

The Relationship Between Digital Transformational Leadership Styles and Knowledge-Based Empowering Interaction for Increasing Organisational Innovativeness

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The effects of leadership styles on organizational innovativeness are still arguable due to inconsistencies. Many researchers analysed the direct and indirect relationships with antecedent variables of organizational innovativeness. The influence of transformational leadership styles has widely been confirmed to have an effect on organizational innovativeness. However, organizations sometimes fail to achieve organizational innovativeness due to their limited understanding of the relationships between leadership, and knowledge-based empowering interaction that will enhance organizational innovativeness. This study is constructed to fill a research gap between Digital Transformational Leadership Styles and Organizational Innovativeness with Knowledge-Based Empowering Interaction as a mediator. This research used owners and executive from 32 digital firms as samples. Data was gathered through an online questionnaire using Likert's Scales, and analysed with Smart Partial Least Squares. The result is that organizations should consider the Knowledge-Based Empowering Interaction to increase Organizational Innovativeness.

Key words: *Digital Transformational Leadership, Knowledge-Based Empowering Interaction, Organizational Innovativeness.*

Introduction

Industry 4.0 has changed the business world today, which now involves several technology components: Cyber-Physics Systems, Internet of Things, Internet Services, Smart Factory & Smart Products, M2M (Machine-to-machine) communication, Big data and Cloud computing. Mastery of knowledge in science and technology are the keys to win competition (Hermann, Pentek, & Otto, 2015). Technology can be studied under technological elements such as technical devices (technoware), human devices (humanware), information devices (infoware), and organizational devices (orgaware) in relation to knowledge management. Technical devices increase added value or productivity; human devices promote science, skills and work ethics; information devices support applied technology; and organizational devices increase the ability of human resources, management practices, and organizational connection to achieve positive results (Daryani et al., 2012). In the era of digital and knowledge-based technology, the terms often heard are digitalization and innovation, so that the success factor of industries, cities and countries is speed or acceleration. Today's changes challenge established theories and systems and people's paradigms from the industrial era to the information age, which has made it difficult to balance and understand these changes without rapid digitalization, knowledge and innovation transformation.

Knowledge management and innovation are processes for creating, exploiting, renewing, applying and understanding knowledge to enhance competitive advantage (Darroch, 2005). Knowledge sharing increases new knowledge and organizational capabilities to create innovation. Knowledge sharing has been studied as the mediator between leadership styles and innovation and these leadership styles and knowledge sharing will enhance organizational innovativeness (Birasnav et al., 2013; Khan et al., 2018; Noruzy et al., 2013; Yaseen et al., 2018). The leadership of an organization is the most important factor for the successful execution of knowledge management (Davenport et al., 1998). However, these are not enough to really produce innovativeness in organizations.

Literature Review

Leadership inspires employees to acquire, transfer and apply knowledge for innovative performance (Lopez & Esteves, 2013). Studies directly examining the relationship between transformational leadership and innovative behaviour have found inconsistencies in their results. Some studies found transformational leadership to have a negative impact on organizational innovation and suggest that future research on the relationship of knowledge sharing is an important antecedent of organizational innovation (Basu & Green, 1997; Calisir et al., 2016; Ng & Kee, 2016; Pieterse et al., 2009; Sethibe, 2018). Some found no effect of transformational leadership styles on exploratory innovation (Jansen et al., 2009). Other studies found a positive effect (Boerner, Eisenbeiss, & Griesse, 2007; Calisir et al., 2016; Noruzy et

al., 2013; Para-González et al., 2018; Yaseen et al., 2018). There is a positive relationship between the construction of transformational leadership and knowledge management activities (Analoui et al., 2013; Birasnav, 2014), knowledge sharing (Masa'deh, et al., 2016; Mohammadi & Boroumand, 2016), and organizational innovation (Garcia-Morales et al., 2008). Leadership styles have different results in their implementation as found in the research gap above.

Digital Transformational Leadership

Companies are experiencing exponential evolution in available technology and systems, and digitization is making more and more fields value creation and linkages through the internet. This has led to a real quantum leap in solutions and concepts. Digital transformational leadership in companies like Facebook, Twitter, Instagram, Airbnb, Alibaba, and Amazon is needed to stay alive.

