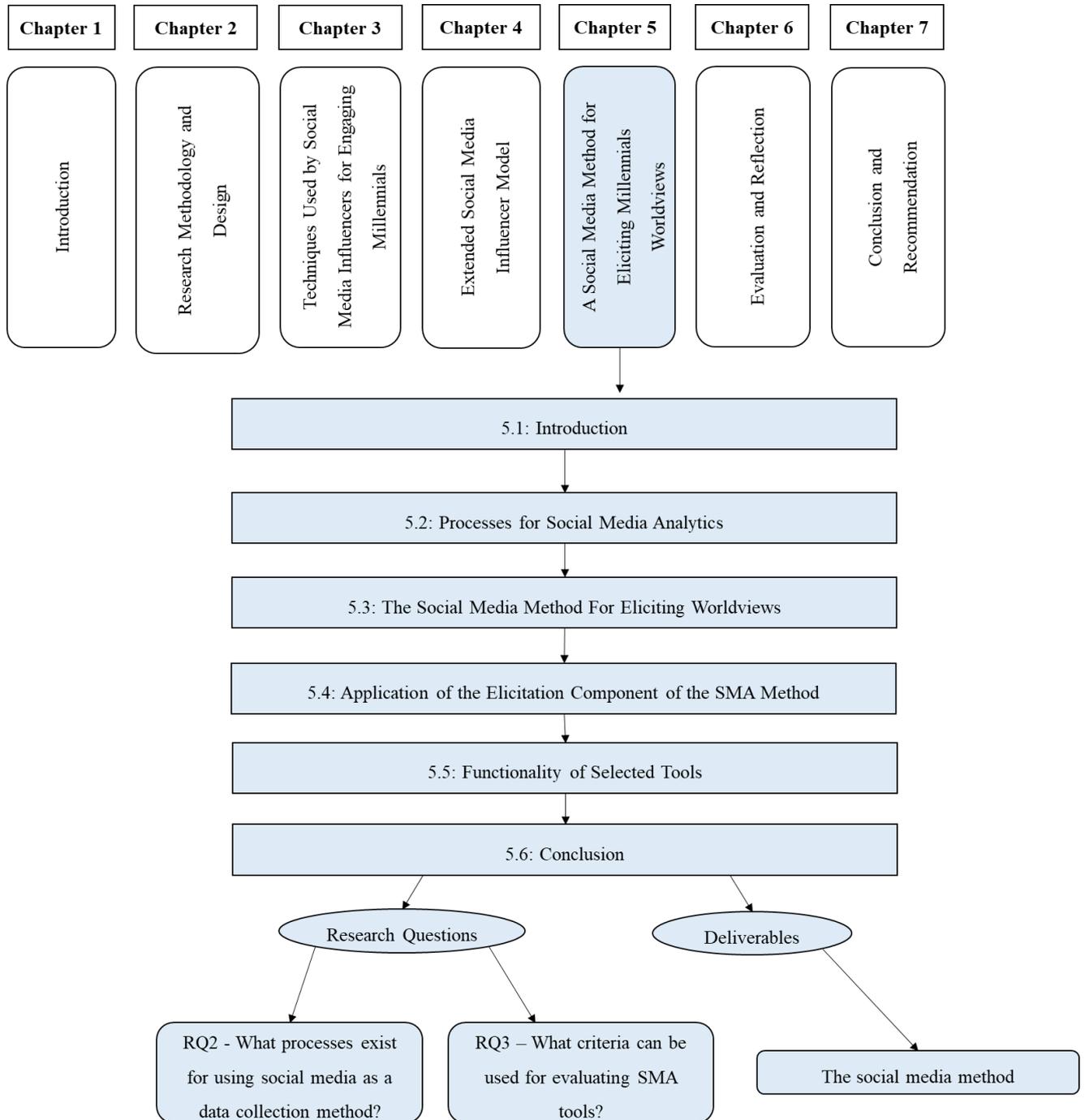


Figure 5-1 Chapter 5 Overview

5.1 INTRODUCTION

The previous two chapters proposed a Social Media Influencer Model that incorporates SMIs' techniques for engaging with millennials. These techniques can be used to facilitate engagement, which creates an opportunity for individuals to air their opinions and creates social media data, which can be collected and analysed by researchers. This provides an opportunity for conducting research using SNSs. The aim of this research is to design a social media method for eliciting the worldviews of millennials on the coastal and marine environment. The first component of the proposed method aims at engaging with the public using SMIs, and the recommended techniques are incorporated in a Social Media Influencer Model. This chapter reports on the further design and development, demonstration and evaluation of the second component of the solution (the Elicitation Component of the method) and the related DSR activities that were conducted to achieve this. The deliverables from addressing these two research questions are used in this component and explained in this chapter. These research questions are:

RQ2: What processes exist for using social media as a data collection method?

RQ3: What criteria can be used for evaluating SMA tools?

The Elicitation Component of the method incorporates a Process for SMA, which can be used as a guideline of the steps needed to follow in order to elicit perceptions and views of the public from the social media data obtained in the Engagement Component of the method (Section 5.2). The proposed Social Media Method for Eliciting Worldviews consists of two primary components, the Engagement Component, which is the Social Media Influencer Model (Chapter 4 Figure 4-3) and the Elicitation Component (Section 5.3). The proposed method is then applied to the context of this research and a focus group used to validate some of the aspects of the method and the criteria and metrics to be used (Section 5.4). Several tools that could be used in the Elicitation Component were evaluated by the researcher and the prominent features and steps outlined (Section 5.5). An analysis of the findings of the qualitative data obtained from the focus group and tool evaluation resulted in some conclusions being made by the researcher (Section 5.6).

5.2 PROCESSES FOR SOCIAL MEDIA ANALYTICS

Once social media data is obtained from using SMIs to engage with followers. Social media data needs to be analysed in order to gain insights into the views of followers i.e. the people that researchers wish to collect data from. In order to do this, Social Media Analytics (SMA) can be used, which is an emerging interdisciplinary field involving techniques for collecting, extracting, analysing and presenting user-generated data to discover insight into a specific subject (Chang et al., 2017; Lee, 2017; Stieglitz et al., 2014). The use of automated SMA is fast and inexpensive when compared to traditional data analysis, in which data collection is often manual and the analysis is labour intensive (Lee, 2017).

This section describes a four-stage analytics process proposed by Lee (2017). The steps in each stage were extended and adapted based on other literature and the extensions are explained in the relevant sub-sections. These stages are iterative in nature and evolve over time as new SNSs, tools and the environment changes. The process is made up of four stages (Figure 5-2). Each stage is accompanied by clear motivation and further explained in the following sections.

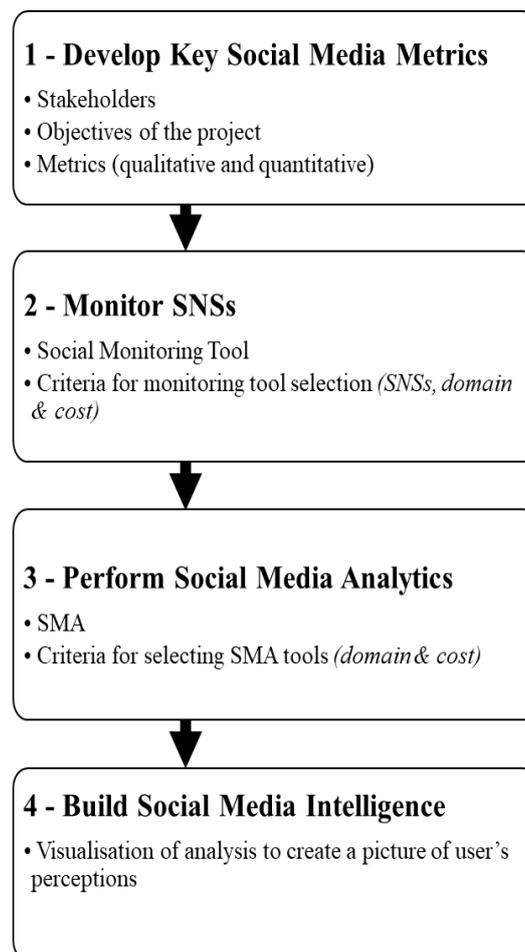


Figure 5-2 SMA Process Model (Adapted from Lee (2017))

5.2.1 Develop Key Social Media Metrics

The first stage of the Process for SMA is to develop key social media metrics. Selecting the right metrics is vital in connecting data with the right outcomes, this is because precise measurement is required when extracting and delivering value from social media data (Lee, 2017). In creating an SMA project, the researcher must decide on the set objectives. These objectives must be accompanied by the qualitative or quantitative metrics (for example, sentiment orientation, strength, subjectivity) that are necessary to understand the target group's attitudes and opinions. These objectives and metrics must be determined by the key stakeholders (companies, government or researchers) of the project.

5.2.2 Monitor Social Networking Sites

Monitoring on the internet is a logical instrument for gathering information (Bekkers et al., 2013). In marketing, companies use social media monitoring for market research, early warning, trend scouting and gaining feedback from their customer (Bekkers et al., 2013; Croll and Power, 2009). Collecting web content on social media is suggested for academics and researchers for gaining access to information (Kuttainen et al., 2012). Content from social media are rich and easily accessible but they must be evaluated and filtered to establish its validity (Chang, 2011).

5.2.3 Perform Social Media Analytics

The ability for researchers to collect, filter, and interpret data and messages creates a plan of action towards set goals (Lee, 2017). The aim of SMA is to aid the monitoring, filtering and analyses of discussions taking place on SNSs, and thus providing a comprehensive picture of users' perceptions. In conducting SMA, there are several analytical tools to aid this process. Although there are some social media data that are structured, there remains quite a lot of social media data that are unstructured leading to high diversity and ambiguity. According to Chen et al. (2012), SMA is a method for uncovering the thoughts and feelings of individuals by analysing both structured and unstructured online data across a vast array of online sources. SMA includes tools and frameworks for collecting, monitoring, analysing, summarising and visualising social media data to extract meaningful patterns and intelligence (Wamba et al., 2016). The third stage of the SMA Process Model involves performing SMA. This section explores a variety of techniques for performing SMA.

SMA has gained prominence in the marketing field where organisations utilise SMA to mine customers sentiments and to support marketing and customer service activities (Misirlis, 2017). Organisations such as Pepsi, McDonalds and Marriott have employed SMA to create a competitive advantage (Lee, 2017). The availability of user generated content (UGC) that is accessible through web-based API (Application Program Interface) on social media has made analysing social media a popular research and business activity (Batinca and Treleaven, 2015). SMA comprises an array of techniques and methods developed to derive specific metrics from social media data (Lee, 2017). Some of these techniques are addressed in the next few paragraphs.

Sentiment Analysis is the first popular SMA technique identified in the literature. The growth of SNSs contributes a large amount of UGC such as comments, reviews, and opinions about products, services and events (Vohra and Teraiya, 2013). People can gain insights into a products' strengths and weaknesses based on the sentiment of prior users. These opinions can be useful to individuals and organisations but becomes overwhelming. Sentiment analysis is a new research domain that is interesting to researchers to help analyse and summarise the opinions expressed in text data on SNSs. According to Lee (2017), "Sentiment analysis, also known as opinion mining, refers to the application of computational technologies such as natural processing language (NPL) and computational linguistics to identify and extract subjective information from vast amounts of UGC". Sentiment analysis is one of the most researched topics within the fields of information processing and it offers opportunities for the development of new applications due to the huge growth of available information from blogs, wikis and social media (Serrano-Guerrero et al., 2015).

Trend analysis was the second technique identified in several studies and is a major application of data analysis, it helps in identifying trends for strategy creation and action planning (Trucolo and Digiampietri, 2017). Social networks have large-scale information infrastructures for its users to communicate and exchange ideas on different topics. Trend detection for these topics poses a significant interest (Budak et al., 2011). One of the reasons is that trends can be used in detecting emergent behaviours on social networks. Another reason is that these trends can be viewed as a reflection of a collective societal concern or decision making. Trend analysis in social media is carried out by filtering through interlinked or corresponding events or topics being discussed on SNSs (Mehmood et al., 2014). Trend analysis techniques can be used in mining opinions among millennials. These techniques would

help to determine the appreciation, criticism, and level of severity of discussed topics in comments, Tweets or blogs (Mehmood et al., 2014).

Visual Analytics is another SMA technique and is the science of analytical reasoning by interactive visual interfaces that was initially motivated on by the U.S. defence needs (Fan and Gordon, 2014). Visual analytics is made up of a range of activities, from data collection to data supported decision-making. Visual analytics is a part of scientific and information visualisation but includes technologies from other fields such as knowledge management, statistical analysis, cognitive science, decision science, and many more. The importance of visual analytics lies in its ability to process data to reveal its hidden structure in detail. It provides computational methods for data reduction, displays correlations among disparate data sources, and allows the user to physically manipulate data displays (Fan and Gordon, 2014). The ultimate goal of using visual analytics is to identify patterns, trends and structures, and to gain useful insights through analysis of a vast amount of data collected from various SNSs (Wamba et al., 2016). To create a better understanding of visual analytics, visual analytics is a collection of techniques that uses graphical interfaces to present summarised, heterogeneous information to help users visually inspect and understand results of an underlying computational process. An example of a commonly used interface is a dashboard where different metrics and key performance indicators are displayed in a way that resembles a car's dashboard design. This technique can be used for crisis management and for detecting breaking news from social media chatter (Fan and Gordon, 2014).

Social Network Analysis is an SMA technique for modelling connection, growth and dynamics of activities and networks in SNSs (Wamba et al., 2016). Modelling social network dynamics and growth can help monitor activities. This technique has been used by marketing campaigns to identify key influencers on Twitter or other SNSs. It can be used for identifying sub-communities within large communities such as discussion forums to allow for precision when tailoring products and marketing materials (Fan and Gordon, 2014). Social network analysis is used to analyse a social network graph to better understand its underlying structure and connections as well as to identify its relative importance of different nodes within the network. In a social network graph, nodes represent users and the edges represents the associated relationships. The relationships are usually detected from user actions directly connecting two people such as accepting friend requests. Social network analysis uses various techniques for understanding the mathematical structure of graphs such as counting the number

of edges a node has and computing eigenvectors to determine key nodes in a network (Fan and Gordon, 2014).

Topic Modelling is an SMA technique used to analyse large bodies of captured text to discover dominant themes or topics (Fan and Gordon, 2014). The themes discovered can be further explored to build navigational interfaces. Themes discovered can be used for other analytical tasks such as finding out users' interest, detecting emerging topics in social media postings, or summarising parts or all of a text collection (Fan and Gordon, 2014). Topic modelling makes use of advanced statistics and machine learning techniques for its analysis.

5.2.4 Build Social Media Intelligence

The fourth and last stage of the Process for SMA is to build social media intelligence. SMA can be used to monitor and analyse social media discussions but it does not prescribe or guide environmentalists on their next line of action. Social media intelligence helps to prescribe what should be done with the results of SMA (Lee, 2017). Social media intelligence is achieved by combining knowledge generated from traditional intelligence activities and that gained from SMA, to help in developing a better actionable decision. Social media intelligence can therefore be achieved by monitoring social media, performing SMA, data management, and sharing of analytic outcomes with relevant stakeholders (Lee, 2017). The objectives that social media intelligence aims to achieve includes (Moe et al., 2014);

- Understanding the behaviours driving the creation of online opinions from both a psychological and sociological perspective;
- Assess the implication of these behaviours on how we interpret social media; and
- Integrate these insights into an overall strategy.

5.3 THE SOCIAL MEDIA METHOD FOR ELICITING WORLDVIEWS

The Process for SMA is proposed to address the objective of eliciting worldviews (Figure 5-2), which forms the second component of the proposed solution for the research problem of this study i.e. the method. A method is a set of steps, algorithms, or guidelines that can be used to perform a task (March and Smith, 1995). A method should contain underlying constructs and a representation (model) of the solution space (March and Smith, 1995). The proposed Social Media Method for Eliciting Worldviews is illustrated in Figure 5-3 and is made up of two components. The first component is labelled the Engagement Component and is aimed at

engaging the public and was investigated in Chapters 3 and 4 to address the second solution objective SO₂. The second component of the method is the Elicitation Component and is aimed at eliciting worldviews and is investigated in this chapter in order to meet the broader objective of the solution, SO₁.

The Engagement Component contains the Social Media Influencer Model. This model contains characteristics that SMIs possess to create influence as well as the techniques that can be utilised by SMIs for engaging with the millennials on environmental issues. Engagement on SNSs can be in the form of comments, likes, and shares. This creates social media data that provides an opportunity for researchers to elicit key insights into millennials' worldviews.

The Elicitation Component aims at the elicitation of social media intelligence through SMA. Social media data that is obtained through engagement with SMIs on SNSs and the Engagement Component provides social media data that can be analysed. The Elicitation Component shows the process that must be taken to conduct SMA. Key metrics must be developed to connect social media engagement with the right outcomes. Social media engagement facilitated by SMIs provides social media data that can be monitored by an SMA tool for monitoring. Key metrics such as sentiment orientation, age, gender and location can all be detected from each social media post by performing sentiment analysis. Sentiment orientation states whether the opinion from a user's post is positive, negative or neutral. The metrics derived from social media datasets can be further utilised by researchers to build intelligence. However, building intelligence is not the main focus of this study and therefore the detail of this process can be recommended as a research area to future researchers who will utilise this method for eliciting millennials' worldviews on the coastal and marine environment.

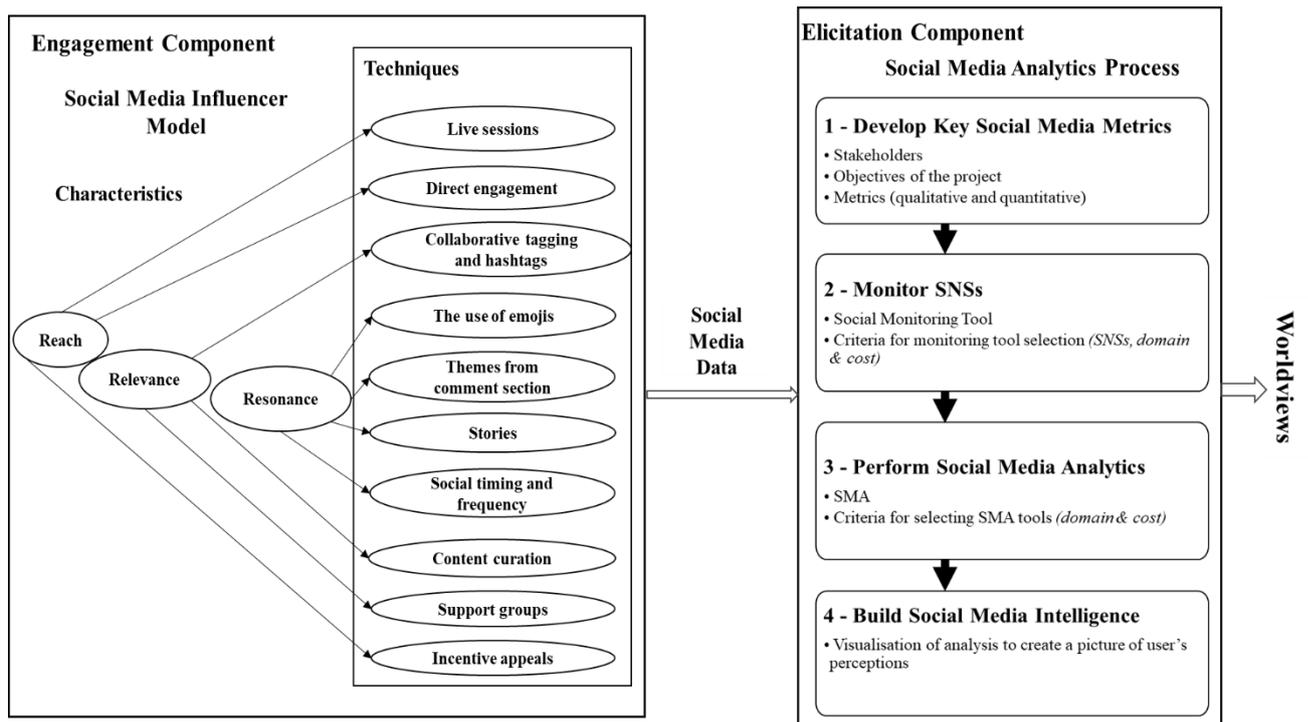


Figure 5-3 Social Media Method for Eliciting Worldviews

5.4 APPLICATION OF THE ELICITATION COMPONENT OF THE SMA METHOD

The proposed Social Media Method for Eliciting Worldviews (Figure 5-3) was applied to the research problem of this study related to collecting data from millennials on their worldviews regarding the coastal and marine environment. The second component of the method includes the four stages of the SMA Process Model. This section reports on the application of this component to the research context.

