How potential and realized absorptive capacity increased ability to innovate: the moderating role of structural ambidexterity

Elidjen Elidjen
Business Creation Program, Managament Department, BINUS Business School Undergraduate Program, Bina Nusantara University, Jakarta, Indonesia, and Management Department, BINUS Business School Doctor of Research in Management, Bina Nusantara University, Jakarta, Indonesia

Asri Pertiwi
Management Department, BINUS Business School Doctor of Research in Management, Bina Nusantara University, Jakarta, Indonesia

Tirta Nugraha Mursitama
Management Department, BINUS Business School Doctor of Research in Management, Bina Nusantara University, Jakarta, Indonesia, International Relations Department, Faculty of Humanities, Bina Nusantara University, Jakarta, Indonesia, and

Jap Tji Beng
Department of Information Systems, Universitas Tarumanagara, Jakarta, Indonesia

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Abstract

Purpose – Digital start-ups have limited resources. With the demands of rapid growth, digital start-ups need to rely on their ability to explore external knowledge and exploit it into swift innovation. Developing absorptive capacity is an alternative to overcome this difficulty. This study aims to demonstrate how the potential and realized an increase in absorptive capacity enables organizations to innovate moderated by structural ambidexterity. Empirical evidence places more emphasis on the impact of absorptive capacity on innovation but still leaves the "black-box" question of innovation and how potential absorptive capacity (PACAP) can achieve realized absorptive capacity (RACAP).

Design/methodology/approach – This study tests, with a structural equation model, samples collected from 143 digital start-ups in Indonesia.

Findings – The finding of this study suggests that PACAP influences the ability to innovate only if RACAP mediates it and structural ambidexterity positively moderates the relationship between these two variables.

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Research limitations/implications – First, this study uses digital start-up organizations as respondents. Second, this study explores the role of the structural ambidexterity that moderates the relationship between PACAP and RACAP manifested in digital start-ups organizations that are identical to temporary companies with limited resources. Third, digital start-ups have a fast-growth life cycle, unlike regular companies. Finally, the validated scale is based on data collected entirely from digital start-ups located in Indonesia, which may limit the generalizability of the findings to other industry contexts.

Practical implications – Start-ups suffer from the ability to innovate that increases their propensity to fail. They overcome this failure by increasing the absorptive capacity of the founding team to improve their ability to innovate. Because of limited resources available at digital start-ups, the flexibility of their management style can overcome these barriers, allowing the pursuit of both knowledge exploration and exploitation in a balanced way.

Originality/value – Most of the studies explained that the ability to innovate comes from absorptive capacity. In fact, they do not explore PACAP and RACAP and their relationships. Moreover, the studies also indicated that the contextual ambidexterity moderated PACAP and RACAP. Meanwhile, digital start-ups in this study revealed that structural ambidexterity with two dimensions, i.e. shared value, and behavioral integration, enables and positively moderates the relationship between PACAP and RACAP.

Keywords Innovation, Absorptive capacity, Start-up, Structural ambidexterity

Paper type Research paper

Introduction

Most innovations result from acquiring, transforming and applying knowledge rather than just invention (McMillan *et al.*, 2000; Zahra and George, 2002; Leal-Rodríguez *et al.*, 2014). Because of its exploratory nature, access to and use of external knowledge sources is essential for the innovation process in organizations. This process depends on the absorptive capacity, which is influenced by the organization's knowledge base (Yongping *et al.*, 2011; Lee and Huang, 2012). In the volatility, uncertainty, complexity, ambiguity environment, innovation is crucial for any strategic growth. Meanwhile, the innovation process involves two complementary activities – the intensive search for knowledge to explore the new and different markets of existing offerings. Following that, the results of the quest for this new knowledge are brought into the organization, combined with organizational memory, and exploited for commercial purposes (Menguc and Auh, 2010; Chandrasekaran *et al.*, 2012). Ultimately, this prevents the organization from focusing solely on internal knowledge.

Explorative learning leads to potential absorptive capacity (PACAP). These exploration activities are characterized by variety, experimentation, flexibility and divergent thinking (Jansen *et al.*, 2009; Lavie *et al.*, 2010; Turner *et al.*, 2013), which involve the search for opportunities (March, 1991). In contrast, exploitation captures activities such as refinement, efficiency and knowledge extension (Koryak *et al.*, 2018) by reducing variance and increasing control and formalization (Jansen, VA Den Bosch and Volberda, 2005; Lavie *et al.*, 2010; Santoro *et al.*, 2020). However, conflicting structures, processes, strategies and objectives on knowledge exploration (PACAP) and knowledge exploitation (RACAP) have led to a debate about how PACAP can enhance RACAP at the right time by eliminating inertia. This inconsistent competence can create a paradoxical challenge to achieve organizational ambidexterity (Tushman and Benner, 2015; Venugopal *et al.*, 2017). Although the attributes of exploitation and exploration pose conflicting and paradoxical challenges (Lavie *et al.*, 2010; Smith, 2014; Koryak *et al.*, 2018), both are the key to achieving innovation (Wang and Rafiq, 2014; Khan and Mir, 2019; Venugopal *et al.*, 2020). Moreover, several studies (Camisón and Forés, 2010; Enkel *et al.*, 2017) support that the PACAP and RACAP processes occur sequentially in achieving innovation. Logically, it is challenging to transform and exploit knowledge gained from external knowledge without being acquired or assimilated first (Zahra and George, 2002).

