Social Media and Tacit Knowledge Sharing: Developing a Conceptual Model

Sirous Panahi , Jason Watson , Helen Partridge

***Abstract*—**With the advent of social web initiatives, some argued that these new emerging tools might be useful in tacit knowledge sharing through providing interactive and collaborative technologies. However, there is still a poverty of literature to understand how and what might be the contributions of social media in facilitating tacit knowledge sharing. Therefore, this paper is intended to theoretically investigate and map social media concepts and characteristics with tacit knowledge creation and sharing requirements. By conducting a systematic literature review, five major requirements found that need to be present in an environment that involves tacit knowledge sharing. These requirements have been analyzed against social media concepts and characteristics to see how they map together. The results showed that social media have abilities to comply some of the main requirements of tacit knowledge sharing. The relationships have been illustrated in a conceptual framework, suggesting further empirical studies to acknowledge findings of this study.

***Keywords*—**Knowledge sharing, Tacit knowledge, Social media, Web 2.0

I. Introduction

TACIT knowledge, the knowledge resides in individual's head in forms of experience, know-how, insight, and so on, is the most valuable and significant part of human knowledge existed [1], [2]. It plays an important role in improving individual and organizational productivity and competitive advantage. For example, it is perceived as an important asset in improving quality of work, decision making, organization learning, productivity, competitiveness, serving customers, producing goods, accuracy of task performance, and major time saving for individuals and organizations [3-5]. As a result, tacit knowledge sharing is critical for individuals and organizations.

From a knowledge management (KM) perspective, documented explicit knowledge is easy to be shared and managed through the use of information and communication technologies (ICT) [6], [7]. Whereas, the unstructured nature of tacit knowledge makes it difficult to be easily managed and shared by at least traditional knowledge management systems (KMS) [7]. It has been argued that traditional mechanisms of tacit knowledge sharing, such as apprenticeship/mentoring, face-to-face meetings/chatting, direct observation, etc. is no longer cost effective and feasible in the new fast growing business models [8-10].

Sirous Panahi is with the Queensland University of Technology, Brisbane, QLD 4000, Australia (phone: +61 435 843205; fax: +61 7 3138 9390; email: sirous.panahi@student.qut.edu.au). He is also with Tehran University of Medical Sciences, Iran.

Dr. Jason Watson is with the Queensland University of Technology, Brisbane, QLD 4000, Australia (email: ja.watson@qut.edu.au)

Prof. Helen Partridge is with the Queensland University of Technology, Brisbane, QLD 4000, Australia (email: h.partridge@qut.edu.au)

Traditional KMS have also been found ineffective in this regard. Most of them were intranet-based, centralized within an organization with lack of interactivity and most important that they had ignored people agent in KM processes as one of the main components of KM [3], [11], [12]. Rapidly moving current global economy requires faster learning and effective ways of tacit knowledge flow [13].

For tacit knowledge sharing technologies needed that support free-form communication and collaboration [14]. With the advent of new web technologies such as social web initiatives, it seems there now exist new opportunities to facilitate experiential knowledge sharing among experts [15]. According to Abidi *et al.* [16], social web paradigm can be helpful for tacit knowledge sharing through interactive and collaborative technologies, such as social networking and online discussion forums, where a community of specialized practitioners can share, critique and validate their collective experiential knowledge. Osimo [17] and Steininger *et al.* [18] have also argued that social web platforms are particularly effective tools in facilitating tacit and informal knowledge sharing among individuals.

In spite of viewing social media as potent tools for tacit knowledge sharing by some researchers, there is still a lack of understanding on how social media may facilitate tacit knowledge sharing among experts, how can maximize the benefits, and how to tailor social media platforms for specific needs of professionals. Therefore, to better understanding the phenomenon of tacit knowledge sharing in social media space, this study is intended to make a theoretical link between social media concepts and characteristics with requirements of tacit knowledge creation and sharing to find out probable potential of social media in facilitating tacit knowledge sharing.

This paper is organized as follows. First, tacit knowledge has been defined followed by a discussion on social media characteristics. The third section reviews IT (information technology) and tacit knowledge sharing schools of thoughts. The fourth explains research method. The fifth section discusses the commonalities between tacit knowledge sharing requirements and social media features. Conclusion and direction for future work is the final part of this paper.

