Organizational agility: do agile project management and networking capability require market orientation?

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Abstract

Purpose – This study aims to examine the joint impact of networking capability and agile project management on organizational agility of telecommunication technology providers' in Indonesia. The study also examines the moderating role of market orientation as a predominant strategic orientation on the relationship between agile project management and organizational agility.

Design/methodology/approach – Research data were collected via a questionnaire survey from the executive management of telecommunication technology providers in Indonesia to obtain 150 valid questionnaires for analysis. This study analyzed the overall model fit and causal relationship using confirmatory factor analysis and structural equation modeling.

Findings – The results indicate that networking capability positively affects organizational agility. However, agile project management's significant effect on organizational agility occurs only when the relationship is moderated by market orientation. The results of the study also demonstrate that organizational agility positively affects organizational performance.

Research limitations/implications – This study is based on a cross-sectional nature and might fail to capture the studied variables' dynamic over an extended period.

Originality/value – The study enriches the previous literature in organizational agility by presenting the collective impact of networking capability and agile project management and the moderating role of market orientation. However, dissimilar with major prior studies, the results indicate that agile project management's direct effect on organizational agility is not significant. Agile project management needs to be moderated by market orientation to create exceptional customer values and overcome the competition for the organization to achieve organizational agility, responsiveness and adaptability to address customers' needs and requirements. Furthermore, the study's result corroborates the importance of organizational agility to achieve organizational performance in the highly dynamic telecommunication industry.

Keywords Networking capability, Agile project management, Organizational agility, Organizational performance, Market orientation

Paper type Research paper

Introduction

The telecommunication industry is characterized as having the highest degree of environmental instability and volatility (Ahlbäck *et al.*, 2017; Kurniawan *et al.*, 2020) and competition (Frost and Sullivan, 2018; Gyemang and Emeagwali, 2020; Hapsari *et al.*, 2020). For example, telecommunication technology providers such as Ericsson, Nokia, Cisco, Huawei, ZTE and Samsung are multinational enterprises facing heterogeneity in cultural, institutional and economic contexts (Khanagha *et al.*, 2018). They must respond to technological disruption in heterogeneous markets and highly complex competing forces, where most of them often require local customization and adaptation (Khanagha *et al.*, 2018). Therefore, organizational agility becomes one of the most crucial factors to achieve

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organizational (Kale *et al.*, 2019; Li *et al.*, 2014; Liu and Yang, 2019; Ravichandran, 2018; Tallon and Pinsonneault, 2011; Teece *et al.*, 2016). Technology providers need to respond to customers' requirements with speed in the new market with much lower entry barriers (Balashova and Gromova, 2017).

There are two significant challenges that technology providers need to address to become agile organizations to satisfy operators' requirements in business-to-business (B2B) relationships. The first challenge is related to the shrinkage of technology providers' domination from proprietary hardware and software oligopoly market structure to commodity off the shelf or common hardware and software-driven telecommunication network (Aguirre *et al.*, 2019). The standardized and centralized software as controller and common hardware enable telecommunication operators to purchase different equipment models from different telecommunication technology providers and have them all interoperate and compatible with each other (Duan *et al.*, 2016; Bajpai *et al.*, 2015). The shifting toward common hardware and software standardization requires technology providers to revisit their partnership strategy. The technology providers must develop the capability to manage and leverage complex partnerships in new and more open (not proprietary) software ecosystem (Aguirre *et al.*, 2019). The networking capability to develop an extensive partnership is crucial to ensure having a sufficient number of suppliers to gain competitive costs and enough component supplies and to ensure technology providers have a sufficient number of business partners to acquire the capability to develop competitive and flexible end-to-end solution rapidly (Kurniawan *et al.*, 2020a; Liu *et al.*, 2019; Mu, 2014).

The second challenge faced by organizations developing solutions that can address customer's requirements under dynamic environments is to incorporate agile project management practices that enable a more responsive, fast-learning execution (Bergmann and Karwowski, 2019; Conforto *et al.*, 2014; Kurniawan *et al.*, 2020b). It is a project management approach that capable of handling projects under empowered and cross-functional project teams as key enablers (Conforto *et al.*, 2014; Conner, 2000; Kane *et al.*, 2016; Olausson and Berggren, 2010; Shipman and Tooey, 2017; Vázquez-Bustelo *et al.*, 2007). In contrast, most nonsoftware companies are not designed initially to have this type of structure (Conforto *et al.*, 2014). Agile project management provides the teams with authority to manage their objectives during the iteration process. However, they are also required to measure their performance and provide their report to management at the end of projects to maintain a high level of ambitions (Birkinshaw, 2018; Conner, 2000; Mahadevan *et al.*, 2017; Shipman and Tooey, 2017).

However, this study finds the gaps in the literature. First, there is a lack of study that examines the direct and collaborative impact of networking capability and agile project management on organizational agility. Both have dissimilar normative implications regarding the strategies to achieve high performance. Agile project management represents the resource-based theory that suggests organization to protect, rather than share, valuable, rare, inimitable and nonsubstitutable resources and know-how to avoid knowledge spillover and competitive advantage elimination (Ju *et al.*, 2020). In contrast, networking capability represents the relational view that suggests an organization to share systematically valuable knowledge with partners, which, in return, acquires valuable knowledge and resource from them (Dyer and Singh, 1998; Kurniawan *et al.*, 2020a; Mu *et al.*, 2016). Second, the lack of knowledge concerning the role of market orientation in the relation between networking capability, agile project management and organizational agility motivates further examination.

Prior studies argue that organizational agility is impacted by how an organization manages the projects in an agile manner and allocate resources dynamically (Balashova and Gromova, 2017; Conner, 2000; Teece *et al.*, 2016). The organization's agility in responding to dynamic requirements is influenced by how project teams are integrated into a nimble and

agile network and freed from top-down bureaucracy (Balashova and Gromova, 2017; Conner, 2000; Shipman and Tooey, 2017). However, another study argues oppositely that agile project management has its dark side, which is the time pressure caused by inappropriate iterative cycles used in the project, too short or too long, that create pressure on the team (van Oorschot *et al.*, 2018). Too short iterative cycle leads to poor performance in terms of quality, learning objectives and innovation to address customers' primary requirements. Too long iterative cycle leads to cost and time pressure (Annosi *et al.*, 2016). Therefore, without a particular strategic orientation to understand customers' needs, project management may not achieve its objective and achieve organizational agility.

Yang *et al.* (2018) argue that a strong networking capability may increase the organization's exposure to valuable internal knowledge leakage to its competitors. Networking can also create the outflow of specific resources, allowing partners to engage in opportunistic behavior, leading to incapability to rapidly and appropriately address customers' requirements. Other studies also highlight that networking has a negative effect when there is opportunistic behavior in dealing with specific resources (David and Han, 2004; Lui *et al.*, 2009). However, a study by Rezazadeh and Nobari (2018) on cooperative entrepreneurship accentuates that synergy can be achieved by cooperation with partners that accelerates the decision-making process. Networking capability enables firms to obtain information and competences reliably and rapidly, making them strategically agile because it is well-positioned in its strategic network core. Firms can capture better and faster opportunities and deal with potential competition and threats (Battistella *et al.*, 2017). Based on the contrary arguments given above, this study seeks to answer the following three research questions:

RQ1. Is there a direct relationship between networking capability and organizational agility and between agile project management and organizational agility in the B2B telecommunication industry?

RQ2. What is the role of market orientation in the above relationships?

RQ3. What is the effect of organizational agility on organizational performance?

The rest of the document is organized as follows: We first discuss the theoretical background that leads to our hypotheses. Then, we described the research method and our empirical design, followed by a discussion of the results. We conclude with a discussion of study limitations and the theoretical and managerial implications of our results.

Literature review

Organizational performance

Organizational performance study is pivotal in strategic management for expanding organization knowledge of how various strategies and actions affect organization outcomes (Richard *et al.*, 2009; Williams, 2018). The ultimate objective of strategic management is to achieve performance improvement for contemporary organizations' success and survival (Schendel and Hofer, 1979; Venkatraman and Ramanujam, 1986). Organizational performance becomes one of the primary dependent variables of interest in strategic management research recently (Richard *et al.*, 2009). However, even though the performance concept had been widely discussed, scholars have not reached any agreement on basic terminology, definitions and how to measure it (Richard *et al.*, 2009; Venkatraman and Ramanujam, 1986; Williams, 2018).