5.4.1 Key Metrics of the Social Media Analytics Project

The first stage of the SMA Process Model is developing key social media metrics with the relevant stakeholders in order to guide the choice of SMA techniques and SNSs to be utilised. Therefore, the SMA project for the coastal and marine environment case needed to clearly identify its objectives and the relevant metrics to be used to evaluate the project. This study forms part of a larger project on community social cohesion towards pro-environmental behaviours in coastal towns. The three steps in this stage and how they were applied to this research context are described in this section.

1. **Target key stakeholders** is the first step. Here key stakeholders should be approached when deciding on the metrics of the SMA project. In this research, key stakeholders

(researchers from social sciences) were approached for a focus group discussion to confirm and elaborate on the objectives and metrics of the SMA project. These researchers possess the necessary information that would drive the adoption of the proposed method.

A focus group was considered an ideal research method to address the fourth research question RQ₄ and to represent the target user group of stakeholders (Section 2.4). Five researchers were found who were willing to participate and were potential users or stakeholders of social media projects for collecting research data. Four of the participants were researchers from the field of social sciences while one of the participants was a researcher from the field of law. The participants are referred to as P1, P2, P3, P4 and P5.

2. Define objectives of the SMA project is the second step. The focus group helped confirm the objectives of the SMA project. These objectives are:

- To elicit millennials views around pro-environmental behaviours from SNSs;
- To create a sampling frame of millennials on the Eastern Cape; and
- To determine the predominant worldviews of millennials with concerns to the coastal and marine environment.

3. Define key metrics. In the third step, focus group participants identified the key metrics for the SMA project. From the transcript, various themes were identified related to the metrics. The aim was to elicit the worldviews of individuals from social media data in the context of this research and as stated by the participants required two primary metrics. These two metrics will be used as criteria to guide the selection of a suitable tool for conducting SMA. These metrics must be used to obtain insights at the end of the SMA Process to ensure the solution to the problems are met. The first two metrics relating to the research context are summarised in Table 5-1 together with the evidence from the focus group transcripts and were:

- Demographic detection – including age, race and gender. The individuals' perceptions targeted are those of the millennial generation. Demographics refers to the population groups such as age, race and gender. Using the millennial context of this research. The participants highlighted age as a criterion that would influence the selection of a suitable SMA tool. The SMA tool should be able to assist researchers in identifying the millennial age group from the posts on SNSs.

- Location – With regards to the coastal and marine environment, the location from the social media posts must be derived. The participants highlighted that the SMA tool should allow for location detection, this is largely due to the context of this research being with regards to the coastal and marine environment. So, detecting location should be an added incentive to influence an SMA tool’s selection.

Table 5-1 Metrics for Selection of SMA Tool

Criteria	Evidence from focus group transcripts
Demographic Detection	<p><i>“I’m using social media for sampling purposes. So, I need to create a sampling frame of millennials on the eastern coast” - (Focus group transcript, p.1).</i></p> <p><i>“We can specify and the gender or, you know, the nationality, the demographics in all those areas as well” - (Focus group transcript, p.5).</i></p>
Location	<p><i>“I’m using social media for sampling purposes. So, I need to create a sampling frame of millennials on the eastern coast” - (Focus group transcript, p.1).</i></p>

Three additional criteria relating to the features of the tools were identified by the focus group participants and are summarised in Table 5-2 together with evidence of sample statements extracted from the transcripts. They were:

- Cost;
- Keyword search and
- SNSs provided for by the SMA tool.

The cost of an SMA tool is vital. SMA as a method for data collection can cost a lot of money. Any tool to be considered must be cost-effective for researchers over the long term, which would in turn help reduce research cost. For example, P4 and P5 highlighted that tools for performing SMA were quite expensive and cost is a huge factor that would influence its adoption for carrying out research.

To aid data collection on different issues, the participants highlighted that the SMA tool should allow for searches to be made. These searches could be keyword search or specific hashtags. After identifying key metrics for an SMA project, these metrics can influence the selection of the SNSs used.

The participants highlighted that Twitter allows for a more ethical approach and provides less privacy restrictions. The SMA tool to be adopted must therefore be compatible with Twitter.

These findings from the focus group discussion helped the researcher in determining the criteria on which to evaluate various existing tools for SMA.

Table 5-2 Criteria for Selection of SMA Tool

Criteria	Evidence from focus group transcripts
Cost	<p><i>“Cost is a huge part of it” - (Focus group transcript, p.4).</i></p> <p><i>“I mean, some of this social media analytics programs, they cost a lot of money” - (Focus group transcript, p.5).</i></p>
Keyword Search	<p><i>“And also, that you could put in that information that you want so you can specify keywords that you're looking for” - (Focus group transcript, p.5).</i></p>
Social Networking Sites (Twitter)	<p><i>“With Twitter, if you are using Twitter. There are no ethical issues. As soon as you create a Twitter account, they ask you about your privacy, “can the information that you are putting on to Twitter, please be aware that this is public, and it may be allowed to be reused”. You're not allowed to use the name of that particular person, but you're allowed to do use their content” - (Focus group transcript, p.5).</i></p> <p><i>“As far as our ethics committee is concerned, you can use Twitter and Twitter is obviously, you disclaim that you are signing an agreement as part of the terms and conditions that information can be used” - (Focus group transcript, p.4).</i></p>

5.4.2 Monitoring Social Networking Sites

The second stage of the SMA Process Model involves monitoring SNSs. Monitoring on SNSs allows for quick access to valuable information on users’ profiles, awareness, liking, preference and interests (Lin and Rauschnabel, 2016).

5.4.2.1 Tools for Monitoring SNSs

This section briefly describes the application of the Process for SMA in the context of this research with regards to tools that can be used for monitoring SNSs. The researcher conducted searches on research portals online for social monitoring tools and performed some preliminary testing on the tools. The following four tools were tested because they occurred frequently in literature and were found easy to use in the preliminary tests conducted by the researcher:

- ATLAS.ti;
- NVivo;
- Brand24; and
- Keyhole.

ATLAS.ti is a powerful workbench utility for qualitative data analysis (Susanne, 2017). It is a well-equipped qualitative knowledge workbench that provides researchers with the necessary instruments to thoroughly analyse and evaluate, search, query and visualise findings. Among a host of functionalities that ATLAS.ti possesses, it allows users to monitor social media data by importing Twitter data based on hashtags or keyword searches.

NVivo is a qualitative analysis and mixed-methods data analysis software used by researchers globally. NVivo can be used by qualitative researchers to store, sort, categorise, and classify data (NVIVO, 2019). NVivo possesses a Ncapture browser add-on that allows users to monitor web contents and retrieve datasets from SNSs.

Brand24 is a social monitoring tool that allows monitoring on a global scale (Dytman-stasieńko, 2018). It is also a tool for measuring and analysing the buzz around brand, product or keywords (Brand24, 2019). Brand24 can be used to generate an organised stream of mentions of keywords for faster interaction. It can be used for collecting data from many SNSs such as Facebook, Instagram and Twitter.

Keyhole is an advanced analytic tool for hashtags, media monitoring and social media analytics to gain understanding of any conversation and the people behind them (Keyhole, 2019). Keyhole is a web-based platform that can be used for brand monitoring, campaigns monitoring, events monitoring and market research (Keyhole, 2019).

5.4.2.2 *Criteria for Selecting Tools for Monitoring SNSs*

The four tools tested by the researcher were then evaluated based on four of the five metrics specified by the focus group participants (Table 5-1 and Table 5-2). The ‘demographic’ metric was not included because it can only be derived when performing SMA. Each metric was allocated a rating score to help the researcher to select the most suitable tool for social monitoring. This section describes the rating method used.

Cost – For cost, tools that were free or discounted for academics were allocated a score of 3. Tools that are neither free nor possess a discount for academic researchers scored the lowest rating of 0.

Keyword Search – A monitoring tool should allow for searches to be made while monitoring SNSs by means of keywords and hashtags. Tools that allow researchers to monitor SNSs based

on certain keywords or hashtags carried a rating score of 1 and those that provided no search facility scored 0.

Social Networking Sites – Twitter was highlighted by the focus group participants as the primary SNS for carrying out research, this is due to its minimal privacy restrictions. The SNSs that each of the tools support are highlighted. Tools that support monitoring of Twitter data was scored as 3. The participants added an additional score of 1 for every SNS supported.

Location – The location of posts can be derived from monitoring social media data. The SMA tools should be able to detect the location of posts made from the monitored social media data. This criterion carried a rating score of 1 for those tools that can detect location and 0 for those that can't.

In Table 5-3 a summary of the rating of the four tools are provided. The tool with the highest score is NVivo, with a rating score of 10. Therefore, NVivo was selected as the most suitable tool for monitoring SNSs.

Table 5-3 Selecting Tools for Monitoring SNSs

Tools	Criteria and Metrics						
	Cost	Score	Keyword Search	SNS	Score	Location	Total
ATLAS.ti	Discounted for academic researchers - \$99 for 2 years license.	3	1	Twitter	3	1	8
NVivo	Discounted for academic researchers - \$99 for 2 years license.	3	1	Twitter Facebook Instagram	3 1 1	1	10
Brand24	\$49 monthly	0	1	Twitter Facebook Instagram	3	1	5
Keyhole	From \$179 to \$999 monthly	0	1	Twitter Facebook Instagram	3	1	5

5.4.3 Perform Sentiment Analysis

The third stage of the SMA Process Model involves performing SMA. In performing SMA, there are different techniques that can be utilised (Section 5.2.3). The technique selected for

this SMA project is sentiment analysis because it allows researchers to analyse opinions, sentiments, attitudes and emotions from written texts on SNSs (Liu, 2012), therefore meeting the objective of eliciting worldviews. Sentiment analysis tools interpret and provides meaning from unstructured data, and can be used in measuring an individual's, group's or community's emotions towards any types of services, products, brand or event (Wamba et al., 2016). In the context of this research, sentiment analysis is suitable because in eliciting millennials' worldviews on the coastal and marine environment, it is therefore vital that millennials' opinions on SNSs be collected and measured. Sentiment analysis tools offer emotions and opinion mining as well as age recognition in this regard.

5.4.3.1 *Approaches for Sentiment Analysis*

Three possible approaches to sentiment analysis are:

- Machine-Learning Approach;
- Lexical-based Approach; and
- Hybrid Approach.

A machine-learning approach learns to evaluate sentiment through acquiring and integrating knowledge gained from a large number of sentiment examples (Lee, 2017). This approach often relies on the use of supervised classification. One of the strengths of the machine-learning approach is its ability to adapt and create trained models for specific purposes and context. The machine-learning approach requires two sets of documents: training and a test set. The training set is used by an automatic classifier to learn the differentiating characteristics of documents and the test sets checks to see how well the classifier performs (Vohra and Teraiya, 2013). The machine learning approach starts with collecting trained dataset in which a classifier is trained on. While training classifiers, an important decision to make is feature selection. Feature selection tells us how a document is represented. The most commonly used features in sentiment classification are term presence and their frequency, part of speech information, negations, and opinion words and phrases. The advantage of the machine-learning approach is its ability to adapt and create trained models for specific purposes and context. The limitation is that, it is difficult integrating into a classifier, general knowledge which may not be acquired from training data (D'Andrea et al., 2015).

The lexical-based approach uses a pre-defined set of words that carry a specific sentiment and evaluates sentiments by using a large dictionary of phrases and pre-scored words (Lee, 2017). The lexical-based approach relies on a sentiment lexicon. A sentiment lexicon is a collection of known and precompiled sentiment terms, idioms and phrases developed for traditional genres of communication (Serrano-Guerrero et al., 2015). The lexical-based approach can be used for analysing a document, if more positive word lexicon is found then the document is positive otherwise it is negative (Vohra and Teraiya, 2013). The lexical-based approach to sentiment analysis is unsupervised learning because it does not require prior training in order to classify data. An advantage of using the lexical-based approach lies in the fact that general knowledge sentiment lexicon has wider term coverage. The lexicon-based approach has two limitations, firstly, the number of lexicons in the words are finite which might be problematic especially when extracting sentiment from very dynamic environments. Secondly, Sentiment lexicons often assigns a fixed sentiment orientation and score to words without taking note of how they are used in text (D'Andrea et al., 2015).

The hybrid approach is a combination of both the machine-learning and the lexicon-based approach. This combination has the potential to improve sentiment classification performance (D'Andrea et al., 2015). The main advantage of this approach is to attain best of both worlds-stability, improved accuracy and readability from a carefully designed lexicon (Vohra and Teraiya, 2013). The limitation of this approach is that reviews with lots of irrelevant words are often assigned a neutral score because the approach couldn't detect any sentiment (D'Andrea et al., 2015).

5.4.3.2 Tools for Sentiment Analysis

The six sentiment analysis tools discussed in this section were among the most popular and up-to-date tools found across most research portals and websites. These tools were also cited across various articles on tools for sentiment analysis (Abbasi et al., 2014; Connelly et al., 2017; Serrano-Guerrero et al., 2015). These tools were:

- SentiStrength;
- Semantria;
- uClassify;
- Text2Data;
- RapidMiner; and

- Brand24.

SentiStrength is a standalone sentiment analysis tool (Abbasi et al., 2014). SentiStrength employs several methods to extract positive and negative sentiment from text (Thelwall et al., 2017). It uses the lexical-based method for assigning scores to negative and positive phrases in text. SentiStrength detects both positive and negative sentiment strength to a given line of text. The output of a sentiment could be positive or negative. SentiStrength is a standalone sentiment analysis tool, it needs to be fed with datasets. Datasets from twitter or Facebook can be uploaded to SentiStrength to derive sentiment.

Semantria is a sentiment analysis tool created by Lexalytics Inc, a prominent text analysis software provider. It uses the machine learning method to assign weighted sentiment scores to topics, themes, categories and entities within a sentence or phrase (Lexalytics, 2019). Semantria offers an excel plugin that enables the analysis of Excel spreadsheets according to positive, neutral and negative sentiments (Linus and Lawrence, 2014). Semantria offers academic researchers a free trial version which allows the researcher to analyse up to 50,000 document transactions.

uClassify is a web-based sentiment analysis tool launched in 2008 by a group of machine learning enthusiasts based in Stockholm. uClassify can be used as a sentiment analysis tool for creating text classifiers for various tasks (Connelly et al., 2017). It uses a machine learning approach to train classifiers. uClassify performs many functionalities such as language detection, text, gender, age recognition, spam filter, document tagging, sentiment analysis, emotion detection, among others (Serrano-Guerrero et al., 2015). uClassify allows a maximum of 500 requests for free per day.

Text2Data is a London-based web online service that offers Text Analysis SAAS (software as a service) using machine learning methods (Gao et al., 2015; Text2Data, 2019). It is used for sentiment analysis, text summarisation, document classification, entity extraction, themes discovery, keyword analysis, citation detection and slang detection. Text2Data delivers affordable quality text analysis services to assist companies in understanding their customers better. It offers a real-time sentiment analysis API, which is used to analyse texts based on content through a scalable and RESTful API service (Gao et al., 2015). Text2data determines a document's sentiment depending on many factors such as document type (such as twitter dataset, amazon content, emails etc), length and its lexical coherence (Text2Data, 2019).

RapidMiner is a programming free data analysis platform that uses machine learning to build predictive models (Rapidminer, 2019). It allows data mining and analysis processes to be designed from elementary building blocks called operators (Ristoski et al., 2015). Additionally, more functionalities can be added to RapidMiner by developing extensions, which can be found on the RapidMiner marketplace.

Brand24 is a social monitoring tool that allows monitoring on a global scale (Dytmanstasieńko, 2018). It is also a tool for measuring and analysing the buzz around brand, product or keywords (Brand24, 2019). Brand24 can be used to generate an organised stream of mentions of keywords for faster interaction. It can be used for collecting data from many SNSs such as Facebook, Instagram and Twitter. Brand24 utilises the hybrid approach for conducting sentiment analysis of a hashtag or keyword (Krasinski, 2019). The ability for Brand24 to provide visual representation of analytics performed makes it one of the preferred analytic tools for marketers (Brand24, 2019).

5.4.3.3 Metrics for Selecting Sentiment Analysis Tools

The two metrics used for the third stage of the SMA Process (Perform sentiment analysis) were cost and demographic detection. Cost was selected because it is a standard criterion across all tools, while demographic detection was selected because the demography can only be detected by a sentiment analysis tool. The other criteria/metrics identified by key stakeholders were already catered for by the tools for monitoring SNSs.

Cost – Cost carried a rating score of between 0 and 3. Tools that are neither free nor discounted for academic researchers scored 0.

Demographic Detection –The SMA tool to be selected should be able to analyse the demographics from each individual post from social media data. Using the millennial context, age is one of the demographical information that the SMA tool should be able to analyse. This metric carried a score of 0 if no detection feature was provided and 1 if provided.

A summary of the evaluation of the sentiment analysis features of the tools is provided in Table 5-4. uClassify scored the highest and was therefore selected as the most suitable for conducting this SMA project. One metric that made uClassify stand out is the age detection feature.

Age detection is necessary in determining the millennial demographic from the posts on social media data.

Table 5-4 Selecting Sentiment Analysis Tools

Tools	Approach	Criteria				
		Cost	Score	Demographic Detection	Score	Total
SentiStrength	Lexical based	Free for academic researchers	3	No	0	3
Semantria	Machine-learning	\$999 monthly	0	No	0	0
uClassify	Machine-learning	Discounted for academic researchers - \$99 for 2 years license	3	Yes – Age & Gender	1	4
Text2Data	Machine-learning	From \$25 to \$331 monthly but Text2Data offers a 50% discount for academic usage.	3	No	0	3
RapidMiner	Machine-learning	Free licenses for academic usage	3	No	0	3
Brand24	Hybrid	\$49 monthly	0	No	0	0

5.5 FUNCTIONALITY OF SELECTED TOOLS

NVivo was selected as the most appropriate tool for monitoring SNSs because it satisfied the criteria and metrics stated by the focus group participants and scored the highest among the four tools reviewed (Table 5-3). For sentiment analysis, uClassify scored the highest among the six tools reviewed and therefore was selected as the SMA tool for performing sentiment analysis (Table 5-4). These two tools were therefore subjected to a more thorough testing process by the researcher and an overview of the functionality provided by the tools is provided in this section.

