



Aligning the IT portfolio with business strategy: Evidence for complementarity of corporate and business unit alignment

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ARTICLE INFO

Keywords:

Cross-domain alignment
IT-strategy fit
Business unit
Multi-business organization
Complementarity
Firm performance

ABSTRACT

Research on alignment between business strategy and information technology (IT) strategy has generated extensive insights over the last three decades. That research has focused primarily on the fit between business and IT strategies, while cross-domain alignment, i.e., alignment between business strategy and IT infrastructure components, has received far less attention. Further, previous studies have focused on the implications of alignment for firm performance while the effects of cross-domain alignment on business unit performance in multi-business organizations (MBOs) are yet to be examined. This issue is important as IT infrastructures are evolving rapidly. Specifically, MBOs are increasingly turning to corporate IT platforms to support a common set of shared IT needs, while still allowing individual business units to manage unique aspects of their own IT needs through local IT applications. Extending prior research, this study proposes that performance of business units in MBOs is influenced by two complementary forms of cross-domain alignment, viz., alignment between the corporate IT platform and the corporate business strategy, and alignment between the business unit's portfolio of IT applications and its business strategy. Using data from a global survey of 120 organizations, we find evidence that complementarity between these two forms of cross-domain alignment creates a joint positive effect on business unit performance. We also find that this effect varies with the extent of process digitization within business units. Implications for theory and practice are discussed.

Introduction

The quintessential multi-business organization (MBO) with its emphasis on market-facing business units (BUs) that are centrally directed by a corporate unit is the most established organizational structure in use today (Gaba and Joseph, 2013, Chen et al., 2019). A key characteristic of this hierarchical organizational structure is that it forces information technology (IT) decision-makers to examine alternatives and to make choices about what IT investments will enable the realization of business value within BUs and across the organization (Quaadgras et al., 2014). However, few tasks are as challenging as the tension that IT decision-makers face between investment in firm-wide corporate IT platforms and more localized BU-specific IT applications (Ross et al., 2006, Reynolds

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<https://doi.org/10.1016/j.jsis.2020.101623>

Received 7 April 2019; Received in revised form 6 August 2020; Accepted 6 August 2020

Available online 01 September 2020

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and Yetton, 2015).¹ Investment in corporate IT platforms enables greater cross-unit coordination, thereby avoiding duplication of effort and IT resources. In contrast, investment in BU-specific systems provides the BU with much sought-after IT autonomy to aggressively pursue local value propositions.

Given the above tensions, it follows that overall organizational performance is influenced by complementarities between corporate efforts to build general-purpose IT platforms that meet corporate goals (Tanriverdi, 2006) and divisional efforts where BUs build market or product-specific IT applications to meet local strategic needs (Weill et al., 2002, Reynolds and Yetton, 2015). Without the aid of a corporate IT platform, individual BUs would need to directly support their entire spectrum of IT needs from local resources, even if this led to duplication of effort. Furthermore, the absence of a corporate IT platform could undermine MBOs' ability to exploit cross-unit synergies (Tanriverdi, 2006). Corporate IT platforms promote cross-unit synergies because they are developed and leveraged centrally to provide core capabilities such as payroll, regulatory/legal, procurement, and channel management that are common across multiple BUs. When making decisions about IT use, each market-facing BU faces a critical question, viz., how to maximize the performance benefits of IT resources, whether delivered through a corporate IT platform or through local IT applications. Quite simply, how can the corporate IT platform and local systems work together to support BU performance?

Prior literature on IT/business alignment finds extensive evidence that IT resources play a critical role in enabling and supporting strategic activities (Gerow et al., 2014, Coltman et al., 2015, Tallon et al., 2016). That literature argues that the management of IT resources enables an IT strategy that matches or aligns with a business strategy. It also argues that the notion of cross-domain alignment between an IT portfolio and a business strategy assesses whether IT resources support strategic objectives (Henderson and Venkatraman, 1993, Gerow et al., 2015). At the corporate or MBO level, this form of cross-domain alignment assesses whether the corporate strategy is supported by applications and other resources housed within the corporate IT platform. At the BU level, however, cross-domain alignment is concerned with whether the BU strategy is supported by the BU's IT application portfolio (Reynolds and Yetton, 2015). Thus, the corporate parent seeks to improve alignment between corporate business strategy and the corporate IT platform (which we term *corporate domain alignment*) while individual BUs focus on alignment between BU strategy and their IT application portfolio (which we term *BU domain alignment*).²

Despite the importance of these organizational efforts to use alignment to improve organizational performance and BU performance, extant research has tended to focus primarily on the effects of strategic alignment on organizational performance. Effectively, that research ignores the effects of cross-domain alignment on BU performance (Gerow et al., 2014, Gerow et al., 2015). Thus, further research is needed into how both corporate domain alignment and BU domain alignment influence the performance of BUs. The objective of this study is to advance our understanding of the effects of corporate domain alignment and BU domain alignment on BU performance. We address this goal through the following research question: *How do corporate domain alignment and BU domain alignment—separately and jointly—influence BU performance?*

To address the above question, we draw on prior research on dynamic capabilities (Augier and Teece, 2009, Helfat et al., 2007, Sirmon and Hitt, 2009). A key tenet of dynamic capabilities theory is that asset orchestration is vital for superior performance as it provides a roadmap for managing resources, such as IT, in ways that promote alignment and resource complementarity (Sirmon and Hitt, 2009, Queiroz et al., 2018). In MBOs, asset orchestration includes the management of both shared IT (through the corporate IT platform) and local IT (through the BU's own IT resources) to meet BU IT needs (Fonstad and Subramani, 2009, Reynolds and Yetton, 2015). Drawing on the asset orchestration perspective and prior research on cross-domain alignment, we propose that corporate domain alignment and BU domain alignment exert joint effects on BU performance. Specifically, our theory posits that corporate domain alignment and BU domain alignment complement and reinforce each other in improving BU performance. Further, drawing on prior research on the relationship between IT and business processes (Tallon et al., 2016), we propose that the magnitude of this complementary relationship depends on the degree of process digitization within the BU.

We test the proposed theory using data collected from 120 MBOs. Consistent with the complementarity hypothesis, we find that enhancing corporate domain alignment has little or no effect on BU performance if local BU domain alignment is low. In contrast, when BU domain alignment is high, the marginal benefits of increased corporate domain alignment are much higher. Our analysis also finds that those complementarity effects are contingent on the level of process digitization within the BU. This suggests that a BU's ability to use IT to support its core business processes influences the benefits that can be realized from corporate domain alignment and BU domain alignment.

Our theorization and empirical findings make a distinct contribution to the theory of how BU performance is influenced by the interplay between corporate domain alignment, BU domain alignment, and BU process digitization. This study also has important implications for practice. Specifically, we find that BUs benefit the most from the complementary relationship between corporate domain alignment and BU domain alignment when local BU process digitization is low. As BUs become more successful in using IT to digitize their core business processes—becoming increasingly self-reliant in using IT to support their local business needs—the benefits accrued from this relationship diminish. These findings suggest important levers for MBOs to manage BU performance. Subsequent sections theoretically develop these ideas, describe our methodology, and discuss our results and contributions.

