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# Mitigating IT Professionals' Turnover in Non-IT Organizations: An Organizational Identification Perspective

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## Abstract

The turnover of IT professionals is a perpetual challenge for non-IT organizations. Based on self-categorization theory, this study proposes that IT employees' turnover may be mitigated by fostering their identification with non-IT organizations, which can be done by meeting various facilitative conditions. Guided by intergroup contact theory, we identify IT employees' perceived alignment between IT and the core business of an organization (business-IT alignment), the extent of boundary-spanning activities that IT employees engage in, and the closeness of the relationships between IT and non-IT employees as the drivers of their organizational identification. Using survey data collected from organizations in different industries, we obtained empirical evidence supporting the positive effects of the perceived business-IT alignment, the extent of boundary-spanning activities, and the relationship closeness between IT and non-IT employees on IT employees' organizational identification. Additionally, there was a three-way interaction effect among the three drivers such that the relationship closeness between IT and non-IT employees reduced the positive effect of the extent of boundary-spanning activities on IT employees' organizational identification when business-IT alignment was low. However, this negative moderating effect diminished when business-IT alignment increased. The findings of this research advance the literature and offer practical guidelines for non-IT organizations on how to enhance their IT employees' organizational identification and how to mitigate their turnover intentions.

**Keywords:** Organizational Identification, Turnover Intention, IT Professionals, Non-IT Organizations, Business-IT Alignment, Boundary-spanning Activities, Closeness of Interpersonal Relationship

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## 1 Introduction

The turnover of high-tech professionals has been an enduring challenge facing the IT sector all over the world (Johnson, 2018). A recent report from LinkedIn shows that the IT sector has the highest turnover rate of 13.2%, compared to other business sectors such as retail and consumer products, media and entertainment, professional services, and government/education/nonprofit (Petroni, 2018). While strong

turnover culture suggests favorable IT job prospects and easy migration for IT employees, it certainly poses a critical challenge to organizations that do not specialize in IT products and services (i.e., non-IT organizations) (Zwieg et al., 2006). These non-IT organizations rely on their IT employees to achieve operational or strategic objectives via various IT solutions (Ferratt et al., 2005; Oh & Pinsonneault, 2007). In general, turnover is expensive for organizations (Computer Economics, 2008). The turnover of IT employees is particularly

detrimental, as it can undermine the realization of value from IT investments (Dinger et al., 2015; MacCrory et al., 2016; Moore & Burke, 2002; Parker & Skitmore, 2005). Thus, retaining qualified IT employees is a top priority of human resource management for non-IT organizations (Dinger et al., 2015; Joseph et al., 2007) eager to better understand turnover among their IT employees (Ferratt et al., 2005; U.S. Bureau of Labor Statistics, 2016).

The extant literature has noted that personal characteristics (e.g., personal expertise), job and organizational variables (e.g., role stressors, career advancement prospects, rewards), and market conditions (e.g., ease of movement) can influence the turnover of IT employees (see Joseph et al., 2007 for a review). However, the prevalence of a turnover culture among IT professionals (Moore & Burke, 2002) suggests that there could be a unique factor rooted in the IT profession that perpetually affects turnover behaviors. In particular, the extent to which IT professionals perceive oneness with or belongingness to an organization as important members, termed organizational identification, plays a crucial role (Mael & Ashforth, 1992; Vardaman et al., 2018). IT employees often experience a set of sociostructural boundaries that separate them from mainstream non-IT employees in non-IT organizations (Zwieg et al., 2006).

Such boundaries may arise from status inequality, knowledge gaps, communication barriers, and departmentalization between IT and non-IT employees. For instance, IT employees are often viewed as having a distinct background and working language with little or no business knowledge (Muse, 2016) or as playing a more ancillary technical role than non-IT employees (Mithas & Krishnan, 2008). According to the self-categorization literature, the perception of salient intergroup boundaries may drive IT employees to categorize themselves as an “out” group within the organization (Hogg & Terry, 2000; Miller et al., 2010). This categorization may lead IT employees to detach psychologically from their organizations and undermine their organization identification (Cole & Bruch, 2006). As a result, IT employees would leave the organization. In other words, the extent to which IT employees identify themselves with the non-IT organization they work for is a key factor affecting their turnover decisions. Thus, drawing on the organizational identification literature, we regard the turnover culture in the IT profession as an outcome of poor identification between IT employees and their non-IT organizations.

We, therefore, propose fostering IT employees’ organizational identification as a potential solution to mitigate their turnover. Although extensive research has investigated the antecedents of organizational identification (Riketta, 2005), there is still a lack of research investigating how to overcome the challenges

inherent to the IT profession that inhibit IT employees from forming a psychological sense of oneness and identifying themselves with their non-IT organizations. A theoretical development that fills this gap is important as it would provide non-IT organizations with insights into strategies and tactics for IT-employee retention policies to maximize the business value of IT human capital. Thus motivated, this study aims to provide a nuanced theorization of the drivers that can boost IT employees’ organizational identification with non-IT organizations and, in turn, mitigate their turnover.

This study is informed by two strands of literature. First, we employ self-categorization theory to argue that the distinct workplace context leads IT employees to confront boundary-based barriers and experience unique psychological needs associated with uncertainty reduction and self-concept enhancement, which, if not adequately addressed, would hinder their organizational identification. Second, we draw on intergroup contact theory and adapt it to the IT workplace context to identify the factors that can help dissolve boundaries. Specifically, we posit that IT employees’ perception of the alignment of business strategies and IT strategies (business-IT alignment), the extent of their boundary-crossing practices in collaborating with people from other functional units to perform various job duties (boundary-spanning activities), and the closeness of the personal relationships they have with non-IT colleagues (relationship closeness with non-IT employees) are the drivers of organizational identification. In addition to hypothesizing their separate direct effects, this research also theorizes how the interaction among the three drivers impacts IT employees’ organizational identification. As the levels of these drivers may vary across organizations, a nuanced understanding of their interaction could enable organizations to develop specific IT human capital management strategies based on their distinct contexts.

The rest of the paper is organized as follows. First, we develop the theoretical underpinnings for the study by theorizing IT employees’ organizational identification and deriving its drivers based on self-categorization theory and intergroup contact theory. Next, we formulate our research hypotheses and test them using a survey of IT employees. We conclude the paper by discussing the theoretical and practical implications of our work.

## **2 Theoretical Background**

Our theorization is grounded on two lines of literature. First, we use self-categorization theory to explain the relationship between IT employees’ organizational

identification and their turnover behavior and to obtain the overarching logic for the challenges that IT employees may face in identifying themselves with their non-IT organizations. Second, we draw on intergroup contact theory to derive the specific antecedents of IT employees' organizational identification and explain their effects.

## **2.1 IT Employees' Organizational Identification**

Organizational identification refers to the extent to which one perceives oneness with or belongingness to an organization (Mael & Ashforth, 1992). Self-categorization theory posits that organizational identification stems from a cognitive process whereby one uses the organizational boundary as a frame of reference to define an extended sense of self that is inclusive of the organization (Hogg & Terry, 2000; Miller et al., 2010). Yet the degree to which people include their organizational belongingness as a partial self-definition may vary. As per self-categorization theory (Hogg & Terry, 2000), people categorize themselves into and identify with a social group that satisfies their psychological needs for reducing existence uncertainties and enhancing their self-concept (Brewer & Gardner, 2001; Grieve & Hogg, 1999). It is posited that high organizational identification emerges when employees perceive existence and legitimacy assurance and function with confidence (Hogg & Terry, 2000). Hence, the degree of organizational identification depends on the extent to which the organization can reduce one's existence uncertainty and promote one's self-concept (e.g., confidence).

