

Management of Knowledge Sharing – Seeking a Right Blend with Push and Pull Forces

Eddie K.K. Law,

Open University, Hong Kong.

E-mail: kklaw@ouhk.edu.hk

Andrew Chan,

City University of Hong Kong, Hong Kong.

E-mail: mgandrew@cityu.edu.hk

Abstract

Two divergent thoughts (managerial control vs. intrinsic motivation) appear in the extant literature regarding the fostering of knowledge sharing behaviors of workers. Such divergence misapprehends the inclusivity of the two managerial mechanisms that otherwise hinder a possibly more powerful synergy achieved basing on a convergence of their respective theoretical roots. The current article attempts to consolidate a clearer focus out of the divergent perspectives by adopting a push-pull metaphor to develop a convergent model that demonstrates the synchronicity of the two viewpoints in substantiating the knowledge sharing behaviors of workers. The resulting integrative management model levels the skepticism against the conventions surrounding the role of managerial control and breaks the stereotyping of exclusive focus on intrinsic motivation as a means of fostering knowledge sharing and other Knowledge Management behaviors.

Key words: *knowledge sharing, managerial control, motivation, knowledge management.*

1. Introduction

Knowledge sharing among employees is an important practice for organizations to build their knowledge-based competitive advantage (Kogut and Zander 1992, Argote and Ingram 2000). Yet, the management of knowledge sharing has often been ‘black-boxed’ (Alvesson and Karreman 2001) and “managers are not optimally equipped by the current literature to make decisions about how to embed knowledge sharing initiatives in existing organizational structures and cultures” (Foss et al. 2010, p. 467). The reason for such deficiency of the seemingly rich literature lies with a divergence of perspectives on how knowledge sharing behaviors of workers can be fostered.

The two divergent literatures – namely managerial control and intrinsic motivation – possess different assumptions, different viewpoints and different focuses on the study of knowledge sharing management. The many differences between the two streams of research have created disciplinary barriers and made the diverse streams seldom come across one another. Such barrier-setting fragments the literature into more discrete sub-themes, dissipating efforts to sustain a tighter grip or focus on “important questions about the degree of integration across disciplines and the extent to which a truly cumulative body of knowledge [regarding the management of knowledge sharing] is emerging” (Argote et al. 2003, p. 572).

We argue that the divergent literatures should be converged to form a greater synergy in fostering knowledge sharing behaviors. Such convergence or integration effort has long been called for by different researchers who shared the same criticisms regarding the disorganization of the current literature (Alvesson and Karreman, 2001, Argote et al. 2003, Kang et al. 2007, Foss et al. 2009, 2010). Based on the premises that knowledge sharing is always rooted in individual behaviors and their drivers (e.g., willingness to engage in sharing) and that workers’ willingness to share what they know cannot always be taken for granted due to costs and appropriation concerns, we develop in this article an integrative management model to foster knowledge sharing by adopting a push-pull metaphor where managerial control acts as push forces and intrinsic motivation acts as pull forces. The developed model breaks the hegemony of intrinsic motivation on promoting knowledge sharing behavior and demonstrates that the both types of managerial mechanisms possess their own deficiencies that require the complimentary forces from one another.

The major contribution of the article thus lies in the bridging of divergent theoretical viewpoints that generates clearer meanings of the ‘management’ of knowledge sharing. The

article also sheds light on one of the long standing questions in the knowledge management (KM) literature – how to foster knowledge sharing among workers. Researchers have pinpointed that knowledge sharing is never an easy process and a casual behavior (Szulanski 1996, Wilkesmann et al. 2009).

The article is structured as follows to develop our arguments. First, we review the concept of knowledge as a production factor, the emergence of KM as well as the significance of knowledge sharing and its difficulty in management. Second, the major division of theoretical perspectives in the management of knowledge sharing behaviors is re-examined. Third, we demonstrate how the divergent literature can be incorporated into a push-pull framework and how a powerful synergy can be created by a convergence of theoretical disciplines. Finally, the article ends by highlighting its significance and contributions to KM research.

