

**Cognitive processes, rewards and online knowledge sharing behaviour: the moderating effect of organisational innovation**

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# Cognitive processes, rewards and online knowledge sharing behaviour: The moderating effect of organisational innovation

## Abstract

**Purpose** - Online knowledge sharing is a critical process for maintaining organisational competitive advantage. This research develops a new conceptual framework that investigates the moderating impacts of innovation on self-efficacy, extrinsic and intrinsic rewards on employees' online knowledge sharing behaviour in public and private sector companies.

**Design/methodology/approach** – This research analysed 200 responses to test the moderating effects of organisational innovation on the relationship between self-efficacy and rewards and online knowledge sharing behaviours. Analysing using component-based partial least squares (PLS) approach and Smart-PLS 3 software.

**Findings** - Our results reveal that self-efficacy significantly affects online knowledge sharing behaviour in firms, regardless of the organisation type. Extrinsic rewards encourage employees in private companies to share knowledge online, whereas intrinsic rewards work effectively in public companies. Additionally, the study found the moderating role of organisational innovation in examining the relationship between rewards and online knowledge sharing behaviour.

**Research limitations/implications** – Future research may consider different dimensions such as knowledge donating and collecting behaviours as well as motives, such as self-enjoyment, reciprocity or social interaction ties may be investigated to get a deeper understanding of online knowledge sharing behaviour.

**Practical implications** – Firms must tailor training and rewards to suit employees' ability and needs so as to align with organisational type and innovation.

**Originality/Value** – The study's distinctive contribution is the under-researched context of Vietnamese public and private sector banks for investigating the moderating effects of organisational innovation on micro- and meso-factors on online knowledge sharing behaviour.

**Keywords:** *Extrinsic rewards; Intrinsic Rewards; Online knowledge sharing; Public companies; Private companies*

**Paper type:** Research paper

## Introduction

Prior research has examined knowledge self-efficacy and rewards as crucial determinants of knowledge sharing that then affect organisational innovation (Nguyen, 2020b; Nguyen *et al.*, 2019c). In modern times, knowledge is regarded as key to sustainable competitive advantage and the ability of organisations to apply knowledge to its productive processes is viewed as a key factor in an organisation's value creation and realisation processes (Malik *et al.*, 2018) as well as leading to a range of innovation outcomes (Bock and Kim, 2002; Bock *et al.*, 2005; Nguyen, 2020b; Malik and Nilakant, 2016; Malik *et al.*, 2020). However, as valuable knowledge often resides in an employee's mind (Nguyen *et al.*, 2019c), transfer of knowledge in an organisation ultimately depends on employees' knowledge sharing behaviours (Bock *et al.*, 2005; Nguyen, 2020a). When knowledge is not shared among employees, knowledge gap increases, leading to low productivity (Baird and Henderson, 2001).

In order to enhance knowledge sharing behaviour of employees, many organisations have set up online knowledge sharing systems to facilitate the knowledge sharing process. However, in an organisation, employees may be reluctant to share their valuable and essential knowledge (Bock and Kim, 2002; Davenport and Prusak, 1997; Nguyen *et al.*, 2019a; Nguyen *et al.*, 2019b). Consequently, employees tend to hoard knowledge and look suspiciously upon knowledge shared by others (Bock and Kim, 2002). This natural tendency is not easy to change. Ruggles (1998) examined 431 U.S. and European organisations and argued that the most significant difficulty in knowledge management is changing an individual's behaviour. The annual losses associated with knowledge hiding may cost the average American company up to US\$ 47 million in productivity losses (Panopto, 2018). It is, thus, imperative for to understand what motivates employees to share knowledge in an online mode and transfer that knowledge to a firm's capital to contribute to the development of an organisation's competitive advantage.

In an attempt to develop a clearer understanding of the motivators of knowledge sharing, prior researchers have indicated several factors that motivate employees to share knowledge. For instance, knowledge self-efficacy and rewards were shown to significantly affect knowledge sharing (Lin, 2007a; Bock and Kim, 2002; Nguyen *et al.*, 2019c). However, despite the emphasis on motivational factors when examining online knowledge sharing, there are several limitations in the existing literature.

First, although rewards vary from extrinsic incentives such as bonuses or promotions to intrinsic rewards such as praise and public recognition, majority of prior studies have tended to focused on extrinsic rewards. This may stem from the relative ease and measurement of acquisition of extrinsic rather than intrinsic rewards (Choi *et al.*, 2008; Bartol and Srivastava, 2002; Wasko and Faraj, 2005). However, extrinsic rewards per se are not sufficient to motivative online knowledge sharing behaviour. Thus, some researchers have argued that intrinsic rewards are even more important than extrinsic rewards in eliciting knowledge sharing behaviours (Bartol and Srivastava, 2002; Choi *et al.*, 2008). The research on the impact of rewards is equivocal. For example, Kim and Lee (2006), Hau *et al.* (2013), Taylor (2006) and Choi *et al.* (2008) reinforce the belief that rewards positively affect knowledge sharing behaviour, but other studies have reported no effect and a negative impact, such as those by Bock and Kim (2002), Bock *et al.* (2005), and Olatokun and Nwafor (2012). These results necessitate the need to find the potential causes for such inconsistencies.

Another limitation in existing research is that when examining motivators of online knowledge sharing, previous scholars have revealed little about how the impacts of motivators differ between public and private companies. Public and private companies differ widely in their motivation, values and purpose that employees bring to work, due to the differences in management purpose and objectives, the key job types and organisational structures (Malik, 2018). Public companies, for example, operate in a more bureaucratic manner and are directed to serve the society and citizens and its employees exhibit altruistic values (Yeh *et al.*, 2018). In contrast, private companies are profit-oriented and face fierce competition and are faced with a rapidly changing market environment (Yeh *et al.*, 2018). Thus, these differences between public and private companies may lead to different driving forces of employees' online knowledge sharing behaviours.