II. Tacit knowledge defined

Following Nonaka and Takeuchi's [19] classification of knowledge, which is still the most widely used categorization of knowledge in literature [20], knowledge can be viewed as a spectrum which extends from completely tacit to totally explicit [3]. Explicit knowledge refers to knowledge that has been articulated and written down. Examples are knowledge published in books, journals, manuals, guidelines, databases,

and so forth [21]. On the other hand, tacit knowledge refers to personal knowledge resides in individual's head in the forms of experience, know-how, insight, expertise, personal believes and so on. This type of knowledge can be found in everyday discussions, face-to-face informal meetings, and reports.

Unlike explicit knowledge, tacit knowledge is more dependent to its human carrier [22]. Properties of these two types of knowledge are shown in TABLE I. The main issue of KM is associated with managing tacit knowledge rather than explicit knowledge [2], [23].

TABLE I
PROPERTIES OF TACIT AND EXPLICIT KNOWLEDGE

Tacit Knowledge	*Explicit knowledge*
- Resides in human minds - Highly individual and personal - Learnt through experiences, skills, observation, intuitive feeling, mental modes, beliefs, and values - Unstructured, difficult to see, codify, estimate, investigate, formalize, write down, capture and communicate accurately - Unconscious knowledge (Both known and unknown to the holder) - Job specific, context-specific - Experience based, 'knowledge-in-action' - Transferred through conversation and narrative (story-telling, discussions, etc.) - Know-how - Experts knowledge	- Articulated, structured and documented - Learnt through instruction, recitation, or repetition - Easy to recognize, codify, formalize, store, share, communicate, and use - Can be found in books, journals, databases, etc. - Consciously accessible - Know-that, know what - Academic knowledge

Sources: [3], [24-26]

III. SOCIAL MEDIA CHARACTERISTICS

Social media can be defined as "collaborative online applications and technologies which enable and encourage participation, conversation, openness, creation and socialization amongst a community of users" [27]. A wide variety of characteristics and capabilities have been defined for social media in the literature. However, for the purpose of this study, those features of social media have been considered that are relevant to knowledge sharing purposes. They are the capabilities of social media that encourage, support, and enable people to share their knowledge easily and effectively through different mechanisms. These characteristics of social media can be categorized into four features:

User-generated content: Co-creation of the content is one of the main characteristics of social media [27-29]. Users are no longer just simple reader, but rather they can contribute in creating, editing, commenting, annotating, evaluating, and distributing original contents in social media space [30]. Indeed, O'Reilly's [31] principle of "harnessing collective intelligence" in web 2.0 environment happens when users collectively participate and collaborate in content generation [32].

Peer to peer communication: What differentiate social media from old web technologies is its power in connecting users to users (one-to-many) in an interactive way, compared to old approach of linking users with contents [33]. Connectivity is the main feature of social media, enabling people easily to stay connected with each other in a real-time and in a global base [27], [32], [33]. Communication is essential for knowledge sharing [34]. Social media have provided an effective channel for social interaction and real-time conversations between users in forms of chatting, video/telephone conferencing, etc.

Networking: Building a community of users is another main characteristic of social media [28], [30], [33]. It has enabled people with common interest gather together in an online space, locate each other, share their profiles, brand themselves, develop relationships, discuss freely about their everyday issues, and transfer their knowledge and experiences. Establishing a knowledge community and expert locating services in social media help to implicit knowledge sharing among individuals [34].

Multimedia oriented: Another main characteristics of social media applications is enabling users to store and share multiple content forms such as text, image, audio, video, and other formats in an interactive and easy way [35], [36]. This provides opportunity for users to easily share their own created multi-media files, tag, and comment on them in social web sites. As a result, millions of multimedia contents have been exchanged among individual users since social media platforms get launched. YouTube, Flicker, and various Podcast services are examples of social media for multimedia sharing which allows people to share variety of video and photo files with different subjects [37].

User friendly: Social media is best known for ease of use applications that do not require high technical proficiency or long term formal courses [29], [38-40]. They are easily accessible and open for everybody to try and participate in any aspects of existing facilities [33], [40]. Simple, dynamic, attractive, joyable, easy for multimedia publication, customized, and cost effective are some of the main attributes are given for social media applications [24], [29], [38]. There are rarely any constrains in accessing or using social media tools [33].

The combination of those features and associated tools have made social media good channel for knowledge sharing activities. It helps people get connected, communicate with each other, build relationship, develop trust, and share their knowledge. It supports knowledge creation, distribution, and visibility of knowledge more effectively compared to traditional knowledge management systems [34].