5.5.1 NVivo for Monitoring SNSs

NVivo is a tool that can be used for monitoring content on the web and on SNSs. It was designed primarily for the analysis of qualitative data, but this tool does even more. Its functionalities goes beyond managing complex projects from multiple sources to processing open-ended text responses with geographical and categorical data from fixed-response

questions (Jackson and Bazeley, 2019). NVivo provides a browser extension called NCapture for capturing web-based data using Google Chrome for analysis within NVivo. NCapture can be used on social media to collect datasets. It works on SNSs such as Facebook, Twitter, LinkedIn and YouTube. The datasets collected from these SNSs can be exported to excel or a pdf file format. These are the steps below for using NCapture for importing and exporting Twitter datasets:

1. Install NVivo and the Ncapture browser extension;
2. Open your browser and access Twitter;
3. Search for a suitable hashtag or keyword;
4. Click on the NCapture extension and capture Tweets as Datasets as shown in Figure 5-4;
5. After capture, Twitter datasets will be saved in the default location;

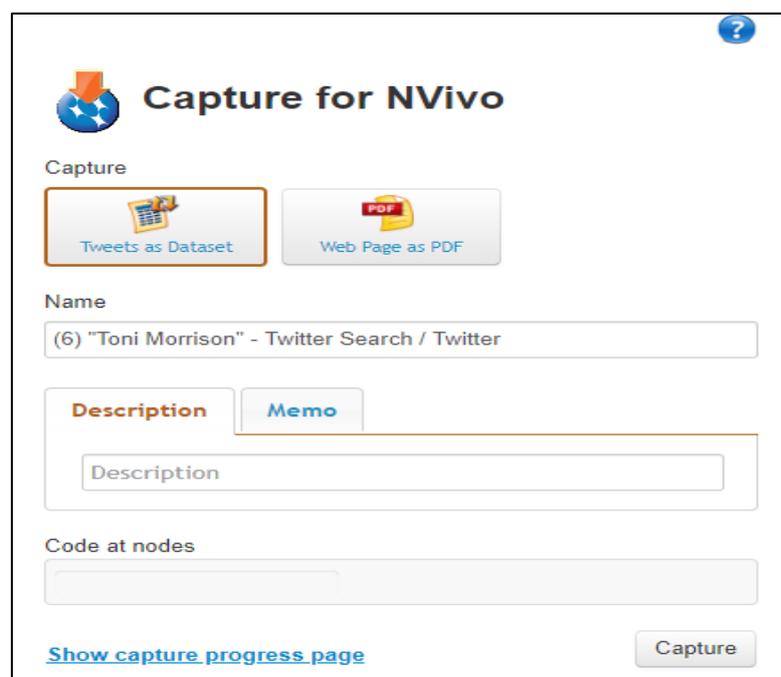


Figure 5-4 NCapture for NVivo

The datasets captured from Twitter can be imported into NVivo and exported as a Microsoft Excel file to any other SMA tool to perform sentiment analysis on. NVivo can't be used for sentiment analysis but provides functionalities that can be used for making visualisations to aid understanding of the datasets results.

In monitoring SNSs, NVivo is best utilised for monitoring Twitter data. NVivo can be used for Facebook and Instagram but certain restrictions exist. Facebook and Instagram have strict

privacy restrictions with regards to monitoring social media posts. The only way posts can be collected on Facebook using NVivo is through a Facebook group. The Facebook group must be created by the user and NVivo must be installed as a Facebook App. This App allows posts made by member to this Facebook group to be monitored or collected by NVivo. Instagram data can only be monitored by NVivo from the comments made on an Instagram post unlike Twitter where data can be monitored and collected from key search words and hashtags.

The location of the user can also be detected from Tweets using NVivo. The location on Tweets is a geotagging feature in Twitter's API that provides users with a more meaningful experience by contextualising Tweets (Twitter, 2014). On Twitter, the location feature can be turned on by the user to accompany Tweets. Since most Twitter users opt out of tweeting with the location feature on, NVivo is also able to detect the home location provided by the user on their public profile. When monitoring Tweets from Twitter, the researcher can also filter Tweets according to location by using Twitter's advanced search functionality. A guide for monitoring Twitter data using NVivo, and the results can be found in Appendix I.

5.5.2 uClassify for Sentiment Analysis

uClassify is a free machine learning web service that has trained classifiers for sentiment analysis. Its classifiers are well suited for short and long texts (Tweets, Facebook statuses, blog posts, product reviews etc) (uclassify.com, 2015). Its classifiers can analyse sentiment, age, gender, text language and mood among a host of others. On <https://www.uclassify.com/>, users can access these trained classifiers to analyse texts. The problem with using uClassify for analysis lies with its user-interface as shown in Figure 5-5. Its user interface is not suitable for conducting analyses on social media datasets. The user will have to copy and paste each post from datasets into the text editor before uClassify can do any analysis on them. This negatively impacts the user experience because datasets can neither be imported into uClassify for analysis nor can results be exported out of uClassify.

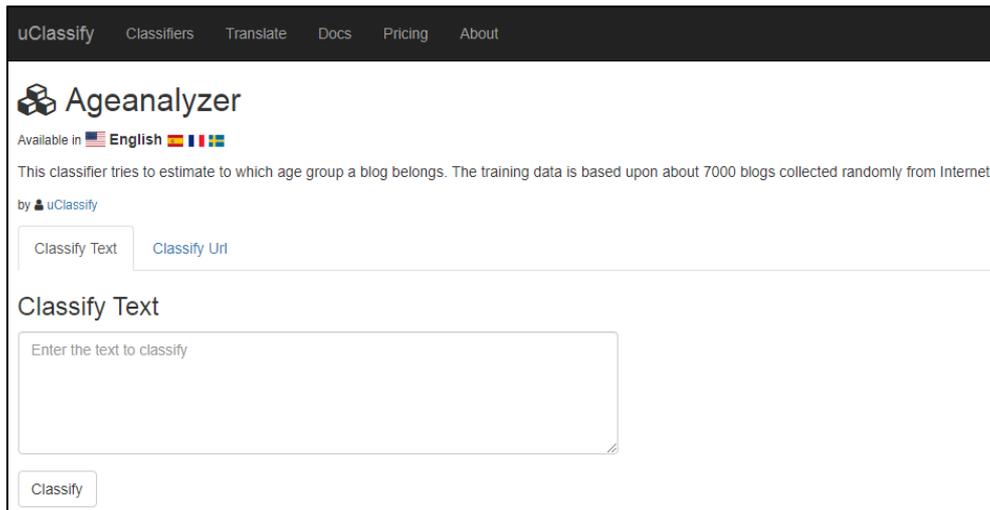


Figure 5-5 uClassify Interface for Analysing Text

To address this challenge, SeoTools for Excel created by Niels Bosma offers a connector for uClassify that provides a user-friendly and effective method to analyse text using uClassify and its machine learning classifiers (Niels Bosma, 2019). The SeoTools connector can be accessed and downloaded on <https://seotoolsforexcel.com/uclassify/>. After downloading the SeoTools file, install the software. This software is a Microsoft Excel add-on and can only be used on Excel to analyse datasets. To activate uClassify on the SeoTools connector, these steps should be followed:

1. Launch Microsoft excel and click on the SeoTools tab in excel;
2. To add the uClassify connector, click on the Manage button located on the Connectors ribbon;
3. A dialog box should appear, click on the language category, click and install uClassify;
4. Close the dialog box;
5. To access uClassify, click on Others located on the Connectors ribbon;
6. Click on Language and click on uClassify;
7. A uClassify panel shows up on the left-hand side of the excel page;
8. On the uClassify panel, choose the classifier you want to use by clicking on the Select link;
9. A dialog box appears requesting for the Read API keys;
10. To proceed, you will need a Read and Write API access;
11. Register an account on uClassify at <https://www.uclassify.com/account/register>;
12. After registration, you will receive an account with 500 limit calls per day;
13. Click on the “Api keys” tab, there you will find the read and write API keys;

14. Copy the read API key and paste it on the text box shown in excel and click on the save button;
15. You will also need to register for SeoTools by clicking on the register button at the bottom of the uClassify panel on excel;
16. Click on request a trial using your email address and a 14 days license key will be sent to your email;
17. Copy this license key from your email;
18. Type in your email and paste the license key into the license key textbox on SeoTools and click on register;
19. Now you have full access to uClassify connector for social media analytics.

uClassify's sentiment analyser categories Tweets based on it being positive or negative. It is best suited for short and long texts such as Tweets, Facebook posts, blogs posts and product reviews (uclassify.com, 2015). uClassify's sentiment analyser has been trained on 2.8 million documents with data from Twitter, movie reviews and Amazon product reviews. uClassify's age analyser has been trained on about 7000 blogs collected from the internet (uclassify.com, 2015). The age analysis is based on the difference in writing styles among age groups (Simaki et al., 2016). Also, content-based features can be used to distinguish age groups, teenagers write more about friends and mood swings, people in their 20's write mostly about college life and those in their 30's write more on marriage, jobs and politics (Santosh et al., 2013). The detail of the steps taken to analyse datasets with uClassify, and the results obtained can be found in Appendix I.

5.6 CONCLUSION

SMA has gained prominence over the years for deriving sentiments and opinions from social media data. The rapid rise in usage of SNSs mostly by the millennials provides ample opportunities for researchers and marketers to discover useful insights. In collecting data from social media, SMA provides a fast and inexpensive approach. This chapter discussed the various techniques that can be utilised for analysing social media data and eliciting information and value from this data. In carrying out investigations on a method for collecting social media data, SMA processes were discussed in Section 5.2. The proposed method includes a four-stage SMA Process Model for eliciting insights from social media data using SMA tools.

To conduct SMA, various SMA tools were reviewed. The tools reviewed were investigated and evaluated based on metrics such as cost, demographic, location, and keyword search. These metrics all form part of the objectives of the SMA project, and the tools selected were able to cater for these objectives. The objectives of the SMA project comprise of key metrics that suits the context of this research (Section 5.4). The tools that fit the set metrics were selected and can be utilised for conducting the SMA project. It is evident that this chapter has successfully answered RQ₂ (What processes exist for using social media as a data collection method?) and RQ₃ (What metrics can be used for evaluating SMA tools?). This chapter also reported on the process of fulfilling the following two solution objectives:

SO₁. To provide processes for using social media as a data collection method. These processes included those for engaging with millennials and eliciting worldviews from them (links to RQ₂);

SO₃: Recommendations for selecting SMA tools/platforms (links to RQ₂).

In summary, this chapter reported on the iterative DSR activity of design and development of the proposed solution (the method). The next chapter presents the findings of a preliminary evaluation of the social media method.

CHAPTER SIX

EVALUATION AND REFLECTION

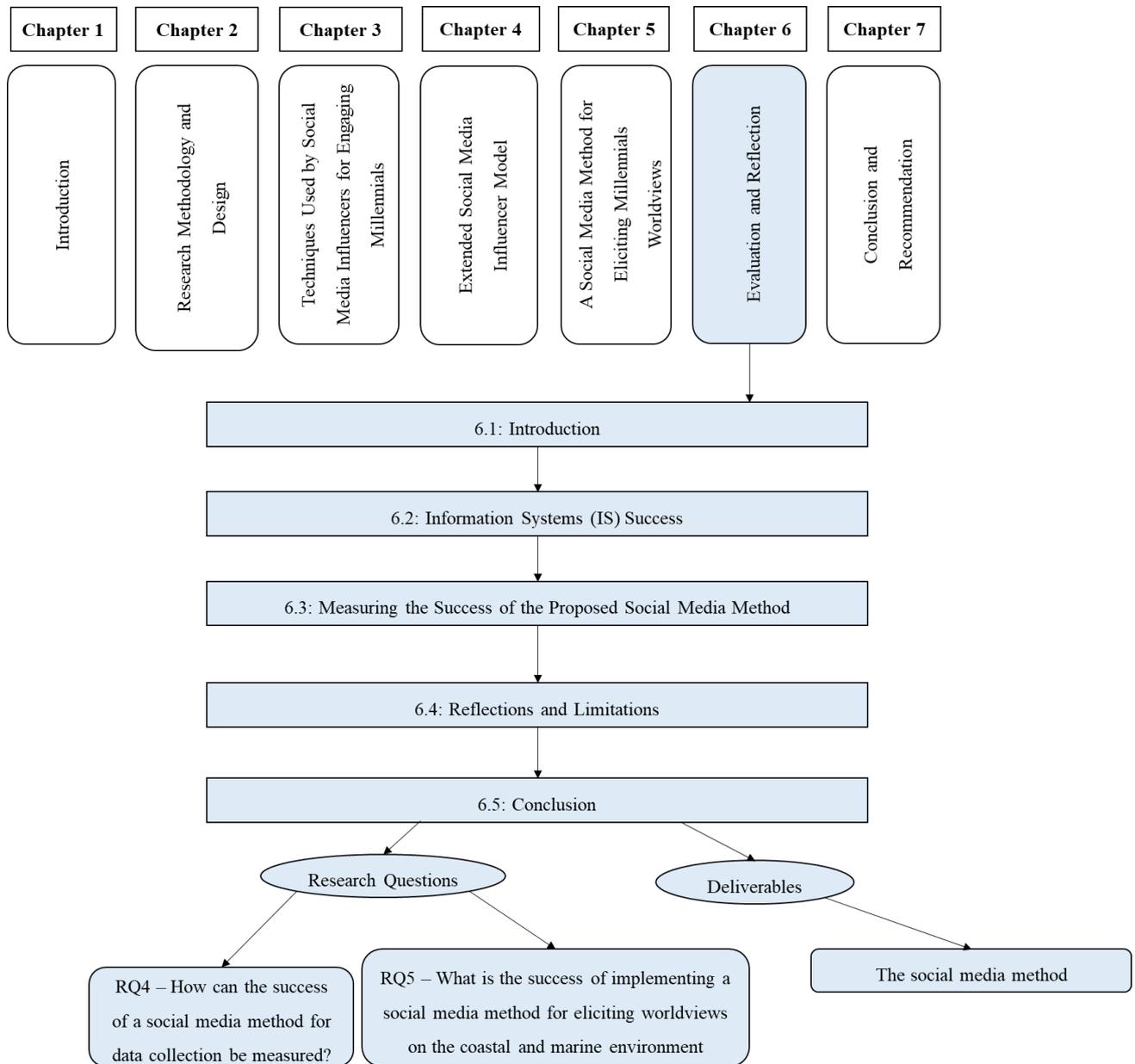


Figure 6-1 Chapter 6 Overview

6.1 INTRODUCTION

In this chapter, the proposed Social Media Method for Eliciting Worldviews is evaluated and reflected on. The goal of this method is to provide an effective and structured approach to using social media for data collection by researchers. The success of this method must be measured. One of the most vital reasons for measuring the method is to understand its efficacy (Toni and Zanutto, 1989). Another reason why the success of the method must be measured is to verify the alignment of the research goals with the proposed method.

This chapter is based on the demonstration and evaluation activity of the DSR process, where the method created will be demonstrated, observed and measured. The reflections and findings made by the researcher will also be presented in this chapter. The chapter overview is shown in Figure 6-1 and the research questions it aims to address are:

RQ4: How can the success of a social media method for data collection be measured?

RQ5: What is the expected success of implementing a social media method for eliciting worldviews on the coastal and marine environment?

Success in Information Systems (IS) can be evaluated using the DeLone and Mclean IS model (also referred to as the D&M model) for measuring the success of an IS intervention (Section 6.2). The D&M model is therefore used as a foundation for evaluating the success of the proposed method (Section 6.3). A reflection on the analysis provided additional insight into the success of the proposed method (Section 6.4). Several recommendations, conclusions and limitations of the social media method were identified (Section 6.5).

6.2 INFORMATION SYSTEMS (IS) SUCCESS

Various authors observed that in the last decade, companies spent large investments on the introduction of new information and communication technologies. It wasn't easy assessing the benefits gained from these investments, which often turned out to be failures (Legris, P., Ingham, J., Collerette, 2003; Toni and Zanutto, 1989; Yi and Hwang, 2003). Hence the measurement of IS success is of vital importance to aid our understanding of the value and efficacy of IS investments (DeLone and McLean, 2002). IS success can be defined as the measure of the degree to which the evaluator of the system believes that the stakeholder is better off (Kim et al., 2003). There are various internal and external stakeholders who have

interest in and demand different aspects of IS performance. IS success measurement focuses on individual performance, business process performance, and organisation performance.

This study adopted the D&M model for this research in order to determine the success of the social media method. *“IS success measures the degree to which the person evaluating the system believes that the relevant stakeholder (in whose interest the evaluation is being made) is better off”* (Seddon, 1997).

In the context of this research IS success is therefore defined as the degree to which the researchers evaluating the artefact believe that the worldviews of the millennials are successfully elicited.

The D&M model provides a valuable framework for understanding the multi-dimensionality of IS success (DeLone and McLean, 2016). The model in its final version aims to measure or assess the impacts of certain characteristics of technology (information, system and service quality) on variables such as “user satisfaction”, “intension to use” and “net benefits” (Toni and Zanutto, 1989). The objective of the D&M model is to determine the benefits derived from the IS in an individual’s and organisational basis. The six dimensions of IS success defined by DeLone and McLean in its updated version are: system quality, information quality, service quality, intention to use, user satisfaction, net benefits. It is also important to note that these six dimensions are not independent success measures (DeLone and McLean, 2016).

Figure 6-2 shows the updated version of the D&M model. In this model quality has three major dimensions: “information quality”; “system quality”; and “service quality”. Each measure must be measured separately because they all have an effect on subsequent “intention to use” and “user satisfaction”. “Use” must precede user satisfaction but then, a positive experience with “use” will impact positively on “user satisfaction” and similarly an increased “user satisfaction” will lead to an increased “intention to use” (DeLone and McLean, 2003).

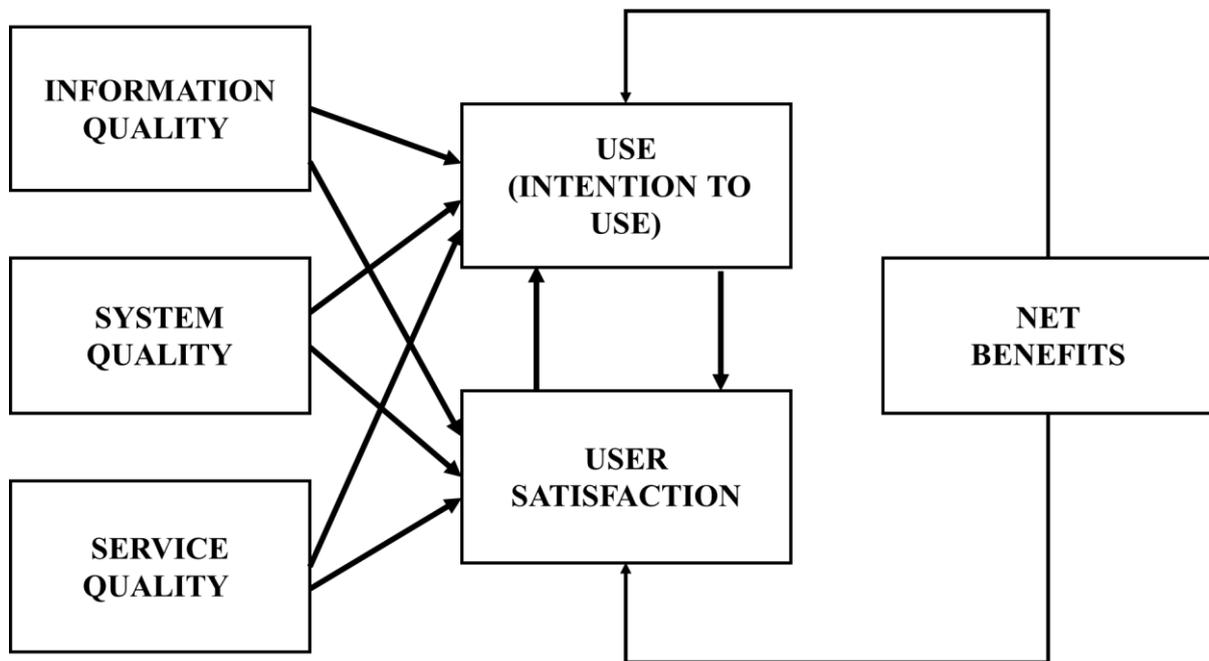


Figure 6-2 Delone and McLean IS Success Model (DeLone and McLean, 2003)

The results of the “use” and “user satisfaction” will bring about “net benefits”. If the IS system is to be continued, it is assumed that the “net benefits” from the owner or sponsor of the system are positive, thus reinforcing a feedback loop on subsequent “use” and “user satisfaction”. In the case where the “net benefits” are negative, this will likely cause a decreased use and discontinued usage of the system (DeLone and McLean, 2003). The D&M model includes arrows to show relationships and associations among the success dimensions in a process sense.

Information Quality is made up of the desirable characteristics of the IS’s outputs. Its measures focus on the perceived quality and usefulness of the information produced by the system. This dimension is a key antecedent of user satisfaction. Some of its measures are relevance, understandability, timeliness, usefulness and completeness (DeLone and McLean, 2016; Urbach and Müller, 2012).

System Quality is made up of desirable characteristics of an IS. Its measures focuses on the usability aspects and performance characteristics of the system under examination (DeLone and McLean, 2016; Urbach and Müller, 2012). Some of the measures are ease of use, system flexibility and reliability, ease of learning, response time, sophistication, and navigation.