Leadership describes the relationship of interaction between leaders and subordinates that influences the way subordinates behave toward completing tasks. This can be understood in terms of maximizing productivity, their clarity of vision, their willingness to improve organizational outcomes, as well as organizational innovativeness in creatively searching for new ideas and abilities. Leaders should improve togetherness in the organization, joint commitment, and unite members in achieving their organizational goals and objectives. Transformational leadership is investigated as an antecedent for organizational learning and knowledge sharing to improve organizational innovation and performance (Arif & Akram, 2018; Garcia-Morales et al., 2008; Garcia-Morales et al., 2012; Matzler et al., 2012; Mohammadi & Boroumand, 2016; Sethibe & Steyn, 2015).

Transformational leadership consists of four styles: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. Ideal influence or charisma of leaders provides vision, a mission, and inspires subordinates. Inspirational motivation is when leaders act as role models for their subordinates. Intellectual stimulation means that leaders stimulate the efforts of their assistants to be innovative and creative. Finally, individual consideration provides support, guidance, and training to followers (Avolio & Bass, 1999; Bass & Riggio, 2006).

Leadership transforms organizational capability, digitalization and innovation. Leaders need to support the development of a business environment that shifts from an economy of product value to a business model based on experience and knowledge. Changes occur in all basic aspects and leadership should have organizational resilience and an ability to adapt to changes that are exponential in order to improve organizational innovation and performance in this competitive environment (Arif and Akram, 2018, Subramony et al., 2018, Yaseen et al., 2018).

Transformational leadership in the era of digital technology should not only understand the changes in the digital world, but also be an active designer of change. Digital transformational leadership that sees the threat of digital transformation should be ready to lose the old business and emerge to new businesses by adapting comprehensively and accelerating with faster changes to deliver innovations that secure long-term success (Swift et al., 2018). Digital transformational leadership understands the pace of technological development and is able to increase their capacity to change and meet new challenges and consumer demands. Leaders can maintain the speed of change or risk losing to competition.

Digital transformational leadership leads the change in management and is responsible for deciding where, when and how to embrace digital disruption. The leader has the final say to decide which innovation best suits the goals of the organization and has the foresight to predict where the next hurdle will come from. Leaders bring companies to victory in the digital age with three habits (Swift & Lange, 2018):

1. Following the trends of emerging technologies
2. Determining the direction of the digital development and investment strategy
3. Leading the team to change quickly and precisely

Being a leader that thrives in the digital age and focuses on development of digital tools will accelerate the pace of change across an organization at an unprecedented speed. Digital leaders must be prepared to pivot their business strategies immediately. They need the infrastructure in place to guide change and minimize employee resistance. But even more importantly, they need digital talents that can cope with digital transformation to envision a new future and empower the workforce to embrace it.

Knowledge-Based View (KBV)

Barney in resources-based value theory (RBV) determines competitive advantages to be the ability to control the company resources that are valuable, rare, inimitable, and that cannot be replaced. This includes company management expertise, organizational processes and routines, and information and knowledge (Barney, 1991; 2001). Knowledge is the most strategic resource (Grant, 1996). Thus, a superior organization is a learning organization that produces knowledge which improves on the past and produces a breakthrough. Knowledge is the result of interaction between individuals, groups, and organizational units that are influenced by internal and external motivational factors or empowerment that will encourage the creation of new knowledge and innovations which can enable increased performance and productivity.

There are two types of knowledge, explicit knowledge, and tacit knowledge or intangible knowledge. Explicit knowledge is conveyed in words and numbers, scientific formulas, specifications, standard operating procedures, graphics, manuals, etc., and passed on from one

person to another in a systematic way. Tacit knowledge is in the human mind, very personal and difficult to form, making it difficult to communicate or convey to others, such as feelings, intuition, body language, physical experience, and practical instruction. It is also rare or unique, cannot be imitated, and cannot be substituted (John & Andrew, 2017).