Finally, organisational innovation has not been examined as a moderator in knowledge sharing. Organisational innovation is a critical factor for both public and private enterprises' achievement of goals, and as such, has received a great deal of attention from researchers and practitioners to understand the impact of knowledge sharing on organisational innovation (Calantone and Stanko, 2007; Khedhaouria and Jamal, 2015; Lin, 2007b; Tangaraja *et al.*, 2015). Further, researchers and practitioners have to consider how to design their reward systems for fostering organisational innovation. Active sharing knowledge is known to enhance organisational innovation because personal knowledge could be transferred to organisational capital, which can enhance employee performance and reduce redundant learning time

(Calantone *et al.*, 2002; Scarbrough, 2003). Conversely, in highly innovative companies, employees tend to have more responsibilities to contribute to the innovativeness of their company, and as a result, the forces that drive knowledge sharing are likely to be different in these firms.

In line of the above equivocal findings and tensions in the literature, the objective of this study is threefold: (1) to deepen the understanding of the drivers of online knowledge sharing in an organisation, wherein both extrinsic and intrinsic rewards are simultaneously examined; (2) to examine the driving factors of online knowledge sharing in public and private companies, and (3) to investigate the moderating role of organisational innovation in online knowledge sharing. To this end, we contribute by developing a conceptual model for analysing the above relationships. The rest of the paper is organised as follows. First, the paper presents a detailed literature review, followed by the study's hypotheses and the methodological approach adopted. This is followed by the results and discussion sections, respectively. Next, implications for theory and practice are discussed followed by conclusion .

## **Literature review**

### *Online knowledge sharing in organisations*

In this research, we define online knowledge sharing as the process by which employees transfer or disseminate their opinions, experience, skills and know-how via online means to other colleagues within the organisation to provide them mutual help in problem-solving and ideas development (Nguyen, 2020a; Van den Hooff *et al.*, 2012; Nguyen *et al.*, 2019a). Online knowledge sharing is considered a crucial part of building a knowledge-based competitive advantage in an organisation (Kogut and Zander, 1992; Argote and Ingram, 2000; Cohen and Levinthal, 1990). Online knowledge sharing often enhances interpersonal socialisation in an organisation as they facilitate a continuous series of interaction that facilitate the creation and transfer of knowledge. A number of organisations have recognised the importance of the online transfer of knowledge in improving the performance of employees. Therefore, such organisations have invested in technological infrastructure that facilitates online knowledge sharing (Bughin and Manyika, 2007; Young *et al.*, 2008).

According to motivation theory, individuals need to have motivation to perform a behaviour. In the organisational online knowledge sharing context, motivation may stem from employees' knowledge self-efficacy when employees are confident about their knowledge to

contribute to the organisation. Kumar *et al.* (2009) argue that employees with higher levels of self-efficacy often display considerably flexible behaviour such as giving useful advice that benefits the organisation but not mandated in the contract. They tend to view knowledge sharing as one important component of their work and believe that sharing knowledge is very important to effective daily work and entails getting along with others in pleasant (Borges, 2013; Wang and Yang, 2007).

Motivation to share knowledge online in an organisation may also originate from the rewards that are offered by the organisation. Vroom's (1964) expectancy theory indicates that motivation level to perform a behaviour relates directly with rewards, which produce fulfilment (Kiatkawsin and Han, 2017; Purvis *et al.*, 2015). Thus, extrinsic and intrinsic rewards are often proposed to encourage employees to contribute to the organisation including actively participating in online knowledge sharing. Employees often weigh their expectations of rewards against costs if they share their knowledge online (Taylor, 2006). An effective reward system will encourage employees to increase effort, which can potentially lead to performance improvement. The combination of extrinsic and intrinsic rewards may be helpful in encouraging employee's online knowledge sharing. Although a variety of studies have investigated rewards, but there is a paucity of research which includes both types of reward in a single study. Table 1 shows previous studies examining rewards in organisations in the knowledge sharing literature.

#### *Public versus Private Sector Organisations*

The nature and extent of differences between employees in public and private companies have been a topic of debate. This debate stems from different aspects that public and private sector organisations depict (Milner, 2000). The first aspect is organisational goals. In public organisations, it is more difficult to measure organisational goals because they may be conflicting and be significantly influenced by political issues (Pandey and Wright, 2006). The second aspect is the diversity of goals and ownership in public organisations as they vary in terms of their ownership, funding, and control (Willem and Buelens, 2007). Fragmented authority and less incentive for efficiency are other aspects that differentiate public from private sector organisations (Heffron, 1989). The differences between public and private organisations may lead to different determinants of online knowledge sharing behaviour of employees. Previous studies have shown that there are differences in terms of the motivators of knowledge sharing between public and private sector organisations. For example, Liebowitz and Yan

(2004) argued that in public sector organisations, knowledge sharing hardly occurred because employees often consider knowledge as power and useful for promotion opportunities. Seba *et al.* (2012a) found that organisational structure, leadership, time allocation, and trust may impede knowledge sharing in the public sector, such as that seen in the Dubai police force. Lin (2007a) found the antecedents of employee's knowledge sharing attitudes and intentions in 50 private sector organisations were reciprocal benefits, knowledge self-efficacy, and enjoyment in helping others. However, in the literature on knowledge sharing, few studies have compared the influence of drivers of online knowledge sharing in different organisational types, such as in the public and private sectors.

### *Knowledge sharing motives*

Knowledge self-efficacy is defined as the employees' confidence in their ability to provide valuable knowledge to other colleagues in an organisation (Kankanhalli *et al.*, 2005b; Spreitzer, 1995). Based on the self-efficacy theory (Bandura and Walters, 1977), employees, who have high levels of knowledge self-efficacy, tend to have powerful self-motivation (Hsu *et al.*, 2007), which often leads to active knowledge sharing (Lin, 2007a; Bock and Kim, 2002).