Service Quality – refers to the degree and manner with which IS are utilised by its users. Some of its measures are actual use, intention to (re)use, frequency of use and extent of use (DeLone and McLean, 2016; Urbach and Müller, 2012).

Intention to Use/Use refers to the degree and manner with which IS are utilised by its users. Some of its measures are actual use, intention to (re)use, frequency of use and extent of use (DeLone and McLean, 2016; Urbach and Müller, 2012).

User Satisfaction is of the most important dimension of IS success. It refers to the user's level of satisfaction when utilising the system. It is important to measure user satisfaction when the use of an IS is mandatory. Some of its measures are effectiveness, efficiency, information satisfaction and system satisfaction (DeLone and McLean, 2016; Urbach and Müller, 2012).

Net Benefits correlates with user satisfaction and use, however, there's is still a need for measuring net benefits directly. Net benefits include the former separate dimensions of individual impact and organisational impact from the original D&M model. Net benefits refer to the extent to which IS are contributing (or not contributing) to the success of the different stakeholders. Some of its measures are task innovation, job simplification, individual productivity, improved decision making, enhancement of communication and collaboration, and overall success (DeLone and McLean, 2016; Urbach and Müller, 2012).

6.3 MEASURING THE SUCCESS OF THE PROPOSED SOCIAL MEDIA METHOD

6.3.1 Evaluating the Application of the Social Media Method

The method proposed (Figure 5-3) was applied to the context of this study and evaluated during the evaluation activity of DSR (Section 5.4). As a result, two SMA tools (NVivo and uClassify) were selected by the researcher as the most appropriate tools for addressing the solution objectives. These tools aim to assist stakeholders with collecting and analysing thousands of social media data quickly. In Figure 6-3, the application of the social media method is illustrated, showing the selected SMA technique for sentiment analysis and the two selected tools, NVivo for monitoring SNSs and uClassify for performing sentiment analysis.

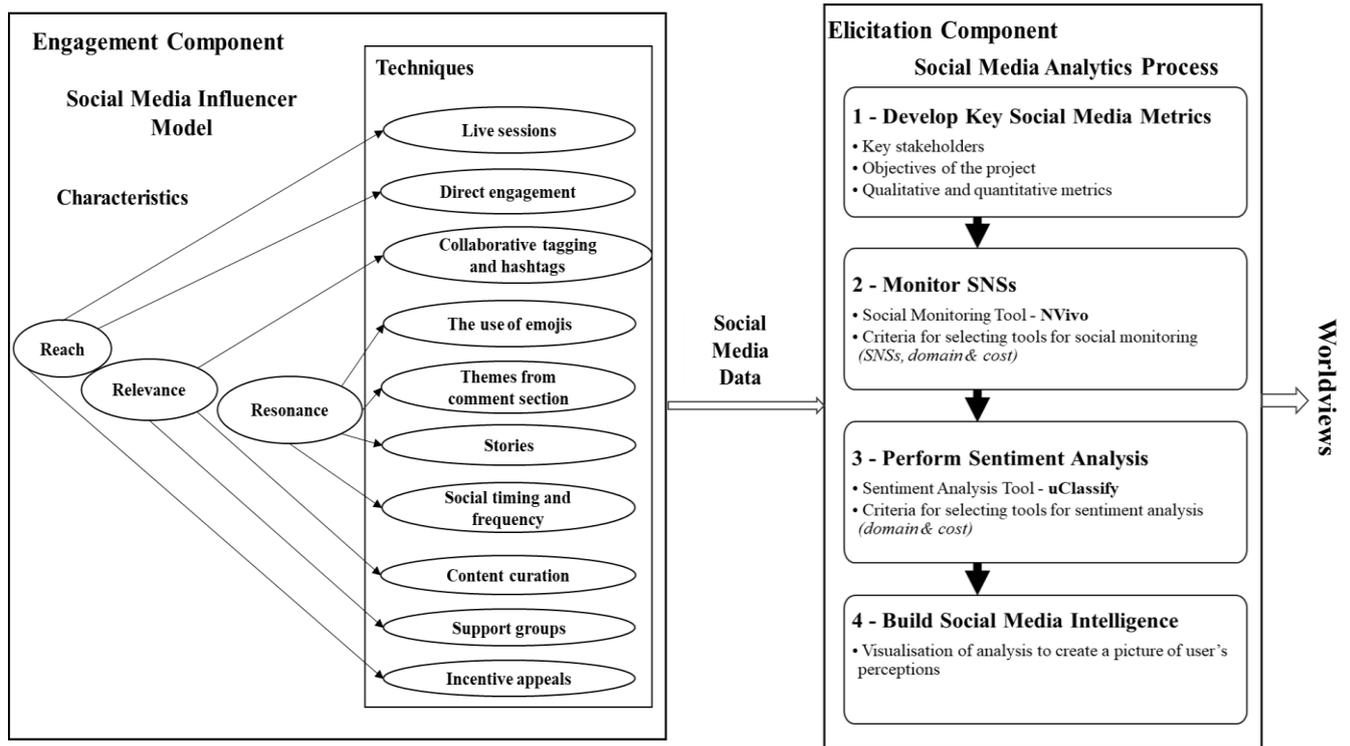


Figure 6-3 Application of the Social Media Method for Eliciting Worldviews

In measuring the potential success of the proposed social media method, the D&M model was used. Relevant measures for each of the six D&M dimensions were identified from those proposed by Urbach and Müller (2012). These measures are summarised in Table 6-1 and were used to provide qualitative insights to evaluate the proposed social media method. Based on the definition of service quality, it was determined that service quality was not a relevant dimension for the proposed social media method; hence the service quality measures were not used.

Table 6-1 Dimensions and Measures Used

D&M Dimension (DeLone and McLean, 2016)	Measures (Urbach and Müller, 2012)
System Quality	System features
	Access
	Turnaround time
Information Quality	Timeliness
	Reliability
Intension to Use/Use	Intention to re(use)
	Frequency
User Satisfaction	System satisfaction
	Efficiency
Net Benefits	Task innovation
	Job simplification

The same focus group of five participants who identified the key metrics of the SMA project (reported on in Chapter 5 Section 5.4.1) were used for evaluating the success of the social media method. The discussion held with the focus group participants addressed the proposed social media method by discussing the two components of the method, the Engagement Component, which involves the use of SMIs for engaging the public, and the Elicitation Component of the method, which consists of the SMA Process Model. The questions posed to the focus group are included in Appendix G. An analysis of the transcripts relating to the potential success of the method is provided in the following sections.

6.3.2 Social Media Influencers for Engaging

With regards to the Engagement Component of the model, some of the participants felt that using SMIs could be advantageous since one can reach a far wider audience and SMIs can help in creating a trend where more people can get involved in providing information on an issue. They also confirmed that SMIs can be used to influence SNSs' users to be involved in becoming part of the solution when various issues arise. Instead of being too problem focused on SNSs, SMIs can facilitate interventions where followers can come up with solutions. The participants agreed that SMIs can be utilised for creating a trend and for reaching a wider

audience. For example, the following statements made by participants confirmed the Engagement Component part of the method that uses SMIs.

“And then obviously, furthermore, you can reach a far wider audience” – (Focus group transcript, p.4).

“you can pick up more easily on the opinions and how they view a certain situation, especially if there's a trend as well. So if all of a sudden there is a trend, more people get involved and, you know, they provide that information where If you could just have one specific focus group talking about it, so in that sense, you can definitely gain more information and get a better understanding of what's happening out there and then bring it back into a focus area and discuss it further” (Focus group transcript, p.4).

“I also think, if social media influencers can sort of promote involvement in research. You know what I mean in social media research rather than just in the issue itself, but to facilitate research, which then can come up with solutions. So, I think we're very problem focused. Social media is very problem focused saying. There's so much plastic in the ocean. Look at, you know, a forest burning down. But there is no promotion of an actual solution. So, the promotion of social media and research for social scientists is quite important. I think that's where social media influencers can be very important.” - (Focus group transcript, p.1).

6.3.3 Social Media Analytics Processes for Eliciting

The second component of the method is the Elicitation Component, which consists of the SMA Process. The first stage of the SMA Process (Identify key metrics) was successfully applied in the focus group and is reported on in Section 5.2.1. In the second part of the focus group discussion, the researcher gave a walkthrough of the second and third stage of the SMA Process (Monitor SNSs and Perform Sentiment Analysis) respectively (Section 5.2.2 and 5.2.3). In the walkthrough of the two selected tools, the monitoring tool NVivo and the SMA tool uClassify were demonstrated to the participants.

For the **Monitor SNSs** stage, the researcher used NVivo and requested from the participants keywords or hashtags that they would like to look up on Twitter. The following keywords were highlighted:

- Ocean citizenship;
- Millennials;
- Pro-environmental behaviour; and
- Sustainable development.

In the demonstration the researcher used the SMA tool selected for monitoring SNSs called NVivo to collect Tweets on Twitter. These Tweets were based on the keywords highlighted above. The researcher demonstrated to the participants on how to collect datasets of Tweets in less than ten minutes. This dataset was made up of thousands of Tweets based on the keywords specified.

There were questions posed to the participants based on the D&M IS success dimensions of system quality, information quality, intention to use, user satisfaction and net benefits. These questions can be found in Appendix G and the focus group discussion transcript can be found in Appendix H. The dimensions and their measures were used as *a priori* themes and the responses were thematically analysed and coded and then mapped to these themes.

Table 6-2 summarises the three success dimensions that were met during the **monitor SNSs** stage conducted using NVivo, together with copies of the relevant transcripts from the participants. These dimensions are information quality, system quality and intention to use. The participants highlighted that the method provides a reliable means for data collection because the rate of return while using questionnaires is quite low. The timeliness of using the method for discovering insight was also an attribute that the participants mentioned. The measures of information quality confirmed from the responses were reliability and timeliness.

Table 6-2 IS Dimensions on Monitoring SNSs

Dimension	Measures	Evidence from Focus Group Transcript
Information Quality	Reliability	<i>“Another thing that I wanted to add why it could be interesting is in terms of my research wanting to do a questionnaire. The rates of return are always a big factor. You might send out 5000, you might get back two. There's nothing you can do about it. So, with this, the rate of return is not a factor” - (Focus group transcript, p.1).</i>
	Timeliness	<i>“It doesn't take that much time to do one to extract the data every week to say, you know, for the next three months, I'm expecting data every week. And it's easy to have that data available and to reuse it like when you analyse everything” - (Focus group transcript, p.5).</i>
System Quality	Turnaround time	<i>“eehh I'm gonna be so quick with my data collection... wow! How on earth? I can finish next year early next year” – (Focus group transcript, p.5).</i>
	System features	<i>“You can even, there is all your Tweet, it identifies the location.” – (Focus group transcript, p.4).</i>
Intention to Use	Intention to re(use)	<i>“OK. That's fine. So, you first identify your keywords and so then you're going to say you gonna collect data on a Tuesday for the next three months to see to compare them” – (Focus group transcript, p.5).</i> <i>“I'm not doing a questionnaire anymore” – (Focus group transcript, p.4).</i>
	Frequency	<i>“And my idea was to create a questionnaire. The way I'm going to do it now is to take basically what I'm trying to get out of the questionnaire and try and find a way to analyse Tweets to sort of encompass all those questions” - (Focus group transcript, p.1).</i>

The system quality dimension identified from the responses addressed the turnaround time and the system features. The participants highlighted how easy it was to collect datasets on Twitter and they were impressed with the time it took to complete the task. The intention to use dimension identified from the responses, addressed the intention to re(use) and the frequency measure. One of the participants who was considering using a questionnaire on SNSs stated that she would use the demonstrated tool due to its fast turnaround time.

The participants all seemed quite impressed with the demonstration of the monitoring stage and stated that this might just have been a huge breakthrough with regards to data collection. In particular, the participants were impressed with the speed at which hundreds and thousands of Tweets can be collected in a short period of time. Since the participants did mention that keeping the Tweets anonymous is necessary, the researcher demonstrated to them on how to remove the identifiers from the datasets.

For the **Perform Sentiment Analysis** stage of the SMA Process, the researcher demonstrated to the participants on how to perform sentiment analysis using the same Twitter datasets collected earlier. The SMA tool uClassify was used. Before performing the sentiment analysis on the datasets, an overview of uClassify was shown to the participants. In addition to sentiment analysis, other types of analysis such as mood, topics, age, language and gender were shown to the participants as analysis that can also be done using uClassify (Figure 6-4).

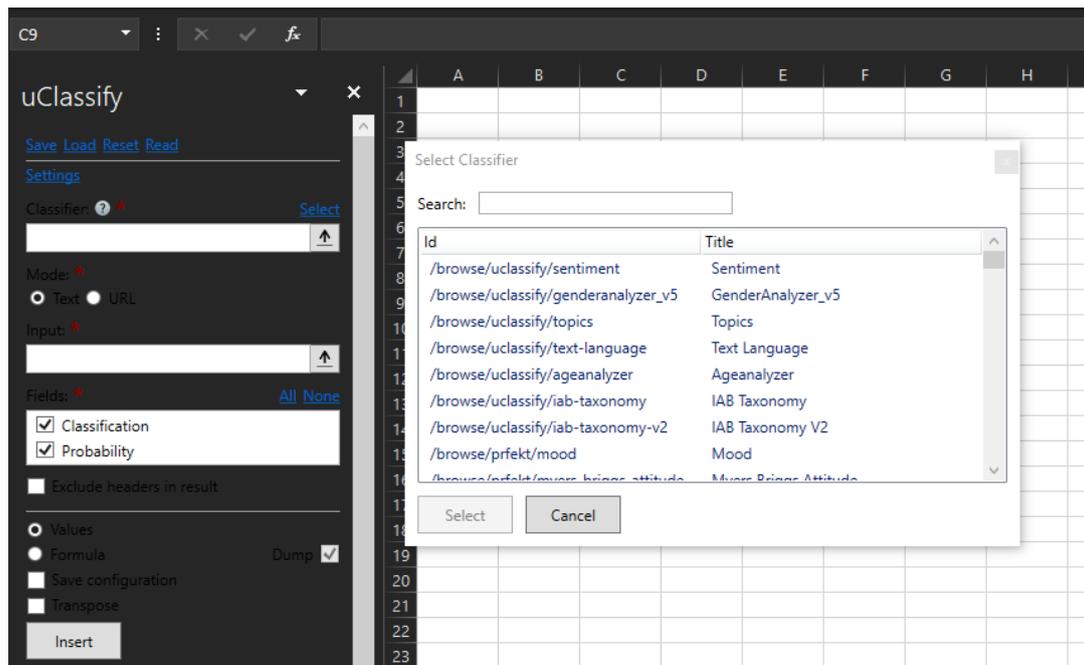


Figure 6-4 uClassify Analysers

The Tweets were analysed using the sentiment analyser of uClassify. The sentiments on each tweet were classified as either positive, negative or neutral, with the probability of accuracy specified. The researcher also demonstrated to the participants on how each set of Tweets can be analysed automatically by dragging the sentiment analyser's formula across all columns of Tweets (Figure 6-5).

Text	Location	Sentiment	Probability	Age	Probability
@Schooler1_ Eish broe that cross my mind too..I think it wou	Durban	negative	69.91%	36-50	56.63%
RT @deephthierry: Khoza : Mlungisi meet the new Coach Mr Zinnbauer	Klipfontein view,midrand	positive	0.606669	13-17	0.309145
RT @Nkgadimaclinton: They are trying to be Chiefs. Bringing ii	Mthatha, South Africa	positive	0.66503	65-100	0.242621
RT @EWNsport: BREAKING NEWS: Orlando Pirates have appointed Josef Zinnbauer as their new head coach.	Komatipoort, South Africa	positive	0.775901	18-25	0.216735
RT @LuthandoZibeko: Your appointment gave hope to aspirin	Komatipoort, South Africa	positive	0.945467	65-100	0.257194
RT @LutendoKhoromm2: Rhulani Mokwena is still the future (Komatipoort, South Africa	positive	0.897527	18-25	0.18103
RT @Emma_Tsebe: Josef Zinnbauer has been announced as th	Komatipoort, South Africa	positive	0.738865	65-100	0.765939
RT @Thapi_T: Balance Me Here abantu base #OnceAlways my Orlando Pirates Fam	South AfricaZA in DURBAN,				
Spare a thought for Rhulani; handover for someone to take yo	Rustenburg, South Africa				
@gretchen_ndou 🥰🥰 Rhulani was doing well, pity results (South Africa limpopo Tshaulu				
Oooh my Dream finally Came true.					
Honestly Rhulani is too young to coach Orlando pirates, he	Groblerdsdal, South Africa				
RT @LuthandoZibeko: Your appointment gave hope to aspirin Jozi					
RT @soccerzela: Rhulani Mokwena's record in the hot seat at Pirates:					

Figure 6-5 uClassify's Analysis

From the analysis, it was evident that the participants were satisfied with the analysis done and were convinced that this method could assist them a great deal with their various research projects. The comments were thematically analysed and mapped to the various IS success dimensions (*the a priori themes*). Table 6-3 provides a summary of this mapping and related comments from the transcripts. From the qualitative analysis of the data it was evident that two of the success dimensions, user satisfaction and net benefits were met. For example, P4 stated how research was getting easier by the day and P5 stated how she intends to extract data over the next three months and perform analysis on them. Some of the participants also gave instances of how they could use the social media method in their various studies and how they could also explore other variables that the SMA tools provides. Regarding net benefits, participant P5 stated that the tool could simplify her work and improve the way that her tasks would be conducted.

Table 6-3 IS Dimensions on Performing Sentiment Analysis

Dimension	Measures	Evidence from Focus Group Transcript
User Satisfaction	System satisfaction	<p>“Research is getting easier and easier these days” – (Focus group transcript, p.4).</p> <p>“And then you get all this data and then I mean, just. And then it analyses before you actually so it’s just and it also gives you the opportunity to explore a number of different variables within your research with, because the data is easily accessible. So, you can look at more than one aspect. I mean, you know, when you had like the age and the gender and then there were all these other stuffs as well that you can actually do” - (Focus group transcript, p.4).</p>
	Efficiency	<p>“It’s I mean, it’s there, you don’t have to go and copy and paste everything on spreadsheet I mean, it happens. It’s just the ease. And you can do it, like I said. I mean, for you to be consistent and for your data to be reliable as well, too” - (Focus group transcript, p.5).</p>
Net Benefits	Task Innovation	<p>“you make my life so much better. My masters look like a breeze right now. Mine is completely done, sir. I mean. That section. Like I said, I can do. I can do four five data extractions a month for the next three months to make sure that I get the good enough sample size. and then from then, do the age analysis. And from then extracting that, I can then do the positive or negative opinion. And then I’m done. So literally my data is done.” – (Focus group transcript, p.5).</p>
	Job simplification	<p>“Everything is there that you need on one program, you can do everything. You just go into that program and it’s there. So, it’s not like you’re sitting with two spreadsheets and you’re comparing the two with each other and then combining it, it’s actually using these two programs, combining into one” - (Focus group transcript, p.5).</p>

6.4 REFLECTIONS AND LIMITATIONS

The focus group discussion revealed key responses that assisted the researcher to measure the potential success of the social media method based on the D&M IS model. In measuring for the success of the social media method, the IS dimensions were utilised. These dimensions each consist of measures for measuring IS success. The responses from the focus group transcripts contained measures that addressed system quality, information quality, intention to use, user satisfaction and net benefits. In Table 6-2 and 6-3, each of these IS dimensions are linked to the relevant comments. All the dimensions of the D&M IS model were addressed except for that of service quality; this was because service quality represents the quality of support provided from an organisation, and this does not apply to the social media method.

The analysis of the focus group discussion transcript revealed that the social media method is a successful intervention for eliciting millennials worldviews on the coastal and marine environment. The success of the social media method was based on the IS dimensions and their

respective measures addressed from the comments made by the participants. In eliciting millennials' worldviews on the coastal and marine environment, the method caters for the solution objectives by deriving the opinions, age and location from posts made on SNSs. The participants were generally satisfied with the social media method but had a few concerns. These concerns are not necessarily bad but should be taken note of for future research. It was noted that, when collecting data from SNSs, researchers must be aware that users on SNSs do not represent the whole population. There are still a lot more people that are not on SNSs or who are not active. Another concern was that of bias, when monitoring SNSs on certain issues, researchers must be aware of the present conditions or political climate that could spark certain sentiments towards an issue. Lastly, the participants highlighted that using the method over time will increase its rigour and trustworthiness.

