The architecture of marketing leadership: how different structures of marketing presence in the top management team drive new product performance

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Abstract

Purpose – Prior research seldom explores the different structures of marketing presence in the top management team (MPTMT) and their impact on new product performance. In this paper, we distinguish among three structures of MPTMT: (1) a dedicated MPTMT; (2) a joint marketing and sales MPTMT; and (3) a joint marketing and other operations MPTMT. We then examine how these three structures of MPTMT are related to cross-functional integration in NPD and, subsequently, new product performance.

Design/methodology/approach – Path analysis is used to test the model using data collected from 139 U.S. manufacturing firms. We conducted two rounds of survey data collection (with a one-year gap) to assess the potential effect of common method variance.

Findings – The results show that, compared with no MPTMT, all MPTMT structures positively affect cross-functional integration in NPD, which, in turn, enhances new product performance. However, joint MPTMT structures have a greater impact than a dedicated MPTMT. Our moderation analysis also reveals that as TMT heterogeneity increases, the effect of dedicated MPTMT diminishes, but the effects of the other two joint structures remain positive and stable.

Research limitations/implications – The model could include alternative mediating organizational processes and performance outcomes.

Practical implications – The findings provide managers with insight on how to configure and leverage marketing influence in the upper echelons in both SMEs and large firms.

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Ethical approval was obtained from a previous institution where the first author was affiliated before initiating data collection. Clear information regarding the research objectives and scope was communicated to all participants before they proceeded to respond to the survey. Every participant willingly provided their informed consent before taking part in the study.

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Originality/value – The findings of this study highlight the importance of delineating MPTMT structures, understanding how they create value, and specifying their boundary conditions.

Keywords Chief marketing officer, Marketing and sales integration, Top management team heterogeneity, Cross-functional integration, New product performance, SMEs

Paper type Research paper

Introduction

A marketing presence in the top management team (hereinafter MPTMT) denotes the inclusion of an executive with responsibility for managing the firm's marketing function. The influence of MPTMT on firm performance has sparked considerable debate in the marketing literature over the years. While early studies cast doubts regarding its effect (e.g. Boyd *et al.*, 2010; Nath and Mahajan, 2008), recent research indicates that MPTMT can significantly influence performance, contingent upon specific firm characteristics and performance metrics (e.g. Germann *et al.*, 2015; Nath and Bharadwaj, 2020). In light of the mixed results, scholars underscore the importance of delving deeper into the intricate relationships between MPTMT and the critical processes of marketing (Brower and Nath, 2018; Whitler *et al.*, 2018) that may act as mediators in MPTMT's contribution to a firm's competitiveness (Feng *et al.*, 2015).

However, research that addresses this critical area is scant. For the most part, previous studies have focused on modelling the direct relationship between MPTMT and overall firm performance. Moreover, the extant literature often neglects the different structures of MPTMT and their impact on marketing processes and in turn, performance. Most research assumes that MPTMT is exclusively represented by executives with marketing titles (e.g. Nath and Mahajan, 2011; Nath and Bell, 2016), overlooking that in practice, marketing activities are often led by executives without traditional marketing job titles. For instance, Bennett and Miles (2006) highlight that in many organizations, the Chief Operating Officer (COO) frequently oversees marketing responsibilities. Homburg *et al.* (2015) illustrate that the sales function often takes charge of crucial marketing decisions. Similarly, Blachetta and Kleinaltenkamp (2018) show that in business-to-business firms, marketing activities can fall under various functional areas. Thus, past findings might risk underrepresenting or misconstruing the actual influence of MPTMT in firms. It is crucial for both academics and industry practitioners to develop a more complete understanding of how marketing leadership is structured within top management teams and the effect of these leadership structures on a company's operations. This knowledge is essential to accurately recognize and leverage the strategic importance of marketing professionals in the upper tiers of corporate management.

To fill these gaps, our study builds upon prior research to distinguish among three predominant structures of MPTMT: (1) a dedicated MPTMT (i.e. marketing led by a top manager dedicated to marketing; (2) a joint marketing and sales MPTMT (i.e. marketing led by a top manager responsible for both sales and marketing); and, (3) a joint marketing and other operations MPTMT (i.e. marketing led by a top manager responsible for general or operations management). We then assess the impact of these different MPTMT structures on a critical area of marketing operation: new product development (NPD). Specifically, we examine how these MPTMT structures influence a firm's cross-functional integration – an essential process of NPD – and, in turn, new product performance.

We further examine how TMT heterogeneity may moderate these relationships. TMT heterogeneity, representing diversity within a top management team, is a core upper echelons characteristic that influences organizational processes and outcomes (Hambrick, 2007). Recent research suggests that the impact of TMT heterogeneity may interact with the structural characteristics of TMT (Hambrick *et al.*, 2015). Through this examination, we aim

to deepen our understanding of the conditions under which different structures of MPTMT become more or less effective in promoting cross-functional integration in NPD.

Our research makes several contributions to the marketing literature. First, it responds to the literature's call to explore the mechanisms through which MPTMT drives competitive advantage (Bommaraju *et al.*, 2019; Brower and Nath, 2018; Whitler *et al.*, 2018) by clarifying the relationships among MPTMT, cross-functional integration, and new product performance. Second, our study distinguishes between various MPTMT structures, revealing their diverse impacts on firms. Thus, our results enrich the MPTMT literature, providing fresh insights into structuring marketing leadership within the TMT to enhance a firm's value (Whitler *et al.*, 2021). Furthermore, by investigating the moderating role of TMT heterogeneity, our research enhances the understanding of contextual boundaries that influence the impact of various MPTMT structures, aligning with the calls to explore the factors that affect the MPTMT-performance relationship (Moorman and Day, 2016). In addition, by including both SMEs and large firms in our sample, our study complements and extends prior research, thereby enhancing the generalizability of findings on MPTMT's value. Finally, while existing studies have drawn links between functional integration and NPD effectiveness at the operational level (e.g. Cometto *et al.*, 2016; Mostaghel *et al.*, 2019), the influence of integrating marketing and other functional leadership roles at the top management level on NPD process and performance remains underexplored (Whitler *et al.*, 2021). We shed light on this issue in our study.

Theoretical framework and hypotheses

Advocacy for the presence of an executive(s) in the TMT with responsibility for managing the firm's marketing function was noted decades ago (e.g. Hise, 1965; Piercy, 1986), but marketing scholars have only recently begun to systematically investigate the impact of MPTMT in a firm (Whitler *et al.*, 2021). The primary theoretical lens for understanding MPTMT's influence is the upper echelons theory, which posits that a firm's strategic choices and outcomes are shaped by the TMT's characteristics (Hambrick, 2007). The argument for the impact of MPTMT relates to the most frequently debated area in this literature – the characteristics of functional backgrounds of TMT members (Brower and Nath, 2018; Cannella *et al.*, 2008). It suggests that with MPTMT, TMTs are more likely to allocate attention, resources, and commitment to customer-value creation activities, thus enhancing firm performance.

