



Cognitive Collective Engagement: Relating Knowledge-Based Practices and Innovation Performance

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Abstract

This research discusses a new concept of “cognitive collective engagement” which integrates engagement theory with knowledge-based view. We propose that cognitive collective engagement can be considered as an organization-level construct influenced by knowledge-based resources which come from individual cognitive side. Specifically, we evaluate three distinct organizational practices as resources which are knowledge-oriented leadership, knowledge management practices, and talent-based human resources management that can facilitate innovation performance. We empirically test this concept in a sample of 202 firms and provide evidence that cognitive collective engagement mediates the relationship between the three organizational resources and innovation performance.

Keywords Knowledge-based view · Cognitive collective engagement · Innovation performance

Introduction

Employee engagement is the degree of employee behavior in an organization that moved to merge with their work. In recent years, “engagement” becomes the latest

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management keyword. However, Kahn (1990) states that recent empirical evidence shows that engagement becomes a more comprehensive investment description in the attitude of affective, behavioral, and a person who has cognitive energy in the workplace. It is merely a strong motivational concept by which comprehensive explanation for individual level performance outcomes is provided (Rich et al. 2010).

A positive effect on the level of innovation and creation is the result of individuals' engagement with the tasks and objectives of the group (Zhang and Bartol 2010). However, group leader must understand how to translate individual engagement to organizational engagement or collective engagement as suggested by Barrick et al. (2015). In the organization, the aggregate amount of the individual's involvement can be called as collective engagement (Bakker et al. 2006). There are two basic components in engagement or involvement. First, organizational members should have a common goal, and second, they must have an effort to support each other (Kim et al. 2009). Members must be involved in achieving goal in order to reinforce a mutual value by sharing information, values, and vision. In the end, when member has fully engaged and focused on organizational objectives, the relationship of mutual support and individual effort will produce group's energy, enthusiasm, and focus on achieving common goals.

However, despite the suggested link between employee engagement and organizational performance, there is no many researches that examine engagement at the organization level (Bailey et al. 2015). Moreover, Barrick et al. (2015) has investigated the role of collective organizational engagement in mediating the relationship between firm resources and firm performance. However, Barrick et al. (2015) discuss collective organizational performance from all aspects which are physically, cognitively, and emotionally, while Zhang and Bartol (2010) explain about the concept of psychological empowerment that will grow creative process engagement.

This research will explore the role of cognitive in the concept of organizational engagement. In order to improve understanding that employee engagement plays beyond the individual analysis level, a number of scholars develop a conceptualization of engagement as a function at the organizational analysis level, which we called as *cognitive collective engagement* (e.g., Barrick et al. 2015; Fachrunnisa et al. 2016, 2018; Rich et al. 2010; Zhang and Bartol 2010). Eventually, we add more theoretical and empirical research on employee engagement by explaining how cognitive collective engagement may be manifested as a shared information or knowledge among organizational members that is distinct from aggregated cognitive individual-level engagement. In addition, we simply display that employees' cognitive can be collectively engaged at work by analyzing how firms can strategically structure and bundle firm resources to generate shared knowledge among employees. Organizational members are collectively engaged at work cognitively, and by doing so create value for the firm which then lead to innovation performance.

To develop our understanding of cognitive collective engagement, we integrate engagement theory with knowledge-based view theory (Sirmon et al. 2011). There are two basic tenets of the knowledge-based view that serve as the foundation of the model. First, explicit knowledge is merely sourced from cognitive side of individual. This knowledge is acquired, stored, and need to convert into organizational knowledge so that it can bundle together to generate unique organizational capabilities and create value for the firm. Second, leaders manage, synchronize, and leverage the process of bundling knowledge resources in order to maximize the value that the bundled

resources create. The resource management model provides an important lens through which researchers can take a process-oriented view that centers on cognitive collective engagement as a unique capability that firms can develop by structuring a set of resources to rich employees across the organization. The knowledge-based view also recognizes that certain actions (i.e., perceived organizational support) of the upper echelon can foster or “orchestrate” the pursuit of firm environment as a way to enrich the effects firm-level resources have on organizational capabilities (Fachrunnisa et al. 2012; Hitt et al. 2010; Slåtten and Lien 2016).

In order to find three fundamental research questions to advance the literature, we use the insights gained by integrating engagement theory and the knowledge-based model. First, is it possible if the employees choose to invest their tacit knowledge into their work in a way that it becomes a shared firm-level knowledge capability? Second, what are organizational practices or resources that make this shared perception of firm-wide engagement affected? Third, what are the roles that have done by the firm executives in applying the motivational potential of knowledge resources to increase the cognitive engagement of the firm? We contend that Donate and Pablo (2015) provide a key theoretical process which explains that knowledge resources and top managers’ strategic actions are merged to foster cognitive collective engagement. This engagement will indicate the increasing level of innovation performance.

Theoretical Framework and Hypotheses

In the new economics and management literature, a knowledge-based theory of the firm is contributed to develop. It states the main reason for firms’ existence as being the creation, integration, and utilization of knowledge (Melancon et al. 2010; Van der Heijden et al. 2013). The knowledge-based view (KBV) has its roots in the resource-based view of the firm, which focuses on strategic assets as the main source of competitive advantages (Amit and Schoemaker 1993; Gök and Peker 2017). In contrast, under the KBV, knowledge is the main strategic resource, which, when properly managed, allows the firm to create value from its exploitation of production (Crook et al. 2011). Therefore, through the combinative–dynamic capabilities, it results a knowledge-bearing entity that manages its knowledge resources result in the firm (Santos-Vijande et al. 2016).