Venkatraman and Ramanujam (1986) and Richard *et al.* (2009) consider organizational performance as a multidimensional concept. Venkatraman and Ramanujam (1986) argue that the first dimension of organizational performance consists of financial and broader

operational criteria. The second dimension consists of two alternative data sources, primary and secondary data sources. Financial performance includes indicators such as sales growth, profitability (reflected by ratios such as return on investment, return on sale and return on equity) and earnings per share. In comparison, broader business performance conceptualization of operational performance (i.e. nonfinancial) includes such measures as market share, new product introduction, product quality, marketing effectiveness, manufacturing value-added and other measures of technological efficiency within the domain of business performance.

More recent studies still adopt the conceptualization from Venkatraman and Ramanujam (1986). Atkinson and Brown (2001) and Kaplan (2001) argue that nonfinancial performance measures are crucial indicators of organizations' long-term viability. Miller and Lee (2001) consider that nonfinancial performance measures such as employee satisfaction and customer satisfaction are crucial since they can tell more of the story than static financial performance. Chiou *et al.* (2004) consider nonfinancial performance, such as customer satisfaction, essential because satisfied customers tend to return and do repeat business, leading to customer loyalty.

Le Meunier-FitzHugh and Lane (2009), Le Meunier-FitzHugh and Piercy (2007, 2011) propose organizational performance measurement in B2B industrial manufacturers, wholesalers and consumer goods manufacturers to consists of market share, sales revenue, profit margins, exceeding all sales targets during the year, high sales of new products and sales with long-term profitability. Lee *et al.* (2015) adopt financial and nonfinancial measures to comprehend business performance in the franchising industry. Financial performance includes measures such as achieved target of net profit, achieved sales target, increased net profit, increased sales and achieved the number of franchise contracts. Nonfinancial performance includes new products and services improvement, increased employee satisfaction, increased customer satisfaction and increased franchisees' satisfaction. Simon *et al.* (2015) propose to apply a mixture of financial and nonfinancial indicators since both are valuable tools to measure and control businesses by business leaders. Wang *et al.* (2015) argue that firm performance in the high-tech industry is measured by sales growth, market share growth, return on investment and profit level relative to their major competitors.

Rohrbeck and Etingue (2017) use profitability and market capitalization growth as performance measures of multinational European firms across industries including the chemical, financial services, telecom, energy and utilities, healthcare and pharmaceutical, automotive, manufacturing, retail and consumer business and transportation industries. Yan *et al.* (2017) argue that the telecommunication manufacturing company's organizational performance should be measured from organization revenue and increased capital values. Nabass and Abdallah (2018) propose market share, profit and customer satisfaction increase as organizational performance indicators. Kumar *et al.* (2018) argue that organizational performance must indicate the organization's market share, sales revenue, customer service level, profit margin, product quality and order fulfillment lead time compared to competitors. A B2B study measures organizational performance using operational measures such as better service quality, more efficient internal processes and efficient use of resources (Martınez-Caro *et al.*, 2020). Another B2B study by Carmona-Lavado *et al.* (2020) measures business performance using financial and nonfinancial measures including return on investment, return on equity, sales growth, market share, net profit margin and return on assets.

This study defines the organizational performance as the extent of success of the organization at generating a high level of financial and nonfinancial performance that consists of sales revenue, profit margins, cash flow, market share, products and services quality improvement and customer satisfaction. This conceptualization adapts the proposal

from Le Meunier-FitzHugh and Lane (2009), Le Meunier-FitzHugh and Piercy (2011) and Simon *et al.* (2015) to cover financial and broader operational criteria and focus on B2B context. This study also adopts the suggestion from Williams (2018) that suggests to use subjective financial measures to address difficulties associated with gathering performance data from private firms and private family businesses. Prior studies reported a strong association between objective measures and subjective responses (Rafiki *et al.*, 2019).

Organizational agility

Organizational agility is considered a predominant factor in achieving an organization's success and survival in a volatile and dynamic environment (Kale *et al.*, 2019; Liu and Yang, 2019; Tallon and Pinsonneault, 2011; Vagnoni and Khoddami, 2016). The organizational agility receives increasing attention since its ability to addresses unexpected challenges of a highly dynamic business environment by reconfiguring resources, capabilities and strategies effectively (Liu and Yang, 2019; Oosterhout *et al.*, 2006; Sarkis, 2001). In a dynamic business environment, the ability to respond to changes rapidly and appropriately, to become flexible and adaptable to changes, and to manage uncertainty is essential to organization survival (Feizabadi *et al.*, 2019; Nejatian *et al.*, 2018; Sambamurthy *et al.*, 2003; Sherehiy *et al.*, 2007). In the manufacturing industry, organizational agility is imperative for the organization to become the earliest in delivering a leading solution at a competitive cost and to surpass the competition (Gunasekaran *et al.*, 2018, 2019). Therefore, agility is one of the critical factors for the organization to achieve its success by deepening environmental uncertainty and managing it (Vagnoni and Khoddami, 2016; Vecchiato, 2015).

Gunasekaran (1999) defines agility in manufacturing as the capability to survive and prosper in a competitive environment of continuous and unpredictable change by reacting quickly and effectively to changing markets, driven by customer-designed products and services. Another study considers organizational agility as the organizational capability to effectively and appropriately execute and coordinate internal and external information, resources and activities to respond rapidly to market changes (Swafford *et al.*, 2006). Organizational agility is considered the ability to perform complex coordination and integration of different activities, procedures and tasks, allowing the organization to change operational practices and be responsive to market changes (Braunscheidel and Suresh, 2009). In another study, Doz and Kosonen (2010) conceptualize strategic agility as the sensible and deliberate interplay between three meta-capabilities of top management: strategic sensitivity, leadership unity and resource fluidity. Tallon and Pinsonneault (2011) define organizational agility as an organization's responsiveness to changes in demand, new product development, change in product mix, product pricing, market expansion, supplier selection, IT adoption and diffusion. It is the organization's flexibility to easily and quickly retool their business to adapt to the market environment. In this study, we adapt organizational agility terminology from Tallon and Pinsonneault (2011) and define it as the organization's responsiveness to address changes in customer demand, new product development requirements, change in product mix, competitor's action, product pricing, market expansion, supplier and business partner selection and technology adoption and diffusion.

Built upon dynamic capability theory, Teece *et al.* (2016) examine agility at a more fundamental level and consider organizational agility as a variable affected by its dynamic capabilities. Dynamic capabilities foster the organizational agility to address deep uncertainty generated by innovation (Teece *et al.*, 2016). Another study in organizational design argues that to achieve agility, the organization needs to function as an agile network, not a top-down bureaucracy, to achieve full operational agility to develop products to open up markets that do not currently exist (Denning, 2017, 2018). However, this study argues that organizational agility is no more singular strategic focus but a set of firm capabilities,

particularly concerning adaptability and reconfiguration competency (Mishra *et al.*, 2014; Vaishnavi *et al.*, 2019). It is an orchestration of an organization's capability to exploit and explore internal resources (Barney, 1991; Barney *et al.*, 2011) at one edge and to leverage partners' capability and knowledge to create high-value solutions (Pfeffer, 1982; Pfeffer and Salancik, 1978) at another edge, and orchestrated by the capability to comprehend the market dynamics (Jaworski and Kohli, 1993; Kohli and Jaworski, 1990; Narver and Slater, 1990; Narver *et al.*, 2004; Porter, 1981, 1990).

Networking capability

Partnerships between organizations are considered a critical source of competitive advantage since organizations' essential resources may be embedded in interorganization resources and operations (Dyer and Singh, 1998; Liu and Yang, 2019). In a high uncertainty and dynamic socioeconomic condition, organizations undertake networking activities to acquire competitive resources from interconnected organizations since a single relationship cannot provide all required resources (Gunasekaran *et al.*, 2019; De Leeuw *et al.*, 2014). Lavie (2006) argues that networking provides strategic opportunities and aids organizations earn above-normal rents and relational rents. Therefore, building networking between organizations is gaining momentum in strategic practice (Yang *et al.*, 2018).

Networking capability is rooted in dynamic capability theory (Mu *et al.*, 2016; Teece *et al*, 1997, 2016), and relational view (Capaldo, 2007; Dyer and Nobeoka, 2000; Dyer and Singh, 1998). Lavie (2006) argues that an organization's competitive advantage created from incorporating network resources of interconnected organizations extends resource-based theory. Dynamic capability theory suggests an organization to develop a capability to adapt, consolidate, renew and reconfigure both internal and external resources to gain the advantage in seizing and capitalizing opportunities (Teece *et al*, 1997, 2016). The relational view highlights that networking allows the organization to access valuable information and material resources from numerous interconnected organizations (Dyer and Singh, 1998). By harnessing networking capability, organizations can maximize the opportunity to leverage strategic network resources from networks partners, make it possible for them to integrate and optimize various expertise, capabilities and knowledge that are strategic for the organizations (Dyer and Singh, 1998; Lin, 2004; Mu *et al.*, 2016; Mu and Di Benedetto, 2012; Vesalainen and Hakala, 2014).