Different structures of MPTMT

Our review of empirical studies on the impact of MPTMT (see Table 1) reveals that past research mainly considers the presence of marketing in the TMT if a C-suite marketing title (e.g. CMO; VP, Marketing) is found within the firm (e.g. Boyd *et al.*, 2010; Feng *et al.*, 2015; Germann *et al.*, 2015). This approach assumes an absence of marketing influence in the TMT if the title does not include salient marketing terms such as "customer" or "brand". However, a TMT member without marketing terms in his/her title can be responsible for marketing. Bennett and Miles (2006) indicate that it is not uncommon for COOs to handle marketing responsibilities. Homburg *et al.* (2015) report that sales departments often play a crucial role in making marketing decisions. In addition, Blachetta and Kleinaltenkamp (2018) demonstrate that in the context of business-to-business firms, marketing responsibilities are sometimes dispersed across different operational functions. Beckman and Burton (2008) observe that in many firms, especially smaller ones with fewer top management team members, two or more business functions are often merged at the executive level. However, perhaps because previous studies mainly focus on large publicly traded firms, distinctions among different structures of MPTMT that reflect a wider variety of firms are not made.

Table 1.
Chronological overview of key empirical studies on the impact of MPTMT

Authors (date and journal)	Data source	Firms in the sample	MPTMT independent variable(s)	Outcome variable(s)	Key findings	Captures different structures of MPTMT?	Tests the mediating mechanism(s) between MPTMT and performance?
Nath and Mahajan (2008, JM)	Database	167 firms with sales of at least $250 million in 2002	CMO presence: The presence or absence of an executive with a marketing title in TMT	Firm performance (sales growth and Tobin's q)	• No significant impact of MPTMT on firm performance	No	No
Boyd *et al.* (2010, JMR)	Database	88 CMO announcements made by publicly traded firms	CMO appointee experience as a CMO CMO appointee experience with the appointing firm	Firm performance (stock price movement after appointment)	• The impact of CMO appointee is mixed and is contingent upon the types of experience and customer power	No	No
Nath and Mahajan (2011, JM)	Database	167 firms with sales of at least $250 million in 2002	CMO power in TMT (estimated by the levels and size of the TMT) CMO who is also responsible for sales: Whether the word "sales" was present in the CMO's title	Firm performance (sales growth and return on sales)	• CMO power in TMT has no direct effect on performance outcomes • CMO responsible for sales has a positive effect on sales growth	Yes, but only based on marketing job titles	No
Feng *et al.* (2015, JM)	Database	612 publicly traded firms with an average of $8.4 billion in assets	Marketing power (count of, compensation, rank and responsibilities of marketing-titled executives in the TMT)	Marketing capabilities (i.e. SG&A expenses); firm performance (ROA and TSR)	• Marketing power affects firm performance, mediated by marketing capabilities	No	Yes, using marketing expenses as a proxy for marketing capability

(*continued*)

Table 1.

Authors (date and journal)	Data source	Firms in the sample	MPTMT independent variable(s)	Outcome variable(s)	Key findings	Captures different structures of MPTMT?	Tests the mediating mechanism(s) between MPTMT and performance?
Germann *et al.* (2015, JM)	Database	155 publicly traded firms with sales of at least $250 million in 2002	CMO presence: The presence or absence of an executive with a marketing title in TMT	Tobin's q; systematic risk; idiosyncratic risk; sales growth	• CMO presence is positive on Tobin's Q, but less related to other performance measures. A list of contingencies is discussed	No	No
Nath and Bell (2016, JMC)	Database	224 *Fortune 500* firms	Marketing/PR integration (MPRI) in the TMT: A senior-level executive who is responsible for both marketing and public relations	Reputation; profitability	• MPRI is positively related to reputation • The impact of MPRI on profitability is positive only in service-oriented firms	Yes, but only based on marketing job titles	No
Brower and Nath (2018, ML)	Database and survey	117 of the 3,000 largest publicly traded U.S. firms	CMO presence: The presence or absence of an executive with a marketing title in TMT	Market orientation	• The effect of CMO presence is insignificant • The effect of the interaction between CMO presence and marketing experience in the TMT is positive	No	No
Whitler *et al.* (2018, JM)	Database	1,091 firms listed in the S&P 1500 between 2007 and 2012	CMO presence: The presence or absence of an executive with a marketing title in TMT	Revenue growth; Tobin's q; TSR (total shareholder return); ROA	• CMO presence positively affects Tobin's Q and TSR	No	No

(*continued*)

Table 1.

Authors (date and journal)	Data source	Firms in the sample	MPTMT independent variable(s)	Outcome variable(s)	Key findings	Captures different structures of MPTMT?	Tests the mediating mechanism(s) between MPTMT and performance?
Bommaraju *et al.* (2019, JM)	Database	329 firms listed in S&P 900 between 2007 and 2015	Marketing personnel presence in the TMT: Whether a member with a marketing title is in TMT	Firm performance (Tobin's q)	• Marketing personnel presence in the TMT positively affects performance. In addition, the presence doesn't weaken the positive impact of customer on the board on performance	No	No
Srinivasan and Ramani (2019, JM)	Database	781 publicly traded firms in the U.S. between 2000 and 2015	Marketing power (Count of, compensation, rank and responsibilities of marketing-titled executives in the TMT) Presence of CEO with marketing background	Myopic marketing spending; myopic revenue management	• With a marketing CEO, an increase in marketing power decreases the likelihood of both myopic marketing spending and myopic revenue management	No	No

(*continued*)

Table 1.

Authors (date and journal)	Data source	Firms in the sample	MPTMT independent variable(s)	Outcome variable(s)	Key findings	Captures different structures of MPTMT?	Tests the mediating mechanism(s) between MPTMT and performance?
Vaid *et al.* (2020, IMM)	Database	820 executive appointment announcements (436 of which being marketing and sales) in firms traded on U.S. public exchanges	Announcements of marketing-only, sales-only, and joint marketing and sales appointments	Abnormal return	• Marketing-only appointment announcements generate positive abnormal stock returns • Sales-only appointment announcements generate positive abnormal returns only in the absence of marketing-only appointments • Joint marketing and sales appointment announcements negatively affect abnormal stock returns	Yes, but only based on marketing job titles	No

(*continued*)

Table 1.

Authors (date and journal)	Data source	Firms in the sample	MPTMT independent variable(s)	Outcome variable(s)	Key findings	Captures different structures of MPTMT?	Tests the mediating mechanism(s) between MPTMT and performance?
Winkler *et al.* (2020, JAMS)	Database	627 new ventures from 2013 to 2016, combining data from Crunchbase, Twitter, and Amazon Alexa web information services	CMO personality traits (openness to experience, extraversion, conscientiousness, neuroticism and agreeableness)	Web traffic (to the new venture's website)	• Extraversion is positively related to web traffic, while conscientiousness and neuroticism are negatively related to web traffic. The other two traits have no impact on web traffic • The interactions of these traits and the new venture's maturity affect web traffic	No	No

(*continued*)

Table 1.