Consequently, by developing and implementing a series of activities or initiatives, it will deploy organizational capability and extract value, so that can be called as KM practices (Ghazi and Edien 2015). The main purposes of the use of KM organization are to get knowledge cognition, individually and collectively, and to shape itself in such a way as to make the use of firm knowledge to achieve effective and efficient performance. Alavi and Leidner (2001) explained that the use of KM practices aims to give positive organizational outcomes such as enhanced communication and participation levels among staff members, efficiencies in finding solution and time to market, more energetic financial performance, better marketing practices, and improved project team performance; therefore, the widespread acknowledgement of KM contributed to succeed all organizations. Nonetheless, in technology-intensive industries with the capability of firms to continually develop new products or processes, innovation seems to be the most important challenge for KM which is heavily depended by competitive advantage (Nonaka and Takeuchi 1995).

This paper focuses on product innovation as one of the important goals of KM in technological and knowledge-based setting firms (Andersson et al. 2015). The following discussion explains the relationships between KM initiatives and innovation, going on to cover their links to cognitive collective engagement. With this new cognitive collective engagement theory, a comprehensive theoretical model that explains its antecedents, boundary conditions, and effects on innovation performance is developed and tested. The integration of Nonaka and Takeuchi's (1995) knowledge management model and Kahn's (1990) engagement theory finds the important outcome of cognitive collective engagement.

Talent-Based HRM (Human Resources Management) and Cognitive Collective Engagement

Talent-based HRM is a process of human resources management which emphasizes the employees' potential talent comprehensively which includes recruitment, selection, training and development, compensation, and performance appraisal in order to increase organizational value (Tasselli et al. 2016). In the process of talent-based HRM, keeping the availability of employees' talent should be adjusted with the job assignment in order to increase the performance appraisal (Rao and Greeve 2016). It can be stated that talent-based HRM focuses on the strategy to get employees who have competencies and skills which are appropriate with the position needed. Schiemann (2014) states that one of the outcomes in talent-based HRM strategy is employee engagement. The selecting, training and developing, compensating processes, and performance appraisal will support to create employee engagement. When the employees are collectively involved, they will show the physical, cognitive, and emotional ability to achieve the organizational performance (Slåtten and Lien 2016).

Research by Cooke et al. (2014) found that talent-based HRM has positive influence to employee engagement especially in employees' retention. While Brymer et al. (2016) proved that processes of selection, training, and development help the management to find the potential candidate of employees who have talent-based HRM, so that employees have commitment to cognitively be involved. Research by Abt and Knyphausen-Aufseß (2017) and Shaw (2015) shows that the compensation system motivates employees to be involved collectively in increasing the cognitive ability through quality talent pools, so that they can achieve the best performance. Meanwhile, research by Kim and Ployhart (2015), Subramony et al. (2018), and Vidal et al. (2017) also show that performance appraisal in its practices, such as judgment, dateline assignment, and done well, will give positive influence to the cognitive collective engagement.

H1: Talent-based HRM (i.e., selection, training, compensation, performance appraisal) will be positively related to cognitive collective engagement.

Knowledge Management Practices and Cognitive Collective Engagement

Knowledge management practice is the collective set of (multidisciplined) actions taken by an enterprise to collect, create, preserve, share, and protect organizational knowledge in furtherance of business objectives. Knowledge management contains of two forms, namely knowledge management objective and knowledge management

process. Knowledge management objective emphasizes on the exchange of knowledge, while knowledge management process emphasizes on the conversion of tacit to explicit knowledge. Through the knowledge management process, personal knowledge can be transformed into organizational knowledge. The main goal is to get right knowledge on right people in right time to help in sharing and using information to improve company performance. Scholars recognize that this knowledge management process is a prerequisite for organizational success (Tymon et al. 2010).

Knowledge management has been recognized as a tool which can create innovation and competitive advantage (Haldin-Herrgard 2000). A company which applies knowledge management has better performance (Pathirage et al. 2007). Through KM process, individual knowledge can be changed to be organizational knowledge (Skyrme and Amidon 1997).

There are many studies which realize the role of knowledge creation and knowledge conversion in succeeding the organization (Nonaka et al. 1994). Organizations that do the process of creating the better knowledge are capable to combine the knowledge with different ways and provide value for consumers (Mumford et al. 2000). In the process of knowledge conversion, individual knowledge interacts each other to create new knowledge by developing tacit and explicit knowledge quality (Geldres-weiss et al. 2016). Knowledge conversion process is really needed because it would be organizational knowledge for widely positive influence and successful business (Hoyer et al. 2010). Through knowledge conversion, organization can share explicit knowledge that is created and changed into tacit knowledge on individual level (Tseng et al. 2011).

There are some ways on how organizational engagement will benefit the organization. First, the interaction of group member will share the positive element behavior such as affective, motivational, and attributes that performance attributes can be improved such as collective efficacy and the potential for high group. Second, their input and output in the organization will mutually compare each member. It is called as the process of social comparison. To customize, their engagement in the group will be matched by each member. Third, leaders can increase the level of connected members' feeling and identify their destination with organizational goals, which at a later stage will override his desire to achieve organizational goals are more valuable (Piccolo and Colquitt 2006). Therefore, organizational value is increased by collective engagement through the innovation performance improvement.

Cognitive collective engagement is engagement that must be possessed by such organization. This concept is derived from knowledge management and organizational engagement theory. In innovative tasks, the balance between cooperation and competition and the balance between tacit and explicit knowledge are important factors to improve innovation performance (Umashankar et al. 2011). Cognitive collective engagement can be concluded as the cognitive belief which is built by engagement that arises with the intensity of the collaborative and needs to solve innovative task. In addition, each member of a team can build engagement based on the intellectual shared. Organizational members should fight core competencies in order to develop and contribute to other team members. In this case, team members are not expected trying to hold all competencies and finish the task that should be focused independently. If that situation happens in time, it makes teamwork unhealthy because team members think that other members are not partner or enemies who expected to help the group performance.