The social media method allows for monitoring SNSs and analysis of social media data in order to elicit the worldviews of the public. The focus group discussion, which included a demonstration of the proposed tools, revealed the following recommendations and considerations for using social media for data collection:

- Before sentiment analysis can be conducted on uClassify, an Excel dataset of SNS posts must be obtained using NVivo.
- Since Twitter has less restrictions on the privacy of users' posts, NVivo works well on Twitter for obtaining datasets in an Excel spreadsheet for analysis. The other SNSs have tighter restrictions, which prevents NVivo from obtaining posts as an Excel dataset. Facebook posts can only be obtained as an Excel dataset on a group created by the researcher, where posts made to the group can be monitored and collected by the group's admin. Other SNSs have tighter restrictions for protecting the privacy of users' information. This limitation makes Twitter the most suitable SNSs for collecting data on social media and for academic research.
- A limitation to using the SMA tools was that sentiment analysis can only be performed on textual content. A post on SNSs with a picture would not influence how the analysis is done because uClassify has trained classifiers for only textual content.

6.5 CONCLUSION

Measuring the social media method is essential in determining its success. In this chapter, the proposed social media method was measured for its potential success by using the dimensions and measures in the D&M IS model as underlying *a priori* themes. These dimensions were system quality, information quality, intention to use, user satisfaction and net benefits. An analysis of the focus group discussion's transcript provided various responses that were measured using these themes. The analysis showed that the dimensions were all addressed by the social media method.

It is evident that this chapter has answered both research questions RQ₄ and RQ₅. This was achieved by investigating the IS success model's dimensions, and by conducting a focus group discussion to measure the potential success of the artefact i.e. the proposed method. This chapter was concluded by reflecting on the findings of the study and by highlighting the limitations of the selected tools. The next chapter concludes the research study.

CHAPTER SEVEN

CONCLUSION AND RECOMMENDATION

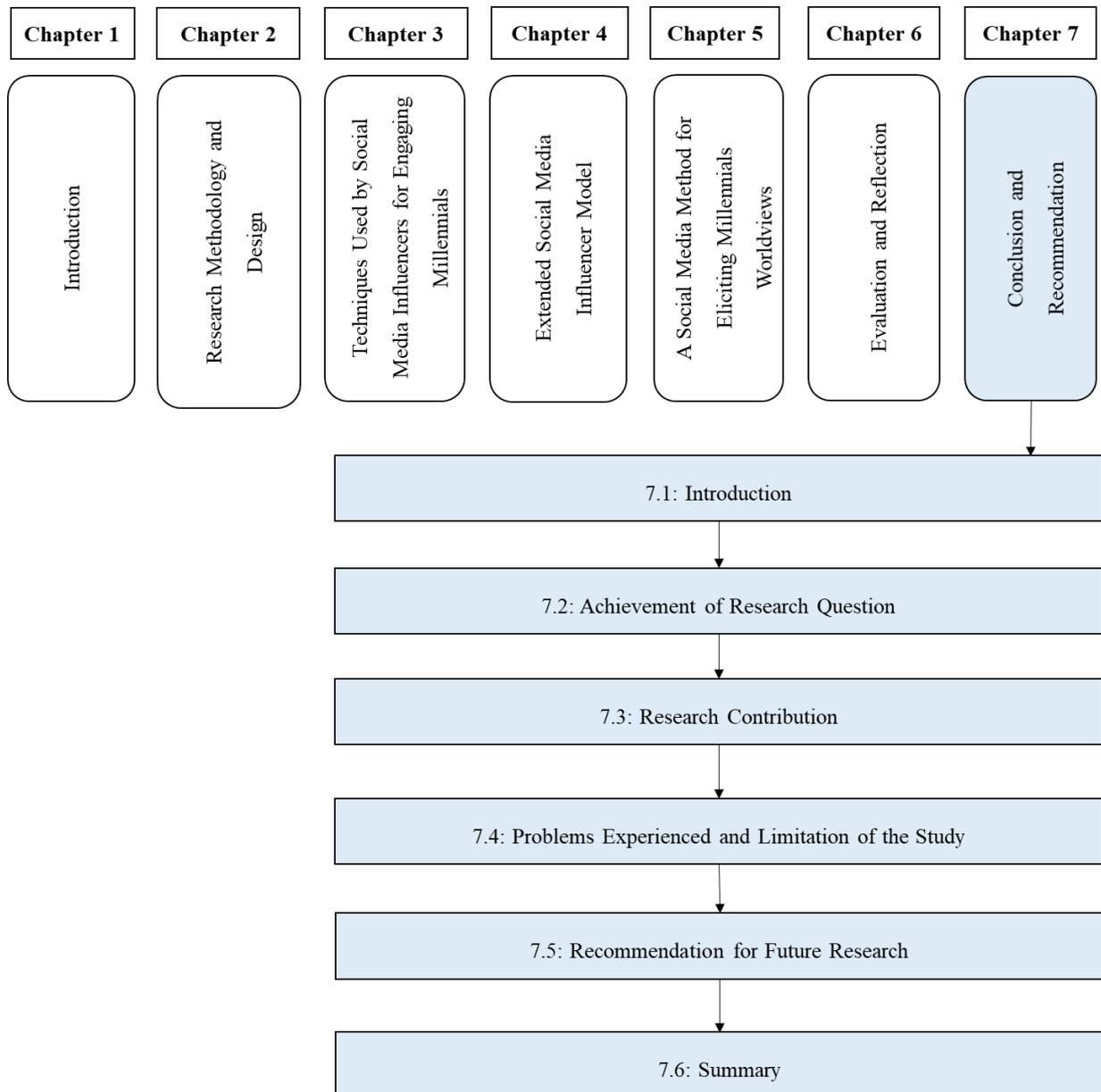


Figure 7-1 Chapter 7 Overview

7.1 INTRODUCTION

Millennials consume and interact with many technologies daily, which provides an opportunity for researchers to discover new ways to increase engagement. The use of traditional data collection methods such as surveys and questionnaires are less effective in data gathering processes (Eichholz et al., 2013). In targeting millennials with questionnaires and surveys, the results are less accurate due to hurried completion and lack of interest. The increase in usage of SNSs by millennials allows for inventive strategies to aid data collection.

SNSs allow users to air their opinions online and connect with each other. In creating engagement on an issue, it was clear from the literature that it is beneficial to utilise SMIs to create buzz around it. The engagement created on an issue or topic can in turn provide researchers with social media data. Also, existing data from SNSs can be collected by researchers to elicit the opinions from SNSs. In eliciting the opinions from social media data collected, SMA techniques can assist researchers.

Currently, there is very little guidance available to researchers for using social media for data collection in research projects. The majority of studies identified were related to tourism and marketing. The purpose of this study was to propose a social media method for eliciting millennials' worldviews on the coastal and marine environment (Chapter 6). The proposed method contains several techniques that can be used by SMIs for engaging with millennials on issues affecting the coastal and marine environment (Chapter 3 and 4). The proposed method also contains the SMA Process that aims to guide researchers on eliciting worldviews from social media data (Chapter 5). This chapter provides a summary of the entire study by explaining what has been achieved, giving recommendations and presenting insights on knowledge acquired throughout the research process. At the start of this dissertation five research questions were posed and it is evident that these have been answered (Section 7.2), and several theoretical and practical contributions were made (Section 7.3). Some limitations were identified, and challenges faced during the duration of the study (Section 7.4). An analysis of the findings led to several recommendations for future research (Section 7.5) and an overall summary of the study was derived (Section 7.6).

7.2 ACHIEVEMENT OF RESEARCH QUESTIONS AND SOLUTION OBJECTIVES

The research questions were identified at the beginning of this study. The main research question that this study addressed was:

How can social media be used as a successful data collection method for eliciting millennials' worldviews on the coastal and marine environment?

In providing an answer to the main research question, the following subsidiary questions were addressed.

RQ1. What techniques are used by social media influencers to engage millennials in awareness campaigns?

RQ2. What processes exist for using social media as a data collection method?

RQ3. What processes can be used for evaluating SMA tools?

RQ4. How can the success of a social media method for data collection be measured?

RQ5. What is the expected success of implementing the social media method for eliciting worldviews on the coastal marine environment?

Table 7-1 presents the research questions and chapters in which each was addressed

Table 7-1 Research Questions and Chapters

RQ	Subsidiary Research Questions	Chapter
1	What techniques are used by social media influencers to engage millennials in awareness campaigns?	3, 4
2	What processes exist for using social media as a data collection method?	5
3	What criteria can be used for evaluating SMA tools?	5
4	How can the success of a social media method for data collection be measured?	6
5	What is the expected success of implementing social media method for eliciting worldviews on the coastal marine environment?	6

The first research question, RQ₁, was addressed in Chapter 3 and 4 through a review of literature and interviews with SMIs. The literature review discussed the characteristics of SMIs, as well as the techniques used by SMIs for engaging with their followers (Section 3.6). An interview with SMIs was conducted to verify the techniques identified from literature (Section 4.2). The interviews also identified other techniques used by SMIs, and it shed some light on the challenges faced by SMI. A Social Media Influencer Model (Figure 3-9) was proposed from the findings from the literature review and the interviews, to show the relationship between the SMIs' characteristics and techniques. The model was verified using interviews with SMIs and a social media expert, several additional techniques were identified, and an extended model proposed (Figure 4-3). Therefore, the techniques that can be used by SMIs for engaging with millennials in awareness campaigns identified in this study were direct engagement, collaborative tagging and hashtags, live sessions, the use of emojis, themes from the comment section, stories, social timing and frequency, content curation, support groups and incentive appeals.

The second research question, RQ₂, was addressed in Chapter 5 through a literature review on the processes that exist for using social media for data collection. The literature review discussed SMA processes that can be used to guide researchers for data collection on SNSs (Section 5.3) and proposed the SMA Process Model for eliciting worldviews (Figure 5-2). An investigation into different SMA techniques was carried out and sentiment analysis was chosen as the SMA technique utilised for this research (Section 5.9). The processes for using social media as a data collection method identified were developing key social media metrics, monitoring SNSs, performing sentiment analysis and building social media intelligence.

The third research question, RQ₃, was addressed in Chapter 5 through a literature review and focus group discussion. The focus group discussion was carried out to identify the criteria and metrics necessary for evaluating the SMA tools (Section 5.6). The literature review was conducted to investigate existing SMA tools that can assist with monitoring SNSs and performing sentiment analysis (Section 5.8 and 5.10). Using the criteria and metrics identified from the focus group discussion, two SMA tools (NVivo and uClassify) were selected. The criteria identified for evaluating SMA tools were demographic detection, location, cost, keyword search and SNSs supported.

The fourth research question, RQ₄, was addressed in Chapter 6 through a literature review and an analysis of the transcripts from the focus group discussion. The social media method was

proposed based on the findings from RQ₁, RQ₂ and RQ₃ (Section 6.3). A literature review on the D&M IS Success model for measuring the social media method was conducted. Focus group discussions on the proposed social media method was carried out to identify the key metrics necessary for measuring the success of the social media method. Using the metrics from the focus group discussion, the IS Success dimensions and measures were used as *a_priori* themes to measure the success of the social media method.

Research question five (RQ₅), was addressed in Chapter 6 to determine the potential success of the method. A focus group discussion, which included a demonstration of the recommended tools, revealed that the method has a lot of potential to be successfully used by researchers in the field of social sciences for their data collection. However, some challenges and limitations were further identified.

Table 7-2 summarises the research questions, the chapters and the deliverables of each chapter. The next section discusses the research contribution of this study.

Table 7-2 Research Contributions

RQ		Chapter	Deliverables
1	What techniques are used by social media influencers to engage millennials in awareness campaigns?	3 4	SMI Techniques Characteristics of SMIs Social Media Influencer Model Challenges of SMIs
2	What processes exist for using social media as a data collection method?	5	The SMA Process
3	What criteria can be used for evaluating SMA tools?	5	Tools for performing SMA
4	How can the success of a social media method for data collection be measured?	6	Application of the Social Media Method for Eliciting Worldviews
5	What is the expected success of implementing the social media method for eliciting worldviews on the coastal marine environment?	6	The Social Media Influencer Model. The Social Media Method for Eliciting Worldviews.

It is also evident that all three solution objectives (Section 3.7) were met:

SO₁. To provide processes for using social media as a data collection method. These processes included those for engaging with millennials and eliciting worldviews from them (links to RQ₂);

SO₂. To provide techniques for engaging with millennials on topics related to the coastal and marine environment (links to RQ₁); and

SO₃: Recommendations for selecting SMA tools or platforms (links to RQ₃).

7.3 RESEARCH CONTRIBUTIONS

This study makes several contributions for using social media for data collection. These contributions can be applied to elicit millennials' worldviews on the coastal and marine environment.

7.3.1 Theoretical Contributions

This main contribution of this research is a proposed Social Media Method for eliciting millennials' worldviews on the coastal and environment (Section 6.3). This social media method consists of two contributions embedded in it. The two contributions are: an extended Social Media Influencer Model for engaging the public (Section 4.5); and the SMA Process for eliciting worldviews (Section 5.2). The extended Social Media Influencer model presented in this study describes the relationship between the SMIs' characteristics and the techniques for engaging the public and is presented in Figure 7-2. The characteristics were derived from literature while the techniques were derived from literature and interviews with SMIs. The SMA Process describes a four-stage analytic process for using SMA for data collection. SMA tools to assist researchers with monitoring SNSs and performing sentiment analysis to gain useful insights were also identified.

The results of this study show that the proposed social media method can successfully facilitate data collection on SNSs to elicit millennials worldviews on the coastal and marine environment. The social media method will therefore assist researchers with deriving key metrics from social media data. These key metrics could be age, location, and opinions from social media data. The social media method will therefore serve as a valuable contribution to

the field of social sciences, for eliciting millennials’ worldviews on the coastal and marine environment.

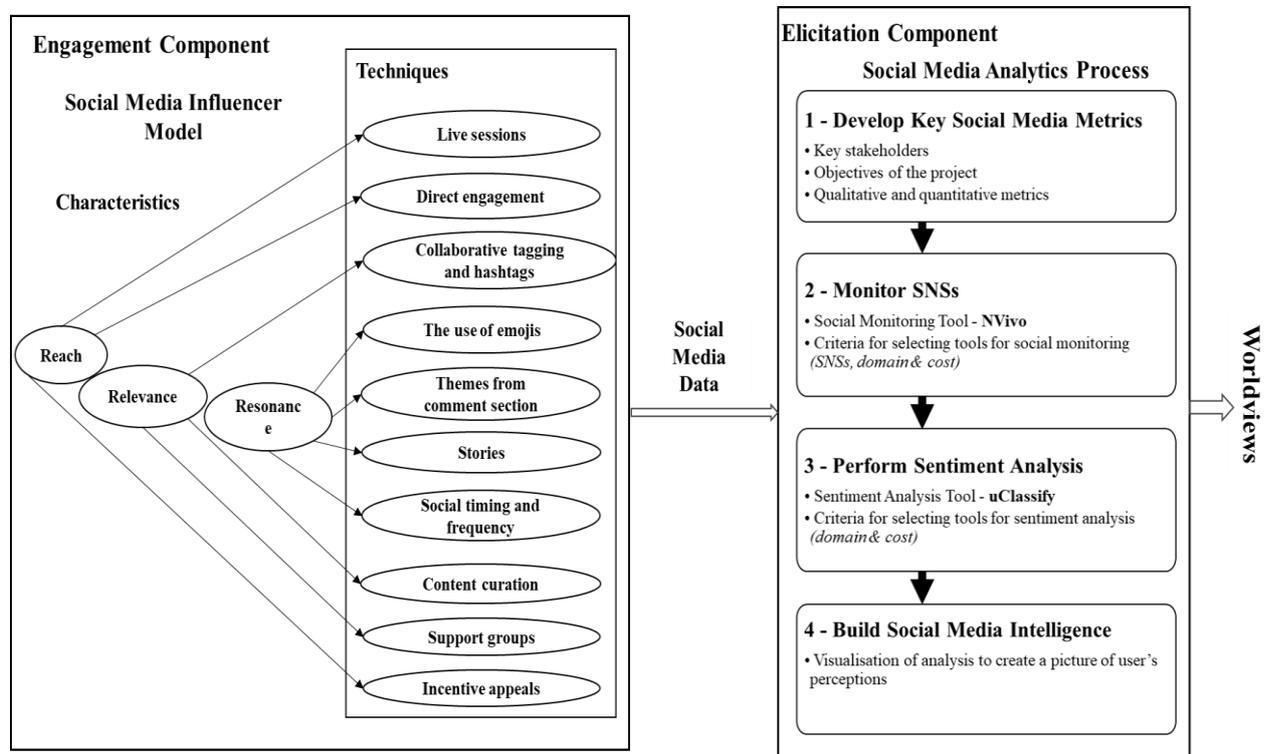


Figure 7-2 The Social Media Method

7.3.2 Practical Contributions

Fellow researchers who conduct research on issues affecting the coastal and marine environment are on a mission to adopt inventive strategies for doing research on SNSs. Furthermore, studies have shown that the use of traditional methods for data collection are not always effective when geared towards the millennial population. This is due to millennials’ short attention span and their desire for interactive tools.

The proposed social media method can therefore be adopted by researchers from the field of social science to target and elicit millennials’ opinions on environmental issues and awareness. Researchers can utilise the SMA tools to analyse the sentiment, age and location from social media posts. Other features of the sentiment analysis tool also include a gender analyser, language detector, mood, tonality and topics. These features can be utilised by researchers to explore other diverse research areas.

The social media method proposed in this study provides a sense of direction for researchers in the field of social sciences doing research on social media as a platform for data collection

and analysis. Researchers can use the proposed social media method for monitoring and analysing contents on review sites as well. This study describes how posts monitored from SNSs can be analysed using an SMA tool called uClassify. In this study, the primary focus was given to uClassify's sentiment and age classifiers for addressing some of the research questions. Although the findings from the study includes some technicalities, researchers can use this study as a guide to overcome any difficulties faced with using the SMA tools. Training sessions or tutorial videos can be provided to key stakeholders of this study upon request.

7.4 PROBLEMS EXPERIENCED AND LIMITATIONS OF THE STUDY

The main problem encountered was that of getting SMIs for interviews. Due to the busy nature of SMIs, the researcher got so many rejections when approaching SMIs for an interview. Even after the SMIs accepted the invitation, it was also difficult fixing a set date for the interviews which made the duration of the interview process elongate even further. However, the researcher was able to convince the SMIs interviewed to help recruit some of their colleagues for an interview.

Time constraint was also a factor with regards to the focus group discussions. The focus group discussion was conducted during the time when the participants were finalising their research activities for the year. This was limiting because some participants had to pull out from the focus group discussion at the last minute due to their high academic workload. As a result, the focus group discussion only had five participants.

With regards to the SMA tools, the researcher experienced some difficulty when conducting preliminary testing. NVivo as a tool for monitoring SNSs has its limitations. The researcher found it difficult monitoring and obtaining datasets from Facebook. This was due to the strict privacy features that Facebook had. The mechanism in place to cater for this problem would be through the creation of a Facebook group or page where users are invited to join, and thereby give the admin consent to monitor and obtain datasets from users' posts on the group. Hence Twitter remains the most suitable SNSs for monitoring and obtaining datasets from users' posts. uClassify for performing sentiment analysis also had its challenge with regards to its usability and lack of integration. To cater for this challenge, Niel Bosma created an SEO connector using uClassify's machine learning trained classifiers. This connector allows uClassify to work as an excel add-on on any datasets obtained from SNSs.

Generally, time was the biggest issue that the researcher had. The data collection process (interviews and focus group discussion) took a lot of time to arrange and complete. This was because it was difficult getting participants that met the criteria for inclusion.