Expanding on the concept of absorptive capacity from Zahra and George (2002), we highlight the relationship between PACAP and RACAP. Not all knowledge explorations (PACAP) can be

transformed and exploited (RACAP) for innovation purposes (March, 1991; Lane *et al.*, 2006; Camisón and Forés, 2010; Volberda *et al.*, 2010). Zahra and George suggest investigating social integration mechanisms that might strengthen the relationship between these two contradictory activities that complement each other to overcome barriers to innovation. We investigate these innovation barriers in digital start-ups in Indonesia. Its operating history is still relatively young, so its knowledge base may depend on the role of the founding team. The pursuit of radical innovation also makes start-ups vulnerable to failure. Although start-ups support novelty, the rapid environmental changes can cause this novelty to become obsolete quickly. Therefore, environmental uncertainty explains an understanding that start-up inertia is different from established companies. We argue that the founding team's inertia determines how the knowledge exploration process (PACAP) can be exploited (RACAP) to achieve innovation. Finally, we are curious how young companies can drive PACAP toward RACAP. With this in mind, we extend the idea by placing structural ambidexterity as a social integration mechanism in the relationship between PACAP and RACAP in digital start-ups. Some have investigated how a structural ambidexterity strategy can be applied to small firms (Fourné *et al.*, 2019), while most agree that contextual ambidexterity is more appropriate for firms with limited resources (Wu and Wu, 2016; Balboni *et al.*, 2019; Constant *et al.*, 2020). Following O'Reilly and Tushman (2007) advice, we place the behavioral integration of top management team (TMT) and shared values as two dimensions of structural ambidexterity. We highlight the importance of the founding team as a TMT that fosters ambidexterity. In particular, we also place shared values that helped the founding team to achieve the vision of the startup (Li *et al.*, 2014). Finally, the discussion, implications and future research directions are discussed.

Theoretical framework and hypotheses

Absorptive capacity and innovation

From the notion that competitive advantage no longer relies on internal knowledge but comes from external knowledge, it becomes the basis for absorptive capacity, where the learning process is directed to explore and exploit external knowledge. Cohen and Levinthal (1990) first introduced absorptive capacity as an organization's ability to assess, assimilate, transform and apply external knowledge for commercial purposes. However, they argue that the impact of the two learning processes as dimensions on this absorptive capacity construct is different, so it is suggested that they require conflicting strategies (Cepeda-Carrion *et al.*, 2012b). By linking it to exploration and exploitation learning activities, Zahra and George (2002) re-conceptualize absorptive capacity and divide its construct into PACAP and RACAP. Each subset represents two dimensions where acquisition and assimilation are identical to knowledge exploration activities, while transformation and exploitation are knowledge exploitation activities. Exploitation occurs when individuals modify their beliefs to adapt to existing organizational codes in the individual context. It occurs through disseminating knowledge between individuals (March, 1991; Park *et al.*, 2015b). March (1991) observed that although exploitation strategies can result in faster knowledge acquisition in the short term, a singular focus on these activities can be detrimental to the organization in the long run. On the other hand, exploration occurs when organizational codes are modified by individual beliefs according to reality, thereby creating new ideas (Park *et al.*, 2015a) that allow for new opportunities. As a result, knowledge exploitation and exploration are considered complementary rather than competing processes that allow the creation of new knowledge within the organization. Finally, the ideas of Zahra and George (2002) also invite some opinions whether PACAP and RACAP are two different processes or concurrently.

Potential absorptive capacity

Identifying and assimilating external knowledge (PACAP) from different sources can enable each individual in the organization to create a combination of knowledge that contributes to

innovation (Camison and Fores, 2010; Enkel *et al.*, 2017). Furthermore, continuous updating of knowledge stocks through knowledge assimilation (Chaudhary, 2019), which improves PACAP levels, leads to increased innovation, preventing the organization from the competency trap (Camison and Fores, 2010). Although several studies suggest that PACAP can directly affect innovation capability (Volberda *et al.*, 2010; Ebers and Maurer, 2014; Song and Lie, 2018; Khan *et al.*, 2019), start-ups are embryonic firms with unique characteristics. Following a study by Alves *et al.* (2016), it is observed that both PACAP and RACAP affect the innovation ability of large companies, but only RACAP directly affects the innovation ability of companies with limited resources. We propose the following hypothesize based on the theory (Figure 1):

H1. Potential absorptive capacity positively influences the ability to the innovation of digital start-ups.