IT employees face difficulties in identifying with their non-IT organizations when boundaries exist separating them from their non-IT peers. First, structural boundaries exist in organizational departmentation (Hollenbeck et al., 2002). Second, status inequality exists when IT employees serve as technical support to non-IT employees (Mithas & Krishnan, 2008). Third, communication barriers exist due to differences in knowledge background and working language between IT and non-IT employees (Deng & Chi, 2015; Muse, 2016). As per self-categorization theory (Hogg & Terry, 2000), such perceptions of structure, status, and communication boundaries undermine IT employees' self-identification with the organization.

The aforementioned boundaries in IT workplace contexts give rise to distinct psychological needs associated with uncertainty reduction and self-concept enhancement for IT employees. Because of the lack of business domain knowledge, IT employees are often uncertain about normative thoughts, expectations, and

behaviors when communicating with non-IT employees (Muse, 2016). Additionally, IT employees also face legitimacy uncertainty. Executives are often unclear about the strategic value of IT (Tallon et al., 2002). IT employees are likely to perceive that they are substitutable and their jobs are insecure in the face of IT outsourcing (Mithas & Krishnan, 2008). The ambiguity of IT value to the core business can engender stability and legitimacy concerns among IT employees, making the organization an unlikely frame of reference for their identification. In summary, the boundaries between IT and non-IT employees and unfulfilled uncertainty reduction and self-concept enhancement needs can pose challenges for IT employees in identifying themselves with their organizations.

However, the existing literature has yet to delineate the factors that can address these challenges confronting IT employees' organizational identification. Furthermore, the research on organizational identification, while ample, mainly focuses on non-IT employees (see Appendix A). The literature on professional employees in nonprofessional organizations, however, has only revealed distinct behaviors of the professional (see Appendix B). There is a dearth of detailed investigation on how to reshape professional employees' behaviors to benefit their nonprofessional organizations that could be applied to the IT professional context. To address this research gap, our research focuses on psychological processes and needs stemming from the unique IT work context (Joseph et al., 2007) and explores the drivers of IT employees' organizational identification. Thus, we need to identify factors that can help dissolve the boundaries mentioned earlier. Intergroup contact theory is helpful because it focuses on dissolving intergroup boundaries and promoting intergroup outcomes (Allport, 1954).

## **2.2 Intergroup Contact Theory**

Intergroup contact theory delineates a set of sociostructural conditions, including equal status, authoritative support, cooperative interdependence, common goals, personal interaction, and mutual acquaintance and friendship as facilitating conditions to promote intergroup outcomes (Allport, 1954; Dovidio et al., 2003; Pettigrew, 1998; Pettigrew & Tropp, 2006; Tausch et al., 2010) (see Table 1 for a summary of these conditions). Past research has found extensive evidence demonstrating that these conditions can effectively reduce intergroup differentiation, produce cognitive and psychological recalibration of intergroup boundaries, attenuate the negative effects of intergroup segregation, and thus enhance the tendency for optimal intergroup outcomes (Pettigrew & Tropp, 2006).

**Table 1. Summary of Conditions in Intergroup Contact Theory**

Condition	Defining features	Key findings
Equal status	Group members expect and perceive themselves to be at the same level of status in the contact situation.	<ul style="list-style-type: none"> <li>• The expectation and perception of equal status have to be made public (Cohen &amp; Lotan, 1995)</li> <li>• A clear and shared perception of equal status help promotes optimal intergroup relationship (Cohen &amp; Lotan, 1995)</li> </ul>
Authoritative institutional support	Explicit institutional support from the authority, law, and local atmosphere on the approval of group members' intergroup relationship	<ul style="list-style-type: none"> <li>• Authority support establishes norms and an atmosphere of acceptance (Pettigrew, 1998)</li> <li>• Institutional support is conducive to positive contact effects (Pettigrew &amp; Tropp, 2006)</li> <li>• Authority support should not be conceived of or implemented in isolation (Pettigrew &amp; Tropp, 2006)</li> </ul>
Common goals	Superordinate goals that require groups to need each other to achieve.	<ul style="list-style-type: none"> <li>• Common goals must be an interdependent effort without intergroup competition (Bettencourt et al., 1992)</li> <li>• Common goals work with cooperative interactions to affect group outcomes (Gaertner et al., 1999)</li> </ul>
Cooperative interdependence	Members from the groups engage in collaborative work on a common task.	<ul style="list-style-type: none"> <li>• Relations between the two groups become more harmonious only when a series of superordinate goals, ones that could not be achieved without the cooperation of both groups, are introduced (Sherif, 1966)</li> </ul>
Personal interaction and acquaintance	Members develop personalized relations and associations.	<ul style="list-style-type: none"> <li>• Intergroup contact should provide personalization opportunities leading to a personal acquaintance between the members (Dovidio et al., 2003; Miller, 2002)</li> </ul>
Friendship	The contact situation must provide the participants with the opportunity for close interaction to become friends.	<ul style="list-style-type: none"> <li>• Optimal intergroup contact requires time for cross-group friendships to develop. Cross-group friendship leads to the unfolding of the full decategorization, salient categorization, and recategorization sequence (Pettigrew, 1998).</li> <li>• Constructive contact relates more closely to long-term close relationships than to initial acquaintanceship (Pettigrew, 1998).</li> </ul>

Notably, these conditions are complementary (Dovidio et al., 2003; Pettigrew & Tropp, 2006). First, equal status should be elicited or endowed by an authoritative or institutional party to ensure a shared perception of equality among all group members (Cohen & Lotan, 1995). Second, cooperative interdependence and common goals are interlinked. Cooperative interdependence can only meaningfully unfold when group members pursue a common goal (Gaertner et al., 1999). Third, personal acquaintance and friendship are conceptually converging. They differ in the intimacy of the interpersonal relationship. However, both have been found to improve intergroup outcomes (Dovidio et al., 2003).

However, the research that examines the relative predictive power of the facilitative conditions posited by intergroup contact theory is sparse and inconsistent (Koschate & van Dick, 2011). Some empirical studies have documented that enhanced intergroup dynamics would emerge when these conditions are all present (Dovidio et al., 2003; Smith, 1994). However, others have shown varying efficacies in improving intergroup outcomes. For example, Molina and Wittig (2006)

found that personal acquaintance and interdependence were more effective for students of different ethnicities in group course projects, whereas Koschate and van Dick (2011) observed that interdependence under a common goal and that equal status was more important than other conditions in organizational settings. The inconsistent findings suggest that the efficacies of the conditions for intergroup outcomes should be contextualized in the research context.

