The Dark Side of Online Social Networks (OSNs): Exploring Users' Negative Experiences

By

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Certificate of Original Authorship

I, Layla Boroon declare that this thesis, submitted in fulfilment of the requirements for the award of Master by Research in Computing Science, in the Management and Leadership School/Engineering and IT Faculty at the University of Technology Sydney. This thesis is wholly my own work unless otherwise referenced or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

Signature:

February 2018

This thesis was formed in a conventional format.

This thesis is an unpublished, independent work and original intellectual product of the author, L. Boroon.

Dedication

To my love Kazem whom I am proud of him for his generosity, supports, passion, kindness and patience and to my beloved parents for their encouragement that let my dreams come true.

And

To my dear son Soheil who has made my life more amazing, enjoyable, meaningful.

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Abstract

The use of Online Social Networks (OSNs) has increasingly grown over the past few years, and subsequently many studies have reported several positive effects of using OSNs. However, negative effects of using OSNs have so far received less attention. Adverse outcomes, risks, and negative effects of using OSNs have been considered as the dark side of OSNs. Given a lack of a comprehensive picture of the dark side of using OSNs and how various negative effects maybe related, this study has been conducted to i) explore adverse consequences of OSNs use from users' perspective that have been previously reported in the literature, ii) categorise the explored negative effects to identify the characteristics of the dark side of using OSNs, iii) develop and validate a framework for the dark side of OSNs use, and iv) propose directions for future research for developing strategies in order to reduce negative effects of OSNs use.

Firstly a systematic literature review was undertaken to gain an insight into existing studies on the dark side of OSNs use. A total of 43 negative effects of OSNs use were extracted from the content of the 29 selected articles for review. A coding process was used and negative effects were categorised into six groups or themes: i) cost of social exchange, ii) cyber bullying, iii) low performance, iv) annoying content, v) privacy concerns, and vi) security threats. Then, on the basis of these six themes and their underlying sub-categories, a framework for the dark of using OSNs and its characteristics was proposed. Next, the validity of the proposed framework was verified by conducting a semi-structured expert interview research. The interview process was held with 12 experts in the field of information systems, computing science and psychology. Experts agreed with 94.3 % of findings, and provided feedback for minor changes and clarifications.

This study contributes to the literature in terms of both theory and practice. The key theoretical contribution of this study is to offer a comprehensive picture of users' negative experience through developing and validating a framework for the dark side of OSNs use. The practical contributions are i) raising users awareness of the adverse consequences of using OSNs, ii) informing policy makers about what constitutes the dark side of OSNs, iii) guiding practitioners and authorities to develop educational content for users, and iv) informing OSNs developers about how to protect their users against adverse outcome of platform use.

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Chapter 1: Introduction

1.1. Research Background

Online Social Networks (OSNs) are networked communication platforms in which users can create profiles and content, establish connections, develop audio and video interactions with their connections, and exchange user-generated content (Berger et al. 2014; Ellison & Boyd 2013; Erfani, Abedin & Blount 2016b). Mäntymäki & Islam (2016) argue that using OSNs creates both positive and negative socio-psychological effects (i.e. controversies, risks, negative experiences or adverse consequences) on their users, and identifying such effects of OSNs use is very important. While some studies such as Cao et al. (2015), Mäntymäki & Islam (2016), and Berger et al. (2014) reported a lack of studies on the negative effects of OSNs use, many others such as Erfani, Abedin & Blount (2016b), Lee, Agrawal & Rao (2015), Abedin & Babar (2017), and Poblet, García-Cuesta & Casanovas (2017) primarily focused on the positive aspects of OSNs use. Thus, little attention has been paid to the negative effects of using OSNs (Berger et al. 2014). Exploring negative effects, controversies, risks or adverse consequences of OSNs use is essential, as 2.62 billion of the world's population are OSNs users (Statista 2018c) and their life and wellbeing may be threatened by the negative consequences of using OSNs (Mäntymäki & Islam 2016).

As stated earlier, positive effects of OSNs use have been widely studied in the past (Berger et al. 2014). For instance, Erfani, Abedin & Blount (2016b) show that experiencing social belongingness, obtaining social support, and consequently experiencing better psychological wellbeing are the benefits of online healthcare community use. Another study demonstrated that OSNs use has positive effects on friendship quality, bridging social capital, and bonding social capital in early adolescents' social lives (Helmig, Spraul & Ingenhoff 2016). Agnihotri et al. (2016) showed that OSNs use has had an important role in communicating information to customers and enhancing salesperson behaviours to increase customer satisfaction. A study conducted by Noar et al. (2017) claims that using Facebook, as the most famous OSN platform, led to remarkable increases in public engagement with skin cancer prevention. Moreover, OSNs help people who explore networked markets such as hospitality and tourism to get more

information and support from one another than from vendors (Kasavana, Nusair & Teodosic 2010; Milano, Baggio & Piattelli 2011).

In contrast, fewer contributions have been made in regards to negative socio-psychological experiences of OSNs use in people's lives (Mäntymäki & Islam 2016). Studies on negative effects of using OSNs have reported a number of adverse consequences of OSNs use, but have missed the opportunity to offer a comprehensive picture of such negative effects. Examples of reported negative effects of using OSNs are inappropriate, annoying or obscene content, overload of social responsibility, and social pressure (Fox & Moreland 2015), stress (D'Arcy et al. 2014; Fox & Moreland 2015), feeling of jealousy (Fox & Moreland 2015; Sánchez, Muñoz-Fernández & Ortega-Ruíz 2015), depression, panic (Yan et al. 2016), privacy risks (Liu et al. 2016; Shiue, Chiu & Chang 2010), addictions, and reduced quality of life (D'Arcy et al. 2014). Furthermore, the term 'dark side' of OSNs use has been just recently used in the information systems literature, which refers to the controversies, risks, negative experiences, negative effects or adverse consequences of OSNs use (D'Arcy et al. 2014; Fox & Moreland 2015). Yet, there is still not a comprehensive and consistent definition for this term, and what categories of negative effects of OSNs use may represent the dark side of using OSNs.To address the above gaps, this study aims to i) explore various negative effects and adverse consequences of OSNs use that have been identified by previous studies, ii) categorize those effects into distinguishing groups as the characteristics of the dark side of using OSNs, then iii) develop and validate a framework for the dark side of OSNs use, and iv) propose directions for future research for developing strategies in order to reduce negative effects of OSNs use.

The remainder of this research thesis is completed in the following chapters. Chapter 2 provides an overview of the research background and the gaps, which have been addressed through this study. Chapter 3 outlines the research design and methodologies. Chapter 4 describes the systematic literature review process as the first method that was used in this research. Chapter 5 demonstrates the result of the expert interview as the second research methodology. Finally, Chapter 6 describes the discussion, contributions, limitations and conclusion of this research.

1.2. Research Questions

Three research questions were designed to address the objectives of this research, which have been explained in details in the next subsection. Accordingly, this study aims to answer the following questions:

Question 1: What are the negative effects of OSNs use for users?

This question will address the first objective through conducting a systematic literature review.

Question 2: How can these negative effects of using OSNs be categorized as characteristics of the dark side of OSNs use?

The second objective will be addressed through this question.

Question 3: What does the term 'dark side' entail in the context of OSNs use? How would the above categorized negative effects collectively represent 'dark side' of OSNs use?

The answer of this question covers the third and fourth objectives.

1.3. Research Objectives and Significance

As discussed in the previous section, currently there is no holistic and consistent definition of the dark side of using OSNs or categories for the dark side of OSNs use. Given this background, the main objectives of this study are as follows:

Objective 1: To explore negative effects of OSNs use reported in the past studies

Given a lack of studies of the negative effects of OSNs use (Berger et al. 2014; Cao et al. 2015), and also given the large level of risks surrounding OSNs users (Cao et al. 2015; D'Arcy et al. 2014), a deep and broad understanding of negative aspects of using OSNs is essential (Mäntymäki & Islam 2016). Exploring various negative effects of OSNs can help users to better understand, control, prevent and mitigate the adverse consequences or negative effects of using OSNs (Emerald 2017). Past studies have emphasized the importance of exploring users' negative experiences of OSNs use (Berger et al. 2014; Cao et al. 2015; Fox & Moreland 2015; Garcia & Sikström 2014; Mäntymäki & Islam 2016) as a first step for classifying them based on their similarity to represent the 'dark side' of OSNs use (D'Arcy et al. 2014; Fox & Moreland 2015; Garcia & Sikström 2014).

Objective 2: To categorise the negative effects of using OSNs into distinguishing groups of characteristics, and to understand what the dark side of OSNs use may entail

According to scholars such as D'Arcy et al. (2014), Fox & Moreland (2015) and Garcia & Sikström (2014), the notion of the 'dark side' of OSNs use is in its early stages and is still a very broad term that can comprise various types of adverse consequences of using OSNs. At the time of conducting this research, no prior study provided an integrated and comprehensive representation of the negative effects of OSNs and what the underlying concepts and characteristics of the 'dark side' of using OSNs maybe there. Skowronek & McKinney (2010) has explained that a concept can be defined by its characteristics and characteristics of a concept may be affiliated with attribute values of that concept. Hence, to define the term 'dark side of OSNs use' as a concept, it is important to identify the characteristics of dark side of OSNs use. To identify the characteristics, the negative effects of OSNs use as the attribute values of the dark side of using OSNs should be categorized into different groups (Skowronek & McKinney 2010).

Objective 3: To propose a framework of the dark side of using OSNs for guiding the future research on developing strategies to reduce users' negative experiences of using OSNs.

Recent studies have called for a clearer understanding of the dark side of OSNs use (Emerald 2017). While some studies have reported a number of individual negative effects of OSNs use (D'Arcy et al. 2014; Dredge, Gleeson & De la Piedad Garcia 2014a; Fox & Moreland 2015; Liu et al. 2016; Wendorf & Yang 2015; Yan et al. 2016), there is still a lack of a comprehensive understanding of how these negative effects may be related or can be categorized as a framework for presentation the dark side of using OSNs (Emerald 2017; Fox & Moreland 2015). Thus, this study aims to develop and propose a framework of high level adverse consequences of using OSNs for users. This framework can then be used as a guide for future studies on the dark side of OSNs use.

Objective 4: To validate the proposed framework and characteristics of the dark side of OSNs use

Validation of a new framework is important for ensuring the rigor of findings (Lynn 1986; Morgan & Smircich 1980). Therefore, the final objective of this study is to examine the validation of the proposed framework through expert interviews to make sure the

extracted negative experiences of OSNs use, and uncovered categories or characteristics of the dark side of using OSNs make sense.

1.4. Research design

To answer the research questions, two research methods were used:

i. A systematic literature review was conducted to address research questions 1 to 3 and cover the first, second, and third objectives:

This study used Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines as an approach proposed by Moher et al. (2009), Bandara, Miskon & Fielt (2011), Wolfswinkel, Furtmueller & Wilderom (2013), and has also been previously used by other scholars such as Erfani, Abedin & Blount (2016a), to perform the systematic literature review. This review resulted in selection of 29 relevant articles. Following the above guidelines, the selected articles were carefully and thoroughly analyzed, which led to extraction of 43 adverse consequences of OSNs use and these were then categorised into six themes as the characteristics of the dark side of OSNs use.

ii. An expert interview as a qualitative research instrument was employed to validate the findings of the systematic literature review as the fourth objective.

Semi-structured interviews with twelve experts in the field of information systems, computing science, psychology and computing in human behavior were conducted. Then, Lynn (1986)'s guidelines for validation of frameworks through expert interviews were used for the analysis of the interview data. As a result, the experts confirmed 94.3 % of the initial findings, and the proposed framework was refined with minor changes based on the feedback received.

1.5. Key findings and contributions

This thesis has led to the following major findings and contributions:

* *Identifying and extracting 43 negative effects and adverse consequences of OSN use*

Some studies assert that a deep understanding of the negative consequences of OSNs use is required, because i) using OSNs negatively effects on human lives by causing and increasing socio-psychological problems (Mäntymäki & Islam 2016), and ii) moreover, there are not sufficient studies in the field of the adverse consequences of

OSNs use (Berger et al. 2014; Cao et al. 2015). Therefore, this study was inspired by the lack of research in the field of the negative effects of using OSNs. To our knowledge, this thesis is one of the first studies that has explored the negative outcomes of OSNs and identified the 43 negative effects. These findings can guide future studies in this area and can help practitioners and also it was a first step for developing the proposed framework of the underlying concept of the dark side of OSNs use.

- *Categorizing the identified negative effects into six groups as the characteristics of the dark side of OSNs use for users*

  Since one of the most important objectives of this study was to identify what the dark side of OSNs use might entail, Skowronek & McKinney (2010) approach inspired this thesis to categorise the 43 extracted negative effects of using OSNs into different characteristics. Therefore, by using a coding process as a part of PRISMA statement (Bandara, Miskon & Fielt 2011; Erfani 2015; Moher et al. 2009; Wolfswinkel, Furtmueller & Wilderom 2013), four subcategories (i.e. intrinsic/cognitive costs, opportunity/executional cost, inappropriate posts and obscene content, privacy concerns, security threats, cyber bullying and low performance) and six themes of the dark side of OSNs use (i.e. cost of social exchange, inappropriate content, privacy concerns, security threats, cyber bullying and low performance) were uncovered.

- *Proposing a framework for demonstrating what the dark side of OSNs use entails*

  A framework as a visual diagram indicates relationships among different attribute values and characteristics of a concept (Kitchel & Ball 2014). This relational visualization is a fruitful codification that guides researchers or scholars to understand real significance of each item and distinguish their differences especially for those ones that seem quite similar to one another (Kitchel & Ball 2014; Petter, Straub & Rai 2007). Therefore, this study proposes a framework to demonstrate the relationship between attribute values and characteristics of the dark side of OSNs use. This framework not only shows what the dark side of using OSNs might entail, but also clarifies the dependency between different characteristics of the dark side of OSNs and their contents. This framework might be very useful for future studies to develop strategies for reducing the negative consequences of OSNs use.

- *Validate the proposed framework through conducting interviews with 12 experts*

There is general agreement among scholars that validation of findings should be of concern to researchers (Polit & Beck 2006). Accordingly, some studies emphasize that not only must researchers make efforts to enhance content validity of their findings through conceptualization and using proper analysis prior to generating their findings, but also it is recommended for them to evaluate the relevance of their findings through expert assessment (Polit & Beck 2006). Thus, verifying the validity of a study is very important, because it enhance the appropriateness, meaningfulness and usefulness of a research study (Lynn 1986; Polit & Beck 2006). Hence, interviews of the 12 experts who had expertise in the field of information systems, computing science, human behavior in information technology and psychology supported this study to provide more understandable, scientific and reliable findings.

1.6. Definition of key terms

***Online Social Network (OSN)*:** Ellison & Boyd (2013) define OSN as "a networked communication platform in which participants i) have uniquely identifiable profiles that consist of user-supplied content, content provided by other users, and/or system-level data; ii) can publicly articulate connections that can be viewed and transferred by others; and iii) can consume, produce, and/or interact with streams of user-generated content provided by their connections on the site" (p. 158).

***Dark side of OSNs*:** Refers to controversies, risks and adverse consequences surrounding the social media and OSNs (D'Arcy et al. 2014; Emerald 2017; Fox & Moreland 2015).

***Negative effects of OSNs*:** Negative effects refers to different types of users' negative experiences caused by using OSNs such as fear, loneliness, depression, other negative emotions (Przybylski et al. 2013; Yoo & Jeong 2017), lack of online safety, stealing personal information and misrepresentation (Liu et al. 2016).

***Systematic literature review*:** A systematic literature review refers to types of literature reviews that collect and critically analyze multiple research studies or papers, using methods that are selected before one or more research questions are formulated, and then finding and analyzing studies that relate to and answer those questions in a structured methodology (Okoli 2015; Rabi 2017; Tranfield, Denyer & Smart 2003).

***Characteristics (of dark side of OSNs)*:** According to Oxford (2017b) , a characteristic is 'a feature or quality belonging typically to a person, place, or thing and serving to

identify them'. In this study, the characteristics of the dark side of using OSNs refer to the categorized negative effects of OSNs use, which describe what the dark side on OSNs use is.

Expert interview: expert interview is a kind of individual interview carried out between an interviewer and respondent with people who are specialist and experts in the field of research. These types of respondents are carriers of deep scientific knowledge or experiences of the research object (Libakova et al. 2015). An expert interview could be performed in non-formalized or semi-formalized surveys (Libakova et al. 2015).

Content validity: "Content validity is the determination of the content representativeness or content relevance of the elements/items of an instrument by the application of a two stage process" (Lynn 1986) (p. 382). Furthermore, some researchers define the content validity as "whether or not the items sampled for inclusion on the tool adequately represent the domain of content addressed by the instrument" (Polit & Beck 2006) (p. 489).

Framework: "frameworks are the keys to fruitful codification; the step that raises the inventory beyond simple accumulation toward real significance" (Hill & Hansen 1960) (p. 299). The latter emphasized that a framework will often save us from the error of comparing propositions whose concepts are widely different in spite of common terms" (Hill & Hansen 1960) (p. 300). Moreover, "a framework can be defined as a representation of substantive theory if there is a solid rationale, which accompanies said framework" (Kitchel & Ball 2014) (p. 190). In addition, "the term framework only refers to a visual diagram or description indicating relationships between or among variables. A framework or model indicates a relationship exists, but lacks the rationale behind the relationship" (Kitchel & Ball 2014) (p. 190).

Cost of social exchange: According to Social Exchange Theory (SET), cost can be defined as negative consequences from exchange behavior that reduces behavior frequency (Tong, Wang & Teo 2007; Yan et al. 2016). Although, instead of this terminology, the term 'cost' has been used in some studies, both of them have exactly the same definition (Tong, Wang & Teo 2007; Yan et al. 2016). Tong, Wang & Teo (2007) SET divides cost of social exchange into two types namely, intrinsic cost and opportunity

cost. Yan et al. (2016) state that intrinsic cost is equivalent to cognitive cost and opportunity cost is equivalent to executional cost.

***Annoying Content*:** Annoying Content refers to inappropriate and obscene content such as dumb jokes by users which are purposely or unwittingly disturbing some other users (Preece 2004).

***Privacy Concerns*:** Privacy concerns with OSNs refers to concerns related with storing, re-purposing, provision to third parties, and displaying of information pertaining to oneself via the Internet (Anderson & Agarwal 2011). According to Fox & Moreland (2015), some OSNs applications like Facebook ultimately control users privacy and limit their ability to hide some of their information from the world (Ellison 2007).

***Security Threats*:** OSNs adaptation is being affected by security threats, because using of OSNs causes security incidents (He 2012) such as confidential data loss, misuse of information or impersonation (D'Arcy et al. 2014; Liu et al. 2016).

***Cyber Bullying*:** Cyber bullying can be defined as an aggressive and intentional act carried out by an individual or a group of attackers. They attempt to harm and imbalance the power of their victims by using the electronic form of contacts (Dredge, Gleeson & De la Piedad Garcia 2014a).

***Low Performance*:** low performance refers to poor or incomplete performance when one who fails to attend to his or her responsibilities and accomplish them according to a set of standards (Fox & Moreland 2015; Paul, Baker & Cochran 2012). There is a significant positive relationship between waste of time by using OSNs and low academic performance (Fox & Moreland 2015; Paul, Baker & Cochran 2012) and low job performance (Fox & Moreland 2015; Lu et al. 2015).

Chapter 2: Research Background

2.1. Online Social Networks (OSNs) in the Information Systems Literature

Throughout the past few years, a new class of information networks called online social networks (OSNs) has emerged and grown (Berger et al. 2014). An OSN is a virtual space that allows its users to generate, share, transfer, and exchange different types of information such as text, video, voice, and picture (Chaffey et al. 2009). Cao et al. (2015) discussed different categories of OSNs applications such as, blogs, instant messaging, podcasts, social networking websites (e.g. Renren and Wechat in China, Vkontakte in Russia, Facebook), professional networking websites (e.g. LinkedIn), microblogging (e.g. Twitter, Weibo in China), and virtual worlds (e.g. Second Life). The following paragraphs provide more information about each category:

- *Microblogging*: Microblogging is a form of online communication that allows a subscriber to distribute short messages to other subscribers of this service (Java et al. 2007). Java et al. (2007) state that micro-posts can be made public or broadcasted to a private group of subscribers. Subscribers can read microblog posts online in forms of an instant message, an SMS text message, email or the web. The latter study explains that microblogging is provided by several platforms such as Twitter, Jaiku and Pownce. According to some researchers, Twitter is the most popular microblogging service (Java et al. 2007; Menkhoff et al. 2015).

- *Virtual worlds*: This world refers to a computer generated space that enables its users to interact with one another in an environment other than the real world (Schroeder 1996). In other words, a virtual world is a technological environment that allows the users to have a set of experiences and a strong sense of being in that environment (Warburton 2009). Although there are different types of virtual world that have different utilization, second life is the most mature and popular multi-user virtual world platform being used in education (Warburton 2009).

- *Social networking websites*: Social network sites can be defined as web-based services that allow users to i) create a public or semi-public profile within personal settings, ii) generate the content of a social network site and share it with the public or groups of users, iii) view and access their list of connections and those made by

others within the system (Ellison 2007). According to Ellison (2007), although social network sites such as MySpace, Facebook, Cyworld, and Bebo have been designed to provide different service, Facebook is the most popular social network sites. Research in 2017 shows that Facebook had 2.06 billion monthly active users and currently has the largest number of users in comparison with other OSNs platforms (Statista 2018a).

- *Professional networking websites*: According to Guillory & Hancock (2012), a professional networking site is another way for create linkage or communication to certain people. Users of professional networking sites can engage, share or connect with other professionals. The main purpose of a professional network is to expand a business, build the network, and career improvement (Guillory & Hancock 2012). What makes a professional network distinct from a social network service is that a professional network is mainly concentrated on the relationship of business nature and career building rather than personal relationship (Guillory & Hancock 2012). There are several professional networking sites such as LinkedIn, Quora, Plaxo, Viadeo, XING, Udyomitra, and Meetup. Guillory & Hancock (2012) state that LinkedIn is the most popular professional networking site that enables people to upload online resumes and form connections with colleagues, friends, businesses, and professional people.

- *Blogs*: Nardi et al. (2004) explain that a blog is an online service that allows its users to blog in a form of journalism to shape democracy outside of all the official media and conventional politics . As well, a blog is used in a form of personal communication and expression that enables bloggers to note and record their specific interests with a strong sense of their personality, passions and point of view (Hsu & Lin 2008; Nardi et al. 2004). To communicate with a blogger, reader can send their comments through the facilities that are provided by the blog interface (Hsu & Lin 2008).

- *Instant messaging*: Instant messaging refers to online mobile communications services that have gained considerable attention (Church & de Oliveira 2013). Recently, the mobile instant messaging has replaced traditional messaging services and people use various types of the mobile instant messaging such as Telegram, WhatsApp, Viber and Line (Church & de Oliveira 2013). Church & de Oliveira (2013) assert that all of the instant messaging platforms have been designed as

applications for smartphones and enable their users to send and receive location information, images, video, audio and text messages in real-time regardless of any limitation of time or places.

All of the above types of OSNs applications provide different features to their users such as 'tag', 'post', 'dig', 'blog' (Xiang, Gretzel & Fesenmaier 2009), 'like', 'follow' and 'friend request' on the Internet. The pervasive nature of OSNs, their unique features to support users to establish connections, develop interactions with their connections, and share content and consume content provided by their networks makes them an attractive tool for people (Shao 2009; Van Dijck 2009).

According to Barbagallo, Francalenei & Merlo (2008), OSNs are social systems that allow a very large number of individuals or groups to have an online relationship with one another. According to Ellison (2007), OSNs are communication and interaction tools that allow people to capture, store and present information among one another. OSNs are collection of individuals who have a common interest and generate, share, transfer and exchange information among themselves (Kumar et al. 1999). More importantly, OSNs have the ability to connect all people all over the world regardless of all the restrictions of time and place.

