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Exploring the Impact of Technological Capability on Inter-Firm Relationships in Malaysian Manufacturing Supply Chains

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Abstract
This paper aims to investigate the influence of technological capability on power dynamics, trust, and inter-firm relationship performance within supply chains. Adopting a quantitative research design, the study will utilize survey questionnaires to collect data from manufacturing companies listed in the Federation of Malaysian Manufacturers directory. The proposed methodology will employ structural equation modelling to test the hypothesized relationships. Previous research has underscored the benefits of maintaining long-term inter-firm relationships, which can enhance overall business performance and facilitate opportunities for new product development. Literature suggests that technological capability can confer competitive advantages to supply chain members. However, it may also lead to power imbalances that can negatively impact inter-firm relationships. Understanding these dynamics is crucial for manufacturing companies seeking to leverage technological capabilities effectively while mitigating potential risks to inter-firm relationships. By elucidating the relationship between technological capability, power dynamics, and inter-firm relationships, this study aims to provide valuable insights for manufacturing companies. It will inform decision-making processes related to technological capability expansion, offering a nuanced understanding of the advantages and disadvantages associated with such investments. Ultimately, the findings of this study can assist manufacturing companies in optimizing their technological capabilities and navigating power dynamics within supply chains to foster stronger and more sustainable inter-firm relationships, thereby enhancing overall business performance.
Keywords: Technological Capability, Power Dynamics, Trust, Inter-Firm Relationships, Supply Chains
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1. INTRODUCTION

The contemporary business landscape is marked by several transformative factors that compel manufacturers to rethink their approach to sustaining competitive advantage. Globalization has dismantled traditional barriers to trade, opening up new markets and intensifying competition on a global scale (Mrak, 2000; Gordon, 1988; Cerny et al., 2005; Went, 2000; Petras and Veltmeyer, 2001). In this interconnected world, manufacturers must navigate diverse cultural, economic, and regulatory environments to remain competitive. Furthermore, maturing markets present manufacturers with the challenge of meeting evolving consumer demands and preferences. As markets reach saturation points, differentiation becomes increasingly crucial for maintaining relevance and market share. Manufacturers must continually innovate and adapt their offerings to stay ahead of shifting market dynamics. Rapid technological change represents both a challenge and an opportunity for manufacturers (Tofail et al., 2018 ; National Research Council et al., 1998; Srai et al., 2016). On one hand, technological advancements have led to disruptive innovations that can quickly render existing products and business models obsolete. On the other hand, embracing emerging technologies presents manufacturers with new avenues for enhancing productivity, efficiency, and product quality. Recent factors in today's world, such as globalization, maturing markets, and rapid technological change, have fostered manufacturers to seek new ways of establishing and maintaining sustainable competitive advantage (Santoro and Chakrabarti, 2002). Moreover, heightened competition within the marketplace necessitates manufacturers to differentiate themselves through innovation, quality, and customer experience. In today's fast-paced business environment, companies must continuously monitor market trends, anticipate competitor actions, and proactively respond to changing customer needs to maintain a competitive edge (Day et al., 2004; Brown and Elsenhardt, 1998; Prossomariti, 2021). In response to these factors, manufacturers are exploring new strategies for establishing and sustaining competitive advantage. This may involve leveraging data analytics and artificial intelligence to gain insights into consumer behavior, adopting agile manufacturing practices to enhance flexibility and responsiveness, and forging strategic partnerships to access new markets and capabilities. Ultimately, manufacturers must embrace change and cultivate a culture of innovation and agility to thrive in today's dynamic business environment. By staying attuned to emerging trends, investing in technology and talent, and prioritizing customer-centricity, manufacturers can position themselves for long-term success in an increasingly competitive marketplace.