### **Hypotheses Development**

Employees who have a high level of knowledge self-efficacy, tend to share knowledge online with colleagues (Kankanhalli *et al.*, 2005b; Wasko and Faraj, 2005; Bock and Kim, 2002). Malik, Boyle and Mitchell, 2017; Olatokun and Nwafor (2012), who examined 297 employees across six ministries in the Nigerian civil service commission, found that competence and confidence, which refer to knowledge self-efficacy, may be a requirement if an employee wishes to engage in online knowledge sharing in a public company. Amayah (2013) argued that the key factors affecting knowledge sharing in public companies, such as knowledge self-efficacy, could also be successfully used in private companies. Therefore, we propose the following hypothesis:

**H1:** *Knowledge self-efficacy is positively related to online knowledge sharing behaviour in a) public companies and b) private companies.*

**Table 1: Studies Examining Self-efficacy & Organisational Rewards in Knowledge Sharing Literature**

Study's Authors	In organizations	Organisation type	Online knowledge sharing	Knowledge self-efficacy	Rewards		Country	Sample size	Sample characteristics
					General rewards	Specific rewards			
Al-Alawi <i>et al.</i> (2007)	✓	Both public and private			✓		Bahrain	231	employees in organisations from the public and private sectors in the Kingdom of Bahrain
Al-Busaidi <i>et al.</i> (2010)	✓	Private	✓		✓		Oman	104	employees in a major private petroleum organisation
Alam <i>et al.</i> (2009)	✓	NA			✓		Malaysia	305	employees in manufacturing companies from Melaka and Johor states
Bock <i>et al.</i> (2005)	✓	NA				Extrinsic	Korea	154	employees from 27 organisations
Bock and Kim (2002)	✓	Public				Extrinsic	Korea	467	employees from four large, public companies
Amayah (2013)	✓	Public			✓		USA	439	civil service employees at a mid-size public academic institution in the Midwest
Cho <i>et al.</i> (2007)	✓	NA				Extrinsic	Korea	207	working adults taking evening classes in the part-time MBA programs of Hanyang University
Choi <i>et al.</i> (2008)	✓	NA	✓			Extrinsic & intrinsic	Korea	164	employees in two manufacturing companies
Dong <i>et al.</i> (2010)	✓	NA		✓		Extrinsic	Vietnam	124	employees in six multinational companies in Ho Chi Minh city.
Durmusoglu <i>et al.</i> (2014)	✓	NA			✓		Europe	1108	employees in diversified European corporation active in 10 industries with 11 SBUs in 9 different countries, e.g. Italy, Russia, Turkey, UK, and others.
Eze <i>et al.</i> (2013)	✓	NA			✓		Malaysia	250	manufacturing sector participants from the SME Corporation Malaysia business directory