Use various types of OSNs applications is being significantly increased by online users (Cao et al. 2015) who deal with OSNs in three ways: consuming, participating and producing contents online (Shao 2009; Van Dijck 2009). The below bar-chart provides information on the most popular social network sites as of September 2017, ranked by number of active accounts (Statista 2018b). The top rank has been allocated to Facebook with 2.06 billion monthly active users. The second top with a large statistical difference from Facebook is YouTube with 1.5 billion monthly active users. As the bar-chart below shows, gradually, the number of active users of different applications is reducing to the point where Telegram has the least number of active users (Statista 2018b).
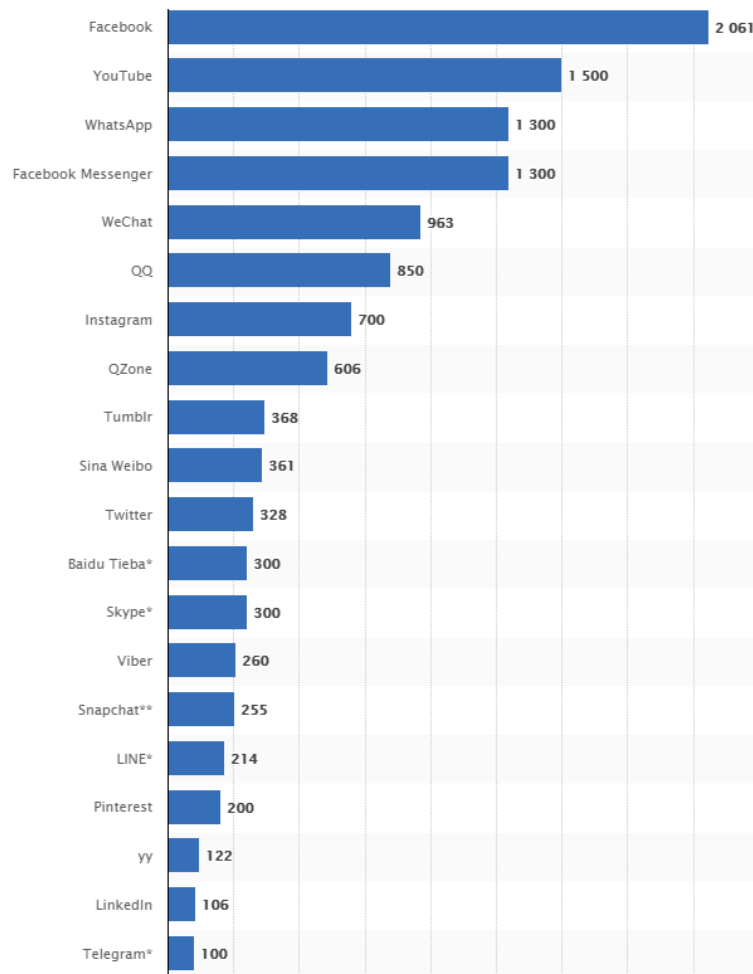
Figure 1: Most famous social network sites worldwide as of September 2017, ranked by number of active users (in millions) (adapted from (Statista 2018b)

OSNs have attracted billions of people and are continually expanding (Cao et al., 2015, Erfani et al., 2017). Since OSNs have become an important part of many people's lives (Ellison and Boyd, 2013), and many users spend hours using OSNs each week or even each day (Junglas et al. 2013); naturally, such extensive use of a social tool has positive and negative implications on people's lives (Mäntymäki & Islam 2016).

2.2. History of OSNs

OSNs are increasingly attracting the attention of people all over the world in general (Ellison & Boyd 2013) and industry and academic researchers in particular (Ellison 2007). Although, some early social network platforms such as Friendster failed due to technical and social issues, they built a foundation for the success of subsequent OSNs (Ellison & Boyd 2013). The perspective of origin, source and development of the OSN phenomenon is explained in the following paragraphs.

The Initial Years of OSNs (1997-2002)

The first recognizable OSN site, SixDegrees.com was developed in 1997 (Ellison 2007). SixDegrees.com enabled its users to create profiles, list their friends and then in the beginning of 1998 allowed its users to surf other users' friend lists. Of course, some similar sites existed before SixDegrees that were used for dating and communicating but they did not have all the site features that SixDegrees provided to its users (Ellison 2007). AIM and ICQ buddy lists, for example, supported their user to create lists of friends, although those friends were not visible to others. Another example refers to Classmates.com that had been designed for high school/college students for enabling them to surf the network for other users but Classmates.com users could not create profiles or list of their friends until years later (Ellison 2007). Ellison (2007) State that SixDegrees as a text messenger tool promoted itself by attracting millions of users, but it failed and closed in 2000 due to the poor development of the online advertising industry. From 1997 to 2001, a number of social networking tools began to support various combinations of features for users' profiles. For instance, in 1999, LiveJournal launched as an instant messaging tool that allowed its user to manage their privacy settings. In addition, in 1999 a Korean virtual world site, Cyworld started its activity as a social network site and its developers added some features on it in 2001. Furthermore, a Swedish web community, LunarStorm, was redesigned as a social network site in 2000 with new features such as friends lists, guestbooks, and diary pages (Ellison 2007). In 2001, Ryze.com was constructed as the first business social network site to help people to link their businesses but did not experience great popularity. In the following year, in 2002, Friendster was created and although it provided access of friends-of-friends feature to its users, very soon it lost many of its users due to its inability to handle rapid growth in user numbers (Heidemann, Klier & Probst 2012).

The Maturity and Popularity of Social Network Sites (2003–Present)

From 2003 to now, lots of OSNs were created (Ellison 2007). MySpace, for instance, was developed in 2003 in Santa Monica, California as an OSN typically comprises a digital photo and in-depth information about users' personal interests (Heidemann, Klier & Probst 2012). According to the latter authors, this platform became very popular by competing with sites like Friendster, Xanga, and Asian Avenue and focusing to attract unsatisfied users of Friendster. Moreover, MySpace promoted itself by considering its

users demand for new features to personalise their pages. Of course, in 2003, except MySpace, a few OSNs such as MyChurch as a religion-focused site, SmallWorld as an elite site, Couchsurfing as an activity-centred site and LinkedIn as a business and employment-oriented social networking service attempted to reach a competitive advantage by targeting specific groups but they were not as successful as MySpace (Ellison 2007). At the same time, some OSNs were launched that had certain popularity in specific regions. For example, Friendster gained proved attractive in the Pacific Islands; Orkut became the premier OSN in Brazil and India (Madhavan 2007), Mixi gained very wide adoption in Japan, LunarStorm accepted in Sweden, Dutch users embraced Hyves, Grono took off in Poland, Hi5 was attracted in smaller countries in Latin America, South America and Europe, Chinese QQ instant messaging took off in china, and Bebo became very popular in the United Kingdom, New Zealand, and Australia (Ellison 2007).

Facebook was created by Mark Zuckerberg in 2004 (Ellison & Boyd 2013). According to Ellison & Boyd (2013), at the beginning, Facebook was designed as a Harvard-only OSN site but after a short time, it was converted to a worldwide OSN and now it is the most popular OSN platform (Berger et al. 2014; Statista 2018a). Faceboook is used for different purposes such as communicating with friends and family as well as with customers for marketing purposes (KUMAR et al. 2017). YouTube is the second most popular worldwide OSN platform (Gill et al. 2007; Statista 2018b) that was launched in 2005. YouTube is a video-sharing site that provides free video streaming (Keelan et al. 2007). From 2005 onwards, Facebook was accessible for students from other schools and it was enabled to have a broader membership. In addition, WeChat has profoundly penetrated into the daily life of Chinese people as a OSN application (Lien, Cao & Zhou 2017). This application is an instant messaging communication service that provides text, video and voice services to its users. Lien, Cao & Zhou (2017) state that Tencent has developed this application in 2011. WeChat not only is increasingly used in Chinese social communication, but also in the Chinese market and financial transaction (Business-Insider 2016 ; Lien, Cao & Zhou 2017). In the early years of their operations, Facebook and other successful OSNs services such as Hyves (The Netherlands), MySpace, YouTube, Orkut (Brazil), StudiVZ (Germany), and Renren (Asia) fascinated millions of people and began to gain increasing interest among investors (Ellison & Boyd 2013).

2.3. OSNs applications and potentials

This section briefly reviews some examples of OSNs applications and their benefits.

2.3.1. Health

Ellison & Boyd (2013) state that OSNs use has become a significant part of many people's lives, so that many users spend hours per week or even per day for using OSNs (Junglas et al. 2013). Thus, such widespread use of online social tools naturally affects users' psychological well-being (Reinecke & Trepte 2014). For example, the effect of social network site use on the psychological well-being of cancer patients was explored by Erfani, Abedin & Blount (2017). The latter researchers focused on a Facebook group which had been allocated to Ovarian Cancer Australia to assess how Facebook use impacts on the psychological well-being of the members of this group as cancer patients. This research showed that use of Ovarian Cancer Australia Facebook i) raises social support, ii) increases the experience of social connectedness, iii) develops social presence and learning, and iv) finally improves the psychological well-being of cancer patients (Erfani, Abedin & Blount 2017).

Another example mentions Bender, Jimenez-Marroquin & Jadad (2011) research which aimed to characterise the purpose, use, and creators of Facebook groups related to breast cancer. The latter study searched Facebook for breast cancer groups and could find 620 groups containing a total of 1,090,397 members. Some groups were created by individuals whose one of his family members had breast cancer and some of them were created by a group of people. Bender, Jimenez-Marroquin & Jadad (2011) realised that all groups were created to provide some useful services such as fundraising, awareness, product or service promotion related to fundraising and patient/caregiver support to people who have breast cancer. Therefore, Bender, Jimenez-Marroquin & Jadad (2011) indicate that Facebook may play an prominent role in facilitating public engagement in health promotion and fundraising activities.

2.3.2. Customer Relationship Management

The impact of diffusion of adaption of using Facebook in customer relationship management in Australia and overseas has been widely studied and agreed. Essential purposes of customer relationship management are to enhance customers loyalty and to build a long term relationship with customers (Chua & Banerjee 2013). Accordingly,

social network sites have provided communication channels and structure for small-medium enterprises (Jafarazdeh et al. 2013). These channels are attractive for organisations due to their flexibility, cheap services and promotion customer relationship management tools (Jafarazdeh et al. 2013). Additionally, Abedin (2016) found that some factors such i) increasing popularity of social networking sites among customers as a market pressure, ii) establishing a direct and closer customer relationship, iii) brand promotion, and iv) experimental purposes, are the key motivations for organisations to use Facebook as the most popular social network site in their customer relationship management services. Furthermore, Abedin (2016) discussed that some encouraging factors for using Facebook in the provision of customer services come from Facebook's features such as i) availability of rich tools, ii) ease of use, iii) ease of receiving customers' feedback, and iv) the opportunity to reach a large number of potential and existing customers. Notwithstanding the benefits that using Facebook has had for organisations, there are some key challenges such as reliability of Facebook policies, scalability of Facebook page, recruiting experts and finding qualified human resources and dealing with negative comments.

2.3.3. Disaster Management

Some researchers express that social media has a prominent role in quick broadcast of information when a natural disaster occurs. Information exchange for crisis management during a natural disaster is vital, and OSNs platforms have been increasingly used by government organizations to interact with citizens in order to increase the government's capacity in disaster management processes (Houston et al. 2015; Poblet, García-Cuesta & Casanovas 2017). Twitter as a social networking site, for example, simply has been use for crisis management during disastrous circumstances all over the world (Lee, Agrawal & Rao 2015) such as Earthquake of Morgan Hill CA (Crooks et al. 2013) and Kenya's Westgate mall terror attack (Simon et al. 2014).

Abedin & Babar (2017) examined the role of using Twitter as a microblogging platform by large institutional-like emergency response organisations and smaller non-institutional players like digital volunteers during a fire hazard, which occurred in the Australian state of Victoria in early February 2014. The above authors emphasized that both emergency response organisations and digital volunteers proactively used Twitter to propagate any information related to the fire hazard. Therefore, presence in Twitter helped emergency response organisations to maintain their communications with their followers during the

fire hazard by posting a high level of tweets (Abedin & Babar 2017). In these interactions, the digital volunteers or the emergency response organisations' followers have often posted a larger number of shares and re-tweets than the emergency response organisations. Abedin & Babar (2017) concluded that not only very good interactions had occurred between emergency response organisations and digital volunteers through using Twitter, but also the contents of tweets were more informative than directive.

2.3.4. Other potentials

People use deception to accomplish some of their goals such as appearing attractive, capable or competent. Self-enhancing deceptions are prevalent and typically are a part of a scramble to manipulate how we introduce ourselves to the world (Guillory & Hancock 2012). Guillory & Hancock (2012) explored how LinkedIn forms patterns of deception in its users' resumes. The latter study concluded that the rate of deception that occurred in LinkedIn is less frequently in public profiles than in private profiles or traditional resumes. In comparison with traditional resumes, LinkedIn resumes are less deceptive about the types of information that refer to former work experiences and responsibilities. Guillory & Hancock (2012) assert that the public availability of information of users' work experiences has a positive effect on honesty and social ties.

2.4. Negative effects of using OSNs on individuals

On the one hand, OSNs use and adoption is increasingly rising, and on the other hand the use of OSNs result in socio-psychologically negative effects on different aspect of users' lives (Mäntymäki & Islam 2016). While research on the negative effects of OSNs is needed and very essential (Mäntymäki & Islam 2016), very few studies have so far been conducted in this area (Berger et al. 2014; Cao et al. 2015; D'Arcy et al. 2014; Fox & Moreland 2015; Garcia & Sikström 2014; Silic & Back 2016b; Turel & Qahri-Saremi 2016). Fox & Moreland (2015) emphasize that researchers have paid considerably less attention to the negative effects of networking sites and just very few studies have explored such impacts of OSNs on specific groups of users. Most of the past investigations have had a limited focus on one or a few particular negative experiences of OSNs users. Furthermore, Mäntymäki & Islam (2016) state that the awareness of negative and positive consequences of using information technology and information systems is increasing. Recent research shows that increasingly people and users are becoming aware of negative consequences of using OSNs, particularly privacy and

psychological consequences, and thus more work is needed to better understand such adverse outcomes (Mäntymäki & Islam 2016).

Exploring risks and negative aspects of OSNs use is essential, as 3.9 billion of the world's population are OSNs' users (Statista 2017) and their life, well-being and performance may be threatened by controversies, risks and adverse consequences resulted from using OSNs (Mäntymäki & Islam 2016). The following paragraphs provide some example of the negative consequences of OSNs use.

Turel & Qahri-Saremi (2016) emphasize that using online social network sites causes problematic behavior, and the likelihood of occurrence of these problems is increased with increasing number of users. A problematic behavior refers to inappropriate, prohibited, or dangerous behaviors, which are in conflict with general discipline, rules and regulations and even with individuals' goals. For example, according to Basacik, Reed & Robbins (2011), 14 percent of drivers who are OSNs' user confessed that they use OSNs applications while driving. This situation decreases the rate of drivers' caution and also slows down drivers' response time up to 38 percent. Therefore, using OSNs while driving is a more serious source of distraction for drivers that having alcohol in the blood within legal limits (10 to 30 percent) and marijuana use (21 percent) (Basacik, Reed & Robbins 2011).

Another negative effect of OSNs use refers to decreasing student performance (Paul, Baker & Cochran 2012; Turel & Qahri-Saremi 2016). This is a very critical situation that using OSNs is dramatically increasing among young adults; for example, between 85 to 99 percent of college students are social media users (Junco 2012). McCoy (2016) found out that despite all informative training about destructive impacts of using digital devices, American college students spend around one-fifth of their time in class using social media on non-class purposes. Paul, Baker & Cochran (2012) argue that there is a negative relationship between students' academic performance and the time that they spent using OSNs. Consequently, students who have paid higher attention on their academic activities and gotten higher result, have spent the lower time on OSNs use (Paul, Baker & Cochran 2012). Another example of the adverse consequence of using OSNs can refer to harassment of ex-Partners via Facebook. Managing and maintaining romantic relationships can be tricky in the online social networking sites (Lyndon, Bonds-Raacke & Cratty 2011). Since, there are abundant stories and warnings about inappropriate

behavior in Facebook like Facebook stalking of ex-Partners, Lyndon, Bonds-Raacke & Cratty (2011) examined whether individuals fanatically observe or harass their ex-romantic partners on Facebook. The latter researchers understood that the Facebook users who obsessively monitor their ex-partners do public harassment, covert provocation and venting during their obsessive observations and some of these users use Facebook just to monitor or harass their ex-partners (Lyndon, Bonds-Raacke & Cratty 2011).

2.5. Dark side of OSNs

Given that OSNs can negatively influence all aspects of human life such as, mental/physical heath, financial situation, time, energy (Yan et al. 2016), privacy (Fox & Moreland 2015) and security (Jiang, Heng & Choi 2013), increasingly major information systems conferences, journals, and other outlets are calling for more research into the dark side of using OSNs in particular and social media in general (ECIS 2018; Emerald 2017). According to a few studies that specifically concentrated on the dark side of using information technology or information systems, controversies, risks and adverse consequences surrounding OSNs have been considered as the dark side of these services (D'Arcy et al. 2014; Fox & Moreland 2015; Silic & Back 2016b; Turel & Qahri-Saremi 2016). However, there is currently no holistic and consistent definition for the notion of the dark side of using OSNs. The following paragraphs provide brief explanations about those studies focused on the dark side of information technology or information system use:

Problematic effects and the dark side of the technology use have been investigated in the information system literature in general, but less particular attention has been paid to the online social networks. For example, D'Arcy et al. (2014) state that they purposed to achieve advanced knowledge in any area relevant to the 'dark side' of information technology in general and the scope of information system in particular. The latter authors identified and introduced five categories includes stress, work overload, interruptions, addiction, and misuse as potentially negative consequences of information technology use. D'Arcy et al. (2014) believe that the above categories of the dark side of information technologies are the most important problems that should be considered through future research on information technology and information systems. This is because, these negative effects may be related to each other; for instance, it is possible that work

overload is associated with 'addiction' development and 'misuse' of information (D'Arcy et al. 2014).

Fox & Moreland (2015) assert that social media researchers typically concentrate on the positive consequences of social media use and the dark side of using social network sites has received less attention. Thus, Fox & Moreland (2015) focused their study on the dark side of using Facebook as the most famous social network site. The latter authors identified a number of the negative effects of Facebook use such as inappropriate or annoying content, lack of privacy and control, social comparison and jealousy, relationship tension and conflict with others. Fox & Moreland (2015)'s results indicate that although, using Facebook has benefits for its users, the users feel pressured to check Facebook frequently because of the fear to losing their relationship or new demands. Moreover some negative effects come from Facebook features such as Facebook's visibility and persistence for connectivity (Fox & Moreland 2015). These features not only cause privacy violation, but also social comparison to other network members, jealousy, and anxiety (Fox & Moreland 2015).

Silic & Back (2016b) explain that despite much research on positive effects of online social networks on firms and organizations, the negative effects on information security were not adequately addressed. This gap encouraged Silic & Back (2016b) to study the dark side of online social networks and focus on phishing risk as one of the most common risks that is caused by online social network use. Their research's result uncovered that employees are easily deceived, because online social networks have become important security holes networks by using social engineering techniques and malicious attacks (Silic & Back 2016b).

Turel & Qahri-Saremi (2016) assert that notwithstanding the benefits that using social networking sites has had for the users, there are negative consequences of social networking site use that has led to various types of problematic behaviors. Turel & Qahri-Saremi (2016)'s research contributed to the study on the dark side of information systems and explain the drivers of the dark side and its consequences. Problematic use of Facebook, for instance, has a negative direct effect on students' academic performance (Turel & Qahri-Saremi 2016).

At the society level, recently Chan, Ghose & Seamans (2015) has also found that using online services increases racial hate crimes. The latter study empirically investigated the impact of using online services on racial hate crimes through studying on American internet users from the period 2001–2008. Chan, Ghose & Seamans (2015) argue that according to the collected evidences, availability of the internet or online services increase racial hate crimes, especially areas where have higher rate of racist populations.

Given the above descriptions about the studies on the dark side of using information technology or information systems, although all of them believe that the term 'dark side' refers to the users' negative experiences, none of them provides the similar and consistent definition for the dark side. Fox & Moreland (2015) argue that narratives surrounding individuals' negative psychological and relational experiences tied to the social networking site and its affordances can be referred to as the dark side of the social networking sites. Furthermore, in other studies, the dark side of OSNs has been referred to as drawbacks such as, plagiarism, misrepresentation, time pressure, addiction, and negative psychological consequences (Garcia & Sikström 2014). Turel & Qahri-Saremi (2016) state that the dark side of using online social networks refers to problematic and negative consequences of using online social networks such as negative behavior and emotions. A more recent definition for the dark side of social media refers to loss of ownership and privacy, lack of protection of public safety, threatening and enabling new forms of cyber bullying as a result of using these websites (Emerald 2017).

2.6. Gaps in the literature

Given the reviewed literature on OSNs and the importance of studying the negative effects of OSNs use, below are the gaps in the current literature that this Master thesis aims to address:

- The first gap is a lack of study on negative effects of OSNs use in the literature. As some recent systematic literature reviews argue, not only there is not sufficient study about the negative effects of OSNs use, but also this area has been largely ignored by researchers (Berger et al. 2014; Cao et al. 2015). Mäntymäki & Islam (2016) state that while using OSNs has brought many socio-psychological problems in human lives, more studies are still needed to further understand different problems and negative effects.

- In addition to the above gap, there is still little understanding of various types, or groups of the negative effects of OSNs use (D'Arcy et al. 2014; Fox & Moreland 2015; Garcia & Sikström 2014). While past studies have discussed and reported several adverse consequences of using OSNs, no prior research has categorized them into groups based on similarities of the negative consequences (e.g. D'Arcy et al. (2014) and Fox & Moreland (2015). According to the abovementioned studies, a comprehensive picture of the dark side of using OSNs needs to be defined by identifying different types of the negative effects of using OSNs and then they should be classified into different groups (Skowronek & McKinney 2010). Hence, this thesis aims to address this gap as one of its objectives by categorising the identified negative effects into distinctive groups representing the characteristics of the dark side of OSNs use.

- Another gap in the current literature is a lack of a comprehensive and consistent definition for the term 'dark side' of OSNs use. While few studies (e.g. (D'Arcy et al. 2014; Fox & Moreland 2015; Garcia & Sikström 2014; Silic & Back 2016b; Turel & Qahri-Saremi 2016)) directly focused on the dark side of information technology or information systems on OSNs use, they just provided a general definition for the dark side which refers to negative effects, risks, adverse consequences, and negative users' experiences of using OSNs. It means there are already some definitions in the literature, but none of them provide a detailed explanation of what constitutes the 'dark side'; while this terminology is quiet a new term that has been imported in recent studies of information systems scopes, it needs to be made clear what exactly the negative effects or users' experiences are referring to. Therefore, this research is going to propose a framework that specifies the underlying negative effects of OSNs as the dark side of OSNs use. According to Skowronek & McKinney (2010), a concept can be defined by its characteristics and characteristics are formed by categorizing the attribute values of that concept. Accordingly, this thesis provides its proposed framework by categorizing different types of the negative effects of OSNs use.

Chapter 3: Research Design

This study has used a mixed-method approach to answer its questions. This chapter provides a detailed explanation of the logic behind the selection of each method. Next, in Chapter 4 and 5, steps for execution of each method as well as their results are outlined.

The two methods are a systematic literature review and an expert interview. A framework for dark sides of using OSNs has been developed through using these methods. In addition, the concept of reflective versus formative models was used to demonstrate how the elements of the proposed frameworks are inter-related. Thus, the first section of this chapter presents what the systematic literature review is and what procedure has been used for applying this method. The second section offers an overview of the formative versus reflective model. Next, the final section provides the importance and relevance of conducting expert interviews as well as the interview process and protocol. Figure 2 shows the entire process of this research in a frame.

Research Design

1. Initiating the research

- Define the keywords
- Develop the background
- Identify problems
- Design the research questions

2. Systematic Literature Review

Step 1: Define Reference-Selection Criteria
- Keywords combinations: (negative impact OR negative effect OR dark side OR risk OR challenge OR adverse consequences OR harm) AND (online social community OR online social network OR social networking sites).
- Time Frame: From 2004 to current
- Select 16 High Ranking Journals: MISQ, ISR, JMIS, JAIS, EJIS, JIT, CAIS, CACM, I&M, ACMTOCHI, I&O, DSS, ISJ, JSIS, ASIS&T and CHB.