In today's rapidly evolving business landscape, technological capability plays a crucial role in driving innovation and adapting to market changes (Hitt et al., 1998; Sambamurthy et al., 2003; Tidd and Bessant, 2020). Firms with strong

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technological capabilities are better positioned to develop cutting-edge products and services that meet the changing needs and preferences of consumers (Latip et al., 2013). Moreover, these capabilities enable firms to streamline their operations, enhance efficiency, and maintain a competitive edge in the market (Wang et al., 2006). As technology continues to advance, firms that invest in and leverage technological capabilities effectively are more likely to succeed and thrive in the increasingly competitive business environment. Extending inter-firm relationships within the supply chain has become essential for firms seeking to maintain a competitive advantage in today's business environment. By collaborating strategically with partners along the supply chain, firms can enhance efficiency, reduce costs, and improve overall performance (Corsten & Felde, 2005). These relationships allow firms to leverage each other's strengths, share resources and knowledge, and address common challenges collectively (Gyau & Spiller, 2008). Moreover, closer inter-firm relationships enable firms to respond more effectively to changes in market demand and customer preferences, thereby increasing their agility and resilience (Ryssel et al., 2004). As a result, firms that invest in fostering strong and collaborative relationships within their supply chains are better positioned to adapt to market dynamics and sustain their competitive advantage over time (Sengun & Wasti, 2009). The relationship between technological capability and inter-firm relationships within the supply chain is indeed complex and multifaceted. While technological advancements can facilitate closer collaboration and coordination among supply chain partners, they can also introduce challenges related to power dynamics and conflicts. Boeck and Wamba (2008) highlight the potential for disagreements to arise when firms attempt to align their technological strategies within the partnership. In such cases, power dynamics may come into play, with firms exerting pressure on each other to conform to their preferred technological solutions. This can lead to tensions and conflicts within the relationship, undermining trust and cooperation among supply chain partners (Fang et al., 2011; McCarter and Northcraft, 2007; Kumar, 1996; Fawcett et al., 2012; Wilhelm, 2011; Spekman and Carraway, 2006). Thus, while technological capability holds the potential to enhance collaboration, its implementation must be carefully managed to avoid exacerbating power struggles and fostering discord within the supply chain. The research aims to explore how power dynamics mediate the relationship between technological capability and relationship performance in the manufacturing supply chain of Malaysia. By investigating this mediation effect, the study seeks to bridge the gap between Resource-Based View theory and power-dependency theory in the context of technological capabilities and inter-firm relationships (Latip, 2012; Latip et al., 2014; Ahmad, 2019; LI, 2014; Grimm et al., 2023). While previous studies have often treated power as a dependent variable, this research proposes to examine power as a mediator, offering a more comprehensive understanding of the dynamics between technological capabilities, power dynamics, and relationship performance. This approach is grounded in the recognition that power plays a significant role in shaping firm interrelationships, and integrating it as a mediator will enhance insights into the complex interactions between different theoretical perspectives (Meena et al., 2024; Petersen et al., 2008; Archpru Akaka et al., 2012). Through this study, the aim is to advance scholarly understanding of the mechanisms underlying supply chain dynamics and contribute valuable insights for both theory and practice in the field of supply chain management.

2. LITERATURE REVIEW

The evolution of buyer-supplier relationships traces back to the origins of trade itself, marking a fundamental aspect of human commerce. Over time, this relationship has matured into a pivotal element of business strategies, adapting alongside the changing nature of commerce (Wilson, 1995). Initially, businesses focused on selecting suitable partners throughout their lifecycle. However, as business practices evolved, attention shifted towards nurturing and maintaining existing beneficial relationships. This transition underscores the importance of continuity and sustainability in modern business dynamics, as firms recognize the value of long-term partnerships in achieving strategic objectives (Zerbini and Castaldo, 2007). Integrating Rahman and Bennett's insights (2009) into the discourse underscores the imperative for closer relationships within the contemporary business landscape. Factors like globalization and heightened market competition intensify pressures on firms to excel in areas such as cost efficiency, product quality, timely delivery, and technological innovation. Consequently, this heightened competitive environment underscores the necessity for robust inter-firm relationships, particularly with key suppliers. As such, fostering closer ties with suppliers becomes not only advantageous but often essential for firms striving to maintain competitiveness and meet evolving market demands. The essence of inter-firm relationships lies in the mutual benefits that accrue to the involved parties, as highlighted by prior research (Latip & Al-Hakim, 2011; Patrakosol & Lee, 2009). Dwyer et al., (1987) further elaborate on this notion, suggesting that firms engage in cooperative relationships with their primary suppliers in anticipation of various advantages. These collaborations often persist as long as both parties perceive tangible benefits arising from the alliance. This perspective underscores the dynamic and mutually beneficial nature of inter-firm relationships, which are sustained by the continual realization of shared value.