2. Knowledge, Knowledge Management and Knowledge Sharing

Knowledge refers to the know-what, know-how and know-why for performing tasks (Davenport and Prusak 1998). Those knowledge may appear in impersonal, organizational routines as well as personal, subjective interpretation and capabilities. Researchers tend to classify organizational routines as objective, explicit knowledge which can be codified and stored in the organization and personal skills/capabilities as tacit knowledge which is highly personalized, contextualized and difficult to be expressed and articulated (Nonaka and Takeuchi 1995). This distinction between explicit and tacit knowledge has occupied a significant portion of literature regarding how it affects the mobility of knowledge (Zander and Kogut 1995, Lord and Ranft 2000, Dhanaraj et al. 2004, Reychav and Weisberg 2009, Joia and Lemos 2010).

The knowledge-based view (KBV) of firms suggests that the strategic management of knowledge is critical to organizations' development and sustenance of competitive advantage in the present knowledge-based economy (Kogut and Zander 1992, 1996, Grant 1996, Spender 1996). Knowledge has become the major, if not the only production factor of modern firms. As such, organizations are turning to KM initiatives to leverage their knowledge-based advantage over competitors (Schultze and Leidner 2002). Results from Zack et al. (2009)'s study of 88 firms from Canada, USA and Australia representing ten different industry sectors showed that KM practices were directly related to organizational performance (product leadership, customer intimacy, operational excellence) which, in turn, was directly related to financial performance.

KM has been specifically defined as “a systemic and organizationally specified process

for acquiring, organizing and communicating both tacit and explicit knowledge of employees so that other employees may make use of it to be more effective and productive in their work” (Alavi and Leidner 1999, p. 6). According to Davenport and Prusak (1998) and Zack et al. (2009), the assumption underlying the practice of KM is that by locating and sharing useful knowledge, organizational performance will improve. Therefore, the quintessence of KM involves the sharing of knowledge throughout the organization so that organizational members can utilize the existing or newly acquired/created knowledge for company production. Meta-analysis conducted by Van Wijk et al. (2008) confirmed that knowledge sharing within firms increases both firm performance and innovativeness. Growing evidences suggest that organizations and their members are more productive when they are able to successfully create the conditions in which knowledge is shared by potential providers and then learnt and actively put to use by the recipients of new knowledge (Argote et al. 2000, Agrawal 2006, Haas and Hansen 2007, Mon et al. 2007, Reychav and Weisberg 2009).

Knowledge sharing refers to the provision or receipt of know-what, know-how and know-why for performing tasks (Foss et al. 2010). The successful sharing of knowledge is able to save the trouble of reinventing the wheel (Bender and Fish 2000), to create shared understanding (Nickerson and Zenger 2004), to reduce uncertainty (Tushman and Nadler 1978) and to turn individual learning into organizational learning (Nonaka and Takeuchi 1995). However, the process of knowledge sharing is full of ‘stickiness’ (Szulanski 1996). Particularly, the reluctance of workers to reveal and share their knowledge has been the most crucial challenge to effective knowledge sharing. A handful of research has demonstrated that the unwillingness of workers to disclose and donate knowledge is the major reason for knowledge sharing failures (Cabrera and Cabrera 2002, Husted and Michailova 2002, Ardichvili et al. 2003, Kamoche 2006, Wilkesmann et al. 2009).

Managers are therefore continuously looking for effective means to encourage their workers to engage in knowledge sharing. However, workers’ psychology on knowledge sharing is rather complex and is thus difficult to be managed. On the one hand, workers need to disclose their knowledge to reveal their market value to the organization. On the other hand, once their knowledge is disclosed, it will easily become an organizational asset or public good that may diminish their personal market value. Hence, workers are struggling between disclosing and sharing their knowledge and hoarding and protecting their knowledge. Cabrera and Cabrera (2002) conceptualize such struggle as a social dilemma to knowledge workers. Other concerns and considerations relating to knowledge sharing include fear of criticisms or

worry of misleading other co-workers (Ardichvili et al. 2003).

Such knowledge sharing dilemma lays the foundation for studying knowledge sharing behavior of workers and its management. The willing of workers to reveal and share what they know should not be taken for granted. Instead, the fundamental duty of managers is to resolve the psychological struggle and thus break the reluctance of workers on knowledge sharing. The extant literature contains diverse opinions on how managers can reinforce or promote the sharing behaviors of workers. The more prominent postulation concerns the importance of workers' intrinsic motivation on knowledge sharing. Another perspective lies with the exertion of external managerial control to foster knowledge sharing.

