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ROLES OF SOCIAL CAPITAL AND DYNAMIC CAPABILITIES IN R&D ALLIANCE CAPABILITIES

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Abstract

Alliance capabilities is substantially vital in assuring the sustainability and positive performance in a strategic alliance relationship such as university and industry R&D alliances. More collaboration and alliances between university and industry in research and development (R&D) sector is required in order to increase Malaysia's R&D and innovation level and thus, assisting Malaysia in transitioning into Industry 4.0. In order to promote more fruitful and successful collaboration between Malaysian university and industry R&D alliances, it is noteworthy to look into the micro-level processes associated with alliance capability. However, in order to be able to comprehend the micro-level processes of alliance capabilities namely alliance management capability (AMC), alliance integration capability (AIC), and alliance learning capability (ALC), theories that illustrate the principle of the processes should be well-understood. Accordingly, this paper intends to elaborate on the literature review that evaluates the micro-level processes of alliance capabilities, how social capital and dynamic capabilities theory interact at the individuals' activities.

Keywords: Alliance capability, alliance success, dynamic capabilities, social capital, R&D.

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1. Introduction

According to Gulati (1998), strategic alliance involves the exchanging, sharing or co-developing activities between organisations. In this relationship, organisations cooperate in numerous collective activities such as joint product development and others through combining together their resources in achieving competitive advantage. It has been anticipated that strategic alliances can achieve competitive advantage through an effective collaboration where complementary resources can be created and subsequently contribute values to the organisation performance (Wittmann et al., 2009). When looking into R&D alliances, alliances between universities and industries may enable them to innovate through new knowledge creation, transfer, and integration (Un & Rodríguez, 2018). Furthermore, R&D alliances between universities and industries promotes substantial effect to each of them in a way that universities may gain benefit from this strategic relationship through continuous fund in continuing research activities and maintaining faculty needs while industries benefited from the relationship as the source of knowledge and technologies creation to keep up with the rapidly changing economy (Berbegal-Mirabent et al., 2015; Mascarenhas et al., 2018; Ting et al., 2017).

2. Problem Statement

As Malaysia is progressively migrating to Industry 4.0, R&D and innovation have been deemed as a vital turning point in making Industry 4.0 to be prevalent at all stages of the economies. Malaysian government has clearly emphasized the gravity of more collaboration between university and industry in spurring innovation levels according to the recent Malaysia Plan. However, based on Malaysia Productivity Corporation (2017) report, weak connections between university and industry can be found which resulted in low technological innovation. Whilst in the latest Malaysia Productivity Corporation (2018), productivity performance through innovation among others has been highlighted as an enabler in achieving the Eleventh Malaysia Plan (2016-2020) (Economic Planning Unit, 2015) target of 3.7% productivity growth and how universities can keep up with industry requirement by providing innovative product and services. Therefore, based on this, it is safe to conclude that greater alliances between university and industry in the R&D sector are crucial in promoting a higher level of innovation in Malaysia which subsequently affecting the economy as a whole. In sustaining the strategic alliances, organisations have been encouraged to practice sets of qualities that contribute to alliance capabilities in order to ensure the success of the alliances. Therefore, based on a study by Kohtamäki et al. (2018) on alliance capabilities dimensions, this paper aims to elaborate further on the possible underlying theories of the alliance capabilities dimension which are social capital and dynamic capabilities theory and how the theories interplay in alliance management capability (AMC), alliance integration capability (AIC), and alliance learning capability (ALC) processes. Findings from this study will be used to further investigate the level of alliance capabilities in the Malaysian university and industry R&D alliances and how it impacts the R&D alliance performance.

3. Research Questions

Based on the arising issue discussed earlier, the research question is formulated as per below:

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How do social capital and dynamic capabilities interact in the framework of alliance capabilities based on Malaysian university and industry R&D alliances perspective?