IV. IT AND TACIT KNOWLEDGE SHARING?

There is a major debate among researchers about whether information technology (IT) can have a role in tacit knowledge sharing among individuals. Some, particularly before social web researchers, insist that tacit knowledge sharing by using IT is too limited if it is not absolutely impossible to achieve [3], [41-43]. Others argue that IT can facilitate tacit knowledge sharing although it may not be as rich as face-to-face interactions [5], [9], [44-52].

Each school has its own reasons and explanations. However, perspectives of the second school (advocators of IT contribution to tacit knowledge sharing) seem more reasonable and acceptable than the earlier one. Tacit knowledge cannot be

regarded as a binary digit (0 or 1), pure tacit or pure explicit. The notion of the "degree of tacitness" or "the degree of explicitness" is more meaningful when examining the type of knowledge shared in a specific context [53], [54]. In addition, constraining tacit knowledge sharing mere to tacit-tacit conversion (socialization) may not be a good examination of tacit knowledge sharing phenomenon through IT assisted communications. Every knowledge (including explicit knowledge) has components of tacit dimension [43], [55]. Therefore, every tacit-tacit as well as tacit-explicit conversions and vice versa could be regarded as a tacit knowledge sharing phenomenon [49]. This is what misguided in the most investigation of IT- facilitated tacit knowledge sharing.

Today, it can be argued that face-to-face communication is no longer the principal way of tacit knowledge sharing, particularly where experts are not always geographically co-located, but must change their experiential tacit knowledge. Therefore, today the use and optimization of IT for facilitating tacit knowledge sharing is almost inevitable [50]. IT certainly can enable individuals to share their tacit knowledge (or at least the knowledge with low to medium degree of tacitness) by supporting various conversions of tacit-explicit knowledge, although it may not be as rich as face-to-face interactions. It can provide a field that people freely express their personal new ideas, perspectives, and arguments. It can establish a positive dialog among experts enabling them socially interact about their job related issues. It can build an environment that allows experts locate each other and develop the domain of their professional network. And finally it makes information more available by then enables people to arrive at new insights, better interpretations, etc. [5], [9], [46], [49].

V. Research Method

The methodology undertaken in this study is literature review analysis and connecting concepts in a conceptual framework. First, major requirements of tacit knowledge sharing, essential factors that should be present in an environment in which tacit knowledge sharing takes place [56], have been identified by systematic review of literature using content analysis approach. Next, selected requirements of tacit knowledge sharing have been discussed in relation to the social media characteristics and capabilities. Finally, a conceptual model has been developed to illustrate the identified relationships among these two subjects.

To identify major requirements of tacit knowledge sharing, prospective set of articles was drawn up by searching popular KM online databases such as ProQuest, Ebsco-Host, Emerald, Web Of Science, Elsevier, ScienceDirect, and Google Scholar/books. No time and geographical limitations were considered. But, the language limitation (English) was applied to the selected articles. The combination of the following terms used for searching the aforementioned databases:

"Tacit/implicit+knowledge+sharing/transfer/dissemination /exchange +requirements/enablers/drivers/prerequisites/ determinants/essentials/conditions/mechanisms"

To ensure about the quality of papers, cases having less academic rigor (not published in peer-reviewed scholarly publications) or having inadequate discussion about the topic were discarded from the sample. Finally, near to seventy articles related to tacit knowledge sharing requirements were chosen for the analysis. Initially, exact statements of authors which explicitly or implicitly stated some requirements for tacit knowledge sharing were collected and summarized in a table. Then, those which had a close meaning combined together.

A long list of enablers has been found for tacit knowledge sharing in literature, which will be published in another paper. However, for the purpose of this paper, only five major requirements have been chosen. Selection criteria have been discussed in the next section.

VI. Social Media for Tacit Knowledge Sharing Commonalities and Hypotheses

With the advent of social web technologies some researchers argue that these technologies have abilities to alleviate some of the issues and challenges existed in the tacit knowledge sharing process among experts. For example, Khan and Jones [57] suggested that as new emerging social web technologies in forms of online social networks, blogs and wikis are being used widely in organizations, these new ways of communication and communities must be addressed in the discussions on tacit knowledge sharing. Hsia *et al.* [15], Abidi [16], and Steininger *et al.* [18] have also addressed that social web technologies are effective tools to transfer tacit knowledge among professionals.