3. Divergent Literatures Regarding the Management of Knowledge Sharing

3.1 Intrinsic Motivation and Knowledge Sharing

The role of intrinsic motivation has received significant attention in KM studies. Since the creation and donation of knowledge is a highly discretionary effort, many researchers argue that KM practices can only be induced by the enhancement of intrinsic motivation (Osterloh and Frey 2000). Intrinsic motivation "is valued for its own sake and appears to be self sustained" (Deci 1975, p. 105). In other words, motivation is intrinsic "if an activity is undertaken for one's immediate need satisfaction" (Osterloh and Frey 2000, p. 539).

Following the above logic, workers will be willing to share their knowledge if they realize that knowledge sharing will bring them some intrinsic values such as self-development, self-efficacy and belongingness. Self-efficacy on knowledge utilization and sharing has been proposed to be one important intrinsic motivator for workers to engage in knowledge sharing practices (Cabrera and Cabrera 2005; Kankanhalli et al. 2005). In addition, through sharing knowledge, workers are able to obtain the three senses of competence, autonomy and relatedness in Deci and Ryan's (1985) cognitive evaluation theory. Such desires are especially relevant to knowledge workers as they are often characterized by high needs of intellectual, personal and career growth (Tampoe 1993). All these internal pleasures and senses are intrinsically driving workers toward knowledge sharing.

Previous research findings have confirmed the effect of intrinsic motivation on workers' knowledge sharing behaviors. For instances, findings from Lu et al. (2006) suggest that an important way to promote knowledge sharing is to enhance the self-efficacy of workers to utilize and share their knowledge; Srivastava et al. (2006) found that by creating an autonomous and participative environment that workers enjoy, knowledge sharing can be promoted in teams.

Nevertheless, the notion of intrinsic motivation has been criticized of focusing too much on the positive side of the world and narrowing their views on promoting performance to the greatest possible extent while neglecting the need to avoid below-average performance or even detrimental behaviors (Sackett et al. 1988, Osterloh and Frey 2000), e.g. the hoarding of knowledge. In this regard, Daniels (2000) has subtly explained the interplaying roles of extrinsic and intrinsic reinforcement contingencies on different levels of work performance. He argues that extrinsic (negative) contingencies may foster behavior at least up to a minimum standard while intrinsic contingencies tend to generate behavior that exceeds the minimum standard. Malott (2005, p. 107) also expressed his skepticism on the usefulness of intrinsic motivation as a managerial mechanism by commenting that “a world based only on intrinsic reinforcers would be wonderful; but I also think it is impossible to achieve”. He gave a simple example: if there were only intrinsic motivation but no deadlines (control) for the completion of work projects, the workers would still perform, maybe at a rather high quality, but often with a fatal prospect of infinite procrastination.

3.2 Managerial Control and Knowledge Sharing

Managerial control has been defined in a variety of ways in the literature including the formal and informal routines and procedures of the firm (e.g., work flows, procedure manuals), the processes by which the firm coordinates activities (e.g., job design, job allocation) and the cultural norms and practices within the firm (e.g., organizational values, organizational cultures) (Turner and Makhija 2006). Regardless of how researchers defined managerial control, they tended to follow the classic conceptualization proposed by Ouchi in 1979 that the design of managerial control mechanisms should incorporate outcome control mechanisms (clear performance appraisals and related reward and punishment consequences), process control mechanisms (standardized operating procedures, specialized job descriptions and supervision relationships) and clan control mechanisms (formal meetings and informal socializations).

The role of managerial control mechanisms in managing knowledge sharing has however been a pejorative. The general view about managerial control is that it constrains individual action at work, limits task autonomy and variety and therefore dissatisfies or even alienates workers (Rousseau 1978, Klein 1991, Heckscher 1994). For example, Falk and Kosfeld (2006) found from a principal-agent experiment that control mechanisms represent a signal of distrust to the agents and a limitation of their autonomy, consequently diminishing their motivation to engage in productive activity. Falk and Kosfeld refer such ‘crowding out’ of

work effort to as the hidden costs of managerial control. Commenting on the weaknesses of managerial control mechanisms in fostering KM behaviors, Adler (2001, p. 220) explains that “effective development of knowledge – whether new concepts in the research lab, new products in the development department or process refinement suggestions on the shop floor – depends on employee commitment and on collaborative teamwork for which mutual trust is a critical precondition (Bromiley and Cummings 1995). Effective sharing of knowledge depends equally critically on a sense of shared destiny, which in turn both depends on and engenders a sense of mutual trust (e.g. Nahapiet and Ghoshal 1998)”.

