Mechanisms for Enhancing the Use of Social Media for Knowledge Sharing by the Construction Professionals

Ramtin Etemadi*
School of Architecture & Built Environment, Queensland University of Technology (QUT), Brisbane, Qld 4001, Australia

Carol K.H. Hon
School of Architecture & Built Environment, Queensland University of Technology (QUT), Brisbane, Qld 4001, Australia

Glen Murphy
QUT Business School, Queensland University of Technology (QUT), Brisbane, Qld 4001, Australia

Karen Manley
School of Architecture & Built Environment, Queensland University of Technology (QUT), Brisbane, Qld 4001, Australia

*corresponding author email: Ramtin.Etemadi@usq.edu.au
Abstract

Purpose – This paper investigates the mechanisms for transforming construction professionals’ intentions into the use of Social Media (SM) for Knowledge Sharing (KS). The objectives are to: 1) identify the common types of SM platforms used by the construction professionals for KS; 2) identify the key problems influencing transformation of the construction professionals’ intentions into the use of SM for KS; 3) identify the factors mitigating problems; 4) provide recommendations for enhancing construction professionals’ use of SM for KS.

Design/methodology/approach – The data was collected through semi-structured interviews with Australian construction professionals and analysed using Grounded Theory (GT). The outcomes of the analyses formed a framework for the enhancement of SM use for KS.

Findings –

The findings show that (1) private SM followed by enterprise SM are more appealing to the construction professionals due to the lower level of uncertainties for KS compared to public SM; and (2) uncertainties about users’ privacy/confidentiality and the quality of the shared knowledge adversely affect the transformation of the construction professionals’ intentions into use of SM for KS. Three types of trust are identified as the mitigators of the identified problems. A framework is proffered to enhance SM use for KS by construction professionals.

Originality/value – This paper contributes to the construction literature by developing a grounded theory to explain the factors which impact the transformation of the construction professionals’ intentions into the use of SM for KS. Additionally, the practical contribution of this study is the provision of a framework constituting recommendations for the enhancement of SM use for KS.

Keywords: knowledge sharing; social media; construction professionals; uncertainties; trust;

Introduction

The use of Social Media (SM) for professional purposes has been the focus of research in recent years due to SM’s capability for facilitating communication and Knowledge Sharing (KS) (e.g. Behringer & Sassenberg, 2015; Benetoli et al., 2016; Leonardi, 2014; Philpot, 2013; Wu et al., 2016). The findings of the previous studies show the promising results of using new ICT tools such as SM for professional KS in sectors such as higher education, public relations, Information Technology (IT), healthcare, tourism, retail and manufacturing ((Almeida & Soares, 2014; Grover & Froese, 2016; Kamara et al., 2002; Le et al., 2014; Maqsood et al., 2003; Newell et al., 2006; Oesterreich & Teuteberg, 2016)Dumbrell et al., 2014; Gaál et al., 2015; Sigala et al., 2015). SM’s capabilities can tackle the issue of interrupted KS processes which is common in fragmented and project-based industries such as construction (Almeida & Soares, 2014; Etemadi et al., 2019; Oesterreich & Teuteberg, 2016).

However, SM is adopted to a very limited extent in the construction sector (ABS, 2018; Azhar & Abeln, 2014). The number of studies which have investigated the underlying reasons for the underutilisation of SM in the construction industry is still limited. Barriers and enablers of improving the construction professionals’ motivation and intention to uptake SM is in the core of the existing studies. However, impediments of transformation of the construction professionals’ motivation and intention into their actual use of SM is yet to be fully investigated.

The studies about transformation of SM users’ intention into their actual use have been conducted in non-construction contexts. The findings indicate that uncertainty impedes the transformation of individual’s intention into actual use (Leonardi et al., 2013). The applicability of the findings of such studies in the construction sector is yet to be examined. In the case of confirming the adverse impact of uncertainties on the construction professionals’ decision to use SM for KS, the types of the uncertainties, and the mitigating factors for such uncertainties are yet to be explored.

This research aims to address these gaps and investigate the mechanisms for enhancing construction professionals’ use of SM for KS. The objectives are to 1) identify the common types of SM platforms used by the construction professionals for KS; 2) identify the main types of uncertainties influencing transformation of the construction professionals’ intention to the actual use of SM for KS; 3) identify the factors mitigating the identified uncertainties; and 4) provide recommendations for enhancing
construction professionals’ use of SM for KS. Significance of this study lies in going beyond the limitations of the existing theory-based and confirmatory studies and providing an in-depth analysis of the transformation of the construction professionals’ intention into actual uptake of SM for KS. This study also contributes to the literature by providing an evidence-based practical framework outlining the steps to increase the uptake of SM for KS by construction professionals.

**Literature review**

**SM use for professional KS**

SM is defined as a broad range of online applications allowing users to interact, create or share content (Hajli & Lin, 2014; Rambe & Nel, 2015). The shared content can take various forms, ranging from public posts, comments and direct messages to streamed videos, and images; the shared content connects two or more users and stimulates conversations (van den Hooff & de Ridder, 2004). When the shared contents are work-related, content sharing is an act of professional KS. The main factor in KS is the involvement of two or more parties in the process (Etemadi et al., 2019; Leonardi, 2017). One of the parties involved in the process of KS is a knowledge seeker. The seekers’ need for knowledge is met through the contributions of a source or provider of knowledge who is known as a knowledge contributor. The outstanding power of SM is in its capability to facilitate the connection between knowledge seekers and knowledge contributors (Gibbs et al., 2013; Jarrahi & Sawyer, 2013; Leonardi, 2014; Leonardi et al., 2013).