As mentioned earlier, the main purpose of this paper was to see how social media concepts and capabilities primarily map to the tacit knowledge sharing requirements. To achieve this purpose, first we identified conditions and requirements that tacit knowledge sharing needs to take place in the previous section. The purpose of this paper was not to discuss the degree of importance, relevance, or accuracy of the identified tacit knowledge sharing factors in detail. The goal was mere identification of tacit knowledge sharing major requirements and mapping them with social media characteristics and concepts.

The literature analysis showed that there are five major commonalities between social media concepts and characteristics and tacit knowledge sharing requirements. The commonalities were selected based on criteria such as highly cited in literature and applicability to social web concepts and capabilities. For instance, factors such as apprenticeship /mentoring or practical experience which are fairly impossible in social media space were excluded from this study. Factors related to personal characteristics (e.g. talent, personality, self-efficacy, etc.) were also excluded from the analysis. Since, the study is intended to investigate technological contributions rather than personal motivators.

Selected requirements of tacit knowledge sharing are presented in TABLE II, accompanied with sources stressing these indicators in the two area of the topic: tacit knowledge

sharing and social media. The selected requirements would be matched to the social web characteristics and capabilities to find out their relationship, to formulate hypothesis, and to develop a conceptual model, which will be discussed in the following sub-sections.

TABLE II
SELECTED DIMENSIONS IN THE TWO MAIN DOMAIN OF STUDY

Dimensions	Tacit knowledge sharing Studies	Social web studies
Social interaction	[3], [7], [19], [25], [49], [52], [55], [58-60], etc.	[7], [38], [49], [61-65], etc.
Experience sharing	[3], [26], [45], [49], [55], [66-68], etc.	[27-29], [36], [40], [69-72]
Observation	[7], [19], [26], [66], [73-77], etc.	[36], [78-81]
Informal relationship /networking	[3], [14], [25], [73], [82-84], etc.	[27], [65], [70], [85-87]
Mutual trust	[7], [58-60], [66], [83], [84], [88], etc.	[89-94]

A. Social Interaction

Social interaction in forms of face-to-face communication, conversation, verbalization, discussing, and dialoguing has been determined as a main perquisite for tacit knowledge sharing in almost all reviewed literature (See TABLE II). For instance, Polanyi [55], who first originated the term tacit knowledge, asserts that close interaction is necessary for tacit knowledge transferring amongst individuals. Murray and Peyrefitte [52] deem interpersonal interactions necessary for efficient diffusion of tacit knowledge. Yang and Farn [58] have also viewed tacit knowledge transferring as a natural process of social interaction. Song [60] conceives that face-to-face communication has potential to give immediate feedback and make multiple cues available to people which in turn facilitate tacit knowledge sharing. Furthermore, work related discussions during interactions have also considered as an introduction to tacit knowledge sharing.

On the other side, social interaction is one of the main characteristics of social web initiatives (See TABLE II). Zheng *et al.* [38] defines social media as a "network technologies based media that support social interaction, social information aggregation and sharing". Lietsala and Sirkkunen [61] recognize one of the five main features of social web sites as a place for social interaction. Kamel Boulos and Wheele [64] argued that emergence of web 2.0 tools have enriched online social interaction by integrating "human approach to interactivity on the web", "better support of group interaction", and "fostering a greater sense of community". Boateng *et al.* [62] emphasize too on interactivity and communicative aspects of web 2.0 tools.

Some authors connected social interactions in social media with tacit knowledge sharing. For example, Marwick [49] argues that online discussion forums, chat rooms and other real-time online interactions can facilitate effectively tacit knowledge sharing among team members. Lai [7] has also confirmed possibility of tacit knowledge transferring in internet discussion and chat sessions. Wahlroos [63] observed that the emerging social media represent a significant potential in enhancing tacit knowledge sharing by providing live conversations, relationship networking and collaboration among individuals.

As a result, it can be argued that there is a commonality between job-specific social interactions in social media sites and tacit knowledge sharing. Therefore, hypothesis 1 could be made as:

> ***Hypothesis 1:*** *Social interactions over social media are positively associated with tacit knowledge sharing.*

B. Experience sharing

Practical experience is recognized as one of the main essentials of tacit knowledge acquisition process. Consequently, sharing personal experience through various methods such as story-telling, observation, participation, discussion, etc. is also considered as one of the powerful way of transferring tacit knowledge (See TABLE II). People learn and obtain a sense of competence by sharing their experience [95]. Nonaka [66] points out that disseminating tacit knowledge is not possible without experience sharing. He calls this process of generating tacit knowledge through shared experience "socialization". Haldin-Herrgard [3] underlines exchange of experiences in process of tacit knowledge diffusion. Yi [96] regards individual experience sharing as a key source of tacit knowledge.