¹ Corporate IT platforms refer to technology assets and services—hardware, applications, data, networks, and management services—that are shared across the organization (Ross et al., 2006; Reynolds and Yetton, 2015).

² Corporate domain alignment and BU domain alignment are forms of cross-domain alignment and differ from strategic alignment by focusing on IT infrastructure components rather than IT strategy (Gerow et al., 2015).

Theoretical background

Asset orchestration and IT/business alignment

Prior research has examined how organizations can remain competitive by renewing resources, routines, and capabilities (Sirmon et al., 2011, Vergne and Depeyre, 2016, Queiroz et al., 2018). The literature on dynamic capabilities is concerned with the management of resources and how to structure the resource portfolio in ways that create superior value (Eisenhardt and Martin, 2000, Teece, 2007). That literature suggests that managerial competences—notably, search/selection, and asset orchestration—are essential to achieving competitive advantage (Helfat et al., 2007). The structuring of any resource portfolio largely overlaps with search and selection processes that are central to dynamic capabilities as both refer to identification of opportunities and formulation of actions, including allocation of resources. Asset orchestration, with its focus on the assembly and re-structuring of the resource base, implies that improved outcomes arise when complementary resources are identified and deployed in support of the business strategy (Helfat et al., 2007, Sirmon et al., 2011, Augier and Teece, 2009).

Prior literature identifies four orchestration modes that allow firms to create value from their asset base, namely, accessing, integrating, developing, and releasing (Danneels, 2011, Schriber and Löwstedt, 2018). The accessing and releasing modes focus on inter-unit relationships, e.g., the relationship between corporate parents and BUs. In contrast, integrating and developing modes focus on intra-unit processes, e.g., the development of new assets, whether within the BU or at the corporate level (Schriber and Löwstedt, 2018). In MBOs, the accessing mode allows BUs to leverage external resources, such as corporate resources, that complement the BU's local resource base. The releasing mode allows BUs to abandon an asset that no longer generates expected benefits. Releasing resources may include voluntarily relinquishing access to or use of a corporate resource that limits BU flexibility and autonomy. The integrating mode can take the form of applying assets under control in new ways, such as when BUs leverage existing IT applications to digitize their business processes. The developing mode allows BUs to create new assets such as new IT applications to meet changing strategic needs, potentially doing so on the back of existing corporate IT resources.

A key implication of the above literature is that resources can be orchestrated into configurations with unique performance characteristics (Sirmon and Hitt, 2009). Consequently, the value of resources such as corporate IT platforms and BU IT applications depends on how they are used in combination with other resources and capabilities to meet the organization's strategic needs (Yeow et al., 2018). For example, while a corporate IT platform can deliver standalone value to MBOs by reducing IT operating costs and improving financial performance, its value is likely to be greater when corporate IT platform capabilities are orchestrated to align with the corporate strategy in order to meet corporate-wide objectives (Reynolds and Yetton, 2015). Conversely, a corporate IT platform that is misaligned with the corporate strategy will negatively affect the organization's ability to meet its strategic objectives. Hence, the aligning process—i.e., the process through which organizations achieve a desired state of IT/business alignment—is an important value-creating mechanism whose benefits depend on the organization's ability to manage resources (Yeow et al., 2018, Karpovsky and Galliers, 2015).

Cross-domain alignment in MBOs

The management of resources to enhance IT/business alignment enables MBOs to execute corporate and BU strategies (Reynolds and Yetton, 2015). The corporate strategy specifies the markets in which the firm competes, describes the firm boundaries, and the formal relationships between BUs and the corporate parent (Bowman and Helfat, 2001). Corporate strategy is primarily concerned with answering the question, "What set of businesses should we be in?" (Hofer and Schendel, 1978, Beard and Dess, 1981). In contrast, BU strategy concerns business-level decisions and the scope of business activities under which each BU operates to build competitive advantage within a market segment (Porter, 1980). Each BU within an MBO has the ability to devise and execute its business strategy within the constraints imposed by corporate management. In that regard, corporate parents act as intermediaries, "influencing the decisions and strategies pursued by the businesses" (Goold et al., 1994, p. 12). Hence, the MBO structure presents a particular alignment challenge since business strategies are developed both at the corporate level and within individual BUs.

Henderson and Venkatraman's (1993) classical alignment model identifies distinct dimensions of alignment, namely, alignment between business strategy and IT strategy (intellectual or strategic alignment), alignment between IT strategy and IT infrastructure and processes (IT alignment), alignment between IT and business infrastructure and processes (operational alignment), alignment between business strategy and business infrastructure and processes (business alignment), and two forms of cross-domain alignment: alignment between business strategy and IT infrastructure and processes (cross-domain: business strategy to IT), and alignment between IT strategy and business infrastructure and processes (cross-domain: IT strategy to business) (Henderson and Venkatraman, 1993, Gerow et al., 2015). These distinct dimensions of alignment have been operationalized in different ways. For example, cross-domain alignment between business strategy and IT—which is the focus of this study—has been operationalized based on measures that directly assess the state of alignment between business strategy and IT infrastructure and processes (Gerow et al., 2015). The intellectual dimension of alignment has been operationalized based either on direct measures that assess the state of alignment between business strategy and IT strategy (Liang et al., 2017) or indirect fit measures computed from separate assessments of IT strategy and business strategy.³ Despite differences in the way alignment is conceptualized and measured, extant research finds that firms that realize IT/business alignment generally achieve performance gains such as higher productivity and financial performance

³ For a review of alignment conceptualizations and measures, see Chan and Reich (2007), Gerow et al. (2014), and Coltman et al. (2015).

(Gerow et al., 2014).

However, prior research has tended to focus on explaining the performance implications of intellectual or strategic alignment (Liang et al., 2017, Wu et al., 2015, Gerow et al., 2014). It pays far less attention to the performance implications of cross-domain alignment between business strategy and IT infrastructure components (Gerow et al., 2015). The growing importance of corporate IT platforms has created a compelling need to better understand the implications of this form of alignment. This is particularly relevant for MBOs as this form of cross-domain alignment involves organizational efforts to improve both corporate domain alignment and BU domain alignment. Yet, the literature has not conceptually or empirically examined the performance implications of cross-domain alignment in MBOs.

IT executives wanting to improve cross-domain alignment in MBOs must decide what IT resources to allocate to both the corporate IT platform and BU IT portfolios. For example, the IT needs of business processes such as HR, legal, procurement, and accounting are often similar across BUs (Weill et al., 2002). Using shared applications through a corporate IT platform can enable common processes and improve cross-unit coordination (Tanriverdi, 2006). On the other hand, the IT needs of primary processes such as logistics, operations, sales, and customer support can vary by BU because of the unique activities each BU uses to execute its strategy. As a result, MBOs should invest in complementary IT resources such as corporate IT platforms and BU IT applications to support their entire spectrum of IT needs. Further, due to path dependencies, misalignment at the corporate level triggered by such things as a poorly designed HR application can trickle down to other areas of the organization and ultimately affect BU performance (Tallon, 2012). As a practical example, in their study of a global financial services MBO, Fonstad and Subramani (2009) encountered a situation that is all too familiar to many divisional CIOs: the organization's largest BU was able to derive value from IT applications developed locally to meet its specific needs but the use of corporate IT capabilities to support enterprise-wide goals was uncoordinated, resulting in weak alignment at the corporate level. Such misalignment can, in turn, impede BU performance in the long run (Fonstad and Subramani, 2009).