Both tacit & explicit knowledge are epistemological dimensions of organizational learning, the process of creating knowledge and learning organizations that work through various stages of socialization (tacit to tacit), externalization (tacit to explicit), combination (explicit to explicit) and internalization (explicit to tacit). After internalization is achieved, the process begins again, starting from a higher level of knowledge, and resulting in cognitive evolution with an increasing accumulation of knowledge. This process has a spiral shape (Bass, 1999). Synergizing both tacit and explicit knowledge creates new knowledge.

Knowledge sharing consists of two dimensions: knowledge donation (KD) and knowledge collection (KC). Knowledge donation is to share personal intellectual capital through conversation and knowledge collection is to earn their intellectual capital through consulting with partners. Knowledge emerging from KD and KC improves organizational routines, processes and practices for innovation (Razak et al., 2018; Wang & Kwek, 2018). Knowledge that is shared and exchanged within organizations will produce new information and experiences that grow linearly, but if the new knowledge gets feedback or support it will grow exponentially (Liao et al., 2007).

KBV theory proposes that the ability to create value by creating, transferring, and incorporating knowledge is essential to the process of using and discussing various organizational knowledge resources that can be transformed into tangible resources in product or process innovation (Cepeda-Carrion, Martelo-Landroguez, Leal -Rodríguez, & Leal-Millán, 2017). Organizations that are more flexible and dependable to change and exploit organizational knowledge resources into innovation will achieve and maintain competitive advantage, as well as contribute to improving business performance and market value (García-Zamora, González-Benito, & Muñoz-Gallego, 2014).

Empowered Interaction Capability

A company's interactions with customers determines the success of the company. There are six interaction capabilities, namely individuated interaction capabilities, relational interaction capabilities, ethical interaction capabilities, empowered interaction capabilities, developmental interaction capabilities, and concerted interaction capabilities (Karpen et al., 2012, Karpen et al., 2015). Each of these strategic interaction capabilities is meaningful and mutually integrated, which is beneficial as a relevant theme from the Service-dominant Logic, a concept



of service interaction between companies and customers. (Vargo and Lusch, 2004; Vargo and Lusch, 2017; Vargo et al., 2008).

Empowered interaction capability becomes a special talent needed by leaders to deal with things that are more complex, require cognition (the process of gaining knowledge) and are related to intellectuals (Karpen et al., 2012; Karpen et al., 2015). Empowered interaction capability encourages an individual actor to form profitable resources and experiences that facilitate, enhance, and actualize shared value creation in the organizational level of interaction capabilities. This interaction can be developed by sharing knowledge to encourage the emergence of innovations that organizations need to have for competitive advantage, which results from organizational performance (Wang and Wang, 2012; Wuryaningrat, 2013). This study refers to Karpen's idea of how the concept of Empowered Interaction Capability is adopted in the process of dynamic interaction between organizational members in order to improve team performance (Karpen et al., 2017).