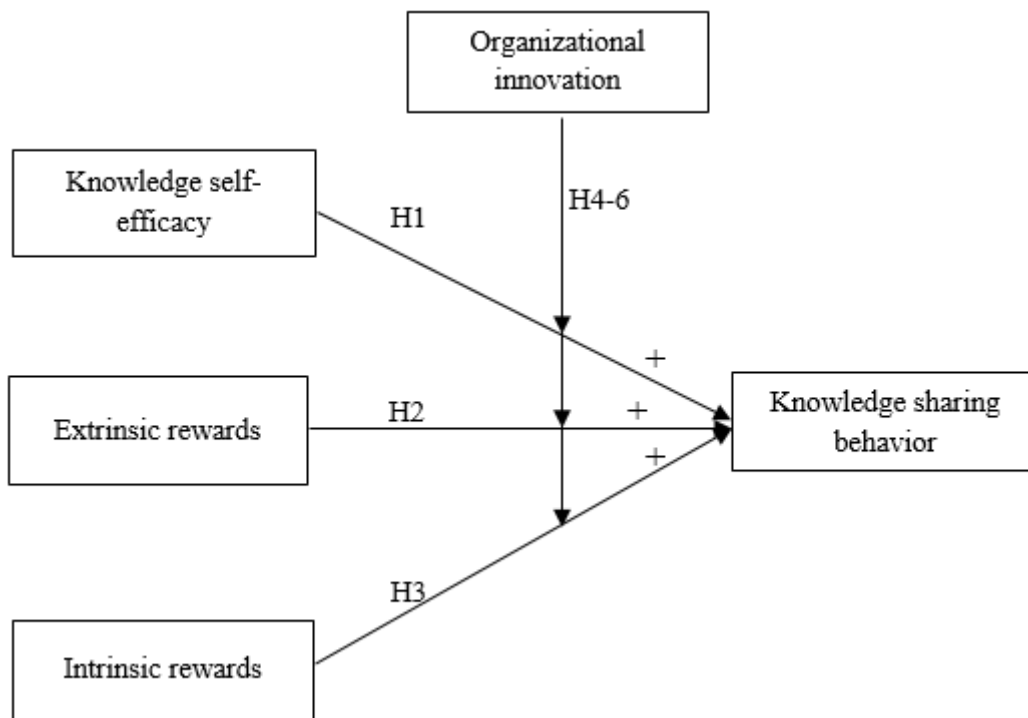


Fathi <i>et al.</i> (2011)	✓	NA			✓		Malaysia	141	employees in a manufacturing company
Gebreegziabher (2014)	✓	NA	✓		✓		Ethiopia	103	employees working for three centres, namely Nile SEC, ENTRO, and NELSAP-CU as permanent staff and reachable NBI stake holders
Hau <i>et al.</i> (2013)	✓	NA				Extrinsic	Korea	2010	employees in multiple industries
Huang <i>et al.</i> (2008)	✓	NA		✓		Extrinsic	China	159	MBA students working in a university of different organisations
Hung <i>et al.</i> (2011)		NA				Extrinsic	Taiwan	120	upper division undergraduate and MBA students from one university
Kim and Lee (2006)	✓	Both public and private			✓		Korea	322	employees in five public-sector and five private-sector organisations
Kumar and Rose (2012)	✓	Public		✓		Extrinsic	Malaysia	472	Administrative and Diplomatic Service employees from the Malaysian public sector organisations
Liao (2008)	✓	NA				Extrinsic	Taiwan	105	R&D employees
Lin (2007b)	✓	NA		✓		Extrinsic	Taiwan	172	employees from 50 large organisations
Lin (2007a)	✓	NA		✓		Extrinsic	Taiwan	172	employees from 50 large organisations
Lin <i>et al.</i> (2009)	✓	NA		✓		Extrinsic	Taiwan	172	employees from 50 large organisations
Lin and Lo (2015)	✓	NA				Extrinsic	Taiwan	180	nurses in a regional teaching hospital
Olatokun and Nwafor (2012)	✓	Public		✓		Extrinsic	Nigeria	297	respondents across six ministries in the state's Civil Service Commission
Pee <i>et al.</i> (2010)	✓	Private Public			✓		Japan	95	a dyad of business subgroup and external IT consultant subgroup in a project team in a particular phase

Seba <i>et al.</i> (2012b)	✓	NA				Extrinsic	UAE	311	officers in Dubai Police Force
Tan (2016)	✓	NA		✓		Extrinsic	Malaysia	421	94 professors, 154 associate professors, and 173 senior lecturers
Taylor (2006)		NA	✓			Extrinsic	USA	52	graduate and undergraduate accounting information students assigned to six groups
Tohidinia and Mosakhani (2010)	✓	NA	✓	✓		Extrinsic	Iran	502	employees from oil companies
Wickramasinghe and Widyaratne (2012)	✓	NA	✓			Extrinsic	Sri Lanka	150	software developers
Wu and Zhu (2012)	✓	NA				Extrinsic	China	180	employees from ten companies
Zhang <i>et al.</i> (2014)		NA	✓			Extrinsic	Hong Kong, China and Netherland	113	postgraduate students in engineering and business in the innovative virtual class
Zhang <i>et al.</i> (2013)	✓	NA	✓			Extrinsic	China	159	Liaisons between employees from different departments of Xuan Cheng Division

*Note:\** Under rewards, general rewards refers to papers that did not specify whether the nature of rewards was extrinsic or intrinsic, whereas specified rewards refers to papers that did specify the nature of rewards as extrinsic, intrinsic or both. NA: Not available

## Hypotheses development



**Figure 1: Conceptual framework**

Figure 1 shows the study's conceptual framework.

Rewards refer to a benefit that employees can receive if they share knowledge online. Rewards can be broadly categorised into two types: extrinsic and intrinsic (Choi et al., 2008). The former refers to monetary incentives such as bonuses, paid vacations, and promotions, (Kankanhalli *et al.*, 2005a), whereas, the latter refers to intrinsic incentives such as praise and public recognition (Choi et al., 2008). Employees often seek a strong incentive to share their knowledge online (Ryan and Deci, 2000; Roca and Gagné, 2008). It is unrealistic to assume that an employee will be willing to share their valuable knowledge without taking into an assessment what may be gained and lost through such knowledge sharing behaviours (Al-Alawi et al., 2007). When employees achieve an extrinsic or intrinsic reward for their knowledge sharing, they are motivated to share knowledge (Hau et al., 2013). Extrinsic and intrinsic rewards have been shown to encourage knowledge sharing behaviour of employees (Huang et al., 2008) in both public and private companies (Pee et al., 2010; Kim and Lee, 2006). Extrinsic and intrinsic rewards therefore may encourage online knowledge sharing (Taylor, 2006). Therefore, the following hypotheses are proposed:

**H2:** *Extrinsic rewards are positively related to online knowledge sharing behaviour in a) public companies and b) private companies.*

**H3:** *Intrinsic rewards are positively related to online knowledge sharing behaviour in a) public companies and b) private companies.*

### ***The moderating effect of organisational innovation***

Organisational innovation is a multi-dimensional construct and refers to the implementation of new organisational methods (Camisón and Villar-López, 2014), such as product, process and management innovation. Product innovation focuses on the creation of new products/services (Gumusluoglu and Ilsev, 2009), whereas process and management innovations relate to an organisation's tendency to implement new processes or management methods to improve the operation or service for improved organisational performance (Liao et al., 2007). Organisational innovation is an important source of sustainable competitive advantage because it has the potential to substantially enhance firm performance by reducing production and transaction costs and thereby improving labour productivity (Ganter and Hecker, 2013; Scuotto et al., 2017).

Employees in innovative organisations are more likely to share knowledge to contribute to the improvement of organisational performance, as such environments require high levels of innovative activity. Employees with high self-efficacy are more likely to share their knowledge to apply their individual knowledge to an organisation's production activities (Diliello et al., 2011; Bresciani et al., 2018; Wang and Chen, 2020). Employees in innovative organisations are often motivated to showcase their knowledge self-efficacy for mobilising the creativeness of employees through knowledge sharing (Diliello et al., 2011; Gong et al., 2009; Tierney and Farmer, 2011; Wang et al., 2013; Lo et al., 2020). The key tenets of the self-efficacy theory further suggests that self-efficacy stems from an intrinsic belief that employees have the ability to contribute valuable knowledge to an organisation. This belief is often sensitised to a firm's contextual environment (Bandura, 1977). As such organisations with a high level of innovation activities and employees with high levels of high self-efficacy may perceive their role as critical in maintaining or improving their organisation's innovation activities.