4. Purpose of the Study

Even though the topic of strategic alliance in terms of alliance capability has been extensively discussed in previous literature, it is still required to investigate alliance capability at the individual level activities and routines. The existing research of alliance capabilities is diversified in several disciplines without a collective meaning has caused predicament for the actual dimension of alliance capability to be determined. Hence, the concept of alliance capabilities was constructed according to numerous disciplines and theoretical views. To appropriately outline the activities and routines involved in alliance capabilities, the work of Kohtamäki et al. (2018) is used in this paper to determine how social capital and dynamic capabilities interplay in the activities.

5. Research Methods

In investigating the level of alliance capabilities in Malaysian university and industry R&D alliances, this paper will employ quantitative study with survey as the medium in gathering the data. A total of 29 universities in Malaysia, including public and private universities, are anticipated in participating in this survey, and the universities selection will be based on the data gathered from SETARA 2017, QS Rankings 2020, and The Times Higher Education World University Rankings 2020 based on the universities R&D outputs. The sampling unit for this study will be dyads whereby one dyad is equivalent to one university researcher and one industry partner that is working on the same R&D project and the project must be currently running in order to adhere to the alliance capabilities framework.

6. Findings

The rationale in adopting this work is due to the paper has comprehensively defined the dimensions of alliance capabilities, where such definitions and explanations are not found on other papers.

6.1. Alliance Capabilities

Alliance capabilities (AC) is described as the firm's capability in managing, integrating, and learning to accomplish mutual advantages. At the micro-level processes, AC can be measured by assessing the individual level's activities, tools, or routines. Hence, to properly outline the alliance capabilities based on Malaysian university and industry R&D alliances, it has been recommended to investigate alliance capabilities at the individual level activities. Felin et al. (2012) had also highlighted that experience and resources are part of the routines that can assist in building capabilities and understanding the role of individuals is essential for building routines and capabilities. It should be further emphasised that individual action is necessary for enacting processes that occur within an organisation. Through alliance capabilities, Malaysian university and industry alliances are presumed to have a greater chance in achieving high R&D alliance performance that can be measured through relational, organisational, and financial performance.

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Therefore, in the following section, the micro-level alliance capabilities components will be discussed, including AMC, ALC, and AIC.

6.2. Alliance Management Capability

AMC describes as R&D alliances' capability in setting up alliance target, efficiently structuring the implementation of task, and performing evaluation on alliance relationship as part of the specific activities in managing strategic alliances. In alliance target setting, the function and role of dedicated alliance function (DAF), alliance manager, and specialist in R&D alliances are determined in terms of how they can assist in handling inter-organisational relationship, codify information gathered from the inter-organisation interactions, and structuring individuals activities into structures and routines that can assist in the achievement of mutual goals in R&D alliances (Gu et al., 2013). Furthermore, implementation of tasks can be realized by coordinating with alliance partners through activities such as joint action i.e. joint R&D development and production, accurate task allocation by alliance manager or alliance specialist in ensuring the effectiveness of task execution, communication and codification of knowledge that can support in alliance learning and achieving mutual outcomes, and the participation of alliance specialist in knowledge sharing at the operational level. Lastly, alliance evaluation can be conducted through identifying any loopholes in the strategic alliance relationship and applying required remedies and this can be done through alliance evaluation activities between R&D alliance partners and are crucial in ensuring the sustainability of R&D alliance performance and relationship quality (Kim & Kim, 2009).

6.3. Alliance Integration Capability

The second dimension of AC is AIC which is defined as an alliance partner's capacity in building social and structural ties. Social integration is considered as the development of universities and their industry partners' relational capabilities that can be built by having appropriate activities and mediums for communication, such as establishing effective communication and dialogue. Effective communication can occur by facilitating joint activities such as strategic R&D discussion and group meetings that utilize suitable ICT tools i.e. Skype, email (Bresciani et al., 2018). Contrarily, structural integration which is the other element of AIC refers to the ability to build a structured relationship that can result in productive joint R&D activities between strategic alliance partners and a better firm's performance. It should also be noted that effective social integration will allow them to efficiently partake in joint activities that can further act as a source of knowledge.