Many of the interactions among knowledge seekers and knowledge contributors on SM are visible to other users. The visibility of users’ interactions on SM contributes to the knowledge of the observers (Schlosser, 2005; Sun et al., 2014; Takahashi et al., 2003). This highlights the benefits of turning non-users to users of SM even if they restrain themselves from active KS. Meanwhile, increasing the level of active engagement of users is necessary for the maintenance and survival of SM as a KS medium. It has been estimated that more than 80 per cent of businesses fail to benefit from KS on SM due to the disengagement (Piskorski, 2011; Waterloo et al., 2018; Wyld, 2008). Proposal of strategies to enhance users’ engagement on SM for KS is related to the characteristics and the scope of the users of SM platforms.

The literature categorises SM platforms into three groups according to their characteristics and the scope of the users (Waterloo et al., 2018). The first group is the public SM. Platforms such as LinkedIn, Facebook, Twitter and TikTok are among the most popular public SM. Public SM can be used for KS by anyone who has a membership on these platforms. The users can interact through posting, sharing, commenting, or messaging various types of content. The second group of SM is private SM (Waterloo et al., 2018). Private SM are platforms that offer modalities and features similar to public SM (e.g. posting, sharing or exchanging text, and multimedia). However, unlike public SM, private SM has a higher level of privacy and confidentiality of the KS activities. Private SM provides more control over the audience and the use of the shared content; users generally have a pre-established connection as well as pre-existing knowledge about each other (Statista, 2020). Platforms such as WhatsApp, Telegram and WeChat are among the most popular private SM (Statista, 2020).

The third group of SM is enterprise SM. Enterprise SM is designed specifically for intra-organisational KS. Enterprise SM provides a semi-private platform as its users are limited to the employees of an enterprise with some level of prior knowledge about each other. However, the level of privacy and confidentiality in enterprise SM is often similar to public SM (Statista, 2020). Yammer, Slack and Workplace by Facebook are some of the popular examples of enterprise SM. The number of users of enterprise SM is growing (Etemadi et al., 2019). However, the COVID-19 pandemic has accelerated the growth of enterprise SM recently (Pandey & Pal, 2020).

The growing need for the uptake of SM for KS highlights the significance of investigation of the mechanisms for transforming the construction professionals’ motivation and intention into uptake of SM for KS. A review of the literature suggests understanding the barriers and enablers influencing the intention to use SM for KS is the preliminary step for the investigation of the mechanisms to transform motivation and intention into actual uptake of SM for KS. Existing literature on barriers and enablers of adoption of SM for KS are grouped into the confirmatory and exploratory studies.
Barriers and Enablers of SM use for KS

Confirmatory studies

Confirmatory studies about the barriers and enablers of adoption of SM try to explain the factors influencing users’ intention to use SM for KS. Confirmatory studies take technology adoption theories as the base and use their factors (constructs) to explain acceptance and adoption of various technologies. As shown in Figure 1 (below), technology acceptance models and theories evolved through time to improve their explanatory power. (Rogers, 2010)(Davis, 1989)(Venkatesh et al., 2003)

Given adoption of social media is a relatively new phenomenon, the more evolved technology acceptance models such as Theory of Planned Behaviour (Rogers, 2010), extensions of Technology Acceptance Model (Davis, 1989), and the Unified Theory of Adoption and Use of Technology (Venkatesh et al., 2003) are used more frequently to explain adoption of social media. Although technology acceptance models/theories differentiate in details, majority of them share a similar structure (Figure 2). In this structure, the model/theory suggests the factors influencing users’ intention to use a technology. Then users’ intention influences their act/behaviour.

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**Figure 1**: The process of evolvement of technology acceptance/adoption models/theories (adopted from: Taherdoost, (2018))

**Figure 2**: The schematic structure of technology acceptance and adoption models/theories.
Review of Theory of Planned Behaviour (TPB), Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology demonstrates the similarity of the structure of the technology adoption models/theories better. In TPB, uses’ attitude, subjective norms, and perceived behavioural control influence users’ intention to use technology. TPB suggests users’ intention influences their behaviour (actual use). In TAM, and its extensions, perceived usefulness, perceived ease of use and attitude towards technology, influence users’ behaviour. In UTAUT, performance expectancy, effort expectancy, and social influence impact users’ behavioural intention to use the technology. Behavioural intention, and facilitating conditions influence users’ behaviour (or actual use).

The examples of TPB, TAM and UTAUT show how technology adoption models and theories follow the schematic structure demonstrated in Figure 2. The indirect impact of the influence factors on the act/behaviour of technology use through their influence on the intention to use correspond to the barriers and enablers of technology use (e.g. social media use for KS). Review of the confirmatory studies in the field of social media which have used technology adoption models/theories show the factors suggested as the barriers and enablers of social media use can be grouped in five categories: organisational factors, technological factors, social factors, individual factors, and professional factors (C. Chiu et al., 2011; C.-M. Chiu et al., 2006; Wasko & Faraj, 2000, 2005).

With the exception of the organisational factors, all other four groups are common barriers and enablers for users’ intention to use private, public and enterprise SM. Organisational factors exclusively impact users’ intention for enterprise SM use and include social influence, peer support, organisational structure, organisational culture, collaborative norms, KS procedures and supportive managerial techniques for SM use in enterprises (Chin, Choo, et al., 2015; Chin, Evans, et al., 2015; Etemadi et al., 2019).