The case of Commonwealth Bank of Australia (CBA) provides a further example of the importance of cross-domain alignment in MBOs (Reynolds and Yetton, 2015). In the mid-2000s, CBA's corporate strategy was focused on customer service and building a single view of customers across its market-facing BUs that included investment management, insurance, and retail banking. In order to realize that strategy, one of the first things that CBA had to confront was the multiple and often distinct IT systems that were used in different BUs to verify customers' information. In the process, IT executives found that misalignment at the corporate level could negatively impact market-facing BUs (Reynolds and Yetton, 2015). For example, in the absence of integrated or shared systems, employees in different BUs were regularly unaware of products and services that customers had with other parts of the bank. To resolve that issue, CBA created a corporate IT platform that would align with the corporate strategy of having a single relationship with each customer (Reynolds and Yetton, 2015).

Hypothesis development

The complementarity of corporate domain alignment and BU domain alignment

Following from the above discussion we draw two key conclusions. First, the degree of corporate domain alignment can influence the performance of BUs. Second, MBOs leverage complementary IT resources to support their IT needs. While corporate parents seek to build corporate IT platforms to support common activities and processes across BUs, individual BUs focus on the use of IT applications to support unique activities and processes needed to compete in local markets. Thus, corporate domain alignment and BU domain alignment can complement and reinforce each other in enhancing BU performance.

According to the economic theory of complementarities, complementarity occurs when "doing *more* of one thing increases the returns of doing *more* of another" (Milgrom and Roberts, 1995, p. 181). Formally, let $f(x, y, z)$ be a payoff function where z is a vector of variables related to the payoff. The variables x and y are complements if f has the property:

$$f(x'', y'', z) - f(x', y'', z) \geq f(x'', y', z) - f(x', y', z) \\ \text{for all } x'' > x', y'' > y' \text{ (Porter and Siggelkow, 2008).}$$

Thus, complementarity occurs when increasing the variable x from its lower level x' to the higher level x'' is more beneficial when y is at the higher level y'' than at the lower level y' (Porter and Siggelkow, 2008).

Prior research shows that complementary resources in MBOs generate synergies that can have mutually supportive performance impacts (Tanriverdi, 2006). In that context, asset orchestration is an important mechanism through which BUs create value from corporate resources. For example, the accessing mode of asset orchestration suggests that BUs can generate performance benefits by accessing and leveraging corporate IT resources that complement their local capabilities. Conversely, not taking account of complementarities can lead to missed opportunities, duplicate effort, a loss of value creation, and to an eventual decline in financial performance. For example, an organization that invests in local BU IT solutions but which fails to invest in corporate IT resources to improve corporate domain alignment will likely produce sub-optimal results because of duplicate IT investment, foregone opportunities for knowledge sharing, and an absence of economies of scale in IT procurement (Reynolds and Yetton, 2015).

On the other hand, when corporate domain alignment is high, corporate IT managers will be well positioned to build IT support for activities that are common across BUs and to complement BU's own efforts to build local IT support for idiosyncratic activities (Reynolds and Yetton, 2015). This allows BUs to more effectively address what is unique to them to compete effectively in their target markets since time and effort is not expended finding ways to support activities that are now supported through a corporate IT platform (Weill et al., 2002, Ross et al., 2006). It also allows BUs to increase integration across functional areas, which in turn can lead to improved BU performance (Davis et al., 1992). Thus, corporate domain alignment complements BU domain alignment in

Corporate Domain Alignment	High	B	C
	Low	A	D
		Low	High
		BU Domain Alignment	

Fig. 1. Combinations of corporate domain alignment and BU domain alignment.

improving BU performance. In Fig. 1, we illustrate four possible combinations of corporate domain alignment and BU domain alignment based on high-low combinations of each.

To illustrate the comparative performance across the four cells in Fig. 1, let us first consider cell A to be a baseline scenario (low corporate domain alignment, low BU domain alignment). Moving to the scenario in cell B (high corporate domain alignment, low BU domain alignment) is unlikely to significantly improve BU performance because corporate domain alignment alone may not be sufficient to support all BU IT needs. The nature of the activities supported by the corporate IT platform—HR, legal, procurement, finance, and so on—may not be what the BU considers to be value adding. Since a large part of the corporate strategy in MBOs is meant to coordinate activities across BUs and to maintain a portfolio of BUs that delivers optimal firm performance (Tanriverdi, 2006), the primary goal of corporate domain alignment is to support corporate-wide strategic goals and shared BU needs; idiosyncratic BU needs are of secondary importance. In contrast, moving to the scenario in cell C (high corporate domain alignment, high BU domain alignment) will result in a significant improvement in BU performance due to complementarity effects; the BU is able to use local IT to meet its idiosyncratic needs and to use the corporate IT platform to support its other needs.

Overall, we expect BU performance to vary across the four cells in Fig. 1 such that performance will be highest in cell C, and performance in cell D will be higher than performance in cell B. According to the definition of complementarity provided earlier, firms will see greater improvement in BU performance when they move from the baseline scenario in cell A to cell C, as opposed to moving from cell A to cell D, since the latter continues to lack support for shared needs. In other words, increasing BU domain alignment from low to high will be more beneficial when corporate domain alignment is high; that is when specific BU IT needs such as HR, accounting or legal are met through the corporate IT platform. Because corporate IT platforms are designed to provide support for shared business activities, a base level of IT support for new initiatives could already exist within the corporate IT platform so resources are not wasted by BUs as they seek to build IT support for their business strategies. In that case, BU resources can be better spent aligning IT around those unique activities that the BU regards as a competitive differentiator. Based on the preceding discussion, we hypothesize that complementarity between corporate domain alignment and BU domain alignment enhances BU performance as follows:

Hypothesis 1 (H1). *Corporate domain alignment and BU domain alignment complement each other, such that their interaction effect on BU performance is positive.*

The direct and moderating effects of BU process digitization

BUs that are successful in managing local IT resources, particularly with respect to the integrating mode of asset orchestration (Schriber and Löwstedt, 2018), are better able to use IT applications to automate business processes that are critical to the BU's strategy (Tallon et al., 2016). Accordingly, we propose that increasing BU process digitization, defined as the extent to which a BU uses IT applications to support its core business processes, is likely to affect BU domain alignment. In this instance, core business processes represent unique activities that position a BU to compete in its markets. Thus, the digitization of core processes within the BU is associated with overall improvements in IT support for strategic activities across the BU's value chain (Tallon et al., 2016). As noted in the alignment literature, increased digitization can take the form of greater automation, informatization or transformation of business processes, each of which can play a direct role in allowing the BU to achieve its strategic goals (Tallon et al., 2016). As IT applications become increasingly embedded in business processes, the BU IT application portfolio can also play a central role in enabling workflow, routines, and procedures that are essential to promoting and enabling changes to the BU strategy (Nevo and Wade, 2010, Tallon et al., 2016). What this could then mean for the BU is that any increase in process digitization based on a portfolio of IT applications will have a direct effect on BU domain alignment, which in turn can impact BU performance.