We contextualize intergroup contact theory by exploring constructs that satisfy the defining features of facilitative conditions. We propose the alignment between IT and business in an organization, boundary-spanning activities that IT employees perform, and relationship closeness with non-IT employees as the facilitative conditions for IT employees' organizational identification (see Table 2 for construct mapping). First, the alignment between IT and business (business-IT alignment) refers to the extent to which the missions, objectives, and plans stipulated in business strategies are shared and supported by IT/IS strategies (Karahanna & Preston, 2013; Sabherwal & Chan, 2001).

**Table 2. Research Constructs Contributing to IT Employees' Organizational Identification**

Construct	Definition	Mapping conditions in intergroup contact theory and justifications	
Business-IT alignment	The extent to which the mission, objectives, and plans stipulated in the business strategy are shared and supported by the IT/IS strategy	<ul style="list-style-type: none"> <li>• Equal status</li> <li>• Authoritative institutional support</li> </ul>	<ul style="list-style-type: none"> <li>✓ Elevates the status of IT function to the strategic level</li> <li>✓ Represents explicit authoritative endorsement and support of the relationship between business objectives/initiatives and IT in the institution</li> <li>✓ Creates an organization-wide recognition and perception of the elevated status of IT function</li> </ul>
Boundary-spanning activities	The practices that IT employees permeate departmental boundaries, collaborate with people from other functional units and rely on them when performing various job duties.	<ul style="list-style-type: none"> <li>• Common goals</li> <li>• Cooperative interdependence</li> </ul>	<ul style="list-style-type: none"> <li>✓ IT employees' crossing boundary activities are initiated by tasks involving the inputs from both IT and non-IT employees, who complete these tasks under a common goal.</li> <li>✓ An interdependent collaborative relationship is formed as neither IT nor non-IT employees can accomplish the task alone.</li> </ul>
Relationship closeness with non-IT employees	The extent of the intimacy of the interpersonal relationship an IT employee has with non-IT colleagues.	<ul style="list-style-type: none"> <li>• Personal interaction and acquaintance</li> <li>• Friendship</li> </ul>	<ul style="list-style-type: none"> <li>✓ The intimacy and closeness of an IT employee's relation with non-IT employees could range from initial interaction, acquaintance, to long-term friendship. Thus, relation closeness represents both acquaintance and friendship.</li> </ul>

The strategic coupling between IT and business necessitates a harmonious intertwining relationship between IT and business functions (Henderson & Venkatraman, 1999; Luftman & Brier, 1999; Oh & Pinsonneault, 2007), which promotes the status of the IT function to a strategic level that is on par with other business functions. This may result in the inclusion of IT professionals in top management, showing a strong authoritative endorsement of the integration of business and IT that will guide various organization-wide decisions and activities (Jarvenpaa & Ives, 1990; Karahanna & Preston, 2013; Liang et al., 2017). Hence, business-IT alignment encapsulates equal group status with the authoritative institutional support of intergroup contact theory.

Second, IT employees engage in boundary-spanning activities when they cross departmental boundaries, collaborate with people in other functions, and rely on them for performing various job duties (Baroudi, 1985; Guimaraes & Igbaria, 1992). For instance, in system design, development, and implementation, IT employees often work with other functions to solicit user requirements and needs and provide IT solutions (Deng & Chi, 2015; Yeow et al., 2018). In the system post-implementation stage, IT employees interact with end users to provide training (Levina & Vasst, 2005) and resolve system use problems (Deng & Chi, 2015). These cross-boundary activities are enacted by concrete goals of initiating IT-enabled business transformation, rolling out new IT solutions, and

solving business users' IT issues that are shared by both IT and non-IT employees. Driven by these goals, an interdependent collaborative relationship is formed as neither IT nor non-IT employees alone can accomplish these tasks. Thus, conceptually, boundary-spanning activities integrate collaborative interdependence and common goals, the two closely related facilitative conditions of intergroup contact theory.

Third, relationship closeness with non-IT employees is defined as the extent of the intimacy of the interpersonal relationship an IT employee has with non-IT colleagues. Kunda et al. (2002) observed that technical employees developed networks with outgroup nontechnical employees to deal with social boundaries and isolation and avoid being labeled as "professional strangers." The interpersonal relationship with nonprofessional employees is an important social networking characteristic for professional employees in nonprofessional organizations. The intimacy level can range from initial interaction to acquaintance to friendship. Hence, relationship closeness with non-IT employees can capture the essence of both the personal acquaintance and friendship of intergroup contact theory. Overall, based on intergroup contact theory, we identify business-IT alignment, boundary-spanning activities, and relationship closeness as the drivers of IT employees' organizational identification (see research model in Figure 1).

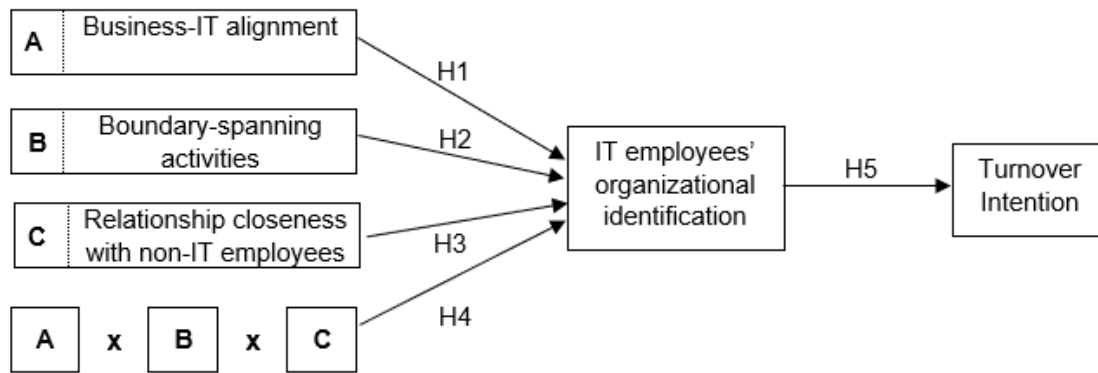


Figure 1. Research Model

### 3 Hypothesis Development

#### 3.1 The Effect of Business-IT Alignment

Strategic business-IT alignment signals formal recognition of the contribution and value of the IT function from top management (Benbya et al., 2019; Jarvenpaa & Ives, 1990; Karahanna & Preston, 2013). Business-IT alignment increases shared understanding among business and IT employees (Benbya et al., 2019) and balances the possibly uneven distribution of power between IT and other functions (Wu et al., 2015), thus diminishing potential intergroup differences and inequality and boosting IT employees' confidence. Consequently, it may dissolve the boundaries resulting from IT employees' perception of the gap between IT and other functions and communication barriers. As per self-categorization theory (e.g., Bergami & Bagozzi, 2000; Hogg & Terry, 2000), the reduced boundaries and enhanced confidence should heighten the salience of the organization as a frame of reference in IT employees' development of their organizational identification. Moreover, we contend that business-IT alignment could fulfill the innate needs of IT employees to reduce existence uncertainty. Business-IT alignment enables IT employees to view themselves as valuable assets to their organization (Chan et al., 1997) as their IT knowledge and skills can help organizations reap the full value of IT investment (Wu et al., 2015). Thus, business-IT alignment confers existence legitimacy and meaningfulness on IT employees, reducing existence uncertainty. As a result, in line with self-categorization theory (e.g., Bergami & Bagozzi, 2000; Hogg & Terry, 2000), IT employees' identification with the organization should be enhanced.