Prior studies have acknowledged the potential benefits of networking capability. Yang and Liu (2012) find that developing and maintaining network structures positively contribute to organization performance in Taiwan's glass industry. The interfirm partnership enables firms to deal with the increasing complexity of technological dynamics (Hoang and Rothaermel, 2010; Keil *et al.*, 2008) and enhance innovative capability (Ahuja, 2000; Baum *et al.*, 2000; Keil *et al.*, 2008). Several studies also argue that organizations' predominance performance is generated by specific resources and the collaboration and arrangement of various resources (Eisenhardt and Martin, 2000; Gulati *et al.*, 2011; Lavie, 2006; Song *et al.*, 2005).

However, other researches also underline the negative effect of networking capability. Yang *et al.* (2018) highlight that networking may cause an unbalance outflow of organizations' specific assets. When organizations become more intensive in inviting outside resources to come, the more organizations depend on network partners' external capability. This negative effect is complex since when partners become closer to firms, and the relationship becomes more intense, it can cause organizations within this partnership into ambiguous pains when there is conflict, discord and ongoing disagreements (Anderson and Jap, 2005; Yang *et al.*, 2018). It is also argued that networking performance will diminish when there is opportunistic behavior in dealing with specific resources (David and Han, 2004; Lui *et al.*, 2009), and there will be cost incurred in preempting the opportunistic behavior of

networking partners (Yang *et al.*, 2018). Furthermore, empirical research by Yang *et al.* (2018) ratifies that networking capability not only improves the performance growth but also increases performance variability. It is because the organization is required to bring in higher costs to avoid other organizations taking advantage of them, which intensifies the overall fluctuation of the organizations in the network (Yang *et al.*, 2018).

This study adopts the networking capability definition from prior research by Jifeng Mu and Anthony Di Benedetto and defines it as the competency of a firm to purposefully search and find network partners, manage and leverage network relationships for value creation (Mu and Di Benedetto, 2012). However, this study reconceptualizes the indicators of "finding networking partners" dimension by adding the "partners to count on in time" indicator and add "a resource sharing support" indicator to the "leveraging network relationships" dimension.

Agile project management

Recently, organizations face many challenges to deliver the project successfully and respond to customer's requirements because of the intensifying dynamism (Cattani *et al.*, 2011; Miterev *et al.*, 2017). Agile project management is considered as one of the project delivery approaches that improve responsiveness, fast-learning execution, productivity, quality and customer satisfaction in today project society (Balashova and Gromova, 2017; Conforto and Amaral, 2016; Gemünden *et al.*, 2018; Lundin *et al.*, 2015). The nature of agile project management that capable to manage and embrace changes plays pivotal role to achieve project success (Arefazar *et al.*, 2019; Azanha *et al.*, 2017; Macheridis, 2018).

Agile project management accentuates the iterative cycle of work, continuous assessment and reflection and persistent learning (Scholz *et al.*, 2020; Stoddard *et al.*, 2019). Balashova and Gromova (2017) consider agile project management an incremental product development consisting of iterative short cycles of updates and rapid learning to accommodate changing customer requirements. It is a project management approach with more straightforward, flexible, iterative and less management intervention to produce superior innovation and customer value (Arefazar *et al.*, 2019; Conforto *et al.*, 2014).

Agile project management empowers cross-functional teams to work more independently with reduced structural hierarchy and communication overheads to achieve timely decisions about core organizational strategies and actions (Dubey and Gunasekaran, 2015; Kane *et al.*, 2016; Shipman and Tooey, 2017). Agile project management applies a flatter hierarchy to accelerate decision-making by reducing the communication layers (Conforto *et al.*, 2014; Leybourn, 2013; Shipman and Tooey, 2017). The agile approach can promote teamwork and teambuilding by emphasizing communication, trust and collective learning (Stoddard *et al.*, 2019).

The agile approach encourages project teams to transform into self-organizing teams with more responsibility and accountability. Agile project management encourages project teams to work more independently and make necessary adjustments and adaptation based on project requirements (Balashova and Gromova, 2017; Chow and Cao, 2008; Conforto *et al.*, 2014; Kane *et al.*, 2016; Sivathanu and Pillai, 2018). Organizations are shifting into cross-functional teams (Balashova and Gromova, 2017; Conforto *et al.*, 2014; Kane *et al.*, 2016; Olausson and Berggren, 2010; Vázquez-Bustelo *et al.*, 2007), applying the project-based approach, reducing rigid and vertical departmental structure and build a structure around customers who able to respond their needs (Birkinshaw, 2018; Kane *et al.*, 2016; Mahadevan *et al.*, 2017; Ronzon *et al.*, 2019).

However, this study argues that agile project management also needs to incorporate balancing control as one of its crucial dimensions to ensure agile teams focus on strategic priorities (Andersson *et al.*, 2019; Azanha *et al.*, 2017; Shipman and Tooey, 2017). Agile project management needs to embed corporate philosophy, which is the

organization's long-term survival (Andersson *et al.*, 2019). Agile project management is the ability to balance flexibility and stability to maintain profitability in a dynamic business environment (Azanha *et al.*, 2017). Organizations to maintain formal structure for the fundamental backbone and stimulating horizontally connected fluid teams to drive speed and nimbleness (Aghina *et al.*, 2018; Kane *et al.*, 2016; Ronzon *et al.*, 2019).

Therefore, this study defines agile project management as a project management practice emphasizing on the integration of cross-functional and empowered teams built around the customer, with reduced structural hierarchy and communication overheads and functions as an interactive network, but balanced by vigorous enforcement of the corporate philosophy (organization's organization is long-term survival) and strategic priorities. Therefore, the agile project management construct has three dimensions consisting of self-managing (empowered), cross-functional collaboration and balancing control.

Market orientation

Market orientation is a strategic orientation that aims to create and deliver superior value to customers in search of competitive advantages in the marketplace (Guo *et al.*, 2019). Market orientation thrives significantly since the seminal works by Kohli and Jaworski (1990) and Narver and Slater (1990). Market orientation becomes one of the cornerstones in marketing and management literature because of its contribution as a strategic orientation that can effectively address customer requirements (Hakala, 2011).

Market orientation is one of the strategic orientations that has been considered to have a strong performance impact on B2B context (Frösén *et al.*, 2016; Wilden *et al.*, 2019). Prior research has highlighted the cruciality of market orientation as it defines how the organization responds not only to current market needs but also to anticipate future market dynamics (Herhausen, 2016; Teece, 2007; Wilden *et al.*, 2019). Market orientation is considered to contribute the most impact to organizational performance compared to other strategic orientations such as entrepreneurial orientation, learning orientation and innovation orientation (Grinstein, 2008). Therefore, it still receives a considerable interest in academic research and a practical business domain (Masa'deh *et al.*, 2018; Zebal and Saber, 2014).

Market orientation reflects the organization's ability to examine the changes in market conditions and address these dynamics appropriately to sustain its performance (Mandal and Saravanan, 2019). Jaworski and Kohli (1993) and Kohli and Jaworski (1990) conceptualize market orientation as observable behaviors, including intelligence generation, intelligence dissemination and coordinated action. Therefore, market orientation refers to an organization-wide development and distribution of market intelligence that consists of both current and future customers' needs across all functional units and the development of the organization's actions (Jaworski and Kohli, 1993; Kohli and Jaworski, 1990). Narver and Slater (1990), Li (2005), and Grawe *et al.* (2009) conceptualize market orientation as the integration of customer orientation, competitor orientation and inter-functional coordination.

Recently, driven by the increasing rate of technological change and turbulent in the market, more organizations enter into partnership that facilitate the development of interfirm collaboration of market orientation (Diaz-Foncea and Marcuello, 2013; Rocha and Miles, 2009; Sahi *et al.*, 2018; Tajeddini and Ratten, 2017). Dahlquist and Griffith (2015) and Tajeddini and Ratten (2017) argue that predominant value for customers can be achieved by building an effective interfirm marketing collaboration. Therefore, this study adapts market orientation definition from Deshpandé and Farley (1998) and defines it as "the set of inter-functional and inter-partner processes and activities consisting of intelligence generation, intelligence dissemination, and coordinated action directed at creating and satisfying customers through continuous needs-assessment." This study reconceptualizes market orientation as a four-dimension construct, including customer orientation, competitor orientation, interfunctional

coordination and interpartner coordination (IPC). They are considered to represent market orientation variable appropriately in an increasingly open telecommunication ecosystem.

