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Abstract

Purpose – The purpose of this paper is to investigate how customer power of environmental factors affects customer support (CS) engineers' personal motivations in a knowledge-sharing context. The authors examine extrinsic (i.e. organizational rewards, reputation, and reciprocity) and intrinsic motivations (i.e. knowledge self-efficacy) affecting knowledge-sharing intentions based on the social exchange theory (SET) and self-efficacy theory. Furthermore, the authors introduce the concept of the social power theory to investigate the moderating effect of customer power on the relationships between personal motivations and knowledge-sharing intentions.

Design/methodology/approach – This study collects 349 questionnaires of CS engineers from 16 countries, including the USA, China, Japan, South Korea, and Taiwan. After the data collection, the research model and hypotheses are tested using partial least squares.

Findings – The empirical results show that reputation, reciprocity, and knowledge self-efficacy are significantly and positively related to knowledge-sharing intentions. Also, the results show that customer power can significantly moderate the relationships between personal motivations and knowledge-sharing intentions.

Research limitations/implications – The findings help multinational corporations employ the perception of customer power to motivate CS engineers to share knowledge. Especially, the results can help organizations increase customer added value through effective knowledge sharing.

Originality/value – The research model integrates personal motivations derived from the SET and self-efficacy theory and customer power of environmental factors. Additionally, this study is the first to investigate the moderating effect of customer power on employees' personal motivations and behavioral intentions.

Keywords Motivation, Knowledge sharing, Social exchange theory, Customer power, Self-efficacy theory, Social power theory

Paper type Research paper

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1. Introduction

Knowledge is the most valuable resource for organizations to sustain their competitive advantage (Wasko and Faraj, 2005). Knowledge can help organizations increase added value for their customers, coordinate departments, improve quality in operational and functional processes, reduce costs, and accelerate innovation. For this reason, at the organizational level, companies invest significantly into knowledge management systems (KMS). The IDC estimates the cost of KMS to have risen from 2.7 billion in 2002 to 4.8 billion in 2007 (Babcock, 2004). A new report indicates that knowledge management market revenues exceeded USD157 billion in 2012 (PRWeb, 2013).

According to a knowledge management survey (KPMG Knowledge Advisory Services, 2003), 74 percent of the respondents think that achieving higher customer added value is the main objective of knowledge management. Customer added value refers to the technical support and service assistance provided by the organization. Because customer support (CS) engineers are knowledge workers who add value for customers in an organization, it is critical to understand how to motivate them to share knowledge. Therefore, several studies have proposed that knowledge-sharing intentions are predominantly determined by both extrinsic and intrinsic motivations (Amayah, 2013; Bock and Kim, 2002; Bock *et al.*, 2005; Hsu and Lin, 2008; Hung *et al.*, 2011; Kankanhalli *et al.*, 2005; Liao *et al.*, 2013; Lin, 2007; Park *et al.*, 2014; Pi *et al.*, 2013; Wasko and Faraj, 2005).

Extrinsic motivations are incentives that the organization and management provide for good job performance, such as monetary rewards and recognition. Intrinsic motivations are independent of any rewards or recognition by others but satisfy an individual's need for self-efficacy (Deci and Ryan, 1985; Ryan and Deci, 2000). Both extrinsic and intrinsic motivations can be studied using the social exchange theory (SET) and the self-efficacy theory (Constant *et al.*, 1994, 1996; Thibaut and Kelley, 1959). The SET is introduced to explain knowledge-sharing behaviors because knowledge sharing is regarded as a type of social exchange (Blau, 1964). According to the self-efficacy theory, individual confidence can influence particular behaviors, such as knowledge-sharing behaviors (Bandura, 1986). Thus, the two theories have been widely used to predict and explain behavioral intentions in knowledge sharing.

However, knowledge-sharing behaviors are likely to be influenced not only by personal motivations but also by environmental factors (Yoo and Torrey, 2002). Environmental factors refer to power or influence from the organizational environment (Iacovou *et al.*, 1995; Wang and Ahmed, 2009). Although existing knowledge-sharing studies have focussed on peer influence, such as subjective norms (Bock *et al.*, 2005; Hsu and Lin, 2008; Kankanhalli *et al.*, 2005; Pi *et al.*, 2013), there is little empirical research examining the effect of customer power in a knowledge-sharing context.

Customer power is defined as the ability of a customer to influence the supplier's intentions and actions (Brown *et al.*, 1983, 1995; Goodman and Dion, 2001). When customers are major profit sources for a supplier, they can have the power to influence the supplier's behaviors (Zhao *et al.*, 2008). For example, customers have a natural right to influence the supplier based on a sales contract. Customers also have a punitive capability that can cancel business and reduce the volume of business with the supplier (Maloni and Benton, 2000). Therefore, customer power plays an important role in environmental factors (Grover, 1993; Jeyaraj *et al.*, 2006). The social power theory (SPT) is introduced to explain customer power in a supply chain, and includes five types of power, i.e., expert power, referent power, legitimate power, reward power, and coercive power (French and Raven, 1959).

In this study, we investigate the influence of the strength of customer power on CS engineers' knowledge-sharing intentions. CS engineers' knowledge-sharing intentions arise from extrinsic and intrinsic motivations, as derived from the SET and the self-efficacy theory. Because environmental factors do not determine behaviors in a straightforward sense (Deci and Ryan, 1985, 1987), we aim to investigate the moderating effect of customer power on the relationships between personal motivations and knowledge-sharing intentions. The proposed model is tested through survey data and objective data collected from 16 countries.

The remainder of the paper is organized as follows. The second section reviews the relevant literature and theories. The third section describes the proposed research model and hypotheses. The fourth section describes the research methodology and collected data. The fifth section presents the results from the model analysis. The sixth section presents the findings based on these results. The seventh section presents the theoretical and practical implications of this study. The conclusions and limitations of the study are outlined in the final section.