The significance of technological capability in fostering inter-firm relationship performance and ensuring competitiveness within the market is well-documented in the literature (Ehigie & McAndrew, 2005; Latip et al., 2013; Sheu et al., 2006; Tsai, 2004; Tyler, 2001; Wang et al., 2006). This capability empowers firms to leverage technological advancements to enhance their operational efficiency, innovate products and services, and ultimately achieve superior performance outcomes within collaborative relationships. Technological capability, in essence, represents a firm's ability to effectively utilize advanced tools and techniques to enhance its manufacturing processes, product quality, and overall operational efficiency (Ehigie & McAndrew, 2005; Sheu et al., 2006). With the rapid pace of technological innovation, firms must continuously upgrade their technological capabilities to remain competitive in the dynamic marketplace. This includes not only investing in cutting-edge hardware and software but also fostering a culture of

innovation and adaptation to leverage these technological advancements effectively. Moreover, technological capability extends beyond the mere possession of advanced equipment; it encompasses the integration of technology into various aspects of the firm's operations, including supply chain management, production planning, quality control, and customer relationship management (Tsai, 2004; Tyler, 2001). By harnessing the power of technology across these domains, firms can streamline processes, reduce costs, improve product quality, and respond more swiftly to market demands.

Technological capability plays a pivotal role in shaping a firm's competitiveness and performance within the manufacturing sector. As such, understanding the multifaceted nature of technological capability and its implications for inter-firm relationships is crucial for firms seeking to thrive in today's increasingly digital and interconnected business landscape. Power dynamics are inherent in buyer-supplier relationships within the supply chain, shaping the interactions and behaviors of the parties involved. Power, broadly defined, refers to the capacity of one party to influence the actions or decisions of another (Monczka et al., 2001). In the context of inter-firm relationships, power can manifest in various forms, such as control over critical resources, expertise, information asymmetry, or the ability to offer attractive alternatives (Ratnasingam, 2000). Within the supply chain context, power dynamics between buyers and suppliers play a crucial role in determining the nature and outcomes of their interactions. Doherty and Alexander (2006) expand on the definition of power to encompass how one partner can shape the behavior of another within the supply chain ecosystem. This power can stem from factors such as market position, financial strength, technological capabilities, or regulatory advantages. It is important to recognize that power dynamics in buyer-supplier relationships often entail a degree of dependency between the parties (Ratnasingam, 2000). While one party may wield greater influence or control in certain areas, they may also rely on the cooperation or compliance of the other party to achieve their objectives. As such, understanding and managing power dynamics is essential for fostering productive and sustainable relationships within the supply chain. The influence of power dynamics on inter-firm relationships has garnered significant attention from researchers, particularly within the context of buyer-supplier interactions. Access to scarce resources, whether they be technological expertise, market insights, or specialized capabilities, often translates into significant power for a partner within the relationship (Chong et al.,, 2008; Jun et al., 2000). While previous studies have explored the role of power in shaping inter-firm relationships (Chong et al., 2009; Doherty & Alexander, 2006; Ritter & Walter, 2006), there remains a gap in understanding how technological capability influences power dynamics and, subsequently, impacts relationship performance. By investigating this link, researchers can gain deeper insights into the mechanisms through which firms leverage their technological resources to exert influence and negotiate favorable terms within the supply chain. Examining the association between technological capability and power within inter-firm relationships offers valuable implications for both theory and practice. It sheds light on the strategic importance of technological investments in enhancing firms' competitive positioning and negotiating power within the marketplace. Additionally, it underscores the need for firms to strategically manage their technological assets to maximize their impact on relationship performance and overall business outcomes.