However, such criticisms on managerial control mechanisms tend to exaggerate too much on its disciplinary and monitoring aspects and neglect its facilitative and motivational aspects. Briscoe (2007) and Foss et al. (2009) contend that most managerial mechanisms proposed by organization theorists have been rooted in a bureaucratic perspective which emphasizes on specialization and efficiencies and inhibits flexibility and autonomy. Managerial control, however, possesses a motivational nature in addition to its bureaucratic image. In fact, the inducement of intrinsic motivation on workers also require the sophisticated designs of outcome control, process control and clan control.

Several scholars have captured the dual effects of managerial control mechanisms. For examples, Frey (1993) argues in addition to the proposed crowding-out effect (monitoring reduces work effort) of control mechanisms, there is simultaneously a disciplining effect of control mechanisms that takes place to raise work effort, e.g. breaking the reluctance of workers to share knowledge; Adler and Borys (1996) argue that bureaucracy’s impact could diverge from the monolithic image and even be enabling if workers believed that it was helping them get their work accomplished; Turner and Makhija (2006, p. 197-198) specifically discuss how control mechanisms may facilitate the sharing of knowledge within organizations: “first, control mechanisms have inherent information processing properties (Tushman and Nadler 1978, Ouchi, 1979, Nelson and Winter 1982, Egelhoff 1991, Grant 1996). Such mechanisms, whether they encompass routines, coordination mechanisms, or organizational norms, mandate specific relationships between individuals and groups that influence how information is shared and knowledge is disseminated within the firm (Simons 1994, Makhija and Ganesh 1997). Second, controls create incentives and disincentives for organizational members to behave in a manner consistent with firm goals and objectives (Anthony 1965, Camillus 1986). Since meeting goals and objectives requires the use of knowledge by organizational members, the purposeful structuring of control mechanisms by a

firm in turn directs the type of knowledge management behavior exhibited”.

3.3 Problems with the Divergent Literatures

The two streams of research reviewed above have seldom, if ever, come across one another and long remained as discrete sub-themes within the literature. The major reason for such division of literature lies with the different assumptions and perceptions of researchers with respect to their inclined theoretical viewpoints on the organizational phenomenon under study, i.e. the management of knowledge sharing behaviors. Researchers advocating the importance of intrinsic motivation largely focus on the impacts of workers’ psychological and attitudinal changes (e.g. satisfaction, happiness, commitment) on their behaviors. They assume that knowledge workers are in themselves intrinsically motivated given the highly discretionary nature of knowledge work. As a result, it is concluded that any interventions that may reduce workers’ satisfaction or commitment and thus their intrinsic motivation are detrimental to their voluntary exhibition of KM behaviors. Given such a purely psychological focus in their research, they tend to ignore or deny the role of organizational control on promoting KM behaviors even though those control or coordination mechanisms are needed to induce the motivation, both extrinsic and intrinsic, of workers (Foss et al 2009).

On the contrary, researchers examining the effect of managerial control mechanisms on knowledge sharing behaviors tend to place effectiveness and efficiency measures at the center stage. They seldom tap into the motivational mechanisms, especially intrinsic motivation, of workers. However, it has been suggested that in addition to the functions of coordinating and streamlining work flows, managerial control mechanisms are able to influence variables such as autonomy, task identity and self efficacy that impinge on the intrinsic motivation of workers (Foss et al 2009).

Therefore, the divergence of literature brings at least three problems. First, the divergence undermines the intrinsic relationship between managerial control and intrinsic motivation, ignoring the contributive effect of managerial control on the inducement of intrinsic motivation. Second, because of such ignorance, there is hegemony of intrinsic motivation on KM research and the role of managerial control has been downplayed. Third, the divergence overlooks an important synergy that can be created by the convergence of the literatures. Such synergy is built on the complimentary effects of externally pushed and internally pulled forces of workers toward knowledge sharing.