2. Literature review

2.1 SET

The SET was proposed in the 1950s (Homans, 1958; Thibaut and Kelley, 1959; Blau, 1964; Emerson, 1972a, b). The SET posits that an individual engages in social interaction based on personal motivations (Blau, 1964). Although the SET is derived from the economic exchange theory, social exchange includes many social factors that are not apparent in economic exchange (Liao, 2008). Thus, Hall (2001) proposes two exchange resources in knowledge markets. First, explicit/hard rewards for knowledge exchange refer to tangible benefits, such as economic rewards (e.g. enhanced pay, stock options, or bonuses), access to information and knowledge, and career advancement/security. Second, soft rewards for knowledge exchange refer to intangible benefits, such as enhanced reputation.

Constant *et al.* (1994) argue that both personal benefits (e.g. rewards and respect from others) and organizational motivations (e.g. a request for help) are reasons to share information. Thibaut and Kelley (1959) also propose that direct rewards, expected gain in reputation and influence on others, and anticipated reciprocity can encourage people to engage in social exchange. Several studies have confirmed that these reasons affect knowledge-sharing intentions in several domains, such as virtual communities, electronic networks of practice, and electronic knowledge repositories (Amayah, 2013; Bock and Kim, 2002; Bock *et al.*, 2005; Casimir *et al.*, 2012; Hsu and Lin, 2008; Hung *et al.*, 2011; Kankanhalli *et al.*, 2005; Liao *et al.*, 2013; Lin, 2007; Park *et al.*, 2014; Pi *et al.*, 2013; Wasko and Faraj, 2005).

The SET focusses primarily on social factors, such as approval, status, and respect (Blau, 1964). Extrinsic motivations are incentives that the organization and management provide for good job performance, such as monetary rewards and recognition (Deci and Ryan, 1985; Ryan and Deci, 2000). Thus, both social factors and economic rewards can be classified as extrinsic motivations (Kankanhalli *et al.*, 2005). However, Deci and Ryan (1985) also argue that increased intrinsic motivation, such as a feeling of confidence, can result in increased voluntary behaviors. Knowledge sharing can be regarded as a type of voluntary behaviors (Osterloh and Frey, 2000); thus, intrinsic motivations should also be considered. We introduce the concept of self-efficacy as an intrinsic motivation to explain knowledge-sharing intentions in the next section.

2.2 Self-efficacy theory

Bandura (1977) proposes the self-efficacy theory to explain the relationship between individual confidence and behaviors. Self-efficacy is defined as the level of confidence an individual has in his/her ability to execute certain actions or achieve specific outcomes (Bandura, 1986). Extending the concept of self-efficacy, Compeau and Higgins (1995b) develop the measurement of computer self-efficacy in computer contexts. Computer self-efficacy is defined as an individual's judgment of his/her capability to use a computer. Several studies have demonstrated the relationships between self-efficacy and the reactions to adopt and use computers (Compeau and Higgins, 1995b; Compeau *et al.*, 1999; Fagan *et al.*, 2008; Hill *et al.*, 1986, 1987; Igbaria and Iivari, 1995; Taylor and Todd, 1995), and the willingness to learn to use the computer and its software (Compeau and Higgins, 1995a; Gist *et al.*, 1989; Martocchio, 1992; Webster and Martocchio, 1993).

Recently, the self-efficacy theory has been applied to the knowledge-sharing context (Bock and Kim, 2002; Constant *et al.*, 1994, 1996; Kankanhalli *et al.*, 2005; Lin, 2007). Bock and Kim (2002) argue that individual attitude and behavior are influenced by self-produced factors, i.e., knowledge self-efficacy. Knowledge self-efficacy is defined as an individual's confidence in his/her ability to share expertise that is useful to the organization (Kankanhalli *et al.*, 2005). Previous studies have suggested that knowledge self-efficacy can solve job-related problems (Constant *et al.*, 1996), improve work efficiency (Ba *et al.*, 2001; Luthans, 2003), and contribute to knowledge sharing (Bock and Kim, 2002; Kankanhalli *et al.*, 2005; Lin, 2007).

Through knowledge sharing, an individual can be satisfied by enhancing his/her knowledge self-efficacy or confidence in his/her ability to provide knowledge that is useful to the organization (Constant *et al.*, 1994, 1996). Because intrinsic motivations provide internal satisfaction that an individual experiences through performing a job independent of any rewards or recognition (Deci and Ryan, 1985; Ryan and Deci, 2000), knowledge self-efficacy can be classified as one of the intrinsic motivations positively affecting knowledge-sharing intentions (Kankanhalli *et al.*, 2005).

2.3 SPT

The SPT, proposed by French and Raven (1959), is composed of five powers: reward power, coercive power, legitimate power, referent power, and expert power. Power is the ability to control or influence behaviors, attitudes, values, opinions, objectives, and needs of others (Hunt and Nevin, 1974; Rahim, 1989). The concept of power is an important organizational behavior study area (Brass and Burkhardt, 1993; Drea *et al.*, 1993; Hinkin and Schriesheim, 1990, 1994; Mechanic, 1962; Pavlou, 2002; Pfeffer, 1992; Yukl and Falbe, 1991).

The SPT is introduced to explain customer power in a supply chain. Customer power is the ability of a customer to influence the supplier's intentions and actions (Brown *et al.*, 1983, 1995; Goodman and Dion, 2001). There are five types of customer power: reward power means that a customer has the ability to mediate rewards to suppliers; coercive power means that a customer has the ability to mediate punishment to suppliers; legitimate power means that a supplier believes the customer retains the natural right to influence it; referent power means that a supplier values identification with the customer; and expert power means that a customer has knowledge, expertise, or skills desired by suppliers (Maloni and Benton, 2000).