Organizational performance and organizational agility

Organizational agility reflects a valuable, rare, imperfectly imitable and nonsubstitutable capability to achieve responsiveness and adaptability in addressing market changes and improve competitive advantages (Braunscheidel and Suresh, 2009; Liu and Yang, 2019). Organizational agility allows firms to anticipate or respond to the market changes promptly and with ease (Oosterhout *et al.*, 2006). Therefore, it is expected to contribute to achieving superior firms' financial performance (Sambamurthy *et al.*, 2003). Besides, with the responsiveness to switching suppliers, firms can achieve lower costs, better quality or improved delivery times that eventually improve firms' profitability and revenue (Tallon, 2008). Agility in the supply chain is demonstrated to have a significant positive effect on humanitarian supply chain predisaster performance in NGOs, government agencies, military organizations and paramilitary forces involved in humanitarian operations in Asia (Altay *et al.*, 2018). Blome *et al.* (2013) evidence that agility in the supply chain positively affects firm operational performance in multinational firms located in Germany.

Organizational agility enables organization to sense and seize business opportunities and to perform effective and efficient responses to operational changes to ensure the organization's superior performance (Liu and Yang, 2019; Liu *et al.*, 2013). Organizational agility mediates the pursuit of valuable knowledge and allows organizations to develop innovative products and services or respond to competitors' maneuver appropriately to result in superior organizational performance (Cegarra-Navarro *et al.*, 2016). Agility encourages organizations to produce and deliver innovative products and increases customer satisfaction and competitiveness. Therefore, agility is considered an enabler of organizations' performance (Nejatian *et al.*, 2018). An organization's agility capability is a critical source of competitive strategy to achieve superior organization's performance as it enables the organization to react effectively to unpredictable changes (Liu and Yang, 2019; Ofoegbu and Akanbi, 2012; Yang and Liu, 2012). Therefore, based on the above arguments, we hypothesize that:

H1. Organizational agility has a positive and direct effect on organizational performance.

Networking capability and organizational agility

Networking capability allows firms to gain the flexibility to leverage crucial resources and business partners and to work across boundaries to reach organizational agility (Battistella *et al.*, 2017; Liu and Yang, 2019). Networking capability enables firms to obtain information and competences reliably and rapidly, making them strategically agile because it is well-positioned in its strategic network core (Liu and Yang, 2019). By having this positioning, firms can capture better and faster opportunities and deal with potential competition and threats (Battistella *et al.*, 2017; Liu and Yang, 2019).

Another study by Rezazadeh and Nobari (2018) on cooperative entrepreneurship accentuates that synergy can be achieved by cooperation with partners that accelerates the decision-making process. Collaboration with partners enables firms to leverage partners' resources and knowledge during joint project implementation, which is a worthwhile strategy for firms' agility (Sanchez and Nagi, 2001). Partnership with agile firms stimulates partners to achieve an equivalent level of capabilities, competencies and flexibilities in their enterprise to conform with a rapidly changing customer and market demands (Yusuf *et al.*, 2014). Another study argues that supplier relationship management becomes extremely critical for successfully implementing agile manufacturing in a turbulent environment (Dubey and Gunasekaran, 2015). Therefore, it is reasonable to hypothesize:

H2. Networking capability has a positive and direct effect on organizational agility.

Agile project management, market orientation, organizational agility

How the organization manages the projects and allocates resources dynamically will impact its business agility (Balashova and Gromova, 2017; Teece *et al.*, 2016). Stoddard *et al.* (2019) argue that agile project management enables organizations adapt quickly to change. The organization's ability to deploy resources quickly and efficiently is vital to respond to market dynamics (Dubey *et al.*, 2019). Rule-bound hierarchies with many vertical levels may become serious opponents for agility (Alavi *et al.*, 2014). The highly bureaucratic nature of hierarchical organizations in managing project makes decision cannot be made within a short time (Teece *et al.*, 2016). Connectivity and information sharing are pivotal and are considered as important capabilities and antecedents of agility (Dubey *et al.*, 2018). Bock *et al.* (2012) argue that structural simplification through delegation facilitates awareness of new opportunities that result in flexibility. Distributed power, team and work group-based and horizontal structure is argued to allow more flexibility in implementing strategic actions (Child and McGrath, 2001; Perez-Valls *et al.*, 2015).

Agile project management allows teams to collaborate interactively and transparently to achieve one vision delivering accurate products and solutions to customers with speed (Balashova and Gromova, 2017; Denning, 2017). A flatter organization and decentralization in project handling reduce time-consuming hierarchical referrals and promote favorable climates and motivations for teams to contribute to ideas generation (Alavi *et al.*, 2014). Project team self-managing nature enhances agility by providing more opportunities for the employee to contribute and make a decision.

There are two study perspectives propose the relationship between agile project management and organizational agility. One stream of study argues that an organic resource management offers advantages over an overly rigid systematic approach in developing an innovative solution as it enables leveraging the full spectrum of organizational competencies while harnessing the unique skills of individuals (Rubin and Abramson, 2018). Organization's competencies to establish new project management practice to address complex and customs requirements responsively in a turbulent market are crucial to coping with risks and uncertainties (Gemünden *et al.*, 2018). A flatter organization and decentralization in project handling reduce time-consuming hierarchical referrals and promote favorable climates and motivations for teams to contribute to ideas generation (Alavi *et al.*, 2014). Self-managing promotes teams' sense of ownership and self-commitment to the successful implementation of the decisions to be made (Sharpe, 2013; Alavi *et al.*, 2014). The above perspective argues that agile project management has a direct and positive effect on organizational agility.

However, another study argues that good resources need to be mobilized in the correct direction to respond and address changes in customer requirements (Serrador and Pinto, 2015). Fail to understand customer requirements and competitors' maneuver can cause inaccurate solution proposal and lose the bidding (Conforto *et al.*, 2016). Therefore, agile project management does not affect organizational agility directly. The best capabilities of the project team must be moderated by the capability to generate and disseminate market intelligence and to take coordinated actions to deliver exceptional values to customers. The project team's best capabilities must be manifested in the form of a solution that can provide the highest value for customers compared to competitors. For example, a company has excellent project management and capable of developing a good solution. However, the competitor knows that the customer urgently requires a solution within a very short period, which is the winning key. Instead of developing the solution in-house, the competitor sources the solution from third party, makes minor customization and delivers it faster. The company fails to understand the customer requirement and comprehend the competition; therefore, it fails to respond to customer requirement faster.

Lee and Xia (2010) argue that there is a trade-off between response extensiveness and response efficiency of agile project management. Response extensiveness refers to the number of different types of requirements a team is able to implement. Response extensiveness is related to the extent, range, scope or variety of software team responses. In contrast, response efficiency is related to the time, cost, resources or effort associated with team responses (Lee and Xia, 2010). Response extensiveness has a negative impact on on-time completion and on-budget completion. Therefore, without maintaining strategic orientation and understanding customer's requirement and competition, agile project management may fail to effectively respond to customer's requirements and contribute to firm business performance. Hernández-Linares *et al.* (2021) and Deshpandé and Farley (1998) argue that market orientation can further improve the connection between an organization's resources and capabilities with the customers' needs. Therefore, we hypothesize that:

H3a. Agile project management does not have a significant direct effect on organizational agility.

H3b. Agile project management has a positive effect on organizational agility when it is moderated by market orientation.

Based on the above explication and the relationship between two independent variables: networking capability and agile project management, two dependent variables: organizational agility and organizational performance, and one moderator variable: market orientation, this study proposes a research model as shown in Figure 1. Model 1 shows the impact of networking capability and agile project management on organizational agility (direct) and organizational performance (indirect) without the moderating role of market orientation between agile project management–organizational agility path. Model 2 shows the impact of networking capability and agile project management on organizational agility (direct) and organizational performance (indirect) with the moderating role of market orientation between agile project management–organizational agility path.

Research method

Data collection

Research data were collected via a questionnaire which is distributed through electronic format (Google Form) and printed format directly delivered to the respondents. The respondents were the executive management of the organization, including Board of Director, CxO, Sales or Marketing Head, Country Manager, General Manager and Senior Manager of the selected companies who were believed to have sufficient knowledge on both company strategy and the business process of the company.

The target populations were medium and large telecommunication technology providers (vendors) in Indonesia, having a legal business entity in Indonesia. Medium- and large-scale firms have the same characteristic in terms of project management, in which both types of firms have multiple project teams working simultaneously on different projects. The medium and large company classification is based on Indonesia Central Bureau of Statistics and The Act of The Republic of Indonesia Number 20 of 2008 classification, as shown in Table 1.