Notably, intergroup contact theory suggests that it is group members' perception of authoritative support for intergroup equal status that matters in dissolving intergroup boundaries (Cohen & Lotan, 1995). Business-IT alignment may have little effect on IT employees' organizational identification if it is

invisible to all groups. Strategic alignment initiatives formulated by top executives must be communicated across functional boundaries and hierarchical levels (Benbya et al., 2019; Henderson & Venkatraman, 1999) to create awareness of the alignment. We thus focus on IT employees' perception of business-IT alignment in our theorization.

**H1:** IT employees' perceived business-IT alignment in the organization is positively associated with their organizational identification.

#### 3.2 The Effect of Boundary-Spanning Activities

IT job assignments require varying levels of boundary-spanning activities (Levina & Vasst, 2005). For instance, IT employees responsible for business applications, such as system analysts, tend to permeate function boundaries more often than those who specialize in more technical work such as IT infrastructure and cybersecurity, as the job assignments of the former require them to have more interactions with employees in other functions than those of the latter (Pawlowski & Robey, 2004). The varying degree to which IT employees engage in boundary-spanning activities may result in their differential organizational identification. First, boundary-spanning activities can attenuate the perception of the boundaries between IT and non-IT employees. Boundary-spanning activities allow IT employees to permeate the departmental boundaries inherent to most organizations, thus reducing the salience of structural boundaries. This may trigger IT employees who conduct boundary-spanning activities to categorize themselves and other non-IT employees into the same social group, leading to organizational identification (Hogg & Terry, 2000). Second, boundary-spanning activities expose IT employees to business environments and give them opportunities to gain business knowledge (Pawlowski & Robey, 2004). It enables them to become increasingly business-oriented, reducing knowledge gaps and

communication barriers between IT and non-IT employees (Jiang et al., 2014). Third, boundary-spanning activities could reduce IT employees' uncertainty perceptions. Often required by intergroup collaborations and cooperation (Cummings, 2004; Richter et al., 2006), boundary-spanning activities signal the interdependence between IT and other departments to accomplish common tasks and create opportunities for non-IT employees to understand their value and legitimacy (Marrone, 2010). Hence, boundary-spanning activities ensure the meaningfulness of IT employees in the organization and enhance their self-concept. Additionally, the collaboration with non-IT functions could familiarize IT employees with the norms, beliefs, and behaviors of non-IT employees, making them feel more confident and less uncertain in terms of how to behave in the broader organizational context. Thus, IT employees acting as boundary spanners would be more likely to identify with the organization.

**H2:** The extent of boundary-spanning activities IT employees engage in is positively associated with their organizational identification.

### 3.3 The Effect of Relationship Closeness with Non-IT Employees

Past literature on social identity suggests that the relationship one has with another person, who constitutes a social referent, influences one's identification with that referent (Bartel & Dutton, 2001; Brewer & Gardner, 2001; George & Chattopadhyay, 2005). When an organization becomes a social referent, IT employees' organizational identification will be affected by their interpersonal relationships with non-IT peers. First, IT employees' interpersonal relationships with non-IT employees may reduce their perception of the structural boundaries between IT and non-IT functions. Close interpersonal relationships enable the permeation of structural boundaries at the individual level (Mummendey et al., 1999). This permeation can lead IT employees to perceive a salient inclusive organization (Karahanna & Preston, 2013). Moreover, IT employees who are influenced by non-IT employees with whom they have close ties can develop a holistic view and knowledge of the organization. The attenuated differences between IT and non-IT employees could weaken their perception of communication barriers and cause them to categorize themselves into the same social group, leading to heightened organizational identification.

In addition to modifying boundary perceptions, cross-group interpersonal contacts can reduce the uncertainties that IT employees may experience when interacting with non-IT peers. Through the knowledge transfer, information exchange, and social learning that often take place during interpersonal interactions, IT

employees increase their familiarity with norms, expectations, and behaviors in the business context (i.e., *general business knowledge*) (Deng & Chi, 2015; Muse, 2016). Exhibiting such norms, expectations, and behaviors that are perceived as legitimate and appropriate in the organization can enable them to enact their organizational and social roles more confidently, making them more likely to attach themselves to the organization and perceive themselves as an integral part of the organization, which leads to high organizational identification (Hogg & Terry, 2000).

**H3:** The closeness of IT employees' relationships with non-IT employees is positively associated with IT employees' organizational identification.

### 3.4 Interactions among the Drivers of IT Employees' Organizational Identification

A low level of business-IT alignment would be expected to hinder the development of shared understanding between IT and non-IT employees (Reich & Benbasat, 1996). While both boundary-spanning activities and close relationships with non-IT employees can allow IT employees to gain necessary general business knowledge, thereby addressing their existence uncertainty and boosting their organizational identification independently, as discussed earlier, their interactions may be complex. As individuals can gain a greater amount of novel information and knowledge from weak ties than from strong ties (Granovetter, 1973), IT employees could acquire more *non-redundant* general business knowledge from non-IT employees with whom they are less close (i.e., weak ties) than from those with whom they are closer (i.e., strong ties). By contrast, when shared knowledge between IT and non-IT employees is fostered by close interpersonal relationships, the effect of boundary-spanning activities on the expansion of IT employees' general business knowledge—and, consequently on their organizational identification—would be less likely to increase, as there is a limited inflow of novel information in such situations. In other words, general business knowledge enhancement that satisfies IT employees' need for legitimacy and heightens their organizational identification is likely better generated by boundary-spanning activities when the relationship closeness with non-IT employees is low. Further, boundary-spanning activities can help IT employees realize the value of their distinct IT knowledge and skill sets for the organization and promote their confidence (Baroudi & Igbaria, 1995; Levina & Vasst, 2005), which can in turn reduce their existence uncertainty and improve their perception of self-value within the organization (Wu et al., 2015). A low level of relationship closeness with non-IT employees will likely further strengthen such perceptions, as IT



employees would attribute these perceptions to their professional competence rather than their personal relationships (Sluss & Ashforth, 2007). Thus, the perceptions of heightened uncertainty reduction and increased confidence associated with boundary-spanning activities will likely be more pronounced when the relationship closeness between IT employees and non-IT employees is low, leading IT employees to develop stronger organizational identification. Overall, we expect the extent of IT employees' boundary-spanning activities and relationship closeness with non-IT employees to negatively interact to affect IT employees' organizational identification when there is a low level of business-IT alignment.