4. A Bridging Tool – The Push-Pull Metaphor

As reviewed above, each of the divergent perspectives possesses its own limitations and

therefore neither one of them alone is sufficient to achieve a long-standing fostering effect (Osterloh and Frey 2000). Instead, an investigation of a ‘chemistry of organization’ (Grandoir and Furnari 2008) that identifies the relevant organizational mechanisms/variables and how various combinations of these may impact knowledge sharing is greatly necessary (Foss et al. 2010). To develop such ‘chemistry of organization’, we adopt a push-pull metaphor to examine the possibility of converging the divergent literatures into an integrative model and how a power synergy can arise out of such a convergence.

4.1 The Push-Pull Metaphor

The push-pull metaphor has been a popular theoretical tool in sociology to explain people’s educational and retirement choices (Mazzarol and Soutar 2002, Stimson and McCrea 2004, Li and Bray 2007) as well as in business studies to examine marketing management, supply chain management and R&D management (Zmud 1984, McAulay et al. 2006, Kirkwood 2009). Such perspective suggests that the occurrence of every action or behavior can be traced back to some push and/or pull forces (Zmud 1984, McAulay et al. 2006, Kirkwood 2009). In short, push forces refer to external pressures that push individuals toward a behavior whereas pull forces refer to the inherent desirability of individuals to engage in a behavior. For example, Kirkwood (2009) has examined the push-pull perspective on motivating entrepreneurship behavior. Forces that push people to become an entrepreneur involve more work-related factors such as being passed away for promotion or job loss. Forces that draw people toward becoming an entrepreneur include a desire for independence and potential monetary rewards. Kirkwood’s findings showed that people were motivated by both push and pull factors to become entrepreneurs and he suggested that both push and pull factors should be observed acting in combination, complex and intertwined in generating motivational effects. Similarly, Zmud (1984) and McAulay et al. (2006) have adopted the push-pull perspective to examine the reasons for people’s development of professional commitment and success of organizational innovation respectively. They also generated the same conclusion that the phenomenon under observation can and should be explained by both push and pull forces and thus called for more studies on modeling the push-pull perspective.

These past research provide support to the transcendence of the push-pull perspective in analyzing and explaining motivations of behaviors. We contend that the push-pull metaphor can also be applied to examine the management and fostering of knowledge sharing behaviors in organizations. For that, we propose a re-conceptualization of the divergent literatures of knowledge sharing management by subsuming them under a push-pull framework.

Specifically, the literature regarding the role of managerial control in fostering knowledge sharing represents the external pressures that push workers toward the behavior of knowledge sharing whereas the literature advocating the importance of intrinsic motivation represents the inherent desirability that pulls or draws workers toward the sharing behavior. When examining the literature by such push-pull perspective, the divergent literatures converge in generating fostering effects of workers' knowledge sharing behaviors.

4.2 Managerial Control and Knowledge Sharing – the Push Factor

The exertion of managerial control can act as a push factor to reinforce workers' knowledge sharing behaviors because, as discussed in previous sections, it has a disciplining and directing effect on worker behaviors (Turner and Makhija 2006). Managerial control can be employed to ensure that workers' behaviors are aligned with the strategic goals of the organization (e.g., knowledge sharing). The strategically aligned behavior (SAB) literature contends that it is imperative for managers to align their employees' interest with that of the collective (team or organization) through the implementation of certain organization policies so that they would prioritize the collective goal over their self agenda (Gottschalg and Zollo 2007). Those organization policies may include standardized operating rules and procedures, job design and arrangement as well as rewards and punishment (extrinsic reinforcement). Briscoe (2007, p 311) propose that the imposition of rules and procedures is useful to induce SABs, including knowledge sharing behaviors, because "rules and procedures can help standardize work activities and tolls to make hand-offs more feasible, thereby increasing the worker's options for control and flexibility" with respect to their work. Other research have shown that company's internal reward and control systems are related to the degree to which employees attach importance to the company's strategic objectives (Strahle et al. 1996) as well as how well employees are motivated to behave in accordance with the company's strategic objectives (Besser 1995, McMullen and Shepherd 2006, Gottschalg and Zollo 2007).