Therefore, synergize members need to connect a strong support from managerial, information and knowledge are shared, which then can create a great value. Proactive and responsive members are expected to make organization survive. Members of the team are expected to collaborate with each other and succeed from service features and be a competitive organization part. Cognitive collective engagement creates some explicit knowledge dimensions and collective engagement. Integrity and ability are two dimensions the explicit knowledge has. Besides spiritual engagement, emotional engagement, intellectual engagement, physical engagement are the dimensions of collective engagement. However, due to the nature and characteristics of the completion of an innovative product which needs short collaborative task and relying on the latest information and knowledge, then intellectual engagement is compared with other dimensions of engagement. Therefore, in this research, several dimensions measure the concept of CCE which are integrity, ability, and intellectual engagement. Integrity consists of what is thought (cognitive) and what it does. Ability is defined as cognitive skill needed to finish a task. Moreover, intellectual engagement refers to sharing an attachment based on the intellectual cognitive into teamwork.

H2: Knowledge management practices will be positively related to cognitive collective engagement

Knowledge-Oriented Leadership and Cognitive Collective Engagement

Lian and Tui (2012) explain that the way to inspire workers to accomplish important task is to use leadership as a way. Leadership is defined as a clear management approach toward employees and supports them to follow the leader to reach the goal of the firm. Leadership in knowledge organizations is particularly relevant when knowledge workers perceive leaders as actively engaging and committing to support knowledge and learning activities (Marrone 2010). Moreover, their co-workers should be recognized and rewarded by knowledge leaders (Abt and Knyphausen-Aufseß 2017), rather than promoting negative behaviors that threaten knowledge transfer, sharing, and application (Cooke et al. 2014).

The third resource consisted in the resource bundle that affects cognitive collective engagement is knowledge-oriented leadership. We more focus on knowledge-oriented leadership behaviors because they collectively impact all cognitive conditions—intellectual, communication orientation, problem definition, criteria development, and solution development—relative to other leadership styles. In addition, leaders can exhibit knowledge-oriented leadership at any firm level. We more focus on the CEO's leadership as an organization-level construct shared by all employees. Thus, when exhibited by the CEO, knowledge-oriented leadership behaviors, such as sharing compelling visions, intellectually stimulating followers, and setting challenging goals and expectations (Finegold and Frenkel 2006), uniformly influence the organization as a whole. We posit that knowledge-oriented CEOs enhance employees' existing levels of cognitive resources available for the pursuit of organizational goals and objectives.

Becker and Vance (1993) stated that organizational leadership in knowledge-intensive companies means leading through a knowledge lens will take knowledge exploration advantage and exploitation processes. In other words, leaders must give

guidance to the knowledge workers to learn and use knowledge, in order to achieve the knowledge goals of the firm as a whole. Knowledge-oriented leadership thus implies affording KM a prominent role in the firm so as to sense and seize opportunities to innovate (Teece 2009). Related to the knowledge-oriented leadership, leaders should master how to develop KM channels and acquire both knowledge exploration and knowledge exploitation. Moreover, best KM practice in the firm, essentially through an effective KM leadership style, motivation, communication, and staffing, should be promoted by them.

Knowledge-oriented leaders generate conditions to promote responsible behaviors among employees and teams, the role of leaders as mediators for sharing and applying knowledge (Nonaka and Takeuchi 2011), the role of leaders for evaluating employees on the basis of tolerating errors and promoting learning rather than work output (Pan and Scarbrough 1999), the generation of expectations regarding the quality of the work of employees trying to promote creativity (Bollinger and Smith 2001), leading by example by assuming the role of knowledge managers (Dawley et al. 2010), and rewarding employees who share and apply knowledge (Haas and Hansen 2005) which leads them to exert extra effort and to perform beyond expectations (Donate and Pablo 2015). Finally, one of the fundamental goals of a knowledge-oriented leader is to encourage followers to rise above their own self-interests in pursuit of organizationally valued objectives (Campbell et al. 2012). Kahn (1990) argues that, when individuals' values, goals, and objectives are more aligned with those of the firm, they are more willing as a whole to make them available to engage in their work (Rich et al. 2010).

Related to the leadership style, Ribiere and Sitar (2003) believed that for supporting the innovation of firm, knowledge leaders should merge disparate behaviors, depending on the demands of each situation. As highly innovative firms have to merge for both exploration and exploitation initiatives to reach the organizational ambidexterity (Monreal-Pérez et al. 2012), they should have capability to lead members toward objectives in different contexts with distinct task requirements (Rosing et al. 2011). In addition, Williams and Sullivan (2011) point out their skepticism toward the merits of the traditional, heroic, transformational leader in a learning context, instead recommending alternative kinds of learning leaders, who build knowledge organizations by combining transactional (focused on leader–follower exchanges in the form of benefits, rewards, incentives, and self-interest) and transformational (focused on the motivation and inspiration of followers to give their best) behaviors. In this vein, Singh and Kant (2009) stated the role of leaders such as developers and facilitators of KM who plan knowledge processes and preserve their implementation through reward systems. Interestingly, Ribiere and Sitar (2003) believed that the firm needs a managerial combination in order to manage explicit—through its exchange and combination—and tacit knowledge through its communication and use innovative contexts (i.e., transactional and instrumental) and visionary (i.e., transformational and role modeling) leadership styles. DeTienne et al. (2004) also contemplate this integrative perspective by considering role-modeling leadership (leading by example) which includes main aspects such as vision articulation, clarification of leaders' expectations of their followers, recognition, and rewards.