As business-IT alignment increases gradually, we argue that the negative interaction between boundary spanning and relationship closeness will wane. IT is expected to deliver more strategic value than operational or social value to organizations as business-IT alignment increases (Benbya et al. 2019; Wu et al. 2015) because it forces IT employees to work more intimately with non-IT colleagues for knowledge integration and creation so that the alignment can materialize (Benbya et al. 2019). To effectively enact their roles, IT employees need more and deeper *specialized domain knowledge* (Jiang et al. 2014). Although IT employees who engage in boundary-spanning activities are equipped with the necessary skills and general business knowledge to communicate with non-IT employees (Levina and Vasst 2005), with the high requirement of business-IT alignment, they may still lack *tacit business competence* and *specialized domain knowledge* that non-IT employees would have picked up through formal education and experience. In this context, past research has suggested that high levels of trust and social learning that can be nurtured by close interpersonal relationships can facilitate the transfer of tacit, sticky, and specialized knowledge from non-IT employees to IT employees (Alexopoulos and Buckley 2013; Carlile 2004; Levin and Cross 2004). Such *deep* knowledge exchange may allow IT employees to adapt quickly to boundary-spanning job requirements. As a result, IT employees' existence uncertainty will likely decrease, leading to enhanced organizational identification. Therefore, when business-IT alignment increases, the benefits of deep knowledge exchange will weaken the negative interaction between boundary spanning and relationship closeness on organizational identification.

**H4:** When business-IT alignment is low, the extent of boundary-spanning activities will negatively interact with the closeness of IT employees' relationships with non-IT employees to influence IT employees' organizational identification. However, as business-IT alignment increases, the

negative interaction effect between the extent of boundary-spanning activities and the closeness of IT employees' relationships with non-IT employees will be weakened.

### 3.5 The Effects of Organizational Identification of IT Employees on Turnover Intention

Prior literature has extensively documented the cognitive and behavioral consequences of organizational identification. Self-identifying with an organization invokes a psychological process whereby an individual's self-identity becomes intertwined with the identity of the organization (Van Knippenberg & Sleebos, 2006). The convergence of personal and organizational identities fosters a sense of belonging and leads to a long-term committed relationship between the employee and their organization (Bergami & Bagozzi, 2000; Foreman & Whetten, 2002; Van Knippenberg & Sleebos, 2006; Van Vugt & Hart, 2004). We extend the positive effect of organizational identification on the employee-organization relationship to our context and propose that IT employees' organizational identification is negatively related to their turnover intention.

**H5:** IT employees' organizational identification is negatively associated with their turnover intention.

## 4 Methodology

### 4.1 Survey Instruments

We conducted a survey to test our hypotheses. The instruments were adapted from previous studies. Relationship closeness was measured using the name generator method (Burt et al., 2000; Jones & Volpe, 2011). We asked respondents to list the names of people (at least three and a maximum of 10) they often interacted with at work. Respondents were then asked to evaluate on a 5-point scale how close they felt to the person and if they were from the IT or a non-IT department (see Tables 3 and 4 for instruments).

We measured the extent of boundary-spanning activities and relationship closeness with non-IT employees from the perspective of IT employees because our theorizing is based on their perceptions. We exercised caution to avoid demand effects in the design of the questionnaire. We measured organizational identification first, followed by other antecedent constructs. Control variables were gender, age, education, tenure, work experience, salary, job title, job market perception, firm type, number of employees in the IT department and organization, and the industrial rank of the organization.

**Table 3. Likert-Type Survey Instruments**

Construct	Question	Sources
Organizational identification	1. When someone criticizes my company, it feels like a personal insult.	(Edwards & Pececi, 2007; Mael & Ashforth, 1992)
	2. When I talk about my organization, I usually say 'we' rather than 'they'.	
	3. My organization's successes are my successes.	
	4. If a story in the media criticized my organization, I would feel embarrassed.	
	5. I feel strong ties with my organization.	
	6. I feel a strong sense of belonging to my organization.	
	7. Belonging to my organization is an important part of my self-image.	
Business-IT alignment	1. The IS strategy in my organization is congruent with the business strategy.	(Karahanna & Preston, 2013; Preston & Karahanna, 2009) and self-developed
	2. Decisions in IS planning are tightly linked to the strategic plan of the organization.	
	3. Our business strategy and IS strategy are closely aligned.	
	4. Top management in my organization recognizes the strategic roles of IT and IS.	
Boundary-spanning activities	1. In the past six months, I had associated with people from other departments in my organization. (Cross-department collaboration)	(Miles & Perreault, 1976) and self-developed
	2. In the past six months, I had needed the support of people from other departments to get my work done. (Job dependence)	
	3. In the past six months, I had often communicated with employees from other departments to discuss information system functions and configurations. (Cross-department collaboration)	
	4. Dealing with different functional departments had been the norm of my daily work for the past six months. (Cross-department collaboration)	
	5. In the past six months, I could not have gotten my work done without input from other departments. (Job dependence)	
Turnover intention	1. I will probably look for a job at a different organization next year.	(Jiang & Klein, 2002; Moore & Burke, 2002)
	2. I think about leaving my organization.	
	3. I will be with my organization two to three years from now (reverse coded).	
	4. I will be with my organization for a long period (reverse coded).	
<i>Note:</i> All questions were measured on a 1 (strongly disagree) to 7 (strongly agree) Likert scale.		

**Table 4. Measurement of Relationship closeness with non-IT Employees**

No	Name	Level of closeness * (1- very intimate; 2- close; 3- neutral; 4- slightly distant; 5- distant)	Department (choose 1 if the person is from the IT department; choose 2 if the person is from a non-IT department)
1-10		1 2 3 4 5	1 2
<i>Note:</i> *The measurement had reverse wording.			

## 4.2 Data Collection

We conducted the survey in one of the most developed provinces in eastern China because of the relatively high likelihood of having IT departments in non-IT organizations in this area. We followed the standard back-translation process (Brislin, 1980) to create the Chinese version of the questionnaire based on its English version. When choosing the target organizations, we searched for non-IT organizations in each of the cities of this province from telephone directories. For each city, we randomly chose a certain number of organizations in different professional fields. We first called each of the chosen organizations to ensure that it had an IT department in place and was willing to participate in the survey. After reaching out to about 100 organizations, we finalized a

list of 25 qualified organizations from different sectors in eight cities. Our correspondents in these organizations provided contact information for some of their IT employees who might be willing to participate in the survey. We then sent survey requests by mail and email. In total, 250 questionnaires were distributed; the number of questionnaires sent to each organization was proportionate to its number of IT employees.

## 5 Analysis and Results

We collected 192 responses, yielding a response rate of 76.8%. Of these, 31 incomplete responses were removed, leaving 161 responses. The profile of the respondents is shown in Table 5.

**Table 5. Respondent Profile**

	Variables	Values	No. (%)
Personal data	Gender	Male	120 (74.5)
		Female	41 (25.5)
	Education	College	25 (15.5)
		University	117 (72.7)
		Postgraduates	19 (11.8)
	Organizational tenure	Less than 2 years	64 (39.8)
		2-3 years	52 (32.3)
		3-5 years	25 (15.5)
		More than 5 years	20 (12.4)
	Age	Below 23	33 (20.5)
		24-29	82 (50.9)
		30-35	24 (14.9)
		36-40	11 (6.8)
		Above 41	11 (6.8)
	Work experience	Less than 2 years	49 (30.4)
		2-3 years	56 (34.8)
3-5 years		27 (16.8)	
More than 5 years		29 (18.0)	
Organizational data	Firm type	Foreign ventured	19 (11.8)
		Joint ventured	19 (11.8)
		State-owned	54 (33.5)
		Private	56 (34.8)
		Others	13 (8)
	Industry sector	Accounting / Insurance/ Banking / Finance	36 (22.4)
		Manufacturing / Trading	38 (23.6)
		Pharmaceutical / Healthcare	11 (6.8)
		Advertising / Marketing firms	11 (6.8)
		Real estate / Construction	6 (3.7)
		Education institutions	8 (5)
		Logistics / Supply chain	6 (3.7)
		Services	22 (13.7)
		Energy	13 (8)
	Government agency / NGO	10 (6.2)	
	No. of employees	Less than 50	24 (14.9)
		51-99	17 (10.6)
		100-299	34 (21.1)
		300-599	24 (14.9)
		600-1999	24 (14.9)
		More than 2000	38 (23.6)
	No. of IT employees	Less than 5	32 (19.9)
5-9		31 (19.3)	
10-29		31 (19.3)	
30-49		29 (18.0)	
More than 50		38 (23.6)	

### 5.1 Measurement Instrument Assessment

Four factors had eigenvalues larger than 1 (Table 6). One item for organizational identification (OGID1) yielded a low loading and was removed from further analysis. All other indicators loaded more highly on their intended construct than other constructs.