7.5 RECOMMENDATIONS FOR FUTURE RESEARCH

Currently, the SMA tools are textual based; this means that the tools can only collect and analyse text-based data from SNSs. Future research should investigate how the social media method can be extended to include SMA tools that can analyse pictures. SNSs like Instagram and Snapchat are mostly visual-based and a tool that can analyse pictures could provide an opportunity for research into new areas.

The validity of the analysis conducted using uClassify can be another area where further research can be done. The results derived from conducting sentiment analysis and age analysis can be investigated, evaluated and compared with other SMA tools to determine its level of accuracy. This evaluation combines a variety of accuracy factors such as recall and the F1 score when trying to understand the validity of the analysis. The validity of the analysis conducted is one aspect not covered in the study due to its complexity and which might broaden the scope of this study.

Another possible research direction would be to adopt this method for some actual research projects on the worldviews of millennials on the coastal and marine environment. The method proposed in this study contains SMA tools that can be utilised across various research disciplines to uncover new findings. Adopting the method proposed would help to further validate and improve the method's rigor over time.

7.6 SUMMARY

The focus of this study was to develop a social media method to elicit millennials' worldviews on the coastal and marine environment. The research study was carried out to address the lack of guidance regarding the use of SMA for eliciting millennials' worldviews. This research took on a holistic approach by considering the use of SMIs for engaging the public, and the use of SMA for eliciting their worldviews. This research produced a social media method that consists of the Social Media Influencer model for engaging the public on environmental awareness, and an SMA Process for eliciting the worldviews of millennials.

The research methodology adopted was the DSR methodology to develop the social media method by following the six DSR activities in an iterative manner. This research falls under the exaptation quadrant of the DSR knowledge contribution, which represents extending known solutions (SMIs and SMA) to new problems (eliciting millennials' worldviews).

A review of literature using the grounded theory approach revealed the techniques used by SMIs for engaging with the public (Section 3.6). The characteristics SMIs must possess to yield influence were also revealed from the review of literature. The analysis of the characteristics and techniques showed relationships between them. The techniques identified from literature was further verified using interviews with SMIs, where additional techniques and themes were identified (Section 4.3). The findings were conceptualised into an extended Social Media Influencer model for engaging with the public (Section 4.5). The Social Media Influencer Model was incorporated into the social media method for engaging with the public to create social media data.

An investigation into the use of SMA was carried out to discover guidance for using SMA for eliciting millennials' worldviews. An SMA Process was discovered and incorporated into the social media method for eliciting worldviews from social media data (Section 5.2). The SMA Process recommended tools for monitoring SNSs and performing sentiment analysis. A focus group discussion was carried out to determine the criteria for selecting SMA tools.

The social media method was measured for success using the D&M IS model (Section 6.3). The method was discussed with focus group participants and the comments were measured using the six dimensions from the D&M IS model. The success of the social media method was accomplished, and its limitations were addressed. The study has therefore provided answers to its main research question:

RQ: How can social media be used as a successful data collection method for eliciting millennials' worldviews on the coastal and marine environment?

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Appendix A: Ethical Clearance Letter



PO Box 77000, Nelson Mandela University, Port Elizabeth, 6031, South Africa mandela.ac.za

Chairperson: Research Ethics Committee (Human)
Tel: +27 (0)41 504 2235
chamain.cilliers@mandela.ac.za

NHREC registration nr: REC-042508-025

Ref: [H19-SCI-CSS-003] / Approval]

29 August 2019

Dr B Snow
Faculty: Science

Dear Dr Snow

A SOCIAL MEDIA METHOD OF ELICITING MILLENNIAL'S WORLDVIEWS ON COASTAL AND MARINE ENVIRONMENT

PRP: Dr B Snow
PI: Mr O Okuah

Your above-entitled application served at the Research Ethics Committee (Human) (meeting of 31 July 2019) for approval. The study is classified as a medium risk study. The ethics clearance reference number remains H19-SCI-CSS-003 and approval is subject to the following conditions:

1. The immediate completion and return of the attached acknowledgement to Imtiaz.Khan@mandela.ac.za, the date of receipt of such returned acknowledgement determining the final date of approval for the study where after data collection may commence.
2. Approval for data collection is for 1 calendar year from date of receipt of above mentioned acknowledgement.
3. The submission of an annual progress report by the PRP on the data collection activities of the study (form RECH-004 to be made available shortly on Research Ethics Committee (Human) portal) by 15 November this year for studies approved/extended in the period October of the previous year up to and including September of this year, or 15 November next year for studies approved/extended after September this year.
4. In the event of a requirement to extend the period of data collection (i.e. for a period in excess of 1 calendar year from date of approval), completion of an extension request is required (form RECH-005 to be made available shortly on Research Ethics Committee (Human) portal)
5. In the event of any changes made to the study (excluding extension of the study), completion of an amendments form is required (form RECH-006 to be made available shortly on Research Ethics Committee (Human) portal).
6. Immediate submission (and possible discontinuation of the study in the case of serious events) of the relevant report to RECH (form RECH-007 to be made available shortly on Research Ethics Committee (Human) portal) in the event of any unanticipated problems, serious incidents or adverse events observed during the course of the study.
7. Immediate submission of a Study Termination Report to RECH (form RECH-008 to be made available shortly on Research Ethics Committee (Human) portal) upon unexpected closure/termination of study.
8. Immediate submission of a Study Exception Report of RECH (form RECH-009 to be made available shortly on Research Ethics Committee (Human) portal) in the event of any study deviations, violations and/or exceptions.
9. Acknowledgement that the study could be subjected to passive and/or active monitoring without prior notice at the discretion of the Research Ethics Committee (Human).

Please quote the ethics clearance reference number in all correspondence and enquiries related to the study. For speedy processing of email queries (to be directed to Imtiaz.Khan@mandela.ac.za), it is recommended that the ethics clearance reference number together with an indication of the query appear in the subject line of the email.

We wish you well with the study.

Yours sincerely

A handwritten signature in black ink, appearing to read 'C. Cilliers', written in a cursive style.

Prof C Cilliers
Chairperson: Research Ethics Committee (Human)

Cc: Department of Research Capacity Development
Faculty Officer: Science

Appendix 1: Acknowledgement of conditions for ethical approval

Appendix B: Approval Condition

I, DR B SNOW (PRP) OF THE STUDY ENTITLED A SOCIAL MEDIA METHOD OF ELICITING MILLENNIAL'S WORLDVIEWS ON COASTAL AND MARINE ENVIRONMENT (H19-SCI-CSS-003), DO HEREBY AGREE TO THE FOLLOWING APPROVAL CONDITIONS:

1. The submission of an annual progress report by myself on the data collection activities of the study by 15 November this year for studies approved in the period October of the previous year up to and including September of this year, or 15 November next year for studies approved after September this year. It is noted that there will be no call for the submission thereof. The onus for submission of the annual report by the stipulated date rests on myself.
2. Submission of the relevant request to RECH in the event of any amendments to the study for approval by RECH prior to any partial or full implementation thereof.
3. Submission of the relevant request to RECH in the event of any extension to the study for approval by RECH prior to the implementation thereof.
4. Immediate submission of the relevant report to RECH in the event of any unanticipated problems, serious incidents or adverse events.
5. Immediate discontinuation of the study in the event of any serious unanticipated problems, serious incidents or serious adverse events.
6. Immediate submission of the relevant report to RECH in the event of the unexpected closure/discontinuation of the study (for example, de-registration of the PI).
7. Immediate submission of the relevant report to RECH in the event of study deviations, violations and/or exceptions.
8. Acknowledgement that the study could be subjected to passive and/or active monitoring without prior notice at the discretion of RECH.

Signed: _____

Date: _____

Appendix C: Information and Informed Consent Form

NELSON MANDELA UNIVERSITY

INFORMATION AND INFORMED CONSENT FORM (Interview)

<u>RESEARCHER'S DETAILS</u>	
Title of the research project	A Social Media Method for Eliciting Millennials' Worldviews on the Coastal and Marine Environment
Reference number	
<i>Principal investigator</i>	Obrukevwe Okuah
Address	Nelson Mandela Metropolitan University, South Campus, Embizweni Building, 1st Floor, 01E
Postal Code	6031
Contact telephone number (private numbers not advisable)	+27 (0) 504 2079
Email Address	S211292575@mandela.ac.za

<u>A - DECLARATION BY OR ON BEHALF OF PARTICIPANT</u>		<u>Initial</u>
I, the participant and the undersigned	(full names)	

<u>A.1 HEREBY CONFIRM AS FOLLOWS:</u>		<u>Initial</u>
I, the participant, was invited to participate in the above-mentioned research project		
that is being undertaken by	Obrukevwe Okuah	
from	Nelson Mandela University	
of the Nelson Mandela University.		

<u>THE FOLLOWING ASPECTS HAVE BEEN EXPLAINED TO ME, THE PARTICIPANT:</u>		<u>Initial</u>
2.1	<p>Aim:</p> <p>The researchers aim to design and use an appropriate social media method to elicit millennials' worldviews on the coastal and marine environment. In designing this method, techniques for engaging social media users by Social Media Influencers (SMIs) will be investigated to come up with specific guidelines for using social media for data collection.</p>	
2.2	<p>Procedures:</p> <p>I will partake in an interview and be asked questions relating to SMIs characteristics and techniques for engaging their followers.</p> <p>These interview sessions will be recorded using a voice recording instrument and will last a maximum of 1 hour.</p>	

		I understand that the information I provide may be reused by the researcher for purposes other than the dissertation (e.g. journal papers or conference papers). I may withdraw from the interview at any time and know that the points raised during discussions are confidential, as is their identity during the study.		
2.3	Confidentiality:	Points raised and information taken during discussions would be handled with strict confidentiality.		
2.4	Privacy and Anonymity	My identity will not be revealed in any discussion, description or scientific publications by the investigators.		
2.5	Voluntary participation:	My participation is voluntary	YES	NO

3. THE INFORMATION ABOVE WAS EXPLAINED TO ME/THE PARTICIPANT BY:		<u>Initial</u>
Obrukevwe Okuah		
I was given the opportunity to ask questions and all these questions were answered satisfactorily.		

4.	No pressure was exerted on me to consent to participation and I understand that I may withdraw at any stage without penalisation.	
----	---	--

5.	Participation in this study will not result in any additional cost to myself.	
----	---	--

A.2 I HEREBY VOLUNTARILY CONSENT TO PARTICIPATE IN THE ABOVE-MENTIONED PROJECT:		
Signed/confirmed at	on	20
Signature or right thumb print of participant		

B - STATEMENT BY OR ON BEHALF OF INVESTIGATOR(S)		
I,	Obrukevwe Okuah	declare that:
1.	I have explained the information given in this document to	(name of patient/participant)
	and / or his / her representative	(name of representative)
2.	He / she was encouraged and given ample time to ask me any questions;	
Signed/confirmed at	on	20
Signature of interviewer		

Appendix D: Consent Form (Focus Group)

NELSON MANDELA UNIVERSITY

INFORMATION AND INFORMED CONSENT FORM (Focus Group Discussion)

RESEARCHER'S DETAILS	
Title of the research project	A Social Media Method for Eliciting Millennials' Worldviews on the Coastal and Marine Environment
Reference number	
<i>Principal investigator</i>	Obrukevwe Okuah
Address	Nelson Mandela Metropolitan University, South Campus, Embizweni Building, 1st Floor, 01E
Postal Code	6031
Contact telephone number (private numbers not advisable)	+27 (0) 504 2079
Email Address	S211292575@mandela.ac.za

A - DECLARATION BY OR ON BEHALF OF PARTICIPANT		<u>Initial</u>
I, the participant and the undersigned	(full names)	

A.1 HEREBY CONFIRM AS FOLLOWS:		<u>Initial</u>
I, the participant, was invited to participate in the above-mentioned research project		
that is being undertaken by	(name of researcher)	
from	(affiliation e.g. department/school/faculty)	
of the Nelson Mandela University.		

THE FOLLOWING ASPECTS HAVE BEEN EXPLAINED TO ME, THE PARTICIPANT:		<u>Initial</u>
2.1	<p>Aim:</p> <p>The researchers aim to design and use an appropriate social media method to elicit millennials' worldviews on the coastal and marine environment. In designing this method, techniques for engaging social media users by Social Media Influencers (SMIs) and Social Media Analytics processes will be investigated to come up with specific guidelines for using social media for data collection.</p>	

2.2	Procedures:	<p>I will partake in a focus group study to measure the success of the social media method</p> <p>These focus group sessions will be recorded using a voice recording instrument and will last a maximum of 1 hour.</p> <p>I understand that the information I provide may be reused by the researcher for purposes other than the dissertation (e.g. journal papers or conference papers).</p> <p>I may withdraw from the focus group at any time and know that the points raised during discussions are confidential, as is their identity during the study.</p>			
2.3	Confidentiality:	Points raised and information taken during discussions would be handled with strict confidentiality.			
2.4	Privacy and Anonymity	My identity will not be revealed in any discussion, description or scientific publications by the investigators.			
2.5	Voluntary participation:	My participation is voluntary	<table border="1"> <tr> <td>YES</td> <td>NO</td> </tr> </table>	YES	NO
YES	NO				

3. THE INFORMATION ABOVE WAS EXPLAINED TO ME/THE PARTICIPANT BY:		<u>Initial</u>
(name of relevant person)		
I was given the opportunity to ask questions and all these questions were answered satisfactorily.		

4.	No pressure was exerted on me to consent to participation and I understand that I may withdraw at any stage without penalisation.	
----	---	--

5.	Participation in this study will not result in any additional cost to myself.	
----	---	--

A.2 I HEREBY VOLUNTARILY CONSENT TO PARTICIPATE IN THE ABOVE-MENTIONED PROJECT:		
Signed/confirmed at	on	20
Signature or right thumb print of participant		

B - STATEMENT BY OR ON BEHALF OF INVESTIGATOR(S)

I,	(name of interviewer)	declare that:
2.	I have explained the information given in this document to	(name of patient/participant)
	and / or his / her representative	(name of representative)
2.	He / she was encouraged and given ample time to ask me any questions;	
Signed/confirmed at		on 20
Signature of interviewer		

Appendix E: Interview Schedule (SMI)

1	Biographical Information		
1.1	In your opinion what percentage of your followers are in these target age groups?	18 – 40 (in %)	>40 (in %)
1.2	How long have you been an Influencer for?		
1.3	In which industry or niche (subject matter) do you belong?		
1.4	What motivated you to target this industry?		
1.5	What social networking sites are you currently on?		
1.6	Which social networking sites are you an Influencer on?		

2	Characteristics of SMIs		
2.1	Reach - defines how far information can travel across the SNSs used and the communities at large. It is a measure of popularity, affinity and potential impact (Solis and Webber, 2012).		
2.1.1	How many followers or subscribers do you have on each social media platform?		
2.1.2	Where's the bulk of your followers from? SA or Worldwide? Or Where's the location of your influence (Specific country)?		

2.1.3	Have you ever done any community outreach programs (goodwill) on your platform?	
2.2	<p>Resonance - is a measure of the duration, frequency and level of interactivity round content or post on a SNS (Solis and Webber, 2012). More people will see each post or update if the resonance is high, which would in turn influence the reach and the duration of content on followers' timelines. In increasing interactivity, SMIs need to have a proper commitment and involvement with their followers.</p>	
2.2.1	How often do you make social media posts? Hourly, daily or weekly?	
2.2.2	How many times do you make posts on a certain topic or issue?	
2.2.3	How engaged are you with your followers?	
2.3	<p>Relevance - it refers to how individuals are aligned through the subject matter (Solis and Webber, 2012). Relevance helps build relationships among like-minded individuals.</p>	
2.3.1	What makes you a SMI?	
2.3.2	How did you know that you've gained authority or expertise in this social media niche (or your subject matter)?	
2.3.3	Do you regard yourself as being a credible source of information with regards to your niche?	

3	SMI's Techniques			
		Do you use this technique?	How did you use them?	Has it been successful?
3.1	<p>Direct Engagement - SNSs allow its users to express their thoughts and opinions online (Khalid et al., 2018). One of the most important technique utilised by SMIs involves having a proper commitment and involvement with their followers (Pestek and Alic, 2018). The comment section of a SMIs' profile is the cornerstone of all interaction as this is where social media followers react to an influencer's content and expresses their opinions (Pestek and Alic, 2018). An influencer that pays attention to the voices in the comment section and reacts to them makes the audience feels listened to and generates greater insights of where the conversation is leading to (Pestek and Alic, 2018).</p>			
3.2	<p>Collaborative Tagging and Hashtags - Collaborative tagging is among one the most successful social media techniques that allows users to annotate webpages or other online resources using tags (Zeng et al., 2010). Tags can be shared amongst users and allows the exploration of a wide range of information for retrieval or for recommendation purposes (Zeng et al., 2010).</p>			
3.3	<p>The Use of Emojis - Emojis can also be referred to as picture-words, they are a form of standard language that is used across various platforms and cultures (Ge and Gretzel, 2018). Emojis are used for illustration, or in some cases, replace words sent digitally, and they add depth to messages by providing electronic gestures that convey the warmth of a face-to-face communication (Lee, 2018).</p>			
3.4	<p>Social Timing and Frequency - Interactivity on content shared on social media defines the level of engagement achieved by a SMI but building interactivity requires social timing. Social timing in the context of social media engagement refers to posting at the right day and time to increase likes, shares and clicks (Patel, 2017).</p>			
3.5	<p>Content Curation - Content curation is the act of searching, categorising and organising relevant online content that addresses a specific issue (Fotopoulou and Couldry, 2015). In social media, curation can be defined as the process of remixing social media content for further consumption (Duh et al., 2011). Social media users can curate existing content by searching for a collection of posts from diverse sources, reorganise them to fit the given context or perspective, and publishing the final story to their followers (Duh et al., 2011).</p>			

3.6	<p>Incentive Appeals - SMI's are often faced with decisions between motivating people with content that shows the consequences of actions that are desirable or undesirable (Dillard and Shen, 2013). There are two types of appeals used in persuading people to adopt certain changes. These are the negative appeals and the positive appeals. A negative appeal arouses fear and motivates behavioural changes by communicating to the audience about the harmful outcomes from initiating or continuing an unhealthy practice (Thompson et al., 2011). A positive appeal in an SMI's message could present a mirror image positive outcome that can be achieved for performing a healthy alternative (Dillard and Shen, 2013).</p>			
Any other SMI's techniques you know of?				
		Do you use this technique?	How did you use them?	Has it been successful?
3.7				
3.8				
3.9				
3.10				

Rate how successful these techniques have been	Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree
Direct Engagement	1	2	3	4	5
Collaborative Tagging and Hashtags	1	2	3	4	5
The Use of Emojis	1	2	3	4	5
Social Timing and Frequency	1	2	3	4	5
Content Curation	1	2	3	4	5
Incentive Appeals	1	2	3	4	5
	1	2	3	4	5
	1	2	3	4	5
	1	2	3	4	5
	1	2	3	4	5

Future Outlook	
In the future, where would you like to be as an influencer?	
How do you track your analytics? (like engagement rate, number of views or comments).	

Any Challenges you currently face been a SMI?

And lastly,

Would you ever consider making posts on environmental issues?

Appendix F: Interview Schedule (SME)

Interview Questionnaires

4	Biographical Information				
4.1	Age	18 - 30	31 - 40	>40	
4.2	Gender	Male		Female	
4.3	Education	Undergrad Degree	Honours Degree	Masters Degree	PHD Others
4.4	Profession				
4.5	How long have you been engaged in social networking sites (SNSs)?	< 1 Year	1 – 5 Year	6 – 15 Year	>15 Year
4.6	How frequently do you use SNSs?	Daily	Weekly	Monthly	Yearly

5	Characteristics of a Social Media Influencer (SMI)	
5.1	Reach - defines how far information can travel across the SNSs used and the communities at large. It is a measure of popularity, affinity and potential impact (Solis and Webber, 2012)	
5.1.1	How many followers or subscribers should an influencer have before trust is gained?	
5.1.2	Does the location of an SMI have an effect on influencing? And why?	
5.2	Resonance - is a measure of the duration, frequency and level of interactivity round content or post on a SNS (Solis and Webber, 2012). More people will see each post or update if the resonance is high, which would in turn influence the reach and the duration of content on followers' timelines. In increasing interactivity, SMIs need to have a proper commitment and involvement with their followers.	
5.2.1	How often should a SMI make social media posts?	