Authors (date and journal)	Data source	Firms in the sample	MPTMT independent variable(s)	Outcome variable(s)	Key findings	Captures different structures of MPTMT?	Tests the mediating mechanism(s) between MPTMT and performance?
Nath and Bharadwaj (2020, JAMS)	Database	401 public U.S. firms in the COMPUSTAT Database from 2009 to 2013	CMO presence: the presence or absence of an executive with a marketing title in TMT	Firm performance	• CMO presence has a positive effect on firm performance • Chief sales officer presence strengthens the effect of CMO under high industry sales volatility • Chief technology officer presence enhances the effect of CMO presence when industry innovation is high • Chief supply chain officer presence amplifies the effect of CMO presence under high firm diversification	No	No

(*continued*)

Table 1.

Authors (date and journal)	Data source	Firms in the sample	MPTMT independent variable(s)	Outcome variable(s)	Key findings	Captures different structures of MPTMT?	Tests the mediating mechanism(s) between MPTMT and performance?
Kumar *et al.* (2021, JIBS)	Database	297 firms in the COMPUSTAT Database from 2007 to 2016	Strategic, operational, and financial discretion of the CMO	Internationalization of the MNE	• Internationalization increases at a diminishing rate with the increase of CMO's strategic, operational, and financial discretion • The TMT's international experience amplifies the effects of the CMO's operational and financial discretion • CMO equity compensation strengthens the impact of strategic discretion	No	No

(*continued*)

Authors (date and journal)	Data source	Firms in the sample	MPTMT independent variable(s)	Outcome variable(s)	Key findings	Captures different structures of MPTMT?	Tests the mediating mechanism(s) between MPTMT and performance?
Current study	Survey	139 SMEs and large firms in the U.S.	Dedicated MPTMT, joint marketing and sales MPTMT; joint marketing and other operations MPTMT	Cross-functional integration, NPD performance	• All MPTMT configurations, when compared to the absence of MPTMT, positively influence cross-functional integration in NPD, thereby improving new product performance • Joint MPTMT structures have a greater positive impact than a dedicated MPTMT. • As TMT heterogeneity increases, the positive effect of a dedicated MPTMT weakens more than those of the other two MPTMT structures	Yes, based on who is responsible for marketing in the TMT	Yes

Source(s): Authors' own creation

Table 1.

We reason that prior literature may have captured MPTMT in too narrow a manner. Drawing from insights from prior literature (e.g. Bennett and Miles, 2006; Homburg *et al.*, 2015), we distinguish among three common structures of MPTMT in this study. The first structure is when a marketing executive with a dedicated marketing role is present in the TMT. Examples of these titles include CMO and VP, Marketing. The second is when sales and marketing are combined or a sales executive in the TMT is responsible for the marketing function. Examples include VP, Sales and Marketing, or VP, Sales. The third structure of MPTMT is when other types of TMT members are responsible for marketing. Examples include COO or VP, Operations.

MPTMT and NPD

To understand how the different configurations of MPTMT might influence a firm, we turn to the effect of MPTMT on NPD. NPD represents a crucial activity for creating customer value, therefore, should be subject to the influence of MPTMT. However, as shown in our review of the key MPTMT studies (Table 1), prior research has not investigated the impact of MPTMT on NPD performance or the mechanisms through which MPTMT could affect such a vital source of competitive advantage in marketing.

In this study we investigate the impact of different structures of MPTMT on cross-functional integration in NPD because (1) cross-functional integration is an essential value-creation process in NPD (Nakata and Im, 2010); and (2) it is an important NPD process that could be influenced by the TMT (Gonzalez-Zapatero *et al.*, 2016). Cross-functional integration is defined as the extent of integration across the functional units in the process of creating new products (Ramaswami *et al.*, 2009). We further assess the moderating effect of TMT heterogeneity on the relationship between MPTMT structures and cross-functional integration. We then link these relationships to new product performance. Overall, our model conceptualizes and tests a potential path of influence between different structures of MPTMT and new product performance through cross-functional integration. The research model is shown in Figure 1.

MPTMT and cross-functional integration. To begin, we posit that an MPTMT promotes cross-functional integration by, first, supporting a market-oriented culture within the firm (Brower and Nath, 2018; Wiedeck and Engelen, 2018). A market-oriented culture helps

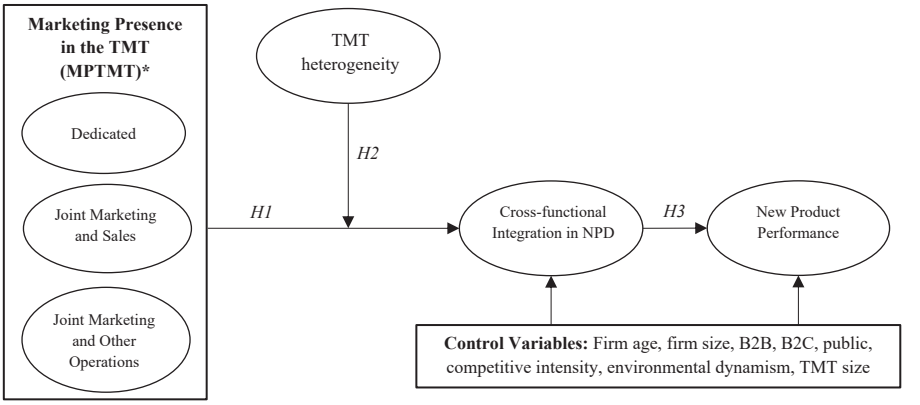

Figure 1.
Research model

Note(s): * 'No MPTMT' serves as the baseline of the model
Source(s): Authors' own creation

provide shared goals and integrate functions around the needs of customers (Gonzalez-Zapatero *et al.*, 2016). An MPTMT can also help mobilize top management's support for customer-value creation mechanisms such as NPD by providing market-based input (e.g. knowledge) to decision-makers in the TMT. The resulted support from the TMT is considered an important enabler of cross-functional integration (Hult, 2011). Finally, Boyd *et al.* (2010) argue that an MPTMT enhances the relationship between the firm and external stakeholders, such as alliance partners. This is important because cross-functional integration often involves cooperation between internal functions and external parties such as suppliers (Ferreira *et al.*, 2019). Therefore, we hypothesize that:

H1a. Compared to no MPTMT, all structures of MPTMT are positively related to cross-functional integration.