Generally, this combination of knowledge leadership behavior is similar with KM initiatives of creation, transfer, storage, and application within the firm. Moreover, knowledge-oriented leadership should encompass clear communication related to the

expectations of knowledge employees and the company's objectives, along with motivational (Baum et al. 2000). In the first place, leaders must be as advisers so that employees can understand their job desk and KM initiatives can contribute to ensuring communication. Without managers stressing the importance of KM initiatives, employees will assume that KM is of little importance (DeTienne et al. 2004).

From the discussion above, there are some aspects that combine knowledge-oriented leadership in KM development. They are transformative and transactional leadership styles which include of motivation and communicational elements. There are main goals for a knowledge-oriented manager. They are being a role model, support learning by challenging workers and motivating them intellectually, institutionalize learning through the provision of incentives and training, develop a pro-learning culture such as tolerates mistakes and encourages cross-functional and discipline engagement, and improve knowledge transfer, storage, and application mechanisms (Andersson et al. 2015). For KM creation, conducive conditions such a greater commitment to R&D activities for experimentation and creative learning is created by knowledge-oriented leadership. In knowledge-intensive companies, role model of leader common sense of higher purpose to place innovation as an aspiration that applies to both leaders and followers (Carpini et al. 2017). Moreover, these activities which are motivated and rewarded will help the firm build appropriate condition and improve initiative for knowledge sharing and lead to get new ideas for knowledge conversation (Nonaka and Takeuchi 1995). KM exploitation activities are applied by same reason which in this case, knowledge-oriented leadership, through a more transactional perspective, is likely to intensify willingness to exploit existing knowledge (Doshi et al. 2013) through the development of initiatives storage (i.e., to remember what the company already knows), transfer (e.g., to take advantage of knowledge in other locations), and application (e.g., to integrate pieces of knowledge). In addition, the willingness to develop KM storage, transfer, and application practices is increased by the perspective that motivational and communication elements affect the effectiveness of these exploitation initiatives.

This study creates the hypothesis that with a greater tendency of company toward knowledge-oriented leadership, it will more intensively support employee to be bounded in cognitive situation. In the organizational learning process which is created by knowledge-oriented leadership, the members will be realized cognitively, learn together about new ideas, and the way to resolve assignments. The situation that is created by knowledge will create attachment cognitively. Teamwork will engage in discussion frame that includes their cognitive and intellectual. Then, knowledge-oriented leadership may create cognitive collective engagement. In other words, knowledge-oriented leadership has a direct effect on cognitive collective engagement.

H3: Knowledge-oriented leadership is positively related to cognitive collective engagement

Impact of Cognitive Collective Engagement on Innovation Performance

Performance is an act that is done to increase value added in an organization (Carpini et al. 2017). Innovation performance is defined as the result or outcome from

innovativeness and creativeness (Gök and Peker 2017). In addition, Mazur and Inków (2017) explain that innovation performance attends the quality of innovation process which is needed in order to achieve high competitive organization. One of innovation performance factors is ambition and commitment of organization members to adapt, become better, and collaborate to give excellent service. It is purposed that through cognitive collaboration, it will create creativeness in innovation (Carpini et al. 2017; Santos-Vijande et al. 2016; Zhang et al. 2015).

Cognitive collaboration involves the cognitive idea combination, point of view, and cognitive vision of innovation which is needed and opinions which are from individual cognitive to be planned in the product innovativeness. Based on some research, it can be concluded that cognitive organizational engagement can be main factor in creating innovation performance. Organizational engagement of individual creates integrity and intellectual engagement. Employee engagement will increase job satisfaction, commitment, and advocacy of employees to create competitive advantage in organization (Santos-Vijande et al. 2016).

Harvey and Kou (2013) show that individual collective engagement in organization actually can support creativeness and innovativeness process in resolving problems in job performance. The empirical research by Santos-Vijande et al. (2016) finds that the collaboration which is done by frontline employees influences to create teamwork coordination to increase innovation performance such creativity in servicing customers. While Geldres-weiss et al. (2016) and Yusr (2016) show that employees' involvement in TQM practices focus on value added and continuous improvement, influence in increasing competitive ability, and then also influence positively toward increasing innovativeness in organization.

The importance of engagement stimulates work ethic in the business context (Goktan and Miles 2011). It also increases collaboration of quality prosper among teamwork which then increases organizational performance through innovation. Study about collective engagement (Slåtten and Lien 2016) shows that there is influence toward organizational performance through knowledge-based service. The collective engagement of some employees in the organization will support cooperation in teamwork to share knowledge and experience to each other to create creativity in solving problems. Creativeness which is created by collective engagement is needed to produce the product, process, and organizational and marketing innovation. Each individual has potential performance in accordance with the level of individual engagement and interest to commit in the role of their performances. Study by Stanley et al. (2013) explains that collective engagement creates employee commitment, solving the job because of support to increase innovation performance.

In the research by Slåtten et al. (2011), the condition that supports employees to feel as “we” in company makes them engage collectively, physically, cognitively, and emotionally to be creative and innovative in the role of their performances in achieving appraisal performance. Previous research by Albdour and Altarawneh (2014) and Simsons and Buitendach (2013) also shows that employee engagement influences positively toward organizational commitment. Slåtten and Lien (2016) show that there is positive influence between collective engagement and company ability to create innovation. Cognitive collective engagement develops cognitive attitude, managing and sharing knowledge and experience, and involvement. Then, it can create emotional awareness to commit in the role of performance and increase the ability of

individual to think more creative. This creativity is needed to increase innovation performance.