Consequently, they tend to share more knowledge than others. Thus, organisations that are innovative, as measured on a continuum of high to low, regardless of their legal structure -

public or private, the influence of knowledge self-efficacy on knowledge sharing is moderated by organisational innovation. Therefore, we propose the following hypothesis:

**H4:** *Organisational innovation moderate the impact of self-efficacy on online knowledge sharing behaviour in a) public companies and b) private companies.*

The impact of rewards on knowledge sharing is not consistent across several studies, thereby raising the prospects of other organisational factors at play in explaining the variance in results. Indeed, in highly innovative organisations, employees tend to perceive extrinsic and intrinsic rewards differently. Employees that are active in knowledge sharing tend to contribute to the organisations so they maintain or improve their innovation. Thus, the effect of extrinsic and intrinsic rewards on employees' online knowledge sharing behaviours may be moderated by organisational innovation. Marx and Faleiros Soares (2015) further emphasise that organisational innovativeness should be taken into consideration when designing reward systems because the effect of rewards on online knowledge sharing may vary. Employees who are motivated by extrinsic and/or intrinsic rewards often perceive that they will engage in online knowledge sharing behaviours because of a specific type of reward that they value more (Pee et al., 2010; Kim and Lee, 2006; Huang et al., 2008; Al-Alawi et al., 2007). However, in companies with high innovation, regardless of whether they belong to public or private sectors, employees may have a feeling of higher responsibility to contribute to a company's innovation. These employees are less inclined to believe that their online knowledge sharing behaviours are caused by the rewards an organisation offers.

**H5:** *Organisational innovation moderates the impact of extrinsic rewards on online knowledge sharing behaviour in a) public companies and b) private companies.*

**H6:** *Organisational innovation moderates the impact of intrinsic rewards on online knowledge sharing behaviour in a) public companies and b) private companies.*

## **Research methods**

### *Sample*

The sample in this study comprises of employees working in Vietnamese banking companies who had used online knowledge platforms in these organisations to share their knowledge for various activities. These banking companies were selected based on the suggestion of Kim and Lee (2006) and Tohidinia and Mosakhani (2010) because knowledge management practices

are essential in this industry, especially as this industry has a well-developed information technology infrastructure for online knowledge sharing.

A total of 200 usable responses were received from an initial of 892, indicating the response rate of 22.4%. Of the total sample, 40.5% were male, and 59.5% were female. The majority of respondents were in the age group of 21 to 30 years (58.5%), followed by age groups of 31-40 years (33%), 41-50 years (6%) and 51-60 years (2.5%). In terms of their qualifications, more than 70% of respondents had a bachelor's degree and the nature of majority of respondents was working in full-time role. Online platform systems used in organisations for sharing knowledge include platforms, such as Skype, Zoom, Zalo, WhatsApp and Messenger.

### *Measurement*

All measurement items were adapted from existing scales in the literature to ensure content validity, using a 7-point Likert scale, wherein, 1 for 'strongly disagree', and 7 for 'strongly agree'. Knowledge self-efficacy was measured by adapting knowledge self-efficacy scale used in the Bock et al. (2005) study to assess the confidence employees had in their ability to contribute to an organisation using online knowledge sharing, including items such as "When sharing knowledge online, I feel confident in my ability and knowledge to help my organisation to improve work processes". The Cronbach's alpha value for this adapted scale was 0.95.

Extrinsic rewards were adapted from Lin (2007a), assessing the tangible incentives that employees of an organisation may receive for sharing their knowledge using online platforms with their colleagues, including items such as "I share my knowledge online because in return I will receive a higher bonus". The Cronbach's alpha value for this adapted scale is 0.91. Intrinsic rewards were adapted from Choi et al. (2008), which assessed the intangible incentives that employees of an organisation may receive for sharing their knowledge sharing using online platforms with their colleagues, including items such as "The more I share my knowledge online, the more my reputation would be enhanced". The Cronbach's alpha value for this adapted scale was 0.96. Knowledge sharing behaviour was measured by adapting the scale in Akhavan and Mahdi Hosseini (2016) and Kim and Lee (2013) to assess employees' online knowledge sharing behaviour, including items such as "I often share my information, skills and experiences with my colleagues". Cronbach's alpha value for this adapted scale is 0.93.

Organisational innovation was measured by adapting the scale in the study of Liao et al. (2007). This scale comprises three dimensions (product, process and management innovation). Product innovation was assessed organisational capability to provide differentiated or new

products or services, including items such as “Our company often develops new products and services well accepted by the market”. Process innovation is referred to as an organisational capability that identifies a better or new manufacturing or service process to achieve better performance, including items such as “Our company always acquires new skills or equipment to improve the operation or service process”. Management innovations relates to organisational capabilities to improve organisational performance by implementing new managerial practices, systems, and methods, such as innovating a firm’s business model, including items such as “Our company’s department heads often adopt new leadership approaches to lead all employees towards task completion”. The reliabilities were .96 for all dimensions.

### *Procedures*

The questionnaire was initiated based on the scales adapted from the previous studies. A pilot survey of 30 Vietnamese employees was conducted to check for the reliability of the measures and the clarity of the questionnaire. The main data collection process began with an email sent to employees in Vietnamese banking companies to invite employees who have engaged in online knowledge sharing in their companies, to participate in a survey using the online survey link in SurveyMonkey. SurveyMonkey was used in this study due to its ability to ensure data security and the anonymity of the participants at all times. Two funnelling questions were placed at the beginning of the online survey to ensure that the employees 1) worked in the banking industry; and 2) had used an online platform in their organisation to share knowledge. These filtering questions ensured that only eligible respondents participated in the survey. To minimise response bias, similar questions were placed in different sections of the survey to ensure identical responses. 200 completed questionnaires were received within three months of the launch of the survey.