Realized absorptive capacity

RACAP is the primary key to increasing firm performance, generating innovation for competitive advantage (Zahra and George, 2002). RACAP reflects an organization's ability to integrate and reconfigure existing knowledge with new knowledge into processes, routines and operations to create new competencies (Camisón and Forés, 2010; Flatten *et al.*, 2011; Khan *et al.*, 2019). Thus, RACAP requires PACAP to achieve innovation and the two are complementary (Leal-Rodríguez and Roldán, 2013). Previous studies have also revealed that the correlation between PACAP and RACAP will mean nothing unless PACAP complements RACAP positively (Cepeda-Carrion *et al.*, 2012b; Leal-Rodríguez and Roldán, 2013; Ali and Park, 2016; Gao *et al.*, 2017), so this study provides two hypotheses (Figure 1):

H2. Potential absorptive capacity positively influences realized absorptive capacity.

H3. Realized absorptive capacity mediated the potential absorptive capacity to the ability to innovate.

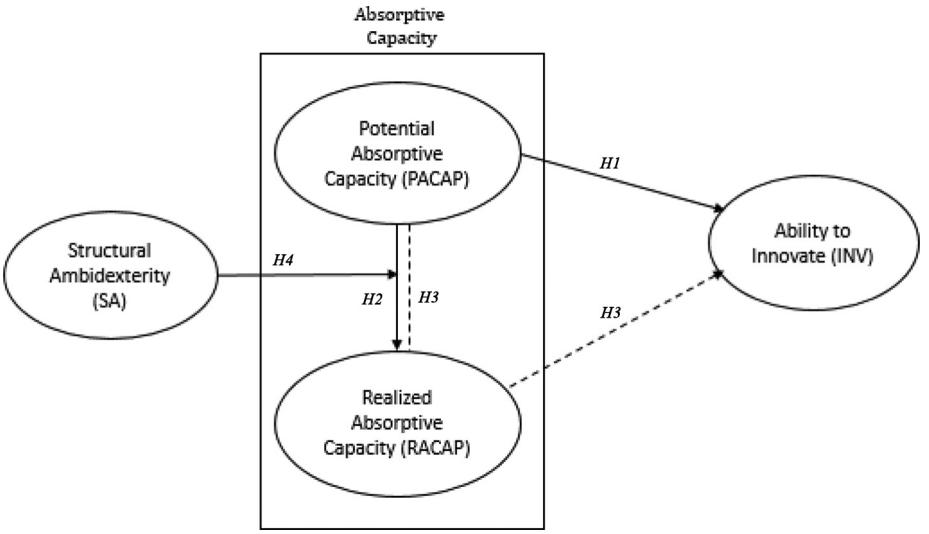

Figure 1.
Model and hypotheses

Structural ambidexterity as moderating variable

Organizational studies explain that organizational form relates to different strategies and environmental conditions. Therefore, organizations can switch between structuring in favor of the development stage and alternatively commercializing the innovation cycle to adapt. This idea of ambidexterity was first coined by Duncan (1976), who argued that organizations need to change the structure for searching and executing search results. The conflicts arising from these contradictory activities need to be reconciled by changing the structure over time in a successive way. In dealing with a dynamic environment, contextual ambidexterity may be most effective for organizations to simultaneously carry out exploration and exploitation activities. However, for start-ups, treating this dual role of individuals is not easy; each individual must focus on exploration and exploitation simultaneously. Separation of exploration and exploitation activities through separate structures (Kauppila, 2010; van Wijk *et al.*, 2012; Huang and Kim, 2013) can be carried out in small units. Furthermore, studies on organizational ambidexterity are broadly associated with innovation (Cho *et al.*, 2019; Khan and Mir, 2019; Venugopal *et al.*, 2020), competitive advantage (He and Wong, 2004; Gupta *et al.*, 2006; Venugopal *et al.*, 2020) and organizational learning (Datta, 2011; Caniels *et al.*, 2017; Xie *et al.*, 2020) for organizational growth and survival (Balboni *et al.*, 2019).