H4: Cognitive collective engagement is positively related to innovation performance

The Moderating Role of Perceived Organizational Support

In order to support innovation performance, organization should prepare environment by which knowledge worker can produce, share, and use explicit and tacit knowledge. Research has proven that knowledge management helps organization to achieve that role (Boonet et al. 2013). Every organization in this modern era should fight, manage, and increase their knowledge workers. This is one of the main challenges in every organization. An organization must play the role in developing the work place to reconstruct and develop the employees' professionalism. However, in the other knowledge management practice, there is managerial responsibility that must be done such as giving training and developing to the employees. Li et al. (2015) give special assignment to learn new ideas and also make the work movement, and be responsible to develop and train new creativities to the employees.

The organization which has orientation to increase innovation capacity is forced to support the members by giving comfortable and conducive situation. If the employees have been engaged cognitively so that needs intervention from primary managerial team by giving support to the organization. The organization that attends the employees' welfare, appreciates every simple contribution, and is susceptible toward the employees' need because those treatment will quickly create innovation from the cognitive engagement (Dahlin et al. 2018). For example, community of practices which has been engaged in the contribution cognitively, continually discuss to solve the organizational problems that need support from organization physically, such as meeting place, facilitation of discussion, and recognition of their existence. Hence, perceived organizational support will moderate the relation between cognitive collective engagement and innovation performance (Fig. 1).

H5: Perceived organizational support will moderate the relationship between cognitive collective engagement and innovation performance

Method

Population, Sample, and Data Collection

A survey methodology is used in this study to collect primary data for empirical analysis. The samples used in this study are a selection of firms with high usage of technology, since these companies disposed to be sensitive to the use of both exploration and exploitation practices (He and Wong 2004), and innovation plays a pivotal role

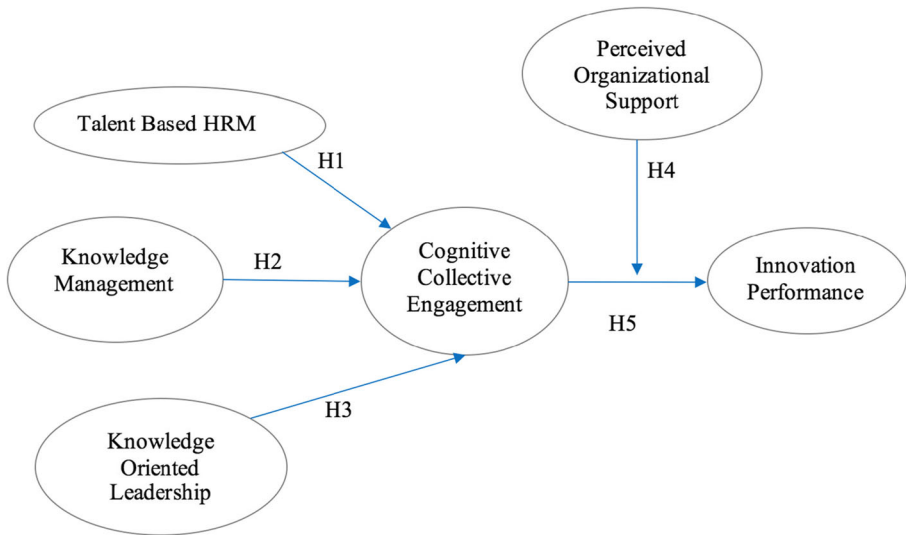


Fig. 1 Research model

in their strategies for reaching competitive advantages (Grant 2002; Jansen et al. 2009). Moreover, probably a wider spectrum of KM strategies is owned by technology firms than non-technology firms; a greater emphasis on the management of both explicit and tacit knowledge is a place, and the technical (IT-based KM strategies) consideration and humanistic (personalization strategies) perspectives of KM. In addition, a different management support from non-knowledge organizations is required by knowledge organizations from technology-intensive industries, and the leadership role and KM processes should manage HR distinctively and supportively (Yahya and Goh 2002).

The population of this study includes four innovative industries in Indonesian industrial classification, which are included in a homogeneous-specific section that falls under the classification of manufacturing of textile, fashion, food and beverages, and shoes. The Ministry of Industry categorizes these industries as the industries which fit with the research goal of analyzing knowledge-based organizations so that is called as technology intensive. The sample of this study consists of those with more than 100 employees in the firms. The exact population used is 529 firms: 68.3% from fashion and textile, 15.6% food, and beverages 16.1%.

There are some data collection processes. They are composing company data and also collecting interest information (e.g., the companies' addresses, senior management team identification, and secondary data) into an ad hoc database specifically for this research project. To compiling primary data, the research assistants give questionnaire to 529 firms. The questionnaire contains of detail literature review on measurement scales and some questions that address KM, engagement, innovation, and organizational support. The questionnaire is also completed with letter that requests to the senior managers or executives who acquire the topic of this study to complete the questionnaire.

Before doing the survey, executives of five technology-intensive companies do personal interviews rigorously and the questionnaire should be validated first by a number of academics. These interviews aim to improve the quality of items and correct wording issues. Finally, after 3 months, the yielded 220 usable questionnaires represent

41.6% response rate. The majority of the respondents are CEOs, human resource directors, or middle-level managers. Respondent firms have, on average, 13.6 years of longevity ($SD = 31.2$) and an average size (number of employees) of 127.3 ($SD = 365.2$). Analysis of differences between respondents and non-respondents for a given set of variables tests for non-response bias. t tests reveal no significant differences between the two groups in relation to size ($t = 0.605$; $p = 0.88$) or age ($t = 0.892$; $p = 0.72$). The analysis also fails to yield significant differences regarding the industry distribution of the sample and the entire population.