### **Results**

The measurement and structural models were evaluated by the component-based partial least squares (PLS) approach. Smart-PLS 3 software was employed for data analysis.

#### *Measurement model*

In the measurement model, the internal consistency reliability of constructs was assessed using Cronbach’s alpha and composite reliability tests (see Table 2). All the Cronbach’s alpha values of the measures were above the acceptable threshold of 0.70 (Nunnally, 1994). The composite

reliability of all constructs also surpassed the recommended level of 0.7 (Nunnally, 1994). The convergent validity was confirmed when all the average variance extracted (AVE) values was greater than 0.5, thereby exceeding the suggested threshold value (Fornell and Larcker (1981). The discriminant validity was confirmed when (see Table 3), as none of the construct correlations (non-diagonal entries) exceeded the corresponding square root of the AVE values (diagonal entries).

### *Common method bias*

Both ex-ante and ex-post procedures were undertaken to minimize response bias and errors. Regarding the ex-ante procedure, validated scales from previous studies to measure the variables that were reported with high reliability were adapted. A pilot study was conducted to check for reliability. In the introduction section of the main survey, respondents were assured of anonymity in their responses. For the ex-post procedure, common method bias was assessed through variance inflation factor (VIF). In SmartPLS V3, a consistent PLS algorithm analysis was run with the weighting scheme at the factor level to check all inner VIF values. Consistent with PLS algorithm analysis, each of the five variables was considered in turn as a dependent variable; the others were considered as independent variables. The VIF scores of all constructs were well below the threshold of 3.3 recommended by Bharati *et al.* (2015), indicating that multicollinearity and common method bias were unlikely to be an issue with the data.

**Table 2** Reliability

Variable	Source	Measures	Factor loading
Knowledge self-efficacy ( $\alpha=.95$ , CR=.95, AVE=.80)	Bock et al. (2005)	When sharing knowledge online, I feel confident in my ability and knowledge to....	
		(1) help colleagues to solve their problems	.91
		(2) create new business opportunities for my organisation	.89
		(3) help my organisation to improve work processes	.90
		(4) help my organisation to increase productivity	.83
		(5) help my organisation to achieve performance objectives and outcomes	.94
Extrinsic rewards ( $\alpha=.91$ , CR=.91, AVE=.72)	Lin (2007a)	I share my knowledge online because in return I will receive...	
		(1) a higher salary	.77
		(2) a higher bonus	.73
		(3) increased promotion opportunities	.93
		(4) increased job security	.93
Intrinsic rewards ( $\alpha=.96$ , CR=.96, AVE=.84)	Choi et al. (2008)	(1) People honour my job when I teach or share my own skills online	.96
		(2) The more I share my own knowledge online, the more my reputation would be enhanced	.88
		(3) When I share my knowledge online, I can get more chance to show my skills to the other colleagues	.87
		(4) When I share my knowledge online, people approve of me as an expert in our company	.96



Product innovation ( $\alpha=.96$ , CR=.96, AVE=.82)	Liao et al. (2007)	(1) Our company often develops new products and services well accepted by the market	.88
		(2) Our company can often launch new products or services faster than our competitors	.87
		(3) Our company is frequently the first to market new products and services	.92
		(4) Our company has a better capacity in R&D for new products and services than our competitors	.94
		(5) Our new product introduction has increased over the last 5 years	.91
Process innovation ( $\alpha=.96$ , CR=.96, AVE=.82)	Liao et al. (2007)	(1) Our company always acquires new skills or equipment to improve the operation or service process	.93
		(2) Our company can develop more efficient process and service operation	.93
		(3) Our company is creative in its operating methods	.94
		(4) Our company seeks new ways of doing things	.92
Management innovation ( $\alpha=.96$ , CR=.97, AVE=.88)	Liao et al. (2007)	(1) Our company's department heads often adopt new leadership approaches to lead all employees towards task completion	.97
		(2) Our company emphasises innovative and creative capability when recruiting a new employee	.94
		(3) Employees are often given incentives to generate new ideas as well as seek new ways of doing things	.92
		(4) Our company will change the divisions of work among different departments according to the needs of market management	.92
Knowledge sharing behaviour ( $\alpha=.93$ , CR=.93, AVE=.76)	Akhavan and Mahdi Hosseini (2016) and	(1) I often share my information, skills and experiences with my colleagues online	.92
		(2) When I have learned something new I often tell my colleagues about it online	.89
	Kim and Lee (2013)	(3) I regularly tell my colleagues online what I am doing	.79
		(4) Online knowledge sharing among my colleagues is considered normal	.92

A: Cronbach's alpha CR: composite reliability; AVE: average variance extracted

**Table 3** Discriminant validity

	1	2	3	4	5
1. Knowledge self-efficacy	<b>.89</b>				
2. Extrinsic rewards	.44*	<b>.84</b>			
3. Intrinsic rewards	.61*	.62*	<b>.92</b>		
4. Organisational innovation	.67*	.44*	.72*	<b>.88</b>	
5. Knowledge sharing behaviour	.64*	.46*	.70*	.63*	<b>.88</b>

\*Correlation is significant at the .01 level (2-tailed);

The bold numbers in the diagonal row are the square roots of AVE

### *Structural model*

The structural model was assessed. The coefficient of determination ( $R^2$ ) was 58.5%, indicating that 58.5% of the variance in the level of online knowledge sharing behaviour can be explained by knowledge self-efficacy, extrinsic and intrinsic rewards.