Customer power is viewed as one of the environmental factors in supply chain literature (Bowersox *et al.*, 1999; Flynn *et al.*, 2008; Frohlich and Westbrook, 2001; Naylor *et al.*, 1999; Zhao *et al.*, 2008). These studies have investigated the cooperation

between firms (i.e. suppliers and customers) and treated customer pressure as an environmental factor (Grover, 1993; Jeyaraj *et al.*, 2006). Thus, environmental factors refer to power or influence from the organizational environment (Iacovou *et al.*, 1995; Wang and Ahmed, 2009). However, this study is the first to investigate the moderating effect of customer power on employees' personal motivations and behavioral intentions.

Of the five customer powers, legitimate power and coercive power are investigated in this study. The other three are neglected herein. Expert power means that a customer has information or expertise on the product desired by the supplier (Zhao *et al.*, 2008). In this study, CS engineers are supposed to maintain sophisticated equipment that few customers have the knowledge or gear to maintain. It is the CS engineers that have the expert power in the supplier/customer relationship. Therefore, the influence of the expert power of customers should not exist in this study. Referent power refers to the managers' desire to run organizations in ways similar to what customers have (Zhao *et al.*, 2008). Because the surveyed targets are CS engineers, referent power should not affect them very much. Reward power means that a customer has the ability to reward the supplier (Zhao *et al.*, 2008). Customers usually reward the supplier by increasing the purchase quantity, which, in general, is viewed as the success of the sales department rather than the service department. Thus, reward power is also neglected in this study. Many studies have empirically confirmed the validity of legitimate power and coercive power (Flynn *et al.*, 2008; Jonsson and Zineldin, 2003; Liao, 2008; Ramaseshan *et al.*, 2006; Zhao *et al.*, 2008). Therefore, the effects of the two powers are investigated in this study.

2.4 Personal motivation and customer power

There are a variety of ways in which personal motivations can be classified. In addition to extrinsic and intrinsic types, personal motivations can be economic, social, or psychological (Coleman, 1988; Lin, 1986, 1999, 2000). As explained in the previous studies, reputation is viewed as a social factor, while organizational rewards are viewed as economic factors (Bock *et al.*, 2005; Huber, 2001).

Both reciprocity and self-efficacy are classified as psychological factors. Self-efficacy is introduced to explain psychological phenomena (Bandura, 1977) and has been widely cited in psychology literature (Bandura *et al.*, 1999; Butler, 1998; Hoy, 1998; Locke, 1997; Maddux, 1998; Vrugt, 1998). Reciprocal benefits are important to psychology when they can help to explain the maintenance of social norms (Blau, 1964). Bandura (1977, 1986) also proposes that people interact with the expectation of reciprocation and trust.

This study argues that customer power, as an environmental factor, can moderate the relationships between psychological factors and behavioral intentions. Rotter (1954) argues that behaviors are influenced by environmental factors and not by psychological factors alone. Deci and Ryan (1987) also propose that people give psychological meaning to those environmental factors and that meaning is the critical element in determining behaviors. This implies that a combination of environmental and psychological factors influences behaviors. Therefore, we aim to investigate the moderating effect of customer power on the relationships between reciprocity and knowledge-sharing intentions and between knowledge self-efficacy and knowledge-sharing intentions.

Notably, we omit the moderating effect of customer power on the relationships between organizational rewards and knowledge-sharing intentions and between reputation and knowledge-sharing intentions. Because customer power is viewed as an environmental factor in this study, it is unrelated to economic and social factors. Organizational rewards refer to economic incentives that are provided by the organization

rather than by customers. Reputation refers to respect and image awarded by managers or colleagues. Therefore, in this model, the two relationships are not influenced by customer power.

3. Research model and hypotheses

3.1 Extrinsic motivations

Extrinsic motivations are incentives that the organization and management provide for good job performance, such as monetary rewards and recognition. Kankanhalli *et al.* (2005) argue that organizational rewards, reputation, and reciprocity are extrinsic motivations. These personal motivations influence knowledge-sharing behaviors based on the SET.

An individual can be motivated by a desired reward. According to studies (Casimir *et al.*, 2012; Kankanhalli *et al.*, 2005), organizational rewards have a positive effect on knowledge-sharing intentions. Previous studies have proposed to reward individuals economically for knowledge sharing (Gomez-Mejia and Balkin, 1990; Jauch, 1976; Koning, 1993; Malhotra and Galletta, 1999). Most organizations incentivize tasks through a reward system. Therefore, organizational rewards are likely to result in increased CS engineers' knowledge-sharing intentions. This study defines organizational rewards as the importance of economic incentives provided for service knowledge sharing, according to the definition of Kankanhalli *et al.* (2005).

Reputation is a strong motivator of knowledge exchange (Wasko and Faraj, 2005). A body of evidence has confirmed that reputation positively affects knowledge-sharing intentions (Hsu and Lin, 2008; Huang *et al.*, 2008; Park *et al.*, 2014; Pi *et al.*, 2013; Wasko and Faraj, 2005). Wasko and Faraj (2005) also note that an individual who perceives that participation will enhance his/her professional reputation will contribute more helpful responses to electronic networks of practice. Therefore, CS engineers may share their knowledge to enhance their image or reputation. This study defines reputation as the perception of increase in reputation from service knowledge sharing, according to the definition of Kankanhalli *et al.* (2005).