3. TECHNOLOGICAL CAPABILITY AND INTER-FIRM RELATIONSHIP PERFORMANCE

The recognition of technological capability as a critical resource for maintaining competitiveness aligns with the principles of the resource-based view (RBV) theory. According to RBV theory, firms compete based on the strategic deployment of their unique resources and capabilities (Wang et al., 2006). Sustainable competitive advantage, a central tenet of RBV theory, is seen as essential for long-term success and can be attained through the accumulation and strategic utilization of valuable resources, including technological capabilities (Tsai, 2004). In today's highly competitive business landscape, firms face relentless pressure to invest in cutting-edge technology and innovation to remain relevant and secure their position in the market. This imperative stems from the understanding that technological advancements not only drive operational efficiency but also enable firms to differentiate themselves from competitors, deliver superior products and services, and respond effectively to evolving customer needs and market trends (Wang et al., 2006). By leveraging their technological capabilities, firms can gain a competitive edge, enhance their market position, and achieve sustainable growth in the long run. Therefore, continuous investment in state-of-the-art technology and the development of technological expertise are imperative for firms striving to thrive in today's dynamic business environment.

The literature consistently highlights the pivotal role of superior technological capability in driving competency development and enhancing overall business performance. Studies by Jonker, Romijn, and Szirmai (2006) and Kim (2006) underscore how advanced technological expertise enables firms to effectively leverage new knowledge, thereby facilitating the development of core competencies essential for sustained competitive advantage. Moreover, superior technological capability empowers firms to innovate and introduce novel products and services to the market. Research conducted by Kam (1999), Lall (1992), and Tsai (2004) suggests that firms with advanced technological capabilities are better positioned to achieve efficiency gains and differentiation through process and product innovations. By continuously investing in research and development and adopting cutting-edge technologies, firms can streamline operations, enhance product quality, and introduce innovative offerings that meet evolving customer demands. In essence, the ability to harness superior technological capabilities not only drives competency development and innovation within firms but also enables them to achieve higher levels of operational efficiency and differentiation. As a result, firms with strong technological capabilities are better equipped to navigate competitive markets, adapt to changing industry dynamics, and sustain long-term growth and profitability.

The application of the resource-based view (RBV) theory extends beyond the internal resources of a firm to encompass its relationships with external partners, including those within the supply chain. Within this framework, cooperative

relationships between firms are seen as strategic assets that contribute to competitive advantage (Ramaseshan et al., 2006). Cooperative relationships, particularly within the context of supply chain partnerships, are instrumental in enhancing a firm's competitive position by facilitating various strategic objectives. For instance, such alliances can ensure a stable and uninterrupted supply of materials, thereby reducing operational risks and enhancing efficiency (Jap & Ganeson, 2000). Moreover, the long-term nature of these relationships fosters trust, collaboration, and mutual understanding, which are valuable intangible assets that contribute to a firm's overall resource portfolio. From the RBV perspective, a firm's ability to cultivate and sustain long-term cooperative relationships can be viewed as a strategic resource that confers competitive advantage. These relationships represent a form of relational capital that is difficult for competitors to replicate, as it is built on trust, shared values, and interdependence (Ramaseshan et al., 2006). Therefore, firms that effectively manage and leverage their dyadic channel relationships as strategic assets are better positioned to achieve sustained competitive advantage in the marketplace.