6.4. Alliance Learning Capability

The third and last dimension is the ALC that defines as the R&D alliances' ability in achieving knowledge creation, knowledge assimilation, and knowledge internalisation throughout the strategic alliance lifespan. It has been reported that alliance learning capability can increase overall R&D alliance success (Kale & Singh, 2007). This dimension is characterised by knowledge creation in which knowledge and routines can be built by university and industry R&D alliance partners by learning through the relationship experience and interaction (Anand & Khanna, 2000). The next item is knowledge assimilation that refers to universities and their industry partners' ability to codify and explicate knowledge gathered throughout alliance relationships into systematic formats such as manuals that can assist the operations.

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Finally, knowledge internalisation defines as both universities and their industry partners' ability to disseminate knowledge gathered across the individual in the firm through activities such as training or mentoring is also presumed as important in ensuring the success of the strategic alliances (Sluyts et al., 2011).

In the following section, this paper will further elaborate on the two possible theories that interplay in the alliance capabilities dimension.

6.5. Dynamic Capabilities

Dynamic capabilities described as firm's ability in integrating, building, and re-configuring internal and external competencies in addressing the dynamic environment (Teece et al., 1997). While resource-based view has mainly focused toward the selection of the resources with competitive advantage criteria (Barney, 1991), dynamic capabilities are leaning towards the development of the organisations' internal and external resources i.e. universities and their industry partners to cope with the dynamic environment. The objective of dynamic capabilities is achieved through adaptation, integration, and reconfiguration of the available resources such as individuals in a firm in order to cope with the changing business environment.

In relation to alliance capabilities, the notion of dynamic capabilities is concise of organisational processes, namely coordination and integration, learning, and reconfiguration (Teece et al., 1997). According to the author, the firm's capabilities will be enhanced through its ability in embedding coordination into the routines and activities to address the dynamic environment. It has been argued that alliance capabilities fulfill the dynamic capabilities theory in way that it will allow organisations in sensing available opportunity, seizing the opportunity, and reconfiguring the available resources. Similarly, R&D alliance can manage and utilise the appropriate processes such as R&D alliance target setting i.e. aligning shared goal, task implementation i.e. coordination R&D activities, and evaluation i.e. assessment of project performance that subsequently contribute to AMC. Alliance target setting is achieved when universities and their industry partners have the capability in re-shaping their resources through the configuration of activities and processes that can further align their collective goals (Niesten & Jolink, 2015). With regard to the implementation of task, coordinating with strategic alliance partners will assist in eliminating redundant tasks, increasing organisations' dependency, as well as advantage in reaping idiosyncratic resources in an R&D dyadic relation (Schilke & Goerzen, 2010). These set of activities will assist alliance partners such as the university and industry R&D collaboration in Malaysia who have different organisational culture to coordinate better and to have a perceived collective goal which will enhance the overall performance and collaboration success (Azman et al., 2018; Niesten & Jolink, 2015). In correlation with coordination demonstrated in dynamic capabilities, it has been suggested that university and industry R&D alliance's ability in establishing certain processes that may boost its performance, and these processes in hand are characterised as resources that are difficult to replicate.

Learning process is the second role in the dynamic capabilities and it can be achieved through the unique processes constructed following the coordination ability of the R&D project management explained earlier. Coordination and interaction and are crucial in the learning process and it may trigger inter-organisational learning capability that further results in strategic opportunities. Learning has been further elaborated as an activity that enables tasks to be executed better and efficiently through repetition and

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experimentation. Similarly, the ability to employ specific learning process is vital for the alliance success. As far as the study is concerned ALC refers to the universities and their industry partners' ability in creating, assimilating, and internalising knowledge derived from the alliance lifespan. According to the theory, certain activities, competencies, and strategies are formed based on R&D alliance's interaction and experience is deemed as the source of knowledge (Kale & Singh, 2007). Additionally, according to the same author, R&D alliance's ability in codifying knowledge gathered from the interaction of the strategic alliance partners into a format that can be well understood by the individuals across the firm has been said to assist in the sharing of knowledge. Similarly, knowledge internalisation through the integration of knowledge, knowledge sharing and joint sensemaking can assist in leveraging knowledge collected throughout the inter-organisational experiences to be leveraged across firms that may assist in R&D alliances learning process (Einola et al., 2017). Hence, Malaysian university and industry R&D alliances may benefit from the learning process by gaining the ability in gathering and combining knowledge from both outside and inside firm's boundaries which can enhance the alliance capabilities for both universities and their alliance partners (Feller et al., 2013; Lorenzoni & Lipparini, 1999).