Technological factors include ease of use of the technology, interface design, users’ technological skills and cybersecurity (Chin, Choo, et al., 2015). It is important to note that the adverse impact of lack of data privacy – as a sub-element of cybersecurity – on SM use for KS is growing and being emphasised in recent years more than ever. Second Social factors include communication climate, social presence, and critical mass (Chin, Choo, et al., 2015; Klein & Kozlowski, 2000; Vaghefi et al., 2018). Individual factors include enjoyment, altruism, and users’ self-efficacy (Ameen et al., 2018; Etemadi et al., 2019; Hanson et al., 2011; Herrero & San Martin, 2017; Mandal & McQueen, 2012). Professional factors include performance expectancy, task-related gains and financial expectancy (Chung et al., 2015; Etemadi et al., 2019; Hanson et al., 2011; Karjaluoto et al., 2010; Lièbana-Cabanillas et al., 2014; Liebana-Cabanillas & Alonso-Dos-Santos, 2017; Siamagka et al., 2015).

Despite the widespread use of the confirmatory approach for the investigation of the barriers and enablers of adoption of SM, there is a major drawback about this approach (Bagozzi, 2007). Many technology adoption models assume a direct link between the intention to use a technology and the actual use of the technology without focusing on the mechanisms which can transform a user’s intention into their behaviour (Ardichvili, 2008; Bagozzi, 2007; Islam et al., 2014). The link between intention to use and the actual behaviour is a complex decision-making process. The criticism about the confirmatory studies is about oversimplification of this process (Ardichvili, 2008; Ardichvili et al., 2003; Chin, Choo, et al., 2015; Razmerita et al., 2016; Schiuma et al., 2012). Oversimplification also occurs as a result of limited emphasis on the influence of peers and environments on the process of decision-making (Bagozzi, 2007; Islam et al., 2014; Silva, 2007). To address the drawbacks of the confirmatory studies, scholars attempted to go beyond the frameworks of the technology acceptance models and implement exploratory methods.

**Exploratory studies**

There is a considerable overlap between the findings of the exploratory and confirmatory studies. The common barriers and enablers identified by confirmatory and exploratory studies include, technological, social, individual, professional and organisational factors (Hew & Hara, 2006; M. Hsu & Chang, 2014; Kankanhalli et al., 2005; Trier et al., 2017; Vajjhala, 2013; Molly McLure Wasko &
Faraj, 2005). These factors, within the context of the confirmatory studies, are recognised as motivational factors (Ardichvili, 2008; Ardichvili et al., 2003; C.-M. Chiu et al., 2006; de Long & Fahey, 2000; Lin, 2007; Razmerita et al., 2016; Rode, 2016; Schiuma et al., 2012; Trier et al., 2017; Vaghefi et al., 2018). Motivational factors correspond to the barriers and enablers of users’ intention in the context of the confirmatory studies. However, the main contribution of the exploratory studies is to unpack the complex mechanism of decision-making process which transforms users’ motivation and intention into the behaviour of using SM.

Review of the findings of the exploratory studies in the context of social media use for KS shows uncertainty is commonly recognised as an impediment for transformation of motivation and intention into behaviour of use (Hsu & Chang, 2014; Pavlou, 2005; Pfeffer & Salancik, 2003; Trier et al., 2017). In the context of SM use for KS, uncertainty is the users’ inability to predict the outcome of their online KS activities (Hsu & Chang, 2014; Pavlou, 2005). A study conducted by Trier et al. (2017) provided a comprehensive understanding of the negative impact of uncertainty on the behaviour and the actual use of SM for KS. Trier et al. (2017) identified response-related, platform-related and participant-related uncertainties as the main types of uncertainties impeding SM use. Response-related uncertainties are about the quality of the shared knowledge. Platform-related uncertainties are about users’ confidentiality and security concerns in the process of KS (Trier et al., 2017). Participant-related uncertainties are about users’ reactions and feedback to each other. Similar to the approach used in the study by Trier et al. (2017), this paper adopts a holistic approach and considers a combination of uncertainties stemmed from SM behaviour and KS behaviour to investigate the types of uncertainties for the use of SM by the construction professionals.

Categorisation of users’ KS behaviours on SM

SM literature defines the users based on their online behaviour. The user who use SM silently are passive users. The users who actively engage in online interactions are active users (Hacker et al., 2017; Wasko & Faraj, 2005). KS literature uses a similar dichotomous approach to define individual’s role in the KS process based on their KS behaviour. Knowledge seekers are individuals who are looking for knowledge. Knowledge contributors are individuals who provide knowledge for the knowledge seekers (He & Wei, 2009; Leidner et al., 2006). When using SM for KS, users can engage themselves into both types of online KS behaviour simultaneously (Leonardi, 2014; Treem & Leonardi, 2013; Trier et al., 2017). If the interaction between knowledge seekers and knowledge contributors was visible, other users who are exposed to the interaction can benefit from the interaction and acquire knowledge (de Long & Fahey, 2000; Hew & Hara, 2006; Hsu & Chang, 2014; Kankanhalli et al., 2005; Majchrzak et al., 2013; Rode, 2016; Shanshan, 2014; Trier et al., 2017; Vajjhala, 2013; Wasko & Faraj, 2005). In the process of KS on SM, a knowledge contributor can only be active users. However, knowledge seekers can be active or passive SM users. The decision about active/passive use of SM for KS depends on the uncertainties the users associate with their KS and SM behaviours. The current study attempts to explore the uncertainties associated with each type of the KS and SM behaviours to unveil the mechanisms the construction professionals decide about the use of SM for KS. A qualitative method is used to provide an in-depth understanding of the interplay between uncertainties and user’s KS/SM behaviours.