5.2.2	How engaging do you feel an influencer should be with their followers and in what ways possible?	
5.3	Relevance - it refers to how individuals are aligned through the subject matter (Solis and Webber, 2012). Relevance helps build relationships among like-minded individuals.	
5.3.1	What makes one a SMI?	
5.3.2	How do you know an influencer that has earned authority in a subject matter?	

6	SMI's Techniques	
6.1	<p>How can an influencer utilise direct engagement as a tool for engaging?</p> <p>Direct Engagement – SNSs allow its users to express their thoughts and opinions online (Khalid et al., 2018). One of the most important technique utilised by SMIs involves having a proper commitment and involvement with their followers (Pestek and Alic, 2018). The comment section of a SMIs' profile is the cornerstone of all interaction as this is where social media followers react to an influencer's content and expresses their opinions (Pestek and Alic, 2018). An influencer that pays attention to the voices in the comment section and reacts to them makes the audience feels listened to and generates greater insights of where the conversation is leading to (Pestek and Alic, 2018).</p>	
6.2	<p>How does collaborative tagging and hashtags help in communicating and engaging followers with contents?</p> <p>Collaborative Tagging and Hashtags – Collaborative tagging is among one the most successful social media techniques that allows users to annotate webpages or other online resources using tags (Zeng et al., 2010). Tags can be shared amongst users and allows the exploration of a wide range of information for retrieval or for recommendation purposes (Zeng et al., 2010).</p>	
6.3	<p>Does Emojis really add depth to a social media post by conveying the warmth of a face -to- face interaction?</p> <p>The Use of Emojis – Emojis can also be referred to as picture-words, they are a form of standard language that is used across various platforms and cultures (Ge and Gretzel, 2018). Emojis are used for illustration, or in some cases, replace words sent digitally, and they add depth to messages by providing electronic gestures that convey the warmth of a face-to-face communication (Lee, 2018).</p>	

<p>6.4</p>	<p>Is the concept of social timing and frequency really a technique used by social media influencers to continuously engage with their followers?</p> <p>Social Timing and Frequency - Interactivity on content shared on social media defines the level of engagement achieved by a SMI, but building interactivity requires social timing. Social timing in the context of social media engagement refers to posting at the right day and time to increase likes, shares and clicks (Patel, 2017).</p>	
<p>6.5</p>	<p>How can content curation be used to address issues on social media?</p> <p>Content Curation - Content curation is the act of searching, categorising and organising relevant online content that addresses a specific issue (Fotopoulou and Couldry, 2015). In social media, curation can be defined as the process of remixing social media content for further consumption (Duh et al., 2011). Social media users can curate existing content by searching for a collection of posts from diverse sources, reorganise them to fit the given context or perspective, and publishing the final story to their followers (Duh et al., 2011).</p>	
<p>6.6</p>	<p>What are your thoughts on the use if incentive appeal?</p> <p>Incentive Appeals - SMIs are often faced with decisions between motivating people with content that shows the consequences of actions that are desirable or undesirable (Dillard and Shen, 2013). There are two types of appeals used in persuading people to adopt certain changes. These are the negative appeals and the positive appeals. A negative appeal arouses fear and motivates behavioural changes by communicating to the audience about the harmful outcomes from initiating or continuing an unhealthy practice (Thompson et al., 2011). A positive appeal in an SMI's message could present a mirror image positive outcome that can be achieved for performing a healthy alternative (Dillard and Shen, 2013).</p>	

Are there other techniques SMIs can utilise for engaging with millennials?

6.7		
6.8		
6.9		
6.10		

Appendix G: Focus Group Questions

Welcome & Introduction of the Interviewer

Good Afternoon everyone, welcome to this focus group discussion. Thank you for taking part in this study to evaluate Social Media Analytics and to measure the success of a social media method for eliciting millennials' worldviews on the coastal and marine environment. My name is Obrukevwe Okuah, a Masters student from the department of Computing Sciences. I'm currently working on a social media method for eliciting millennials' worldviews on the coastal and marine environment. This method aims to provide researchers with a more convenient means of collecting and analysing data on social media. Some of you were invited to participate in this study, because you are social sciences researchers.

Consent Forms

You have been handed a consent form that include further details about the research study such as its title and research aim. Please take a few minutes to read the form carefully, sign and return it. I will explain the guidelines of the discussion further on.

Guidelines

- As the moderator, I'll guide the discussion.
- Please ask me if you require any clarity
- I will not use any of names in my thesis
- I'll be recording this discussion, so I do not miss any information
- I would appreciate if one person speaks at a time and phones be put on silent.
- There are no right or wrong answers, only different points of view.
- You are allowed to disagree, but you must respectfully allow each other to share their views.
- Any questions or comments before we start?

Research Goals & Objectives

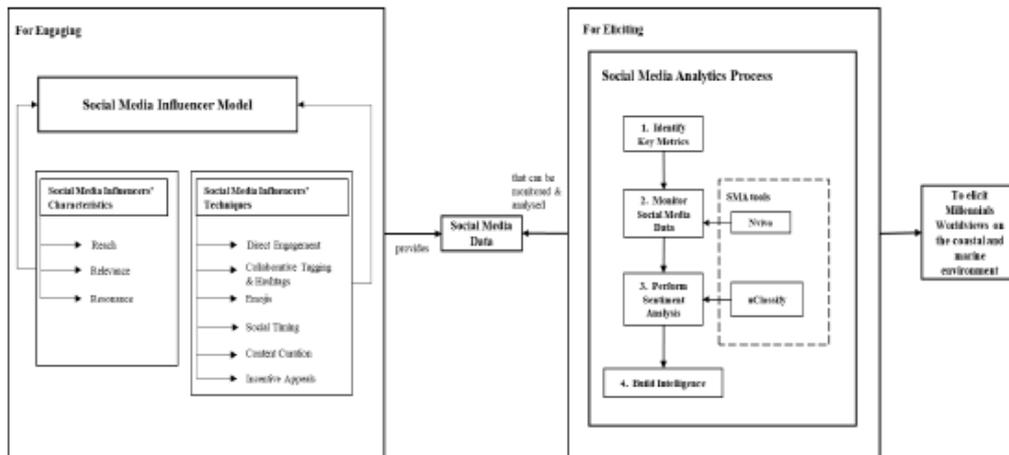
To determine criteria (barriers and enablers) for adopting the social media method. This includes the application of the steps of the proposed SMA process.

Research Questions

RQ3 – What criteria can be used for evaluating SMA?

RQ4 – How can the success of a social media method for data collection be measured?

Social Media Method for Eliciting Worldviews



Key Terms

Social Media Influencers (SMIs) are social media users who have gained a huge following and have attained some level of credibility that can lead to impact or persuasion in interaction with their followers.

Social Media Analytics involves techniques for collecting, extracting, analysing and presenting user-generated data to discover insight into a specific subject.

Questions for Focus Group

Probing questions

Influencer part of the method

1. What do you know about Social Media Influencers?
2. Who are the top influencers you know?
3. Do you know of any techniques used by influencers to create social media engagement?

Objectives and Metrics

1. Should you use social media for data collection in your research, what kind of objectives or metrics do want to obtain?
2. Can Social Media Influencers assist in any way with achieving set objectives? If yes, how?
3. Which Social Networking Sites would you consider for gathering social media data? And why?

Social Media Analytics

1. Have you used social media analytics in the past?
2. Are you aware of any tools for SMA and have you used any of these tools?
3. What factors would influence your selection of a tool for conducting SMA?

Perform SMA for participants

1. How important is this analysis to you?
2. Do you think Social Media Analytics could provide useful and quality information for your research? Why or why not?
3. What are your views on the trustworthiness of the information posted & obtained from social media?
4. What are the barriers you may foresee in using SMA as a data collection tool?
5. Are you satisfied with this method? Why or why not?

Closing & Thank You

Summarise main aspects mentioned in discussion and confirm with participants

Is there anything else about the social media method that you would love to add before we close?

Appendix H: Focus Group Transcript

Digital copies available upon request

uClassify for Performing Sentiment Analysis

Using uClassify to analyse sentiment, age and gender

1. Open the dataset stored as an excel file;
2. Click on the SeoTools tab;
3. Click on "Others" on the connectors ribbon, click on the language category and click on uClassify;
4. Select the type of classifier you need for analysis;
5. An internet connection is required to access the different type of classifiers;
6. Mode should be set to "Text";
7. Click on the input textbox, you will see an arrow on the right;
8. Click on the arrow till its showing facing down;
9. Now go and click on the cell that contains the text for analysis;
10. After clicking on the cell, a formula is displayed on the input textbox on the uClassify panel;
11. Make sure classification is checked and probability is checked;
12. Also make sure to exclude headers in results by checking the box;
13. Click on the "formula" radiobutton and check the "dump" box;
14. Now click on the cell to contain the analysis;
15. Now click on "insert" on the uClassify panel;
16. The results in now shown on the cell;
17. To apply the formula to the rest of the rows, drag the fill down to the other cells below;
18. The results are automatically populated.
19. To display the probability of each results, go to the next corresponding column and repeat steps but this time the probability should be checked, and classification should be unchecked.

The datasets obtained from monitoring SNSs with NVivo was analysed using uClassify to obtain the sentiment orientation and age. The location was obtained from monitoring and is shown on the datasets in Figure 1. Figure 2 shows the classifications of the sentiments and age from the tweets. Each of the sentiment and age classifications have a probability of it being correct. The results were obtained from analysing the tweets using uClassify's sentiment and age analyser.

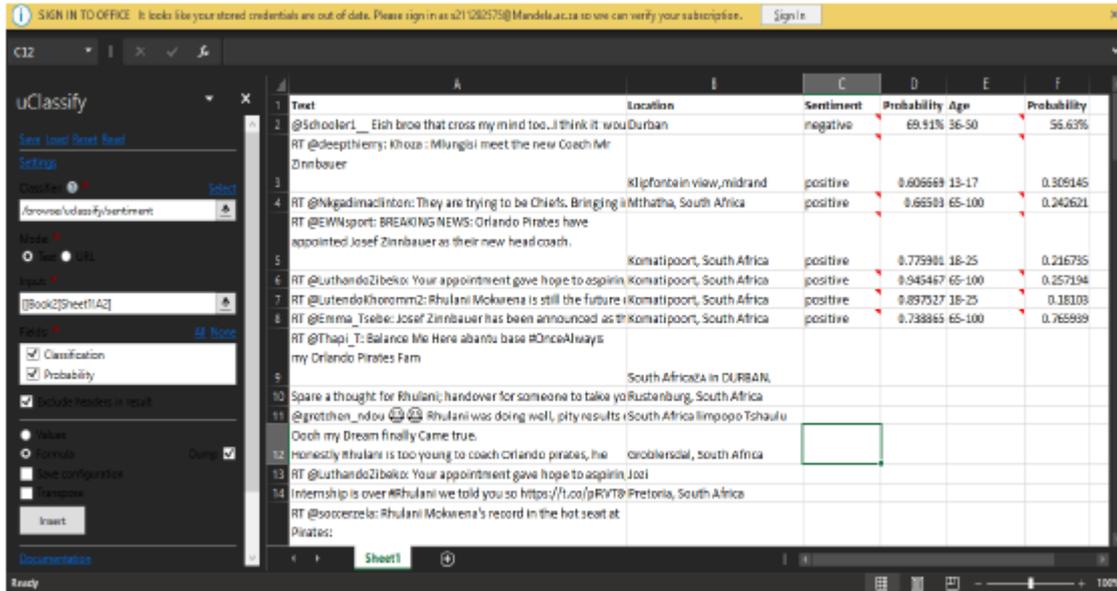


Figure 2 Sentiment and Age Classification

Appendix J: SAICSIT 2019

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A Grounded Theory Analysis of the Techniques Used by Social Media Influencers and Their potential for Influencing the Public Regarding Environmental Awareness

Conference Paper · September 2019

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A Grounded Theory Analysis of the Techniques Used by Social Media Influencers and Their potential for Influencing the Public Regarding Environmental Awareness

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ABSTRACT

There is a need for new inventive strategies to communicate to the public on particular subjects such as climate change, biodiversity loss and sustainability. Social Media Influencers (SMIs) are an emerging type of third-party endorsers who can aim to shape and influence the attitudes and perceptions of people through social media. In the field of marketing, SMIs have had great impact on customer retention and relationships. SMIs could help in engaging with the public to adopt pro-environmental behaviour. However, there is limited research related to SMIs in the field of environmental awareness. This study reports on a grounded theory analysis that explored the literature related to the characteristics of SMIs and the techniques used by SMIs that could be used by researchers for influencing the public regarding environmental awareness and pro-environmental behaviour. This paper fulfils a need for identifying strategies for engaging and influencing the public to gain insights into their pro-environmental behaviour.

CCS CONCEPTS

Information systems → Information systems applications → Collaborative and social computing systems and tools; World Wide Web → Web searching and information discovery; Social and professional topics → Professional topics → Sustainability

KEYWORDS

Social Media, Environmental Awareness, Social Networking Sites, Social Media Influencers, Pro-environmental behaviour

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1 Introduction

Social Media Influencers (SMIs) are social media users who have gained a huge following and have attained some level of credibility that can lead to impact or persuasion in interaction with their followers [1,2]. SMIs are also known as opinion leaders, who possess a great amount of influence on the attitudes, behaviour and decisions of people [3]. The ability for users of Social Networking Sites (SNSs) to grow their following and generate influence and trust among followers has become a source of capacity for reach to target audience in a credible and effective way [2]. Social Networking Sites (SNSs) are a key subset of social media and are websites that provide a virtual community for those individuals interested in a topic or want to interact and meet up with new people [4]. SNSs allow its users to communicate using voice, instant message, chat, videoconference and blogs and its services allows friends of friends to be contacted [4]. SNSs have been used to promote causes they believe in and there have been many campaigns carried out using SNSs. SNSs have been used to foster environmental behaviour, to provide news, sign petitions, and to create more awareness and motivations [5,6]. Environmental awareness equips individuals with the knowledge of the environment and the challenges it faces. In order to change people's perceptions about the environment, key insights into individuals' pro-environmental behaviour are needed. A concept known as Earth Stewardship has been developed where individuals and organisations bear the responsibility of being environmentally responsible and promote sustainable practices [7]. SMIs can be used to potentially steer people towards being

environmentally conscious and they can use their influence to help create a positive impact in their communities [9].

The growth of SNSs over the years provides a good medium for generating insights into peoples' pro-environmental behaviour. SMIs' voices on SNSs form a strong bond with like-minded individuals and these voices help in influencing and generating valuable interactions. Although, the size of followers of an SMI is a factor when discussing the capacity to influence, this is not always the best indication of the success of an influencer [10]. The capacity for an SMI to influence other people can vary. SMIs utilise various techniques to engage and derive specific information from their followers and these techniques have been utilised by brands in marketing to retain and build customer relationships [11]. However, these SMIs techniques are not easily accessible to policy makers for research on generating insights and awareness on environmental issues. Whilst some studies have reported on the use of SMIs in marketing campaigns, research into the use of SMIs' influence for environmental awareness is limited. In addition, it is not clearly highlighted what characteristics and techniques are required for successful engagement with the public on environmental issues and pro-environmental behaviour. The purpose of this paper is to address this gap in the research and to identify the characteristics of SMIs, as well as the techniques used by SMIs to target and engage with their followers. This paper forms part of a larger research study that aims to investigate social media as a data collection tool for eliciting views towards the coastal and marine environment. The coastal and marine environmental context falls within the domain of community and social cohesion towards pro-environmental behaviour in coastal towns.

The research questions this literature aims to address are:

- Q1: What are the common characteristics of SMIs?
- RQ2: What techniques can be used by SMIs to engage with the public on environmental awareness?

The structure of this paper is as follows: Section 2 illustrates the grounded theory review method adopted for this study. Section 3 describes the review results from the findings of the grounded theory literature review and discusses on SMIs' characteristics and techniques. Section 4 reports on the SMI model and limitations faced, and lastly Section 5 discusses the conclusions of the research study.

2 Grounded theory method

The grounded theory approach was adopted as the research method for this paper. The aim of the grounded theory approach is to point to well-rooted connections between variables [12,13]. The grounded theory approach has gained prominence in IS research and grounded theory research has been published in major IS journals [14]. The grounded theory approach followed in this study was the one proposed by [12] and consists of the four stages of 1) define; 2) search and select; 3) analyse and 4) present.

2.1 Define

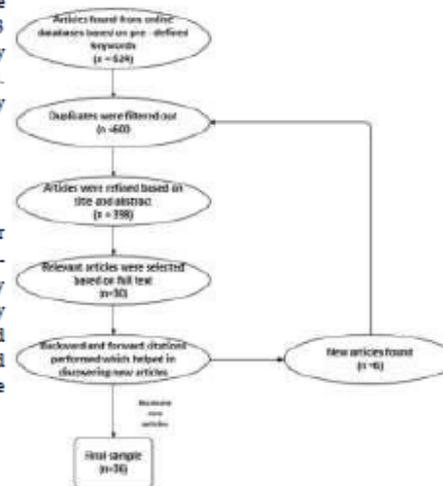
In this stage, the researcher decides on key criteria to be included and excluded from this study as it allows the mapping out of the scope of this research. The criteria used for including articles for this paper were: "studies done within the last five to eight years", "studies on Social Media Influencers' (SMIs) attributes, techniques and characteristics" and "studies on SMIs for environmental awareness". The fields of study included were: "Information Systems (IS), Social Sciences and Marketing".

The scope of this research falls mainly within the IS field since it involves the application of technological tools or platforms to manage and improve economic and social welfare. The field of social sciences is also important because the area of study concerns IS application in environmental awareness research while the field of marketing was considered because it contains a wider pool of research resources since SMIs in marketing is prevalent.

In order to find articles published in IS, social sciences and marketing, the following websites and databases were searched: ResearchGate, Emerald, ScienceDirect, Scopus, Google Scholar, Sage and EBSCOhost. The search string used on these databases includes the terms "Social Media Influencers", "Social Media Influencers AND Environmental Awareness", "Social Media Influencers' techniques for engaging", "Social Media Influencers in marketing", "Social Media Influencer's characteristics". This ensured that the literature review covered the context of the study.

2.2 Search and Select

In this stage, the actual search through identified sources was done, this stage can be time-consuming, and it often involves the researcher revisiting related criteria for inclusion into the research study [15]. In the select stage, the researcher was able to filter and remove variables that do not fit the criteria of the research. This process is shown in Figure 1.



• Figure 1: The Search and Select stage conducted

The articles found from the databases were loaded into a qualitative research tool, ATLAS.ti, where duplicates were removed, and relevant articles were selected by first looking at the title and abstract to see if they referred to SMIs or environmental awareness. Inspection of 398 articles using ATLAS.ti were carried out based on information such as SMIs' characteristics, techniques and social media for environmental awareness. Only 30 articles met the desired criteria for inclusion into this study. Backward and forward citation was necessary to enrich the sample by doing iterations until no new relevant articles were discovered [15]. While doing the iterations, 6 new articles were discovered hence the total of 36 articles for inclusion into this study according to Figure 1.

2.3 Analyse

In the analyse stage, the key principles of grounded theory are applied for analysing the text of a carefully selected set of individual studies [15]. For this research the 'analyse' stage was also carried out using the ATLAS.ti software. This stage consisted of three steps as proposed by Corbin and Strauss [12] as: open coding, axial coding and selective coding.

231 *Opening Coding.* This involves the "breaking down, examining, comparing, conceptualising, and categorising data" [12, p. 61]. In selecting data for open coding, a form of theoretical sampling known as open sampling is used [16]. This step is important at the beginning stage of coding because it allows for proper concept building that will assist with the second and third steps of coding [17].

In answering RQ1 and RQ2, open sampling was used to code any line of data that was deemed important or relevant to the study. Open sampling involves identifying certain parts or portions of an article that can lead to or provide greater understanding of the categories and their properties. This step was carried out by simply highlighting sections of text and assigning codes or categories to them using ATLAS.ti.