Reciprocity can facilitate knowledge sharing (Wasko and Faraj, 2005). Hsu and Lin (2008) note that a motivational exchange can be derived from mutual help and reciprocal benefits. Several studies have supported the relationship between reciprocity and knowledge-sharing intentions (Bock *et al.*, 2005; Chai *et al.*, 2011; Liao *et al.*, 2013; Lin, 2007). The teamwork between CS engineers can be regarded as a cooperative problem-solving process. They can solve customers' problems by sharing their own experience and leveraging the service knowledge of others. Such reciprocal benefits are likely to improve their knowledge-sharing intentions. This study defines reciprocity as the belief that current service knowledge sharing leads to future knowledge requests being met, according to the definition of Kankanhalli *et al.* (2005). Therefore, this study hypothesizes the follows:

H1. Organizational rewards will be positively related to knowledge-sharing intentions.

H2. Reputation will be positively related to knowledge-sharing intentions.

H3. Reciprocity will be positively related to knowledge-sharing intentions.

3.2 Intrinsic motivations

Intrinsic motivations are independent of any rewards or recognition by others and can satisfy an individual's need for self-efficacy. Knowledge self-efficacy is an intrinsic motivation (Kankanhalli *et al.*, 2005). It can serve as a self-motivational force for

knowledge sharing (Bock and Kim, 2002; Kalman, 1999). Previous studies have confirmed that knowledge self-efficacy is positively related to knowledge-sharing behaviors (Bock and Kim, 2002; Kankanhalli *et al.*, 2005; Lin, 2007). When a CS engineer believes that his/her knowledge is valuable to the organization, he/she will contribute knowledge to the KMS. Thus, his/her knowledge self-efficacy will develop positive knowledge-sharing intentions. This study defines knowledge self-efficacy as the CS engineer's confidence in his/her ability to provide service knowledge that is valuable to the organization, according to the definition of Kankanhalli *et al.* (2005):

H4. Knowledge self-efficacy will be positively related to knowledge-sharing intentions.

3.3 Customer power

Many studies have posited and confirmed that integrated effects of environmental and psychological factors can significantly influence behaviors (Deci and Ryan, 1987; Rotter, 1954). Among the four personal motivations, reciprocity and knowledge self-efficacy are psychological factors (Bandura, 1977, 1986; Blau, 1964) but organizational rewards and reputation are economic and social factors (Bock *et al.*, 2005; Huber, 2001). On the other hand, customer power was treated as psychological pressure (Grover, 1993; Jeyaraj *et al.*, 2006) because it may cause organizations perceive threatened. Since environmental psychological pressure influences individual psychological factors (Chang *et al.*, 2014; Kankanhalli *et al.*, 2005), we argue that reciprocity and knowledge self-efficacy are likely to be contingent on customer power being investigated in this study, namely, legitimate power and coercive power.

The pressure of customer power is a positive factor to push the adoption of IT, as reported by several studies (Chwelos *et al.*, 2001; Iacovou *et al.*, 1995; Jeyaraj *et al.*, 2006; Kuan and Chau, 2001). CS engineers who have low expectation of reciprocity and knowledge self-efficacy yet acknowledge high customer power should have higher intentions to share knowledge than those who do not perceive customer power. Thus, this study proposes that the effects of reciprocity and knowledge self-efficacy on knowledge-sharing intentions might be reduced by customer power. Conversely, the lower perception of customer power can make reciprocity and knowledge self-efficacy salient personal motivations for knowledge sharing.

In this study, legitimate power and coercive power are from the concept of customer power under prior studies. Legitimate power reflects a customer's natural right to influence the organization (Maloni and Benton, 2000). When an organization perceives that its customer has the legitimate right to influence it, employees in the organization have legitimized the customer's influence (Rezaboklah *et al.*, 2006; Zhao *et al.*, 2008; Flynn *et al.*, 2008). Coercive power reflects a customer's ability to mediate punishment to the organization (Maloni and Benton, 2000). Customers can use coercive power to pressure the organization, such as the threat of a business loss (Crook and Kumar, 1998; Zhao *et al.*, 2008). Thus, employees are forced to comply with the customer's requirements. We hypothesize the follows:

H5. The higher the perception of a customer's legitimate power, the lower the effect of reciprocity on knowledge-sharing intentions.

H6. The higher the perception of a customer's legitimate power, the lower the effect of knowledge self-efficacy on knowledge-sharing intentions.

H7. The higher the perception of a customer's coercive power, the lower the effect of reciprocity on knowledge-sharing intentions.

H8. The higher the perception of a customer's coercive power, the lower the effect of knowledge self-efficacy on knowledge-sharing intentions.

The research model is shown in Figure 1. The model suggests that extrinsic (i.e. organizational rewards, reputation, and reciprocity) and intrinsic (i.e. knowledge self-efficacy) motivations influence knowledge-sharing intentions. Legitimate power and coercive power moderate the relationships between reciprocity and knowledge-sharing intentions and between knowledge self-efficacy and knowledge-sharing intentions.

4. Research methods

4.1 Subjects

The aim of this study is to investigate CS engineers' knowledge-sharing intentions with respect to the customer support engineering knowledge systems (CSEKS). CS engineers create, store, retrieve, transfer, and apply maintenance-related service knowledge via CSEKS. Such KMS have been widely used by organizations with CS engineering departments in many different industries, such as manufacturing, telecommunication, and information services.

The subject of this study is a multinational corporation that researches, develops, manufactures, and sells manufacturing equipment. The majority of its customers are based in North America, Europe, and Asia. To maintain its machinery, its branch companies and service departments are located in 16 countries, including the USA, China, Japan, South Korea, and Taiwan. We distributed 1,200 questionnaires to the CS engineers throughout all of the countries by delivering them to the managers.