The link between technological capabilities and the manufacturer-supplier relationship has been explored in various studies, shedding light on the role of technology in fostering closer collaboration between these entities. An example of such research is the study conducted by Angeles et al., (1998), which investigated the impact of electronic data interchange (EDI) implementation on the relationships between manufacturers and suppliers. Their findings, based on a sample of 128 firms in the USA, revealed that the adoption of EDI technology facilitated the development of closer cooperative relationships between manufacturers and suppliers. This study underscores the importance of technology in enhancing communication, coordination, and information sharing between supply chain partners. By leveraging technological capabilities such as EDI, firms can streamline their procurement processes, reduce lead times, and improve overall supply chain efficiency. Consequently, these advancements in technology can contribute to the strengthening of relationships between manufacturers and suppliers, ultimately leading to mutual benefits and competitive advantages for all parties involved. Vlosky et al., (2000) provide further support for the notion that the usage of extranets fosters closer partnerships between manufacturers and suppliers. Their argument revolves around the idea that firms which consistently deliver superior benefits are held in high esteem by other members within the supply chain. Consequently, these firms are more likely to commit themselves to the establishment, development, and maintenance of strong relationships with their supply chain partners.

This perspective highlights the role of technology, specifically extranets, in facilitating collaboration and cooperation between manufacturers and suppliers. Extranets provide a secure platform for sharing information, coordinating activities, and conducting transactions, thereby strengthening the bonds between supply chain participants. As a result, firms that leverage extranet technology effectively are better positioned to cultivate enduring partnerships with their suppliers, leading to enhanced efficiency, responsiveness, and competitiveness across the supply chain. The study conducted by Boeck and Wamba (2008) delves into the relationship between a firm's technical resource, specifically radio frequency identification (RFID), and manufacturer-supplier relationships within the retail supply chain. Through structured, semi-structured, and non-structured interviews involving 52 individuals from various sectors of the retail supply chain, the researchers uncovered several noteworthy implications of technological capability on these relationships. Firstly, the utilization of RFID technology enabled enhanced communication and information sharing both upstream and downstream in the supply chain. This facilitated smoother coordination of activities and improved visibility of inventory levels and movement. Secondly, the adoption of RFID fostered closer cooperation among supply chain members, as they anticipated shared benefits derived from the system's implementation. This collaborative mindset contributed to the establishment of mutually beneficial relationships characterized by trust and reciprocity. Thirdly, RFID technology augmented the overall value of these relationships by providing additional access to pertinent information for all stakeholders in the supply chain. This enhanced transparency and data availability enabled more informed decision-making and improved performance outcomes. Boeck and Wamba (2008) assert that technological capability, exemplified by the use of RFID, engenders positive interrelationships among supply chain members. Moreover, they suggest that technological advancements have the potential to streamline supply chain operations and create new opportunities for collaboration, thereby amplifying the benefits derived from these relationships compared to counterparts not leveraging such technology.

4. THE ROLE OF POWER

Power dependence theory, as articulated by Emerson (1962), posits that power within a relationship channel is contingent upon the mutual dependency of organizations involved. This theory elucidates how power dynamics emerge as a result of inter-organizational reliance. According to this framework, firms seek to influence each other's behaviors within a relationship, and power manifests when one firm possesses unique resources essential to the other party's operations. Scholars have warned about the potential power imbalances that may arise in relationships due to the deployment of technology-driven capabilities. This concern is rooted in the premise that disruptions in manufacturer-supplier exchanges can occur when one party acquires technological advantages. Such disruptions often stem from shifts in power dynamics within the relationship. For instance, Coughlan et al. (2001) argue that information technology significantly influences a firm's bargaining power within supplier-manufacturer relationships. Vlosky et al., (2000) have observed that the adoption of technological capabilities, such as radio frequency identification (RFID), can introduce power imbalances within supply chain relationships, potentially influencing the interdependency among parties involved. They argue that such imbalances can create an unfair dynamic within relationships, as more powerful firms may gain undue leverage, thereby dominating the relationship landscape. This disparity in power may lead to perceptions of unfair advantage among members of the supply chain, affecting their competitive positioning.