232 *Axial Coding.* Axial coding involves finding the relations between identified categories and its sub categories, by reassembling fractured data using a coding paradigm that takes the conditions, context and strategies of this research into account [12,16]. This was achieved by merging codes that are similar or related as recommended by Lewis [17]. Using ATLAS.ti, irrelevant codes were eliminated and then categorised into code groups to show sub-categories.

233 *Selective Coding.* Selective coding allows the researcher to structure the research in ways he or she deems fit [15,16]. In this study, the researcher was able to revisit the codes, search for themes, concepts and relationships. Following this ATLAS.ti was used to create a network diagram comprising of chains of multiple codes as suggested by Lewis [17]. Network diagrams derived from the chain of multiple codes are a qualitative visual

representation of the data [17] and helps in generating concepts, themes, and patterns through the mapping of co-occurring codes. The network diagram obtained for this research is illustrated in Figure 2 and the findings will be discussed in Section 3.

2.4 Present

Information gained from the 'Analyse' stage provides ideas on ways for structuring and presenting the content, findings and insights discovered [15]. The results of the grounded theory method were analysed and are presented as part of this paper in the next few sections.

3 Review results

3.1 Review Themes and Description

The review identified 624 articles found in total. Only 36 articles met all inclusion criteria and were reviewed in detail. The themes categories (and related codes) that were derived after the third stage of coding, were 1) environmental, 2) SMIs, 3) characteristics of SMIs, and 4) techniques used by SMIs. Table 1 shows the theme categories, the description and the number of reviewed articles for each theme. While reviewing articles, themes were derived by categorising certain portions of paragraphs that describes environmental awareness, SMIs and an SMI's characteristics and techniques. Each article could relate to more than one theme. Therefore, the total number of articles in Table 1 is more than 36.

• **Table 1: Review themes and descriptions**

Categories	Theme	Descriptions	Articles (n)
Environmental	Environmental Awareness	Is a component of environmental education. A sharing of knowledge of the issues required for awareness	4
	Pro-environmental behaviour	Describes behavioural changes towards the environment	3
	Positive Impact	Describes the role the public can play in addressing environmental concerns	2
Social Media Influencers (SMIs)	Social Media Influencers	Describes who SMIs are in general	15
Characteristics of SMIs	Reach	Describes the distance (or reach) an SMI's information can travel	2
	Relevance	Describes how an SMI is aligned to the subject matter	3
	Resonance	Describes the duration, frequency, and level of interaction	1
Techniques used by SMIs for Engaging the Public	Direct Engagement	Describes how an SMI expresses thoughts and opinions with users on SNSs	2
	Collaborative Tagging and Hashtags	Describes annotations of webpages	5
	Emojis for engagement	Illustrates the use of emojis on social media posts	3
	Social Timing and Frequency	Explains the timing and frequency of social media posts	4
	Content Curation	Explains the use of existing	6

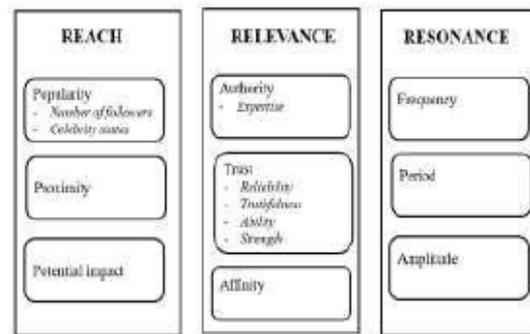
3.1.2 Social Media Influencers. SMIs are social media users who have gained a huge following and have attained some level of credibility that can lead to impact or persuasion in interaction with their followers [1,2]. SMIs are also known as opinion leaders, who possess a great amount of influence on the attitudes, behaviour and decisions of people [3]. According to Freberg et al [24], SMIs are an emerging type of third-party endorsers that aim to shape and influence the attitude and perception of people through social media. In the field of marketing, SMIs have had great impact on customer retention and relationships. Marketers have been able to track SMIs whose social media content is attractive and interesting as a means of reaching their target audience in a genuine way [2]. The Amazon Influencer Program is one of such initiative where SMIs can own their own page on Amazon with an exclusive vanity URL to showcase the products they recommend to their followers [28]. This initiative allows SMIs to promote their URL by making their followers purchase recommendations and also earn money on qualifying purchases while doing it [28].

Technological advancements and the growth of digital services for monitoring and recording activities have created an opportunity for research into human behaviour [29]. Statistics have shown that humans spend most of their time on SNSs, which have provided a good avenue for studies on human behaviour and personalities [29]. The growth of SNSs over the years allowed the rise of SMIs, which provides unexplored potential for engagement. The ability for users of SNSs to grow their following and generate influence and trust among followers has become a source of capacity for reaching target audience in a credible and effective way [2]. A large number of followers accumulated over time has made these SMIs micro-celebrities [30]. Influencers on SNSs can range from would-be or unknown actresses and models, fitness trainers and musicians to wealthy people who love luxury [30]. SMIs possess a sense of humour and their own perspective but most importantly they exhibit what their followers adore and wish they had [31]. SMIs can be identified by examining their follower network through a social network analysis [32], technological advancement can also help in identifying influencers that are relevant to a brand, cause or organisation [24]. The ability for influencers to form a strong bond with like-minded individuals on SNSs cannot be overemphasised. This connection or bond is fortified with valuable and meaningful interactions [10]. In marketing, an SMI's direct voice and the trust possessed by consumers for these individuals, influences the brand through a two way conversation on the product via SNSs [33,34]. The size of followers of an SMI is a factor when discussing the capacity to influence, this is not always the best indication of the success of an influencer. The Amazon Influencer Program does not look just at the number of followers an SMI has when determining who qualifies to join the program but also considers other engagement metrics. Studies have shown that even mid-

level influencers on social networks can hold more engagement and power than those SMIs with a huge following [2]. The reason for this lies in the fact that SMIs with a smaller following may hold a stronger loyalty among their followers [2]. According to Ruiz-Gomez [35], these influencers with small following are known as micro-influencers, and based on the world of practitioners bar regarding audience size, micro influencers following should be in the range of 5,000 to 50,000 followers. Although this range is not standard across all platforms. YouTube for example, only allows content creators to join its partner program when subscribers sits at a minimum of 1,000 subscribers and 4,000 watch hours [35]. Micro-influencers on Instagram should be capped at a minimum of 5000 followers [36].

3.1.3 Characteristics of Social Media Influencers. According to Solis and Webber [10], the ability to influence is a measure of social capital, which is made up of three pillars that contribute as characteristics that SMIs must possess in order to influence and engage with their followers successfully. These are illustrated in Figure 3, together with their related characteristics. The three pillars are:

- Reach;
- Relevance; and
- Resonance.



• **Figure 3: Framework: Pillars of Influence adapted from [10]**

3.1.3.1 Reach. Reach is the first pillar of influence and defines how far information can travel across the SNSs used and the communities at large. It is a measure of popularity, proximity and potential impact [10]. The most important role of influence at this point is the state of how well liked, familiar and appreciated the SMI is to his or her followers [2]. The three characteristics related to reach are:

- Popularity;
- Proximity; and
- Potential Impact.

Popularity is the state of which the SMI is being followed by many people. The location or proximity of the SMI can also be taken into consideration because this can influence the subject matter. An influencer should also be easy to reach with regards to any occurrence or situation. In order to increase appreciation and potential impact, goodwill should be invested into the social network community to increase the probability for collaboration and call to action.

3.1.3.2 Relevance. Relevance is the second pillar and it refers to how individuals are aligned to subject matter [10]. Relevance is vital for a successful campaign because the SMI's personal values has to align with the campaign [26]. Relevance helps build relationships among like-minded individuals. Relevance is a measure of authority, trust and affinity. One of the keys to success is that the subject matter and content of social media posts should be interesting and attention grabbing. The characteristics related to relevance are:

- Authority;
- Trust; and
- Affinity.

The SMI earns a level of authority for investing on a subject or topical relevance over time. Respect is earned from having authority in a subject or topic, this is a reward for expertise or speciality. Trust refers to the assurance of the SMI's reliability, truthfulness, ability and strength. The trustworthiness and competence of an SMI helps in conveying credibility of the content posted [27]. Affinity refers to the liking for someone or something. In marketing, SMIs possess liking for a certain brand which helps in establishing connections within a community.

3.1.3.3 Resonance. Resonance is a measure of the duration, frequency and level of interactivity around content or post on a SNS [10]. More people will see each post or update if the resonance is high, which would in turn influence the reach and the duration of content on followers' timelines. In increasing interactivity, SMIs need to have a proper commitment and involvement with their followers. An uninteresting and disregarding SMI can severely affect their capacity to reach followers. The three characteristics related to resonance are:

- Frequency;
- Period; and
- Amplitude.

Frequency refers to the rate at which a subject or topic materialises on social media. The period refers to the length of time a post remains visible after it was initially posted. Amplitude refers to the level of engagement on a SNS.

The combination of these characteristics provides attributes to look out for when determining the capacity of an SMI to influence people. For example, the fact that an SMI has thousands of followers does not necessarily mean that he/she is influential. Although having a large follower count is beneficial, it does not guarantee success in being able to influence and change peoples' perception about the environment [10]. The capacity for an SMI

to influence other people can range from a variety of factors such as a substantial following on SNSs, notable structure or an authority within a community, the size and loyalty of an audience [10].

3.1.4 Social Media Influencers' Techniques for Engaging the Public. The influence SMIs have over their followers, the public, media coverage and organisations cannot be overemphasised. The followers of SMIs are influenced by relevant opinions that carries persuasive messages to meet their information and emotional needs on specific issues [27]. Through "word of mouth communication", followers of an SMI can in turn influence non-followers [37]. There are certain instances where awareness campaigns generated by SMIs affect media coverage and as a result journalists source and repackage SMIs' content and disseminate them to news audiences [37]. The credibility of SMIs lies in their ability to affect media coverage, improve key public's issue awareness and to persuade their followers to assume certain course of actions [24,37]. There are a variety of techniques used by SMIs to engage with the public and to get people talking on social media. The most commonly reported five techniques are as follows:

- Direct Engagement;
- Collaborative Tagging and Hashtags;
- The Use of Emoji for Engagement;
- Social Timing; and
- Content Curation.
- Use of Incentive Appeals

3.1.4.1 Direct Engagement. SNSs allow its users to express their thoughts and opinions online [38]. One of the most important technique utilised by SMIs involves having a proper commitment and involvement with their followers [2]. In targeting the public with awareness campaigns, the SMI must engage with social media users in the comment section. The comment section of an SMIs' profile is the cornerstone of all interaction because this is where social media followers react to an influencer's content and expresses their opinions [2]. An SMI that pays attention to the voices in the comment section and reacts to them makes the audience feels listened to and generates greater insights of where the conversation is leading to [2].

3.1.4.2 Collaborative Tagging and Hashtags. Collaborative tagging is among one the most successful social media techniques that allows users to annotate webpages or other online resources using tags [39]. Tags can be shared amongst users and allows the exploration of a wide range of information for retrieval or for recommendation purposes [39]. In marketing, tagging allows SMIs' followers to go directly to the source of the product tagged if one is interested [34]. Tagging can be done online on an influencer's blog or SNSs. In aiding collaboration on social media, an influencer on Instagram can use tagging to link its followers to other Instagram users and pages [38]. Hashtags are tags that are more specific to SNSs like Facebook, Instagram and Twitter, which are used to mark the topic of a text, it comprises of

2 to 3 words or an abbreviation [40]. Hashtags always starts with “#” hash sign and is used as a strategy to lead users of certain interest to find out more if others have posted using the same hashtags [38,40]. The large number of posts by users on certain hashtags allows the content to be regarded more trustworthy and sparks up personal thoughts and conversation on social media [38]. The #BeatPlasticPollution movement was supported by the United Nations in 2018 during the World Environment Day [41]. This hashtag was used to support a global awareness campaign to discourage the use of disposable plastic products. Collaborative tagging and hashtags maximise exposure and makes content more visible to social media users.

3.1.4.3 The Use of Emojis for Engagement. In creating content aimed at influencing peoples’ pro-environmental behaviour, the style and idea should be engaging. In awareness campaigns, SMIs can engage with the public by using stylistic features that are superficially attractive and entertaining [27]. The content should be easy to process, interesting, mentally stimulating and emotionally arousing. Emojis have emerged as an integral part of social media marketing, and retail marketers have embraced the use of emojis to engage with potential and repeat customers in order to increase sales [42, 43]. Emojis can also be referred to as picture-words, they are a form of standard language that is used across various platforms and cultures [43].

Emojis are used for illustration, or in some cases, replace words sent digitally, and they add depth to messages by providing electronic gestures that convey the warmth of a face-to-face communication [42]. According to Ge and Gretzel [43], SMIs make use of ‘verbal moves’ when initiating or engaging with social media followers. Verbal moves in the context of social media are “speech conveyed through text, emoticons, non- standard orthography, and/or emojis that serve a particular communicative purpose” [43, p. 8]. Influencers utilise emojis in various ways to initiate verbal moves, such as expressing emotions and opinions, delivering information, and asking their followers for input [43]. Emojis enable creativity and engagement with users when communicating, and are opening new opportunities for innovative ways to make information more engaging and playful [42]. SMIs utilise single or mixed rhetorical appeals in their moves by using one or multiple emojis to engage with followers or to create an ongoing conversation on their posts [43]. In order to cause change in peoples’ pro-environmental behaviour, the presentation of content by SMIs should be personally involving and relevant so that the receivers can relate to them as applicable to their situation and needs. The message being presented by the SMI should be simple, explicit, sufficiently detailed, comprehensive, and comprehensible [27].

3.1.4.4 Social Timing and Frequency. Interactivity on content shared on social media defines the level of engagement achieved by an SMI, building interactivity on environmental awareness campaigns requires social timing. Social timing in the context of social media engagement refers to posting at the right day and time to increase likes, shares and clicks [44]. Dan Zarrella

[45] conducted an extensive research on the content posted by 10,000 SMIs on Facebook. The likes, comments and shares on each post were investigated by analysing the day of the week the content was posted. The analysis done showed that content posted on Saturdays and Sundays got more likes than content posted during the weekday [45]. Further analysis done by Zarrella [45] shows that content posted in the evening between the hours of 5pm and midnight got more likes compared to content posted at other times of the day. This could be because Facebook usage at work or school is frowned upon and much Facebook activity happens at home immediately after work or school. This data helps suggest the importance of posting content to engage with users outside of the workday and also to remind campaigners and SMIs that they compete not only with work schedule but also with real life activities such as dinner, family time, and television [45].

In terms of frequency, it varies according to social media platforms. Three Tweets per day is about right for Twitter and data suggests that after the third tweet, engagement slightly decreases [46]. Despite this suggestion, it is best to have conversations as they come up because this will help in engaging followers better than scheduling a tweet. A good Facebook approach to posting frequency is about once or twice each weekday and once over the weekend. This would prevent bombarding people’s feeds, although users love interacting with their favourite brand or SMI, posting too often could cause the loss of page likes [47]. Instagram unlike Twitter and Facebook does not have any clear best practices. The frequency of posts depends on the goals of engagement an influencer aims to achieve.

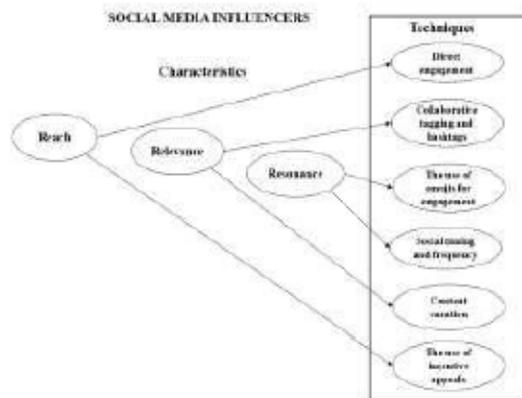
3.1.4.5 Content Curation. Content curation is the act of searching, categorising and organising relevant online content that addresses a specific issue [48]. In social media, curation can be defined as the process of remixing social media content for further consumption [49]. Social media users can curate existing content by searching for a collection of posts from diverse sources, reorganise them to fit the given context or perspective, and publishing the final story to their followers [49]. Due to the information overload on social media, curation provides a promising way to interact and engage on social media [49]. Twitter provides information in real time, which produces an unstoppable wave of content; curation is vital here because it helps to filter out unnecessary information [50]. The ability for an SMI to curate and link other people’s content not only refers its followers to recommended sources but also allows its followers to interact and network with the original content creator [51]. People care a lot about their content on social media and when someone else promote their content through content curation, they are most likely to reciprocate by retweeting or sharing the post with their followers [52]. In awareness campaigns, rather than create new content every time, SMIs can curate existing content and share this with the public to shed more light on the topic and aid pro-environmental behavioural adoption. Curation is based on the assumption that the best collection of hashtags and keywords

would enhance the communication with the social media followers in mind that needs to be converted [53].

3.1.4.6 The Use of Incentive Appeals. In creating persuasive messages on social media posts, SMIs utilise the power of incentive appeals. In directing efforts to influencing people to adopt pro-environmental behaviour, SMIs are often faced with decisions between motivating people with content that shows the consequences of actions that are desirable or undesirable [54]. There are two types of appeals used in persuading people to adopt certain changes. These are the negative appeals and the positive appeals. A negative appeal arouses fear and motivates behavioural changes by communicating to the audience about the harmful outcomes from initiating or continuing an unhealthy practice [27]. A positive appeal in an SMI's message could present a mirror image positive outcome that can be achieved for performing a healthy alternative [54]. The most prevalent strategy involves creating an environmental awareness campaign that showcases the strength of losses from environmental degradation and promises of gains from being environmentally cautious [54].

4 Discussion

The Social Media Influencer Model was developed from the studies and applications selected for this review. The grounded theory method was used to code, analyse and present the data in terms of the constructs and the relationships. These are illustrated in the conceptual model in Figure 4. The conceptual model shows the relationships between the SMIs' characteristics and the techniques used by SMIs for engaging with the public. SMIs should possess these characteristics for them to be able to use these techniques effectively.



• **Figure 4: Social Media Influencer Model**

The analysis revealed that the characteristics of the SMIs influences the techniques used. The definitions were analysed, and deductions were made as reflected in Figure 4. The characteristic reach impacts on direct engagement and the use of incentive

appeals because for an SMI to engage directly and incentivise the public, the SMI must be popular and be able to impact the community. Relevance impacts on collaborative tagging and content curation because an SMI needs to earn an authority in a subject or topic for curated content and collaborative tags to achieve set objectives. Resonance impacts on the use of emojis, social timing and frequency because in order to utilise these techniques effectively, an SMI needs to have proper commitment and interactivity with his/her followers.

This paper identified the characteristics of a successful SMI, and analysed common techniques used by SMIs for engaging with the public in various research fields. Three primary characteristics were identified that an SMI must possess to be deemed influential. The most commonly reported one are reach, resonance and relevance. Therefore, although the number of followers is commonly viewed as a determining factor, it is not the only factor. Related to each characteristic are several techniques that have been used by SMIs to engage the public to take certain actions. The techniques discussed in this paper provides some guidelines that an SMI can utilise to engage the public to take certain actions. There were some limitations that this study encountered; one of the main limitations was that there were limited studies on SMIs' techniques for engaging the public on environmental awareness. Most of the studies found on SMIs' techniques were from marketing. A second limitation is that these techniques have not been empirically verified in the context of environmental awareness or pro-environmental behaviour.

5 Conclusion

SMIs are the newest revolution on SNSs, and they hold a great deal of influence on social media users. This paper serves as a useful instrument for research on SMIs for engaging the public regarding promoting environmental awareness and potentially for influencing pro-environmental behaviour. The grounded theory method was successfully used as the research method for this study and it led the researcher to discover themes that helped in developing relationships amongst the variables. This paper offers two contributions: 1) The characteristics of SMIs, and 2) the related techniques used by SMIs for engaging with the public. The conceptual model findings can be used by other researchers who are engaged in studies relating to social media for environmental awareness. In addition, practitioners can use the model for assisting with planning and designing environmental awareness campaigns. It is recommended that these campaigns consider SMIs and their techniques as part of their approach.

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Appendix K: Interview Transcript

Digital copies available upon request.