Therefore, the major function of managerial control is to suppress workers' opportunistic behaviors and assure their engagement in SABs of the organization. Such external pressure can be viewed as a pushing force to push workers from hoarding knowledge to at least mandatory sharing of knowledge. Although such mandatory participation is typically seen as minimum and not long-lasting, it is still useful necessary because (1) not all workers are intrinsically motivated as presumed by some scholars and changing intrinsic motivation is more difficult and the outcome more uncertain than relying on extrinsic reinforcements and (2) even intrinsically motivated employees may not always work to the benefit of their employers

(Osterloh and Frey 2000). In addition, managerial control mechanisms are also needed to create an environment that can induce workers' intrinsic motivation toward knowledge sharing (Foss et al 2009). Therefore, managerial control is not only directly pushing workers' performance by imposing some kind of coordination and reinforcements, but it is also helping the cultivation of the pull force – intrinsic motivation – toward knowledge sharing.

4.3 Intrinsic Motivation and Knowledge Sharing – the Pull Factor

A variety of studies has suggested that intrinsic motivation can act as a strong internal force to pull workers toward knowledge sharing behaviors. For instances, findings from Lu et al. (2006) suggest that the obtainment of self-efficacy from knowledge sharing is able to attract workers to continue their sharing behavior; Wasko and Faraj (2000) found that when knowledge was considered as a public good of a community instead of a private good owned by the organization or by an individual, employees would behave pro-socially out of a sense of moral duty to participate actively in knowledge exchanges and the purpose is to advance the community as a whole because they simply feel that helping others in the community is 'the right thing to do'; Srivastava et al. (2006) found that workers would proactively share knowledge with their team members when they enjoyed the team environment and the team leadership.

Yet, skepticism remained with the function of intrinsic motivation concerning whether workers can be pulled from non-performance to maximum performance purely by intrinsic reinforcement without any assistance of extrinsic reinforcement (pushing force) from the bottom. Various scholars have raised their concerns on the effectiveness of intrinsic motivation on fostering worker behaviors and advocated an integration of extrinsic managerial control with intrinsic motivation to achieve a best synergy between two seemingly opposing managerial mechanisms (Daniels 2000, Malott 2005). In other words, a convergent model instead of divergent arguments is needed to pursue genuine meanings out of the past postulations and contributions.

5. A Convergent Management Model

Given the respective deficiencies of managerial control and intrinsic motivation, the two types of managerial mechanisms should not be considered as mutually exclusive. Instead, they are exerting different but complimentary influences on workers and their convergence is able to effectively promote knowledge sharing as well as other KM behaviors. The push-pull perspective provides as a solid conceptual tool to explain the synergy arising from their convergence.

First, managerial controls act as external forces to push workers from non-participation to participation as well as to create the conditions for cultivating intrinsic motivation. As discussed before, due to appropriation concerns, hoarding knowledge tends to be a preferred option for workers than disclosing and sharing knowledge. A force is thus needed to soften this reluctance. Intrinsic motivation fails such purpose. The effect of intrinsic motivation is too uncertain and slow to change the opportunistic thinking of workers (Osterloh and Frey 2000, Falk and Kosfeld 2006).

On the contrary, the imposition of extrinsic rewards and punishments can push workers to engage at least in mandatory knowledge sharing. Given that workers are considering their self-interests, they will re-calculate the balance between hoarding and sharing their knowledge with the presence of rewards and punishments. Hence, the essence of the push function is to alter workers' calculation of perceived gains and losses from sharing their knowledge via rewards and punishments.

Intrinsic motivation, on the other hand, helps substantiate the reinforcing effect of managerial controls. The fostering effect of managerial control is only instantaneous and the workers may return from mandatory sharing to hoarding once the extrinsic reinforcements disappear. Moreover, the long term imposition of extrinsic reinforcements will cause the crowding out problem. Hence, managers cannot rely on the extrinsic push force in the long run. They have to transform the initially pushed behavior into intrinsically pulled behaviors.