Furthermore, Vlosky et al. (2000) suggest that the possession of distinct technological capabilities can alter the power-dependence dynamics between supply chain partners. They propose that continual enhancements in technological capabilities may strain relationships within the supply chain, as the use of power could precipitate conflicts in inter-organizational interactions. Thus, they caution that while technological advancements offer benefits, they also have the potential to disrupt the equilibrium of power within supply chain relationships. The power dependency theory's premise of power imbalance can be utilized to explore the dynamic between technological capability and power within inter-firm relationships. Ryssel et al., colleagues (2004) argue that the integration of technology can indeed foster disparities in power within such relationships. Consequently, it is posited by scholars that technological advancements may heighten one party's reliance on another, consequently generating a lopsided power dynamic wherein one partner wields the authority to dictate the terms of the relationship to their advantage. This notion aligns with the views expressed by Anderson and Narus (1990) as well as Ke et al. (2009), who suggest that technological capability may engender a shift in power dynamics, potentially leading to asymmetrical relationships between partners. the power dependency theory's premise of power imbalance can be utilized to explore the dynamic between technological capability and power within inter-firm relationships. Ryssel et al., colleagues (2004) argue that the integration of technology can indeed foster disparities in power within such relationships. Consequently, it is posited by scholars that technological advancements may heighten one party's reliance on another, consequently generating a lopsided power dynamic wherein one partner wields the authority to dictate the terms of the relationship to their advantage. This notion aligns with the views expressed by Anderson and Narus (1990) as well as Ke et al. (2009), who suggest that technological capability may engender a shift in power dynamics, potentially leading to asymmetrical relationships between partners. While the power-dependency theory implies that technological capability can induce power dynamics within relationships, it's essential to recognize that power isn't inherently negative. In fact, it can serve as a catalyst for enhancing inter-firm relationships and overall business performance. Arend and Wisner (2005) highlight that power can be leveraged positively to foster collaboration and drive mutual benefits between partners. Thus, while technological capability may introduce power imbalances, it's how organizations navigate and utilize this power that ultimately shapes the outcomes of their relationships. The relationship between technological capability and non-mediated power in inter-firm relationships is a critical aspect that merits further exploration. Non-mediated power, which encompasses factors such as expertise, reputation, and trust, plays a pivotal role in shaping the dynamics of collaborative relationships within supply chains.

Technological capability can serve as a potent source of non-mediated power, bolstering a firm's expertise and credibility within the industry. For instance, firms that possess advanced technological know-how may be perceived as leaders or innovators in their field, garnering respect and admiration from their peers and partners (Zhao et al., 2008). This enhanced reputation can translate into greater influence and sway in decision-making processes, as well as increased opportunities for collaboration and partnership. Moreover, technological capability can contribute to the development of trust and confidence among supply chain members. By demonstrating proficiency in leveraging technology to drive efficiency, quality, and innovation, firms can instill a sense of reliability and dependability in their relationships. This, in turn, fosters a climate of cooperation and mutual respect, where partners feel confident in each other's abilities to deliver on their commitments and obligations (Arend & Wisner, 2005). Furthermore, the presence of non-mediated power stemming from technological capability can facilitate the establishment of shared norms and values within the supply chain. As firms recognize and acknowledge each other's expertise and contributions, they are more likely to align their goals, priorities, and behaviors in pursuit of common objectives. This alignment strengthens the cohesion and resilience of the relationship, enabling partners to navigate challenges and capitalize on opportunities more effectively (Frazier & Summers, 1986 cited in Zhao et al., 2008). In essence, the nexus between technological capability and non-mediated power underscores the interconnectedness of expertise, reputation, and trust in driving successful inter-firm relationships. By recognizing and leveraging the power inherent in their technological prowess, firms can cultivate robust, collaborative partnerships that fuel innovation, growth, and competitive advantage in the dynamic landscape of modern business.