Step 2: Search
- Search the above keyword combinations in title, keywords and abstract of papers published in aforementioned journals.
- Identify the 184 studies through using above criteria

Step 3: Select
- Select primary papers through screening of papers' abstracts
- Select secondary papers through the review of the full text
- select the 29 papers by using both above selection process

Step 4: Analyse / Coding Process
- Opening coding: Identify codes
- Pattern coding: Identify sub categories
- Axial coding: Identify themes
- Selective coding: Identify phenomenon

3. Draft the Framework

- Use reflective versus formative model to develop a draft of the framework from the initial findings of systematic literature review

4. Validate the Systematic Literature Review's findings

- Perform an expert interview process
- Use content validity technique to validate the findings

5. Finalize the Framework

- Propose the final version of the framework after its verification by the content validity

Figure 2: Research design

3.1. Systematic Literature Review

A literature review is a necessary stage of any academic research (Levy & Ellis 2006). A comprehensive and an accurate analysis on a research field requires a structured and systematic literature review (Bandara, Miskon & Fielt 2011). A systematic review requires a holistic and repetitive literature review strategy that helps to select relevant publications through selecting relevant sources, relevant keywords, and a relevant period of time (Vom Brocke et al. 2009). Moreover, a systematic review aims to address a problem/s by identifying, critically evaluating and integrating the findings of all relevant, high-quality individual studies addressing one or more research questions. Bandara, Miskon & Fielt (2011) argue that an effective systematic literature review helps to know: i) how to search relevant papers to review within achievable and defensible scope, ii) how to select relevant articles among the searched articles, iii) how to analyse the findings from a literature review, and iv) how to write and present the findings. In addition, a systematic literature review study is "a scholarly research that in its entirety summarizes and synthesizes knowledge from a prior body of research" (Okoli 2015) (p.879). Thus, in this thesis a systematic literature review was chosen to synthesize the current knowledge about negative effects of OSNs in a systematic manner, so that relevant papers from trusted sources can be collected and analyzed for proposing a rigorous framework. In particular, this study conducts a systematic literature review to:

- Review and extract negative effects of OSNs use in the previous studies.
- Categorize the extracted negative effects on the basis of their similarities reported in the past literature,
- Propose an initial framework for the dark side of OSNs use.

According to Bandara, Miskon & Fielt (2011) two main criteria have to be identified and elucidated for a holistic review in the field of information systems: i) sources: which refer to useful outlets for a literature review (Webster & Watson 2002a), and ii) research strategy, which refers to what terms and periods can be utilized during the paper exploitation process (Levy & Ellis 2006). This study applied PRISMA statement or guidelines as recommended by Moher et al. (2009), Bandara, Miskon & Fielt (2011), and Wolfswinkel, Furtmueller & Wilderom (2013) for meeting the above criteria and conducting a systematic literature review in information systems.

PRISMA guidelines contribute to a theoretical process and have an adequate flexibility for a literature review (Erfani 2015; Moher et al. 2009; Wolfswinkel, Furtmueller &

Wilderom 2013).This perspective enables researchers to conduct an accurate theory-based or conceptual analysis review (Strauss & Corbin 1998). Furthermore, it enables researchers to apply thematic content analysis to identify key themes in every single field of study.

Accordingly, five stages namely 'define', 'search', 'select', 'analyse', and 'present' have been undertaken in this thesis for conducting a systematic literature review (Bandara, Miskon & Fielt 2011; Moher et al. 2009; Wolfswinkel, Furtmueller & Wilderom 2013). The definitions of each stage as well as the obtained results have been discussed in Chapter 4.

3.2. Reflective Versus Formative

In this study, the output of the systematic literature review is a framework, comprising the extracted negative effects of OSNs use and the subsequent categories and grouping. To visualize the relationship between these negative effects and their relevant categories, this research used the concept of reflective versus formative constructs model. While normally formative and reflective models are used in quantitative studies, these notions can still be used in qualitative researches to visualize how different elements of a model may be related to each other (Petter, Straub & Rai 2007). Furthermore, identifying formative versus reflective relationships is in line with the third objective of this thesis, which is to help future research apply and quantitatively examine negative effects of OSNs use in different contexts.

Following Petter, Straub & Rai (2007)'s guidelines, a formative or reflective framework has two types of elements indicators and constructs. In this study, indicators refer to the negative outcomes of the OSNs use and constructs are subcategories and themes of using OSNs, which are the characteristics of the dark side of using OSNs. According to these scholars, detecting whether the relationship is formative or reflective is an important step in developing a framework to represent distinctiveness and the types of relationships of the constructs and indicators. According to Jarvis, MacKenzie & Podsakoff (2003), four essential rules need to be followed to identify formative or reflective constructs and indicators:

- Researchers must pay particular attention to the theoretical relation and direction between a construct and its directions. If researchers want to have correct diagnoses, they should ask the following questions of themselves.

o Do the indicators define the construct or are they exposed through the constructs? The indicators that define the constructs are formative, while the indicators that are manifested via the constructs are reflective. In other words, constructs create the indicators in a reflective construct. However, the indicators cause constructs in a formative model (Edwards & Bagozzi 2000).

o What occurs to the constructs with any changes? Internal consistency is very important for each construct of reflective constructs. Any individual indicator can be changed or removed from a relationship in a reflective model without any impact on the concept or the content validity of its construct. However, this is completely reverse about formative construct. This is because the content validity of a construct will be destroyed by changing or removing any indicator, because a construct is a composite of all the indicators (MacKenzie, Podsakoff & Jarvis 2005).

- The second rule to determine whether a construct is formative or reflective is to examine the interchangeability of the indicators. The indicators with a common theme and ability to change are normally reflective. Reflective indicators have a common category or theme. However, formative indicators not only often indicate different themes, but also they may not be interchangeable.

- The third rule states that all indicators for a reflective construct are measuring the same phenomenon. Therefore, if the value of one of the indicators changes, the values of the rest of the indicators should modify in the same direction. However, formative indicators do not need similar actions like the reflective ones, because formative indicators do not have strong correlations with themselves.

- The last rule is for identifying the formative constructs. The indicators of a formative construct do not require having similar antecedents and consequences. Thus, each indicator can have completely distinct antecedent from others.

To put all descriptions above in a nutshell, Table 1 provides a brief and useful description for these four rules.

Rule	Rules Criteria	Reflective Model	Formative Model
Direction of relationship between the indicators and the constructs	How is the direction between the indicators and the construct?	Direction is from the construct to the indicators	Direction is from the indicators to the construct
	Do the indicators define the constructs or manifestations of the contract?	The indicators manifestations of the construct	The indicators define the characteristics of the construct
	Does any change in the indicators create changes in the constructs?	No, changes in the indicators should not create any change in the construct	Yes, changes in the indicators should create changes in the construct
	Does any change in the constructs create changes in the indicators?	Yes, changes in the construct create changes in the indicators	No, changes in the construct do not create changes in the indicators
Interchangeability of the indicators	Do the indicators have the similar content?	Yes, the indicators should have the similar content	No, the indicators do not need to have the similar content
	Do the indicators have the same theme?	Yes, the indicators should have the same theme	No, the indicators do not need to have the same theme
	Is it possible to remove an indicator without any altering in the conceptual dimension of the construct?	Yes. Removing an indicator should not impact the conceptual dimension of the construct	No. Removing an indicator may impact the conceptual dimension of the construct
relation among the indicators	Does a change in an indicator affect the change of the other indicators?	Yes. It is possible	Not necessarily
Antecedent of the indicators	Do the indicators have the same or similar antecedents and consequences?	Yes, the indicators are required to have the same antecedents an consequences	NO, the indicators are not required to have the same antecedents and consequences

Table 1: Decision rules to identify the reflective constructs from the formative (this table was adopted from (Petter, Straub & Rai 2007))

Figure 3 visualizes the simplest and the most basic definition of a reflective and formative model.

Reflective Model	Formative Model
$\eta 1$ = a construct Yi = the ith indicator	$\eta 1$ = a construct Xi = the ith indicator
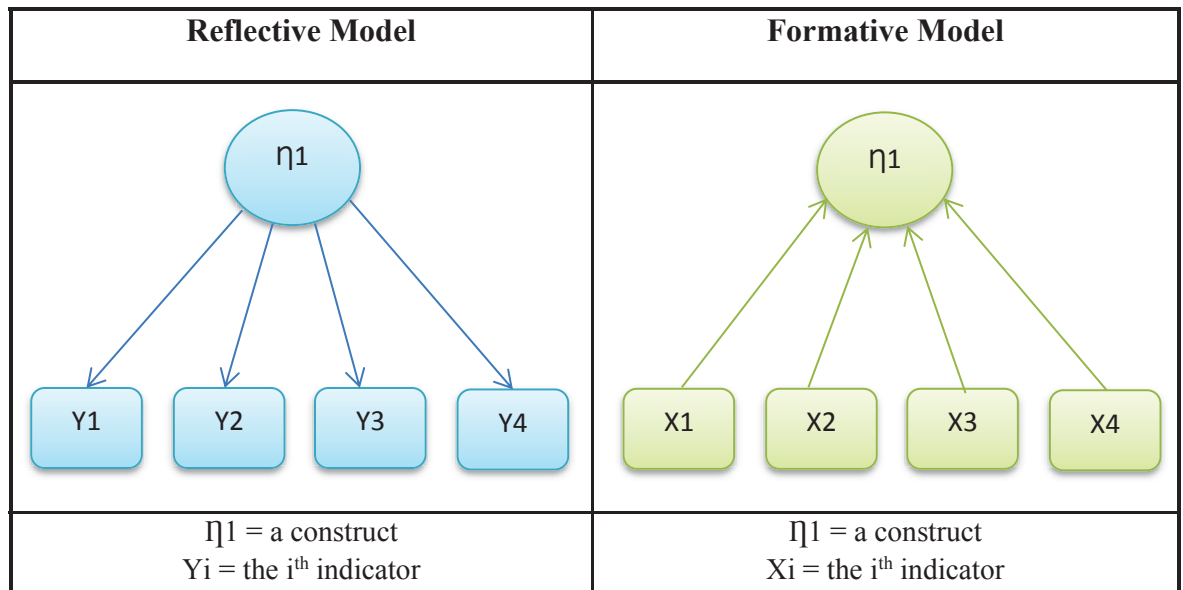
Figure 3: Reflective and formative model (adapted from (Petter, Straub & Rai 2007))

3.3. Expert Interview

While systematic literature review can help in developing an initial framework and reflective/formative model can assist with visualizing the relationship between negative effects and corresponding categories, expert interviews will be needed to assess the validity of these findings.

3.3.1. Why interview

Holden & Lynch (2004) state that the nature of science has two dimensions namely 'objective' and 'subjective'. They are two different approaches and have different characteristics within the social sciences. Therefore, researchers must be aware that their studies are objective or subjective. This awareness helps them to identify which method/s is/are more appropriate for their investigations. In some studies, researchers maintain their distance from the phenomenon and its key actors (Davison & Martinsons 2011). These researches focus on statistics data, so these studies are objective. However, some other researchers require to be very close to their target group such as, individuals, groups or organization/s, these are subjective studies (Davison & Martinsons 2011). According to Holden & Lynch (2004), quantitative method is used for the objective research and qualitative method is used for the subjective ones. The following table summarizes some important characteristics of objective and subjective research which completely separate them from each other.

	Subjectivism to Social Science	Objectivism to Social Science
Reality	Reality is very dependent on human imagination	Reality is an unchangeable structure
Knowledge	Knowledge is used to obtain phenomenological insight, and to reveal different dimensions or characteristics of a phenomenon	Knowledge is used to construct a positivist science
Assumptions about Human Nature	It knows human as a pure spirit and consciousness	It knows human as a responder

Table 2: Basic characteristics of a subjectivist and objectivist studies (Holden & Lynch 2004; Morgan & Smircich 1980)

Qualitative research can be complicated if researchers do not have adequate information on how to implement it (Turner III 2010). A qualitative research is performed in the form of an interview whenever researchers need depth information of participants' experiences, knowledge and point of view in a particular topic (Turner III 2010). According to Turner III (2010) and DiCicco-Bloom & Crabtree (2006), there are three types of interview research: i) unstructured interviews, ii) general interview guide approach/individual in-depth interviews, and iii) standardised open-end interview/semi-structured interviews. Turner III (2010) and DiCicco-Bloom & Crabtree (2006) describe these types of interview as follows:

Unstructured interview: It is an informal conversational interview that no questions are already designed for it, and questions are spontaneously formed in interview sessions. This type of interview is used when researchers are curious about other cultures or religions and need to learn about the area of their interest. Unstructured interview is not limited by any time interval and it might take as long as several hours.

Individual in-depth interviews: This type of interview is more structured than the first type. Questions are potentially formed before each interview session and the type of questions depend on the researcher who is performing the interview process. Therefore, the important issue in this type of interview is the lack of consistency of designed questions. Even interviewees might provide different answers to similar questions based

on how the questions are posed by the interviewers. In addition, individual in-depth interview allows researchers to deeply investigate social and personal information of their interviewees.

Semi-structured interviews: It is an open-end interview that is extremely structured by the interview protocol and uses questions that have been designed before conducting the interview process. A semi-structured interview provides a clear set of instructions for interviewers and can provide reliable, comparable qualitative data (Libakova et al. 2015). A Semi-structured interview usually includes a list of questions and topics that need to be covered during the conversation, usually in a particular order (Cohen & Crabtree 2006). During semi-structured interviews, interviewers follow a guidelines, but they are able to follow topical trajectories in the conversation which go beyond the guidelines when they feel this is appropriate (Cohen & Crabtree 2006; Libakova et al. 2015).

Given the above explanations, this study is a subjective research since the validity of the systematic literature review's outcomes as the characteristics and framework of the dark sides of OSNs use should be verified through direct interviews with some experts who have significant knowledge and studies in information systems scope, the internet discipline, computing science and psychology. To achieve the objective above, the experts are supposed to verify the negative effects of OSNs use as the output of the systematic literature review and provide their point of views about every single one of them and the categories which are uncovered by grouping those negative effects. Thus, an expert interview process in the form of a semi-structured interview is performed in this study.

3.3.2. Expert interview

Although a semi-structured interview includes of a few pre-designed questions about the subject, there is no clear expectations of how interviewees are going to answer them (Cohen & Crabtree 2006; Libakova et al. 2015). Therefore, according to the latter authors, it needs to be determined which type of semi-structured interview should be used. According to Libakova et al. (2015), expert interview is a type of semi-structured interview that can be carried out between interviewer and interviewees who are specialists in the subject of the questions. In this type of interview, interviewees should have studies, experiences, deep scientific or experimental knowledge in the field of the research objectives. Specialists in the subject are interviewed to perform a professional and serious

assessment of findings, then interviewers gain valid and reliable information about their research objective/s (Dorussen, Lenz & Blavoukos 2005; Libakova et al. 2015).

For example, Ebel, Bretschneider & Leimeister (2016) used empirical and theoretical knowledge to provide a framework for developing tool support for the design and management of a new business model. A series of expert interviews was conducted in order to complement the developed framework (Ebel, Bretschneider & Leimeister 2016). Ebel, Bretschneider & Leimeister (2016) designed a semi-structured interview which had been adapted from DiCicco-Bloom & Crabtree (2006). According to the DiCicco-Bloom & Crabtree (2006) technique, the conducted expert interview had the following characteristics: i) the number of sample size was not declared, so the interview process was stopped based on the concept of theoretical saturation, ii) the interviewees were allowed to express their point of view with their own words to deliver understandable information, iii) the interview process and complementing the literature review were simultaneously done in order to design the framework with additional empirical data and the use of knowledge of the interviewees in the completion of framework designing, iv) the interviewees were selected based on at least 10 years' experience within different and diverse projects of business model development, v) the interviewees' nationalities were German, Swiss, Serbian and American, vi) all interviews were conducted in the German language, because all participants were fluent in this language, vii) the interviews were conducted via telephone, because the interviewees were distributed across different locations, and viii) all interviews were recorded and transcribed using qualitative content analysis.

Another example refers to Adomavicius et al. (2008) which defined a set of constructs and methodologies for firms making information technology to lead these firms in ways to predict, understand and estimate the value of an investment in future technological developments without wasting their organization resources. They evaluated the utility of their approach through a semi-structured expert interview process with information technology experts. The characteristics of their expert interview are as follows: i) the interview sessions included an opening to explain the key purpose of the interview, questions, and a closing to provide a debriefing, ii) the opening took on average, 25 minutes, ii) each interview session took on average, one hour, iii) the interviewees were selected from information technology experts with over 10 years' experience who were

senior executives, consultants, research staff and analysts and senior academic researchers, iv) eight people of each group were invited but three in each group accepted the invitation to participate in the interview process, so they interviewed a total of 12 experts.

Given the above examples, it is very important for researchers to know which experts should be interviewed to increase their value and the credibility of a research (DiCicco-Bloom & Crabtree 2006). Accordingly, this study used a semi-structured interview with open-ended questions to obtain experts' opinions to ensure whether the proposed framework of the dark side of OSNs use would make sense, whether the allocation of each negative effect to its corresponding category needs any change, and if any major negative effect is missing in the framework. Therefore, experts from different background and professional experiences were invited to participate. To select such experts, this research nominates academic researchers who have relevant expertise about information systems and OSNs in general and their adverse consequences in particular. Special attention was paid to select experts from information systems, computer science, psychology, social science, and business disciplines who have an established record of accomplishment of publications relevant to OSNs use and applications. Full explanations about the process of the 'expert interview' used in this study have been provided in Chapter 5.

3.3.3. Analysis of Expert Interviews: Content Validity

According to (Bhattacherjee 2012), a qualitative analysis is dependent to the analysers' skill and knowledge about the field of study and the collected data about that area. To analyse any type of data, researchers need to apply a specific method, theory, model or technique. This choice completely depends on the objective of data analysis. Validation of a method for doing a project is a crucial factor in the method selection (Lynn 1986).

Since the main objective of this stage is to validate the systematic literature review's findings (i.e. negative effects of using OSNs, subcategories and themes of the dark side of OSN use) as the characteristics of the dark side of using OSNs, a content validity technique was chosen to analyse the collected data from expert interviews. Lynn (1986) has developed a detailed guideline for using content validity technique for analyzing experts' opinions. According to Lynn (1986), content validity is a technique with two executive stages to determine relevance of the content of a representative of a group and

the elements or the items belonging to that group. The two executive stages are *development process* and *judgment process.* For example, in this study, the themes and sub-categories of the dark side of using OSNs are representative of each group and the 43 negative effects of OSNs use are the elements which belong to these groups.

(i) The development stage is equivalent to the systematic literature review performed in this study. This stage consists of three steps: *Step 1 is domain identification*. In this step, the subject or full content dimension of a project must be identified. The dark side of OSNs use is the full content dimension for this study, where the dark side refers to a collection of negative effects of OSNs use. *Step 2 is item generation*. It identifies or generates the items via sampling from the content domain. The outcome of step two in this thesis refers to the negative effects of OSNs use that have been extracted as the result of the systematic literature review process. *Step 3 is instrument formation*. The last step of development stage is to assemble the generated items from the step 2 in a usable and meaningful form of information. In this research, the outputs of the step 3 are different sub-categories and themes of the dark side of OSNs use as the characteristics of the dark side. Therefore, undertaking the systematic literature review meets all steps of the development stage.

(ii) The judgment process as the second stage of the content validity evaluates the output of the development stage. According to Lynn (1986), the judgment process has two steps. Step 1 is assessment of the items or elements, which refers to the assessment of the content of the 43 extracted negative effects of OSNs use. Step 2 is the assessment of the instrument, which refers to the proposed categories for the dark side of OSNs use. Lynn (1986) explains that a number of experts will need to assess the validity and correctness of each instrument and its contents. The number of experts often depends on how many of them are accessible, available, and interested in participation in a study, and not on the basis of the size of domain population. Lynn (1986) argues that a minimum of five experts is needed, while 10 or more is recommended. Table 3 provides a summary of the above guidelines.

Content Validity Stage	# Step	process
Stage 1: Development Stage	1	Identification of dimension(s) and/or sub dimension of effective variable
	2	Generation of items for all dimensions and/or sub dimensions
	3	Assimilation of items into usable form
Stage 2: Judgment-Qualification Stage	1	Judgment/qualification of content validity of items
	2	Judgment/qualification of content validity of instrument

Table 3: Five stages of Content Validity Determination (Lynn 1986)

Content validity technique leads researchers to calculate the proportions of experts agreeing on the content validity of an item and the corresponding categorization or instrument (Lynn 1986). The validity of an item or an instrument will be confirmed, if the number of experts is equal to five and all of them endorse the allocation of the item to its corresponding category. When six experts participate in the content validity process, an item to maintain its current validity and place needs at least five experts' endorsements with the its current situation. Table 4 presents the portion of experts that need to endorse the content validity of an item or the entire instrument, and the standard error of those proportions.

Number of Experts	Number of Experts Endorsing Item or Instrument as Content Valid										
	2	3	4	5	6	7	8	9	10	11	12
2	1.00										
3	0.67	1.00									
4	0.50	0.75	1.00								
5	0.40	0.60	0.80	1.00							
6	0.33	0.50	0.67	0.83	1.00						
7	0.29	0.43	0.57	0.71	0.86	1.00					
8	0.25	0.38	0.50	0.63	0.75	0.88	1.00				
9	0.22	0.33	0.44	0.56	0.67	0.78	0.89	1.00			
10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00		
11	0.18	0.27	0.36	0.45	0.55	0.64	0.73	0.82	0.91	1.00	
12	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.83	0.92	1.00

Table 4: Proportion of expert (above the line) whose endorsement is required to established content validity beyond the 0.05 level of significance (Lynn 1986)

Chapter 4: The Systematic Literature Review: Developing a Framework

This chapter provides findings of the systematic literature review. It also outlines the steps that were undertaken for conducting the review, including reference-selection criteria, search process for finding the relevant studies, study selection, classifying the initial findings into different groups or themes, developing the framework, and presenting demographic information.

4.1. Reference-Selection Criteria

Before starting the review process, it is necessary to be aware about the variety of available sources, identify them and know how to use them (Wolfswinkel, Furtmueller & Wilderom 2013). As mentioned in section 3.1, the 'define' stage which is recommended by PRISMA guidelines is the first process for conducting a systematic literature review. This stage has been particularly designed to identify appropriate criteria for searching relevant studies in any specific research discipline (Bandara, Miskon & Fielt 2011; Moher et al. 2009; Wolfswinkel, Furtmueller & Wilderom 2013). The following paragraphs explain what the 'define' stage is and how led this study to define its criteria for searching relevant references.

Define: In order to increase the efficiency and performance of a systematic review, first of all researchers need to define the criteria for inclusion and/or exclusion of an article in their selected list (Wolfswinkel, Furtmueller & Wilderom 2013). A systematic literature review is a research strategy which refers to what terms, periods and sources can be utilized during the paper exploitation process. The field of this research, for example, is information systems and the dark side of OSNs use is the subfield or scope of this study. Therefore, this study selected its references among major information system databases. Moreover, researchers can only limit their search to a set of specific journals and determine a certain time frame of the publication in the field of their studies (Wolfswinkel, Furtmueller & Wilderom 2013).

Since the focus area for this research is about the dark side of using OSNs platforms, two groups of keywords are used to find the relevant articles. Group 1 consists of 'online social community', 'online social network', 'social networking sites' and group 2 includes 'dark side', 'negative impact', 'negative effect', 'risk', 'adverse concequence',

'challenge', 'disadvantage and harm'. All possible combinations of these two keyterms groups were used to search related papers.

As mentioned above, the time frame is another important parameter in a research strategy. Given the recommendations by Berger et al. (2014) and Cao et al. (2015) about conducting reviews in the field of OSNs, a time frame starting from 2004 to 2018 was chosen for this research. This is because, according to the above scholars, OSNs development and research started around 2003 to 2004.

Regarding the scope and sources for the search, this research has limited its sources to top ranked journals in the Information Systems discipline. This approach has been previously used in OSNs literature by scholars such as Berger et al. (2014) and Cao et al. (2015). The primary reason for choosing this limited scope for the search was the limited time that is available for a Master by Research degree. As also mentioned in the last Chapter of this thesis, the candidate has planned to conduct a wider and more comprehensive review in the future as part of her PhD program.

To identify the high ranked journals, scholars usually refer to journal rankings (Levy & Ellis 2006; Vom Brocke et al. 2009). Thus, this study used Berger et al. (2014) and Cao et al. (2015) as well as Australian Council of Professors and Heads of Information Systems (ACPHIS 2017) guidelines for selecting top ranked information systems journals to choose its references. This resulted in selection of the following 16 journals in Table 5.