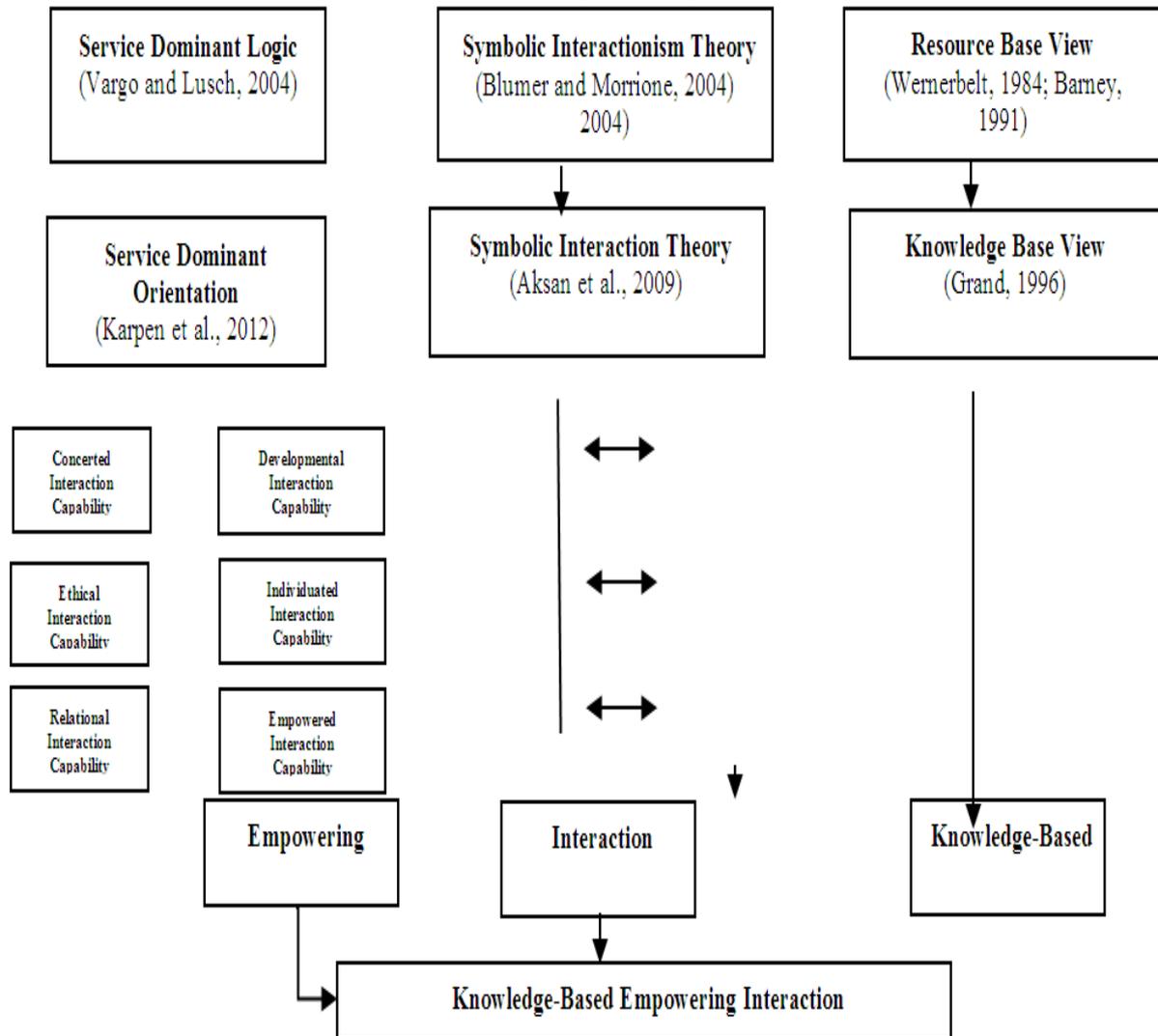
Symbolic Interaction Theory

Symbolic interaction is a process of interpretive action that examines the meaning of mutual interaction between individuals in a social environment (Blumer, 1969, Blumer and Morrione, 2004). Meaning appears when reciprocal interaction between people takes place, and without it, it does not have any meaning (Aksan et al., 2009). Symbolic interactions are based on three basic propositions. According to Blumer and Morrione, (a) humans develop their attitudes towards objects according to the meaning of objects, (b) the meaning is deduced from the interaction, (c) meanings change in interpretive processes (Blumer and Morrione, 2004).