In support of this argument, Zhao et al. (2008) conducted research on the impact of power on relationship commitment within the context of the integration between manufacturers and customers in a supply chain. Their findings, based on 617 manufacturing companies in China, divulge that expert power and referent power are important in improving manufacturers' relationship commitment. Specifically, a dominant firm with expert power is expected to contribute their skills, knowledge, and expertise (in this case technology) with their suppliers, which, in turn, will benefit them in the relationship. In other words, firms that hold expert power may influence other firms' behavior based on its superior expertise. Additionally, firms with referent power, whose goals are common with their suppliers and are often seen as a reference group, might influence their suppliers in a manner seen beneficial to them in the relationship. These findings underscore the significance of both expert power and referent power in fostering stronger relationship commitment among supply chain partners. Maloni and Benton (2000) argue on the impact of power on performance, contending that the manufacturer-supplier relationship may significantly enrich performance. Given that non-mediated power is perceived to improve inter-firm relationships, it may also positively affect relationship performance. This argument is based on research by Brown et al., (1995), which established that the use of non-mediated power embellishes the suppliers' opinion of the manufacturer's performance, as they perceive that the manufacturer holds more powerful resources in the relationship. Stern and Reve (1980) also support this notion, arguing that firms with dominant power enjoy better prosperity, and power-enhanced cooperation in the relationship will lead to increased overall profitability.

These insights highlight the potential positive impact of non-mediated power on relationship performance in the manufacturer-supplier context.

In summary, the arguments presented above unveil the theoretical and potential empirical linkages between technological capability, power, and inter-firm relationship performance. Within the supply chain environment, firms can reap various benefits such as information sharing, joint decision-making, business process integration, and knowledge sharing (Jasperson et al., 2002; Kim, 2006; Latip and Al-Hakim, 2011; Latip et al., 2013). However, a power-dominant firm is expected to exert its influence, which may be perceived as exerting extra pressure by the target firm (Ke et al., 2009). Despite this, there is a notable absence of research investigating the mediating effect of a firm's power on the relationship between technological capabilities and inter-firm relationship performance. This research gap inhibits the advancement of knowledge in this area, underscoring the importance of elucidating the impact of technology on a firm's power, particularly within the manufacturer-supplier context.

5. RESEARCH METHODOLOGY

Utilizing a quantitative approach in this study allows for the exploration of the impact of technological capability on power and relationship performance. Singh (2007) defines the quantitative approach as a research method focused on determining relationships between sets of independent and dependent variables to address research questions. Given that this study aims to describe relationships rather than establish causation among technological capability, power, and relationship performance, the selection of a quantitative approach aligns with the descriptive nature of the research. This approach is consistent with the perspective of Singh and other scholars cited, supporting its appropriateness for the study's objectives. The statistical analysis in this study will predominantly rely on the use of structural equation modeling (SEM). This approach is deemed appropriate as it allows for the utilization of confirmatory factor analysis, enabling the researcher to assess the contribution of each individual item and determine the reliability of the scale in measuring the concept (Hair, Black, Babin, & Anderson, 2009). The target population for this study will encompass all manufacturing companies across various manufacturing subsectors listed in the Federation of Malaysian Manufacturers (FMM) Directory 2013. Since the directory lists companies alphabetically by manufacturing subsectors rather than by firm size, the researcher intends to employ a simple random sampling technique to select a sample of respondents to represent the population of the manufacturing sector.

This study will utilize a survey questionnaire technique to collect primary quantitative data. The research intends to employ 5-point Likert scales ranging from 1 to 5, representing the spectrum from 'strongly disagree' to 'strongly agree', to measure various dimensions of technological capability, power, and relationship performance within the manufacturing supply chain. The use of constant metric values in these scales aims to capture respondents' reactions to specific statements (Kothari, 2004; Singh, 2007). To ensure the reliability and validity of the survey instruments, items for measuring variables will be adapted and adopted from prior research. These instruments will undergo preliminary testing by supply chain professionals, and any necessary revisions will be made to enhance their validity and reliability.

This study will employ a series of statistical methods to analyze the data. Initially, the analysis will begin with assessing the goodness of the data by examining the reliability and validity of the measures. Descriptive statistics will then be used to evaluate the normality of the data and identify any potential outliers. Subsequently, confirmatory factor analysis (CFA) will be conducted to elucidate how different measured items represent the constructs. Hair et al. (2009) assert that CFA constitutes the first part of a comprehensive test of the structural model, allowing researchers to validate or refute the preconceived theory. CFA elucidates how different measured items represent the constructs, closely related to the construct validity of a proposed measured theory. This is crucial because construct validity reflects the accuracy of the measurement items by demonstrating how a set of measurement items represents the theoretical latent construct they are designed to measure. The measured theory is assumed to be supported when the analysis demonstrates construct validity, confirming the fitness of CFA models.