4.2 Measurement development

To ensure the content validity, we define constructs and develop measurement items in accordance with previous studies. Organizational rewards and reputation are measured by four items, respectively (Kankanhalli *et al.*, 2005). Reciprocity is measured by two items (Wasko and Faraj, 2005). Knowledge self-efficacy is measured by two items (Kankanhalli *et al.*, 2005). Legitimate power and coercive power are measured by two items, respectively (Zhao *et al.*, 2008). Knowledge-sharing intention is measured by three items (Moon and Kim, 2001). All 19 items are measured on a seven-point Likert scale ranging from

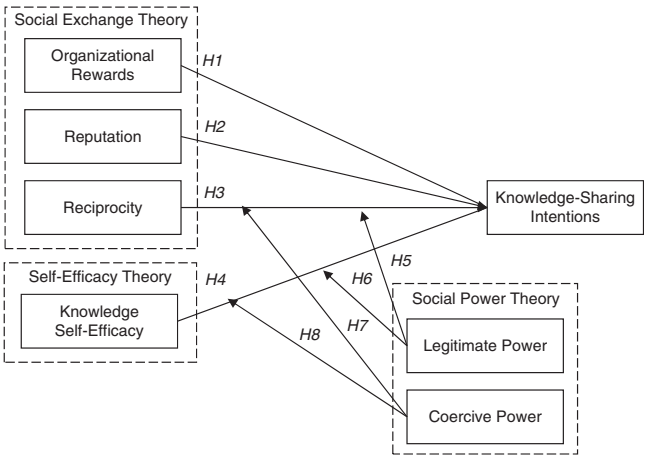


Figure 1.
Research model

"strongly disagree" (1) to "strongly agree" (7). Before conducting the formal survey, we invited 20 CS engineers to participate in the pretest. Following their suggestions, we modified the wording, length, and format of items. Table I lists the operational definitions and measurement items of the seven constructs are listed in Table II.

4.3 Data collection

From the 1,200 questionnaires distributed throughout the multinational corporation, 369 questionnaires were returned, i.e., a response rate of 30.75 percent. After discarding 20 invalid questionnaires, the valid response rate is 29.08 percent. The characteristics of the respondents are as follows: Most of the respondents are CS engineers (86.5 percent), in the 26-35 age range (49.0 percent); the majority of the respondents hold university degrees (67.9 percent); most have over 16 years of work experience (24.6 percent); most of the respondents work in the USA (18.9 percent) and China (14.6 percent).

5. Results

5.1 Common method bias

To assess the common method bias, Harman's one-factor test is examined using principal component analysis. If a single construct accounts for more than 50 percent of the variance, then the common method bias may threaten the validity (Harman, 1976; Mattila and Enz, 2002; Pee *et al.*, 2010). The results show that the combined seven constructs account for 83.58 percent of the total variance. The variance of the seven constructs ranges from 3.10 to 38.02 percent, which are less than 50 percent. Therefore, the common method bias may be excluded by the items in this study.

5.2 Measurement model

Partial least squares (PLS) is used to assess the reliability and discriminant validity of the measurement model. To assess the reliability, the composite reliability (CR) and the average variance extracted (AVE) are calculated (Fornell and Larcker, 1981). Table III shows that the CRs of the items range from 0.71 to 0.84, which are all above the 0.70 recommended level. The AVEs of the items range from 0.64 to 0.79, which are all above the 0.50 recommended level. The results of the confirmatory factor analysis for all of the items are shown in Table IV, which are all above the 0.70 loading criterion. Therefore, the reliability is supported by all of the items in this study.

Construct	Operational definitions	Source
Organizational rewards	The importance of economic incentives provided for service knowledge sharing	Kankanhalli *et al.* (2005)
Reputation	The perception of increase in reputation due to service knowledge sharing	Kankanhalli *et al.* (2005)
Reciprocity	The belief that current service knowledge sharing would lead to future knowledge requests being met	Kankanhalli *et al.* (2005)
Knowledge self-efficacy	The confidence in one's ability to provide service knowledge that is valuable to the organization	Kankanhalli *et al.* (2005)
Legitimate power	The belief that one's customers have the natural right to influence one's actions	Zhao *et al.* (2008)
Coercive power	The belief that one's customers have the ability to provide punishments that are detrimental to one	Zhao *et al.* (2008)
Knowledge-sharing intention	The strength of one's willingness to share service knowledge	Moon and Kim (2001)

Table I. Definition of constructs

Construct	Measurement items	Source
Organizational rewards	1. It is important to be promoted when I share my service knowledge 2. It is important to get a higher salary when I share my service knowledge 3. It is important to get a higher bonus when I share my service knowledge 4. It is important to get more job security when I share my service knowledge	Kankanhalli *et al.* (2005)
Reputation	1. Sharing my service knowledge improves my image within the organization 2. CS engineers in the service department who share their service knowledge have more prestige than those who do not 3. Sharing my knowledge improves others recognition of me 4. When I share my service knowledge, the people I work with respect me	Kankanhalli *et al.* (2005)
Reciprocity	1. I know that team members will share their service knowledge to me, so it's only fair to share my service knowledge to them 2. I trust that if I need help, team members will share their service knowledge to me	Wasko and Faraj (2005)
Knowledge self-efficacy	1. I have confidence in my ability to provide service knowledge that others in my organization consider valuable 2. I have the expertise needed to provide valuable service knowledge for my organization	Kankanhalli *et al.* (2005)
Legitimate power	1. Since they were the customers, we accepted their recommendations 2. The major customer had the right to expect us to go along with their request	Zhao *et al.* (2008)
Coercive power	1. The major customer often hinted that they would take certain actions that would reduce our profits if we did not go along with their requests 2. The major customer might have withdrawn certain services from us if we did not go along with them	Zhao *et al.* (2008)
Knowledge-sharing intention	1. I will share my service knowledge on a regular basis in the future 2. I will frequently share my service knowledge in the future 3. I will strongly recommend others to share service knowledge	Moon and Kim (2001)