Methodology

This exploratory study uses a qualitative Grounded Theory (GT) method. The data for the study is collected through interviews. Using a qualitative method is consistent with the aim and objectives of this study. Using qualitative methods is also recommended for studies, such as this one, which fall in the fields of social sciences and Information Systems (IS) (Walsh et al., 2015). Among various methods for qualitative studies, the GT method is selected due to its capability to identify and usefully categorise the nuances of decisions made by the construction professionals for SM use for KS. In turn, these nuances can reveal latent mechanisms for transformation of the construction professionals’ intention into the actual use of SM for KS.

The GT method has three principles: emergent findings, theoretical sampling and constant comparison (Charmaz, 2008; Walsh et al., 2015). Emergent findings require the researcher’s openness to the findings which cannot be anticipated based on the previous theories (Walsh et al., 2015). The current
study benefits from the emergent finding that an in-depth understanding is needed about factors and mechanisms which are beyond the grasp of confirmatory studies.

Theoretical sampling requires data collection, coding, and data analyses concurrently and retrospectively. The qualitative data in this study were coded and analysed after each interview. The results of coding and analyses were constantly compared to the previous findings to ensure the emerging theoretical framework is grounded in data rather than logical deduction (Charmaz, 2008; Glaser, 1978; Walsh et al., 2015). Based on the principle of constant comparison, data collection stopped when the collection of new data did not add to the pool of codes, concepts and categories, or the overall findings of the study.

**Sampling and data collection**

The target population for the sampling in this study was Australian construction professionals who were users of SM in the following spheres: (1) public (e.g. LinkedIn, Facebook), (2) enterprise (e.g. Yammer, Slack, company’s online network) or (3) private (e.g. WhatsApp, Telegram). A purposeful sampling strategy was used to facilitate access to diverse interviewees across a range of key characteristics, including age, gender, education, professional position, employment status and professional experience. A total of 12 semi-structured interviews were conducted and each interview lasted for 45 minutes on average.

**The interview design**

The interview questions were based on the review of the literature and then refined by the emergence of codes and concepts that emerged during the process. The first part of the interviews aimed at unveiling the types of SM platforms used by the interviewees. The second part was about the types of problems the construction professionals considered while deciding about the actual use of SM for KS. The third part aimed at identifying mitigation mechanisms and potential paths for the enhancement of SM use for KS. The interviews were held face-to-face (6 interviews), by phone (5 interviews) and through Skype (1 interview). The definition and scope of SM platforms were explained in advance to the interviewees. Before asking the interview questions, the interviewees were asked to answer the questions based on their personal experiences while making decisions about using SM for KS. The interviews were voice recorded. Interview transcripts were produced from the recordings after each interview. The coding process took place right after transcribing each recording. To check the validity of the findings the researchers conducted a participant check. A summary of each interview, coded with the identified concepts and categories, was shared with each interviewee. Each interviewee confirmed that the summary accurately reflected their experiences and opinions (Charmaz, 2008; Glaser et al., 1968; Walsh et al., 2015). This ensured the validity of the findings of the coding procedure.

The coding procedure in this study was based on the standard procedure in the GT method consisting of open coding, theoretical coding and selective coding (Glaser et al., 1968). (Bryant & Charmaz, 2007; Charmaz, 2006; Glaser et al., 1968). Through the open coding, one of the researchers read the entirety of the transcripts of the interviews. Codes were assigned to the paragraphs. The codes reflected the interviewee’s main ideas in each set of paragraphs. To be able to combine pertinent codes and identify emerging concepts and categories, the codes were cross-checked with respect to the entirety of the transcript. Through the theoretical coding, the emergent concepts and categories were analysed frequently to identify the relationships among them. The researchers constantly went back and forth between the emergent findings of each interview and the previously identified findings to determine the next steps in the process of data collection. Data collection continued to reach to the point of theoretical saturation.

Theoretical saturation is a defining feature of the GT method and when achieved further data collection does not add to the emergence of new concepts or patterns (Morse, 2000). Theoretical saturation point was achieved by interviewing twelve construction professionals (Table 1). Analyses of the eleventh and twelfth interviews showed the newly added data did not significantly contribute to the identification of new concepts or patterns. At this point, the primary theoretical framework began to reiterate itself. Narrowing down the focus of the research and refinement of the aim and objectives resulted in reaching to the theoretical saturation with 12 in-depth interviews.
Table 1. Demographics of the interviewees

| Interviewee | Position                | Age | Gender | Employment status     | Years of Experience |
|-------------|-------------------------|-----|--------|-----------------------|---------------------|
| 1           | Advisor                 | 37  | Male   | Senior employee       | 14                  |
| 2           | Engineer                | 54  | Male   | Self-employed         | 23                  |
| 3           | Contract administrator  | 34  | Female | Employee              | 6                   |
| 4           | Cost planner            | 46  | Male   | Employee              | 24                  |
| 5           | Senior architect/manager| 62  | Male   | Self-employed         | 39                  |
| 6           | Senior architect        | 43  | Male   | Senior employee       | 19                  |
| 7           | Project manager         | 39  | Female | Senior employee       | 17                  |
| 8           | Project manager         | 38  | Male   | Senior employee       | 21                  |
| 9           | Construction manager    | 71  | Male   | Self-employed         | 51                  |
| 10          | Engineer                | 35  | Female | Employee              | 7                   |
| 11          | CEO                     | 53  | Male   | Manager               | 29                  |
| 12          | Estimator               | 41  | Female | Senior employee       | 18                  |

The GT literature indicates that as the quality of the collected data increases, the sample size can decrease (Glaser et al., 1968). The GT literature does not set a minimum number for interviews. Instead, it suggests determining the theoretical saturation point based on the quality of the collected data reaching the objectives of the study (Charmaz, 2008). This study is an example of a continuous increase in the quality and depth of the collected data; so the researchers could reach to the saturation point with the minimum number of interviews.