Systematic measurement error and bias in the estimation of the true relationship among theoretical constructs may be caused since all single self-report questionnaire data with a cross-sectional research design, common method variance—variance arising from the measurement method rather than the constructs of interest (Podsakoff and Organ 1986). The existence of this problem is checked by the Harman one-factor test (through exploratory factor analysis). This test provides substantial amount of common method variance, such as (a) a single factor arises from the factor analysis or (b) the majority of the covariance among the variables accounted by one general factor (Podsakoff and Organ 1986). The existence of six distinctive factors with Eigenvalues greater than 1.0 is showed by the factor analysis (principal component analysis with varimax rotation) on the questionnaire items. These factors account for 77.2% of the total variance. Moreover, the largest factor accounts for 29.8% of the total variance. Common method variance concern is thus unlikely to merge the interpretations of the results in this study since more than one factor emerges and specific factor accounts for the total majority variance.

Measures

Cognitive Collective Engagement

We measure this variable with four items such as engage in problem identification, involve in information searching, ideas for problem solving, and involve in decision-making process. These items are developed by combination from Zhang and Bartol (2010) and Fachrunnisa et al. (2018). Items range from 1 = strongly disagree to 5 = strongly agree.

Talent-Based HRM Practice

A five-point Likert scale with four items from Brymer et al. (2016) and Schiemann (2014) measures talent-based human resource management practices. The items include selection, training, compensation, and performance appraisal practices which are based on employee talent.

Knowledge Management Practices

A multi-item adopted from Donate and Pablo (2015) is used to measure the collection of knowledge acquisition, knowledge conversion, application, and practices following previous research. Two items measure acquisition, two items measure conversion, three items measure knowledge application, and three items measure knowledge practice.

These items mainly relate to R&D activities that permit the firm to generate new knowledge. Items range from 1 = strongly disagree to 5 = strongly agree.

Knowledge-Oriented Leadership

A five-point Likert scale with six items from Donate and Pablo (2015) measures knowledge-oriented leadership. According to Donate and Pablo (2015), transformational and transactional style items follow the theoretical orientation of this study toward leadership in knowledge-based organizations (Paul et al. 2002; Ribiere and Sitar 2003). The conditions to promote responsible behaviors among employees and teams are measured items by Rosenbloom (2000), the role of leaders as mediators for sharing and practicing knowledge (Nonaka and Takeuchi 1995; Pan and Scarbrough 1999), and the role of leaders for evaluating employees on the basis of tolerating errors and promoting learning rather than work output. Bollinger and Smith (2001) and Roth (2003) state that the generation of expectations regarding the quality employees' work is trying to promote creativity (Haas and Hansen 2005; Roth 2003), leading by example by assuming the role of knowledge managers (Bryant 2003) and rewarding employees who share and apply knowledge (Pan and Scarbrough 1999). The items range from 1 = strongly disagree to 5 = strongly agree.

Perceived Organizational Support

A five-point Likert scale with four items from the Ingram and Glod (2016) measures perceived organizational support. Items measure the conditions to attend the employees' welfare, appreciate employees' contribution, take care of the employees, and susceptible toward employees' need. The items range from 1 = strongly disagree to 5 = strongly agree.

Innovation Performance

This measure is adopted from Donate and Pablo (2015) which was an adaptation from Zahra and Das (1993) and Zahra and Bogner (1999) measures. The measurement refers to new product developments. Apart from absolutely subjective items (e.g., results of the company), this measure also includes relative items (e.g., results compared to those of competitors). Following Zahra and Das (1993), relative measures are a necessary requirement, as innovation effectiveness depends heavily on comparisons (e.g., rivals' performance; previous years' results). Items range from 1 = very low to 5 = very high.

Result

Statistical Analysis and Hypothesis Testing

The study employs partial least squares (PLS) to analyze the research model. The software to conduct the analysis is provided by SmartPLS 2.0 (Ringle et al. 2005). A variance-based PLS approach is preferable to covariance-based methods, since PLS imposes less strict restrictions on sample size and distribution (Chin et al. 2003). PLS is defined as a

SEM technique in which a measurement model and the theoretical structural model are simultaneously assessed (Chin 1998). In addition, an equal method to resolve multicollinearity problems that frequently arise in multivariate regression analysis, since PLS transform predictor variables to an orthogonal component called as PLS (Chin et al. 2003). Although prediction of measurement and structural parameters happens simultaneously, the PLS model application typically occurs in two stages. The first step is to assess the measurement model using confirmatory factor analysis, to estimate the reliability and validity of the theoretical constructs. Then, the second step is to estimate the structural model tests of the (path) associations among the hypotheses in research model.

Measurement Model

Approximation of convergent and validity establishes the measurement of model validation. The fulfillment of three criteria is dependent on convergent validity of the scales (Fornell and Larcker 1981; Hair et al. 1998): (1) all indicator loadings should exceed 0.65, (2) mixture reliabilities should exceed 0.8, and (3) each construct of the average variance extracted (AVE) should exceed 0.5. As Table 1 shows, threshold recommends all the indicator loadings above the CR values range from 0.87 to 0.95, and the AVE ranges from 0.55 to 0.82. Those three conditions for convergent validity hold.

To assess discriminated validity, Fornell and Larcker (1981) stated that the square root of the AVE of a latent variable should be higher than the correlations among the rest of the latent variables. As Table 1 shows, discriminated validity holds for the model, as the square root of the AVE for each construct shows higher than the correlations among the form of variable construct.