Medium and large organizations have functional divisions and multiple project teams suitable to conduct analysis based on the research model. The research population consists of 246 companies in the list from the Ministry of Communication and Informatics between 2008 and 2017. The questionnaire was developed and pilot tested to 37 respondents before performing formal data collection. On the basis of these responses, some revisions were made to questionnaire items to enhance the clarity. The questionnaire was initially designed in English and then translated into the Indonesian language with the assistance of three Professors and one Associate Professor who are competent in both languages.

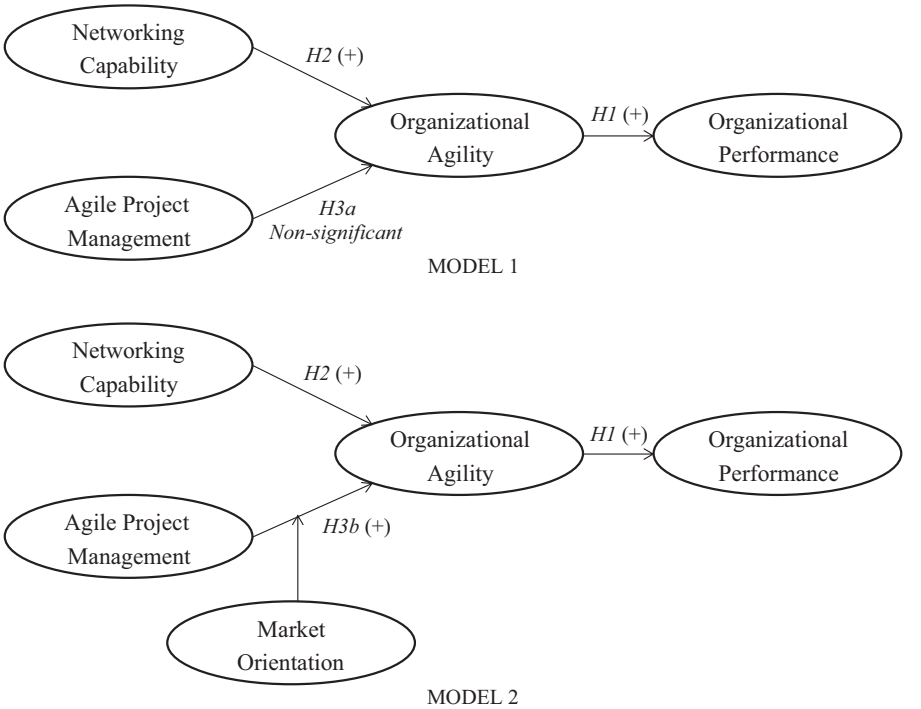


Figure 1.
The proposed research model and hypotheses

Furthermore, to ensure content validity, we conducted face-to-face interviews with five senior leaders to verify that the measures were relevant and complete. Of the 246 distributed questionnaires, 150 valid responses were obtained, representing a response rate of 60.97%. These valid responses meet the suggestion from Bartlett *et al.* (2001) and Cochran's (1977) correction formula regarding the minimum sample size, which is 150 respondents. The demographic profiles of the sample are shown in Table 2.

Measures

This study employed multiitem scales to measure the dimensions of constructs. These scales were derived from prior studies and reconceptualized in this study. All items were assessed on five-point Likert scales ranging from 1 ("strongly disagree") to 5 ("strongly agree"). Appendix presents the scale items for construct measurement.

Table 1.
Size of business based on Indonesia Central Bureau of Statistics and The Act of the Republic of Indonesia Number 20 of 2008

Size of the firm	Number of labors	Revenue
Large business	100 or more	≥3.5 M USD
Medium business	$20 < x < 99$	176 k USD $\leq x <$ 3.5 M USD
Small business	$5 < x < 19$	21 k USD $\leq x <$ 176 k USD
Micro business	$1 < x < 4$	<21 k USD

Note(s): k USD = kilo (thousand) USD, M USD = Million USD

Data analysis

The two-stage structural equation modeling (SEM) approach was used based on the recommendation from Anderson and Gebing (1988) that consists of a measurement model and a causal structural model. This study used LISREL 8.8 to examine the measurement model and test the hypotheses.

Measurement model analysis is performed to obtain a valid and reliable measurement model to be used in a structural model in the next stage. There are three things that should be analyzed during estimation: overall model fit (Goodness of Fit Index [GOFI]), validity and reliability. The validity test is based on the construct validity test to understand to what extent a measurement measures the intended construct. It is based on confirmatory factor analysis (CFA) to measure the standardized factor loadings (SFLs) of each construct or each variable. A good rule of thumb is that a standardized loading estimate should be ≥ 0.5, and ideally ≥ 0.7 (Hair *et al.*, 2014), whereas the testing of construct reliability is based on construct reliability (CR) and variance extracted (VE) (Fornell and Larcker, 1981; Hair *et al.*, 2014). A construct is considered reliable if the value of CR and VE are ≥ 0.70 and ≥ 0.50, respectively. This study uses path analysis to test the predicted causal relationships among the variables and determine whether the model provides an acceptable fit to the data.

Result

Measurement model

The CFA is performed in two stages:

(1) First-order CFA analyzes the observed variables (such as Finding Network Partner 1 [FNP1] to Finding Network Partner [FNP4]) and forms a new latent variable score (LVS) finding network partner (FNP).

No		*n*	%	No		*n*	%
1	*Gender*			6	*Organization origin*		
	Male	102	68.0%		China	16	10.7%
	Female	48	32.0%		Japan	18	12.0%
2	*Position*				Korea	6	4.0%
	Director	16	10.7%		India	3	2.0%
	CxO	24	16.0%		USA	23	15.3%
	Country manager	47	31.3%		Sweden	2	1.3%
	Executive GM	55	36.7%		Finland	1	0.7%
	Senior manager	8	5.3%		Indonesia	62	41.3%
3	*Organization size*				Other	19	12.7%
	Medium	45	30.0%	7	*Type of legal entity*		
	Large	105	70.0%		Foreign investment	30	20.0%
4	*Yearly revenue*				Domestic investment	17	11.3%
	176 kUSD $\leq x <$ 3.5 MUSD	45	30.0%		Limited liability company	90	60.0%
	3.5 MUSD $\leq x <$ 10 MUSD	29	19.3%		Limited partnership	5	3.3%
	10 MUSD $\leq x <$ 25 MUSD	33	22.0%		Other	8	5.3%
	25 MUSD $\leq x <$ 50 MUSD	27	18.0%				
	≥50 MUSD	16	10.7%				
5	*Organization age*						
	$1 = x \leq 10$	26	17.3%				
	$11 = x \leq 25$	60	40.0%				
	$26 = x \leq 50$	52	34.7%				
	˃50	12	8.0%				

Table 2.
Demographic profiles of the sample ($n = 150$)

(2) Second-order CFA analyzes the fitness of the simplified first-order LVS (such as FNP, managing network relationship [MNR] and leveraging network relationship [LNR]) and forms the second-order latent variables networking capability.

The results of the first-order CFA analysis are summarized in Table 3.

As presented in Table 3, all variables' SFLs are equal to or higher than 0.5. Hence, all variables have good validity. A measurement model's reliability is considered good if the CR ≥ 0.7 and the VE ≥ 0.50. Table 3 analysis also indicates that all variables have good

Variable	SFL ≥ 0.5	Error	CR ≥ 0.7	VE ≥ 0.5	RMSEA ≤ 0.08	GFI ≥ 0.90
Organizational performance						
FP (financial performance)			0.83	0.62	0.00	1.00
FP1–FP3	0.74–0.87	0.24–0.46				
NFP (nonfinancial performance)			0.82	0.61	0.00	1.00
NFP1–NFP3	0.63–0.89	0.20–0.60				
Organizational agility						
BPA			0.90	0.50	0.03	0.96
BPA1–BPA9	0.63–0.78	0.39–0.60				
Market orientation						
CTO (customer orientation)			0.89	0.63	0.03	0.98
CTO1–CTO5	0.69–0.86	0.29–0.52				
CPO (competitor orientation)			0.87	0.64	0.04	1.00
CPO1–CPO4	0.69–0.95	0.09–0.53				
IFC (inter-functional coordination)			0.80	0.51	0.00	1.00
IFC1-IFC4	0.58–0.83	0.31–0.66				
IPC (inter-partner coordination)			0.85	0.58	0.00	1.00
IPC1–IPC4	0.64–0.86	0.26–0.60				
Networking capability						
FNP (finding network partners)			0.87	0.62	0.00	1.00
FNP1–FNP4	0.70–0.86	0.26–0.51				
MNR (managing network relationship)			0.85	0.59	0.00	1.00
MNR1–MNR4	0.70–0.83	0.35–0.51				
LNR (leveraging network relationship)			0.87	0.63	0.00	1.00
LNR1–LNR4	0.70–0.89	0.21–0.51				
Agile project management						
SM (self-managing)			0.84	0.51	0.07	0.97
SM1–SM5	0.62–0.82	0.33–0.62				
CFC (cross-functional collaboration)			0.85	0.59	0.00	1.00
CFC1–CFC4	0.66–0.89	0.21–0.57				
BC (balancing control)			0.86	0.60	0.00	1.00
BC1–BC4	0.70–0.82	0.33–0.51				

Table 3.
First-order CFA

reliability. The table also reveals that RMSEA ≤ 0.08 and GFI ≥ 0.90. Hence, based on the GOFI of Measurement Model of RMSEA and GFI, the model shows a good fit.