The processing of relationship closeness scores only focused on those related to the names generated for the non-IT group and involved two steps. First, we averaged the raw scores to form the index of relationship closeness with non-IT employees for each respondent. If all names

generated belonged to the IT group, we assigned the number 6 to the closeness index, as we used a 5-point scale with 5 representing a distant relation. Second, we reverse-coded the index by deducting it from the number 7 so that a higher value would represent a closer relation. To illustrate, suppose one respondent generated four names and indicated that two were from the IT department and two were from non-IT departments. The two non-IT names were used to compute relationship closeness for the respondent. Also, suppose the closeness scores reported by the respondent were 1 (*very intimate*) and 3 (*neutral*) for the two non-IT employees.

Table 6. Factor Analysis Results

Construct	Item	1	2	3	4	5	Cronbach's alpha	Composite reliability	AVE
Business-IT alignment	ALGM1	.21	.21	<b>.75</b>	-.17	-.06	0.86	0.91	0.59
	ALGM2	.14	.20	<b>.84</b>	-.17	-.07			
	ALGM3	.31	.08	<b>.81</b>	.13	.18			
	ALGM4	.40	.01	<b>.67</b>	.16	.21			
Boundary-spanning activities	BSAC1	.14	<b>.69</b>	.13	-.12	-.15	0.87	0.89	0.58
	BSAC2	.04	<b>.75</b>	.34	-.06	-.21			
	BSAC3	.27	<b>.77</b>	.18	-.02	-.13			
	BSAC4	.14	<b>.84</b>	.07	.01	-.03			
	BSAC5	.09	<b>.75</b>	-.00	.01	.31			
Organizational identification	OGID1	.31	.34	.53	-.02	-.17	0.92	0.93	0.58
	OGID2	<b>.76</b>	.09	.11	-.11	-.01			
	OGID3	<b>.72</b>	.18	.29	-.04	-.06			
	OGID4	<b>.81</b>	.02	.22	-.10	-.11			
	OGID5	<b>.72</b>	.19	.33	-.23	-.21			
	OGID6	<b>.77</b>	.25	.31	-.20	-.02			
	OGID7	<b>.80</b>	.17	.24	-.02	.06			
Turnover intention	TINT1	-.01	.03	-.21	<b>.89</b>	-.01	0.79	0.86	0.61
	TINT2	-.13	.01	-.05	<b>.89</b>	-.04			
	TINT3	-.37	-.21	.17	<b>.64</b>	.06			
	TINT4	-.56	-.14	.16	<b>.66</b>	-.06			
Relationship closeness	RELA	-.12	-.14	.06	-.05	<b>.88</b>	-	-	0.78
Eigenvalues		7.45	2.50	2.22	1.55	1.04	-	-	-

Based on our scheme, the closeness index of this respondent was 5 (i.e.,  $7 - [(1+3)/2] = 5$ ). For those who did not generate any names for non-IT departments, their closeness index was 1 (i.e.,  $7 - 6 = 1$ ). Table 7 presents the descriptive data for constructs and their correlations.

Reliability analysis showed high construct reliability with all Cronbach's  $\alpha$  and a composite reliability of greater than 0.70 (Table 6). Discriminant validity was assessed by comparing the square root of the average variance extracted (AVE) of a construct with interconstruct correlations. Correlation results in Table 7 show that all constructs demonstrated satisfactory discriminant validity.

## 5.2 Hypothesis Testing

We employed hierarchical ordinary least squares (OLS) regressions for hypothesis testing. We averaged the scores of the indicators of each construct to form the construct index. Normality and multicollinearity tests showed no violation of the assumptions of regression analysis (variance inflation factor ranged from 1.03 to 1.18). We constructed the base model (Model 1) by entering all the control variables. Dummy variables were used for the categorical control variables (e.g., job title, firm type, firm rank, etc.). The first-order standardized research constructs were included in Model 2. The two-way and three-way interaction terms of the standardized constructs were entered in Model 3. The regression results are presented in Table 8.

The analysis of Model 2 yielded significant impacts of business-IT alignment, boundary-spanning activities, and relationship closeness on organizational identification, lending support for H1, H2, and H3.

The analysis of Model 3 indicated that business-IT alignment and boundary-spanning activities both had significant main effects on organizational identification. More importantly, the three-way interaction term was significant. To assess the form of this interaction effect, we performed additional analyses and plotted the interaction effect according to standard procedures (Aiken & West, 1991; Dawson & Richter, 2006). Splitting the data by the mean of business-IT alignment, we ran two separate OLS regressions on IT employees' organizational identification with all control variables, the extent of boundary-spanning activities, the relationship closeness with non-IT employees, and their interaction term. We also plotted the interaction effects under the low level ( $-1 SD$ ) and high level ( $+1 SD$ ) of business-IT alignment to provide a visual indication of the varying nature of the interactions (Figure 2). We found a significant negative interaction relationship when business-IT alignment was low ( $b = -0.32, t = -2.73, p < 0.01$ ) (Figure 2A), suggesting that relationship closeness with non-IT employees weakened the effect of boundary-spanning activities on IT employees' organizational identification. In contrast, the interaction was not significant when business-IT alignment was high ( $b = 0.07, t = 0.54, p > 0.5$ ) (Figure 2B). Thus, H4 was supported.