Selected Journals	
MISQ	MIS Quarterly
ISR	Information Systems Research
JMIS	Journal of Management Information Systems
EJIS	European Journal of Information Systems
JAIS	Journal of the Association for Information Systems
JIT	Journal of Information Technology
CAIS	Communications of the Association for Information Systems
CACM	Communications of the ACM
I&M	Information and Management
ACMTOCHI	ACM Transactions on Computer-Human Interaction
DSS	Decision Support Systems
I&O	Information and Organization
ISJ	Information Systems Journal
JSIS	Journal of Strategic Information Systems
ASIS&T	Journal of the Association for Information Science and Technology
CHB	Computers in Human Behavior

Table 5: The selected journals

4.2. Approach to Searching and Selecting Relevant Papers

A research strategy plays a prominent role in extracting the relevant studies during the literature review process (Bandara, Miskon & Fielt 2011). Some researchers recommend the search and select stages to find appropriate references for any specific research discipline (Levy & Ellis 2006; Webster & Watson 2002b; Wolfswinkel, Furtmueller & Wilderom 2013).

Search: This stage supports researchers to accurately perform their criteria through *advanced search* forms from journals' websites (Wolfswinkel, Furtmueller & Wilderom 2013). Although different journals have different interfaces for their search engines, all of them have advance search that allow investigators to search a combination of different terms such as, keywords, year of publications and other values (Wolfswinkel, Furtmueller & Wilderom 2013). This study therefore conducted the search on each journal's website after identifying the keyterms, the period of publications, and the sources as the criteria for perfoming a systematic literature review. As following, this study used four criteria to extract relevant and most qualified papers which matched with this research area:

- Papers published from 2004 to 2018.

- Papers published in MISQ, ISR, JMIS, JAIS, EJIS, JIT, CAIS, CACM, I&M, ACMTOCHI, I&O, DSS, ISJ, JSIS, ASIS&T and CHB.

- Using the following keyword combinations : (negative impact OR negative effect OR dark side OR risk OR adverse concequence OR challenge OR disadvantage OR harm) AND (online social community OR online social network OR social networking sites).

'And' and 'OR' as logical operators support this stage to create more keywords by combining the main key terms.

- Searching the above keywords combinations on title, keywords and abstract of each paper.

Table 6 summarizes the research criteria for selecting the relevant studies.

Overview of the Research Criteria	
Time frame	2004 - 2017
Search terms	'online social community', 'online social network', 'social networking sites', 'negative impact', 'negative effect', 'dark side', 'risk', 'adverse consequence', 'challenge', 'disadvantage', 'harm'
Search fields	Title, Keywords, Abstract
Source	MISQ, ISR, JMIS, JAIS, EJIS, JIT, CAIS, CACM, I&M, ACMTOCHI, I&O, DSS, ISJ, JSIS, ASIS&T and CHB

Table 6: Overview of the research criteria

Conducting the search using the above criteria resulted in 184 articles. Table 7 demonstrates the number of papers extracted from each selected journal. The majority of these papers were not necessarily related to the scope of this research. Consequently, based on the filtering of the inclusion and exclusion of criteria and field of this study, the findings were further filtered from the collected publications by performing the 'select' stage.

Number of Publications in Selected Journals from 2004-2016															
Name	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**Total**
MISQ	0	0	0	0	0	1	0	1	0	2	2	1	3	0	10
ISR	0	0	0	0	1	0	1	0	0	3	2	0	4	0	11
JMIS	0	0	0	0	2	1	0	2	0	0	1	3	1	1	11
JAIS	0	1	0	1	0	0	0	0	1	1	0	1	0	0	5
EJIS	0	0	0	1	0	0	1	0	0	0	0	3	1	5	11
JIT	1	0	0	2	0	0	3	0	0	0	0	2	0	0	8
CAIS	0	0	0	0	1	0	0	3	0	3	3	5	3	0	18
CACM	1	0	0	0	0	0	1	1	1	1	1	0	0	0	6
CHB	0	0	0	0	1	1	2	2	9	8	19	20	18	2	82
I&M	0	0	1	0	0	0	0	2	0	0	2	4	6	0	15
ACMTOCHI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
I&O	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DSS	0	0	0	0	0	0	0	0	0	0	1	1	0	1	3
ISJ	0	0	0	0	0	1	0	0	0	0	0	0	1	0	2
JSIS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
JAIS&T	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
Total	2	1	1	4	5	4	8	11	11	18	31	40	39	9	184

Table 7: The number of identified publications in the 16 selected journal

Select: In this stage, researchers are enabled to select appropriate articles which are relevant to their field of studies (Wolfswinkel, Furtmueller & Wilderom 2013). The 'Select' stage is a repeatable process until the end of a study. After performing the 'search' stage, three groups of publications can be found. The first group is clearly identifiable as the corresponding articles have been selected based on relevant titles or abstracts. Bandara, Miskon & Fielt (2011) refer to these studies as 'primary' papers. The second group of papers are not as clear as the first group as the relevant studies. Articles of this group are called 'secondary' papers (Bandara, Miskon & Fielt 2011). This group refers to those articles that do not specifically study the target topic but still consist of some discussion of it. In the second group, researchers should search the key term/s anywhere within the body of the articles. This means researchers should read the full text or some parts of these studies to identify whether they are appropriate references or not. Finally, the last group includes of irrelevant studies and they are not placed on the table

of the relevant studies. The following flowchart demonstrates the 'select' process in this study based on Wolfswinkel, Furtmueller & Wilderom (2013)'s instruction.

How to select the relevant articles to a research area
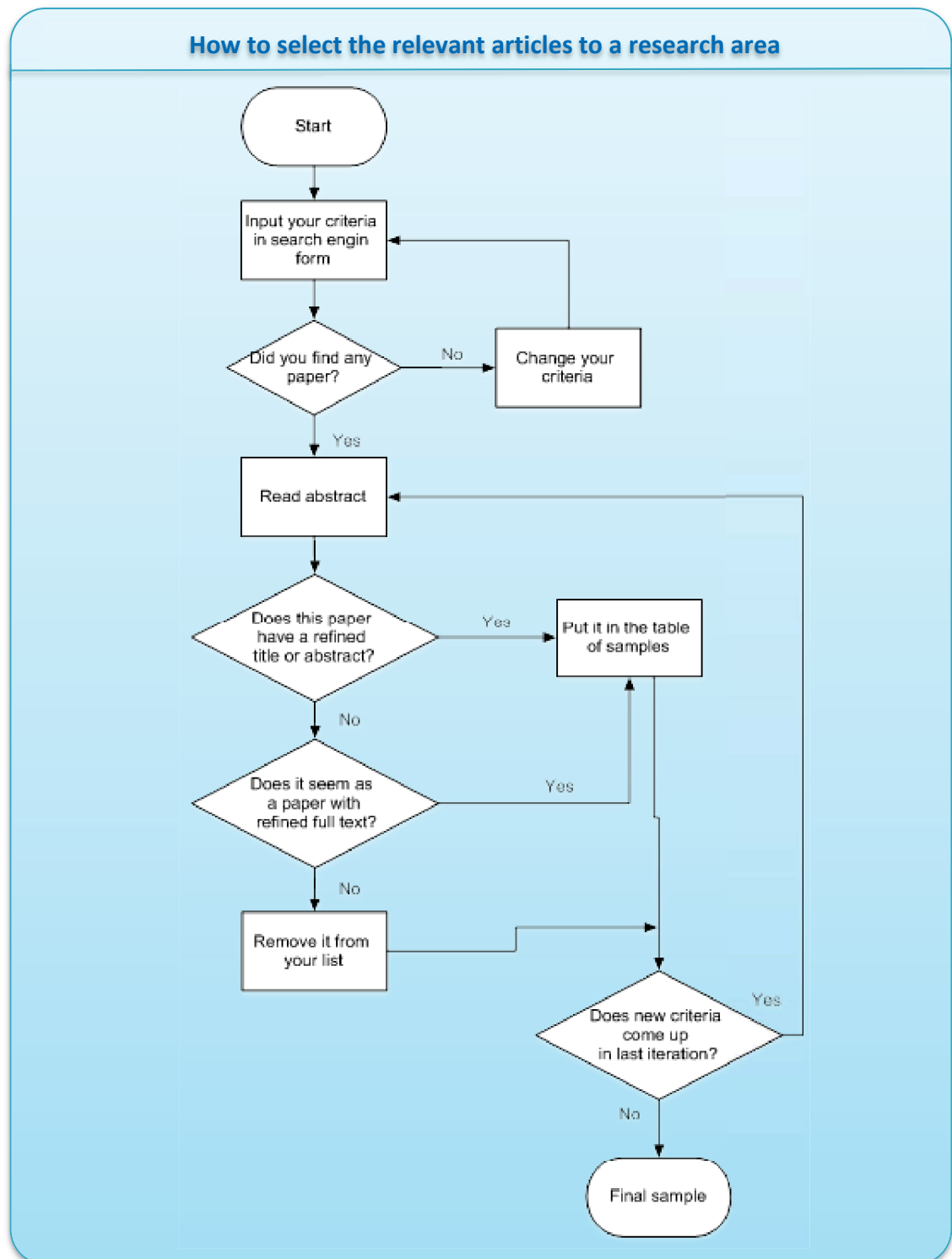
Figure 4: The process of selecting related studies (adopted from (Wolfswinkel, Furtmueller & Wilderom 2013))

In the end, twenty nine primary and secondary relevant studies were selected. Table 8 provides information about the selected papers.

Year	Author(s)	Title	Journal
2015	Sabine Matook; Jeff Cummings; Hillol Bala	Are You Feeling Lonely? The Impact of Relationship Characteristics and Online Social Network Features on Loneliness	JMIS
2015	Benjiang Lu; Xunhua Guo Nianlong Luo; Guoqing Chen	Corporate Blogging and Job Performance: Effects of Work-related and Nonwork-related Participation	
2016	Ofir Turel; Hamed Qahri-Saremi	Problematic Use of Social Networking Sites: Antecedents and Consequence from a Dual-System Theory Perspective	
2017	Tabitha l. James; Paul Benjamin Lowry; Linda Wallace; Merrill warkentin	The Effect of Belongingness on Obsessive-Compulsive Disorder in the Use of Online Social Networks	
2013	Zhenhui Jiang; Cheng Suang Heng; Ben C. F. Choi	Research Note—Privacy Concerns and Privacy-Protective Behavior in Synchronous Online Social Interactions	ISR
2016	Zhijun Yan; Tianmei Wangb; Yi Chen c; Han Zhang	Knowledge sharing in online health communities: A social exchange theory perspective	I&M
2016	Zilong Liu; Qingfei Min Qingguo Zhai; Russell Smyth	Self-disclosure in Chinese micro-blogging: A social exchange theory perspective	
2014	John D'Arcy; Ashish Gupta Monideepa Tarafdar; Ofir Turel	Reflecting on the "Dark Side" of Information Technology Use	CAIS
2004	Jenny Preece	Etiquette online: from nice to necessary	CACM
2014	Michail Tsikerdekis; Sherali Zeadally	Online Deception in Social Media	
2016	Sei-Ching Joanna Sin	Social Media and Problematic Everyday Life Information-Seeking Outcomes: Differences Across Use Frequency, Gender, and Problem-Solving Styles	ASIS&T

2015	ChuangWang; Matthew K.O. Lee; Zhongsheng Hua	A theory of social media dependence: Evidence from microblog users	DSS
2016	Ofir Turel	Untangling the complex role of guilt in rational decisions to discontinue the use of a hedonic Information System	EJIS
2017	Abdullah Algarni; Yue Xu; Taizan Chan	An empirical study on the susceptibility to social engineering in social networking sites: the case of Facebook	
2017	Gregory D. Moody; Dennis F. Galletta; Brian Kimball Dunn	Which phish get caught? An exploratory study of individuals susceptibility to phishing	
2012	Jomon Aliyas Paul; Hope M. Baker; Justin Daniel Cochran	Effect of online social networking on student academic performance	CHB
2013	Elisabeth Staksrud; Kjartan Ólafsson; Sonia Livingstone	Does the use of social networking sites increase children's risk of harm?	
2013	Sun Sun Lim; Yoke Hian Chan; Shobha Vadrevu; Iccha Basnyat	Managing peer relationships online – Investigating the use of Facebook by juvenile delinquents and youths-at-risk	
2014	Christina Sagioglou; Tobias Greitemeyer	Facebook's emotional consequences: Why Facebook causes a decrease in mood and why people still use it	
2014	Rebecca Dredge; John Gleeson; Xochitl de la Piedad Garcia	Presentation on Facebook and risk of cyberbullying victimisation	
2014	Rebecca Dredge; John Gleeson; Xochitl de la Piedad Garcia	Cyberbullying in social networking sites: An adolescent victim's perspective	
2015	Jesse Fox; Jennifer J. Moreland	The dark side of social networking sites: An exploration of the relational and psychological stressors associated with Facebook use and affordances	

2015	Jessica E. Wendorf; Fan Yang	Benefits of a Negative Post: Effects of Computer-Mediated Venting on Relationship Maintenance
2015	Virginia Sánchez; Noelia Muñoz-Fernández; Rosario Ortega-Ruíz	''Cyberdating Q_A'': An instrument to assess the quality of adolescent dating relationships in social networks
2015	Eugene Y. Chan; Najam U. Saqib	Online social networking increases financial risk-taking
2016	Adrian Meier; Leonard Reinecke; Christine E. Meltzer	"Facebocrastination"? Predictors of using Facebook for procrastination and its effects on students' well-being
2016	Mario Silic; Andrea Back	The dark side of social networking sites:Understanding phishing risks
2016	Xiabing Zheng; Matthew K.O. Lee	Excessive use of mobile social networking sites: Negative consequences on individuals
2018	Paul van Schaik; Jurjen Jansen; Joseph Onibokun; Jean Camp; Petko Kusev	Security and privacy in online social networking: Risk perceptions and precautionary behaviour

Table 8: The selected papers as the relevant studies

4.3. Demographic Findings

According to Bandara, Miskon & Fielt (2011), a summary of some sub-topics such as, definitions, objectives, characteristics, historical analysis, reported success factors, reported issues/failure factors, research methods, theories, future-work, contexts of reported studies are important to be reported for most literature reviews in different fields of information systems.

Accordingly, definition/s, objective/s, finding/s, method/s, theory/ies, distribution of regions, OSNs platforms, and users' demographic information (age and gender) from the selected papers for review were extracted and analysed. Table 9 summarizes the demographic findings of the 29 reviewed papers.

Study	Platform	country	Demography of Users	Research Method	Theory
(Preece 2004)	istudio.vantagenet. com/cgibin/pollres ults/002		N=4155	Quantitative: Online questionnaire	
(Paul, Baker & Cochran 2012)	Facebook		N=340; M=163; F=177; Age=18–67	Quantitative: Online questionnaire	
(Jiang, Heng & Choi 2013)	Online chat rooms	Singapore	N=251; F=128; M =123	Quantitative: Online questionnaire	
(Lim et al. 2013)	Facebook	Singapore	N=36; Age=13-18	Qualitative: interview	
(Staksrud, Ólafsson & Livingstone 2013)		25 Eu-countries	N= 1000	Quantitative: Online questionnaire	
(Dredge, Gleeson & De la Piedad Garcia 2014a)		Australia	N=25; F=17; M=8; Age=15–24	Qualitative: interviews; Quantitative: paper-and-pencil questionnaire	
(Dredge, Gleeson & De la Piedad Garcia 2014b)	Facebook	Australia	N=147; M =28; F =119; Age=15-27	Quantitative: Online questionnaire	
(Sagioglou & Greitemeyer 2014)	Facebook	America	**Study 1:** N=123German-speaking; F=72; M=51; **Study 2:**	Quantitative: Online questionnaire	

			N=263 English-speaking; F=163; M=100		
(Fox & Moreland 2015)	Facebook		N=44; F=27; M=17; Age=19-52	Qualitative: interview	
(Matook, Cummings & Bala 2015)	Facebook; RenRen; QQ; Various other OSNs	Australia	N=205; F=125; M=80	Quantitative: Online questionnaire	1. Social Exchange Theory; 2.Communication Theory; 3.Management Theory
(Lu et al. 2015)	A large telecommunications service provider's blog	China	N= 4000 employees	Empirical Validation from a weblog	1. Social Network Theory; 2.Social Capital Theory
(Wendorf & Yang 2015)	Facebook	America	N= 341; F=198; M=143; Age= 18-67	Quantitative: paper-and-pencil questionnaire	Catharsis Theory
(Sánchez, Muñoz-Fernández & Ortega-Ruíz 2015)		Spain	N=16; M=8, F=8; Age=14-17	1. Qualitative: interview; Quantitative: paper-and-pencil questionnaire	
(Chan & Saqib 2015)	Facebook	America	**Study 1:** N=246; Ave-age = 33.9; **Study 2:** N=104; Ave-age =29.5; **Study 3:** N=72; Ave-age =20	Quantitative: Online questionnaire	1.Psychology Theory; 2.Social Capital Theory
(Ballantine, Lin & Veer 2015)	Facebook		N=453	Online Experiment	

(Wang, Lee & Hua 2015)	A microblog platform		N= 470; M= 274; F= 196; Age= 12-61	Quantitative Online questionnaire	Cognitive behavioural model
(Meier, Reinecke & Meltzer 2016)	Facebook	Germany	N=354; F=251; M=103	Quantitative: Online questionnaire	
(Yan et al. 2016)	Phoenix Health; Sweet Home	China	N=82; N=323	Qualitative: expert interview; Quantitative: Online and paper-and-pencil questionnaire	
(Liu et al. 2016)	Sina-Weibo	China	N=441; M=249; F=192; Age=19-35	Quantitative: Online questionnaire	Social Exchange Theory
(Silic & Back 2016b)			N=500; N=11	Field Experiment; Qualitative: interviews	1.Credibility Theory 2.Persuasion Theory 3.Motivation Theory
(Zheng & Lee 2016)	WeChat (Weixin); mobile QQ; Sina Weibo; Renren3	China	N= 490; F=213; M=277; Age=18-60	Quantitative: Online questionnaire	1. Cognitive behavioural model; 2. social cognitive theory
(Sin 2016)	Facebook; Twitter	America	N=791; M = 245; F= 546; age= 20-24	Quantitative: Online questionnaire	1. information behaviour model; 2.Selective model; 3.Information Search Process model; 4.Social-Biological Information Technology model

(Turel 2016)	Facebook; Twitter; LinkedIn; Google+	America	N= 497; F=239; M=258; age=18-51 years old	Quantitative: Online questionnaire	theory of planned behaviour
(Turel & Qahri-Saremi 2016)	Facebook	America	N=341; F=177; M=164; age=18-60	Quantitative (observation and collect the data from the university dataset)	1.dual-process theory; 2.dual-system theory
(Algarni, Xu & Chan 2017)	Facebook	America	N=5; N=377; F=111; M=266; age>18	Qualitative: expert interview; Quantitative: Online questionnaire	1.Credibility theory; 2.Social judgment theory; 3.Politeness theory
(Moody, Galletta & Dunn 2017)		America	N=595; F=262; M=315	Quantitative: Online questionnaire	1. protection motivation theory; 2.Credibility theory
(James et al. 2017)	Facebook	America	N=798; f=539; m=259; age>=18 years old	Quantitative: Online questionnaire	1. need-to-belong theory; 2.gratifications theory
(van Schaik et al. 2018)	Facebook	UK	N=201; M=109; F=92; mean age=42;	Quantitative: Online questionnaire	protection motivation theory

Table 9: The demographic findings of the 29 reviewed articles

Analysis of the demographic findings revealed that:

- Majority of the selected studies in the dark side of OSNs discipline concentrated on developed countries such as America, Australia, Singapore, Germany, United Kingdom and other European countries. While the use of OSNs is rapidly increasing in developing countries, there was almost no research in our selected papers looking at the negative side of OSNs use for this cohort of users. Thus, more research is encouraged to study negative effects of OSNs in developing countries, and to examine how they may compare with the findings of this study.

- Most target groups only relied on students and employees as study samples. Some studies had not reported or distinguished gender of participants.

- As well as, no studies have been conducted on persons under 13 years old and over 69 years. However, they are vulnerable cohorts of users because of their lack of information technology knowledge.

- Majority of the prior studies in the field of the dark side of OSNs use focused on Facebook as a very famous social media platform. While there are a numbers of internet-based mobile applications such as, WhatsApp and Instagram in which their use is dramatically growing but have not been considered by researchers.

- The following bar charts illustrate the rate of publications on the negative effects of OSNs use in the selected journals among 2004 to 2017. As the below bar-chart shows, research on negative effects or adverse outcomes of OSNs use in the mainstream information system journals has only picked up from 2012. This suggests that the importance of this topic is increasing over time and that more studies in future will need to be conducted to investigate other dimensions of negative effects of OSNs use.
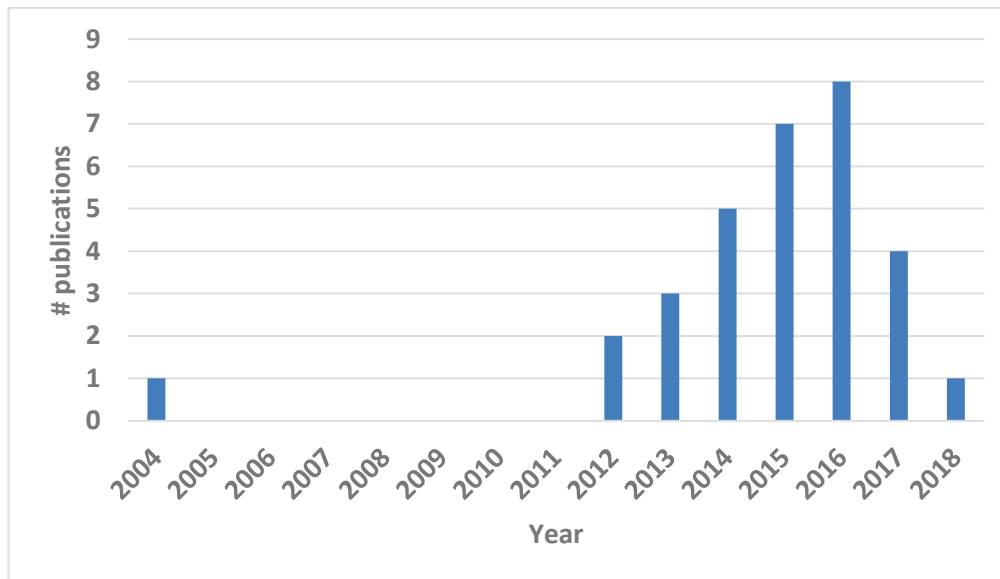
Figure 5: The dispersion of the 29 selected articles from 2004 to 2018

4.3.1. Platforms

As Figure 6 shows, 16 out of the 29 selected papers studied the negative impacts of Facebook as an OSN platform. This is not a surprising result, as Facebook is currently the most popular OSNs in the world. From the point of view of these studies, Facebook was a suitable platform to explore both negative and positive impacts of OSNs use, because it has many attractions for its users. For instance, the affordance of Facebook to provide a convenient and wide online network for groups and private communication forms through both of its computer and mobile applications has attracted a lot of users (Fox & Moreland 2015).

However, other types of OSNs platforms have been much less considered by researchers. Nine of the 29 reviewed research papers, for example, focused on other social platforms such as Twitter, LinkedIn, Google+, Sina-Weibo, Phoenix Health, Sweet Home, RenRen, QQ, a large telecommunications service provider's blog, Craigslist, the Federal Bureau of Investigation (FBI), the Federal Communications Commission (FCC), the U.S. Census Bureau (USCB), and the U.S. Bureau of Labor Statistics (USCBLS). Each of the above applications has a specific purpose, or a particular country uses it in order to achieve particular objectives. Phoenix Health, for example is a Chinese OSN platform which is used in the field of health.