However, an MPTMT can manifest in different structures which might lead to varying influences. Prior research suggests that the dedicated MPTMT executive may struggle to gain cooperation within the TMT (Germann *et al.*, 2015; Whitler and Morgan, 2017). One key reason is that many marketing roles are boundary-spanning (Day, 1994), therefore a dedicated MPTMT (e.g. CMO) must negotiate and request authority that touches upon other TMT members' territories of operation. In addition, the distinct thought worlds possessed by marketing and other function's leaders can also be a source of communication barriers (Homburg and Jensen, 2007). These political and cognitive challenges can trigger high tensions between CMOs and other senior-level managers (Whitler and Morgan, 2017). These tensions might significantly distract the executives' attention away from collective customer-value creation and, therefore, hinder the impact of a dedicated MPTMT on cross-functional integration.

In contrast, having a joint marketing and sales MPTMT may have additional advantages in strengthening cross-functional integration. This joint structure helps facilitate communication between the sales and marketing functions, reducing unproductive conflicts between these two critical functions (Rouziès *et al.*, 2005). A joint marketing and sales MPTMT also commands greater power within the TMT, making negotiation for cooperation with other functional leaders more effective. Furthermore, because the sales function represents another prime source of market knowledge, sales and marketing together have access to critical knowledge resources that might not otherwise be accessible by marketing alone (Speier and Venkatesh, 2002). Research, such as Workman (1993), indicates that both hard (more coercive) and soft (less coercive) influence tactics are prevalent in the NPD process. However, possessing greater information power, as observed by Atuahene-Gima and De Luca (2008), typically leads marketing-related executives to engage in stronger coalition-building efforts and reduced reliance on coercive tactics. This approach tends to foster greater interpersonal ties and team cohesion, which are essential for cross-functional integration in NPD (Hirunyawipada *et al.*, 2015; Nakata and Im, 2010). In other words, the joint sale and marketing MPTMT structure is likely to have both the authority and power necessary to help align the interests and objectives of marketing with other operational units, thereby enhancing the focus on customer-value creation across the organization, including cross-functional integration in NPD (Dawes and Massey, 2005).

A joint marketing and other operations MPTMT can also be advantageous in bringing together distinct functions in NPD. NPD actively involves other non-market-facing functional units, such as engineering and research and development (Arnott *et al.*, 2007; Song *et al.*, 1997). The need for cooperation between marketing and these other functions is well documented in prior literature (Fisher *et al.*, 1997; Liu and Shi, 2020; Sleep and Hulland, 2019). Relative to a dedicated MPTMT, the joint marketing and other operations MPTMT should have increased authority and power (due to the possession of critical market and operational knowledge) in

the TMT. This joint structure should help promote integration between marketing and other functions in NPD. Together, these arguments suggest that:

H1b. The positive relationship between MPTMT and cross-functional integration is the weakest for a dedicated MPTMT.

The moderation effect of TMT heterogeneity. TMT heterogeneity captures the diversity in functional, educational, industry, and organizational backgrounds of the TMT members (Alexiev *et al.*, 2010; Heyden *et al.*, 2013). Past research has shown that a heterogenous TMT, characterized by higher cognitive diversity, is more likely to steer the organization towards exploration in NPD (Mehrabi *et al.*, 2021). However, the interaction between TMT heterogeneity and the different structures of MPTMT concerning cross-functional integration remains unexplored. While we acknowledge that a diverse TMT might provide an MPTMT with a broader understanding of diverse functional necessities and market dynamics (Hambrick *et al.*, 1996), paradoxically, this diversity could also undermine an MPTMT's ability to handle communication breakdowns and conflicts. This is because substantial variances in perspectives and experiences may provoke disagreements, instigate the formation of subgroups, and foster factionalism and power struggles (Carpenter and Fredrickson, 2001; Hambrick *et al.*, 2015). Given the key challenge of MPTMT is to align interests of senior leaders with different thought worlds to focus on customer value creation activities like NPD (Homburg and Jensen, 2007), these discordances could severely undermine the capacity of MPTMT to play the role of an integrating agent. This could obstruct the marketing leaders' ability to act and dilute an MPTMT's actual impact on cross-functional integration in NPD. In contrast, members of homogenous TMTs tend to preserve unity and circumvent social divisions (Barkema and Shvyrkov, 2007), thereby providing a more conductive environment for MPTMT to harmonize TMT members' efforts towards NPD. Given these considerations, we propose that TMT heterogeneity could negatively moderate the influence of MPTMT on cross-functional integration in NPD.

H2a. TMT heterogeneity weakens the impact of all structures of MPTMT on cross-functional integration.

We further contend that because a dedicated MPTMT is more likely to face challenges associated with political and cognitive conflicts in the TMT, as previously discussed in H1b, the negative moderating effect of TMT heterogeneity is most pronounced under this structure. Conversely, joint MPTMT structures have greater power and are better positioned to broker different thought worlds within the TMT. Therefore, they are better equipped to overcome miscommunication and resolve conflict in a heterogeneous TMT. Thus, while the positive impact of joint MPTMT structures on cross-functional integration may also be reduced in heterogeneous TMTs, these structures are still more likely to drive cross-functional integration in NPD compared to dedicated MPTMT. Accordingly, we hypothesize that:

H2b. The negative moderating effect of TMT heterogeneity is the strongest for dedicated MPTMT.

Cross-functional integration and new product performance. Cross-functional integration enhances a firm's ability to coordinate and incorporate diverse input in the creative process of developing new products (Cui and Wu, 2016). Effective cross-functional integration in NPD brings together different operations within an organization, as well as external stakeholders such as customers, end-users, and suppliers, to make sure that all necessary knowledge and resources are utilized in a coordinated manner. This helps ensure that the new products 1) meet the needs and expectations of customers and 2) are brought to market in a timely manner (Bendoly *et al.*, 2012; Bogers *et al.*, 2010). For this reason, Cooper (2019) views

cross-functional integration as a critical factor for the successful development and launch of new products. Previous research provides extensive evidence of the positive impact of cross-functional integration on new product success. For instance, Troy *et al.* (2008) conducted a meta-analysis of 25 empirical studies examining the relationships between cross-functional integration and new product performance, revealing a positive link between the two. Accordingly, our final hypothesis is:

H3. Cross-functional integration is positively related to new product performance.

Methodology

Data collection

Our data were obtained from U.S. manufacturing firms. We used the survey method because it allowed us to identify the locus of marketing leadership in the TMT, capture an organizational process that is difficult to measure with secondary data, and sample both SMEs and large firms, as secondary data for smaller firms is typically not available. The survey was hosted online by the market research firm *Research Now,* similar to other studies in marketing (e.g. Brown *et al.*, 2011; Dahlquist and Griffith, 2014).