However, the success of BUs in using IT to digitize their core business processes often comes at a cost. The greater the degree of process digitization within the BU, the lower the BU's potential dependence on corporate IT resources and capabilities to meet its local strategic needs. BUs may prefer to retain some degree of local autonomy over their IT decisions, fearing that increased reliance on a corporate IT platform could impede their ability to sense and respond to local market needs, even while benefiting the organization as a whole (Tallon et al., 2019). While process digitization from BU IT resources can enhance local BU flexibility, it limits the potential for corporate parents and corporate domain alignment to directly contribute to BU performance. Some executives opposing

greater BU autonomy could criticize the underutilization of corporate IT resources, arguing that BUs are simply reinventing the wheel. After all, MBOs' investments in corporate-wide IT platforms seek to improve corporate domain alignment by providing common IT capabilities across all BUs (Quaadgras et al., 2014, Reynolds and Yetton, 2015). Corporate executives implicitly expect that BUs will not use local resources to duplicate capabilities provided by corporate IT platforms. In practice, however, BUs are often required to use corporate IT systems for the sake of enabling cross-unit coordination (Tanriverdi, 2006). For flagship BUs that occupy a prominent place in organizations, often capturing a disproportionate share of overall corporate revenues, the use of centrally mandated IT systems could breed resentment, and perhaps even trigger the use of shadow IT and other procedures to circumvent or avoid mandated use of a corporate IT platform (Silic et al., 2017). We refer to this as the *success dilemma* for BUs—the more successful they are in using local IT resources, the more likely they want to avoid being limited by a corporate IT platform.⁴ Hence, BU process digitization can be a two-way street: it can both help and hurt as BUs try to improve their performance. In summary, we propose that BU process digitization will directly enhance BU domain alignment but that as BU process digitization increases, the performance benefits of high corporate domain alignment will begin to diminish. Formally, we capture these relationships in the following pair of hypotheses:

Hypothesis 2a (H2a): *BU process digitization has a positive effect on BU domain alignment.*

Hypothesis 2b (H2b): *The complementarity effect of corporate domain alignment and BU domain alignment on BU performance is negatively moderated by BU process digitization.*

Research method

Data collection

A field survey of 120 organizations was conducted to test the study hypotheses. Our sampling frame included 800 randomly selected MBOs from the United States, combined with a further 400 MBOs from Australia and Germany, for a combined total of 1200 organizations. We identified these organizations in S&P Compustat (supplemented by the Directory of Top Computer Executives created by Applied Computer Research, Inc.), the Australian Securities Exchange, and contact lists maintained by IT researchers at Bamburg University and the Center for Information Systems Research (CISR) at the MIT Sloan School of Management. The survey was administered in 2012, with follow up data collection efforts to gather archival financial performance data from publicly available data sources.

We sought to identify an appropriate informant in each organization to assess the effects of cross-domain alignment on the performance of the MBO's key market-facing BU. Given the relationship between BUs and the corporate parent and the degree of visibility that a corporate CIO has into key BUs, we initially argued that the corporate CIO would be the best informant. To confirm this belief, we interviewed senior executives at three publicly-traded MBOs. The executives interviewed held positions such as Vice President of Global E-Commerce, Chief Information Officer (CIO), and Vice President & Chief Security Officer. In our discussions with these executives, we found that CIOs would be appropriate key informants for our study. Not only are they the most experienced and knowledgeable individual in the IS function, but they are exposed to the views of other senior business executives across multiple levels of the organization. Furthermore, discussions with these informants indicated that corporate IT executives have, by necessity, a direct need to work closely with key market-facing BUs that leads them to develop deep insights into the IT challenges across the organization and the broader role of IT in supporting BU activities.

We identified a corporate CIO familiar with the organization's flagship BU or, if that person was unknown, the CIO of the flagship BU as our key informant. A market-facing BU, also referred to as strategic business unit (SBU), is defined as an organizational unit that satisfies the following criteria: it resides at the first level of the organizational hierarchy; it produces and delivers a distinct set of products or services to a specified external market; and it has profit/loss accountability and distinct operating rules. The average BU in our sample accounts for 40% of consolidated corporate revenues. On average, our respondents had been in their current role for eight years and had worked at the same organization for 12 years. This suggests that they had participated in multiple annual strategic planning and budgeting cycles of their firms and were knowledgeable about the IT needs of key BUs and organization-wide efforts to support strategic goals.

Our field survey generated 141 responses for an initial response rate of 12%. Of those responses, twenty-one were excluded due to missing data. Thus, our final sample of 120 MBOs yields a response rate of 10%. While low, this is on par with survey response rates reported elsewhere in the IT/business alignment literature where respondents are senior IT executives (Oh and Pinsonneault, 2007, Gerow et al., 2015). However, the potential for non-response bias needs to be investigated. We analyzed our sample using Armstrong and Overton's (1977) extrapolation procedure. No significant differences were found between early and late respondents (Wilks' $\lambda = 0.97$; $F = 0.62$; $p > 0.05$), suggesting that non-response bias is not a major concern. We also investigated group differences based on country of origin and found no significant differences (Wilks' $\lambda = 0.90$; $F = 1.10$; $p > 0.05$). Furthermore, the use of a single respondent per organization raises the potential for common method variance (CMV). Our assessment of CMV in Appendix A suggests that CMV does not affect our study results.

A summary of our data is shown in Table 1. Our sample comes from the United States (41.6%), Germany (40.1%), and Australia

⁴ We thank an anonymous reviewer for their insights on *BU success dilemma* and for suggesting the use of the term.

Table 1
Sample characteristics (N = 120).

	Frequency	Percent
<i>Country</i>		
United States	50	41.6%
Australia	22	18.3%
Germany	48	40.1%
<i>Industry Segment</i>		
Financial Services (Banking & Insurance)	23	19.1%
Electronics	23	19.1%
Manufacturing	20	16.6%
Wholesale & Retail Trade	14	11.9%
Energy	13	10.8%
Other (e.g., logistics, healthcare, engineering)	27	22.5%
<i>Organization Size (Employee Count)</i>		
< 3,000	36	36.7%
3,000–10,000	30	30.6%
10,001–25,000	12	12.3%
> 25,000	20	20.4%
<i>Respondents</i>		
Corporate CIOs	96	80.0%
BU CIOs	24	20.0%

We collected employee count data for a total of 98 firms. The remaining organizations were anonymized by respondents under the rules set by our IRB for collecting survey data.

(18.3%) and covers a broad spectrum of industries. Overall, 80% of respondents were corporate CIOs while 20% were BU CIOs. The results of a multivariate analysis of variance (MANOVA) indicated no significant differences between survey responses from the two groups (Wilks' lambda = 0.94; $F = 1.35$; $p > 0.05$).

Survey measures

The survey questionnaire used to collect data for testing our hypotheses is provided in Appendix B. All key constructs in our study were measured using multi-item, 5-point Likert-type scales. The survey design was refined using feedback from pilot tests with IT executive sponsors of member firms of MIT CISR.