The result of the theoretical coding was a primary theoretical framework which showed that identified problems constituted a range of uncertainties for the use of SM for KS by the construction professionals based on platform types, KS behaviour and SM behaviour. The theoretical coding was used as the input for the final stage of the coding process which is selective coding. Selective coding resembles the abductive aspect of the GT method (Trepte, 2020; Yao et al., 2007). Through selective coding, the researchers delimited the theoretical framework to its core concepts, categories and patterns. The outcome of selective coding was a secondary theoretical framework which demonstrates the areas for which improving trust is required to mitigate uncertainties. A combination of the findings of the GT method and the best practices in the literature for the mitigation of uncertainties resulted in a three-step framework for the enhancement of SM use for KS.

Findings and discussion

Private SM are preferred to enterprise and public SM for KS

The findings show that private SM was the most preferred type of SM for KS among the participants of the study. Among various private SM, WhatsApp was the most frequently used platform. Except two of the interviewees, the rest of the interviewees used WhatsApp for work-related KS on a daily basis. Some of the WhatsApp users were using WeChat and Facebook Messenger too. Following private SM, enterprise SM was the second commonly used SM among the interviewees. Firms’ internal network (Intranet) and Yammer were used by the interviewees who were employees of medium and large companies. This finding is understandable as the installation and maintenance of internal networks for KS might not be feasible for small and micro-businesses.

Contrary to enterprise SM, the use of public SM (e.g. LinkedIn, Instagram, Facebook) was mentioned by all the interviewees regardless of the size of their enterprises. However, the use of public SM was mainly for marketing and advertisement purposes. Marketing and advertisement are classified as business-to-consumer (B-2-C) communication with the aim of selling products or services. In this sense, marketing and advertisement is out of the scope of this study which focuses on the peer-to-peer KS. The interviewees also mentioned that they followed a limited number of pages on Facebook, Instagram, and LinkedIn. However, the use of public SM by the interviewees remained limited to the observation of potential recruitment opportunities.
Theoretical findings

Primary findings: Uncertainties about privacy/confidentiality and knowledge quality

Uncertainty was the predominant impediment which restrained construction professionals from actual uptake of SM for KS. The uncertainty came from two sources, namely privacy/confidentiality, and knowledge quality. Regarding privacy/confidentiality uncertainty, private SM provides the greatest sense of safety to SM users, making it the preferred type of SM platform. Private SM platform users highlighted their sense of safety stems from a sense of control over the connections, use of the shared knowledge, and potential results of KS on private SM. Interviewees mentioned the sense of control helps them overcome the sense of uncertainty they experience on platforms such as Facebook. The interviewees also linked their sense of control to the pre-existing knowledge about peers on private SM:

“I do not feel safe to share any information with strangers; I don’t know who will use that information and for what purposes. Once the info is out you cannot control it on Facebook for example; on WhatsApp at least I know who I am sharing the info with…” (contract administrator-34-Female-employee)

In contrast to the positive experience of the interviewees about private SM, they associated “lack of control” and “exposure to unnecessary risk” with the use of public SM and interaction with “unknown” users:

“I used to do all my communication with my team and colleagues and subcontractors and even costumers by phone; then I changed it to email. Now I use WhatsApp. I still use email too. But WhatsApp is easier and quicker; I am reluctant to use other ones [Facebook or so on]... I want to know the person I am communicating with. I cannot know who am I talking to on Facebook 100%. What are they gonna use my information for? If that person is a real subbie or tradie or it’s just another fake account... what if they want to steal information from me!? what if it is a scam or their account is hacked!?... too risky, you know?” (construction manager-71-Male-self-employed)

The relationships between the sense of safety, pre-existing knowledge and the sense of control are pointing at an emerging category of uncertainties. This category is the user’s privacy and confidentiality. SM privacy and confidentiality is user’s selective control over the KS process (Brogan & Smith, 2020, p. 17) and includes 1) control over other users or entities’ ability to access the shared knowledge or the knowledge sharer, and 2) control over the personal information of the knowledge sharer. The findings show the association of the privacy/confidentiality uncertainties with active and passive KS on public SM is much higher than private SM. According to the interviewees, this is a major impediment for the use of public SM for KS.

The findings also highlight the impact of privacy/confidentiality uncertainties on enterprise SM use too. Although enterprise SM users described the use of enterprise SM as “a norm” at their workplaces, this norm could not mitigate privacy/confidentiality uncertainties associated with enterprise SM use. Enterprise SM users accentuated the link between privacy/confidentiality uncertainties and the visibility of their KS activities. Uncertainty connected to the visibility was in fact due to the lack of full control over the recipient of the shared content and the engaged users in the process. The visibility of knowledge-seeking activities (e.g. posting questions) was associated with uncertainty as knowledge-seekers on enterprise SM were worried that asking questions might damage their image and reputation at the workplace:

“...when somebody asks something, I double or triple check my response before sharing or posting it on the network. Sometimes I prefer calling them [by phone] and answering their questions or having a conversation directly rather than sharing it on the network – once you share something, it is there and people can see it! if you upload something wrong everyone sees who said that...” (Engineer-35-Female-employee)
Enterprise SM users expressed using the shared knowledge by their peers is the most fruitful way of using enterprise SM. This finding shows privacy/confidentiality uncertainties result in the minimisation of active KS on enterprise SM in favour of passive KS.