We conducted two rounds of data collection with a one-year lag between them and used the second-round data to assess the potential effect of common method variance on the data. *Research Now*'s invitation to its national survey participant pool resulted in 917 potential participants. We included only standalone firms or autonomous business units. Firms six years or younger, and those with 20 employees or less were excluded because they often exhibit distinct NPD processes or may lack a formal TMT structure (Zahra *et al.*, 2000; Boone and Hendriks, 2009). This resulted in 229 firms, of which 139 (61%) providing complete responses. Responses from early and late survey participants were compared to assess non-response bias. No significant difference was found ($p > 0.05$). Firms in the sample were from diverse industries. 48% of firms focus on business markets, 33% focus on consumer markets, and 19% serve both markets. Of the firms in the sample, 70% are private and 30% are public firms. In addition, according to OECD's classification of firm size (OECD, 2024), our final sample is composed of 17% small firms (10–50 employees), 31% medium-sized firms (50–249 employees), and 52% large firms (250 or more employees). The survey participants were senior-level managers (e.g. senior marketing managers, general managers) with an average of 14.1 years of experience with their firms and 21.1 years of experience in their industries. We asked the survey participants about their knowledge on the issues covered in this survey – the mean score on a seven-point scale was 6.06.

Finally, we assessed the extent of NPD within the sampled firms over the past five years, employing a seven-point Likert scale ranging from 1 (indicating no new product lines) to 7 (indicating a significant number of new product lines). The average score on this scale was 4.6 (SD = 1.61), with a notable majority of firms (73%) providing a score of 4 and above. This suggests a significant level of engagement in NPD within the surveyed firms. In addition, we employed a series of questions, each rated on a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree), to measure these firms' involvement in various NPD activities. Mean scores for introducing new product generations (5.16; SD = 1.45), expanding product range (5.51; SD = 1.13), and enhancing product quality (5.62; SD = 1.06) collectively suggest active participation in various NPD aspects. Importantly, all surveyed firms have been involved in at least one of these NPD activities.

Measures

The measures used in this research were adopted or adapted from prior literature (see Appendix). Seven-point Likert scales were employed unless otherwise noted. We pretested

the survey with four academic experts and four industry experts. This led to minor changes in wording. *New product performance* was measured with items adapted from Moorman and Rust (1999) and Zhou *et al.* (2005). *Cross-functional integration in NPD* was measured using items adopted from Ramaswami *et al.* (2009). The scale items for *TMT heterogeneity* was adapted from Heyden *et al.* (2013), Alexiev *et al.* (2010), and Talke *et al.* (2011).

The different *structures of MPTMT* were measured using a two-step approach. First, we asked survey participants if there were members of their firm's TMT specifically responsible for the marketing function. This first step is critical as it allows us to accurately capture the presence of marketing within TMT, even in cases where the responsible executive does not have a marketing title. Only when respondents indicated that marketing was present in the TMT (107 of the 139 sample firms, or 77% of the total sample), we asked the survey participants to provide the responsible TMT member's title. We then coded the reported titles to identify the structure of MPTMT in each firm. Titles such as CMO, VP, Marketing, or Director of Marketing were coded as "dedicated MPTMT" (43 firms, or 31% of the sample). Titles that combined sales (e.g. VP, Sales and Marketing; VP, Sales; or Director of Marketing and Sales) were coded as "joint marketing and sales MPTMT" (32 firms, or 23% of the sample). Titles that indicated that other TMT members were responsible for the marketing function (e.g. CEO, COO, or General Manager), "joint marketing and other operations MPTMT" was used as the code (32 firms, or 23% of the sample). The remaining 32 cases (23% of the sample) which had no executive who was specifically responsible for marketing were coded as "no MPTMT". To assess the impact of the three MPTMT structures (i.e. categories), a dummy variable approach is necessary. For each firm, we created three binary variables, one for each MPTMT structure. A value of 1 was assigned to the category the firm fell into, and 0 to the other two. Firms with no MPTMT received 0 for all three variables, making "no MPTMT" our baseline category. Of note, our measurement approach eliminates subjectivity in the MPTMT data and aligns with well-established practices in studies that capture the presence or absence of marketing in the TMT (e.g. Nath and Bharadwaj, 2020).

Several theoretically related control variables that might affect a firm's NPD behaviour and performance were incorporated in the analysis, including firm age and size, competitive intensity and environmental dynamism (Kreiser *et al.*, 2010), TMT size (Talke *et al.*, 2011) and public vs. private firm (Yli-Renko *et al.*, 2001). Of note, environmental dynamism is measured based on market uncertainty and technological turbulence.

Results

Reliability and validity

Because TMT heterogeneity and new product performance scales are formative, we followed the recommendations of Diamantopoulos and Winklhofer (2001) to assess the validity of these scales. That is, we derived the domain of these scales from the existing literature and confirmed their relevance through expert interviews from both the academic and industry fields. We performed a variance inflation factors (VIF) check to test for multi-collinearity and found the highest VIF to be 2.15, well within the acceptable limit of 10, thus ruling out multi-collinearity concerns. To substantiate external validity, we studied the interrelationships of these scales within a defined nomological framework. It is anticipated that as TMT size grows, so does TMT heterogeneity. This is validated by a significant correlation between the two variables ($r = 0.36$, $p < 0.001$), which aligns with prior studies (e.g. Boone and Hendriks, 2009; Hmieleski and Ensley, 2007). We also expect a correlation between new product performance and customer participation in NPD (Chang and Taylor, 2016). This relationship was confirmed by a significant correlation ($r = 0.36$, $p < 0.001$). Collectively, these findings corroborate the credibility of the formative constructs used in this study.

The reflective variables were assessed using reliability analysis, as well as exploratory and confirmatory factor analysis (CFA). All variables have reliability coefficients above 0.70. The CFA model has an acceptable fit with chi-square = 106.70, degrees of freedom = 55, $p = 0.00$, CFI = 0.94, GFI = 0.90, TLI = 0.92, and RMSEA = 0.08. All factor loadings exceed the value of 0.60 and are significant at $p < 0.001$; the average variance extracted measures range from 0.55 to 0.70. These results provide evidence of convergent validity (Bagozzi and Yi, 1988). Discriminant validity was assessed by performing chi-square difference tests between restricted and unrestricted models for each pair of constructs in the CFA model (Anderson and Gerbing, 1988). For all pair-wise comparisons, the unrestricted model is significantly better than the restricted model ($p < 0.05$). The correlations and descriptive statistics are shown in Table 2.

Common method variance (CMV)

We addressed potential CMV in the following ways. First, the different MPTMT structures were coded based on the survey participants' description of the presence (or absence) of executives in the TMT who are responsible for marketing. As a result, these data are not subjective. In addition, our moderation results should not be an artifact of CMV (Siemsen *et al.*, 2010). Therefore, CMV is not likely to drive the results. Furthermore, we followed up with the original survey participants through our panel provider one year after the initial survey. In this second round of surveys, participants were asked to complete a survey that included the same new product performance items as the original survey. This resulted in 79 responses (a response rate of 57%). The correlation (0.52, $p < 0.001$) between new product performance across the two surveys resembled past results using a similar approach (De Clercq *et al.*, 2009; Yli-Renko *et al.*, 2001). Considering the significant time gap between surveys, respondents are unlikely to recall their previous responses (Podsakoff *et al.*, 2003). Therefore, the consistency in responses suggests that our survey results are not likely to be driven by CMV. The data from this second survey were exclusively used to assess CMV concerns and were not included in the main data analysis. Finally, we utilized a marker variable (MV) to assess CMV (Richardson *et al.* (2009). The MV, gauging economic confidence, has no theoretical tie to our constructs and has been utilized in previous studies (Verhoef and Leeflang, 2009). The correlations between the MV and the variables of interest range from −0.07 to 0.07, and none are significant ($p > 0.05$).