Structural Model

The previous hypotheses test cross-validation (CV) communality and redundancy indices that estimate the structural model quality. It means that the CV communality indices ensure the global quality of the structural model if the indices are positive for all the blocks, considering the measurement model as a whole. In addition, a metric to

Table 1 Descriptive statistics and discriminant validity

Construct	Mean	SD	Range of loadings	CR	Ave	Correlation between constructs						
						CCE	TBH	POS	KMP	KOL	IP	
COGNITIVE (CCE)	3.81	1.07	0.92–0.94	0.95	0.87	CCE	1					
TALENT (TBH) P_ORGSUP	3.62	1.18	0.91–0.93	0.96	0.86	TBH	0.60	1				
(POS) KNOW_MNG	3.84	1.08	0.93–0.94	0.93	0.61	POS	0.60	0.69	1			
(KMP) KNOW LED	3.77	0.81	0.71–0.82	0.93	0.61	KMP	0.40	0.44	0.45	1		
(KOL)	3.87	0.89	0.79–0.83	0.89	0.58	KOL	0.33	0.45	0.52	0.68	1	
IN_PERF (IP)	3.80	0.91	0.79–0.89	0.92	0.74	IP	0.26	0.26	0.38	0.53	0.53	1

All loadings are significant with $p < 0.001$. The diagonal elements are the variance between the construct and their measures (AVE) of diagonal elements are the correlation between the constructs

evaluate the quality of each structural equation is offered by the CV redundancy index. This index should be positive for all endogenous constructs (Tenenhaus et al. 2008). This study provides the model of equal predictive and suitable validity, since all the latent variables have positive values for cross-validation (CV) redundancy and communality indexes (Table 2).

The next step after analyzing the quality of the structural equation is to examine the relations between all constructs. According to Chin (1998), bootstrapping (500 subsamples) generates standard errors and t values. Figure 2 shows the results of the structural model analysis, showing the path coefficients along with their significance levels. Beta and t value (sign) for each hypothesis is shown in Table 3.

H1 assesses a positive impact from talent-based HRM on cognitive engagement, which the analysis ensures. Diamantopoulos and Sigauw (2000) categorize path coefficients that are under 0.30 as causing moderate (effects), from 0.30 to 0.60 as strong, and up to 0.60 as very strong. Consequently, talent-based HRM establishes a strong, positive, significant effect on cognitive collective engagement (path coefficient = 0.61, $p < 0.001$). If the firm practices talent-based HRM often, it will give the better cognitive collective engagement. Another result also arises knowledge-oriented leadership, which has a positive and significant effect on cognitive collective engagement (path coefficient = 0.211, $p < 0.001$). Therefore, H3 also admits empirical support from the data.

The result of H2 and H4 also admits empirical support from the data. Knowledge management practices have a positive and significant relationship on cognitive collective engagement (path coefficient = 0.177, $p < 0.001$). Cognitive collective engagement has a positive and significant relationship on innovation performance (path coefficient = 0.160, $p < 0.001$). In conclusion, knowledge management practices demonstrate a moderate, positive, and significant effect on cognitive collective engagement. Furthermore, cognitive collective engagement also has a moderate, positive, and significant effect on innovation performance.

Finally, the results also confirm the moderated effect of perceived organizational support between cognitive collective engagement and innovation performance. This effect is very strong (path coefficient = 0.894, $p < 0.001$).

Discussion and Conclusion

Research on the best way to plan and implement organizational factors to produce innovation performance is growing, owing to this question's theoretical importance and practical relevance for firms. Among these factors, employee engagement defines as a

Table 2 Quality of structural equation

	CV communality	CV redundancy
COGNITIVE	0.93	0.83
TALENT	0.95	0.94
P_ORG SUP	0.90	0.89
KNOW_MNG	0.92	0.90
KNOW_LEAD	0.85	0.80
IN_PERF	0.88	0.88

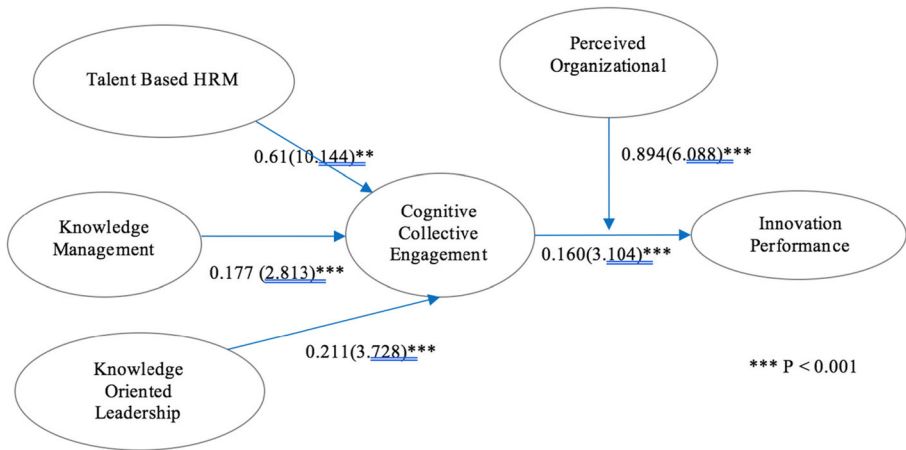


Fig. 2 Research model (standardized solution)

way to establish a clear direction for employees to resolve organizational tasks (Kossek and Lautsch 2018). This study shows that in knowledge-based organizations, a cognitive engagement among members should also be established in order to create the conditions for adequate management of knowledge through talent-based HRM (Morabito 2010). Competitive advantages based on innovation, knowledge creation, transfer, and application are needed to improve new products that allow the firm to gain the competitive frontier (Slåtten and Lien 2016; Yang et al. 2010). It means that cognitive collective engagement is usually seen as a dynamic capability, by focusing on the situation where the knowledge of the firm has continuous reconfiguration through attachment toward cognitive collective engagement (Langeley et al. 2013; Little and Little 2006).