**Table 7. Construct Descriptive Statistics and Correlations**

	Variable/construct	Mean (SD)	Min	Max	Skewness	Kurtosis	1	2	3	4	5	6	7	8
1	Gender	1.24 (.43)	1	2	1.26	-.42	-							
2	Age	2.28 (1.13)	1	6	1.30	1.44	-.10	-						
3	Education	4.93 (.52)	3	6	-.37	1.59	-.07	.06	-					
4	Firm tenure	2.95 (2.13)	1	7	.70	-.93	-.11	.84**	-.04	-				
5	Work tenure	3.36 (2.25)	1	7	.48	-1.24	-.06	.82**	-.08	.95**	-			
6	Job title	3.07 (1.79)	1	7	.34	-.85	-.09	.34**	.11	.33**	.38**	-		
7	Salary level	3.68 (1.54)	1	7	.34	-.53	-.20*	.51**	.26**	.57**	.57**	.43**	-	
8	Turnover experience	1.69 (0.96)	1	6	1.61	2.87	.07	.17*	-.05	.23**	.37**	.21**	.14	-
9	Job market perception	2.10 (0.68)	1	5	2.75	9.97	-.10	.05	.13	-.06	-.07	.14	.10	-.02
10	Firm type	3.38 (1.23)	1	6	.13	.23	.03	.13	-.17*	.11	.09	-.02	-.23**	-.08
11	Firm size	1.97 (0.76)	1	3	.04	-1.28	.04	-.09	-.25**	-.14	-.12	.03	-.23**	.18*
12	IT department size	3.72 (2.26)	1	7	.35	-1.37	.04	-.20*	.21**	-.20*	-.19*	.03	.16*	-.07
13	Industry sector	4.38 (3.18)	1	10	.49	-1.35	-.12	-.08	-.08	-.07	-.08	-.12	-.09	.04
14	Firm rank	4.22 (2.67)	1	7	-.18	-1.77	.01	.13	.10	.17*	.13	-.03	.25**	-.08
15	Business-IT alignment	5.30 (1.17)	2	7	-.64	-.02	.13	-.15	-.14	-.13	-.14	.02	-.05	-.07
16	Boundary-spanning activities	5.15 (1.26)	1	7	-.57	.02	-.05	.21**	-.10	.22**	.20*	.08	.16	-.07
17	Relationship closeness	4.13 (1.45)	1	6	-1.12	.38	-.02	.05	-.06	.07	.07	-.09	-.06	-.05
18	Organizational identification	5.22 (1.18)	1	7	-.84	1.03	.12	.05	-.23**	.11	.10	.02	.04	-.11
19	Turnover intention	3.50 (1.44)	1	7	.33	-.32	-.06	-.24**	.06	-.20*	-.22**	-.04	-.25**	-.03

**Table 7. Construct Descriptive Statistics and Correlations—Continued**

		9	10	11	12	13	14	15	16	17	18	19
9	Job market perception	-										
10	Firm type	-.08	-									
11	Firm size	.01	.22**	-								
12	IT department size	.02	-.36**	-.43**	-							
13	Industry sector	.10	.18*	.17*	.02	-						
14	Firm rank	-.03	-.14	-.52**	.23**	-.07	-					
15	Business-IT alignment	.21**	.01	-.13	.11	.02	.19*	.77				
16	Boundary-spanning activities	.13	.16*	-.11	-.06	-.02	.24**	.30**	.76			
17	Relationship closeness	.06	-.12	-.01	-.13	-.03	.09	-.02	.14	.88		
18	Organizational identification	.19*	.08	-.07	-.07	.02	.07	.56**	.39**	.13	.76	
19	Turnover intention	-.17*	.09	.14	-.08	.04	-.14	-.14	-.17*	-.04	-.43**	.78

Note: \* $p < 0.05$ , \*\* $p < 0.01$ , Diagonals represent the square roots of the AVE values.

Table 8. Regression Results

Independent variables	DV: Organizational identification			DV: Turnover intention	
	Model 1	Model 2	Model 3	Model 1	Model 2
Gender	.24*	.18*	.16*	-.11	-.01
Age	-.25	-.20	-.22	-.10	-.21
Education	-.36**	-.19*	-.17	.16	.01
Firm tenure	.25	.23	.35	.02	.13
Work tenure	-.08	-.08	-.13	-.01	-.04
Salary	.22	.22	.16	-.25	-.16
No. of past turnover	-.10	-.05	-.05	-.02	-.06
Perception of ease of movement on the job market	.14	.05	.03	-.09	-.03
Organization size	-.14	-.12	-.07	.00	-.06
No. of IT employees	-.18	-.09	-.07	.01	-.07
Job title_2	-.02	.00	.02	.06	.05
Job title_3	-.15	-.12	-.10	.20*	.14
Job title_4	.08	.10	.12	.03	.06
Job title_5	.04	-.05	-.05	.02	.04
Job title_6	.02	.01	.05	.00	.01
Job title_7	.07	.05	.05	.12	.15
Firm type_2	-.03	-.06	-.08	-.02	-.03
Firm type_3	-.03	-.05	-.05	.15	.14
Firm type_4	-.05	-.12	-.13	.10	.08
Firm type_6	.10	.09	.08	-.07	-.03
Firm type_6	.02	.02	.01	.06	.06
Industry_2	-.02	-.07	-.05	.16	.15
Industry_3	-.03	-.01	-.02	.09	.07
Industry_4	-.31**	-.18	-.17	.07	-.06
Industry_5	-.14	-.11	-.13	.19	.12
Industry_6	.01	.01	-.02	.07	.07
Industry_7	-.14	-.02	.05	.04	-.02
Industry_8	.04	-.02	-.02	.05	.07
Industry_9	.01	.04	.05	.01	.02
Industry_10	.11	.10	.07	.05	.09
Firm rank_2	-.05	-.06	-.07	.06	.01
Firm rank_3	-.07	-.07	-.09	-.06	-.09
Firm rank_4	.02	-.10	-.11	.15	.15
Firm rank_5	.06	-.01	-.03	-.03	.00
Firm rank_6	-.06	-.17*	-.19*	.15	.12
Firm rank_7	-.12	-.23*	-.26*	.02	-.03
Business-IT alignment (A)		.47***	.40***		
Boundary-spanning activities (B)		.18*	.17*		
Relationship closeness with non-IT employees (C)		.16*	.05		
AxB			-.07		
BxC			-.07		
AxC			.06		
AxBxC			.25*		
Organizational identification					-.43***
R <sup>2</sup> (adjusted R <sup>2</sup> )	.36 (.14)	.57 (.41)	.61 (.44)	.27 (.02)	.38 (.17)
F value	1.65*	3.56**	3.60**	1.07	1.78**

Note: Results are standardized coefficients. \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

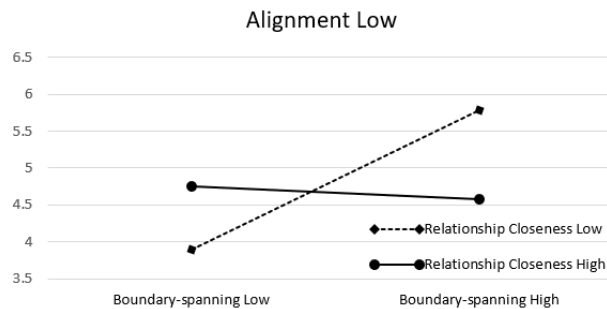


Figure 2a

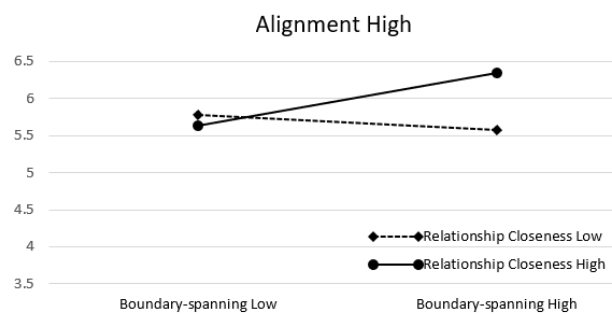


Figure 2b

**Figure 2. The Three-Way Interaction Effect (DV: Organizational Identification)**

Next, we performed a hierarchical OLS regression to test H5. We regressed IT employees' turnover intention on the set of control variables that had been included in previous regression models and organizational identification (see Table 8). The results showed that organizational identification had a significant negative effect on turnover intention ( $b = -0.43$ ,  $t = 4.55$ ,  $p < 0.01$ ). The inclusion of organizational identification increased the explanatory power of the model from 27% (adjusted  $R^2 = 0.02$ ) to 38% (adjusted  $R^2 = 0.17$ ). Therefore, H5 was supported.