Hypotheses testing

We opted for simple path analysis to test our hypotheses. We did not employ SEM since our model mainly comprises objective variables and formative constructs. We also steered clear of PLS because it can be error-prone when dealing with models that incorporate multiple binary variables (Hair *et al.*, 2012; Sarstedt *et al.*, 2022), as ours does. Of note, all variance inflation factors (VIF) are less than 3, far below the recommended threshold of 10. To assess the impact of the different structures of MPTMT on cross-functional integration, we set the absence of MPTMT as the baseline and employ three binary variables in the model. In addition, across all tested path models using AMOS, we consistently observed strong model fit, as evidenced by the chi-square, CFI, and RMSEA metrics.

Results from Table 3 indicate significant positive correlations between all three structures of MPTMT and cross-functional integration (dedicated MPTMT: $\beta = 0.26$, $p < 0.01$; joint marketing and sales MPTMT: $\beta = 0.47$, $p < 0.001$; joint marketing and other operations: $\beta = 0.37$, $p < 0.001$), supporting H1a.

For H1b, we compared the relationships between each of the three structures of MPTMT and cross-functional integration. The impact of dedicated MPTMT is significantly weaker ($\beta = -0.26$, $p < 0.01$) than that of joint marketing and sales MPTMT. However, while the

Table 2.
Correlations and descriptive statistics (N = 139)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Firm age (log)	1													
2. Firm size (log)	0.31	1												
3. B2B	0.05	−0.08	1											
4. B2C	−0.09	−0.09	−0.67	1										
5. Public	0.19	0.50	−0.06	−0.06	1									
6. Environmental dynamism	−0.07	0.13	−0.10	0.04	−0.08	1								
7. Competitive intensity	0.06	0.10	0.00	−0.05	−0.10	0.29	1							
8. TMT size (log)	0.11	0.51	−0.07	−0.11	0.29	0.11	0.04	1						
9. TMT heterogeneity	0.12	0.19	−0.10	−0.01	−0.06	0.04	0.05	0.36	1					
10. Dedicated MPTMT	0.04	0.18	−0.23	0.22	0.14	0.02	0.11	0.11	0.03	1				
11. Joint marketing and sales MPTMT	0.09	−0.01	0.23	−0.17	−0.10	−0.13	−0.01	−0.04	0.02	−0.37	1			
12. Joint marketing and other operations MPTMT	−0.12	−0.19	0.03	−0.13	−0.14	0.08	−0.11	−0.01	−0.08	−0.37	−0.30	1		
13. Cross-functional integration	−0.05	0.19	−0.16	0.10	0.00	0.11	−0.07	0.24	0.34	0.03	0.20	0.10	1	
14. New product performance	−0.06	−0.03	0.00	−0.05	−0.17	0.20	0.14	0.23	0.22	−0.13	0.01	0.13	0.30	1
Mean	1.59	2.53	0.47	0.33	0.30	4.22	5.40	0.96	5.09	0.31	0.23	0.23	4.90	5.06
Standard deviation	0.31	0.89	0.50	0.47	0.46	1.14	1.05	0.43	1.12	0.46	0.42	0.42	1.21	1.02

Note(s): Correlations of |0.17| or above are significant at $p \leq 0.05$
Source(s): Authors' own creation

	Outcome variables		
	Cross-functional integration in NPD	Cross-functional integration in NPD	New product performance
Control variables			
Firm age	−0.13	−0.12	0.01
	(0.29)†	(0.29)	(0.26)
Firm size	0.18	0.17	−0.18
	(0.13)†	(0.13)†	(0.12)†
B2B	−0.07	−0.06	0.01
	(0.24)	(0.23)	(0.21)
B2C	0.13	0.10	−0.06
	(0.25)	(0.25)	(0.23)
Public	0.01	0.04	−0.14
	(0.23)	(0.22)	(0.20)
Competitive intensity	−0.11	−0.12	0.11
	(0.09)	(0.08)	(0.08)
Environmental dynamism	0.11	0.14	0.13
	(0.08)	(0.08)†	(0.07)
TMT size	0.04	0.02	0.27
	(0.25)	(0.24)	(0.22)**
Predictors			
Dedicated MPTMT	0.26	0.28	
	(0.24)**	(0.23)**	
Marketing and sales MPTMT	0.47	0.48	
	(0.26)***	(0.25)***	
Marketing and other operations	0.37	0.38	
MPTMT	(0.26)***	(0.25)***	
TMT heterogeneity	0.32	0.32	
	(0.08)***	(0.08)***	
Dedicated MPTMT × TMT		−0.24	
Heterogeneity		(0.20)**	
Marketing and Sales MPTMT × TMT		−0.15	
Heterogeneity		(0.22)†	
Marketing and Other Operations		−0.14 (0.20)	
MPTMT × TMT Heterogeneity			
Cross-functional integration			0.27
			(0.07)***

Note(s): †$p < 0.10$, *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$; standardized estimates are reported; standard errors in parentheses; all significance tests are two-tailed. No MPTMP is the baseline for assessing the impact of the three structures of MPTMT on cross-functional integration

Source(s): Authors' own creation

Table 3.
Hypothesis testing

coefficient for the joint marketing and other operations MPTMT is greater than that for the dedicated MPTMT, this discrepancy does not achieve statistical significance. Similarly, even though the joint marketing and other operations MPTMT registers a smaller coefficient than the joint marketing and sales MPTMT, the difference between them is not statistically significant. This pattern suggests a hierarchy: the dedicated marketing MPTMT has the smallest impact, the joint marketing and other operations MPTMT is intermediate, and the joint marketing and sales MPTMT stands as the most influential. Yet, statistical significance is only between the extremes. This provides partial support for H1b.

The moderation analysis shows that TMT heterogeneity weakens the effect of dedicated MPTMT on cross-functional integration ($\beta = -0.24$, $p < 0.01$), but not the effects of joint marketing and sales MPTMT ($\beta = -0.15$, n.s.) or joint marketing and other operations

MPTMT ($\beta = -0.14$, n.s.). These results lend partial support to H2a and full support for H2b. To obtain a deeper understanding of H2b, we performed a conditional effect analysis by splitting TMT heterogeneity (the moderator) into a high group (one standard deviation above the mean) and a low group (one standard deviation below the mean). The results are illustrated in Figure 2. Consistent with H2b, when TMT heterogeneity is high, the slope for dedicated MPTMT flattens more than other structures. Of note, aside from the slope representing the impact of dedicated MPTMT when TMT heterogeneity is high, all other slopes are positive and statistically significant. This implies that while the influence of a dedicated MPTMT diminishes with increasing TMT heterogeneity, the positive effects of the other two joint structures remain resilient.