The theoretical foundations of ambidexterity have been elaborated on in different theories such as absorptive capacity (March, 1991) and are supported by several studies. Baum *et al.* (2000) view organizational learning from its own experience as exploitation and learning from the experiences of others as exploration. Then, Beckman *et al.* (2006) treat new partners as a form of exploration and additional relationships with existing partners as exploitation. He and Wong (2004) explicitly embrace the idea that exploration and exploitation are linked to learning and innovation. In line with Gupta *et al.* (2006), Koryak *et al.* (2018) connect exploration and exploitation in the context of organizational learning with TMT composition.

Ambidexterity research argues that small organizations such as start-ups and small- and medium-sized enterprises (SMEs) that adopt organic structures may only need contextual solutions. However, the structural approach can burden senior teams (Wu and Wu, 2016). The problem of firm size and the choice of structural (Du and Chen, 2018) and contextual approaches continues (Mom *et al.*, 2007; Andriopoulos and Lewis, 2009). It has been a widely researched gap (Wu and Wu, 2016; Fourné *et al.*, 2019), but there are still few reviews on start-up cases (Yitzhack *et al.*, 2015; Cho *et al.*, 2019). Adopting the study of O'Reilly and Tushman (2011), we view the founding team as a TMT (Heracleous *et al.*, 2017; Koryak *et al.*, 2018) in a dual structure, having an important role in achieving an ambidextrous organization. Therefore, we place TMT integration behavior (Li *et al.*, 2014; Wassmer *et al.*, 2016) and shared values (Birkinshaw and Gibson, 2004; Lee and Huang, 2012; Khan and Mir, 2019) as a dimension of structural ambidexterity.

Founder behavior indicates path dependence. Founders who come from the experience of many different companies tend to explore more often; on the contrary, founders who come from the same work area previously showed more exploitative behavior (Turner *et al.*, 2013). The founding team must be capable of changing its management style and introducing change conducive to a commitment, engagement in learning and knowledge sharing. Then, we measure the moderating structural ambidexterity of the relationship between PACAP and RACAP in their efforts to achieve the ability to innovate in digital start-ups. We understand the fact that start-ups represent SMEs with limited resources. Following previous studies arguments (Lavie and Tushman, 2010; Wu and Wu, 2016; Lubatkin *et al.*, 2006), these limitations make the strategy of ambidexterity through structural separation an arduous choice. Supported by the study of Müller *et al.* (2020), they also emphasize that start-ups are too small with an undefined structure to accommodate the appropriate level of top management. Relatively smaller organizations acquire less ambidextrous learning

because of their scarce operational resources to capture the benefits of exploratory and exploitative learning at the same time (Lee and Huang, 2012). However, we followed the suggestions of Fourne *et al.* (2019). Their study indicated that structural separation helps organizations of all sizes balance exploration and exploitation. Although start-ups may have fewer resources, they can allocate them to divide between exploration and exploitation activities in a more flexible structure more effectively. By inserting the values of a shared vision as a social integration mechanism that will accommodate the dual emphasis on the relationship between exploration and exploitation, it is possible to apply a structural approach to smaller organizations (Koryak *et al.*, 2018). Following this, then we hypothesize (Figure 1):

H4. Structural ambidexterity positively moderates the relationship between potential absorptive capacity and realized absorptive capacity.

Research design and methodology

Data collection and sample

This study examines the moderating effect of structural ambidexterity on the relationship between PACAP and RACAP to achieve ability to innovate in digital start-ups. We extend the absorptive capacity model (Zahra and George, 2002) which emphasizes social integration mechanisms to enhance the relationship between the two dimensions of absorptive capacity. We conducted a cross-sectional survey of digital start-ups in Indonesia to test our hypotheses. The respondents consisted of founding team members and C-levels who were considered to have comprehensive knowledge of the problems investigated in this study (Simsek *et al.*, 2005). The questionnaire was initially developed in English and translated into Indonesian. The retranslation of the questionnaire was carried out to ensure the comparability of the original and translated versions. The main respondents are start-ups founders (87%), and the rest are C-level teams. The data were obtained from processing 992 raw data of start-ups from the Indonesia Digital Creative Industry Society database. Data were deleted without a contact number or email address and cannot be traced back to its existence. Only start-ups with no more than 10 years were used, so 490 data were obtained. The questionnaire was filled out both offline and online. During COVID-19 pandemic, we distributed the survey online. There were 36 bounced emails and 156 returns, representing 143 start-ups (Table 1).

Measurement

Various studies have explored the relationship between absorptive capacity and innovation (Ali, Bahadur *et al.*, 2020; Aliagshar *et al.*, 2019; Khan and Lew, 2019), but only a few have discussed the mechanism of social integration in the contradictory relationship between the two dimensions of absorptive capacity (Limaj and Bernroider, 2019; Xie *et al.*, 2018; Leal-Rodriguez *et al.*, 2014). The relationship between these two is still a "black-box" and invites open discussion. We place structural ambidexterity as a social integration mechanism to strengthen this relationship. In this case, we investigated how the integration mechanism in start-ups loosely combines exploitation and exploration activities by promoting shared values and vision (Pacheco *et al.*, 2018; Constant *et al.*, 2020).