Lastly, our review shows that the seven studies did not focus on any particular platform/s. They investigated the negative consequences of OSNs use in general, and did not

explicitly examine any OSN. Note that the rate of platforms distribution is greater than the number of selected papers, because some of these papers studied more than one platform.
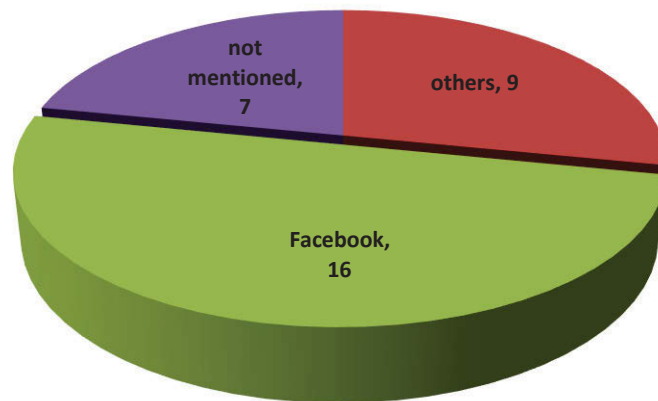
Figure 6: The distribution of the used platforms in the 29 reviewed studies about the dark sides of OSNs use

4.3.2. Distribution of Regions

Distribution of regions is another sub topic that was analysed by the systematic literature review to understand what countries have been most considered by prior studies. Figure 7 demonestrates the distribution of countries under investigation. Most of the reviewed papers studied USA users, as 9 of 29 reviewed articles focused on this country. With a fairly large difference, China is the second country that has been considered by researchers with the attention rate of 4 out of 29. After China, Australia has been the third most noteworthy country by researchers. The next highest statistic belongs to Germany, Spain and Singapore with 2 out of 29. Other European countries (Austria, Belgium, Bulgaria, Cyprus, the Czech Republi, Denmar, Estonia, Finland, France, Greece, Hungary, Ireland, Italy, Lithuania, the Netherlands, Norway, Poland, Portugal, Romani, Slovenia, Sweden, and Turkey) received little attention. As Figure 7 illustrates, 8 out of the 29 reviewed studies did not focus on one or a number of specific countries. This statistic shows a large number of studies have done their investigations by general approach not by concentrating on specific population or regions.
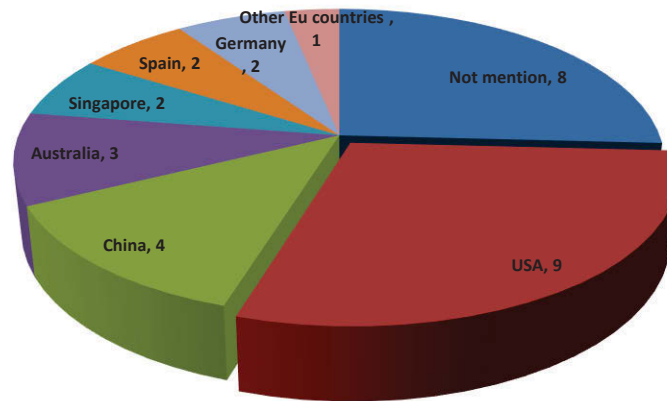
4.3.3. Demographic of Users

Findings of the reviewed articles illustrate that the number of female participants was greater than males in the majority of studies, and few of them had nearly equal distribution of male and female. The age range of participants was between 13 years and 67 years. However, there is not any investigation on two critical groups of people who are younger than 13 years and older than 67 years. They are very important groups for evaluation in the field of the dark side of OSNs use, because they are the more vulnerable cohorts of users. Both groups are usually prone to be significantly impacted by negative consequences of using OSNs, due to their relative lack of knowledge on OSNs and technology use. This is particularly important for social OSNs' users under the age of 14 years.

This literature review shows that most of the target groups in the reviewed researches had a competent computer literacy and information technology background because they are from three groups of people such as, high school students, university students and employees. Thus, it seems that the sample groups have been chosen from available people because the data collection from these groups is more convenient, easier and faster than others. However, unemployed individuals and persons with disabilities have not been included in this research area. The below figure indicates an overview of the target groups' demographic information extracted from the reviewed papers.

Age	Gender	Occupation
•Upper 13 years old •Under 67 years old	•Number of fmale was greater than male in majority of the stydies •Both gender were considered just as gender	•Students •Employees
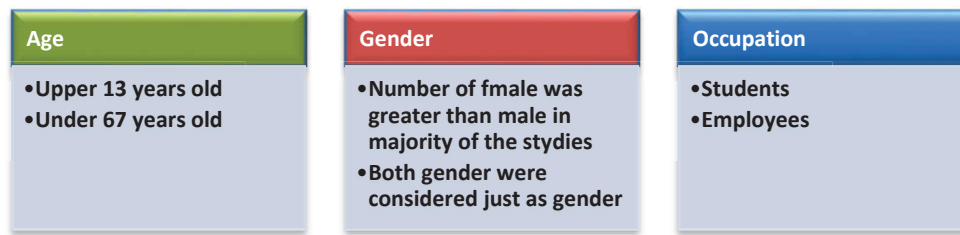
Figure 8: The demographic information of target groups in the 29 reviewed papers through the systematic literature review

4.3.4. Research Methods

Bandara, Miskon & Fielt (2011) argue that it is very useful to analyse research methods applied to prior investigations, because it helps researchers to better understand and evaluate those studies. In addition, it assists researchers to learn how to use different methods in different research approaches. Becoming familiar with different methods used in previous studies helps to identify and assess appropriate methods for a study. Thus, methods strongly influence the trend of a research (Bandara, Miskon & Fielt 2011).

Findings of the systematic literature review showed that 25 out of the 29 selected papers have used the quantitative method, which includes a questionnaire survey such as online questionnaire and paper-and-pencil questionnaire. The second method that has been considered by researchers is interview as a qualitative method. Eight different articles used this method. Finally, we found two papers that had not mentioned any method.
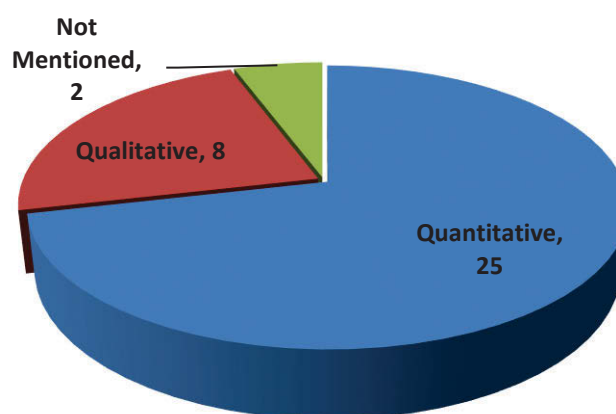
Figure 9: The rate of using different research methods in the 29 reviewed papers

4.3.5. Research Theories

Theories play an important role in the information systems research (Bandara, Miskon & Fielt 2011). In addition, according to Bandara, Miskon & Fielt (2011), it is very important to describe the current situation of a research area by using an appropriate theory or a combination of different theories, because a theory i) reveals what discipline is a foundation for a research area, and ii) assists to expand a field of knowledge. Therefore, this study attempted to identify what theories have been mostly used in the dark side of using OSNs concept.

Review of the 29 selected articles shows that 12 out of 29 studies did not use any theory or did not refer to any use of a particular theoretical perspective. This calls for more application of relevant theories in understanding negative effects of OSNs use, especially as theories significantly can help in understanding users' behavior. The good news, however, was that over 50 percent of the selected studied referred to a theory in their corresponding studies.

The most popular and most used theory in the reviewed papers was Credibility Theory. Other theories used in these studies were communication theory, social exchange theory, social capital theory, social network theory, catharsis theory, persuasion theory, social cognitive theory, theory of planned behaviour, dual-process theory, dual-system theory, grounded theory, social judgment theory, politeness theory, protection motivation theory, need-to-belong theory, gratifications theory.

4.4. Coding and Extraction Process

According to Bandara, Miskon & Fielt (2011), research objectives give direction to areas that need researchers' attention. Hence, understanding a research objective of the 29 selected articles leads this study to understand their findings. Table 9 summarizes the negative consequences of OSNs use, which were extracted by reviewing the 29 selected papers. This table shows each article's objective and the negative effects of OSNs that have been detected through these different objectives.

Following PRISMA guidelines (Bandara, Miskon & Fielt 2011; Moher et al. 2009; Wolfswinkel, Furtmueller & Wilderom 2013), a thematic content analysis for identifying codes and key themes of the selected papers has five stages namely, *define, search, select,*

analyse, and *present*. The stages *define*, *search*, and *select* have already been outlined in sections 4.1 and 4.2.

Next, it is the 'analyse' stage turn to be performed for covering the adverse consequences of OSNs use as the attribute values of the dark side of OSNs from the content of each selected study and categorize them into specific subcategories and themes as the characteristics of the dark side of OSNs use. Consequently, this approach led this study to gather the 43 negative effects of OSNs use as the findings of the prior researches and categorise them into eight subcategories and six different themes based on the similarities of their properties. The following details describes how the 'analyse' stage guided this study to gather the identified adverse consequences of using OSNs and then to categorise them as the characteristics of the dark side of OSNs use.

Analysis

One of the advantages of PRISMA guidelines is that it provides a guide for researchers to perform an analytical review/coding (Bandara, Miskon & Fielt 2011; Moher et al. 2009; Wolfswinkel, Furtmueller & Wilderom 2013). An analytical review focuses on the discovery of concepts of the selected articles.

The 'analyse' stage as a part of PRISMA guidelines refers to a coding process (Moher et al. 2009; Schubert & Williams 2012; Wolfswinkel, Furtmueller & Wilderom 2013). The coding process used in this study has been inspired by and adapted from (Schubert & Williams 2012) and (Wolfswinkel, Furtmueller & Wilderom 2013). This guided this research into a four-step coding process:

- 'Open coding' or 'descriptive coding' is the first step of the coding process for identifying the findings of studies that are under the literature review as the basic information or codes for coding or categorising information (Schubert & Williams 2012; Wolfswinkel, Furtmueller & Wilderom 2013). This step guided this study to uncover 43 negative effects of OSNs use as the codes or attribute values of the dark side of OSNs.
- The next step of the coding process is 'pattern coding' (Schubert & Williams 2012). This step enables researchers to classify different codes into relevant subcategories based on the similarity of their attribute values or properties (Schubert & Williams 2012). Therefore, by conducting this step, the 43 negative effects of using OSNs were

classified into eight subcategories (i.e. intrinsic/cognitive costs, opportunity/executional cost, inappropriate posts and obscene content, privacy concerns, security threats, cyber bullying and low performance).

- The third step is the 'axial coding' which is quite similar to the 'pattern coding' process in terms of performance but different in terms of the level of performance, because it is performed in the third level of the coding process (Wolfswinkel, Furtmueller & Wilderom 2013). By using this step in this study, the eight subcategories of the dark side of OSNs were grouped into six themes (i.e. cost of social exchange, annoying content, privacy concerns, security threats, cyber bullying and low performance) based on their similarities.

- Finally, the 'selective coding' process as the last step of the coding process helps researchers to attach the uncovered themes to a phenomenon (Schubert & Williams 2012; Wolfswinkel, Furtmueller & Wilderom 2013). In summary, the result of these levels of coding process is key themes in the field of any specific field of study. Consequently, using this step led this study to introduce the dark side of OSNs use as a phenomenon and attached the six uncovered themes to this phenomenon as its characteristics.

Present

The 'present' stage, as the last stage of PRISMA, advises researchers to present their findings through an appropriate visualization (Wolfswinkel, Furtmueller & Wilderom 2013). For example, drawing diagrams as a visualization method helps researchers to provide understandable study and reach a wider audience. Thus, to make the coding processes and its output more understandable, Figure 10 provides more details and a visualisation about the coding processes. As Figure 10 shows, the steps of the coding process are performed in order. The rest of this section further elaborates on the above four steps and discusses their outcomes.
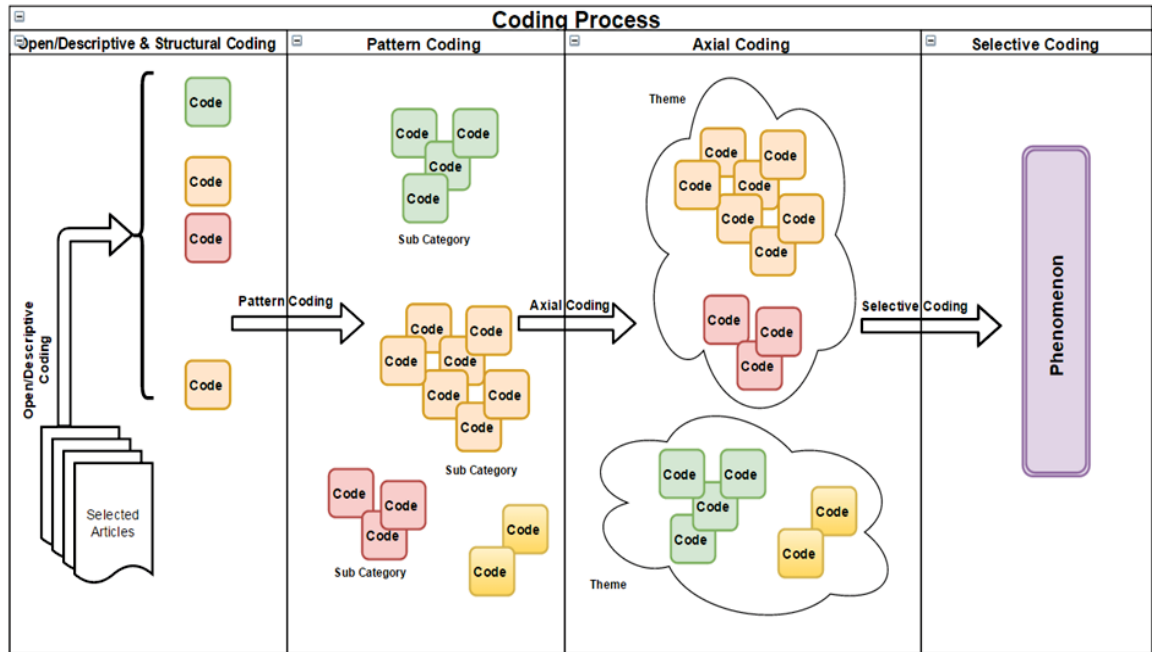
Figure 10: The coding processes

Open coding/descriptive coding: Wolfswinkel, Furtmueller & Wilderom (2013) state that 'open coding' is an analytical process that helps researchers to capture different concepts or variables from the selected articles. Schubert & Williams (2012) also explain that the open/descriptive coding is used to elicit the basic concept from the content of each selected reference. In this step, researchers need to read particular parts of a study such as, abstract, findings, discussion and contribution or implication to identify the codes or findings of that study (Schubert & Williams 2012; Wolfswinkel, Furtmueller & Wilderom 2013). This study applied this coding method to understand what kinds of negative effects of OSNs use have been identified by prior studies in the discipline of the dark sides of using OSNs. After reviewing the 29 selected articles, 43 negative effects of using OSNs as the attribute values of the dark side of OSNs were extracted. This result has been achieved after an iteration process.

According to (Schubert & Williams 2012; Wolfswinkel, Furtmueller & Wilderom 2013), each of these findings is a code or concept of the reviewed studies. In order to better present the result of the open/descriptive coding, these concepts and their descriptions are illustrated in Table 10 and Appendix I. Accordingly, the third column of Table 10 shows the identified negative effects of using OSNs explored and detected by every single reviewed research.

Study	Research Objective	Negative Effects of OSNs use
(Preece 2004)	To examine what problems occur through using Online communities.	1. Offensive content; 2.Sending spam; 2.Forwarding bogus virus warnings ; 3.Sending dumb jokes 4.Typing in all caps or all lower case; 5.Lack of basic grammar and punctuation; 6.Not editing text message; 7.Poor use of formatting styles
(Paul, Baker & Cochran 2012)	To explore the impacts of using OSNs on academic performance	Low academic performance
(Staksrud, Ólafsson & Livingstone 2013)	To examine whether the OSNs use increases experiences of online risks and harm among children	Being exposed to sexual images or messages
(Lim et al. 2013)	To investigate the role of online communication in the peer interaction of juvenile delinquents and youths-at-risk	Delinquency
(Jiang, Heng & Choi 2013)	To provide a more comprehensive understanding of privacy concern related to behavior in the context of synchronous online social interactions.	Misrepresentation
(Tsikerdekis & Zeadally 2014)	1. To explore deception in social media via focusing on motivations and techniques which are used by some users to deceive vulnerable users; 2. To address some of these challenges to help potential targets to detect deceptions.	Deception
(D'Arcy et al. 2014)	To develop knowledge about the "dark side" of information technology (IT) use in organizations.	1.Stress; 2.Information overload; 3.Work overload; 5.Interruptions; 6.Addictions; 7.Misuse;

(Dredge, Gleeson & De la Piedad Garcia 2014a)	To examine the definition of cyber bullying based on adolescent users' experience in the field on negative events in an OSN and identify the specific behaviour experience.	1. Feeling of being abused; 2. Being harassed
(Sagioglou & Greitemeyer 2014)	To explore what the immediate emotional impacts of Facebook use are on its users. For example, why Facebook causes deterioration of mood and why people still use it.	Deterioration of mood
(Dredge, Gleeson & De la Piedad Garcia 2014b)	To investigate whether there is any link between specific self-presentation behaviours in Facebook and risk of cyber bullying victimisation for adolescents	Being harassed
(Matook, Cummings & Bala 2015)	To understand the impact of OSNs use on users' perceived loneliness or feeling of loneliness	Feeling of loneliness
(Lu et al. 2015)	To understand the influence of work and non-work-related blog participation on the employees' job performance	Low job performance
(Fox & Moreland 2015)	1. Explore the broadness and intensity of users' negative emotional experiences. 2. To find uncover dark sides in the field of emotional responses and stressors related to Facebook use.	1. Inappropriate post; 2. Distraction addiction; 3. Feeling of jealousy; 4.Dissatisfaction; 5.privacy violation; 6. Reduced self-esteem; 7.Waste of time; 8.Lack of privacy; 9. Incitement to suicide; 10.Conflict; 11.Feeling of guilt; 12.Promot stress; 13.Reduce quality of work;
(Wendorf & Yang 2015)	To examining the relationship among Facebook usage, disclosure of negative feeling and level of users' stress	1. Feeling anger; 2. Feeling disgust; 3. Feeling contempt; 4. Feeling guilt; 5. Feeling fear; 6. Feeling nervousness

(Sánchez, Muñoz-Fernández & Ortega-Ruíz 2015)	To explore the positive and negative impacts of using OSNs and Instant Messaging mobile Apps in relation to adolescent dating life	1. Online jealousy; 2.Cyber stalking behaviour
(Chan & Saqib 2015)	To examine the link between online social networking and financial risk-taking	Increased user's appetite to take too much financial risk
(Wang, Lee & Hua 2015)	To clarify the development of psychological dependence in the context of social media, with a particular focus on microblogging	Addiction
(Yan et al. 2016)	Use the cost model to examine the impacts of costs on OHC members in sharing general and specific knowledge	1.Cognitive costs (CC) which produce pain, uncomfortable feeling, negative psychological effects such as irritation, depression and panic; 2.Executional costs (EC) include the time, material, financial resources
(Liu et al. 2016)	To examine perceived risks in disclosing users' personal information in the context of Micro-blogging as a social media	1. Unsolicited communications; 2. Stolen personal data; 3. Publicizing private information; 4. Impersonation; 5. Safety; 6.Financial loss
(Meier, Reinecke & Meltzer 2016)	To examine the predictors of procrastination with Facebook as well as its impacts on students' academic and overall well-being	Feeling stress
(Silic & Back 2016b)	To investigate how business users (employees and firms) respond to phishing attacks on OSNs	Phishing risks
(Zheng & Lee 2016)	To explore and explain the negative consequences related to family, personal and professional life of excessive use of mobile social networking sites.	Conflicts with others

(Sin 2016)	To explore the level of problematic informational outcomes varies with the use of social networking sites, microblogs, and social question and answer sites	1.Irrelevant Information; 2.Information overload
(Turel 2016)	To examines a model that clarifies the complex effects of guilt and theory of planned behaviour predictors on the discontinuance of an instance of mostly attractive information system, namely Social Networking Sites	Feeling of guilt
(Turel & Qahri-Saremi 2016)	to explore the dark side of information systems use by conceptualizing problematic use and explaining its drivers and consequences	Diminishing academic performance
(Algarni, Xu & Chan 2017)	To investigate the impact of source characteristics on users' susceptibility to social engineering victimization on Facebook.	1.deception; 2.phishing
(Moody, Galletta & Dunn 2017)	To why an individual will fall victim to a phishing attack.	1.deception; 2.phishing
(James et al. 2017)	To seek a deeper understanding of the relationship between OSNs belongingness and Incidence of negative emotions	1. Addiction; 2. Feeling of jealousy; 3. Panic
(van Schaik et al. 2018)	To study security- and privacy-related risk perceptions and precautionary behaviour in social-network use.	1. Privacy risk; 2. Online safety; 3.misuse of information

Table 10: Extracted negative effects of OSNs use

After running the open/descriptive coding process, the pattern coding and the axial coding were performed to detect the subcategories and the themes of the dark side of OSNs use. The following paragraphs provide concise and useful descriptions about these processes and Table 11 demonstrates the consequences of these coding processes.

Pattern coding: In this step, the initial codes were organized into relevant subcategories. In the other words, each finding of a research is a concept/code, and concepts of different studies can be categorised into different groups based on the similarities of their properties (Schubert & Williams 2012; Wolfswinkel, Furtmueller & Wilderom 2013). As Table 11 shows, the second column of this table is the output of the pattern coding process. There are eight subcategories namely, intrinsic cost, opportunity cost, inappropriate content, obscene content, privacy concerns, security threats, cyber bullying and low performance.

Axial coding: Axial coding is performed after the pattern coding process. It identifies interrelations between different categories (Wolfswinkel, Furtmueller & Wilderom 2013). Similar to pattern coding, this stage is an iteration process. The main purpose of the axial coding is to uncover underlying themes of subcategories (Schubert & Williams 2012; Wolfswinkel, Furtmueller & Wilderom 2013). Thus, by conducting this process, the eight subcategories were converted to the six themes of the dark sides of OSNs use. The third column of Table 11 illustrates this outcome (i.e. cost of social exchange, annoying content, privacy concerns, security threats, cyber bullying and low performance).

Selective coding: According to Wolfswinkel, Furtmueller & Wilderom (2013), selective coding is the final step to integrate all themes into a meaningful topic. The main goal of this stage is to develop a single phenomenon for a field of study. Thus, the outcome of this coding process achieves and represents the 'dark side of OSNs use'.

In summary, through the above coding processes, 43 different negative effects of using OSNs were extracted from the content of the reviewed articles. Then, these negative effects were categorized into six themes based on the similarity of their properties and their definitions in the corresponding article. For choosing names of subcategories and themes, the reviewed studies were carefully assessed and relevant names were extracted.

4.5. Validation of the Systematic Literature Review Outputs

An important part of a systematic literature review is the assessment of the validity of the systematic literature review findings. This is important i) to make sure that initial findings make sense, ii) to remove duplication or overlap of the concepts or items and, iii) to consolidate the similar items. An initial validation process was undertaken at this stage through inviting two independent experts in information system discipline, with research expertise in OSNs, to initially assess the coding outcomes and presentation. Both experts were not involved in the coding process. A larger study, expert interview, was later conducted for a thorough assessment of findings, as outlined in the next Chapter.

As the result of this initial validation assessment, the following feedback was received and acted upon:

- To revise 'fat concepts', which were negative effects with either a very long name or those that implied more than one concept. Both experts emphasized that using broad meanings or name overlaps should be avoided. Thus, the name of a few identified negative effects was revised under supervision of the above experts.

- Table presentation improved

- Typo and grammar errors removed

- References for the name of pattern and axial coding were added (Table 11)

- Description or definition for each identified negative effect was provided (Appendix I)

The following table illustrates the consequence of the coding process after the initial content validation.

Open/Descriptive & Structural Coding	Pattern Coding	Axial Coding	Selective Coding
Panic			
Irritation			
Stress	Intrinsic costs (Tong, Wang & Teo 2007)	**Cost of social exchange** (Tong, Wang & Teo 2007; Yan et al. 2016)	**The dark side of OSNs use for users**
Depression			
Feeling of guilt			
Feeling of jealousy			
Feeling of loneliness			
Dissatisfaction			

Distraction addiction			
Deterioration of mood			
Children's risk of harm			
Reduced self-esteem/confidence			
Information overload			
Addiction			
Wasting time	Opportunity costs (Tong, Wang & Teo 2007)		
Wasting energy			
Work overload			
Financial loss			
Users' financial risk-taking			
Inappropriate posts	Inappropriate content (Fox & Moreland 2015; Preece 2004)	**Annoying content** (Fox & Moreland 2015; Preece 2004)	
Poor content (in terms of writing)			
Dumb jokes	Obscene Content (Preece 2004)		
Offensive content			
Lack of privacy/Privacy risk	Privacy issue (Dredge, Gleeson & De la Piedad Garcia 2014b; Fox & Moreland 2015)	**Privacy frustration** (Dredge, Gleeson & De la Piedad Garcia 2014b; Fox & Moreland 2015; Jiang, Heng & Choi 2013)	
Privacy violation			
Safety			
Unsolicited communications			
Publicizing private information			
Misrepresentation			
Deception	Security	**Security**	
Misuse of information			
Impersonation			

Stealing personal data	(D'Arcy et al. 2014; He 2012; Liu et al. 2016)	(D'Arcy et al. 2014; He 2012; Liu et al. 2016)	
Cyber stalking behavior			
Malicious software			
Phishing risks			
Abuse	Cyber bullying (Dredge, Gleeson & De la Piedad Garcia 2014a; Lim et al. 2013)	**Cyber bullying** (Dredge, Gleeson & De la Piedad Garcia 2014a; Lim et al. 2013)	
Harass other users			
Conflict			
Incitement to suicide			
Delinquency			
Low academic performance	Low performance (Fox & Moreland 2015; Lu et al. 2015; Turel & Qahri-Saremi 2016)	**Low performance** (Fox & Moreland 2015; Lu et al. 2015; Turel & Qahri-Saremi 2016)	
Low job performance			

Table 11: Themes or characteristics of the dark sides on OSNs use

Subsequent to the above Table, descriptions for all proposed themes were extracted from the extant literature to explain what each theme would represent. Table 12 shows a summarized description for each theme, with a more detailed description prepared in Appendix II.