Table II.
Measurement items of constructs

Construct	Items	Mean	SD	CR	AVE	Cronbach's α
Organizational rewards (REW)	4	3.32	1.50	0.84	0.79	0.93
Reputation (REP)	4	4.52	1.29	0.81	0.70	0.90
Reciprocity (REC)	2	5.71	1.16	0.83	0.79	0.88
Knowledge self-efficacy (KS)	2	5.10	1.11	0.80	0.75	0.84
Legitimate power (LP)	2	4.27	1.29	0.71	0.64	0.78
Coercive power (CP)	2	3.93	1.39	0.71	0.71	0.83
Knowledge-sharing intention (INT)	3	5.39	1.14	0.84	0.74	0.89

Table III.
Reliability of constructs

To assess the discriminant validity, two criteria are examined (Chin, 1998). First, Table IV shows that the loadings of the items on their respective constructs are higher than the cross-loadings of the items on other constructs. Second, Table V shows that the squared root of the AVE of each construct is larger than its

	REW	REP	REC	KS	LP	CP	INT
REW1	0.81						
REW2	0.80						
REW3	0.82						
REW4	0.78						
REP1		0.82					
REP2		0.94					
REP3		0.93					
REP4		0.82					
REC1			0.80				
REC2			0.81				
KS1				0.81			
KS2				0.91			
LP1					0.87		
LP2					0.87		
CP1						0.89	
CP2						0.87	
INT1							0.78
INT2							0.84
INT3							0.82

Table IV. Results of confirmatory factor analysis

	REW	REP	REC	KS	LP	CP	INT
REW	*0.84*						
REP	0.49	*0.89*					
REC	0.56	0.22	*0.89*				
KS	0.36	0.19	0.26	*0.80*			
LP	0.41	0.12	0.48	0.32	*0.86*		
CP	0.41	0.31	0.76	0.28	0.63	*0.86*	
INT	0.41	0.29	0.15	0.47	0.18	0.22	*0.84*

Table V. Inter-construct correlations

correlations with other constructs. Therefore, the discriminant validity is supported by all of the items in this study.

5.3 Structural model

PLS is used to test hypothesized relationships. Because the research model includes interaction effects of legitimate power and coercive power, we use moderated multiple regression to perform a hierarchical procedure (Sharma *et al.*, 1981; Stone and Hollenbeck, 1984). In the first step of regression, we test the main effects of personal motivations and customer power on knowledge-sharing intentions. In the second step, we test the interaction effects of legitimate power and coercive power on the relationships between reciprocity and knowledge-sharing intentions and between knowledge self-efficacy and knowledge-sharing intentions.

Table VI summarizes the results of the hypothesis tests. The significance of the paths is determined using the *T*-statistic calculated with the bootstrapping technique. The model explains approximately 57.5 percent of the variation in the knowledge-sharing intentions. As hypothesized, *H2-H4* are significantly above the 0.01 levels. The moderating effect of LP × KS is significant at the 0.01 level, but the moderating effect of

	Standardized coefficient	Hypothesis test
Step1: main effects		
Organizational rewards (OR)	0.037	*H1* is not supported
Reputation (REP)	0.122**	*H2* is supported
Reciprocity (REC)	0.494***	*H3* is supported
Knowledge self-efficacy (KS)	0.322***	*H4* is supported
Legitimate power (LP)	−0.004	
Coercive power (CP)	0.034	
Step2: interaction terms		
LP × REC	−0.020	*H5* is not supported
LP × KS	−0.112**	*H6* is supported
CP × REC	−0.081*	*H7* is supported
CP × KS	−0.146**	*H8* is supported

Notes: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

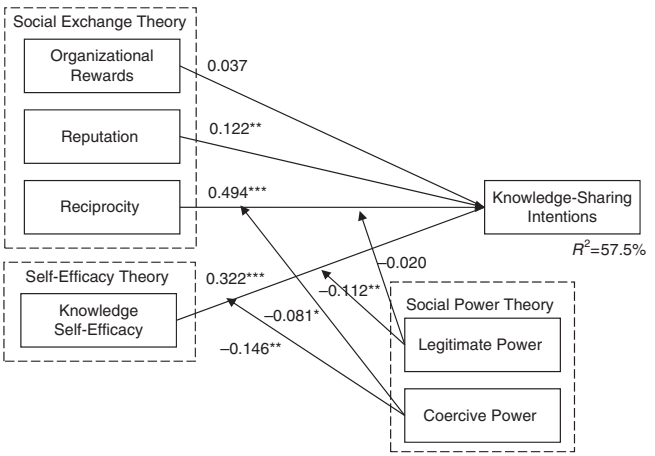
Table VI.
Results of hypothesis tests

LP × REC is insignificant. In addition, the moderating effect of CP × REC is significant at the 0.05 level, while the moderating effect of CP × KS is significant at the 0.01 level. Thus, *H6-H8* are supported.

The results are shown in Figure 2, which shows that reputation, reciprocity, and knowledge self-efficacy influence knowledge-sharing intentions. Legitimate power moderates the relationship between knowledge self-efficacy and knowledge-sharing intentions. Coercive power moderates the relationships between reciprocity and knowledge-sharing intentions and between knowledge self-efficacy and knowledge-sharing intentions.

6. Discussion

Contrary to *H1*, organizational rewards do not significantly affect knowledge-sharing intentions. In this study, rewards are primarily composed of monetary incentives and



Notes: *,**,***Significance level at $p < 0.05$; $p < 0.01$; $p < 0.001$ respectively

Figure 2.
Results of structural modeling analysis

promotions. Because the surveyed organization offers very limited salary raises or bonuses for knowledge sharing, the monetary incentives are relatively low (the mean values of the two items are 3.08 and 3.15, respectively). As a result, because employees do not expect monetary incentives from their organization, organizational rewards are not an effective motivator for knowledge sharing.