Previous studies have employed both direct and indirect measures to assess different dimensions of alignment (Coltman et al., 2015; Queiroz, 2017). The literature examining the intellectual dimension of alignment argues that direct measures are robust when assessments of alignment are based on CIO-reported scores. For example, Liang et al. (2017) collected intellectual alignment data from CIOs and subsequently collected additional data from business executives to validate their CIO-reported alignment scores. They found that CIO-reported and business executive-reported alignment scores are convergent and cannot be distinguished from each other. Similarly, Gerow et al. (2015) employed direct measures to assess several dimensions of alignment, including intellectual alignment and cross-domain alignment. In line with this literature, we use measures that directly capture the state of corporate domain alignment and BU domain alignment in MBOs. We assess the extent of corporate domain alignment on the basis of whether the corporate IT platform supports the corporate business strategy. Similarly, we assess the extent of BU domain alignment on the basis of whether the BU IT application portfolio supports the BU strategy (Reynolds and Yetton, 2015). Following prior research that used interaction terms to operationalize complementarity (Richey et al., 2007; Song et al., 2005; Saldanha et al., 2017), we measure complementarity as the interaction between corporate domain alignment and BU domain alignment.

To measure BU process digitization, we assess the extent to which the BU uses IT applications to support its core value chain processes, i.e., supplier relations, production and operations, product and service enhancement, sales and marketing, and customer relations. These five processes span the breadth of the value chain and apply to both manufacturing and service organizations (Tallon et al., 2016).

Performance can be measured using archival data or self-reported data based on respondents' perceptions of performance relative to competitors. Given our focus on BU performance, data that might be used to assess performance relative to competitors is rarely available in public archival sources (Wall et al., 2004). Accordingly, we use a series of self-reported measures taken from Powell and Dent-Micallef (1997) and Kim et al. (2011).⁵ These measures assess market share, revenues, revenue growth, and profitability relative to competitors. In addition, we collected archival performance data from public sources and used that data to create a proxy measure of BU performance. This proxy measure was used to perform robustness tests, as discussed in the results section.

Lastly, control variables were used to account for differences in BU contribution to firm revenue (percentage of total revenue), BU

⁵ Research by Wall et al. (2004) that compared the use of self-reported and archival measures found evidence that self-reported measures are valid for collecting BU performance data. Tallon and Kraemer (2007) also found that self-reported perceptual measures of IT business value are valid substitutes if archival data are unavailable.

Table 2

Validity and reliability statistics and correlations between constructs.

Research Constructs	Mean (SD)	CA	CR	AVE	1	2	3	4
1. Corporate domain alignment	3.410 (0.857)	0.730	0.811	0.552	0.742			
2. BU domain alignment	3.254 (0.785)	0.720	0.826	0.553	0.631	0.743		
3. BU process digitization	3.780 (0.729)	0.753	0.826	0.500	0.400	0.437	0.707	
4. BU performance	3.340 (0.806)	0.874	0.909	0.667	0.258	0.251	0.108	0.816

CA = Cronbach's Alpha; CR = Composite Reliability; The bold numbers on the diagonal are the square root of the AVE; Off-diagonal elements are correlations between each pair of constructs.

size, BU strategic orientation, industry type, and pace of technology change within the industry. To assess strategic orientation, we used a measure taken from Tallon (2008) that distinguishes between BUs pursuing operational excellence and those pursuing differentiation through product innovation or customer intimacy. We created a dummy variable to account for this difference. We also used dummy variables to account for differences in industry type.

Data analysis

To test our hypotheses, we performed a regression-based analysis of conditional effects (Hayes, 2017).⁶ This approach implements an ordinary least squares (OLS) regression-based procedure based on bootstrapped estimates and can be used to compute *p* values and confidence intervals for direct, indirect, and moderation effects (Hayes, 2017, Kilduff et al., 2016, Schlager et al., 2018). We averaged the items in each scale to form scale scores (Yu et al., 2018, Glaser et al., 2016, Lu and Ramamurthy, 2011). In addition, we mean centered the measures used in interaction terms. To test our measurement model, we performed an exploratory analysis of the underlying questionnaire items.

Research results

Measurement model assessment

We conducted various tests to assess the validity and reliability of our constructs. All construct-to-item loadings are significant, and the items load more highly on their own constructs than on others. Descriptive statistics, including means and standard deviations, construct correlations, Cronbach's alpha, composite reliability, and average variance extracted (AVE) are summarized in Table 2. To assess internal consistency, we examined measures of Cronbach's alpha and composite reliability. Cronbach's alpha and composite reliability measures for each construct exceed 0.72 and 0.81, respectively. In order to assess discriminant validity, we examined AVE and correlations among our constructs. The diagonal elements in Table 2 represent the square root of AVE and exceed the off-diagonal elements in the correlation matrix.

Multicollinearity among constructs is also an important validity concern since very high correlations can produce unstable estimates. This concern is particularly prevalent in studies testing complementarity effects because the components of a complementary relationship co-vary and, therefore, are expected to correlate. To address this issue, we performed a series of collinearity tests. These tests reveal minimal collinearity with all variance inflation factors (VIF) below 2.2 as against a suggested maximum of 10 (MacKenzie et al., 2011). Together, these results suggest that our measures are valid and reliable.

Revisiting findings from prior research

Prior to testing our hypotheses, we examined the relationship between BU domain alignment and BU performance. This allowed us to revisit the standard nomology in the IT/business alignment literature. A regression analysis was performed to assess this relationship. As expected, we found that BU domain alignment has a significant positive effect on BU performance ($\beta = 0.261$; $p < 0.05$). Yet, this analysis does not account for the influence of corporate domain alignment and, therefore, an assessment of joint effects is warranted to investigate potential complementarity effects of cross-domain alignment in MBOs.

Hypotheses testing

We estimated two regression models to test our hypotheses. Model 1 estimates the complementarity effect of corporate domain alignment and BU domain alignment on BU performance, while controlling for BU process digitization. Model 2 adds the direct effect of BU process digitization on BU domain alignment, as well as the moderating effect of BU process digitization on the complementarity effect of corporate and BU domain alignment. The results are presented in Table 3.

H1 states that the complementarity of corporate domain alignment and BU domain alignment has a positive effect on BU performance. In Table 3, Model 1, the interaction between corporate domain alignment and BU domain alignment on BU performance is

⁶ We performed this analysis using the PROCESS macro in IBM SPSS statistics (Kilduff et al., 2016).

Table 3
Results of regression analyses.

	Model 1	Model 2	
		BU domain alignment	BU performance
BU size	0.058	−0.040	0.057
BU contribution to firm revenue	0.002	0.003	0.001
BU process digitization	0.031	0.457***	0.171
Technology change in industry	0.118 [†]	−0.116	0.104
BU strategic orientation	0.193	0.006	0.219
Industry type ^a	<i>Included</i>	<i>Included</i>	<i>Included</i>
Corporate domain alignment	0.132		0.156
BU domain alignment	0.232 [†]		0.273*
BU domain alignment × corporate domain alignment	0.198*		0.014
BU domain alignment × BU process digitization			−0.021
Corporate domain alignment × BU process digitization			−0.046
BU domain alignment × corporate domain alignment × BU process digitization			−0.252*
R ²	0.173	0.251	0.235
R ² change for the interaction term	0.035*		
R ² change for highest order interaction			0.050*

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; [†] $p < 0.1$, all tests are two tailed; Dependent variable: BU performance; Unstandardized coefficients are reported; ^a Industry dummies (D1-D5) included; Bold text is used to denote significant effects.