Derivation of Knowledge-Based Empowering Interaction

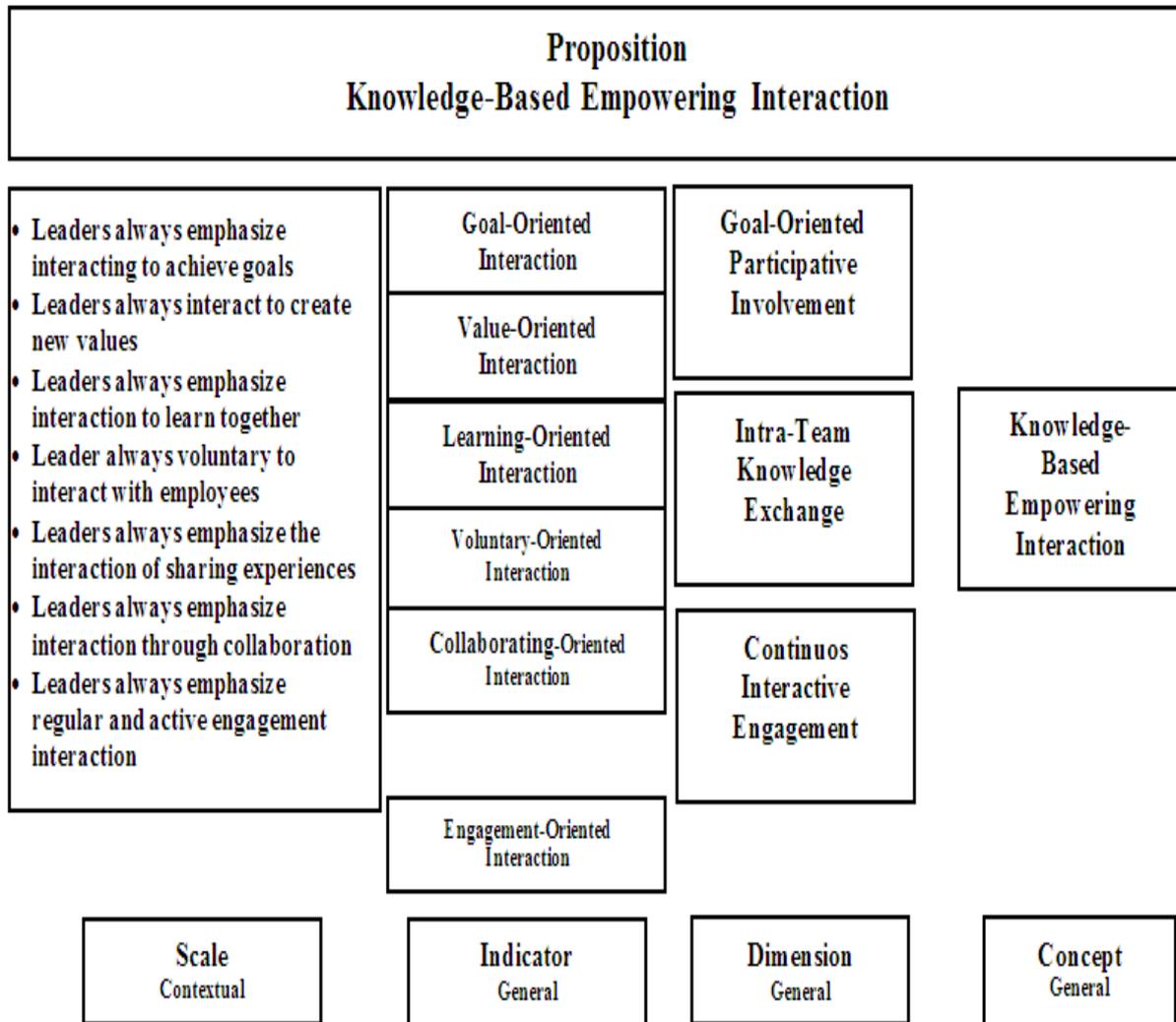
Knowledge-based empowering interaction (KEI) is a newly constructed concept taken from service-dominant orientation theory (Karpen et al., 2012, Karpen et al., 2015); symbolic interaction theory (Blumer and Morrione, 2004; Aksan et al., 2009); the empowered interaction capability and interaction concept, which can be combined as empowering interaction; the resource base view (Wernerfelt, 1984; Barney, 1991); and the knowledge-base view (Grant, 1996) as key to innovation (see figure 1). This research synthesizes the various concepts and theories to obtain KEI as a strategic mediator between types of leadership and organizational innovativeness.

Figure 1. Derivation of Knowledge-based Empowering Interaction



KEI could be understood as an organizational routine that is internally embedded through the life of the organization that includes initiating and encouraging members for goal-oriented involvements, intra-team knowledge exchanges, and continuous interactive engagements to improve organizational innovativeness.