While the interviewees attempted passive KS on SM to avoid privacy/confidentiality uncertainties, their active and passive KS remained subject to the attributed knowledge quality uncertainties. The findings of the study highlighted knowledge quality uncertainty stems from users’ imperfect knowledge about reliability, validity, currency and accuracy of the shared content on SM. Knowledge quality uncertainty on private SM was only associated with passive knowledge seeking. As shown in Table 2, although the interviewees attributed a medium level of uncertainty to the quality of the shared knowledge on the private platforms, they attributed a low level of uncertainty to the knowledge which was shared directly with them. This is one of the surprising findings of the study that contrasts with the stability of low level of knowledge quality uncertainties associated with enterprise SM.

Table 2. Primary theoretical framework (the levels of uncertainties associated with each type of KS on various SM platforms).

| Uncertainties      | Private SM | Enterprise SM | Public SM |
|--------------------|------------|---------------|-----------|
| Privacy / confidentiality | Low        | Low           | High      |
| Knowledge quality   | Medium     | Low           | High      |

The ad-hoc use of public SM for KS by a limited number of the interviewees was interpreted in the light of the high level of associated uncertainties to KS on public platforms. The interviewees expressed the use of public SM for KS can happen in necessary conditions. They highlighted they minimise and limit their public SM use to passive KS. They associated high levels of knowledge quality uncertainty to the public SM. The interviewees expressed their attributed knowledge quality uncertainty by describing the shared knowledge on public SM as “unreliable” and “untrustworthy”.

Secondary findings: the critical role of Interpersonal, knowledge quality, and platform trust

Principal theoretical findings of the study are the outcome of the final round of coding in the application of the GT method. The findings show the negative impact of uncertainties can be mitigated by trust. Based on the emerged concepts and themes in the interviews, trust refers to the individuals’ willingness to decide and use SM for KS without having full control over the outcomes of their KS activities. Lack of full control over the outcomes of KS due to imperfect knowledge was the identified cause of uncertainties in the previous stage of this study. Trust is the antidote of uncertainties; trust replaces users’ imperfect knowledge about the potential outcomes of their KS behaviour on SM. The object of trust can be other users (peers), platform and the quality of the shared knowledge.

Users’ trust in their peers is called interpersonal trust. Interpersonal trust is identified as the main mitigator of privacy/confidentiality uncertainties. Users’ trust in a platform is a replacement for users’ insufficient knowledge about the host platforms’ capability to protect users against cybersecurity issues while providing them with essential technical supports. Similar to the interpersonal trust, platform trust can mitigate the negative impact of privacy/confidentiality uncertainties. In the case of private and public SM, the companies who own and control the digital platform (e.g. WhatsApp® and Facebook®) are the objects of trust. For the enterprise SM, the organisation who owns and controls the platforms as well as the host company for the digital platform are the objects of platform trust. For instance, the object of platform trust for Yammer is both the employee’s organisation and the host of the digital platform (Microsoft®). This study found that although interpersonal and platform trust have a mitigating...
impact on privacy/confidentiality uncertainties, the absence of one cannot be compensated by the existence of the other.

In addition to interpersonal and platform trust, knowledge quality trust is identified as the third type of trust in this study. Knowledge quality trust refers to the user’s trust in the reliability, validity, currency and accuracy of the shared knowledge on SM platforms. Knowledge quality trust can mitigate the negative impact of knowledge quality uncertainty. The outcome of the last stage of the coding in the grounded theory is presented in Table 3.

Table 3. Secondary theoretical framework (the types of trust required to mitigate existing uncertainties).

| Trust               | Private SM | Enterprise SM | Public SM |
|---------------------|------------|---------------|-----------|
| Interpersonal       | –          | ✓             | ✓         |
| Knowledge quality   | ✓          | –             | ✓         |
| Platform            | –          | ✓             | ✓         |

The findings of the current study show that the mitigating impact of trust is underutilised in the construction industry (Table 3). This finding is consistent with the previous studies which have indicated the overall low levels of SM use by the construction professionals for KS. Based on the outcomes of the application of the GT method and the SM literature, a three-step framework is proposed to enhance SM use for KS in the construction sector.

**Practical implication: A three-step framework for the enhancement of SM use for KS**

The findings of this study shed light on the mechanisms for transforming construction professionals’ intention into actual use of SM for KS. Based on these findings, this study provides a three-step set framework to enhance the use of SM for KS by the construction professionals.

**Step 1: Platform selection**

Selection of the right platform is the preliminary step in the process of enhancing SM use for KS. Based on the findings, this study proffers four criteria for the selection of SM platform, namely: 1) Availability, 2) Practicality, 3) Content-sharing capability, and 4) Least uncertainty. The first three criteria need to be considered carefully based on the particular needs of the users of the platform. However, it is recommended to use platforms available on mobile devices as the construction professionals generally need to access the platform in various locations and just-in-time. The selected platform also needs to give the flexibility of sharing a broad range of formats easily to its users. In addition to the capability for instant multimedia sharing (audio/image/video), the platform should have file-transition capabilities. The capability of the platform for hassle-free cross-device and cross-program transition of the files is an important factor to be considered.