Lastly, we find a significant positive relationship between cross-functional integration and new product performance ($\beta = 0.27$, $p < 0.001$), as expected based on H3.

Additional analysis and robustness check

We further analysed the indirect effect of MPTMT on new product performance through cross-functional integration using path analysis, following the guidelines of Aguinis *et al.* (2017) and Preacher *et al.* (2007) to use the bootstrapping method and report the results based on the bias-corrected confidence intervals. The results indicate that there is no direct effect between MPTMT structures and new product performance, and that cross-functional integration significantly mediates the impact of all three structures of MPTMT (dedicated MPTMT: $\beta = 0.07$, SE = 0.03, CI: 0.02 to 0.15; joint marketing and sales MPTMT: $\beta = 0.13$, SE = 0.05, CI: 0.04 to 0.24; joint marketing and other operations MPTMT: $\beta = 0.10$, SE = 0.04, CI: 0.03 to 0.19) on new product performance.

We also performed a moderated mediation analysis and found that the moderated indirect effects are negative and significant for dedicated MPTMT ($\beta = -0.06$, SE = 0.03, CI: −0.14 to −0.01). This suggests that the indirect effect is stronger when TMT heterogeneity is low. The moderated indirect effects for joint marketing and sales MPTMT ($\beta = -0.04$, SE = 0.03, CI: −0.11 to 0.01) and joint marketing and other operations MPTMT ($\beta = -0.04$, SE = 0.03, CI: −0.11 to 0.00) are not significant, suggesting that the indirect effect does not vary significantly across different conditions of TMT heterogeneity. Furthermore, we tested the robustness of the results by adding industry dummies to account for potential industry heterogeneity in our model. The findings remain identical.

Finally, we conducted a post-hoc sensitivity analysis using the method developed by Cinelli and Hazlett (2020) to address concerns regarding omitted variable bias. For the model

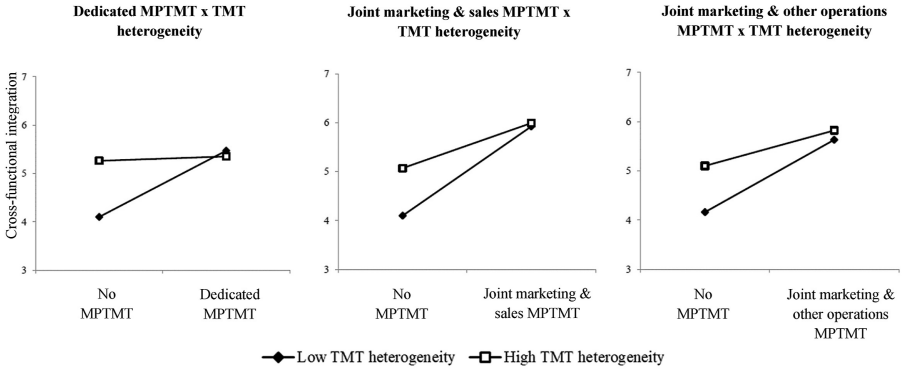

Figure 2.
Interaction of MPTMT structures and TMT heterogeneity on cross-functional integration

Source(s): Authors' own creation

between MPTMT structures and cross-functional integration, the analysis suggested that any unobserved confounder would need to explain between 22–36% of the residual variance of both our predictors (i.e. MPTMT structures and TMT heterogeneity) and cross-functional integration to entirely negate the effect of these predictors. To render the effects of predictors statistically non-significant at $p < 0.05$, an unobserved confounder would need to account for 7–24% of the residual variance of both predictors and cross-functional integration. For the effect of cross-functional integration on new product performance, these estimates are 25 and 10%, respectively. We observed that these robustness values (RVs) exceed the partial R^2 (%) values of the corresponding theoretical predictors including Dedicated MPTMT, Marketing and sales MPTMT, Marketing and other operations MPTMT, TMT heterogeneity, and cross-functional integration. This suggests that a confounding variable would need to have a substantially stronger influence than our theoretical predictors to undermine our conclusions. The large RVs for joint MPTMT structures and TMT heterogeneity make it improbable for any omitted variable to match this profile.

Additional sensitivity tests were conducted to further evaluate the potential impact of unobserved confounders. We assume these confounders had equivalent strength to our most robust control variables: firm size (for the effect of MPTMT structures on cross-functional integration) and TMT size (for the effect of cross-functional integration on new product performance). The analysis showed that unobserved variables would need to account for seven to ten times the variation explained by firm size and twice that explained by TMT size to significantly affect our predictor outcomes. Overall, these sensitivity tests suggest that omitted variable bias is unlikely to affect our findings.

Discussion

Our research investigates the relationships between common structures of MPTMT, cross-functional integration, and new product performance. The findings demonstrate that having an MPTMT (vs. no MPTMT) has a favourable effect on integrating functions for NPD. The joint marketing and sales MPTMT emerges as the most impactful, whereas the dedicated marketing MPTMT exhibits the least positive influence as theorized in H1b.

Our moderation analysis further reveals that TMT heterogeneity lessens the positive effects of dedicated MPTMT. Specifically, the impact of dedicated MPTMT turns non-significant (i.e. a flat slope) when TMT heterogeneity is high. In contrast, the positive effects of the two joint MPTMT structures are not affected by changes in TMT heterogeneity. These results support our theorization in H2b.

The moderated mediation analysis suggests that cross-functional integration serve as a mediator in the relationship between all MPTMT structures and new product performance. Importantly, the indirect effect of dedicated MPTMT is more potent when TMT is homogeneous and becomes insignificant in the context of heterogeneous TMT. Conversely, the indirect effects of the two joint MPTMT structures remain similarly positive, irrespective of the degree of TMT heterogeneity.

Theoretical implications

This study is the first to empirically examine the "MPTMT-NPD process-new product performance" relationship, addressing calls for research on the manifestation of MPTMT in firms (Bommaraju *et al.*, 2019; Whitler *et al.*, 2018). Our findings provide crucial insights into the role of cross-functional integration as a mediator between MPTMT and new product performance. It offers an important explanation for the mixed findings in previous studies exploring the impact of MPTMT on firm competitiveness (e.g. Boyd *et al.*, 2010; Germann *et al.*, 2015; Nath and Mahajan, 2008), as prior research seldom investigates potential

mediators. As such, our findings strongly suggest that future research on the influence of MPTMT should take into account the mechanisms, such as NPD process, through which MPTMT can create value.