The integration mechanism is very important to deal with the exploration and exploitation paradox (Zahra and George, 2002). They are also close to a potential failure (Von Briel, 2018; Murphy *et al.*, 2012). Thus, TMT becomes an important factor in structural separation (Raisch *et al.*, 2009, Rogan and Mors 2014, Brix *et al.*, 2019). In the context of

Respondent's profile	Total	(%)
Area		
e-Commerce	23	16
Fintech	25	17
Education	27	19
IoT/SaaS/IT	22	15
Gaming	13	9
Services	11	8
Tourisms	7	5
Social media/Advertising	5	4
Health tech	5	4
Agriculture	5	4
Operational (Age)		
<1	10	6.9
1–3	48	33.5
3–5	33	23.0
5–7	52	36.6
Staffs (including founders)		
<5	31	21.7
5–7	32	22.3
7–10	36	25.1
>10	44	30.9

Table 1. Composition of the sample firms

limited resources, such as those experienced by start-ups, tensions can increase because maintaining of different units in exploration and exploitation is more arduous (Voss and Voss, 2013). This tension can be overcome with a shared vision (O'Reilly and Tushman, 2007; Jansen *et al.*, 2009; Chang and Hughes, 2012; Constant *et al.*, 2020). We measure the structural ambidexterity through TMT integration behavior and value shared meaning (Table 2). We use six indicators to measure structural ambidexterity (O'Reilly and Tushman 2007; Jansen *et al.*, 2009; Simsek *et al.*, 2005; Venugopal *et al.*, 2020; Chang and Hughes *et al.*, 2012). TMT behavioral integration dimension is measured from collaborative behavior, joint decision-making and information exchange. The dimension of value shared meaning is measured by open communication of the vision, awareness of the long-term vision and respect for different points of view. PACAP is measured through six indicators, of which three indicators explain knowledge acquisition and three other indicators explain knowledge assimilation (Camison and Fores, 2010; Flatten *et al.*, 2011; E-Limaj *et al.*, 2011; Vlacic *et al.*, 2019; Khan *et al.*, 2019). RACAP is measured through transformation and exploitation (Camison and Fores, 2010; Flatten *et al.*, 2011; E-Limaj *et al.*, 2011; Vlacic *et al.*, 2019; Khan *et al.*, 2019).

Result

Confirmatory factor analysis was conducted to test the measurement model through maximum likelihood estimation. The results for the confirmatory measurement model show that all constructs are significant with a significance level of < 0.01. The construct reliability for all constructs was greater than 0.75, which was above the recommended value of 0.6 (Bagozzi and Yi, 1988). We examined the structural model (Figure 2) without moderation. The measurement model shows adequate convergent validity for all constructs with values greater than 0.5 for all constructs (Fornell and Larcker, 1981). The results of the structural

Item description	Factor loading
Ability to innovate, adapted from Enkel *et al.* (2017)	
Radical innovation	
It is easy for us to take benefit of opportunities in new markets	0.70
It is easy for us to penetrate new markets aggressively	0.87
It is easy for us to learn new skills for the first time	0.52
Incremental innovation	
Focus on the efficiency of existing products/services	0.52
Focus on improving exiting knowledge, rather than new knowledge	0.76
Focus on solving problems with existing solutions, rather than new solutions	0.84
Focus on product/service development where we already have experience	0.77
Potential absorptive capacity, adapted from Camisón and Forés (2010) and Enkel *et al.* (2017)	
Acquisition	
Ability to relevant external knowledge search	0.74
Ability to identify, study and consider sources	0.84
Ability to analyze and process relevant new external knowledge	0.74
Assimilation	
There are new ideas and concepts that are communicated openly	0.60
There is cross-unit/departmental support to solve problems	0.81
There are regular cross-unit meetings	0.68
Realized Absorptive Capacity Adapted from (Camisón and Forés, 2010; Enkel *et al.*, 2017)	
Transformation	
Ability to connect existing knowledge with new knowledge	0.71
Ability to absorb new knowledge and make it available for further purposes	0.60
Ability to integrate new knowledge into tasks or works	0.67
Exploitation	
There is technology adoption with new knowledge on product/service	0.76
There is an increase in work effectiveness because of the adoption of new knowledge	0.85
There are financial benefits to the adoption of new knowledge	0.72
Structural ambidexterity, adapted from O'Reilly III and Tushman (2007) and Venugopal *et al.* (2020)	
TMT behavioral integration	
A work system that encourages other team members to help manage their workload voluntarily, when other team members are busy	0.83
A work system encourages each team member to act flexibly in shifting responsibility to anyone to make work easier	0.74
A work system encourages each team member to be willing to help each other complete the work to meet deadlines	0.65
Value-shared meaning	
Everyone communicates openly the future of the business to everyone	0.60
Everyone is aware of the long-term plans and future direction of the business	0.60
Everyone feels a strong sense of start-up success	0.61
Everyone respects everyone's point of view	0.62