Theme's Name	Definition / Description
Cost of Social Exchange	According to Social Exchange Theory (SET), cost can be defined as negative consequences from exchange behavior that reduces behavior frequency (Tong, Wang & Teo 2007; Yan et al. 2016). SET divides costs into two types namely, intrinsic cost (cost of psychological problems / cognitive cost) and opportunity cost (executional cost) (Tong, Wang & Teo 2007).

Annoying Content	Internet users may send their text messages or email without considering the rules of writing (Preece 2004). These types of texts are called inappropriate content because of spelling mistakes, grammar mistake and poor punctuation. In addition some content are obscene, because producers of these contents are purposely or unwittingly disturbing some other users (Preece 2004). Dumb jokes, for example is a kind of these contents.
Privacy Concerns	Privacy concerns with OSNs refers to concerns assisted with storing, re-purposing, provision to third parties, and displaying of information pertaining to oneself via the Internet (Anderson & Agarwal 2011; Fox & Moreland 2015). According to Fox & Moreland (2015) and Ellison (2007), some OSNs applications like Facebook ultimately control users privacy and limit their ability to hide some of their information from the world.
Security Threats	Security threats refer to some incidents that can be like confidential data loss, misuse of information or impersonation (D'Arcy et al. 2014; Liu et al. 2016). Moreover, Silic & Back (2016) argue that although online social networks have become important security holes networks for swindlers persons to do different types of fraud and deception, this research area as one of the most important negative effects of using OSNs has received the least attention.
Low performance	Low performance refers to poor or incomplete performance when one who fails to attend to his or her responsibilities and accomplish them according to a set of standards (Fox & Moreland 2015; Paul, Baker & Cochran 2012). There is a significant positive relationship between waste of time by using OSNs and low academic performance (Fox & Moreland 2015; Paul, Baker & Cochran 2012) and low job performance (Fox & Moreland 2015; Lu et al. 2015).
Cyber bullying	Cyber bullying can be defined as aggressive and intentional act carried out by individual or a group of attackers. They attempt to harm and imbalance the power of their victims by using the electronic form of contacts (Dredge, Gleeson & De la Piedad Garcia

	2014a). Therefore, cyber bullying means bullying in cyber space (Dredge, Gleeson & De la Piedad Garcia 2014a). Cyber bullying negatively impact on general aspects of victims' life such as emotional, behavioural, cognitive, social and physical (Dredge, Gleeson & De la Piedad Garcia 2014a).

Table 12: Definition or description for the characteristics of the dark side of OSNs use

The above two tables set the foundation for proposing a framework of the dark side of using OSNs to identify what dark side of OSNs use may mean, and what its underlying concepts are. Reflective/Formative modeling will next be used to illustrate the relationship between the components of Tables 11 (i.e. 43 identified negative effects, eight and six uncovered subcategories and themes).

4.6. Framework of the Dark Side of OSNs Use

This section proposes a framework of the dark side of using OSNs. A framework illustrates the relationships between the internal components of a phenomenon (Edwards & Bagozzi 2000; Petter, Straub & Rai 2007). As explained in section 3.2, to create a framework based on the reflective versus formative model, the first step is identifying directors and constructs (Petter, Straub & Rai 2007). Then they must be recognized as formative or reflective items (Petter, Straub & Rai 2007).

Indicators and Constructs: Given the output of the coding process, there are different levels of indicators and constructs as follows:

- At the lowest level, 43 identified negative effects of using OSNs are indicators for both sub-categories (i.e. intrinsic cost, opportunity cost, inappropriate content, and obscene content) and themes (i.e. privacy concerns, security threats, cyber bullying and low performance) of the dark side of OSNs use. Accordingly, these sub-categories and themes are constructs for their indicators.
- At the middle level, the sub-categories (i.e. intrinsic cost, opportunity cost, inappropriate content, and obscene content) are indicators of the themes (i.e. cost of social exchange and annoying content) of the dark side of OSNs use. Therefore, these themes or characteristics of the dark side are constructs.

- Finally, at the highest level, the themes (i.e. cost of social exchange, annoying content, privacy concerns, security threats, cyber bullying and low performance) are indicators for the dark side of OSNs use.

Formative and Reflective Items: some studies (Jarvis, MacKenzie & Podsakoff 2003; MacKenzie, Podsakoff & Jarvis 2005; Petter, Straub & Rai 2007) argue that i) in a formative model, indicators cause constructs and, if any indicator be changed or removed, validation of its construct will be destroyed, ii) in contrast, in a reflective model, constructs cause their indicators and indicators can be changed or removed without creating any flaws in the meaning and validation of constructs.

According to descriptions above, the following outputs have been concluded:

- At the lowest level, the 43 negative effects of using OSNs are formative items, because if one or some of them is/are removed, the meaning of their constructs will be destroyed or changed.
- At the second level, four sub-categories (i.e. intrinsic cost, opportunity cost, inappropriate content, and obscene content) are formative, because if they are removed for any reason, the meaning of their constructs will be ruined.
- At the last and the highest level, six themes or the main characteristics of the dark side of OSNs use are formative, because if one or some of them be removed, the meaning of the dark side will be incomplete.

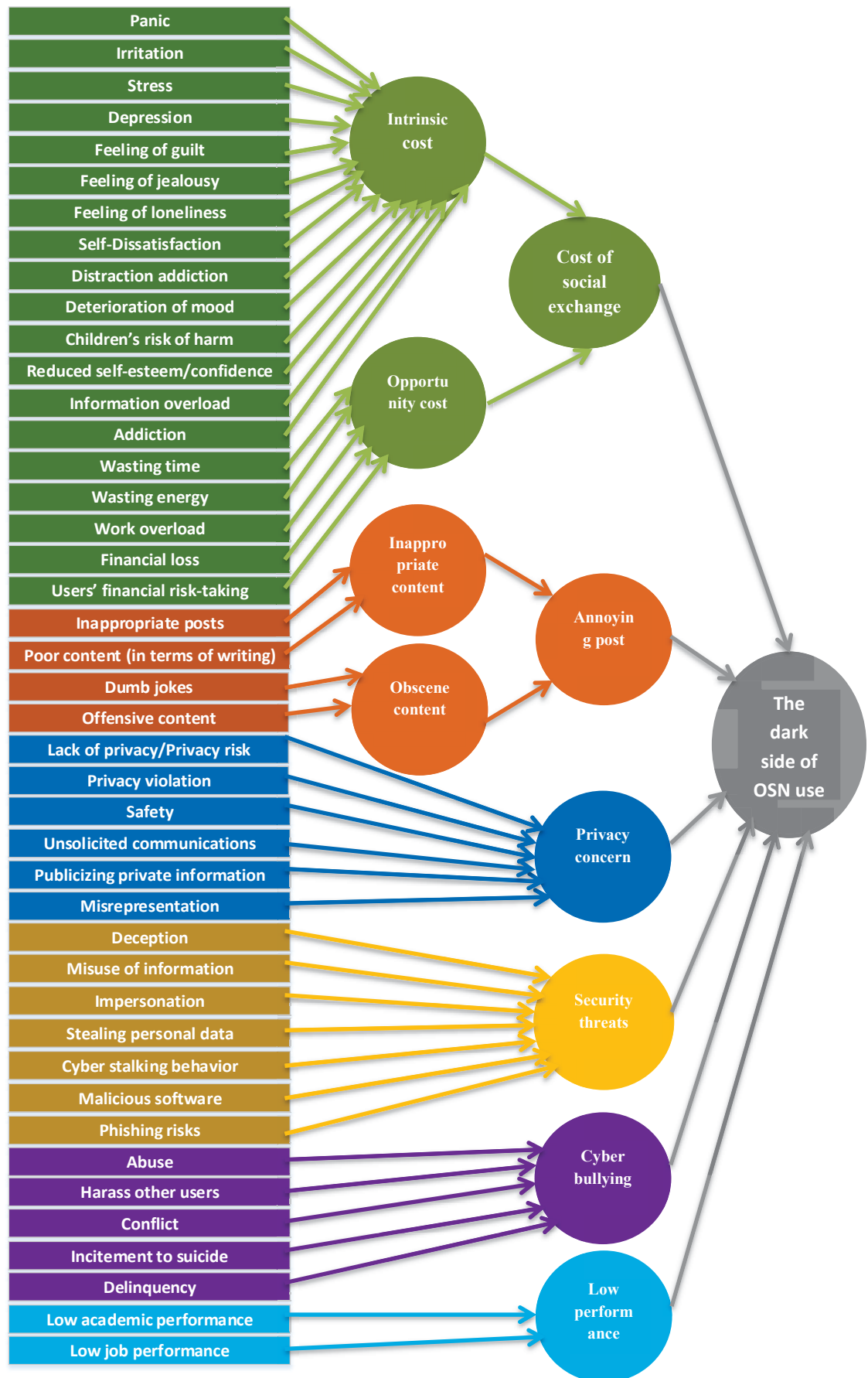The following figure illustrates the initial framework of the dark side of OSNs use.

Figure 11: The initial version of the framework of the dark side of OSNs use

Chapter 5: Interview Findings

This thesis conducted an expert interview process to assess the validity of findings and to ensure the proposed characteristics and framework for the dark side of OSNs use is reliable and make sense. Since each interview session needs to comply with its own general and specific rules in order to increase the quality of the interview session and its documentation (DiCicco-Bloom & Crabtree 2006), a guideline for the interview session was designed (Appendix VII). Accordingly, this study was planned to i) interview with some experts who have experience and study in information systems, information technology, computing science and computer in human behavior, and psychology, ii) the sample size was not declared, so the interview process was stopped based on the concept of theoretical saturation, iii) it was estimated that each interview session will take long 30 minute to an hour, iv) although the interviewees could come from different nationalities, all interviews were conducted in the English language, vii) the interviews were allowed to be conducted via face to face, telephone, and email because the nominated interviewees were distributed across different locations, and viii) all interviews were recorded and transcribed using qualitative content analysis. Therefore, this study by considering all above rules conducted the 12 successful interviews.

This chapter outlines information about i) questions that were designed for the interview process, ii) how the interview process and data collection were conducted, iii) how the collected data was analysed, and what the impact of the experts' opinions has had on the initial result.

5.1. Interview Questions and Structure

A semi-structured interview includes a number of key questions which are designed in advance, and a detailed structure can come up during the interview (Drever 1995). A semi-structured interview is a very flexible method that allows interviewees to share whatever they may wish (DiCicco-Bloom & Crabtree 2006; Drever 1995). Moreover, this technique is very suitable for small-scale and qualitative studies (DiCicco-Bloom & Crabtree 2006; Drever 1995), and it is an open-end process that may take between 30 minutes to several hours (DiCicco-Bloom & Crabtree 2006). According to these scholars, this technique allows interviewers to deeply explore the interviewees' opinion and concerns.

Based on the above explanations, this study designed a semi-structured interview with the structure and questions as follows:

Structure:

- Participant's consent was obtained prior each interview. To comply with ethical considerations, identifiable and personal information was removed from analysis. The experts were advised that they could skip any question or end the interview session at any time if they wished so.
- The sample size was determined by adapting the content validity technique which is explained in section 3.3.3 and saturation point of data. Hence, the number of interviewees was not predicted in advance.
- Each interview session took 30 minutes to 1 hour.
- Two forms of interview were used in this study. Face to face interview was the first choice, and telephone or email interview was the alternative way if the first choice was not possible.
- The interviews were transcribed.

Interview questions:

1. Whether this negative effect of OSNs use belongs to this subcategory or theme?
2. If not so, which subcategory or theme is more relevant? And why?
3. Do you have any general comment for this foundation?

Two different types of semi-structured interviews were conducted in this study, pretest/pilot interview and primary interview.

Pretest was performed due to some reasons as follows:

- To test whether the questions are understandable. If not, how to improve them.
- To apply some changes before running the primary interviews. These changes make the findings more meaningful, scientific, understandable and reliable. According to my supervisor's suggestion, I applied these changes based on the findings before running the primary expert interview process.
- To practice the interview process with some experts who were my principal supervisor and my co-supervisor.

- To improve my interview skill by considering the comments that I may receive from my principal supervisor and co-supervisor.
- To verify the validity of the uncovered characteristics and framework of the dark side of OSNs use

Primary interview was conducted to consult with some experts about the accuracy of the characteristics and framework of the dark side of OSNs use. The experts verified the findings and provided their opinion based on their knowledge, research backgrounds and experiences to improve this research outcome as more scientific, reliable, and creditable result.

Since this part of the study purposes to verify the location of each negative effect in different sub-categories and themes, the questions above were designed to conduct the expert interview as a qualitative research.

5.2. Pretest output

The expert interviewees stated some of the negative impacts do not have an appropriate name. This is because the terms/terminologies that have been used for them are just a name by itself and they are not reflecting negative experiences or cannot express the real meaning of those negative effects. Since this study investigates the dark side of OSNs use for users, the negative experiences or negative feeling of users should be mentioned. Therefore, some terms needed to be changed to the new ones to become more clear and understandable as users' experiences. These changes have been applied exactly before the primary interviews. They helped to make the findings more meaningful and understandable.

Item's Name	
Old term	**New term**
Panic	Feeling panic
Stress	Feeling stress
Depression	Feeling depressed
Children risk of harm	Being exposed to sexual images or messages
Financial loss	Waste of money

Users' financial risk taking	Increase user's appetite to take too much financial risk
Poor email or text messages in terms of writing	Poor content in terms of writing
Safety	Lack of online safety
Harass other users	Being harassed
Conflict	Conflict with others
Security	Security threats
Privacy	Privacy concerns
Abuse	Feeling of being abused
Low quality and performance	Low performance

Table 13: The outputs of the pretest interviews

Furthermore, the interviewees advised to merge some of the subcategories with their themes, which have exactly the same name (i.e. privacy concerns, security threats, cyber bullying and low performance). They believed this change could improve the presentation of the findings of the systematic literature review.

The above changes were applied on Table 11, and then Table 14 was developed as the result of the pretest.

Open/Descriptive & Structural Coding	Pattern Coding	Axial Coding	Selective Coding
Feeling panic			
Irritation			
Feeling stress		Cost of social	The Dark Sides of OSNs for Users
Feeling depression		exchange	
Feeling guilt	Intrinsic Cost (Tong, Wang & Teo 2007)	(Tong, Wang & Teo 2007;	
Feeling jealousy		Yan et al.	
Feeling of loneliness		2016)	
Self-dissatisfaction			
Distraction addiction			
Deterioration of mood			

Being exposed to sexual images or messages		
Reduced self-esteem/confidence		
Addiction to the use of OSNs		
Information overload		
Wasting time	Opportunity Cost (Tong, Wang & Teo 2007)	
Wasting energy		
Wasting money		
Work overload		
Increase user's appetite to take too much financial risk		
Inappropriate posts	Inappropriate Content (Fox & Moreland 2015; Preece 2004)	**Annoying Content** (Preece 2004)
Poor content in terms of writing		
Dumb jokes	Obscene Content (Preece 2004)	
Offensive content		
Lack of privacy/Privacy risk	**Privacy Concerns** (D'Arcy et al. 2014; Fox & Moreland 2015; Jiang, Heng & Choi 2013)	
Privacy violation		
Lack of online Safety		
Unsolicited communications		
Publicizing private information		
Misrepresentation		
Deception	**Security Threats** (D'Arcy et al. 2014; He 2012; Liu et al. 2016)	
Misuse of information		
Impersonation		
Stealing personal data		
Cyber stalking behavior		
Malicious software		
Phishing risks		
Feeling of being abused		

Being harassed	**Cyber bullying**	
Conflict with others	(Dredge, Gleeson & De la Piedad	
Incitement to suicide	Garcia 2014a; Lim et al. 2013)	
Delinquency		
Low academic performance	**Low performance**	
Low job performance	(Fox & Moreland 2015; Lu et al. 2015; Turel & Qahri-Saremi 2016)	

Table 14: The dark side of OSNs use after conducting the pre-test interviews

As a result, this table was used in the primary test (expert interview process) as the characteristics of the dark side of OSNs use.

5.3. Data Collection Procedure

To check the validity of the results, experts who have had remarkable studies and knowledge on the risks of using information systems or information technology have been invited for this part of the research. Accordingly, the following sources were used to recruit the relevant experts for this study:

- Some experts were identified from the literature review who studied the negative effects and the dark side of using OSNs.
- A snowballing approached was used to invite a majority of academic experts who (i) work in one of New South Wales universities in Australia and (ii) had studies and experiences in the field of information systems, computing science, human behavior in information technology use, psychology or health.

Next, an invitation letter (Appendix III) and an interview form (Appendix IV) were designed. The interview form was comprised of short descriptions about the research objectives, the interview objective, the interview questions and the blank spaces for some information such as expert's name and expertise, date and time of interview session. The interview process was started by sending the interview invitation and the interview form to every single expert. Then the main discussion points of the interview (i.e. Table 12, Table 14 and Appendix I) were sent to some of them who agreed to participate in this study.

Date and time of the interview sessions were organised based on the interviewees' availability as well as preferred place or mode for the interview. Most of the experts preferred to conduct the interview session in their office. The interview sessions were audio recorded with the experts' permission and subsequently transcribed.

In this study, 50 interview invitations were sent to the target group. The 12 experts accepted the invitations and the rest either did not reply to the invitation or rejected the invitation. This study achieved the necessary data by 12 interviews. Thus, this number of experts was acceptable for this study, because i) according to Lynn (1986)'s argument, minimum number of participants to hold an expert interview process is between 5 to 10, and ii) after nine interviews no new information was achieved from interviews. Table 15 provides a brief explanation about the result of invitation letters, and Figure 12 indicates the participants' expertise.

Of the 12 experts, 4 of them were in information systems discipline, 2 out of the 12 experts were in the field of information technology and business, 2 of experts were specialized in information technology discipline. The fields of study of the 4 remaining expert were in information systems and computer engineering, software engineering, computer science and psychology. All of them are teaching in Australian universities.

Interview invitation	Sample number	Percentage	Description
Accepted invitations	12	24 %	It shows the proportion of experts who participated in the interview process
Partially accepted	5	10 %	It mentions some experts who accepted to participate on the interview process and asked to have further information about the study and interview process. When they received the requested information, which was the findings as the most prominent part of this research, they rejected the invitation with this argument that they are very busy.

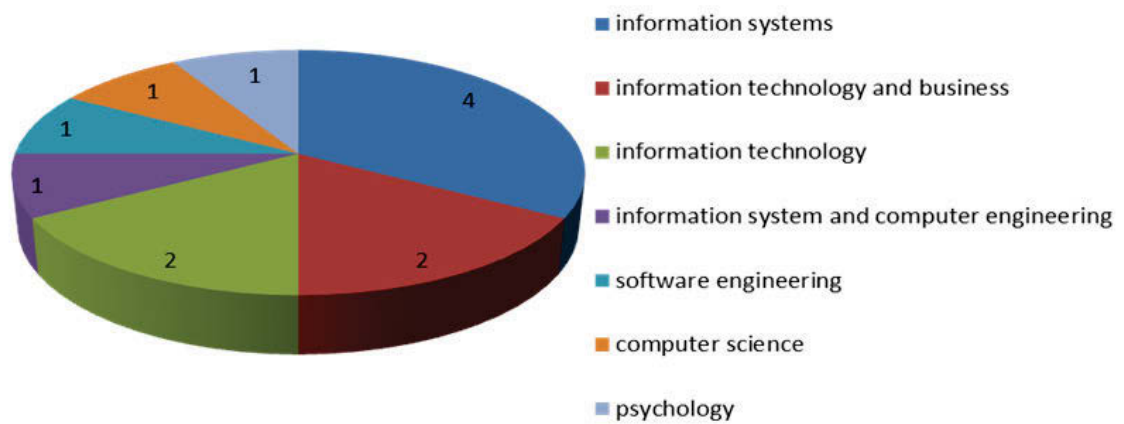| Rejected invitations	33	66 %	It shows the proportion of experts who did not accept to participate in the interview process. Some of them kindly replied to the invitation letter that they are very busy and some of them never replied, even after a kind reminder email.

Figure 12: The research discipline of the interviewed experts

At the beginning of each interview session, four different documents were provided to the interviewee. First one was the interviewee form (i.e. Appendix IV) which included a very brief description about the research objective, the research questions, interviewee's name and expertise, date, time and duration of the interview. This form was filled out during each interview session. Second and the most important document demonstrated the 43 identified negative effects and the characteristics of the dark sides of OSNs use (i.e. Table 14) which were intended to be validated by the invited experts. Third and fourth documents respectively consisted of the definitions or descriptions of the identified negative effects and their themes and categories (i.e. Appendix I and Appendix II). These documents were given to the experts for two reasons: i) provide a brief and comprehensive view of the findings and ii) help them to provide their opinion based on their knowledge and the literature review of this study.

5.4. Analysis of interview data

The sample size for this study was not predetermined but the interview process was stopped after 12 interviews for two reasons; i) according to the content validity technique that allows researchers to stop the expert interview after ten interviews, and ii) achieving saturation data had happened. The interview process was discontinued when the collected information became repetitive and new advice no longer emerged.

After the data gathering, the steps below were followed:

- Listening to the recorded data
- transcribed the recorded data
- Paraphrasing the transcribed data
- Searching to find the commonalities and connection among experts' opinion
- Grouping the experts' opinions based on the similarity of their suggestions about a same item.
- Applying the content validity technique to analyse the collected data

Table 16 demonstrates proportion of experts' endorsement, which is required to establish the content validity.

Number of Experts	Proportion of Expert Whose Endorsement Is Required to Established Content Validity (Endorsement Required = ER)
5	ER= %100
6	%83 ≤ ER ≤ %100
7	%86 ≤ ER ≤ %100
8	%88 ≤ ER ≤ %100
9	%78 ≤ ER ≤ %100
10	%80 ≤ ER ≤ %100
11	%82 ≤ ER ≤ %100
12	%75 ≤ ER ≤ %100
13	%77 ≤ ER ≤ %100

Table 16: Proportion of expert whose endorsement is required to established content validity (Lynn 1986)

Expert opinions about each negative effect were reviewed. Then, the number of agreeing comments on each item was calculated based on the content of Table 16. Ultimately, only three items were changed in which their endorsement requirements were not on the range. The results of content validity have been shown in Table 17 and 18.

Negative Impact	ER	Outcome	Summary of Experts' Inputs / Comments / Direct Quotation
Irritation			
Feeling stress			
Deterioration of mood			
Feeling guilt			
Feeling jealousy			
Feeling of loneliness			
Feeling fear			
Reduced self-esteem / confidence			
Addiction to the use of OSNs			
Wasting time			
Waste energy	100 %	No changes	Generally, all interviewees expressed their agreements
Waste of money			
Inappropriate posts			
Poor content in terms of writing			
Lack of privacy/Privacy risk			
Privacy violation			
Lack of online Safety			
Unsolicited communications			
Impersonation			
Virus			
Bogus			
Phishing risks			

Being harassed			
Incitement to suicide			
Delinquency			
Low academic performance			
Low job performance			
Self-dissatisfaction	92 %	No changes	'cyber-bullying is more appropriate category for this negative impact'
Feeling depression			'This term has a fat concept, so it can be a category instead of a negative impact, because it refers a number of psychological issues.'
Feeling of panic			'Feeling panic could be in the category of cyber bullying, because the 'feeling of being abused' and 'panic' are related to each other.
Dumb jokes			'I would like to change 'dump' to another better word. Some jocks are not dump jokes, some of them could be racist or sexed jocks and they are not necessarily dump; because they might be insult to other people. Somebody might find that funny, but really it is not.'
Publicizing private information			'In my opinion this negative impact is as similar as privacy violation. They have overlap in their meanings. Therefore, you should remove it and just use the 'privacy violation'.'
Deception			'You should use 'deception by others' instead of 'deception', because 'deception' does not make sense.'
Misuse of information			'This problem is very similar to privacy violation. It is better to move this negative impact into the privacy concern group.'
Conflict with others			'You have to make it clear what kind of conflict you are looking for.'
Information overload	83 %	No changes	'Information is a resource so the information overload is an opportunity cost.'
Increase user's appetite to take too much financial risk			'I am not happy with this item. In fact, it does not make sense for me. So I do not have any idea about it.'