After adjusting the model's modification indices, the second-order CFA result is presented in Tables 4 and 5. Table 4 indicates the GOFI of Model 1 and Model 2. Both indicate a good fit of the model.

The validity and reliability result in Table 5 demonstrate that all SFLs of the LVS exceed 0.50 (from 0.79 to 0.99), indicating good validity for both Model 1 and Model 2. The CR values of the constructs all exceed the 0.70 threshold value (from 0.78 to 0.99), and the VE values for all constructs exceed 0.50 (from 0.65 to 0.99), indicating good reliability for both models.

Hypothesis testing

The structural model analysis is performed to determine whether a research hypothesis is accepted or not. The hypothesis is accepted if the absolute *t*-value > 1.96, with a positive or negative coefficient. The results of hypothesis tests are summarized in Table 6, and the structural equation modeling result is shown in Figure 2. Table 6 indicates that all hypotheses of Model 1 and Model 2 are accepted. H1 is accepted since organizational agility has a positive and direct effect on organizational performance. H2 is accepted since networking capability has a positive and direct effect on organizational agility. H3a is accepted since agile project management does not have a significant direct effect on organizational agility. Finally, H3b is accepted since agile project management has a positive effect on organizational agility when it is moderated by market orientation. Table 7 indicates the GOFI of the structural model and demonstrates that both Model 1 and Model 2 have a good fit.

The indirect effect of independent variables on organizational performance for both models is presented in Table 8. The table demonstrates that the indirect effect of agile project management on organizational performance in Model 1 is not significant, with a *t*-value of 1.69. In contrast, the indirect effect of networking capability on organizational performance is significant. When the relationship between agile project management and organizational agility is moderated by market orientation, the indirect effect of agile project management on organizational performance is positive and significant, as indicated in Model 2. Model 2 also indicates a positive and significant indirect effect of networking capability on organizational performance.

As recommended by Baron and Kenny (1986), we use the Sobel (1982) test to validate the significance of the mediating effect of a certain variable in the research model. The Sobel test is used to validate the mediation effect of organizational agility on the relationship between networking capability and organizational performance and the relationship between agile project management and organizational performance. In Model 1, the Sobel test's *z* value is

GOFI	Model 1 without moderation		Model 2 with moderation	
	Result	Interpretation	Result	Interpretation
p-Value ≥ 0.05	0.208	Good fit	0.292	Good fit
RMSEA ≤ 0.08	0.041	Good fit	0.026	Good fit
NFI ≥ 0.90	0.990	Good fit	0.990	Good fit
NNFI ≥ 0.90	0.990	Good fit	1.000	Perfect fit
CFI ≥ 0.90	1.000	Perfect fit	1.000	Perfect fit
IFI ≥ 0.90	1.000	Perfect fit	1.000	Perfect fit
RFI ≥ 0.90	0.980	Good fit	0.980	Good fit
SRMR ≤ 0.05	0.023	Good fit	0.023	Good fit
GFI ≥ 0.90	0.950	Good fit	0.950	Good fit
AGFI ≥ 0.90	0.900	Good fit	0.900	Good fit

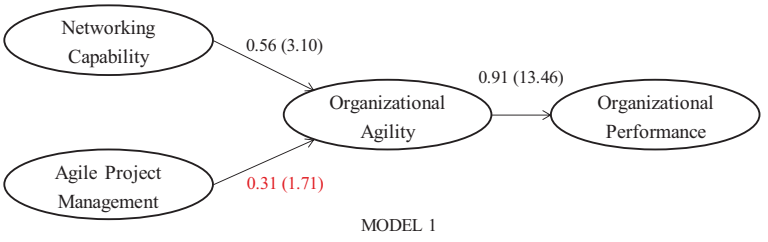
Table 4. Goodness of fit index (GOFI) of the second-order CFA

Table 5.
Validity and reliability of the second-order CFA

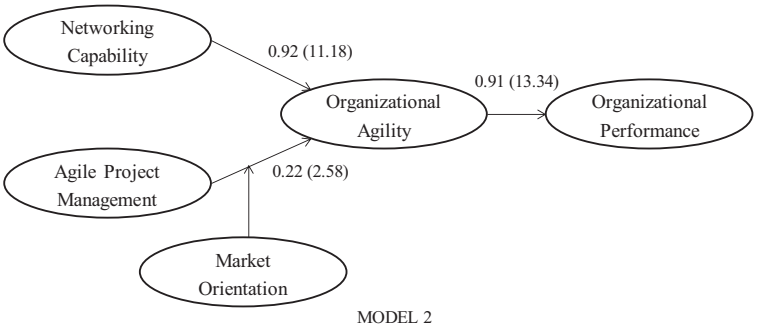
Variable	Model 1 without moderation					Model 2 with moderation				
	SFL ≥ 0.5	Error	CR ≥ 0.7	VE ≥ 0.5	Conclusion	SFL ≥ 0.5	Error	CR ≥ 0.7	VE ≥ 0.5	Conclusion
Organizational performance			0.78	0.65	Good reliability			0.78	0.65	Good reliability
FP	0.82	0.33			Good validity	0.82	0.33			Good validity
NFP	0.79	0.38			Good validity	0.79	0.38			Good validity
Organizational agility			0.99	0.99	Good reliability			0.99	0.99	Good reliability
OA	1.00	0.01			Good validity	0.99	0.01			Good validity
Market orientation								0.92	0.75	Good reliability
CTO						0.82	0.33			Good validity
CPO						0.86	0.26			Good validity
IFC						0.91	0.17			Good validity
IPC						0.87	0.24			Good validity
Networking capability			0.88	0.71	Good reliability			0.88	0.71	Good reliability
FNP	0.88	0.23			Good validity	0.87	0.24			Good validity
MNR	0.83	0.30			Good validity	0.83	0.31			Good validity
LNR	0.82	0.33			Good validity	0.83	0.31			Good validity
Agile project management			0.89	0.73	Good reliability			0.87	0.69	Good reliability
SM	0.85	0.27			Good validity	0.82	0.32			Good validity
CFC	0.83	0.32			Good validity	0.82	0.32			Good validity
BC	0.88	0.23			Good validity	0.85	0.28			Good validity

Model 1 hypotheses	Standardized effect	*t*-Values	Conclusion
H1: Organizational agility has a positive and direct effect on organizational performance	0.91	13.46	Accepted
H2: Networking capability has a positive and direct effect on organizational agility	0.56	3.10	Accepted
H3a: Agile project management does not have a significant direct effect on organizational agility	0.31	1.71	Accepted
Model 2 hypotheses	**Standardized effect**	***t*-Values**	**Conclusion**
H1: Organizational agility has a positive and direct effect on organizational performance	0.91	13.34	Accepted
H2: Networking capability has a positive and direct effect on organizational agility	0.92	11.18	Accepted
H3b: Agile project management has a positive effect on organizational agility when it is moderated by market orientation	0.22	2.58	Accepted

Table 6.
Significance test results on the structural model



1) $N = 150$
2) Chi-Square = 23.42, df = 21, P-value = 0.32194, RMSEA = 0.028
3) Organizational Performance $R^2 = 0.83$, Organizational Agility $R^2 = 0.74$



1) $N = 150$
2) Chi-Square = 6.87, df = 9, P-value = 0.65041, RMSEA = 0.000
3) Organizational Performance $R^2 = 0.83$, Organizational Agility $R^2 = 0.74$