Selection of the platform based on the four criteria might result in unconventional results. However, an unconventional choice of platform might be a better solution for the particular needs of a group of construction professionals for KS. For instance, an enterprise SM like Yammer is a popular choice among project managers due to its socialisation features. Yammer is specifically popular among office-based professional teams. However, a construction project manager and his/her peers have particular KS needs which cannot be met by using Yammer as the main KS platform. A set of simple features such as instant voice-record-sharing capability, the capability to share and transfer various file formats (e.g., .rvt, .dwg, .mpp, .JPEG), and the quality of the mobile app version of the SM can convince a construction project manager to choose a private SM such as Telegram over Yammer.

After shortlisting a range of SM platforms based on the first three factors, one of them should be selected based on the fourth criterion. The SM with the least attributed level of uncertainties is the most suitable platform for KS. The findings of this study show private SM are the platforms with the least attributed uncertainties. Enterprise SM is the second best choice. Selection of public SM is not recommended for
peer-to-peer KS purposes due to the high level of uncertainties associated with public SM. Establishing a customised enterprise SM by medium businesses is not recommended at this stage unless the company has practised KS on SM earlier. The previous experience of using SM for KS can be used to design platforms which match the particular needs of a company. However, for the companies which have never used SM successfully, it is recommended to use pre-existing platforms first. The use of pre-existing platforms can provide sufficient data for the design of a customised platform which suits the particular needs of the company. Following selection of the appropriate SM, users can be added/invited to the platform and start KS effectively.

**Step 2: Mitigation of uncertainties**

The goal of the second step is the mitigation of the existing uncertainties on the selected platform at step 1 by fostering trust and herd behaviour. To tackle privacy/confidentiality uncertainties, interpersonal trust needs to be fostered through trust agents, observational learning and herd behaviour. To tackle knowledge quality uncertainties, knowledge quality trust should be fostered through knowledge quality assessment methods.

**Fostering interpersonal trust and herd behaviour**

Using trust agents can result in observational learning. Observational learning improves interpersonal trust acquisition which will lead to the mitigation of privacy/confidentiality uncertainties. Observational learning also can result in herd behaviour of SM users. Through herd behaviour, users will ignore the uncertainties associated with the imperfect knowledge about the consequences of active KS and contribute to the KS on SM. Trust agents have a key role in fostering trust, observational learning and herd behaviour.

Trust agents are the experienced and skilful members of the professional community who are “power users” of the digital platform as well (Brogan & Smith, 2020, p. 17). Being a member of the professional community is essential for establishing and fostering a trust-based relationship between users and trust agents. Trust agents exploit their interpersonal and communication skills while being accessible for other users for KS. The first impact of trust agents in fostering trust is due to the direct communication and connection with peers. The second impact of the trust agents results from their role in the humanisation of the relationship between users on SM. Humanisation of connections on SM also impacts trust-building and trust-fostering processes in online platforms positively.

The third positive impact of trust agents on fostering trust is indirect and through observational learning. Due to the presence of the trust agents, the users of SM observe and learn from the visible part of the interactions between the trust agent(s) and other users. Observational learning fosters interpersonal trust as users take the trust-based interactions as new information. The new information is being processed by the users to make decisions about SM use for KS. Given a positive value is attached to the observed information, it is likely that the users make decisions in favour of using SM for KS.

The impact of observational learning in the presence of trust agents can go beyond fostering trust. Observational learning can mitigate the impact of uncertainties directly through herd behaviour. Herd behaviour is users’ decision for following the example of other users disregarding their own personal information or knowledge. Due to herd behaviour, users can ignore what they have heard, seen or experienced before about the uncertainties of KS on SM just because they contrast with other users’ behaviour. Therefore, mere witnessing other users’ positive KS activities can result in the enhancement of SM use for KS.

**Fostering knowledge quality trust**

To foster knowledge quality trust, employing knowledge quality assessment methods is the key. Knowledge quality assessment is also known as content credibility assessment in the literature and includes assessment of the quality of the shared content based on its reliability, validity, currency, accuracy and authenticity. On public SM (e.g. Twitter), the use of automated methods such as machine learning algorithms to discern between high-quality and low-quality content is common. Application of automated methods is ideal for detection of unwanted content (e.g. spams), but not recommended for
There are two types of human-based knowledge quality assessment methods. First method is expert or administrative assessment method. In this method, a group of experts/administrators set quality thresholds for the assessment of the quality of the shared knowledge and discern the low-quality content. The content containing the low-quality knowledge can be filtered by the administrators to preserve or improve users’ knowledge quality trust. As administrative method is done manually, its use for knowledge quality assessment on SM with high volumes of KS activity is not efficient. If the platform selected in step 1 of the framework is a private SM with low KS activities, the use of administrative knowledge quality assessment is possible. However, even on private SM, when the number of users or the volume of the KS activities increase, maintaining knowledge quality and trust by using the administrative method becomes cumbersome.

A more efficient method for knowledge quality assessment is crowd-sourced assessment. In this method users rank/promote/demote the shared content based on their perception of quality. This method is used on some of the popular public SM for KS such as Quora and Researchgate. Crowd-sourced knowledge quality assessment is a feasible method on private and enterprise SM. Crowd-sourced assessment can be applied by using add-ons or extensions to enterprise SM. For privates SM (e.g. WhatsApp and Telegram groups), using chatbots is an efficient way to assess the quality of the shared content. The use of Chatbots on private SM (e.g. WhatsApp, Telegram) is easy and common.