In order to test the hypotheses, the sample was split into two groups: public and private companies. In PLS 3, a multi-group analysis with 1000 subsamples was run. H1a and H1b proposed that knowledge self-efficacy was significantly and positively related to online

knowledge sharing behaviour in public and private companies. As shown in Table 4, knowledge self-efficacy had a significant positive effect on knowledge sharing behaviour in both subgroups (i.e. in public companies:  $\beta = .43$ ,  $p < .001$ ; private companies:  $\beta = .38$ ,  $p < .001$ ); thus, hypotheses H1a and H1b were supported. The results in Table 4 also showed no different effects of self-efficacy on online knowledge sharing behaviour between groups of public and private sector firms.

Hypotheses H2a, b and H3a, b proposed that extrinsic rewards and intrinsic rewards were significantly and positively related to online knowledge sharing behaviour in public and private companies. The results showed that extrinsic rewards significantly affected knowledge sharing behaviour in private companies ( $\beta_{\text{extrinsic rewards}} = .20$ ,  $p < .01$ ) and intrinsic rewards significantly affected knowledge sharing behaviour in public companies ( $\beta_{\text{intrinsic rewards}} = .52$ ,  $p < .001$ ). In contrast, extrinsic rewards did not influence online knowledge sharing behaviour in public companies ( $\beta_{\text{extrinsic rewards}} = -.08$ ,  $p > .05$ ) and intrinsic rewards did not influence online knowledge sharing behaviour in private companies ( $\beta_{\text{intrinsic rewards}} = .22$ ,  $p > .05$ ). Thus, hypotheses H2b and H3a, were supported, but H2a and H3b were not supported. The differences in path coefficients of the impact of determinants of online knowledge sharing behaviour in two groups was further assessed.

Table 5 shows the moderating effect of organisational innovation on the impact of individual and organisational factors on online knowledge sharing behaviours. The results indicate that organisational innovation had a moderating effect in the relationship between extrinsic rewards and online knowledge sharing behaviour ( $\beta = .32$ ,  $p < .01$ ) and between intrinsic rewards and online knowledge sharing behaviour ( $\beta = -.30$ ,  $p < .01$ ) in the private sector group of firms. Therefore, hypotheses H5b and H6b were supported, but hypotheses H4a, H4b, H5a, and H6a were not supported.

## **Discussion**

Overall, the study highlights several key findings and contributes to the body of knowledge on knowledge sharing in general and online knowledge sharing, specifically. The findings of this study indicate that knowledge self-efficacy has a statistically significant influence on online knowledge sharing behaviour in both public and private companies. It is, therefore, recommended that by strengthening employees knowledge self-efficacy, we can motivate employees to share knowledge via online platforms. This finding is in line with the studies of Olatokun and Nwafor (2012), Hsu et al. (2007) and Lin (2007a).

Interestingly, the results of this study show that extrinsic rewards were only effective in encouraging employees to share knowledge in private companies, whereas intrinsic rewards were only effective in public companies. This finding is in line with prior research by Buelens and Broeck (2007), Cacioppe and Mock (1984) and Crewson (1997), which shows that employees in private companies value extrinsic rewards more than those in public companies. In contrast, employees in public companies tend to be more motivated by intrinsic rewards (Leete, 2000). This finding is in line with the altruistic motivations that majority of public sector employees are driven with. Further, employees in public sector companies tend to be less inspired by material rewards and place more interest in the fairness and justice of the organisation than those in private companies (Lyons *et al.*, 2006; Buelens and Broeck, 2007).

This proves that emphasis needs to be placed on extrinsic rewards in private companies, whereas more attention is needed on intrinsic rewards for employees in public companies. In private companies, the lure of extrinsic rewards such as salary, promotion and bonus is very strong in online knowledge sharing. It is worth noting that online knowledge sharing occurs only when employees in private companies perceive that extrinsic rewards exceed the costs of sharing knowledge online. Thus, the value of extrinsic rewards may be linked with specific performance with regard to online knowledge sharing (Bartol and Srivastava, 2002). On the other hand, in public companies, intrinsic rewards seem to be effective in motivating employees to share knowledge online. This is in accord with the findings of other researchers (Lyons *et al.*, 2006; Buelens and Broeck, 2007) who argued that in comparison to private sector firms, employees in public companies are less motivated by extrinsic rewards, but place greater interest on intrinsic rewards such as fairness and justice in an organisation.

**Table 4: Structural Model Results**

Path	Public (n=105)	Private (n=95)	Public/Private		
			Coefficient difference	t value	Sig.
Self-efficacy → Knowledge sharing behavior	.43***	.38***	.06	.46	NA
Extrinsic rewards → Knowledge sharing behavior	-.08	.20*	.28	1.86	NA
Intrinsic rewards → Knowledge sharing behavior	.52***	.22	.30	1.79	NA

\*\*\*p<0.001, \*\*p<0.01, \*p<0.05, NA: not significant

**Table 5: Moderating Effects of Organisational Innovation**

Path	Public (n=105)	Private (n=95)	Public/Private		
			Coefficient difference	t value	Sig.
Self-efficacy → Knowledge sharing behavior	.33**	.31**	.02	.14	NA
Extrinsic rewards → Knowledge sharing behavior	-.02	.19	.21	1.27	NA
Intrinsic rewards → Knowledge sharing behavior	.39***	-.06	.45	2.18	*
Organisational innovation → Knowledge sharing behavior	.23*	.21	.02	.10	NA
Self-efficacy x Organisational innovation → Knowledge sharing behavior	-.19	-.03	.16	.94	NA
Extrinsic rewards x Organisational innovation → Knowledge sharing behavior	.03	.32**	.29	1.59	NA
Intrinsic rewards x Organisational innovation → Knowledge sharing behavior	.06	-.30**	.36	2.31	*

\*\*\*p<0.001, \*\*p<0.01, \*p<0.05, NA: not significant

Our findings contrast with those of Amayah (2013), who argued that the private or public nature of an organisation does not affect factors driving knowledge sharing. This would suggest that knowledge management practices, if successfully used in private companies, can also be applied in public companies. Our findings suggest that the driving factors of online knowledge sharing in different organisational types are different. One possible reason for the contradiction is the context of the research. This study focuses on online knowledge sharing in an organisation. There are some differences in the nature of public and private companies, which may lead to the differences in the behaviour of employees.