The first objective of this paper has analyzed the broadening of a specific engagement behavior type—cognitive collective engagement—that means an essential element to gain further innovation for technology firms. The results ensure that the existence of this kind of engagement—combining features of integrity and ability, along with element psychological attachment—is antecedent to the innovation performance. First, the results of the study show that cognitive collective engagement improves innovation performance. These initiatives mainly regard experimentation through internal R&D and shifts in current technological trajectories (Gupta et al.

Table 3 Structural model

Path	Beta	<i>t</i> value (sign)
TALENT → COGNITIVE	0.61	10.144***
KNOW_MNG → COGNITIVE	0.177	2.8132***
KNOW_LEAD → COGNITIVE	0.211	3.7283***
COGNITIVE → IN_PERF	0.16	3.1041***
MODERASI → IN_PERF	0.894	6.088***

****p* < 0.001

2006). In this case, a strong cognitive engagement constrains the firm to start the substantial investment and development initiatives to produce new knowledge. This organizational engagement type leads the firm's employees to believe that knowledge creation, via R&D support, is basic for organizational development and competitive advantage (Nonaka and Takeuchi 2011).

The results also provide that HRM-based talent and KM practices have significant relations toward KM-oriented leadership and cognitive collective engagement. Again, the mixture between talent management and knowledge-based view styles is an effective way of promoting cognitive collective engagement to do with incremental change via the exploitation of cognitive knowledge (Kim and Ployhart 2015). Talent management features of talent-based HRM such as training, rewarding, and monitoring of knowledge activities also contribute to the development of cognitive collective engagement. Therefore, a greater tendency of firms toward talent-based HRM and KM practices for organizational functioning and performance worthwhile likely to consider efforts devoted the development and support of the engagement exploitation practices.

The second objective has analyzed the effect of knowledge-oriented leadership on innovation. As the anticipation, a combination between transformational and transactional styles on knowledge management practices gives positive relationships with cognitive collective engagement. Traditionally, research demonstrates that these KM activities have relation with engagement (e.g., Abubakar et al. 2017; Ferraris et al. 2017; Ghazi and Edien 2015; Huang and Mas-Tur 2016) as new or existing combined leadership of knowledge can contribute to either engagement or loyalty (De Vos and Dries 2013).

The third objective of this study has contributed to the KM literature by showing that cognitive collective engagement mediates the relationship between knowledge-oriented leadership, talent-based HRM, knowledge management practices, and a firm's innovation performance. As the hypotheses propose, when a firm has a greater tendency toward talent-based HRM, this firm develops and supports a larger volume of cognitive situation, cognitive engagement which then gives positive effect to its innovation performance. This cognitive engagement combines the different element styles, such as integrity and ability, by the motivation and communication elements, which arise to develop and encourage scientific dialog for the next product innovation (Dragoni et al. 2009). The main point of this finding is that knowledge-based organizations should have capability to combine the practices oriented toward knowledge exploration (creation) and knowledge exploitation (storage, transfer, and application) and talent-based HRM to maintain such employees' skill. The organizations should have the capability to flexibly change the stress on these elements in accordance with the situation demands (Klein et al. 2017). Therefore, developing an environment that encourages the use of both cognitive and engagement practices—through talent-based HRM and KM orientation—is an essential condition for managers to improve a firm's innovation capacity. Even teams that are specialists in knowledge creation need some degree of support from training, reward, and monitoring schemes, as they have to produce tangible results at some point and identify unresolved errors when they arise (Abt and Knyphausen-Aufseß 2017; Donate and Pablo 2015). Moreover, teams that engage in knowledge exploitation may also need an organizational support to boost commitments to innovation. In any cases, availability of KM practices should exist for cognitive collective engagement to be effective regarding new product development.

An additional contribution of this paper is to investigate the relationship theories among talent-based HRM, KM practices, and innovation performance through an extensive literature review, and anticipate some effects among these constructs. Indeed, the call for additional research on how collective engagement can influence organizational level processes and performance such as innovation is explained by this study (e.g., Singh 2008; Von Krogh et al. 2012; Yukl 1999).

However, this research has the following aspects of limitations. *First*, research design of this study is cross-sectional, and the research design is incapable of ensuring that the causal relationships set out in the hypotheses; even the results are consistent with theoretical reasoning. Further researcher could solve this issue by applying a longitudinal design. *Second*, the study analyzes KM practice characteristics such as KM creation, transfer, storage, and application practices. Nevertheless, approaches that are more specific may be needed to take full advantage of each process so as to obtain distinct results when firms find themselves in different contexts (e.g., environment and time stage) (Rosing et al. 2011). Hence, when a firm requires creativity and experimentation to confront scenarios of radical change, a cognitive engagement is probably most fitting, whereas, in more stable situations, affective engagement may be more appropriate, as the firm essentially pursues stability. In this regard, future studies could try to analyze another type of engagement in KM with different environmental or temporal settings. *Third*, self-report data is used by this study. It may suffer from the effects of general method variance. There are still issues that exist; even the Harman test implies this phenomenon in the current study. Future research could be useful from independently achieving and using objective measures of innovation. *Fourth*, the *t* test to verify that non-response bias is applied in this study. The low response rate from respondents shows a potential limitation. Future research could focus on a wider range of technology industries in order to validate the results and increase the sample size of the study. *Fifth*, the respondents are Indonesian companies which have potential cultural limitations. Therefore, different cultural contexts—countries or geographical areas—can be targeted by future research in order to validate the results for a wider spectrum of cultures and geographies.

In conclusion, this paper shows the effect of cognitive collective engagement in KM practices for further innovation. The empirical evidence has important implications for managers and marks progress in the research of the moderating effects of organizational factors in the relationship between cognitive collective engagement and innovation.

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