Table 2. Construct measurement summary

model test in Model 1 show that the value of the root mean square error of approximation (RMSEA = 0.008, GFI = 0.96, TLI = 0.93 and CFI = 0.96) indicates a value that exceeds the minimum requirement for a fit model that can be accepted (Bagozzi and Yi, 1988).

The output shows that there is no direct relationship between PACAP and the ability to innovate ($\gamma = 0.092$, $p = 0.721$ and $t_{value} = 0.358$), meaning that PACAP does not influence the ability to innovate digital start-ups. On the other hand, there is a direct relationship

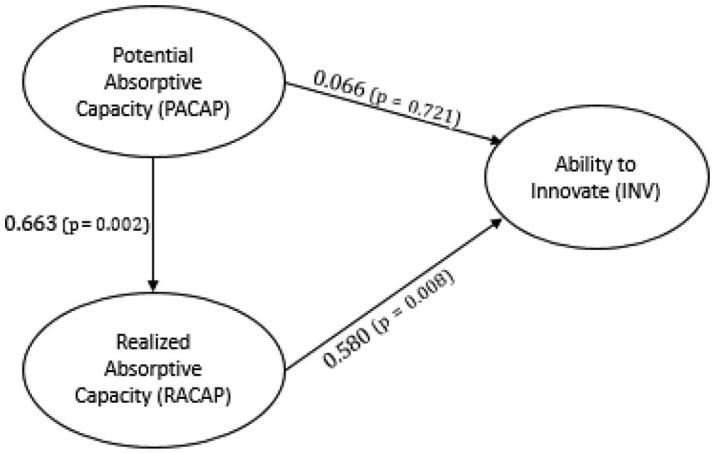

Figure 2.
Structural Model 1 without moderating variable

between PACAP and RACAP ($\gamma = 0.663$ and $p = 0.002$), indicating that PACAP has positive effect on RACAP with t_{value} (3.040) $>$ 1.65. Likewise, RACAP has a positive effect on the ability innovate by 0.580 at a significance level of 1%. This means that *H2* is accepted.

The Sobel test was conducted to determine the mediating role of RACAP on the relationship between PACAP and the ability to innovate. The mediation effect is obtained 0.450 with t_{value} (1.960) $>$ 1.65. Thus, *H3* is accepted where RACAP mediates the relationship between PACAP and the ability to innovate.

We placed the structural ambidexterity variable as a moderating variable in the relationship between PACAP and RACAP (Figure 3). The result shows that structural ambidexterity moderation has a positive effect on the relationship between PACAP and RACAP with t_{value} of 2.071 at a significance level of 0.038. The path coefficient shows that the magnitude of the effect is 0.2%. The result shows that all correlation are significant (Table 3).

Discussion

The social integration mechanism is believed to reduce the barriers to knowledge sharing (Zahra and George, 2002), thereby increasing the efficiency of the PACAP and RACAP ratios. The form of the social integration mechanism is multidimensional. However, until