Sharing quality assessment polls for the shared content on private and enterprise SM can be used as well. Quality assessment polls can be added as follow-up comments, posts or extensions on enterprise or private SM. If the selected platform in step 1 is an enterprise SM designed for a particular company, the inclusion of quality assessment features (e.g. ranking/promoting/demoting) among the default features of the platform is highly recommended.

**Step 3: Optimisation / Transition**

To be able to optimise the use of the selected platform in earlier steps, there is a need for a comparative evaluation of the performance of the platform for KS. Using surveys and data derived from the host platform, the following items should be measured:

1. Overall satisfaction of the users by the functionality and performance of the platform,
2. Levels of the uncertainties for each KS activity,
3. Levels of the mitigating factors
4. The growth in the volume of the KS activities on the platform,
5. The growth in the number of members

The findings should be compared and contrasted with the targets of the managers/administrators of the platform as well as the previous values for each item. Using a continuous improvement mindset at this step is essential to keep up with the ever-growing volume of knowledge and SM use. A continuous improvement mindset at this stage might mean the maintenance of the platform and improving its’ performance or transition to a new platform can be the solution. While re-focusing on mitigation of uncertainties (Step 2) can improve the performance of the platform. If the level of growth of the platform performance is not satisfactory due to the platforms’ limited features, transition to a new platform can be the solution.

In long term, the transition to a more advanced and capable platform is an inevitable step. As platforms function and grow in performance, they reach their technological and practical capacity. Therefore, they cannot provide users’ evolving needs. These needs are the factors used in step 1 for the selection of the platform. Transition to a new platform is also inevitable due to advancements in IT and construction technologies. However, the transition between platforms should take place gradually to be able to maintain the interpersonal, platform and knowledge quality trust. The recommended framework for the enhancement of SM use for KS (Figure 3) is suggested to be used as a loop of steps accordingly.
Conclusion

This study took an exploratory approach and used the GT method to investigate the mechanisms that influence the process of transforming the construction professionals’ motivation and intention into the actual use of SM. The principal theoretical findings show that Privacy/confidentiality uncertainties and knowledge quality uncertainties are the two types of uncertainty which hinder the transformation of the interviewees’ intention into the actual use of SM for KS. The findings of the final stage of the application of the GT method showed that interpersonal trust, platform trust, and knowledge quality trust can mitigate the negative impact of uncertainties for the construction professionals. The theoretical findings of the study are used to structure a three-step framework to enhance SM use for KS by the construction professionals. The first step is the selection of the appropriate SM based on four selection criteria: 1) Availability, 2) Practicality, 3) Supported formats for content-sharing, and 4) Minimum uncertainty. The second step provides a set of practical recommendations for the mitigation of the existing uncertainties. Using trust agents, observational learning, stimulation of herd behaviour and crowdsourced quality assessment are among the main recommended methods in step two. The third step suggests a set of items for the evaluation of the performance of the platform. The findings of the evaluation phase lead the administrators of the platform to the optimisation of the platform use. This study contributes to unveiling the mechanisms influencing the actual uptake of SM for KS by construction professionals and proffering an evidence-based practical framework for enhancing the actual uptake of SM for KS.

Limitations and future research

The first limitation of this study is due to the exclusion of SM use for Business-to-Consumer (B2C) from the scope of the study. The reality of the construction industry, as demonstrated in previous studies,
is focused on the use of SM for financial gains. The use of SM for B-2-C KS is an interesting subject for future studies in the field which can be conducted comparatively with regards to the findings of the current study.

The second limitation of this study is related to its focus on the most commonly used SM platforms among the construction professionals. Although this focus provided a better understanding of the existing conditions in the construction industry, it did not cover more novel SM platforms. As it is anticipated that newer SM platforms will play a greater role in the upcoming years, future research can focus on the critical factors for the use of such new platforms.

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Appendix:

Interview questions on the use of SM for work-related knowledge sharing by the construction professionals:

**Q1:** What are the main SM platforms that are used by you for work-related knowledge sharing? (Please give some examples from your own experience …).

**Q2:** What are the main factors which convince you to use them (SM) effectively for work-related knowledge sharing? Why? (Please give examples from your own experience…).

**Q3:** What are the main impediments for you to use SM for work-related knowledge sharing? (Please give examples of the things or situations that stop you from using SM, such as lack of trust, time…).

**Q4:** What kind of online activity is more fruitful for you? Observing others’ online activities or active participation and presence by engaging in discussions? (Please give some examples from your personal experience).

**Q5:** What can encourage you to use SM more frequently for your work-related knowledge sharing? (Please give examples from your experience depending on your types of social media use.).

**Q6:** What can encourage you to engage more actively in online discussions on SM by asking questions, or sharing your opinion and answers with others? (Please give examples from your personal experience).

**Q7:** What conditions are needed for you to increase your SM use for work-related knowledge sharing? (In addition to items such as more reliable resources on SM, support from your firm or peers, and technical assistance and/or training, please give examples from your personal experience).

**Q8:** What are your expectations from a SM platform in terms of work-related knowledge sharing (Please give examples from your personal experience)?

**Q9:** What can improve your confidence to look for knowledge or share your work-related knowledge on SM?

**Q10:** How SM can meet your needs better in terms of professional development and improving your work-related knowledge?