Correspondingly, user generated content is recognized as one of the principal feature of social web tools (See TABLE II). It enables people easily talk about their stories and experiences [36]. Nilmanat [69] demonstrates that in order to enable people to share their tacit knowledge more successfully in an online environment, it should support experience sharing, discussing, and story-telling. Yi's [96] study concludes that sharing personal experience is the most effective way people use to exchange their tacit knowledge in online contexts. Malita and Martin [71] consider social networking sites as a digital story-telling tools. Strahovnik and Mecava [72] has also identified web 2.0 tools such as blogs, social networking sites, video sites, and Wikis as modern, efficient tools for exchanging ideas and experiences. Therefore, it can be hypothesized:

> ***Hypothesis 2***: Possibilities for e*xperience sharing over social media is positively associated with tacit knowledge sharing.*

C. Informal relationship and networking

Developing informal relationships have been observed as one of the efficient ways of enhancing tacit knowledge sharing among people (See TABLE II). Swan *et al.* [82] emphasize on developing of active networking within and between team members to facilitate circulation of tacit knowledge. Haldin-Herrgard [3] and Smith [25] assume networking plays a vital role in easing share of tacit knowledge. Eraut [73] recognizes informal relationships as one of the preconditions for effective and accurate transfer of tacit knowledge. Joia and Lemos [84] in their comprehensive bibliographical review found that 'relationship network' is considered as one of the major indicator of tacit knowledge sharing. Moreover, Li and Zhou [97] indicate that the main channel for tacit knowledge-sharing is building informal relationship network.

Similarly, social networking sites are well-known for connecting people to people in an informal manner (See TABLE II). Indeed, relationship building is foundation of social networking sites. They allow experts with common interest gather together in an online space and interact synchronously/ asynchronously with each other about their issues and share their knowledge. Bowley [27] views connectivity as one of the main characteristics of social media. DiMicco et al [86] found that 'relationship building' is the most popular action on an enterprise social network site. Stefanone and Jang [87] investigate the role of blogs in building and keeping relationships.

Hence, there can be expected that social networking sites may enhance tacit knowledge sharing by fostering interpersonal relationships among experts. Therefore:

> ***Hypothesis 3:*** *Developed relationships and networking over social media is positively associated with tacit knowledge sharing.*

D. Observation

Observation, watching, and interactive listening are other essentials for effective acquisition and sharing of tacit knowledge. Many researchers have confirmed observation as one of the potent sources for tacit knowledge sharing (See TABLE II). Observing practices of others helps to adopt and imitate those skills and behaviors. It is particularly ideal for transfer of technical part of tacit knowledge, i.e. for sharing know-how, crafts and skills [95]. For instance in healthcare settings, Fox [74] acknowledged acquisition of clinical tacit knowledge through the observation of experts at work. Paavola *et al*. [75] have explained orthopedic surgeons' need for direct observation to obtain tacit knowledge which is required for better diagnosis of patients problem.

Observation of skills can also be achieved by watching images or videos, and through more rich media such as video calls and videoconferencing in a digital domain. Wang [98] recognizes experience sharing as one of the main applications of videos. Mavromoustakos and Papanikolaou [99] affirms people can share their experience through picture and videos. Raisanen and Oinas-Kukkonen [100] determine video, voice and pictures as important media in transferring tacit knowledge. Eraut [73] argues that mediating object such as a picture, drawing or video [e.g. x-ray images] can motivate individuals to discuss and share tacit knowledge. Nilmanat [69] investigates tacit knowledge sharing through images in online discussion threads.

Multimedia sharing is identified as one of the main characteristics of social web technology [36], [78-81]. This multimedia oriented feature has enabled people to store and share their own produced pictures, videos, audio, and other multimedia files in social web space. In addition, it allows people to search, tag, and comment on shared media [36], [78]. Podcasts and Vodcasts are also other social web initiatives that enable individuals to easily keep up-to-date with their favorite audio or video contents [78], [81].