The results show that reputation, reciprocity, and knowledge self-efficacy are significantly and positively related to knowledge-sharing intentions. As Donath (1999) argues, reputation is a strong motivator for knowledge contribution. Our results also imply that CS engineers are willing to build their professional reputation by service knowledge sharing. In addition, as Hsu and Lin (2008) note, knowledge sharing in the context of task-oriented organizations should stress the importance of reciprocal benefits. Given that the cooperative process that CS engineers employ is viewed as task-oriented behavior, they are inclined to share knowledge. Lin (2007) proposes that a sense of competence and confidence can motivate employees to engage in knowledge sharing. Because CS engineers are professionals and knowledge workers, they have confidence in their ability to share service knowledge.

The relationship between knowledge self-efficacy and knowledge-sharing intentions is contingent on legitimate power. If the customers' legitimate power is strong enough, then CS engineers will feel obligated to satisfy the customers' requirements and to try their best to solve customers' problems, with or without the personal motivation of knowledge self-efficacy. This finding extends the prior literature by indicating that the relationships between psychological factors and behaviors can be modified by environmental factors (Bandura, 1977; Rotter, 1954; Yoo and Torrey, 2002).

However, the relationship between reciprocity and knowledge-sharing intentions is not contingent on legitimate power. In this study, the perception of reciprocal benefits (mean = 5.71) is so strong that the influence of legitimate power (mean = 4.27) is not significant. This multinational corporation has built up a strong norm of reciprocity among CS engineers. Because this study target is a large multinational corporation, CS engineers have a very high degree of self-identification and are less influenced by customers' legitimate power.

As hypothesized, the relationships between reciprocity and knowledge-sharing intentions and between knowledge self-efficacy and knowledge-sharing intentions are direct and contingent on coercive power. If a customer's punitive capability increases, then employees' expectations of coercion will grow. When CS engineers are forced to comply with customers' requirements, reciprocal benefits and knowledge self-efficacy appear not to be important. The perception of coercive power plays an important role in knowledge sharing. The findings extend the prior literature by indicating that environmental factors do not determine behaviors directly (Deci and Ryan, 1985, 1987).

7. Implications for research and practice

7.1 Implications for theory

This study combines the SET and the self-efficacy theory to investigate how extrinsic (organizational rewards, reputation, reciprocity) and intrinsic (knowledge self-efficacy) motivations affect knowledge-sharing intentions. Except for organizational rewards, reputation, reciprocity, and knowledge self-efficacy are found to affect knowledge-sharing intentions. The relationships have been supported by most previous studies (Amayah, 2013; Bock and Kim, 2002; Bock *et al.*, 2005; Hsu and Lin, 2008; Hung *et al.*, 2011; Kankanhalli *et al.*, 2005; Liao *et al.*, 2013; Lin, 2007; Park *et al.*, 2014; Pi *et al.*, 2013; Wasko and Faraj, 2005). Future research can investigate other personal motivations, such as enjoyment in helping, loss of knowledge power, codification effort.

Knowledge-sharing behaviors could also be influenced by environmental factors. Although some knowledge-sharing studies have investigated the effects of environmental factors, they have mainly focussed on organizational culture or subjective norms (Bock *et al.*, 2005; Hsu and Lin, 2008; Kankanhalli *et al.*, 2005; Pi *et al.*, 2013). Since customer power plays an important role in determining enterprise internal policies and behaviors (Grover, 1993; Jeyaraj *et al.*, 2006), we introduce the SPT to investigate the effects of customer power in a knowledge-sharing context. This study is the first to investigate the relationship between customer power and knowledge-sharing motivations. Future research studying knowledge sharing in an organizational context may take customer power into consideration. Besides, the subjects of this study are CS engineers. Thus, more research may be needed to apply the findings on other subjects.

Our results show that legitimate power moderates the relationship between knowledge self-efficacy and knowledge-sharing intentions. Coercive power moderates the relationships between reciprocity and knowledge-sharing intentions and between knowledge self-efficacy and knowledge-sharing intentions. More studies may be needed to gain a thorough understanding of the effect of legitimate power on the relationship between reciprocity and knowledge-sharing intentions.

7.2 Implications for practice

Given the findings in this study, three suggestions are proposed to managers who wish to encourage knowledge sharing in organizations. First, the results shed light on the importance of reputation. Management should publicly praise and highly regard CS engineers' knowledge-sharing behaviors and increase in service knowledge. The organization can also build a reputation mechanism into KMS. KMS can be enhanced with functions that give the contributors credit, such as comments, recommend buttons, and number of citations. When employees gain reputation feedback, they are more willing to contribute knowledge.

Second, reciprocity seems to be particularly important to knowledge sharing. This means that mutual knowledge is effective and valuable for CS engineers' problem-solving process. Thus, management should enhance CS engineers' perception of reciprocity by creating and maintaining a reciprocal atmosphere in the workplace. For example, organizations can request helped employees to return the favors to others. It can also encourage employees to build good social relationships by helping each other. However, reciprocity appears not to be important when coercive power is strong. Under conditions of strong coercive power, CS engineers have to share knowledge even if reciprocal benefits are absent. When organizations initially promote knowledge sharing, reciprocal benefits may not exist. To reduce employees' need for reciprocal benefits, management can properly strengthen the perception of customers' coercive power. For example, if employees cannot satisfy customers' requirements, customers may cancel future business order or reduce transaction volumes. The loss of business could influence organizational profits, which in turn influence employees' salary and bonus.

Last, the findings highlight the importance of knowledge self-efficacy. When employees' confidence influences their willingness to share knowledge, management should raise CS engineers' perception of knowledge self-efficacy by providing useful training and assistant. For example, through team collaboration, experienced members can help others preview and revise their contents of service knowledge. As a result, the quality of published documents can be greatly improved. However, knowledge self-efficacy appears to be ineffective under conditions of strong legitimate power and coercive power. In such situations, employees can still share knowledge even if they have low confidence in

their ability to provide knowledge. Thus, for employees with low knowledge self-efficacy, not only can managers increase employees' self-confidence but they can also enhance the perception of customer power to motivate knowledge sharing. A word of caution should be noted, however, that the quality of the knowledge shared by employees with low self-efficacy may not be as high as the quality shared by employees with high self-efficacy. As a result, even though knowledge-sharing intentions may be high because of customer pressure, the quality of the shared knowledge may be low. Proper monitoring and screening mechanisms of the shared knowledge must then be implemented.