Second, our study extends the existing MPTMT literature by drawing attention to the diverse structural configurations of MPTMT. Prior research predominantly equates MPTMT solely with the dedicated structure (e.g. Feng *et al.*, 2015; Germann *et al.*, 2015), overlooking the potential influence of alternative structures. By empirically examining the differential impacts of various MPTMT structures, our study highlights the criticality of considering these structural nuances. Notably, while our findings corroborate the positive assertions regarding MPTMT's impact in the recent marketing literature, they underscore that the influence of MPTMT does not require an exclusive "marketing" title and reveal the contextual variability in the effects of different MPTMT structures.

Moreover, our research augments prior studies, which predominately focus on large, publicly traded companies, by incorporating a more diverse sample that comprises both SMEs and large firms. This approach broadens our understanding of MPTMT's impact across different organizational scales. By collecting primary survey data from a variety of company types, we also capture MPTMT structures more accurately and reflectively. In doing so, our study contributes to the generalizability of insight in the MPTMT literature.

Finally, understanding the impact of MPTMT requires knowledge of its boundary conditions (Moorman and Day, 2016). Our study contributes to this area of the literature by being among the first to examine the moderation effect of TMT heterogeneity on the impact of different MPTMT structures in the important context of NPD. In doing so, we also inform upper echelons theory (Hambrick, 2007; Hambrick *et al.*, 1996; Hambrick and Mason, 1984), providing new evidence of the concurrent positive and deleterious effects of TMT heterogeneity. We show that TMT heterogeneity can have a more deleterious impact in TMTs with a dedicated MPTMT structure than joint MPTMT structures. This supports the argument by Hambrick *et al.* (2015) that the impact of TMT heterogeneity interacts with the structural characteristics of TMT to influence a firm's strategies, processes, and outcomes. Thus, our study adds new insights to the literature on TMT structure (Ma *et al.*, 2022; Vieregger *et al.*, 2017) from the important and rich context of MPTMT.

Managerial implications

The findings of our study, based on a diverse sample of SMEs and large firms, can guide senior managers across companies of varying sizes. First, we suggest that, on average, having any structure of MPTMT adds value to the firm in terms of enhancing NPD process and performance. In addition, firms that prioritize NPD effectiveness should be open to blending marketing leadership with other functional responsibilities. Our findings suggest that in the context of NPD, the benefits of combining marketing leadership with other functional leadership roles, in particular sales role, may outweigh the benefits of having a dedicated MPTMT structure.

Second, in consideration of the impact of TMT heterogeneity, firms must be aware of the dynamics between MPTMT and TMT heterogeneity. When TMT backgrounds are homogeneous, the positive impact of any MPTMT structure on NPD is likely substantial. However, as TMT diversity increases, the positive impact of a dedicated MPTMT structure on NPD becomes limited. Conversely, the joint MPTMT structure is more likely to produce positive effects on NPD regardless of the level of TMT heterogeneity.

Finally, our indirect effect analysis suggests that the impact of an MPTMT on the firm's value creation operations may not be immediately apparent from overall performance. This indicates that there can be multiple paths of influence of MPTMT and the value of an MPTMT can be manifested in various customer value-creation activities. As such, the

performance of marketing leadership should be evaluated in light of these considerations in practice.

Limitations and suggestions for future research

This study has some limitations that provide opportunities for future research. First, our data is cross-sectional; therefore, caution is necessary when inferring causality. Although our model is grounded in upper echelons theory, making it theoretically challenging to suggest that NPD activities drive the formation of various MPTMT structures, future research could offer further validation. Ideally, this would involve a longitudinal survey method that more directly captures marketing leadership structures and organizational processes to examine the relationships explored in this study.

Second, our research studies manufacturing firms in the U.S. We note that NPD processes can vary considerably in service firms. Also, organizational norms and practices vary across different countries. Consequently, future research should test the generalizability of our findings by comparing them with those from different sectors and country contexts.

Third, this study focuses on the NPD process as the MPTMT's influence mechanism. Other value-creation processes could also be influenced by an MPTMT and, more importantly, the effects could be different from those found in this research. Therefore, future studies can build upon our findings by exploring, for example, other customer value-creation processes such as customer management, digital marketing and DEI (diversity, equity and inclusion) marketing.

Finally, our study is among the first to empirically link various MPTMT structures to customer value-creation processes. There may be other unexplored factors, including boundary conditions that could potentially influence these relationships but were not included within the scope of our study. Further research is necessary to test and expand our model. In addition, there is a need for further investigation into the formation of MPTMT. While existing literature focuses mainly on the impact of MPTMT (Moorman and Day, 2016), little is known about why and how MPTMT is created and configured differently in firms. Our framework of distinct MPTMT structures provides a starting point for this line of inquiry.

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Appendix

Items	Factor loading	CR	AVE
Marketing presence in the TMT (MPTMT)	Objective measure[a]		
Is there any member of your firm's top management team specifically responsible for either the marketing function or managing relationships with customers? (Yes/No)	–	–	–
What is his/her/their title(s)?	–	–	–
Cross-functional integration in NPD		0.71	0.55
We used cross-functional teams (e.g. involving R&D, manufacturing, sales and marketing) in designing new products	0.67		
We used trans-organizational teams (e.g. involving suppliers and complementors) while designing new products	0.81		
Market uncertainty		0.83	0.55
Customer needs and product preferences changed quite rapidly	0.72		
Customer product demands and preferences were highly uncertain	0.87		
It was difficult to predict changes in customer needs and preferences	0.70		
Market competitive conditions were highly unpredictable	0.68		
Technological turbulence		0.90	0.70
It was very difficult to forecast technology developments in our industry	0.60		
The technology environment was highly uncertain	0.91		
Technological developments were highly unpredictable	0.93		
Technologically, our industry was a very complex environment	0.86		
Competitive intensity		0.83	0.63
Competition in our industry was intense	0.95		
Anything that one competitor offered to the market, others readily matched	0.80		
Price competition was a major characteristic of our industry	0.61		
In our industry, one heard of a new competitive move almost every day[c]			
New product performance (Relative to stated objectives: 1 = Worse, 4 = As planned, 7 = Better)	Formative measure[b]		
Speed of new product development	–	–	–
Product quality			
Value of products to customers (quality/price)			
TMT heterogeneity	Formative measure[b]		
The members of our firm's top management team	–	–	–
• Have had a variety of educational backgrounds (e.g. bachelor's degree, master's degree, PhD)			
• Have varied widely in their functional background (e.g. finance, marketing, R&D)			
• Have had a variety of industry backgrounds (e.g. technology, automotive, pharmaceutical)			
• Have varied widely in their years of experience with the firm			

Note(s): All multi-item scales are measured using seven-point Likert scales (1 = strongly disagree, 7 = strongly agree) unless otherwise noted

[a]This is an objective measure (please refer to the "Measures" section for details of the coding process)

[b]Assessed using a different approach as described in the "reliability and validity" section

[c]Removed from analysis due to loading

CR = composite reliability; AVE = average variance extracted; all factor loadings are significant at $p < 0.001$

Source(s): Authors' own creation

Table A1. Measurement items