Offensive content			'Change it to 'universally offensive content'; this negative impact might be happened because of different cultures, religions or so on.'
Misrepresentation			'It should be changed to 'being misled'. Since, some users disclose themselves by fake information or misrepresentation (for any reason), they mislead other users.'
Stolen personal data			''Identity theft' is a better term for this negative impact, because it makes sense.'
Cyber stalking behavior			'In my opinion negative impact belongs to the privacy problem.'
Work overload	75 %	No changes	'Low performance sub-category is more appropriate group for this problem.'
Distraction addiction			'This term is similar to 'addiction' so you can merge them in an item.'
Feeling of being abused			'This negative impact expresses a negative feeling. According to the definition of the 'intrinsic cost', all negative feeling belong to this sub-category.'
Distraction addiction			'Correct position for this negative impact is opportunity cost, because it has a direct relationship with wasting time.'
Being exposed to sexual images or messages	25 %	moved to the 'Obscene content' sub-category	Nine out of twelve experts expressed their disagreements for this item. The suggestions of these nine experts are as follows: • Seven out of the nine experts recommended the obscene content as a better category for this negative impact. • Two out of the nine experts recommended the inappropriate content as a better category for this negative impact. According to content validity, this item should be moved to one of the suggested sub-categories, because only 25% of the experts agreed with the intrinsic cost. As a result, the obscene content was accepted as the new sub-category for this negative effect. This because, seven out of nine interviewees recommended the obscene content. According to content validity, since, 78 % of the expert (among 9 experts) agreed with this the obscene content, the 'Being exposed to sexual images or messages' was moved this sub-category.

Table 17: The output of content validity for each negative effect

Subcategory	Endorsement Rate	Summary of Experts ' Inputs / Comments	Outcome
Intrinsic cost	42 %	Majority of the interviewees were not familiar these terminologies and advised me to make them more understandable by using 'cognitive cost' and 'executional cost'.	Intrinsic cost / Cognitive cost
Opportunity cost			Opportunity cost / Executional cost
Inappropriate content	100 %	Generally, all interviews expressed their agreements	No changes
Obscene content	92 %	One of the interviewees advised me to exchange the location of annoying content and obscene content.	No changes
Theme	**Endorsement Rate**	**Summary of Experts ' Inputs / Comments**	**Outcome**
Cost of social exchange	83 %	Two of the interviewees expressed that this terminology does not make sense for us.	No changes
Annoying content	92 %	One of the interviewees advised me to exchange the location of annoying content and obscene content.	No changes
Privacy concerns	100 %	Generally, all interviews expressed their agreements	No changes
Security threats			
Cyber bullying			
Low performance			

Table 18: The output of content validity for sub-categories and themes

As before mentioned, the interview process was conducted to propose more reliable, understandable and scientific framework of the dark side of OSNs use. Thus, the outputs above were applied on the initial version of the framework of the dark side of using OSNs which was illustrated via Figure 11. Consequently, Figure 13 was extracted as the final version of the framework of the dark side of OSNs use. As Figure 4 illustrators, the 'Being exposed to sexual images or messages' negative effects was moved from the 'intrinsic cost' subcategory to the 'Obscene content' subcategory as the most appropriate instrument. In addition, the name of the 'intrinsic cost' and 'opportunity cost' subcategories were changed to 'intrinsic cost/cognitive cost' and 'opportunity cost/executional cost' in order to make them more understandable for readers.
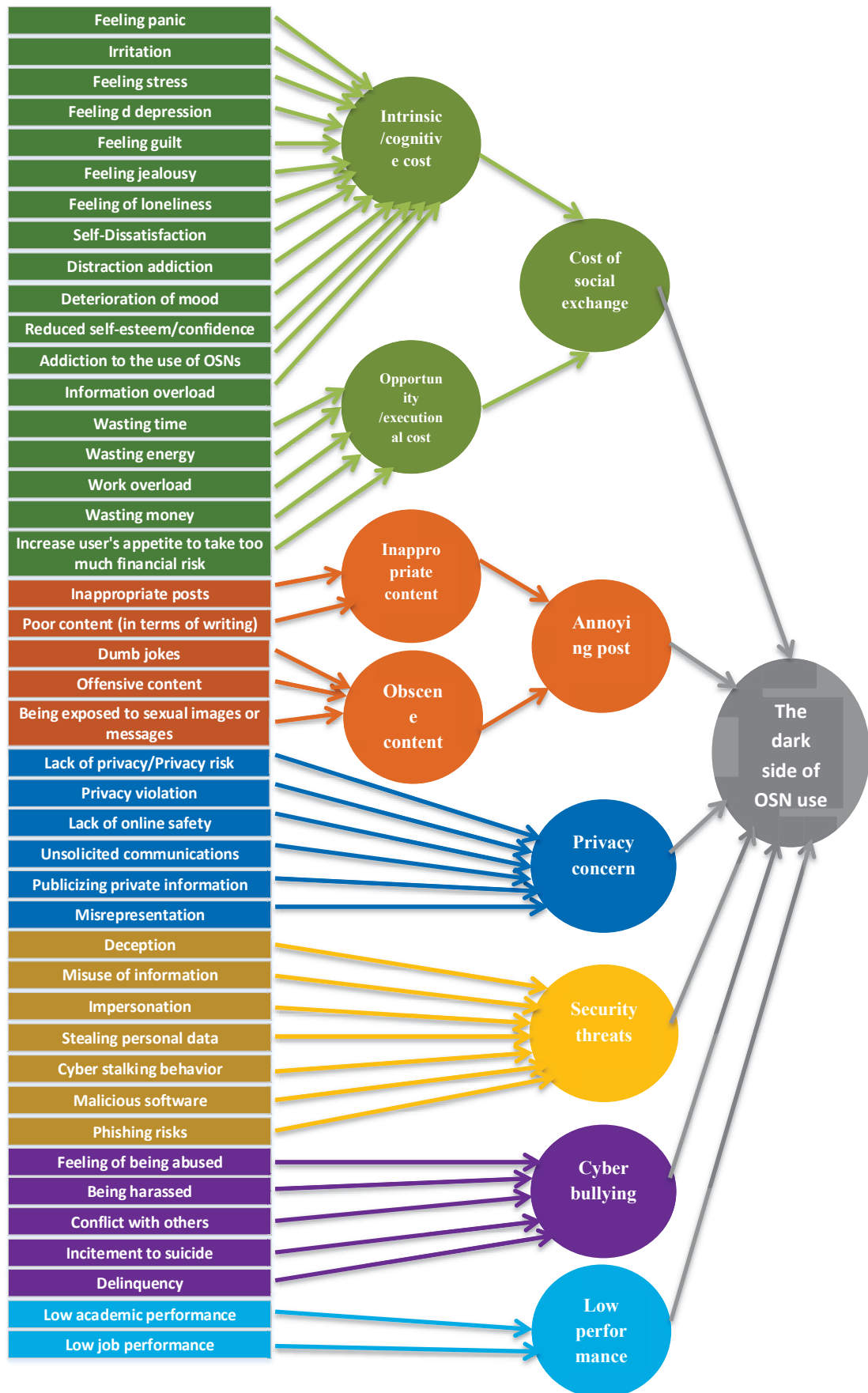
Figure 13: The final version of the framework of the dark side of OSNs use

Chapter 6: Discussion, Contributions, and Future Research

This chapter firstly discusses why this thesis is important and how this research relates to prior studies. Secondly, it outlines the contributions of this thesis and its key findings and their importance. The limitations and future research as the third section of this chapter points out what the limitations of this study are, and what topics are recommended for future research. Ultimately, the last section closes this thesis with the concluding thoughts.

6.1. Discussion

This thesis uncovered 'what the dark side of OSNs use may entail' and then based on this finding proposed 'a framework of the dark side of OSNs use'. This study was motivated by the gaps in the information systems literature on a lack of a comprehensive picture of the dark side of OSNs use. Recent studies have highlighted the negative socio-psychological impacts on their users' lives (Mäntymäki & Islam 2016) and have called for more research contributions to deal with the dark side of OSNs use as well as improving awareness of individual users (Berger et al. 2014; Emerald 2017; Fox & Moreland 2015; Mäntymäki & Islam 2016). In addition, other studies state that not only is there a lack of study in the field of the negative effects and the dark side of OSNs use, but also studying this area has been ignored by most researchers (Berger et al. 2014; Cao et al. 2015). In the same line, major information systems conferences and journals such as Pacific Asia Conference on Information Systems (PACIS 2018), European Conference in Information Systems 2018 (ECIS 2018), and Emerald Group Publishing (Emerald 2017) have recently opened specific track and called for research into the dark side of using social media and OSNs' platforms.

The above all support the current gap in our understating of the dark side of OSNs use, and emphasize the importance of the need for more studies in this area. In particular, this research thesis was inspired by scholars such Tarafdar et al. (2011), D'Arcy et al. (2014), Garcia & Sikström (2014), Shelton & Skalski (2014), Fox & Moreland (2015) and Silic & Back (2016a). All of these studies focused on the dark side of information systems or information technology use and their effects on different aspects of human lives. While adverse outcomes, risks, and negative effects of using OSNs have been considered as the dark side of OSNs, previous studies on this subject only concentrated on one or a few negative effects of OSNs use rather than providing a bigger picture of negative effects of

using these platforms on users. For instance: i) D'Arcy et al. (2014) identified stress, work overload, interruptions, addiction, and misuse as the negative consequences of using OSNs sites, ii) Fox & Moreland (2015) mentioned that narratives surrounding individuals' negative psychological and relational experiences are tied to the social networking site and its consequences can be the dark side of the social networking sites, iii) Garcia & Sikström (2014) stated that the dark side of social networking sites can refers to some adverse outcomes such as, plagiarism, misrepresentation, time pressure, addiction, and negative psychological consequences.

Thus, this research conducted a systematic literature review to lay the groundwork for identifying the negative effects of OSNs use that have been explored by previous studies in order to: i) provide a comprehensive picture of available negative effaces of using OSNs in the literature, and ii) further categorise them and proposed a holistic definition for the dark of using OSNs based on the uncovered characteristics.

Skowronek & McKinney (2010) assert that to define a concept or phenomenon, the characteristics of that concept should be determined. Furthermore, to determine the characteristics of a phenomenon, the attribute values of the phenomenon should be identified and then the identified attributes should be categorised based on their similarities. As a result, each category refers to a characteristic of that concept. Thus, the outcomes of this thesis were uncovered based on findings of prior studies on the negative effects of using OSNs discipline, because before determining the characteristics of the dark side of OSNs use, it was necessary to determine different negative effects of using OSNs as the attribute values. Consequently, this thesis achieved the following findings respectively by running a systematic literature review and an expert interview process::

- Identifying the 43 negative effects or risks of OSNs use as the attribute values of the dark side of OSNs from the previous researches
- Categorising the 43 identified negative effects into 6 distinctive themes as the characteristics of OSNs use (i.e. cost of social exchange, inappropriate content, privacy concerns, security threats, cyber bullying and low performance) by using the coding process as a part of the systematic literature review.
- Understanding what the dark side of OSNs use may entail via the uncovered characteristics of the dark side of using OSNs

- Proposing a validated framework of the dark side of using OSNs by applying reflective versus formative technique on the uncovered characteristics of the dark side of using OSNs

6.2. Contributions

This study contributes to the literature in terms of both theoretical and practical implications as follows:

6.2.1. Theoretical Implications

First: Developing a comprehensive picture of the negative effects of OSNs use

D'Arcy et al. (2014), Garcia & Sikström (2014) and Fox & Moreland (2015) state that the term 'dark side of OSN use' is a broad concept that includes different types of controversies, negative effects, risks or adverse consequences of using OSNs. However, they did not clarify the types or categories of risks that would belong to the dark side of OSNs use. In this study, a systematic literature review uncovered a collection of users' negative experiences of OSNs use, 43 negative effects of OSNs use, which were namely the attribute values of the dark side of using OSNs. These findings then led to proposing a framework of underlying concepts of the dark side of OSNs. To the best knowledge of the author, this study is currently the first effort that provides a comprehensive picture of the negative outcomes of OSNs use, and adds it to the literature on negative experience of OSNs users and provides a useful platform for future research.

Second: Categorizing the 43 negative effects into six groups for representing the dark side of OSNs use for users

To define or represent a concept or a phenomenon, researchers need to uncover the characteristics of that concept based on its attribute values (Skowronek & McKinney 2010). Therefore, the characteristics of the dark side of using OSNs were formed by categorizing the 43 identified negative effects into six groups, and consequently offering a description for the dark side of OSNs use as the adverse consequences surrounding OSN phenomenon such as cost of social exchange, inappropriate content, privacy concerns, security threats, cyber bullying and low performance. These findings are an important and efficient foundation for future research to further investigations on this subject.

Third: Proposing a validated framework of the dark side of OSNs use and validating the framework

The 43 negative effects, eight subcategories and six themes of the dark side of using OSNs as the characteristics of the dark side were used to propose a framework of the dark side of OSNs use. This framework is the first proposed framework of the dark side of using OSNs. It will play an important role in guiding the future research in the field of the dark side of OSNs in particular and social media in general. Validity of the proposed framework was examined based on interviews with 12 experts in the field, which makes it a scientific and reliable framework. This framework has offered a comprehensive picture of underlying concepts of the notion of the dark side of OSNs use.

Fourth: Implications to theories

The framework developed in this study can lead to the extension of existing information system theories, which have been used to elaborate potential impacts of OSNs use. In the past, most of these theories have been used to explain positive implications of using OSNs. For example, some theories such as motivation theory (Lin & Lu 2011), social capital theory (Ellison, Steinfield & Lampe 2011), social networks (Liu et al. 2017), social support theory (Erfani, Blount & Abedin 2016; Maier et al. 2015; Wright 2016), belongingness theory (Erfani, Blount & Abedin 2016; Grieve et al. 2013), sociocultural theory (Erfani, Blount & Abedin 2016; Toetenel 2014; Zourou 2012), social presence theory (Erfani, Blount & Abedin 2016; Kaplan & Haenlein 2010; Lim et al. 2015), persuasion theory (Westerman, Spence & Van Der Heide 2014), social cognitive theory (DeAndrea et al. 2012; Munar & Jacobsen 2014), and communication theory (Youmans & York 2012) have been used in the literature to explore and explain positive effects of using social media or OSNs. The framework developed in this study enables future studies to extent such theories above for exploring and explaining the negative consequences of using OSNs.

Fifth: methodological contribution

One contribution of this research was to mix a well-detailed systematic literature review with expert interviews to make sense of findings. The benefits of this combination were to i) identify the negative effects of using OSNs as the initial data for proposing the framework of the dark side of using OSNs and ii) verify the validity of the proposed framework.

6.2.2. Practical Implications

In addition to the above contributions, this research will lead to a number of practical contributions as follows:

Increase users' awareness about risks and adverse outcomes of OSNs use: This can be achieved through: i) create better connections among OSNs' users, ii) share more meaningful and genuine interactions and iii) reduce the negative effects of using OSNs (Tuunainen, Pitkänen & Hovi 2009). In this study, increasing awareness means notifying OSNs' users of the negative feelings or inappropriate circumstances that they may experience through what they are saying and how they are acting while they are using OSNs platforms. Enhancing awareness can be resulted through helping OSNs' users to connect with one another verbally, nonverbally, and in the community. According to Fox & Moreland (2015), users may not anticipate risks or negative interactions, making them more vulnerable to the negative effects. In addition, recent findings indicate prevalence of users' negative experiences has positive relationship with their lack of knowledge on what risks of using OSNs are and how those risks might happen. Therefore, to decrease the influence of negative consequences of using OSNs, researchers and the community of users should be informed and become familiar with potential problems (Fox & Moreland 2015; Silic & Back 2016a). For example, 95 percent of Victorian students use different types of OSNs platforms and nearly 30 percent of these students do not know what types of risks may be caused via using social networking platforms (Monash-University 2011). According to recent discussion in the Australian Broadcast Company (ABC) News website, since studies indicate that children's mental health is being endangered through social media use, parents need to be aware of problems that may threaten their children whenever their children become addicted to the use of any types of OSN platforms (Kagi 2018). West Australian Premier Mark McGowan, for example, advocates a social media ban for children based on the warnings and reports about the negative effects of using social media. Mark McGowan states that he has forbidden access to social media for his three children and he is hoping more West Australian parents will adopt this policy (Kagi 2018).

Educational content for users: A great way for users to learn about some issues or risks that might threaten them when they are using any kind of OSN platform is through informational digital guidelines. These guidelines should organise key information about

the identified negative effects of OSNs use and put them into a piece of content that catches people's interest. Hence, two types of educational content are recommended: i) each application can provide users with information about risks or negative consequences threatening users while they are using that application, or ii) OSNs developers can create educational platforms with the content of what the negative effects of using OSNs are and how to control, prevent or mitigate them. This is because e-learning or digital training has become a popular mechanism for individual training and has had positive effect on users' performances (Silic & Back 2016a).

Informing policy makers: Findings of this study can have an effective role in setting policies which are plans, courses of action, or sets of regulations adopted by government, organisations, companies, or other institutions to control or mitigate any negative circumstances and to increase discipline (Innvær et al. 2002; Trostle, Bronfman & Langer 1999). Although, OSNs have created some new opportunities such as learning, construction of a wide circle of relationships, and the management of privacy and intimacy for people all over the world especially for children and young people, findings of this study showed that using OSNs can increase the likelihood of new risks such as, cyber bullying, loss of privacy, loss of security, harmful contact and more (Livingstone & Brake 2010). Thus, it is important to consider the negative effects of OSNs use in general and greater attention to 'at risk' children in particular in order to identify implications for future research and setting or developing evidence-based public policy to reduce the negative effects of OSNs use. For example, after reporting some problematic behavior of kids caused by using smartphone like iPhone app, France has moved to ban the use of smartphones in its primary and middle schools (Kawa 2018).

Informing application providers: Currently in the media, there are many conversations about negative effects of using social media or OSNs. As to the conversations or to the current practices in terms of addressing what can go wrong with spending time in social media use, some agencies' websites news have opened discussions and questions whether using social media or OSNs is good or bad. This study can help these conversations with elaborating and identifying what can go wrong by using OSNs, based on the users' negative experiences reported by prior researches. There are some examples of those discussions as follows:

Two major Apple shareholders push for study of iPhone addiction in children (Kawa 2018). These shareholders are concerned that qualities and attractive of iPhone features have caused a public health crisis in general and could hurt children in particular. This discussion not only is on social media, but also on mobile applications. Through this discussion, childrens' access to mobile applications needs to be controlled. Thus, the proposed framework can help in understanding the existing risks with using technology and OSNs applications' features need to be addressed in order to control, mitigate and reduce the negative effects of social media use.

David Ginsberg, director of research, and Moira Burke, research scientist at Facebook have initiated another discussion (Newsroom 2017). These researchers question whether spending time on social media is bad for us. Since using social media is significantly increasing and people are spending more time on such platforms, many users really wonder whether that time is good for them or not. The latter researchers state that as parents, they are concerned about their kids' screen time and their kids' communications through using social media. They are also concerned about spending too much time on their phones while they should pay attention to their family members. They concluded that one of the ways that would be very useful for preventing the negative consequences of using social media is to explore and identify what other studies have found. Therefore, the proposed framework of this study provides a list of negative consequences or risks of using OSNs that can guide the existing conversations about what destructive or threatening effects may entail using social media.

6.3. Limitations & Future Research

Research limitations

One limitation of this study was in relation to the sources used for conducting the systematic literature review, which were limited to sixteen information system journals. Therefore, this study may have missed the chance of finding other potential negative effects of using OSNs, which have been explored by prior studies.

Another limitation of this study was a lack of inputs from OSNs users about negative effects they may have experienced as a result of using these platforms. This study was limited to negative experiences that were reported in the past literature, and thus we have

proposed future research for studying individual users' experience in the following paragraphs.

Both of the above limitations were primarily due to the limited time available to this research as a Master by Research study. I therefore had to limit the scope of the search to limited journals for the systematic review, and did not have the opportunity to explore all information system databases. In addition, I had to rely on two sources of data, systematic review and experts' interviews, in this research and exclude users' direct input into the study. Given these limitation, my objective is to continue this research into a PhD program, and address both of the above areas in my future large scale study of negative effects of OSNs use.

Future research:

This part refers to research areas that were flagged by the systematic literature review for further considerations in the future:

- According to the demographic findings of the reviewed papers through this research, more than 55% of studies focused on Facebook as the most popular platform, 24% of those articles did not mention any specific platform and just 21% of them studied other OSNs platforms. However, there are other popular platforms such as YouTube, Instagram, WhatsApp, Twitter, as well as country-specific applications in which the use of them is significantly increasing. Therefore, they need to be considered by researchers in future research and more studies are needed to elaborate and investigate negative experiences of their users. Findings may find variations in distributions of perceived negative effects across different platforms.

- More than 72% of studies included in the systematic literature review were conducted on OSNs' users living in developed countries. However, two thirds of the internet users live in the developing countries (InternetWorldStats 2018; Statista 2017). Therefore, researchers should consider this region in their future research.

- The reviewed studies surveyed people who mostly were students or employees. This means, they chose their target groups among people who were more accessible. However, there are different groups of people such as in retirement, non-student and the incapacitated that are OSNs' users and need more help to reduce their social issues, which are caused by OSNs use.

- All reviewed studies chose their sample groups from people who mostly were between 13 to 67 years old regardless of their gender. However, study on people who are less than 13 and over 67 is important as well. They are vulnerable people because of lack of information technology knowledge.

- Interviews in this study were limited to the confirmation of systematic literature review findings, and questions were not asked in regards to any additional negative experiences that OSNs users may have experienced. Future research is therefore needed to empirically examine our proposed framework, and seek additional negative effects that can be added to our proposed framework.

- Most of the reviewed studies just explored the negative effects or risks of using OSNs. However, finding the negative effects along with finding their causes can be equally important, because this situation leads researchers to find appropriate solutions faster and easier. Thus, future research can focus on the identified negative effects of OSNs use to detect their causes.

- Almost none of the reviewed research focused on the degree of impact of the risks of using OSNs on the users according to users' gender. It could be another recommendation for future research. This is because gender is an important factor in the extent to which people are affected in unusual situations regardless of individual characteristics. For example, online harassment of women is one of the serious problem that should be more considered by researchers (Raja 2018; Zamaneh 2018).

- The adverse outcomes of OSNs use found as part of our systematic literature review was based on users' explicit self-reported negative experiences. Thus, there may be other implicit negative effects that individual users are not aware they might be under their influence. Thus, researchers should create and develop some mechanisms for detecting potential negative effects of OSNs use.

I have planned to fill some of the above gaps throughout my PhD degree by performing an extensive empirical research.

6.4 Conclusion

The first objective of this thesis was to uncover and categorize the dark side of OSN use; to illustrate the evolution of the existing information system research in this field, and to develop a comprehensive and common understanding for the dark side of OSN use. Furthermore, the second objective was to clarify what the characteristics of the dark side

of OSN are. Then, one of the important purposes of this study was to propose a framework of the dark side of OSN use for developing strategies to reduce the negative consequences of OSNs by future research. Finally, the last one was to verify the validation of the proposed framework.

To address all objectives above, two methods, a systematic literature review and an expert interview were conducted. This research systematically reviewed 29 relevant articles by using the first method. Consequently, 43 negative effects of OSNs use were identified as the attribute values of the dark side of using OSNs. Since the term 'dark side of OSNs use' is a very broad terminology that refers to different types of controversies, risks, negative effects or adverse consequences of using OSNs, the coding process as a part of the systematic literature review guided this research to categorise the 43 identified negative effects as the attribute values of the dark side of using OSNs into six themes (i.e. cost of social exchange, inappropriate content, privacy concerns, security threats, cyber bullying and low performance). Then these themes were introduced as the characteristics of the dark side of OSN use. This classification was based on the similarities or types of those negative effects.