Reconfiguration/transformation is the final organisational facets in dynamic capabilities where it looks into the firm's ability in coping with the dynamic environment. Dynamic capabilities argue that any firm that is able to grasp the reconfiguration and transformation process may able to perform evaluation on the environment and make required adjustments. Reconfiguration and transformation process is also portrayed in the dimension of AMC where the evaluation activities are among the critical elements of AMC. Issues such as low in project performance or project engagement can be detected through alliance evaluation process in which it can support R&D alliances in identifying loopholes in the on-going activities and further take up any required reconfiguration process (Paulraj, 2011). Based on this stance, alliance evaluation activities between university and industry R&D alliances in Malaysia and allow them in conducting their routine 'health check' so that the strengths and weaknesses of alliance partners can be assessed as well as tackling issues or disagreements by applying appropriate solutions.

Proposition 1: Dynamic capabilities interplay in the relationship between alliance capabilities and R&D alliance performance.

6.6. Social Capital

Inkpen and Tsang (2005) defined social capital as the available resources that can be derived from inter-organisational relationship. Based on the context of this paper, social capital can be explained as the exploitation of resources to acquire economic, political, and social returns (Lin, 1999). Furthermore, according to Inkpen & Tsang (2005), networks of relationships are viewed by social capital as scarce resources for the individual and organisation. Nahapiet and Goshal (1998) have argued that social capital can provide benefits to an organisation as it may assist in enhancing the efficiency of actions, encouraging cooperative behaviour, increasing relational capability, and lead to firm's innovativeness. Since the social capital theory is formerly constructed using manifold theoretical standpoints (Payne et al., 2011), this paper intends to adopt Inkpen and Tsang (2005)'s definition of social capital which view individuals in an inter-organisational relationship as valuable which is similar to an earlier study by Nahapiet and Goshal (1998).

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In relation to alliance capabilities, Nahapiet and Goshal (1998) categorized cognitive, structural, and relational as the social capital's dimensions. Firstly, the relationship pattern of the network actors refers as the structural dimension and is measured through network ties, network configuration, and network stability. It is observed that R&D alliance capabilities are aligned with the social capital theory whereby the alliance capabilities dimensions discussed earlier are acknowledging the criticality of the network relationship that may benefit R&D alliances relationship. First, with regard to the network ties, social ties within strategic alliance relationships are determined through the inter-member ties (Inkpen & Tsang, 2005). The relationship between respective alliance individuals can be described as the network ties. Hence, in the presence of highly skilled R&D alliance manager particularly in interpersonal skill can assist in managing the collaborative relationship with the alliance partners that will further lead in creating complementary resources and the success of the alliance (Kale & Singh, 2009).

When examining the aspect of configuration of network, the strategic alliance has a decentralised structure where strategic alliance benefits through the communication established by individuals in an alliance and leverage the knowledge across firms can assist in knowledge sharing. Referring back to the notion of alliance learning capability discussed earlier, Malaysian university and industry R&D alliances may increase their relational competency and coordination ability through learning from the alliance experience that can be gained from recurring interactions and this multiple-repeated interaction has been classified as the source of knowledge creation process (Anand & Khanna, 2000). Furthermore, network stability will occur when the ties disappear when an individual left the organisation and this situation will promote a high level of network instability to the strategic alliances. Subsequently, as emphasised by Rottman (2008), an appropriate learning process and alternative ways of maintaining the relationship can be adopted in order to reduce the effect of network instability caused by the leaving individual. Hence, this instability has also been acknowledged in the alliance learning capability whereby it is vital for R&D alliance to codify gathered information into guidelines, checklists or other formats that can be perceived and well-understood (Kale & Singh, 2007).