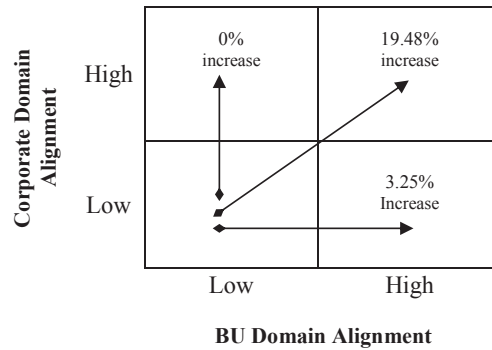


Fig. 2. Percent increase in BU performance due to changes in corporate and BU domain alignment.

positive and significant ($\beta = 0.198$; $p < 0.05$). Further, complementarity explains variance in BU performance over and above the variance explained by the sum of the individual effects of alignment ($\Delta R^2 = 0.035$, $p < 0.05$). These findings support H1. As expected, different combinations of corporate domain alignment and BU domain alignment (i.e., high-low combinations of each, as illustrated in Fig. 1) influence BU performance differently due to complementarity effects. As shown in Fig. 2, increasing BU domain alignment from low to high is more beneficial when corporate domain alignment is high.

The results for Model 2 indicate a significant positive effect of BU process digitization on BU domain alignment ($\beta = 0.457$; $p < 0.001$). Thus, H2a is supported. The results for Model 2 also find that the complementarity effect of corporate domain alignment and BU domain alignment on BU performance is negatively moderated by BU process digitization ($\beta = -0.252$; $p < 0.05$). Therefore, H2b is supported. As shown in Table 4, the complementarity effect gets weaker, with p values transitioning from significant to nonsignificant, as BU process digitization increases.

Furthermore, the results in Table 3 for Model 2 indicate that BU domain alignment can exert a direct positive effect on BU performance ($\beta = 0.273$; $p < 0.05$). It is important to note, however, that the presence of a three-way interaction affects the way direct effects and two-way interactions should be interpreted in Model 2. As Jaccard and Turrisi (2003, p. 45) explain, “the interpretation of the lower-order coefficients always are conditionalized on the higher-order product terms, with the conditionalization being that the other variables in the higher-order product terms equal 0”. Hence, the coefficient for BU domain alignment indicates its effect on BU performance when corporate domain alignment and BU process digitization equal 0 (i.e., when they are “average” or “medium” based on the fact that we mean centered them) (Jaccard and Turrisi, 2003). Similarly, the coefficient for the interaction between corporate and BU domain alignment reflects the effect of the two-way interaction when BU process digitization equals 0. As a robustness test, we collected available archival data on organizational performance from public sources and used that data to create a proxy measure of BU performance (see Appendix C). We then re-estimated the joint effects of BU domain alignment and corporate domain alignment on BU performance. As shown in Appendix C, the results of this analysis are consistent with our findings above.

Table 4Effect of BU domain alignment \times corporate domain alignment on BU performance at various levels of BU process digitization.

BU Process Digitization (mean-centered)	Effect of BU Domain Alignment \times Corporate Domain Alignment	p-value	LLCI	ULCI
-2.380	0.615***	0.007	0.1671	1.0636
-2.200	0.569***	0.008	0.1508	0.9889
-2.020	0.524***	0.009	0.1337	0.9152
-1.840	0.479**	0.010	0.1155	0.8424
-1.660	0.433*	0.012	0.0960	0.7710
-1.480	0.388*	0.015	0.0748	0.7013
-1.300	0.342*	0.021	0.0515	0.6337
-1.120	0.297*	0.032	0.0256	0.5686
-0.960	0.256*	0.050	0.0000	0.5135
-0.940	0.251 [†]	0.053	-0.0034	0.5068
-0.760	0.206 [†]	0.094	-0.0363	0.4488
-0.580	0.160	0.176	-0.0737	0.3952
-0.400	0.115	0.325	-0.1159	0.3466
-0.220	0.069	0.553	-0.1633	0.3030
-0.040	0.024	0.840	-0.2157	0.2645
0.140	-0.021	0.868	-0.2727	0.2306
0.320	-0.066	0.622	-0.3337	0.2007
0.500	-0.112	0.439	-0.3980	0.1741
0.680	-0.157	0.312	-0.4651	0.1502
0.860	-0.202	0.227	-0.5344	0.1285
1.040	-0.248	0.170	-0.6054	0.1086
1.220	-0.293	0.132	-0.6778	0.0901

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; [†] $p < 0.1$; All variables were mean-centered; Results generated using the SPSS PROCESS macro with the Johnson-Neyman output option to calculate regions of significance. In order to ease the interpretation of regions of significance in moderation models, the PROCESS macro slices the distribution of the moderating variable into 21 values (Hayes 2017, p. 256); LLCI and ULCI are confidence interval endpoints; Bold text is used to denote significant effects.

Discussion

Recognizing the growing prevalence of MBOs, the critical role played by BUs, and a dearth of IT/business alignment research that considers both corporate and BU-level alignment in these organizations, this research poses an important question: how do corporate domain alignment and BU domain alignment influence BU performance? Our results reveal that these two types of alignment are complementary and that they have joint positive effects on BU performance. This result could be taken to mean that as corporate parents look to their BUs to drive performance, neither the corporate nor the BU can act alone. Instead, there is a role for each and, therefore, an imperative that corporate and BU managers work together to decide what the corporate IT platform should do best and what the BU should do best. We also find that increased process digitization within BUs can be a two-way street: on the one hand, BU process digitization enhances BU domain alignment but on the other hand, it diminishes or rolls back the performance benefits that BUs realize from the complementarity of corporate and BU domain alignment. This roll back does not mean that greater BU process digitization is somehow bad or that it is negative to the point of actually damaging the BU; instead, it speaks to the question of expanded BU autonomy, reduced reliance on the corporate IT platform, and growing importance of BU domain alignment in driving BU performance. In summary, as we articulate below, this research has important implications for our understanding of how cross-domain alignment in MBOs influences BU performance and for the role of corporate IT platforms in these organizations.

Contributions of the research

Our study contributes to the literature on IT/business alignment in three respects. First, a tiny fraction of research in the IT/business alignment domain has investigated alignment in BUs, as distinct from looking at alignment in organizations as a whole or at the corporate level more specifically (Fonstad and Subramani, 2009, Chan, 2002). In the context of MBOs, both corporate domain alignment and BU domain alignment are important in their own right and neither can be ignored because of path dependencies and resource complementarities (Reynolds and Yetton, 2015). To focus on BU domain alignment alone would be to ignore the voice of the corporate parent. Conversely, focusing on the corporate level alone ignores the fact that BUs are typically the locus of revenues and profitability. Further, to ignore the growing utilization of corporate IT platforms in MBOs minimizes the importance of dynamic capabilities to orchestrate the use of firm-wide and BU-specific IT resources that drive BU performance. Hence, there is a growing need to investigate alignment at the corporate and BU levels and how they interact with one another. As such, this study extends our understanding of cross-domain alignment in MBOs and how alignment at multiple levels influences BU performance.