Intrinsic motivation serves such pull momentum. Managers may induce the intrinsic motivation of workers via the creation of team atmosphere and self-efficacy on utilizing and sharing their knowledge. When sharing of knowledge gradually becomes a value (rather than a normal routine) that represents one's association with the team as well as one's esteem and expertise, the desirability of such feelings of belongingness and efficacy will offset the workers' self-interests concerns and thus pulls them toward their desired value, i.e. sharing their knowledge.

A powerful synergy thus results when the two types of managerial mechanisms converge on a single model (see Figure 1). The synergy works in two ways: in the first way, the push mechanism breaks the reluctance of workers to share knowledge and reinforces them to a mandatory (minimum) level of sharing. The pull mechanism then substantiates the motivation of workers to continue their sharing behaviors and raises the level of sharing to optimal. The logic is that at the beginning most workers are skeptical on sharing their knowledge due to concerns of self-interests. In order to break through such reluctance, managers need to force

the workers to engage in knowledge sharing through some kind of managerial mechanisms, i.e. the traditional carrot and stick method. Such managerial intervention is able to at least lead to mandatory (minimum) level of knowledge sharing (e.g., sharing of organizational routines, documents and basic work techniques) that is able to maintain the daily operation of the organization. This pushing mechanism is particularly useful for low-commitment or opportunistic workers who do not align their individual pursuits with organizational goals (Falk and Kosfeld 2006). Nevertheless, the mandatory sharing is only an instantaneous outcome and the sharing behaviors of workers will fall from the mandatory (minimum) level back to non-sharing again once the pushing mechanisms disappear. In order to substantiate the sharing behavior, managers need to turn the extrinsically reinforced behaviors into intrinsically motivated behaviors. Managers have to induce the intrinsic motivation of workers via the creation of self-efficacy, the construction of team atmosphere, the provision of autonomy and power, etc. This is where the second way of synergy is created. The inducement of intrinsic motivation (i.e. the creation of pull force) has to rely on the implementation of managerial mechanisms (i.e. the push mechanisms). Neither can intrinsic motivation exist without the facilitation from managerial mechanisms nor the reinforcement effect managerial control be long-lasting if the control mechanisms are not targeted, in addition to the pushing function, at the eventual creation of intrinsic motivation, i.e. the pull function. Only the intrinsic enjoyment, fulfillment and achievement aspired by the workers will be able to substantiate the sharing behaviors of workers in the long-run.

The following propositions are developed to illustrate our arguments:

Proposition 1: Managerial control and intrinsic motivation are needed to act as complimentary push and pull forces to foster knowledge sharing behaviors of workers.

Proposition 2: Managerial control acts as push forces to (1) mitigate workers' hoarding behaviors by altering their cost-and-return consideration on knowledge sharing and (2) create the environment that can cultivate intrinsic motivation of workers toward knowledge sharing.

Proposition 3: Intrinsic motivation, induced by obtaining the senses of self-efficacy, achievement and team belongingness through the utilization and sharing of knowledge, acts as a pulling force to substantiate workers' continuous participation in knowledge sharing.

Insert Figure 1 Here

6. Discussion and Conclusion

Based on a push-pull metaphor, we have developed an integrative management model to address scholar's (Argote et al. 2003, Kang et al. 2007, Foss et al. 2010) calls for more

holistic and consolidated models for managing knowledge sharing behaviors. The motivation for such effort is that the current literature fails to “adequately address how firms can manage the knowledge flows across different employee cohorts” (Kang et al. 2007, p. 243) due to the disorganized and scattered nature of past studies. Past studies have fallen into a divergent trend, making scholars to doubt about the issue of integration on those studies. Such divergence failed to provide scholars and managers with a genuine meaning to 'management' and undermined the generation of powerful synergy from a convergence of different theoretical perspectives.

We adopted the push-pull metaphor as a convergent tool to integrate the previously divergent literatures - managerial control and intrinsic motivation – for managing knowledge sharing. A push-pull perspective advocates that any actions of workers can be analyzed as a simultaneous result of externally pushed and internally pulled factors. Following such viewpoint, we conceptualize managerial control as the externally pushed factor and intrinsic motivation as the internally pulled factor for fostering workers' knowledge sharing behaviors. The seemingly contradictory and divergent literatures now converge on a single management model, creating a powerful fostering synergy that either of the divergent streams alone is not able to achieve.