Figure 2. Research Proposition Model



Organizational Innovativeness

Innovation is an important component of sustainable competitive advantage but organizations are mostly designed to promote order and routines that are not friendly to innovation, therefore leadership should provide direction and create an environment that supports creativity and innovativeness through various processes of organizational learning, new knowledge, and essential competencies for the firm (Birasnav et al., 2013; Ryan & Tipu, 2013; Yaseen et al., 2018). Innovation can improve efficiency, productivity, competitiveness, and ultimately performance (Meyer & Subramaniam, 2014). Organization creates competitive advantage through innovation of new products or services, market expansion, production process improvement, and service quality (Damanpour et al., 2018).

Utilization of external organization resources such as the availability of natural resources, technology, and labour market; and utilization of internal organization resources such as employee skills and capability, knowledge sharing, organizational structure, and work systems, create organizational innovativeness (Saleh et al., 2018). Managing resources and intellectual abilities inherent in the organization and every member of the organization (both explicit and tacit knowledge) is a valuable and strategic source for generating innovation. Knowledge management and innovation are important abilities for improving organizational performance (Grant, 1996). To develop intellectual capital, organizations must use social capital which can be achieved through the interactions between members and the ability of the organization to introduce innovation as a form of newness (Wuryaningrat, 2013).

Four types of innovations are product/service, process, market and organization (OECD, 2005; Rajapathirana & Hui, 2018). Product/service innovation creates new products or services such as technical specifications, the latest software for expansion into new markets and industries (Damanpour & Gopalakrishnan, 2001). Process innovation is an implementation of a new method of production or delivery. Market innovation is new marketing method in product design, product placement, promotion, and pricing of products in order to penetrate new markets or increase company sales. Organization innovation is an implementation of a new method in the practice of business and external relations of the company which will improve the company's performance by updating organizational systems, procedures, and routines to encourage a team's cohesiveness, coordination, collaboration, knowledge sharing, and learning (OECD, 2005; Rajapathirana & Hui, 2018).

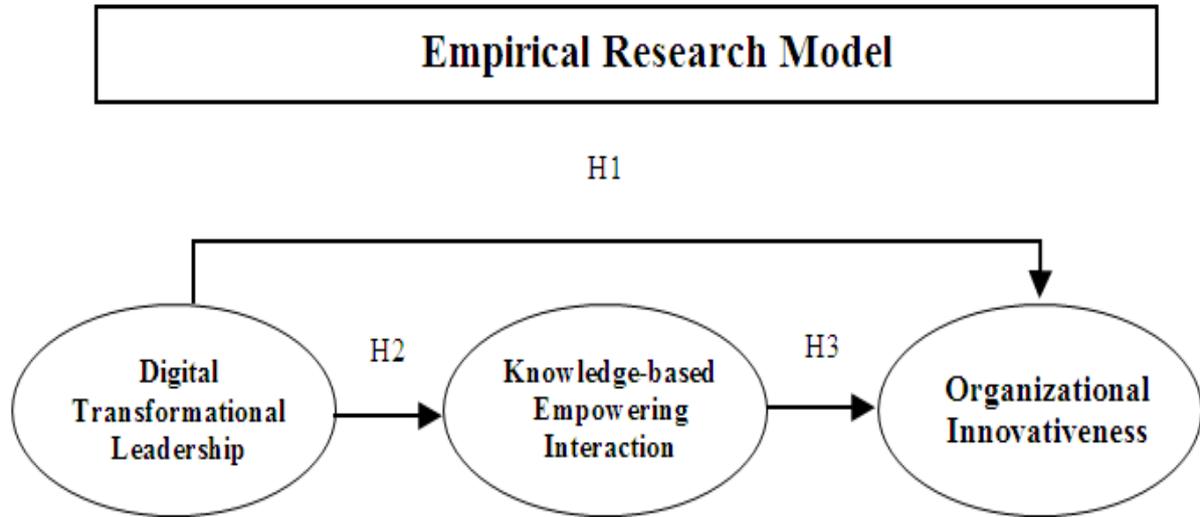
Numerous studies have reported that leadership styles such as transformational and transactional leadership contribute towards innovation through certain mediators such as knowledge sharing, organizational learning, and HRM practices (Garcia-Morales et al., 2012; Khan et al., 2018; González et al., 2018; Sethibe & Steyn, 2015). Transformational leadership has a direct impact on innovation because top management strives to foster innovation, increase growth, and profitability (Matzler et al., 2012).