Second, while an extensive body of research examines the performance impacts of the intellectual or strategic dimension of alignment (Liang et al., 2017, Coltman et al., 2015, Chan and Reich, 2007), less attention has been paid to the cross-domain dimension of alignment at any level (Gerow et al., 2015, Gerow et al., 2014). We integrate insights from the literature on asset orchestration with research on resource complementarities to theorize that different types of cross-domain alignment in MBOs have joint effects on BU performance. In line with these theoretical perspectives, we argue that firms that repeatedly derive value from IT

resources are likely to have dynamic capabilities related to asset orchestration. For example, asset orchestration in terms of developing and integrating IT assets speaks to the challenge of complementarity and the role of managerial competencies in creating an IT asset base that supports the organization's strategic goals. In this regard, managerial competencies such as the accessing, integrating, developing, and releasing modes of asset orchestration allow firms to devise and coordinate firm-wide and BU-specific IT efforts in order to improve cross-domain alignment. We show that complementarity between corporate domain alignment and BU domain alignment enhances BU performance. Moreover, we show that this complementarity effect is stronger than the sum of the individual effects of alignment, providing evidence of system effects that have not been examined in prior IT/business alignment literature.

Additionally, this study contributes to our understanding of the moderating role of BU process digitization on the relationship between cross-domain alignment and BU performance. We find that the joint positive effect of corporate domain alignment and BU domain alignment on BU performance weakens as BU process digitization increases. While BU process digitization can enhance local flexibility, the fact that this originates from inside the BU and is likely led by BU management means that there is a diminished role for corporate IT platforms and corporate domain alignment to directly contribute to BU performance. With echoes of a love-hate relationship that often seems to define parent-child relationships, it is almost as if BUs want to use a corporate IT platform—perhaps even calling for the corporate parent to build a platform—but not so much that it starts to hold them back. In this regard, the use of centrally mandated IT systems or policies surrounding IT procurement and IT use, more broadly, could create tension and undermine BUs' efforts to create value from local IT resources that BUs see as necessary to the preservation of their competitive distinction (Ross and Beath, 2007). Thus, MBOs are more likely to realize IT-based complementarities when they are able to balance BUs' need for IT autonomy with the corporate parent's efforts to increase cross-unit synergies.

Malcolm Harkins, a former Chief Privacy Officer at Intel, described efforts to balance corporate and BU tensions around the need for greater use of IT for security as “protect to enable” (Harkins, 2013). While his comments pertain to corporate efforts to disallow BUs from engaging in certain risky activities, his point is that BUs will conjure up workarounds and other means of circumventing what the corporate parent has dictated and so BUs must be afforded some degree of latitude to do what they do best. In the case of alignment, for BUs competing in broader market segments, centrally mandated IT systems can generate significant benefits such as increased cross-unit synergies and knowledge sharing that promote exchange of ideas and improved decision-making. Yet, these systems ought not to limit BUs to such a degree that BU performance suffers. Getting this balancing act just right, not just once but on an ongoing basis, is perhaps easier said than done for it calls into question the relationship, not just between IT and business executives, but also the relationship between corporate and BU managers at different levels within the organization. To address this challenge, firms may need to focus on the practices and activities of aligning as opposed to the state of alignment per se (Karpovsky and Galliers, 2015) and build asset orchestration capabilities to enable the integration of firm-wide and BU-specific IT assets (Yeow et al., 2018, Schriber and Löwstedt, 2018).

Implications for theory and practice

MBOs are the dominant corporate form in use worldwide, yet extant conceptualizations and measures of IT/business alignment implicitly act as if alignment at the corporate level is indistinguishable from or perhaps even a proxy for alignment at the BU level (Reynolds and Yetton, 2015). Existing theories look upon IT/business alignment in a holistic sense and yet cross-domain alignment at the corporate level will likely be different from that at the BU level. Notwithstanding the presence of a flagship or dominant BU in some situations, both IT resources and business strategy could vary widely between the corporate parent and BUs. What this means is that when theory asks what is the relationship between IT/business alignment and some organizational outcome, the theory ought to be contextualized and clarified by asking whose alignment are we referring to: the corporate parent or one or more BUs. Turning to the issue of measurement, prior research as reported in meta-analysis by Gerow et al. (2014) and in a special issue editorial by Coltman et al. (2015) has focused on measuring alignment, notably the intellectual and cross-domain dimensions of alignment, using measures that assume that there is one strategy or at least a shared strategy for the entire organization. That may be the case for organizations that have just a single BU (Tallon and Pinsonneault, 2011, McLaren et al., 2011) but such organizations are the exception and not the norm. Consequently, one could measure cross-domain alignment at each level within an MBO—at the corporate-level and for each BU—using separate scales and then try to somehow combine or weight those scores to form an aggregate, representative, all-encompassing, MBO score. In summary, when alignment exists at multiple levels within an MBO, extant theories ought to evolve to take account of whose alignment is being described and be cautious about generalizing from one level to another within the same organization. By the same token, organizations may need to be careful about “fixing” perceived misalignment by targeting one particular part of the organization, thinking that by fixing one part, they are essentially fixing the whole.

CIOs continue to describe IT/business alignment as a foremost challenge (Kappelman et al., 2019). Understanding how to resolve this challenge means that we must first accept that MBOs are a pervasive and global organizational form and that alignment cannot be divorced from organizational structure. Organization structure was part of the earlier conceptualization of alignment given by Henderson and Venkatraman (1993) some three decades ago and yet structure has been lost or ignored in a world where the focus has often been on measurement (Tallon et al., 2016). In a more practical sense, for CIOs who face persistent alignment challenges, our research confirms that investing in corporate IT platform capabilities to enable the corporate strategy is central for building a base of IT support for market-facing BUs even if those same BUs may willingly and for good reason try to wean themselves off of the corporate IT platform at some point. As corporate domain alignment improves and the effects of shared IT begin to benefit the BUs, corporate IT managers can then focus their resources on developing IT capabilities for individual BUs with an eye toward folding these capabilities back into the corporate IT platform for broader use, where feasible, across other BUs. To some degree, BUs face similar IT challenges that can be addressed through a combination of corporate IT support and local IT support. At the same time, it

makes sense to allow BUs that face unique challenges to leverage shared IT but to then build on that by implementing their own unique IT solutions to support the more idiosyncratic aspects of the BU's strategy. As process digitization expands, BUs may come to rely less on the corporate IT platform (hence, the negative relationship underlying H2b). However, that is not something that corporate parents should fear or discourage by somehow trying to impose limits on what BUs can do to support their own business strategy. Just as a parent wants a child to grow up to become independent and successful, the corporate parent may want its BU to become independent (within reason) while recognizing that the success or failure of the BU will reflect back on the corporate parent. Deciding what a BU should be allowed to do by itself and what should be retained within the corporate IT platform is *the* question to take from this study for it is a question that requires careful consideration and perhaps even negotiation between all concerned.