Figure 2.
Structural equation modeling result

Table 7. Goodness of fit index (GOFI) of the structural model

GOFI	Model 1 without moderation Result	Interpretation	Model 2 with moderation Result	Interpretation
p-Value ≥ 0.05	0.322	Good fit	0.650	Good fit
RMSEA ≤ 0.08	0.028	Good fit	0.000	Good fit
NFI ≥ 0.90	0.990	Good fit	0.990	Good fit
NNFI ≥ 0.90	1.000	Perfect fit	1.000	Perfect fit
CFI ≥ 0.90	1.000	Perfect fit	1.000	Perfect fit
IFI ≥ 0.90	1.000	Perfect fit	1.000	Perfect fit
RFI ≥ 0.90	0.980	Good fit	0.980	Good fit
SRMR ≤ 0.05	0.025	Good fit	0.025	Good fit
GFI ≥ 0.90	0.970	Good fit	0.970	Good fit
AGFI ≥ 0.90	0.930	Good fit	0.930	Good fit

Table 8. Standardized and t-values of indirect effects of the model

Indirect effect (standardized effect/ t-values)	Model 1 Networking capability	Model 1 Agile project management	Model 2 Networking capability	Model 2 Agile project management × Market orientation
Organizational performance	0.51 (3.03)	0.29 (1.69)	0.84 (8.77)	0.20 (2.55)

3.03 for the networking capability–organizational agility–organizational performance relationship showing a significant mediation effect of organizational agility at a 99% confidence interval. In Model 2, the Sobel test's z value is 8.60 and 2.51 for the networking capability–organizational agility–organizational performance relationship and agile project management–organizational agility–organizational performance relationship, respectively. Therefore, it demonstrates the significant mediation effect of organizational agility on both paths at a 99.9 and 95% confidence interval, respectively.

Discussion

The second-order LVS CFA test result of the agile project management variable demonstrates the construct validity (SFL between 0.83 and 0.88 for Model 1, and 0.82–0.85 for Model 2) and reliability (CR = 0.89 and VE = 0.73 for Model 1, and CR = 0.87 and VE = 0.69 for Model 2). The finding indicates that agile project management needs to embrace balancing control besides self-managing and cross-functional collaboration. Project teams' autonomy and flexibility need to be balanced with strategic priority encouragement and corporate philosophy fostering, which is profitability and long-term organization survival (Andersson *et al.*, 2019; Shipman and Tooey, 2017). In this case, agile project management does not lose control of its strategic guidelines and establish its balance (Andersson *et al.*, 2019; Kane *et al.*, 2016).

The first-order CFA of organizational agility shows that the construct has SFL between 0.63 and 0.78, indicating good validity and CR 0.90 and VE 0.50, showing good reliability. Therefore, the concept of organizational agility needs to embrace the capability to switch business partners (partners that provide the complementary solution, partners that develop relationships with customers or channel intermediary, e.g. reseller, distributor) besides the capability to switch suppliers. Switching business partners easily enables the organization to rapidly develop a competitive and flexible end-to-end solution and address customers' business process requirements.

Concerning the market orientation construct, the first-order CFA confirms the validity (SFL 0.64–0.86) and reliability (CR 0.85 and VE 0.58) of the IPC dimension. Furthermore, Model 2 second-order CFA also indicates that IPC has an SFL of 0.87, showing good validity and contributes to market orientation construct validity (SFL 0.82–0.91) and reliability (CR 0.92 and VE 0.75). The test results show that the reconceptualization of agile project management, market orientation and organizational agility is valid and reliable under this study context.

The study results unveil the positive effect of organizational agility on organizational performance in the telecommunication industry's highly dynamic environment. The coefficient of determination $R^2 = 0.83$ suggests that organizational agility explains 83% of the variation in organizational performance. The ability to respond to changes rapidly and appropriately, become flexible and adaptable to changes and control uncertainty determines the outcome. In a highly dynamic environment, the organization's competitive advantage becomes significantly harder to sustain, and performance improvement becomes more difficult to achieve (Wiggins and Ruefli, 2005). Therefore, the organization's swiftness to adapt toward market change is critically required (Chen *et al.*, 2014; Tallon and Pinsonneault, 2011). The organization's ability to respond to highly complex competing forces, local customization and personalization become one of the most crucial factors to achieve organizational performance (Kale *et al.*, 2019; Li *et al.*, 2014; Liu and Yang, 2019; Ravichandran, 2018; Tallon and Pinsonneault, 2011; Teece *et al.*, 2016).

The Sobel test confirms the mediating role of organizational agility in the relationship between networking capability–organizational performance and moderated agile project management–organizational performance. Organizational agility becomes the gate that encases organizations' dynamic capabilities to ensure the response to customers' requirements can be provided with speed and flexibility.

The study results demonstrate the significant direct effect of networking capability on organizational agility for both models. The finding corroborates a prior study that argues that networking capability allows organizations to collect reliable information and competencies faster (Battistella *et al.*, 2017). It is also aligned with the statement that networking capability promotes organizational agility since it enables organizations to be strategically positioned in the ecosystem to seize opportunities faster (Battistella *et al.*, 2017; Liu and Yang, 2019). The finding then disproves the dark side of networking capability warned by Yang *et al.* (2018) that networking could leak the organization's specific assets and resources. The study results support Lui *et al.* (2009) that when organizations can establish proper governance structures, organizations can navigate the partnership's dynamics and minimize network partners' opportunistic behavior.

The finding that agile project management does not directly affect organizational agility but requires the market orientation moderation evidence that resources need to be mobilized in the correct direction, which is to address customer requirements and outperform the competition. The project team's best capabilities to collaborate cross-functionally, perform self-management and perform self-assessment of team's performance must be moderated by the capability to generate and disseminate market intelligence and to take coordinated actions to deliver exceptional values to customers (Lee and Xia, 2010). Market orientation enables organizations to strategically balance the trade-off between agile project management's response extensiveness and response efficiency. By developing market intelligence, organizations will be able to concentrate on the scope and variety of team responses. This condition enables organizations to understand customers' requirements and competition and to respond to those requirements effectively. This finding contradicts a previous study's result showing minimal moderation effect of project vision/goals on the relationship between agile project management and project success (Serrador and Pinto, 2015). The study finding is strong evidence that to achieve project success, the team needs to

focus on identifying which key aspects are valued most by the customers and market instead of focusing on how to develop the product (Conforto *et al.*, 2014).

Inaccurately addressing the market may inhibit organizations from delivering the proposed solution swiftly and accurately. For example, a bad contract with a harmful and long acceptance process will delay the project delivery even though the organization has the best implementation team. Failure to understand customer requirements and competition can cause an inaccurate solution proposal and loss in the auction. Does not involve the customer during the process of developing a solution to the customer may create a solution that deviates from customer expectation. Furthermore, market orientation ensures the team's commitment to delivering the outcome that creates the customer's highest value. Without market orientation, agile project management does not significantly affect organizational agility. Therefore, agile project management must be moderated by market orientation to positively affect organizational agility.

Limitations and future research

Interpretation of the findings of this study is subject to some limitations. First, this study is based on a cross-sectional nature and might fail to capture the dynamic of the studied variables. Thus, a longitudinal research design which could uncover these effects may modify the findings of this study. Second, the choice of a single industry (telecommunication) in a single country provides a limitation on external validity, especially because of solution-selling characteristic of B2B relationship. Care should be exercised when applying and generalizing the results in other industries. It is therefore suggested to extend the research efforts to other industry sectors in multicountry environments.

Conclusion

This study enriches the literature on organizational agility and resource orchestration in a highly dynamic market. This study reveals that in a highly dynamic market transforming into an open system with lower entry barriers, organizational agility, which is the responsiveness and swiftness to address customer requirements changes, plays a crucial role in achieving organizational performance. When competition barrier is declining because of open standardization, responsiveness and speed determine the outcome. This agility is achieved through orchestrating internal resources under agile management practice and managing and leveraging network partnerships.

However, agile project management requires market orientation moderation to guide the project management capabilities in the right direction of creating exceptional customer values and outperforming the competition. When agile project management is moderated by market orientation, organizations can promptly and accurately respond to changes in customer demand, customize a product or service to suit an individual customer, change the variety of products or services available for sale, adopt new technologies to produce better products or services and response accurately toward competitors' maneuvers. This condition allows the organization to achieve its organizational agility.

Networking capability positively influences organizational agility in responding to the changes in the market. Networking capability improves organizations' capability to scan the market, interpret the incoming information, sense the opportunity and then take anticipatory actions related to this market dynamics. Networking capability enables organizations to access entrepreneurial opportunities from the market and obtain external resources and knowledge to respond to market requirements and perform competitive actions. By cooperating with partners, organizations can manage the lack of internal resources and leverage external capabilities to develop and foster responsiveness in satisfying customers' requirements.