The main objective of this study is to systematically track the impact of knowledge-based empowering interaction (KEI) between leadership styles towards organizational innovativeness in digital organizations. This study adopts a three-dimensional model of innovation related to the service sector, which are product innovation, process innovation, and market innovation.

Empirical Research Model

Figure 3. shows the empirical research model developed for this study.

Figure 3. Empirical Research Model



Research Hypothesis

To answer the research question—“Should organizations consider the knowledge-based empowering interaction to increase organizational innovativeness?”—this study will test and analyse the data in digital industry. It is expected that conclusions can be drawn to answer research question by analysing evidence in relation to the hypotheses that have been formulated in the following table.

Table 1: Research Hypothesis.

No	Hypothesis
Hypothesis 1	Digital Transformational Leadership has a positive effect on Organizational Innovativeness.
Hypothesis 2	Digital Transformational Leadership has a positive effect on Knowledge-Based Empowering Interaction.
Hypothesis 3	Knowledge-Based Empowering Interaction mediates the relationship between Digital Transformational Leadership and Organizational Innovativeness

Research Method

Data for this research is drawn from a survey of knowledge practices in the context of digital firms in Indonesia. In addition, the survey instrument contained instructions for completion and research variables, which consist of the organizational innovativeness, digital transformational leadership styles, and knowledge-based empowering interaction.

The study adopted a self-reported data management approach. Questionnaires distributed online to the top management from the digital industries as well as those owners who are familiar with the company's activities and practices. Purposive sampling was used to collect data from the directory of digital firms. Processing data deployed Smart PLS to answer research questions. All top management voluntarily took part in this survey without any reward. There are 32 valid responses from owners or members of top management in digital start-up companies.

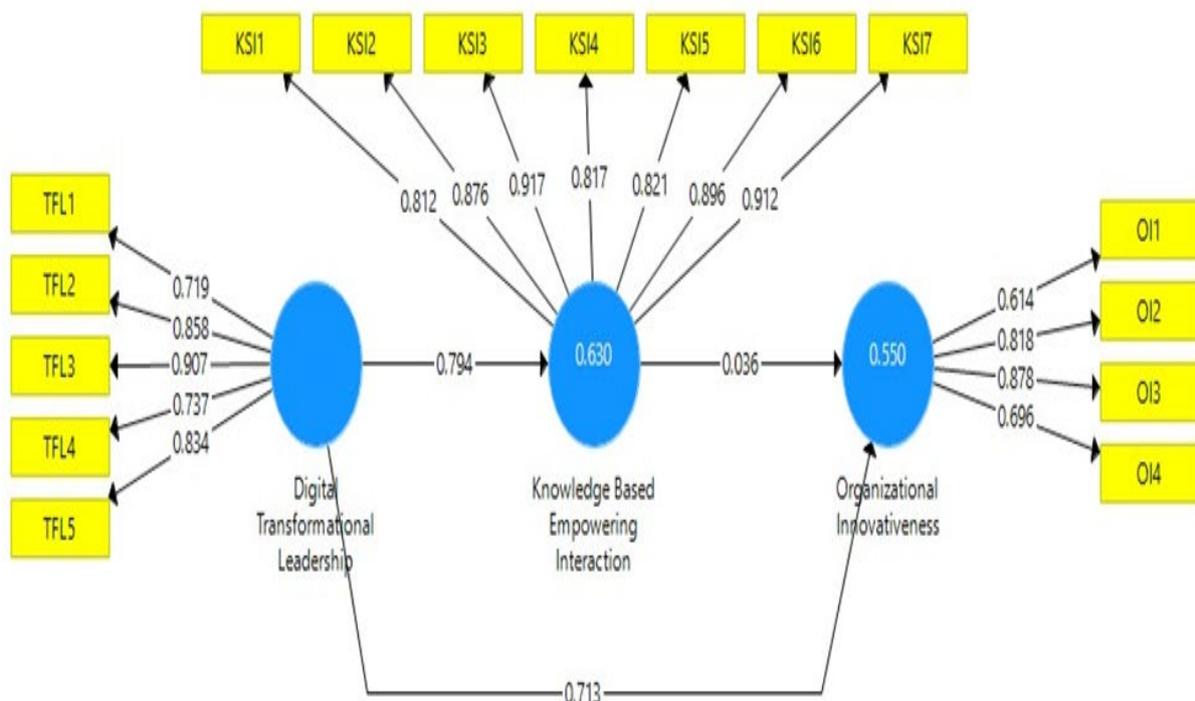
Results

In descriptive statistics using Smart PLS, statements that are considered valid should have an outer loading value greater than 0.5. The loadings range from 0.7 to 0.9 and all Cronbach's alpha values are greater than 0.70.