Limitations and future research

The findings from this study are subject to a number of limitations. We did not collect data from each and every BU in each organization in our sample. Instead, we focused on the key market-facing BU in each organization. While this might have been the largest or most important BU in terms of revenues, there are many other BUs that could be impacted differently by cross-domain alignment. This may limit the generalizability of our findings to key or flagship BUs, as opposed to all BUs in an MBO. On the other hand, our focus on key market-facing BUs helps control for extraneous factors that may influence assessments of performance in organizations competing in multiple product-markets. This tradeoff between generalizability and internal validity is an important factor in deciding on an appropriate research design (Setia et al., 2013). Given our focus on BU performance and how key BUs could benefit from corporate domain alignment, we chose a design that offers greater internal validity to test our theory.

We also note that our operationalization of cross-domain alignment was based on perceptual measures. While this approach is in line with extant research on cross-domain alignment (Gerow et al., 2015), perceptual measures are more prone to bias and error than measures based on archival data. Future studies could use archival data to refine the operationalization of cross-domain alignment. Further, we did not look at the rationale behind the creation of BUs or whether an organization had an appropriate combination of BUs. Organizations are in a constant state of flux and may be compelled to merge or spin off BUs as market conditions dictate. Additionally, since BUs are nested within organizations, future studies could perform multi-level analysis to help explain the relative importance of corporate domain alignment and other corporate level factors in driving BU performance (Misangyi et al., 2006). There is equally an unexplored time dimension in our research. Alignment takes time to change and so future research could look at how and when the effects of corporate domain alignment are realized at the BU level.

Conclusion

The alignment literature has made considerable progress in the three decades since it first began to attract interest from IT academics and practitioners and particularly from those tasked with IT planning and evaluation. As the literature has progressed through different stages, researchers have examined different aspects of alignment and their implications at finer levels of granularity. From cross-referencing of business and IS plans to analyses of alignment at the process level, we are now able to add one more layer of detail to the story by considering the complementarity effects of cross-domain alignment in MBOs. Overall, this study extends our understanding of cross-domain alignment and its effects on BU performance. From this emerges an alignment paradigm that reflects the cross-domain alignment challenges in MBOs and the ways in which IT-based complementarities enable BU performance. Applying this paradigm in future research will, we hope, help to resolve some of the concerns around alignment that continue to make it a pressing challenge for IT executives.

Acknowledgments

The authors would like to thank the Senior Editor, Carol Hsu, and the three anonymous reviewers for their insightful comments and constructive suggestions. This research was partially supported by grants from the Australian Research Council (DP 1096429, LP 120100422, and DP 140100248).

Appendix A

The potential for common method variance

We sought to mitigate CMV by following the recommendations proposed by Podsakoff et al. (2003). They advocate developing the survey instrument in a way that reduces CMV by offering anonymity, protecting respondent identity, and separating scale items used to measure key constructs with questions relating to other non-critical constructs. We followed these suggestions closely when designing our survey.

Furthermore, prior research argues that archival data collected from public sources could be used to corroborate self-reported data and to triangulate research findings, thus mitigating concerns with CMV (Pavlou and El Sawy, 2006). We employed this strategy, as discussed in Appendix C.

Finally, we performed tests for CMV. First, we applied Harmon's ex post one-factor test (Podsakoff and Organ, 1986). No dominant factor emerged in our analysis. However, researchers have argued that this test is relatively insensitive (Sharma et al., 2009). Recognizing this, we employed Lindell and Whitney's (2001) marker variable test. We chose the "predictability of competitors'

strategies” (PCS) as the marker variable for the analysis. As a marker variable is theoretically unrelated to the study’s principal constructs, the correlations should be very small. The average correlation between the principal constructs and PCS was low and non-significant ($r = 0.04$). None of the significant correlations in our model became insignificant after adjustment and non-significant correlations remain non-significant, providing evidence against the existence of CMV in our data. These results, together with the strategies we employed to mitigate CMV, suggest that CMV does not factor in our study results.

Appendix B

Survey items and constructs

Corporate Domain Alignment (1: Strongly disagree; 5: Strongly agree)

To what extent do the following statements reflect the current situation in the MBO?

- The corporate IT platform lacks capabilities that are necessary to enable the effective execution of the corporate strategy.*
- The organization is a long way short of where the corporate IT platform capabilities need to be to support the corporate strategy.*
- The potential of the corporate IT platform is not fully considered when corporate strategy decisions are made.*
- Overall, the corporate IT platform meets the needs of the corporate strategy.

BU Domain Alignment (1: Strongly disagree; 5: Strongly agree)

The constructs below consist of questions concerning the flagship SBU.

To what extent do the following statements reflect the current situation in the SBU?

- The existing SBU IT application portfolio lacks capabilities that are necessary to effectively execute the SBU strategy.*
- The existing SBU IT application portfolio provides sufficient support for the execution of our SBU strategy.
- The potential of the SBU IT application portfolio is not fully considered when SBU strategy decisions are made.*
- Overall, the SBU IT application portfolio meets the needs of the SBU strategy.

BU Performance (1: Strongly disagree; 5: Strongly agree)

Adapted from [Powell and Dent-Micallef \(1997\)](#) and [Kim et al \(2011\)](#).

To what extent do the following statements reflect the current situation in the SBU?

- We are more profitable than our competitors.
- Our sales growth exceeds that of our competitors.
- Our revenue growth exceeds that of our competitors.
- Our market share growth exceeds that of our competitors.
- Overall, our performance is better than our competitors.

BU Process Digitization (1: Not at all; 5: To a great extent)

Adapted from [Tallon \(2008\)](#).

To what extent do IT applications support the following SBU processes? Please limit your appraisal to the extent of IT use rather than the quality of IT support.

- Supplier relations.
- Product/service operations.
- Product/service enhancement.
- Sales and marketing.
- Customer relations.

BU Strategic Orientation

Adapted from [Tallon \(2008\)](#).

What is the current strategic business orientation of the SBU? Please allocate 100 points across the three orientations below. Allocate the greatest number of points to whatever orientation best describes this SBU.

Operational excellence (business strategy that emphasizes efficiency and reliability, low cost, and end-to-end supply chain optimization): ____

Customer intimacy (business strategy that emphasizes flexibility and responsiveness, customer service, and market-place management): ____

Product leadership (business strategy that emphasizes creativity, product development, time to market, and market communications): ____

Note: * denotes reverse-coded items.

Appendix C

Results of additional analysis

We collected available archival data on organizational performance from public sources and used that data to re-estimate the joint effects of corporate domain alignment and BU domain alignment on BU performance. Specifically, we collected archival data on organization revenue for 2012 (the year of the survey) and for the following year. We collected these data for a total of 69 organizations. The remaining organizations in our sample are private and do not disclose financial data or were anonymized by respondents under the rules set by our IRB for collecting survey data. In the survey, we asked about the BU's contribution to revenues as a percentage of the organization's total revenue. This allowed us to calculate the proportion of revenue growth accounted for by the BU. Using BU revenue growth as an objective proxy measure of BU performance, we re-estimated the complementarity effects of corporate and BU domain alignment. Consistent with our findings in the results section, the results of this analysis indicated that BU domain alignment and corporate domain alignment exert joint positive effects on BU performance ($\beta = 0.411, p < 0.05$).

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