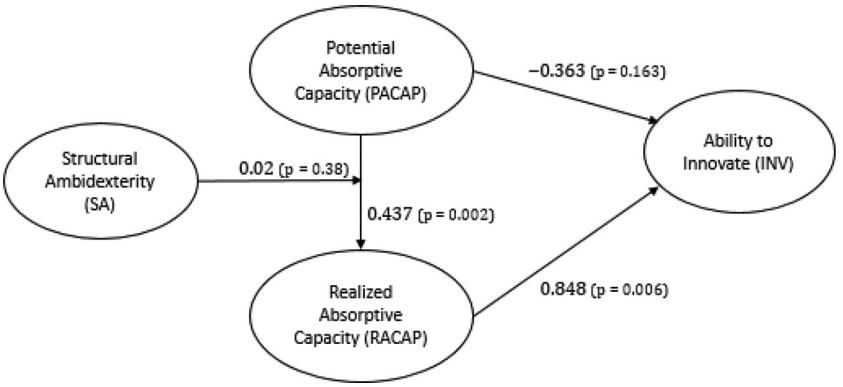

Figure 3.
Structural Model 2 with moderating variable

now, it is still treated mostly as a black box and fails to explain what this construction means or what is involved in it. By combining formal and informal mechanisms, this study focuses on the social integration behavior of the founders as TMTs (Venugopal *et al.*, 2017; Santoro *et al.*, 2020) and the value-share meaning (Pacheco *et al.*, 2018; Johannessen and Stokvik, 2019) who developed a structural ambidexterity approach strategy. In the first model, we measure the relationship between the two dimensions of absorptive capacity and ability to innovate. The study of Volberda *et al.* (2010) noted a lack of consensus on how to conceptualize absorptive capacity in resource-constrained organizations because the conventional proxies use R&D. This R&D activity tends to be minimal (Whittaker *et al.*, 2016), so Jansen *et al.* (2005) proposed a scale to measure absorptive capacity that distinguishes between PACAP and RACAP. While some might argue that start-ups can be the R&D corporations, we try to review the measurements that distinguish these two dimensions of absorptive capacity.

The first hypothesis (*H1*) states that PACAP does not affect the ability to innovate (Leal-Rodríguez *et al.*, 2014; Alves *et al.*, 2016; Mueller *et al.*, 2020). This hypothesis is accepted. Regardless of the size and form of the organization, several influential studies have shown a positive effect on the relationship between PACAP and the ability to innovate (Zahra and George, 2002; Ali and Park, 2016; Davilla *et al.*, 2019; Khan *et al.*, 2019; Xie *et al.*, 2018). However, it is supported by the study of Alves (2016) that PACAP and RACAP do affect the innovation ability of large firms, but only RACAP directly affects the innovation ability of small firms. Khan and Lew's (2019) study investigated the relationship between PACAP and RACAP on innovation ability in 600 SMEs and found that PACAP affected RACAP but not innovation outcomes. Founders are the idea people in start-ups. Although the founder acts as a knowledge absorber (Mueller, 2020), the level of PACAP is higher only if the partner's knowledge base is close to the founder's knowledge domain. Founders also function as knowledge intermediaries who transfer ideas from places they know to places representing innovative possibilities. As these knowledge bases become increasingly disconnected, opportunity recognition becomes difficult.

The next hypothesis states that PACAP will positively influence RACAP (*H2*) and the higher PACAP level will influence the ability to innovate only if it leads to RACAP (*H3*). Both of these hypotheses are accepted. The absence of a direct relationship between PACAP and the ability to innovate explains that PACAP and RACAP have different roles but are complimentary in developing the ability to innovate. This finding suggests that continuous updating of the knowledge stock through the assimilation of dominant knowledge increases the PACAP level. However, this does not appear to lead to increasing ability to innovate, unless PACAP leads to RACAP. That is, start-ups experience a PACAP process before RACAP, consistent with previous research (Cepeda-Carrion *et al.*, 2012a; Leal-Rodríguez and Roldán, 2013; Yeoh, 2019). Small firms are more efficient in converting RACAP into the ability to innovate (Alves *et al.*, 2016). That is, flexibility and agility in start-ups play a more

Table 3.
Descriptive statistic and correlations

Number	Variable	Mean	SD	1	2	3
1	PACAP	4.18	0.44			
2	RACAP	3.90	0.44	*0.67*		
3	STRUCTURAL_AMBIDEX	4.02	0.42	0.46	*0.51*	
4	INNOVATION	4.05	0.42	0.42	0.43	*0.45*

Note: All correlations are significant at the 0.01 level (two-tailed)

relevant role than just focusing on resources. In this line, RACAP deals with the execution process that drives change. As companies get bigger, they reduce their ability to change and adapt to more comfortable environmental conditions. Given their small size, start-ups benefit from experimenting on different trajectories, so they do not fall into the competency trap common to large companies.

Previous studies have shown that a moderate relationship between PACAP and RACAP is the setting of social integration mechanisms. These social integration mechanisms reduce barriers to knowledge sharing rather than increasing the efficiency of assimilation and transformation capabilities (Zahra and George, 2002). To that end, we place structural ambidexterity as a social integration mechanism that moderates the relationship between PACAP and RACAP toward the ability to innovate. We hypothesized that structural ambidexterity moderated the relationship between PACAP and RACAP (*H4*). This hypothesis is accepted. Some studies doubt that this approach can be used in organizations with limited resources (Gupta *et al.*, 2006; Carmeli and Halevi, 2009). However, the issue of limited resources available in digital start-ups can be solved by allocating exploration and exploitation activities separately with the flexibility of their management style which allows the pursuit of both activities in a balanced way. Supported by Fourne *et al.* (2019), they explained that structural separation is more conducive to balancing exploration activities on PACAP and exploitation of RACAP in a technological environment. Although the structural separation approach is more advantageous for searching activities in large companies, smaller organizations can use the separation of these two activities through alliances and collaborations from the flexibility found in digital start-ups.