Table 2: Test Reliability and Validity.

Variable	AVE	Composite Reliability	Cronbach's Alpha
Knowledge-Based Empowering Interaction	0.757	0.956	0.946
Organizational Innovativeness	0.752	0.83	0.736
Digital Transformational Leadership	0.766	0.908	0.871

Figure 4. Result of Smart PLS.



Digital transformational leadership was measured by the scales developed by Podsakoff et al., (1996) with digital term. The digital transformational leadership scale consists of five items. Organizational innovativeness was assessed by the scales developed by Liao et al., (2007) with digital term. The scale comprises of four items. The knowledge-based empowering interaction scale consists of seven items. All items used a five-point Likert scale anchored from 1, strongly disagree, to 5, strongly agree.

Result of Smart PLS is shown on Fig.4. Digital transformational leadership relates positively directly to organizational innovativeness (H1) and relates positively to knowledge-based empowering interaction (H2). Knowledge-based empowering interaction relates positively to organizational innovativeness and mediates the relationship between digital transformational leadership and organizational innovativeness (H3).

Discussion

The results showed that leadership types influence organizational innovativeness, which is consistent with previous studies (Arshad et al., 2016; Jeyaraman et al., 2018; Messersmith & Chang, 2017; Para-González et al., 2018). The empirical model demonstrated that digital transformational leadership had positive effects on knowledge-based empowering interaction, which is different from research conducted by Masa'deh et al. (2016). Therefore, this study proposed knowledge-based empowering interaction (KEI) as essential to enable employee innovativeness.

This study supports the research which states that knowledge-based empowering interaction positively affects the organizational innovativeness (Garcia-Morales et al., 2012; Khan et al., 2018; Noruzy et al., 2013). Other results showed that leadership types had positive impact on the organizational innovation, which is different from previous research (Basu & Green, 1997; Calisir et al., 2016; Pieterse et al., 2009;). There is a strong relationship between digital transformational leadership and organizational innovativeness, mediated by knowledge-based empowering interaction. Organizations that successfully implement knowledge-based empowering interaction will generate innovation in terms of new products which is in line with previous researches (Cheng & Krumwiede, 2011; Jimenez-Jimenez & Sanz-Valle, 2011).

Conclusions

The study contributes scientifically and practically to the discussion around knowledge-based empowering interaction, innovation, and digital transformational leadership of practitioners in Industry 4.0. The study creates an understanding of knowledge-based empowering interaction which comes from the term empowering interaction capability of knowledge sharing, which is needed for a reasonable scientific discussion that can impact innovativeness.



The study's practical contributions are twofold: one, the definition given for knowledge-based empowering interaction helps clarify the basic understanding of the term knowledge sharing among practitioners. Two, the six design indicators can be used for implementing knowledge-based empowering interaction scenarios in companies. They will help identify cases and guidance during implementation stages.

Limitations of the study result from its sample and the research method applied. This study only focuses on organizational innovativeness as the mediator. Further research could look at other mediators such as competitive advantage, intellectual capital, and absorptive capacity. Furthermore, it is possible that topic related to knowledge-based empowering interaction might have been overlooked and, consequently, contributed to an imperfect definition of knowledge-based empowering interaction.

For further research, both academics and practitioners are welcome to test the accuracy and usefulness of the definition given and challenge the utility of knowledge-based empowering interaction. Knowledge-based empowering interaction is an integral part of organization behavioural studies. As underlined by Razak et al. (2018), in organizational learning, competitiveness and innovation are platforms to prepare and develop human capital.



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