Above mentioned discussion leads us to this assumption that there might be a link between watching and listening to the shared multimedia files in social media and tacit knowledge sharing among experts. Therefore:

> ***Hypothesis 4:*** *Observing and listening to the shared multi-media contents on social media is positively associated with tacit knowledge sharing.*

E. Mutual trust

Plenty of studies have found that people would share their valuable tacit knowledge when there be a mutual trust among (See TABLE II). Yang and Farn's [58] and Holste and Fields' [59] studies indicate that there is a positive relationship between trust and professionals' intention to share and use tacit knowledge. Song [60] argues that efficiacy of tacit knowledge sharing is directly affected by existence of mutual trust among participants. In their discussion about the indicators of tacit knowledge sharing, Joia and Lemos [84] convince that mutual trust reduces perceived risks and uncertainties associated with tacit knowledge sharing. Similarly, this is confirmed by Lin's [88] study on the effects of trust on tacit knowledge sharing within an organization.

It is also worthy to mention that mutual understanding is necessary for people to trust each other [89], [101]. Having a similar background [7] and using common language [102], i.e. using known terminology and vocabulary, are also necessary to establish a mutual understanding between team members, which in turn enhance mutual trust required for successful transfer of tacit knowledge.

In online setting, building trust is viewed as important as face-to-face communication for knowledge sharing purposes. Wu *et al.* [89] study shows that trust is positively associated with knowledge sharing in virtual teams. They also indicate that mutual communication and understanding establishes interpersonal trust among virtual team members. Chen and Hung [90] have also found positive relationship between mutual trust and knowledge exchanging behavior in professional virtual communities. Some authors have introduced a concept of 'swift trust', a kind of trust that is formed in a temporary team, for online environment [91-93]. This immediate trust allows people to initiate and continue over the time sharing of both explicit and tacit knowledge in an online communities [94].

According to the above discussion it can be concluded that at least swift trust is essencial for successful transfer of tacit knowledge in social media sites too. Therefore, the next hypothesis could be:

> ***Hypothesis 5:*** *Mutual swift trust over social media is positively associated with tacit knowledge sharing.*

VII. Conceptual framework

Based on the finding and the developed hypothesis in previous sections, a new conceptual framework (See Fig. 1) has been proposed on the nexus between social web initiatives and tacit knowledge sharing behavior of experts in online social communities. The model indicates that social media have abilities to support several major requirements of tacit knowledge sharing by providing a better place for social interaction, by establishing opportunities for experience

sharing, by building a domain of informal relationships, by providing facilities to observe, listen, and imitate best practices, and finally by establishing a mutual swift trust among participants. The combination of these features creates opportunities for effective flow of tacit knowledge in social media space.

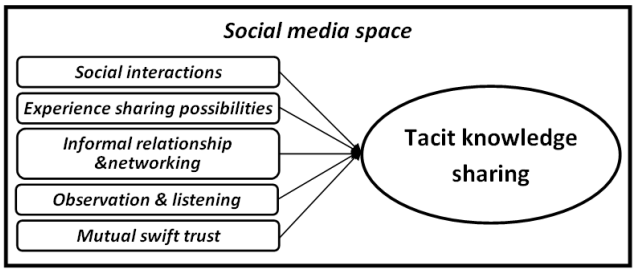

Fig. 1 Conceptual model of tacit knowledge sharing in social media

The proposed model helps to better understand the phenomenon of tacit knowledge sharing using social web initiatives and opens a new discussion in this area. The model connects an important connection between tacit knowledge sharing requirements and social media contribution to comply them, which has not already been investigated in literature. The model can be criticized from several aspects. For instance, the inclusiveness of the model might be questionable as tacit knowledge sharing process is quite complex and is affected by lots of surrounding conditions. In addition, empirical evidences for proving the hypothesized relationships are rare and need to be tested. Besides the aforementioned shortcomings, the model discloses some new theoretical grounds and takes an initial step towards our efforts to fully explore the applications of online social tools for tacit knowledge sharing purpose.

VIII. Conclusion

The literature analysis in this study showed that there five major requirements need to be present in an environment that involves tacit knowledge sharing: social interaction, experience sharing, observation, informal relationship/ networking, and mutual trust. These requirements were analyzed against social media concepts and characteristics to see how they map together. The results showed that social media have abilities to comply some of the main requirements of tacit knowledge sharing. For instance, social media enables synchronous communication in terms of chatting, discussions, story-telling, etc. which in turn may facilitate tacit and expertise sharing among experts. Social media has also provides opportunities for observation and imitation of best practices, expert locating, informal networking, and a friendly space to talk about ideas and ideals.

This paper might be regarded as a working paper. Further empirical studies might be carried out to acknowledge findings of this study. The relationships in conceptual framework need to be validated and tested in different kinds of social media contexts.

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