By examining the influence of two kinds of rewards in public and private companies, the results of this study may explain the inconsistent findings of previous studies. While numerous studies such as those by Hau et al. (2013) and Huang et al. (2008) found extrinsic rewards had a strong influence on knowledge sharing, extrinsic rewards were found to have no influence in the study by Bock and Kim (2002) and Olatokun and Nwafor (2012), wherein, they examined employees in public companies. One possible reason for the different findings is that they investigated extrinsic rewards but did not pay attention to the organisational type.

The distinctive contribution of this study lies in examining the moderating effects of organisational innovation in online knowledge sharing behaviours. This findings is novel and relevant as private sector firms that pursue innovation activities, organisational innovation moderates the impact of extrinsic and intrinsic rewards on online knowledge sharing behaviours. Further, organisational innovation accentuates the influence of extrinsic rewards, whereas, it negatively moderates the impact of intrinsic rewards on online knowledge sharing behaviour. One possible explanation is that in highly innovative private sector companies, employees are driven by extrinsic rewards, and as a consequence they engage in online knowledge sharing behaviours. Further, employees in highly innovative private companies are likely to perceive that their online knowledge sharing behaviour is a prime responsibility for them to contribute to the company; thus, they place the success of the company higher than their reputation.

## **Implications**

This study has attempted to examine the antecedents of online knowledge sharing behaviour in Vietnamese banks to further the understanding of online knowledge sharing behaviour in different organisational types. The model, which consists of individual and organisational factors, has been established to investigate their influence on online knowledge sharing

behaviour in public and private companies. The results of this study indicate some implications for research and practice as follows.

### *Implications for Theory*

Our findings are consistent with the key tenets of Vroom's (1964) motivation theory, social cognitive theory (Bandura, 1974) and previous studies on knowledge sharing, which highlight the importance of an individual's knowledge self-efficacy and organisational rewards on online knowledge sharing. Successful online knowledge sharing behaviour requires a high level of employee's knowledge self-efficacy. If employees are confident about their knowledge, they are likely to share that knowledge through online portals. Further, by examining extrinsic and intrinsic rewards in a single study that incorporates both public and private sector firms, this study has demonstrated sector level differences due to the goals and values of work and employees in these firms.

Another theoretical contribution comes in the form of the examination of organisational innovation as the moderator in both public and private sector firms in examining the relationship between motivators of online knowledge sharing behaviour. Our novel research design and empirical findings has implications for further research as we noted differences in the moderating effects of organisational innovation on online knowledge sharing behaviour in public and private companies and its motivators. Such differences suggest further research is needed on various knowledge management processes to tease out other inter-sectoral and an organisation's innovativeness. The extant theories do not differentiate any sectoral and organisational innovation orientational differences between motivators and self-efficacy on online knowledge sharing behaviours

### *Implications for Practice*

The findings of this study suggests key implications for practice. The study found that by strengthening knowledge self-efficacy we can increase online knowledge sharing behaviours of employees in both public and private companies. This finding implies that an organisation should strengthen knowledge self-efficacy to motivate employees to share knowledge online.

With regard to knowledge self-efficacy, if employees feel they have nothing of value to contribute to their company, they may be discouraged from sharing knowledge online even though they may be willing to share. Thus, managers may consider the provision of training to improve employees' self-efficacy (Pee and Lee, 2015). Job design is also essential in

improving knowledge self-efficacy. Employees, who are allocated work appropriate to their ability and given more autonomy, often have a higher level of knowledge self-efficacy (Pee and Lee, 2015). Continuous practice, role modelling, and positive communication may be helpful to enhance knowledge self-efficacy (Bryant *et al.*, 2005). Managers also need to provide clear and unambiguous feedback to enhance employees' knowledge self-efficacy (Parker, 1998). In the recruitment procedure of the company, managers should consider the candidates who have a keen interest in the position and have great intellectual capacity (Parker, 1998).

Reward systems should be designed specifically to organisational type and keeping in mind the extent of organisational innovation. In public companies, intrinsic rewards seem to be effective in encouraging employees' online knowledge sharing behaviour. Thus, praise and public recognition can be used to motivate employees in public companies to share knowledge online. Those who work in private companies tend to be more interested in extrinsic rewards, such as promotion, bonus or salary. Notably, in highly innovation private companies, extrinsic rewards seem crucial to encourage employees to share knowledge online. Therefore, managers may establish a rating system that evaluates useful knowledge shared. The rating systems will show employee contribution via sharing knowledge online.

#### *Implications for future research*

Future research that builds on the findings of this study and overcomes its limitation is recommended. We conceptualised online knowledge sharing behaviour as a single dimension construct. Future research may consider different dimensions of online knowledge sharing behaviour by incorporating dimensions such as knowledge donating, collecting and hoarding. Such a nuanced understanding will be critical in further understanding online knowledge sharing behaviours in a different light. Additionally, future research can examine the differences in employees' motivations to use different types of online sharing platforms and why that might be the case. Organisational type in this study refers to public and private organisations. A different classification of organisations is based on the size/the number of employees to form small, medium and large companies. It may be fruitful for future studies to examine the impact of motivators along with this classification.

This study focuses on knowledge self-efficacy as individual factors, and extrinsic and extrinsic rewards. Future studies may consider examining other motives such as perceived self-enjoyment, reciprocity or social interaction ties. Finally, the sample was collected from the

banking industry in Vietnam. Future researchers may wish to investigate the model in different industries and different countries to provide a more robust test of the hypotheses.

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