Moreover, the collective goals which is the alignment of the collective responsibilities and targeted results and collective cultures which are the set of norms governing the network behaviour that is shared between strategic alliance partners is described as the cognitive dimension of social capital. Rottman (2008) argued that strategic alliance's culture to be dissimilar and this usually negatively affects knowledge transfer and relationship quality. Similarly, the main obstacle that hindering the successful collaboration between Malaysian university and industry is due to the differences in the cultural and shared objective. Based on the cognitive dimension, it has been addressed in the alliance management capability where R&D alliance partners is encouraged to have the same understanding on their mutual goals (Niesten & Jolink, 2015), enhance in the coordination process (Wittmann et al., 2009), and detect any dissimilarities by performing evaluation activities (Kale et al., 2002). Based on this, it can be deduced that it is important for Malaysian university and industry R&D alliances to acknowledge the criticality of this cognitive dimensions by adapting the appropriate alliance capabilities activities to mitigate any dissimilarity in their goals or cultures.

Finally, relational dimension has been classified as the outcomes derived from individual relationships and interactions that can assist in building trust, knowledge sharing, and the perspective of to

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not perceived alliance partners as competitors is. In addition, according to the author, trust is deemed as an important element in inter-organisational relationship. Further support can be seen in a study by Kale and Singh (2009) whereby in order for strategic alliances to reach its highest potential, trust level needs to be developed in an on-going basis while performing the project. The importance of trust is also reflected in the AIC whereby tools and activities must be developed in order to build trust and increase R&D alliance partners' coordination through joint discussions and activities (Lockström et al., 2010). Based on this, it can be summarized that university and industry R&D alliances may gain advantages in ensuring successful collaboration by building a higher level of trust.

Proposition 2: Social capital can be observed in the alliance capabilities dimension through alliance integration capability that mediates the relationship between alliance management capability and alliance learning capability.

7. Conclusion

Currently, there is limited number of research that investigates alliance capabilities, particularly at the micro-level processes within R&D alliances i.e. universities and their industry partners. Therefore, this paper has discussed the significance of dynamic capabilities at the individual level activities of alliance capabilities towards R&D alliances and the related individual activities and routines that could take place. This paper concentrate on how the elements of dynamic capabilities which are coordination/integration can be implemented through R&D alliances target setting and coordination of activities, learning can be achieved through a successful coordination between R&D alliance partners by gathering knowledge through interactions and simultaneously codifying it into meaningful formats that can be perceived by R&D alliances individuals, and last but not least how evaluation can reconfigure and transform R&D alliances organisational processes through routine ‘health check’ that enable R&D alliances to detect any gaps and alter it accordingly. Through these capabilities, Malaysian university and industry R&D alliances can sense available opportunity, seize the opportunity, and reconfiguring the available resources, as well as to remain competitive in the current dynamic environment.

Nevertheless, this paper has elucidated on the cruciality of the social capital towards the relational capability of R&D alliances networks for the development of alliance capability mainly AMC, AIC, and ALC. Malaysian university and industry R&D alliances may benefit from social capital such that it can promote and upsurge cooperation between strategic alliances by having alliance members with high interpersonal skills, ability in building higher level of trust through repetition interaction i.e. joint R&D meeting, learning session, increase efficiency in action i.e. coordination of R&D alliances activities and simultaneously boost the innovation level. Furthermore, it can be observed that the ability of R&D alliances in building social capital within the individuals can further enhance the efficiency of the sets of activities proposed in the dynamic capabilities and vice versa. On top of that, social capital illuminates the possibility of the alliance management capabilities dimensions in interacting with each other.

Finally, the understanding of the theories that interplay in the alliance capabilities framework is crucial in order for Malaysian university and industry R&D alliances can benefit from it. Based on the discussion above, the dynamic capabilities’ organisational process is clearly outlined as the basis of alliance

capabilities dimensions. Subsequently, these micro-level processes also allow alliance partners to acquire alliance capabilities from the social capital dimension and how this dimension is significant to the development of the strategic alliances relational competencies and enhancing the quality of the network.

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