PACAP is considered as the ability to create organizational memory. On the contrary, RACAP is expected to improve innovation performance. One of the uniqueness of digital start-ups is that they use knowledge management from the founding team, so the creation of organizational memory is highly dependent on the founders. Therefore, the role of founders becomes very important as knowledge intermediaries who can transfer ideas from where they know to where they represent. To improve the relationship between PACAP and RACAP, digital start-ups need to improve structural balance through the integration behavior of the founding team by paying attention to collaborative work systems, joint decision-making and information sharing. In this place, characteristics of exploitation activities require a more rigid and routine environment, difficult to coexist with more flexible exploration activities. Digital start-ups are renowned for their flexible environment because they followed the culture of their founders. Therefore, our recommendation is to collaborate with digital start-ups and corporates. For start-ups, the company's well-established infrastructure allows for faster scaling of the digital start-up business model than the digital start-up itself can achieve. In addition, digital start-ups can also adopt a routine environment which is generally difficult for digital start-ups to do because they are busy pursuing novelty.

Implication

Implication of theory

As empirically demonstrates, this study makes a major contribution to the literature on digital start-ups' absorptive capacity and innovation. The first major contribution is verifying the founding team's efforts to identify, seek and consider external knowledge, not triggering increased organizational innovation capabilities. Consequently, this study refutes previous research in which PACAP positively affects the ability to innovate. Regardless of the unit of analysis studied, it is still rare to find empirical tests regarding this relationship on digital start-up objects. In this corridor, we must understand that although digital

start-ups are included in micro, small, and medium enterprises (MSMEs), they have different characteristics. MSMEs focus on getting stable profits, while start-ups focus on growth. Furthermore, this research also contributes to exploring the relationship between PACAP and RACAP through the placement of the moderating variable structural ambidexterity as a mechanism of social integration.

Although the social integration mechanism is a multidimensional construct, most researchers still treat this dimension as a black box. As a result, few pay attention to how the social integration mechanism impacts the relationship between PACAP and RACAP to enhance innovation capability. Finally, we show that structural ambidexterity can also be implemented in organizations with limited resources such as digital start-ups. We agree that start-ups are embryonic companies. Therefore, it makes sense to focus on individual activities in assessing for themselves when to explore and exploit so that contextual ambidexterity would be more appropriate for this relationship. However, it seems that the contextual approach opens up role ambiguity. Consequently, dividing the unit into exploration and exploitation roles with a shared vision and mission makes more sense.

Implication of practice

This finding contributes to how the external knowledge assimilation ability of the founding team plays a role in improving PACAP. Thus, digital start-ups need to consider that high PACAP levels are influenced by the founding team's ability to absorb external knowledge. A behaviorally integrated founding team manages contradictory innovations through mutual and collective interactions. This is demonstrated through collaborative behavior, shared decision-making and information exchange. Larger teams are useful for tackling difficult and complex issues, but with their small size, digital start-ups can manage heterogeneity within the founding team. These findings also provide insight into how important it is to share the vision and values in digital start-ups. The founder's shared values should blend well into the digital start-up's initial goals, which is why team members work together even when there is conflict. Ultimately, it provides new insights for start-ups.

Limitations and future research

This study is subject to several limitations, and some of these limitations create pathways for the future. First, this study uses digital start-up organizations as respondents. The sample in this study does not distinguish digital start-up areas with service or product characteristics, so the moderating relationship results can lead to different conclusions. Second, this study explores the role of the structural ambidexterity that moderates the relationship between PACAP and RACAP manifested in digital start-ups organizations that are identical to temporary companies with limited resources. The results can be different if done in digital start-up organizations with a balanced group size by comparing structural and contextual ambidexterity. We suggest that future research on this topic collects data from an established firm and compares it with the results on digital start-up. Third, digital start-ups have a fast-growth life cycle, unlike regular companies. Thus, we urgently need to investigate this relationship between PACAP and RACAP in the longitudinal study. Finally, the validated scale is based on data collected entirely from digital start-ups located in Indonesia, which may limit the generalizability of the findings to other industry contexts. We recommend future research in exploring the companies of different scales and various countries.

Conclusion

The research stated that PACAP influences the ability to innovate positively in digital start-ups. It also emphasizes that PACAP influences RACAP positively. In this case, PACAP will create the

ability to innovate greater if RACAP mediates PACAP at the same time. Furthermore, structural ambidexterity positively moderates the relationship between PACAP and RACAP in digital start-ups. It underlined that the complementary relationship enables the ability between PACAP and RACAP to innovate better, and it is moderated by structural ambidexterity eventually.

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Corresponding author
Elidjen Elidjen can be contacted at: elidjen@binus.edu