After achieving the characteristics of the dark side of OSN, it was time to demonstrate the relationship among the attribute values and characteristics of the dark side. Thus, a framework of the dark side of OSN was proposed by using the reflective versus formative model. The value of this framework was verified through 12 experts' opinions. The collected data from the expert interview process was analysed by using the content validity method. Mostly (94 %) the proposed framework was confirmed by the experts and the final version of the framework was revised just by very few changes.

In addition to the above achievement, this study contributes to the literature through theoretical and practical contributions. As theoretical implications: i) this study has provided a comprehensive picture of the negative effects of using OSNs which so far has not been done by any research in this area; ii) since there was not a comprehensive and consistent definition for the dark side of using OSNs, this study uncovered what the dark side of OSNs may entail by categorising 43 identified negative effects into six groups as the characteristics of the dark side of OSNs use; iii) this research clarified relationships among the components of the dark side of OSNs use by proposing a framework of the dark side which could be very useful for future research for developing strategies to

reduce the negative consequences of using OSNs; iv) this study argues that most theories have been used to explore and elaborate positive implications of using OSNs. These theories can be extended for exploring and explaining the negative effects of OSNs use. In addition to the contributions above, this research will lead to a number of practical contributions such as i) raising users awareness of the adverse consequences of using OSNs, ii) informing policy makers about what constitutes the dark side of OSNs, iii) guiding practitioners and authorities to develop educational content for users, and iv) informing OSNs companies and application developers about how to protect their users against adverse outcome of platform use.

Appendix

Appendix I

	Negative impacts	Description
1	Feeling Panic	"Panic can be a sudden unreasoning and overwhelming fear or terror, often affecting a group" (Oxford 2017a).
2	Irritation	"Irritation is a feeling of annoyance, especially when something is happening that you cannot easily stop or control" (HarperCollins 2017).
3	Feeling Stress	"Stress is a physiological condition, usually affecting behaviour, and is produced by excessive environmental or psychological pressures" (Oxford 2017a). For example, stress is caused by use of IT due to inability to adapt with IT in a healthy behaviour and manner (D'Arcy et al. 2014). Level of stress in academic students is increased because the use of social media causes users to waste their time (Meier, Reinecke & Meltzer 2016).
4	Feeling Depression	"Depression is a disorder characterized by feelings of guilt, failure, worthlessness or rejection. Frequently a response to a difficult life-situation, depression leads to low self-esteem, self-recrimination and obsessive thoughts. Insomnia, loss of appetite and lethargy are often present, and in severe cases there is a risk of suicide" (Oxford 2017a).
5	Feeling guilt	"Guilt is a moral emotion which stems from mostly rational awareness to actual or anticipated violation of internal values and rules an individual has" (Turel 2016)
6	Feeling jealousy/envy	"Jealousy is properly restricted to contexts involving emotional rivalry, especially regarding the sex instinct" (Oxford 2017a). For instance, it can be caused when users compare their lives with other Facebook friends or their friend count. As well as this, it refers to romantic jealousy (Fox & Moreland 2015).

		Using of OSNs stimulates and increases the jealousy behaviour because individuals feel insecure about their partners and friends' relationship with others(Sánchez, Muñoz-Fernández & Ortega-Ruíz 2015).
7	Feeling loneliness	"The perception of isolation from others that may be real or imagined and causes feelings of sadness, depression, or anxiety" (Oxford 2017a). Some studies show OSNs use increases feeling of loneliness (Matook, Cummings & Bala 2015).
8	Self-Dissatisfactio n	When a person feels dissatisfaction with something, this means he/she is not contented or pleased with it (HarperCollins 2017). For example, Accessibility of Facebook causes its users to spend a lot of time on it and do some activities that are not required. As a result, this circumstance makes the users dissatisfied with themselves, because they miss their life priorities (Fox & Moreland 2015).
9	Distraction addiction	It refers to some people who cannot control their time when they are surfing on Facebook and forget their daily tasks (Fox & Moreland 2015). It happens when you are getting the information you need and the communication you want, without enraging your family, annoying your colleagues, and destroying your soul.
10	Deterioration of mood	Deterioration of mood can be defined as "disorganized behaviour, or catatonia, negative symptoms such as affective flattening, alogia, or avolition, and marked deterioration in work, social relations, or self-care. Associated features include inappropriate affect, anhedonia, dysphoric mood, lack of insight, depersonalization, and derealisation" (Oxford 2017a). Using OSNs drives negative emotional consequence like deterioration of mood (Sagioglou & Greitemeyer 2014).
11	Being exposed to	Using OSN sites increase children's risk of harm such as seeing sexual images, being bullied on the internet, meeting

		new online contacts offline, receiving sexual messages, negative user generated content (Staksrud, Ólafsson & Livingstone 2013)
	sexual images or messages	
12	Reduced self-esteem/confidence	"Confidence is a belief and self-assurance in one's own abilities" (Oxford 2017a). Excessive use of Facebook is associated with reduced self-esteem/confidence, because some users constantly compare themselves with others (Fox & Moreland 2015).
13	Addiction to the use of OSNs	Addiction refers to inability to control the use of a particular substance which causes physiological or psychological dependence (HarperCollins 2017). For example, Internet users may consider severe psychological dependence on some aspect of information technology that it is called addiction. Although using of some technologies such as OSNs provides strong hedonic feeling, this situation disrupts important activities (D'Arcy et al. 2014).
14	Wasting time	It refers to users who cannot control their time when they are surfing on Facebook (Fox & Moreland 2015; Liu et al. 2016; Xu et al. 2009).
15	Waste energy	It refers to users who spent a lot of time on Facebook and do not use their energy for doing their important tasks (Fox & Moreland 2015; Liu et al. 2016; Xu et al. 2009).
16	Waste money	Financial loss is caused by misuse of information in OSNs (Liu et al. 2016; Xu et al. 2009)
17	Work overload	Work overload is another issue that is occured by some negative aspects of information technology use such as, addiction to use of information technology tools, and interruption of information technology use among different daily tasks (D'Arcy et al. 2014).
18	Information overload	when the amount of information for process is more than the capacity to process, information overload occurs and it is an undesirable condition (D'Arcy et al. 2014).

19	Increased user's appetite to take too much financial risk	Using OSNs activates a cushion which is financial support from an online group of friends. This situation increases users' financial risk-taking (Chan & Saqib 2015). "Financial wealth can be gained or lost when taking risk resulting from a given action or inaction, foreseen or unforeseen. Risk can also be defined as the intentional interaction with uncertainty" (Oxford 2017a).
20	Inappropriate posts	It refers to negative posts to shock, disgust or irritate users by lewd, offensive or detrimental posts such as comments, photos and videos (Fox & Moreland 2015).
21	Unintentionally annoying behavior (e.g. poor email)	It refers to poor email or text messages in terms of writing that can happen with some users due to poor etiquette in OSNs. This situation aggravates other users because of typo and punctuation errors (Preece 2004).
22	Dumb jokes	This is a problem that can be caused by some users in order to aggravate other users. It can happen due to poor etiquette in OSNs (Preece 2004).
23	Offensive content	A clever joke of a person may be seen as an offensive insult to other people because people with different languages, cultures and background are participating in OSNs (Preece 2004). Therefore, "any published or broadcast content such as articles, photographs, films, or websites that is likely to be upsetting, insulting, or objectionable to some or most people" (HarperCollins 2017).
24	Lack of privacy/Privacy risk	It refers to the users' inability to hide something from their existing Facebook friends or even from others outside of their networks. It happens due to a lack of privacy. Also, visibility, persistence and accessibility of Facebook cause privacy frustrations and lack of control in management of private information (Fox & Moreland 2015).

25	Privacy violation	It is happens when some users allow themselves to broadcast their friends or other users' information without any permission or authority (Fox & Moreland 2015).
26	Online Safety	"Safety is the state of being safe from harm or danger" (HarperCollins 2017). However, in OSNs, information safety is minimized through misuse of information (Liu et al. 2016; Xu et al. 2009).
27	Unsolicited communications	Unsolicited communications may happen for everyone who "engages in online therapeutic and other services. For those who do offer online services, it will require use of secure computer systems, creating record-keeping procedures for online communications, training workers in online communication, creating policies regarding what services may be offered online by whom, developing policies for handling both expected and unsolicited e-mail, and evaluating the impact of their online services" (Oxford 2017a). Risk of misuse of personal information includes unsolicited communications (Liu et al. 2016)
28	Publicizing private information	Risk of misuse of personal information includes publicizing private information (Liu et al. 2016)
29	Misrepresentation	"If someone misrepresents a person or situation, they give a wrong or inaccurate account of what the person or situation is like" (HarperCollins 2017). Some OSNs' users may present themselves with false personal information in order to deceive, mislead, reduce their vulnerability or simply for fun (Jiang, Heng & Choi 2013). Misrepresentation refers to falsifying personal information when Individuals adopt misrepresentation to protect themselves (Jiang, Heng & Choi 2013).
30	Deception	Deception refers to Intentional acts to mislead others who are vulnerable to attack (Tsikerdekis & Zeadally 2014).

31	Misuse of information	Ease of sharing personal and private information in addition to the positive aspects provides an easy way to misuse it (Liu et al. 2016). Another risk of using IT is intentional misuse of others' private information and it has been identified as a top security threat for individuals or firms (D'Arcy et al. 2014).
32	Impersonation	"Impersonation (online impersonation) 1. Setting up a social media account, page, or profile which purports to be that of someone else (using their name and likeness) but which is wholly unauthorized by them and against the terms of service of such accounts: typically for some malicious or fraudulent purpose. Compare fake account. 2. Hacking into someone else's social media account and posting in their name. See also fraping. 3. (identity theft) Using someone's credit card or bank details to buy goods and services by posing as that person" (Oxford 2017a).
33	Stolen personal data	Stolen personal data means data breach. "A data breach is a security incident in which sensitive, protected or confidential data is copied, transmitted, viewed, stolen or used by an individual unauthorized to do. Such data breaches may involve financial information such as credit card or bank details, personal health information (PHI), personally identifiable information (PII), trade secrets of corporations or intellectual property. Most data breaches involve overexposed and vulnerable unstructured data – files, documents, and sensitive information" (Wikipedia 2017).
34	Cyber stalking behaviour	Cyber Stalking behaviour can be defined as intentional online intrusion via accessing other users private and security information like an account password to control and use that account (Sánchez, Muñoz-Fernández & Ortega-Ruíz 2015). Cyber stalking is a crime in which the attacker harasses a victim using electronic communication, such as e-mail or

		instant messaging, or messages posted to access to victim's information account.
35	Malicious software	This refers to some problems such as bogus, virus, warnings that can be carried out by some users in order to aggravate other users. It happens due to poor etiquette in OSNs (Preece 2004).
36	Phishing risks	Phishing can be defined as an attack when the attacker attempts to fraudulently retrieve valid users' confidential or sensitive information by simulating electronic communication from a trustworthy source (Jakobsson & Myers 2006; Silic & Back 2016b)
37	Feeling of being abused	Abuse refers to "Inappropriate use or treatment of materials, techniques, persons, programmes, or language" (Oxford 2017a).
38	Being harassed	Harassment refers to "Intimidation, bullying, threatening, or coercive behaviour, including manner of speech, usually by a superior toward a subordinate, sometimes by colleagues in an organization" (Oxford 2017a). Some users can target other users to harass them via OSNs use (Dredge, Gleeson & De la Piedad Garcia 2014b)
39	Conflict with others	"Conflict is serious disagreement and argument about something important. If two people or groups are in conflict, they have had a serious disagreement or argument and have not yet reached agreement" (HarperCollins 2017). It comes out when a user does not comment back for his/her friend (Fox & Moreland 2015).
40	Incitement to suicide	Threat of privacy violation such as broadcasting users' personal and private movies over social media stimulates users to commit suicide (Fox & Moreland 2015).
41	Delinquency	"Delinquency is literally misdeed, guilt, or neglect of duty, and hence in this sense not strictly defined by law. However, particularly when referred to as juvenile delinquency, the term

		is often used to embrace a broad range of behaviour, from that found offensive to respectable values (noisy teenage gatherings, truancy) to petty and occasionally more serious crime (such as shop-lifting, breaking and entering, and car theft)" (Oxford 2017a).
42	Low academic performance	Facebook's users who are students need to check their Facebook before going to their classes. Therefore, they will spend too much time on Facebook so they either arrive late to class or lose their class (Fox & Moreland 2015). Over-involvement with OSNs sites by students causes them to spend too much time and lose their attention. Therefore, their academic performance will be reduced (Paul, Baker & Cochran 2012).
43	Low job performance	OSNs use has a significant negative impact on job performance. This means, when employees with low performance contribute on work-related or non-work-related OSNs, they may distracted with unrelated work. Thus, they will lose their primary responsibilities (Lu et al. 2015).

Appendix 1: A definition or description for each code or the negative effects of OSNs use

Theme's Name	Definition
Cost of Social Exchange	Cost refers to expenses made for accomplishing anything (Yan et al. 2016). According to Social Exchange Theory (SET), cost can be defined as negative consequences from exchange behavior that it reduces behavior frequency (Tong, Wang & Teo 2007; Yan et al. 2016). SET divides costs into two types namely, intrinsic cost (cost of psychological problems/cognitive cost) and opportunity/ executional cost (Tong, Wang & Teo 2007). Intrinsic cost refers to any psychological problems or pressures such as pain, irritation, fatigue, unpleasantness, and annoyance (Tong, Wang & Teo 2007) Some researchers introduce the time, energy, material and financial resources as opportunity or executional cost that anyone spends when she/he engages in certain activities (Tong, Wang & Teo 2007; Yan et al. 2016).
Inappropriate or Annoying content	Some internet users send their text messages or email without considering the rules of writing (Preece 2004). These messages are called inappropriate content because of spelling mistakes and poor punctuation. In addition some content are annoying content because producers of these contents are purposely or unwittingly disturbing some other users (Preece 2004). Dumb jokes, for example is an example of these contents.
Privacy concerns	Privacy concerns refer to users' intellectual views of fairness in the field of privacy (Anderson & Agarwal 2011). According to Fox & Moreland (2015), some OSN applications like Facebook ultimately control users privacy and limit their ability to hide some of their information from the world (Ellison 2007). Furthermore, sometimes, users need to make an immediate decision to share their private information in order to respond to some online transactions

	(Jiang, Heng & Choi 2013). Therefore, time limitation to make a rational decision and privacy frustration cause some problems such as, privacy violation or publicizing private information (D'Arcy et al. 2014; Fox & Moreland 2015).
Security threats	OSNs adaption is of security concern, because using of OSNs causes security incidents (He 2012). These incidents can be like confidential data loss, misuse of information or impersonation (D'Arcy et al. 2014; Liu et al. 2016). Thus, according to He (2012), some factors like insufficient authentication controls, phishing, and cross site request fake threaten the security of OSNs. Moreover, Silic & Back (2016b) argue that although online social networks have become important security holes networks for swindlers persons to do different types of fraud and deception, this research area as one of the most important negative effects of using OSNs has received the least attention.
Low performance	Low performance refers to poor or incomplete performance when one who fails to attend to his or her responsibilities and accomplish them according to a set of standards (Fox & Moreland 2015; Paul, Baker & Cochran 2012). There is a significant positive relationship between waste of time by using OSNs and low academic performance (Fox & Moreland 2015; Paul, Baker & Cochran 2012) and low job performance (Fox & Moreland 2015; Lu et al. 2015). Although, using any kind of OSN helps employees to share their information among each other, they may be involved in different kinds of online interaction activities that may create complicated influence in their job performance (Fox & Moreland 2015; Lu et al. 2015). Moreover, according to some studies, there is a significant positive relationship between waste of time by using OSNs and low academic performance (Fox & Moreland 2015; Paul, Baker & Cochran 2012). In addition to above states, some researchers argue that the more time spent on OSNs and more OSN memberships increase the level of stress and decrease the quality of life (Bevan, Gomez & Sparks 2014).

Cyber bullying	Cyber bullying can be defined as an aggressive and intentional act carried out by an individual or a group of attackers. They attempt to harm and imbalance the power of their victims by using the electronic form of contacts (Dredge, Gleeson & De la Piedad Garcia 2014a). Therefore, cyber bullying means bullying in cyber space (Dredge, Gleeson & De la Piedad Garcia 2014a). Cyber bullying negatively impacts on general aspects of a victims' life such as emotional, behavioural, cognitive, social and physical (Dredge, Gleeson & De la Piedad Garcia 2014a). Cyber bullying is another form of bullying that has become an issue in relation to workplace bullying or competition (Slonje, Smith & FriséN 2013) and workplace bullying induces distress in the work environment (Nelson & Simmons 2003). In addition, cyber bullying means to use communication devices, services and information to harrass, intimidate and bully internet users (Hong et al. 2014). Cyber bullying is an invisible fist from the point of view of these authors. Cyber bullying means harrass or embarrass other people via some act such as sending agressive and threatening comments via text message, email, instant messaging, personal website (Slonje & Smith 2008; Smith et al. 2006; Willard 2007), social networking sites, and gaming sites (Mishna, Saini & Solomon 2009). A researcher (Willard 2006, 2007) argues that there are several types of cyber bullying and divided them as follows: 1) online fights by using offensive language and information; 2) destroying the reputation and relationships of a person by distributing photos, false information, rumors and slandering; 3) penetrate into a personal web account to defame the victim through falsifying his/her information; 4) embarrass an individual by spreading his/her secrets; 5) annoying a person by removing her/him from a group; 6) annoying a person by sending annoying messages. Smith et al. (2008) explain that cyber bullying is an aggressive and purposeful

	act performed by an individual or a group of people against victims who cannot easily defend themselves. Cyber bullying has been defined as evil and frequent use of information and communications technologies to threaten other people. It could be a message that is sent by individuals or a group.

Appendix 2: A definitions or descriptions for the themes of the dark side of OSNs use

Appendix III

Invitation letter
Dear ……….
I am writing to respectfully invite you to an expert interview session which is about dark sides of Online Social Networks (OSNs) use and verifying the characteristics of each theme of the dark sides. This study is being conducted by me as a part of my master by research in computing science at University of Technology Sydney (UTS) under the supervision of Dr. Babak Abedin (my principal supervisor) and Dr. Shadi Erfani (my co-supervisor) in School Management and Leadership.
The objectives of this study are to: (i) uncover and categorize the darks sides of OSNs use, (ii) verify the validity of uncovered categories and themes of the dark sides and, (iii) provide a framework of the dark side of using OSNs for future research to develop strategies for reducing the negative effects of OSNs use. Since, the categories and themed have been uncovered, it is time to check the validity of their characteristics by performing a qualitative method which is an expert interview research.
I became familiar with you through reading one of your interesting articles which is relevant to my research area. I would appreciate if you could please accept my invitation to participate in this interview session which will be conducted in August. If so, please indicate what date and time suit you. Then, this face to face or any online connection session will be conducted at the time that is convenient for you. For more information, the interview will takes approximately one hour.
Should you have any question please do not hesitate to contact me.
Kind regards,
Layla Boroon
Master by Research Student in Computing Science   School of Systems, Management and Leadership   Faculty of Engineering and Information Technology   University of Technology Sydney

Appendix 3: Invitation letter

Date of Interview: / / Time of Interview: Duration of Interview:	**Interview Form**	**≋UTS** UNIVERSITY OF TECHNOLOGY SYDNEY

The purpose of this study:

Use of online social networks (OSNs) has increasingly grown over the past few years. Using of OSNs causes both positive and negative socio-psychological impacts on their users' life. Although, there are a lot of studies about the influence of OSNs use, yet most of the extant literature has so far focused on their positive sides, leaving the dark sides with less attention. This means, most studies in the field of using OSNs have focused on the positive aspects of OSNs and study on the negative ones have been ignored by researches. While some research has previously investigated some negative aspects of OSNs, they often looked at specific and isolated negative impacts and have missed to offer a comprehensive picture of various categories of darks sides of OSNs use. Therefore, the main objectives of this study are as following:

Objective 1: To explore negative effects of OSNs use reported in the past studies.

Objective 2: To categorise the negative effects of using OSNs into distinguishing groups of characteristics, and to understand what the dark side of OSNs use may entail

Objective 3: To propose a framework of the dark side of using OSNs for guiding the future research on developing strategies to reduce users' negative experiences of using OSNs.

Objective 4: To validate the proposed framework and characteristics of the dark side of OSNs use

The purpose of interview is to:

- Verify the characteristics of the themes of the dark sides of OSNs use
- Modify the characteristics of each theme if it is necessary

Interviewee's information

Name	Expertise and Experiences

Interview Questions:

1. Whether this negative impact belongs to this pattern coding or theme?

2. If not so which pattern coding or theme is more relevant?

3. Do you have any general comment for this foundation?

Do you allow me to record your name in the table of experts' panel?

Appendix 4: Interview form

Name	Affiliation and Experiences	Interview Date
Expert 1	This expert is a PhD holder in the field of information systems. Her research interests are in innovative applications of technology to improve performance in health care, energy, education, telecommunication, construction and the water industry, e-Health, e-business, open innovation and cloud computing. Her current work focuses on user reactions to new information technologies, social networks, and e-health.	20.07.2017
Expert 2	This expert is a PhD holder in the field of information systems. His research interests and expertise are around the impacts and implications of social computing applications on organizations and people, and how social information systems empower individuals and businesses to create value and innovate. Equally, his research also includes dark sides of the use of social computing platforms and how vulnerable groups of users may be impacted by them.	26.07.2017
Expert 3	This expert is a PhD holder in the field of information systems. He is the creator of the awareness net modeling language which is a high-level modeling language for collaborative business processes and his research interest include e-learning, knowledge management, e-collaboration, and higher degree research education.	10.08.2017
Expert 4	This expert is a PhD holder in the field of information technology & business. His research interests are:	11.08.2017

	• Identifying new ways to create value for businesses and communities by using technology and social media • Social aspects of users in system design • Social entrepreneurship • Impact sourcing • Trans-disciplinary research which combines expertise from different fields such as health, IT, social science and others.	
Expert 5	This expert is a PhD holder in the field of business and economics. Her research interests are specifically related to the impact of electronic commerce and what this means for human resource management practices and policies in the services sector, in particular, the retail banking industry.	22.08.2017
Expert 6	This expert is an associate professor in the field of information systems. His research interests include software engineering, and electronic commerce.	01.09.2017
Expert 7	This expert is a PhD holder in the field of information technology. His research interests are information systems, green information systems, information systems security, emergency management, and e-government.	07.09.2017
Expert 8	This expert is a PhD holder in the field of clinical communication sciences and developmental psychology Research expertise: • Palliative and supportive care (especially cancer) • Advance care planning • Outcome measurement	14.09.2017

Expert 9	This expert is a Professor holder in the field of software engineering and the director of women in engineering and information technology. Research interests: • Requirements Engineering • Software Engineering • Digital Transformation • Global Software Development • Software Process Improvement • Knowledge Based Software Engineering • Information Technology Services Design and Management • Information Systems Development • Software Product Line Engineering • Service Oriented Software Engineering • Technology Adoption • Mobile Learning	26.09.2017
Expert 10	This expert is a PhD holder in the field of information technology. Research interests: • Decision Support systems • Uncertain Information Processing • Risk and Safety-Related Systems	26.09.2017

	• Human Factors	
Expert 11	This expert is a PhD holder in the field of information systems. His research interest includes management control systems, corporate governance, strategic management, information systems, and inter-disciplinary areas.	18.10.2017
Expert 12	This expert is a PhD holder in the field of computer science. In her PhD study, she developed sophisticated network theory-based algorithms and innovative mathematical approaches to analyse the 'big data' from a new perspective. This innovative research and its applications are published in leading journals.	25.10.2017

Appendix 5: Participants information

Interview Protocol
1. Logistics To record the following information: • Participant's name • Update or modify participant's expertise • Date of interview • Place of interview 5. Introduction • Greet the participants • Brief description about the purpose of the project, the objective of the interview, and other details in the participant's information form • Obtain the participant's permission to record the voice of interview • Inform the participant of her/his right to withdraw at any time, change the time and location of the interview session and pause the voice recording 6. Administrative Procedures • Prepare the participant's information form (i.e Appendix IV) • Inform the participant of the beginning of the voice recording 7. Questioning Start the interview by asking the questions in order of the question list 8. Termination Thank the participant for sharing his/her knowledge and information

Appendix 6: interview protocol

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