Therefore, the study contributes to the development of relational theory, resource-based theory and dynamic capability theory by presenting the interplay effect of leveraging external resources and knowledge through networking capability and orchestrating internal resources through agile project management. Both have dissimilar normative implications regarding the strategies to achieve high performance. According to Resource-Based View (RBV), an organization is suggested to protect, rather than share, valuable, rare, inimitable and nonsubstitutable resources and know-how to avoid knowledge spillover and competitive advantage elimination. However, the relational view mentions that an organization needs to create an effective strategy by systematically share valuable knowledge with partners, which, in return, acquires valuable knowledge and resource from them. This study demonstrates that both can work collaboratively and contribute to organizational agility and organizational performance.

Concerning managerial implications, this study provides managers a comprehensive perspective on how to achieve organizational performance for telecommunication technology providers. Aligned with the study results that elucidate the relationship between variables, this study devises a problem–solution model to achieve organizational performance by focusing on organizational agility transformation for technology providers in addressing the dynamic and complex business environment. The solution model applies dynamic capabilities reconfiguration by searching, structuring, bundling and leveraging internal and external resources under the moderation of market orientation in responding to market dynamics with speed and high responsiveness.

By understanding the customer requirements, specifically latent and future requirements, and understanding the competitive situation, organizations can anticipate and respond appropriately and swiftly to address it. In the new software-defined networking era, the telecommunication network is built to adapt specific needs based on operators' strategy to deliver specific service and content. The service type creation is expected to become more agile through software configuration instead of confined and limited by appliance-based service determination. In this case, technology providers are expected to understand customer-specific requirements and develop the solution on demand. The capability to tailor solutions for the market through coordinated actions between functional departments and partners to create customer value is the key to technology providers.

This study perceives five principles that need to be undertaken by the technology providers to become agile organizations:

(1) Develop an extensive partnership to have a sufficient number of suppliers to gain competitive costs and enough component supplies.

(2) Develop an extensive partnership to ensure a sufficient number of business partners (complementary solution, distributor, partner that bring the relationship with the customer) to acquire the capability to develop competitive and flexible end-to-end solutions rapidly.

(3) Develop sufficient market intelligence since it enables project management to identify critical aspects that will be valued the most by the customers and market.

(4) Design an effective and efficient mechanism to perform product and service customization and personalization.

(5) Design the appropriate agile-stage-gate model that can improve time to market and development productivity.

The study results also suggest that managers develop the capability to manage complex business partnerships. The broadness of vision and scalability of telecommunication

solutions goes beyond the scope of a single company working with a closed proprietary platform. This study proposes the following to improve networking relationships: alignment on the central objectives for the relationship, development of effective and transparent communication, development of constructive process governance, supportive in competence development, relationship nurturing by building social connections and avoid blind spots since partnership establishment.

Finally, this study suggests that managers start to develop balanced and agile project management capability based on three underlying capabilities: self-managing, cross-functional collaboration, balancing control and customer involvement. Managers should develop teams that are comfortable to embrace changes continuously so that teams act as adaptive systems to review and identify the deficiency and implement enhancement. Managers should develop consistent ownership of work within the cross-functional team to deliver the result by building transparent communication and strong ties among team members. Finally, managers should maintain the balancing control through continuous awareness development of corporate philosophy, which is long-term organization survival, and develop a preference for cooperation between agile teams to avoid destructive internal competition.

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Appendix

Construct	Items	Adapted from
Organizational performance	Compared to competitors, our organization can achieve	
Financial performance	(1) Increased sales revenue (2) Increased profit margins (3) Increased cash flow	Simon *et al.* (2015), Le Meunier-FitzHugh and Piercy (2011), Simon *et al.* (2015), Williams (2018)
Nonfinancial performance	(4) Increased market share (5) Product and service quality improvement (6) Increased customer satisfaction	
Organizational agility	Compared to competitors, to what extent you agree that your organization can easily and quickly perform the following business actions? (7) Respond to changes in aggregate consumer demand (8) Customize a product or service to suit an individual customer (9) React swiftly to new product or service launches by competitors (10) Introduce a new pricing schedule in response to changes in competitors' prices (11) Expand into new regional or new markets (12) Change (i.e. expand or reduce) the variety of products or services available for sale (13) Adopt new technologies to produce better products or services (14) Switch suppliers to get better benefits of lower costs, or better quality, or improved delivery times (15) Switch business partners (such as partners for the complementary offer, partners that provide the relationship with the customer, or channel intermediary, e.g. reseller, distributor) to fulfill customer's requirement	Tallon and Pinsonneault (2011)

Table A1.
Scales items for construct measure

(*continued*)

Construct	Items	Adapted from
Market orientation		
Customer orientation	(16) Our organization constantly monitors our level of commitment to serve the customer needs (17) Our organization's business objectives are driven by creating greater customer value (18) Our organization's competitive strategies are based on our understanding of customer need (19) Our organization measures customer satisfaction frequently (20) Our organization pays close attention to after-sales service	Masa'deh *et al.* (2018), Narver and Slater (1990), Panda (2014)
Competitor orientation	(21) Our customer-facing people regularly share information concerning competitor's activities (22) Our organization rapidly responds to competitive actions that threaten our organization (23) Our organization's top managers regularly discuss competitors' actions (24) Our organization targets customers where we have an opportunity for competitive advantage	Masa'deh *et al.* (2018); Narver and Slater (1990), Panda (2014)
Inter-functional coordination	(25) Our organization's top managers from every function regularly visit our current or prospective customers (26) We freely communicate information about our successful and unsuccessful customer experiences across all business functions (27) All our business functions are integrated in serving the needs of our target market (28) We share resources with other business functions when needed	Masa'deh *et al.* (2018), Narver and Slater (1990), Panda (2014)
Inter-partner coordination	(29) There is effective communication between partners to create superior customer value through joint activities (30) There is collective decision-making between partners for the creation of superior customer value (31) There is a collective commitment to maintaining the development of superior customer value through the joint processes (32) If needed, a mutual resource sharing can be done between cooperative partners	Diaz-Foncea and Marcuello (2013), Rezazadeh and Nobari (2018), Rocha and Miles (2009), Tajeddini and Ratten (2017)

(*continued*)

Table A1.

Construct	Items	Adapted from
Networking capability		
Finding network partners	Our organization has a system or mechanism in place to help us (33) Search locally to find proper network partners (34) Search globally to identify appropriate network partners (35) Search widely to look for right partners (36) Find partners to count on in time when the need arises	Dyer and Singh (1998), Gulati (1998), Mu and Di Benedetto (2012), Mu *et al.* (2016)
Managing networking relationships	Our organization (37) Can design an appropriate mechanism to navigate the dynamics of the partner network (38) Can fine-tune network partnership relationships (39) Constantly analyzes relationships with partners so that we know what adjustments to make (40) Can dynamically integrate networking activities into our business operational process	Dyer and Singh (1998), Gulati (1998), Mu and Di Benedetto (2012), Mu *et al.* (2016)
Leveraging networking relationships	(41) Our organization can get the needed assistance from our partners in an accurate manner (42) Our organization can get the needed assistance from our partners in a timely manner (43) Our partners can refer us to a third party who could help if the partners cannot provide direct help (44) Our partners can share resource to us when we need it	Mu and Di Benedetto (2012), Mu *et al.* (2016)
Agile project management		
Self-managing (empowered)	(45) Work is organized in a lean empowered team (46) The management does not interrupt the team during a work cycle (47) Work goals are defined by the team before each cycle starts (48) The team has the responsibility to create the team's functional structure (49) The team systematically inspects performance to ensure continuous improvement	Stephen Denning (2018), Leybourn (2013), Shipman and Tooey (2017)

Table A1. (*continued*)

Construct	Items	Adapted from
Cross-functional collaboration	In every project cycle: (50) The team contains all the key skills required to deliver customers' requirement (51) The team is capable of delivering the solution without a lot of dependency (input) from other teams (52) There are efficient delivery times with fewer communication delays and handover within the team (53) There is consistent ownership of work as a team is responsible for the delivery of the product from design to completion	Leybourn (2013), Shipman and Tooey (2017)
Balancing control	Our organization: (54) keeps equipping the team with corporate philosophy to maintain the team's focus on long-term organization survival or profitability (55) keeps stressing the team to focus on a core set of strategic priorities (56) keeps stressing the preference for cooperation to avoid destructive internal competition between teams (57) has a special team (unit) as a balancing instance (agency) to provide advice for strategic priorities development	Andersson *et al.* (2019), Conner (2000), Shipman and Tooey (2017)

Note(s): Please indicate how much you agree or disagree with each of the following statements in 5-point Likert scale related to your organization. 1-Strongly Disagree, 2-Disagree, 3-Neither agree or disagree, 4-Agree, 5-Strongly agree

Table A1.

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