Specifically, the transcendence of our integrative model lies in at least three aspects:

1. The developed model shows how managerial control and intrinsic motivation can supplement the weaknesses and compliment the fostering effects of one another. Managerial control provides fostering effect to both remedy the uncertain outcome of intrinsic motivation and create the conditions for its occurrence while intrinsic motivation substantiates the instantaneous effect of managerial controls.
2. The developed model addresses the inherent reluctance of workers to disclose and share their knowledge. The model suggests that such reluctance may need to be broken by managerial control at the first stage before intrinsic motivation can take its effect.
3. The developed model applies to different kinds of workers (e.g. low commitment / high commitment, opportunistic / benevolent, reluctant / proactive, etc) typically exist in any organizations. The fostering effect generated from the synergy of push and pull forces is able to cover both intrinsically motivated and opportunistic workers.

Therefore, the contribution of this article is manifold. First, the article offers concrete theoretical and practical guidance to both researchers and managers on how to embed KM behaviors within organizations. It responds to the call of Foss et al. and many others (e.g.,

Szulanski 1996, Lu et al. 2006, Watson and Hewett 2006, Kang et al. 2007, Quigley et al. 2007, Kachra and White 2008) to explore ‘how’ management is done as in contrary to the ‘whats’ – a mixture of antecedents to effective KM. Merely knowing the antecedents to KM is never enough; more importantly we need to know how to manage those antecedents in ways that can effectively foster KM behaviors.

Second, the article bridges different theoretical viewpoints in the extant literature. Past studies have largely relied on intrinsic motivation to explain the behaviors of knowledge workers because researchers often assume that since the creation and donation of knowledge is a highly discretionary effort, it can only be induced by the enhancement of intrinsic motivation (Osterloh and Frey 2000). On the contrary, the use of managerial control is relatively undesired since it is deemed to be contradictory to the discretionary nature of knowledge work, destroying people’s intention to engage in knowledge creation and sharing. However, we have pinpointed that researchers have overlooked the complimentary relationships between intrinsic motivation and managerial control and missed the powerful synergy that can arise out of their combination. Such synergy has long caught the attention of motivation guru Vallerand (1997, p 347), pinpointing that “we should not pit intrinsic against extrinsic motivation because both motivations are present within the individual to different degrees. What may be more useful is to uncover which configurations involving the different types of motivation lead to the most desirable outcomes”. The proposed integrative management model succinctly illustrates such configuration and shows that intrinsic motivation and managerial control are complimentary rather than crowding out or mutually exclusive. The article thus fulfills Argote et al. (2003, p. 572)’s quest that researchers should take advantage of ideas produced in other areas and not only simply rediscover what is known already in their own discipline so as to generate “a truly cumulative body of knowledge”.

Third, although it is argued that knowledge as a production factor causes significant challenges and changes to the role and function of management (Foss 2007, Mitchell and Meacham 2011), the current article demonstrates that the conventional control orientation does not need to be eliminated. Instead, modern researchers should pursue the ‘modified version’ of past theories and models and examine how the modified wisdoms can be applied in today’s context to generate the expected result. As Foss (2007, p. 32) argues that although knowledge firms “may be differentiated from ‘traditional firms’ in terms of governance mechanisms by relying less on direction through the exercise of authority”, managerial control is still necessary only that it “is exercised through very different mechanisms in two

kinds of firms”.

The current article also brings several promising research avenues. First, cultural embeddedness and variations of the integrative management model should be investigated to see if the same management configuration would work for workers with different cultural backgrounds. Specifically, future research should investigate whether the degrees of intrinsic motivation and managerial control mechanisms would vary given different levels of, for example, individualism and power distance of the workers. Second, researchers may also investigate how personality affects the effectiveness of the push and pull forces on different individuals. Factors such as internal/external locus of control, goal orientation, self-efficacy and need for achievement may affect how recipients perceive and react differently to push and pull mechanisms. Third, it is worthwhile to examine the specific effectiveness of the proposed management model on fostering different types of KM practices so as to make the ‘M’ of KM to be even more concrete. The focus of the current article on knowledge sharing is only the first step towards our understanding of the entire KM system.

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Figure 1: A push-pull model for fostering knowledge sharing