The subsequent step involves conducting a line goodness-of-fit (GOF) test to establish the validity of the measurement model and provide evidence of construct validity. Line GOF, determined through chi-square testing, assesses how well the model reproduces the covariance matrix among the indicator items, essentially measuring the disparity between observed and covariance matrices (Hair et al., 2009). Following this, specifying the structural model becomes crucial, involving the assignment of relationships from one construct to another based on the proposed theoretical model. At this stage, the path model will represent both the measurement and structural components of SEM, depicting the complete set of constructs and indicators in the model along with the structural relationships among them. The final step involves testing the structural model's validity to uncover how constructs such as technological capability, power, and relationship performance, as proposed in the theories, truly relate to one another. This assessment can be conducted by examining the goodness-of-fit (GOF) of the model and the significance, direction, and size of structural parameter estimates. Once the validity of the structural model has been established, substantive conclusions and recommendations can be drawn based on the findings of the study. These conclusions and recommendations will provide valuable insights for practitioners and policymakers in the field of manufacturing supply chain management.

6. CONTRIBUTION

The study is anticipated to provide valuable insights into the mediation effect of power on the relationship between technological capability and relationship performance within the manufacturing supply chain context. By examining these relationships, the study aims to contribute to the existing body of knowledge in the field of supply chain management and shed light on the intricate dynamics between technological capabilities, power dynamics, and

relationship performance. The findings of this study have the potential to inform strategic decision-making processes within manufacturing firms, particularly in terms of how they leverage technological capabilities to enhance their relationships with suppliers and ultimately improve performance outcomes. Additionally, the study may offer implications for policymakers and practitioners seeking to optimize supply chain management practices in an increasingly competitive and dynamic business environment. The insights generated from this study can indeed offer valuable contributions to manufacturing companies. By understanding the implications of technological capability on firms' power dynamics and relationship performance, manufacturing firms can make more informed decisions regarding their investments in technological advancements. This knowledge can help them strategically leverage their technological capabilities to strengthen their positions within the supply chain, enhance collaboration with suppliers, and ultimately improve performance outcomes. Furthermore, the study may provide guidance on how manufacturing firms can effectively navigate power dynamics within their relationships with suppliers. Armed with this understanding, firms can develop strategies to mitigate potential risks associated with power imbalances and foster more equitable and mutually beneficial partnerships with their suppliers. The contributions of this study extend beyond academia and have practical implications for manufacturing firms seeking to enhance their competitiveness and sustainability in today's rapidly evolving business landscape. The findings of this study can serve as a valuable resource for policymakers and government officials involved in shaping the direction of Malaysia's manufacturing sector. By gaining insights into the current status of technological capability within the manufacturing industries, policymakers can identify areas of strength and areas requiring improvement. This information can inform the development or refinement of policies aimed at promoting innovation, technological advancement, and competitiveness within the manufacturing sector. Additionally, policymakers can use the insights from this study to tailor support programs and initiatives to address specific needs and challenges faced by manufacturing firms in enhancing their technological capabilities. For example, targeted funding or incentives could be offered to encourage investment in research and development, technology adoption, and skills training. Furthermore, by understanding the relationship between technological capability, power dynamics, and relationship performance, policymakers can develop strategies to foster a conducive environment for collaboration and innovation within the manufacturing supply chain. This may include initiatives to facilitate knowledge sharing, promote industry-academia collaboration, and enhance networking opportunities among manufacturing firms and their suppliers. Overall, the findings of this study can play a vital role in informing evidence-based policymaking aimed at driving the sustainable growth and competitiveness of Malaysia's manufacturing sector in the long term.

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