8. Conclusion and limitations

The primary contribution of this study is the assessment of the effects of personal motivations on knowledge-sharing intentions under the environmental factor of customer power. The proposed model is tested using data collected from 16 countries. Organizational rewards have no effect on knowledge-sharing intentions. Although the result is surprising, it is in line with several studies which found that the effect of organizational rewards faded quickly (Bock and Kim, 2002; Bock *et al.*, 2005; Lin, 2007). Reputation and reciprocity are found to significantly affect knowledge-sharing intentions. The former finding is consistent with the studies of Hsu and Lin (2008), Huang *et al.* (2008), Park *et al.* (2014), Pi *et al.* (2013), and Wasko and Faraj (2005) while the latter finding is in accord with the research of Bock *et al.* (2005), Chai *et al.* (2011), Liao *et al.* (2013), and Lin (2007). Knowledge self-efficacy has a significant effect on knowledge-sharing intentions. The result is also confirmed by the studies of Bock and Kim (2002), Kankanhalli *et al.* (2005), and Lin (2007).

Although it is well known that environmental factors including organizational culture and subjective norm can moderate knowledge-sharing intention (Chang *et al.*, 2014; Kankanhalli *et al.*, 2005), the results presented by this study is the first to show that legitimate power moderates the relationship between knowledge self-efficacy and knowledge-sharing intentions. Coercive power moderates the relationships between reciprocity and knowledge-sharing intentions and between knowledge self-efficacy and knowledge-sharing intentions.

Although the findings of this study provide meaningful implications for researchers and practitioners, there are some limitations. First, a bias of self-reported scales could exist in this study. Second, because data are cross-sectional and not longitudinal, the posited causal relationships could only be inferred rather than proven. Third, because the data are collected from only a single multinational corporation, the generalizability of the results may be limited. Fourth, even though the subjects of this study are located in 16 countries, we performed the statistical analysis based on all of the data. The results may differ according to country or continent. Fifth, this study has not dealt with the influence of reward power, reference power, or expert power (based on our target subjects). The other powers are worthy of examination on other target research subjects. Last, we examine only knowledge-sharing intentions, although it has been demonstrated that behavioral intentions lead to actual knowledge-sharing behaviors.

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Appendix

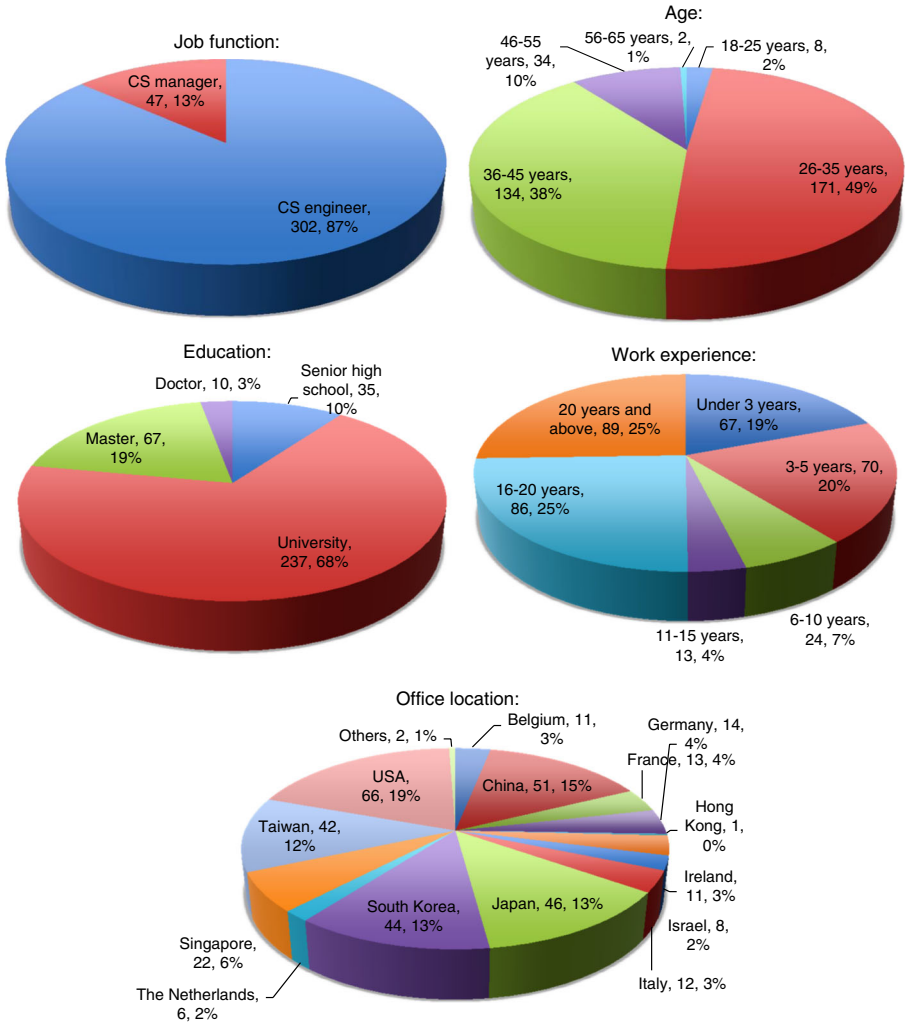

Figure A1.
Profile of respondents

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