Lastly, we employed the structural equation modeling (SEM) technique to assess the research model in its entirety using SmartPLS 3.0 and obtained results identical to OLS regressions. Specifically, we found that, when only business-IT alignment, boundary-spanning activities, and relationship closeness were included in the analysis as the independent variables, they each had a significant relationship with organizational identification (H1, H2 and H3 were supported). With the presence of the two-way and three-way interaction terms, the significant effects of business-IT alignment and boundary-spanning activities remained, and the three-way interaction was significant (H4 was supported). Further, regardless of the inclusion or exclusion of the three-way interaction term, organizational identification had a significant effect on turnover intention (H5 was supported). Figure 3 presents the SEM path coefficients of the research model.

We also performed a post hoc SEM analysis by specifying direct links from business-IT alignment, boundary-spanning activities, relationship closeness, and their two-way and three-way interactions to turnover intention. This model accounted for 32.7% of the variance of turnover intention (adjusted  $R^2 = 24.9\%$ ) and none of the new links were significant. Furthermore, we omitted organizational identification from this model and found that 22% of the variance of turnover intention was explained (adjusted  $R^2 = 10.5\%$ ) and none of the independent and control variables were significant. The decreased explanatory power and the

insignificant links underscored the significance of IT employees' organizational identification in accounting for their turnover intentions.

## 6 Discussion

We set out to better understand how the turnover of IT employees working for non-IT organizations could be mitigated by improving IT employees' identification with their non-IT organizations. Drawing on self-categorization theory and intergroup contact theory and localizing the theories in the unique IT work context in non-IT organizations, we posited that IT employees' perceived business-IT alignment, the extent of their cross-boundary activities, and the closeness of their relationships with non-IT employees could increase their organizational identification. Our empirical study confirmed the effects of the three drivers. Further, through three-way interaction analysis we delineated that business-IT alignment influenced how relationship closeness with non-IT employees moderated the effect of the extent of boundary-spanning activities on IT employees' organizational identification. Specifically, relationship closeness with non-IT employees attenuated the positive effect of boundary-spanning activities on IT employees' organizational identification when business-IT alignment was low. In contrast, the interaction between relationship closeness with non-IT employees and boundary-spanning activities was muted when business-IT alignment was high. Furthermore, our analysis provided empirical support for the hypothesis that the organizational identification of IT employees could significantly reduce their turnover intentions.

### 6.1 Theoretical Contributions

The current study makes several important theoretical contributions. First, it enhances the understanding of organizational identification of IT employees in non-IT organizations. Given the diversity of industries and sectors that deploy IT resources for efficiency and competitiveness, an increasing number of IT professionals are recruited by non-IT organizations.

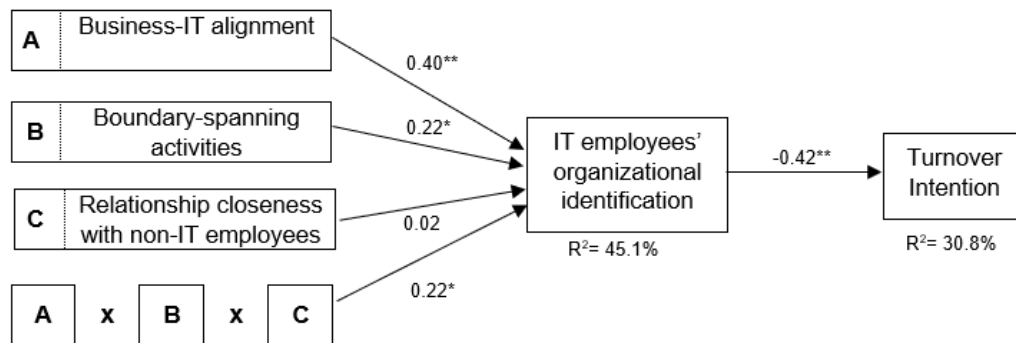


Figure 3. Results of SEM Analysis

Yet limited research has examined the formation of their organizational identity. Our research enriches the literature by filling this gap. It contextualizes the investigation of the organizational identification of IT employees in the unique IT work context and identifies the antecedents to their organizational identification. We note that IT employees' identification with their organizations is shaped by their perception of the strategic business-IT alignment in the organization, their involvement in boundary-spanning work assignments, and the closeness of their interpersonal relationships with non-IT employees, as well as the interaction among these three factors. Collectively, our theorization of the three drivers of IT employees' organizational identification paves the way for future research on other aspects of IT employees' organizational behaviors.

Second, the study extends the literature on business-IT alignment. The extant literature on business-IT alignment (Karahanna & Preston, 2013; Preston & Karahanna, 2009; Tallon et al., 2002; Tallon et al., 2016) tends to adopt an organizational perspective by focusing on the top hierarchical executive level. Our research represents a valuable addition by explicating the effects of business-IT alignment on individual IT employees. This effect points toward a new direction for advancing the research on business-IT alignment. Specifically, given the established view that organizational identification will enhance employees' organizational citizenship behavior, it might be expected that by increasing IT employees' organizational identification, business-IT alignment can improve the individual and collective performance of IT employees, and consequently maximize the realization of the business value of IT.

Third, this study enriches our understanding of the effects of boundary-spanning activities on the organizational behavior of IT employees. While the extant literature focuses on the direct effect of the extent of boundary-spanning activities on the turnover intention of IT employees (Joseph et al., 2007), our research provides an alternative lens into its operation by demonstrating its impact on organizational

identification, which in turn influences IT employees' turnover behavior. Our findings enrich prior research by depicting an indirect path from boundary-spanning activities to employee turnover. In addition, our study explicates the effects of relationship closeness between IT and non-IT employees on the organizational identification of IT employees. Our findings highlight the importance of understanding IT employees' social capital in the research on IT human capital management.

Fourth, in addition to the above theoretical contributions derived from the findings of the main effects of business-IT alignment, boundary-spanning activities, and relationship closeness with non-IT employees, the finding of their three-way interaction enhances the literature by unveiling a complex interdependence among the three drivers of IT employees' organizational identification. It also provides important implications for future research on IT human capital management. We contend that the standing and positioning of the IT function can exert a powerful contextual influence that shapes the combined effects of IT employees' cross-boundary job arrangements and their social ties with non-IT employees.

Finally, the present research enriches the intergroup contact theory literature. We contextualized a set of facilitative conditions in intergroup contact theory within the unique IT profession context and empirically examined their efficacies in promoting a more inclusive self-concept of IT employees. By doing so, we not only enhance the utility of the theory but also address the lack of investigations of the interplay of various facilitative conditions in different intergroup settings.

## 6.2 Managerial Implications

Practically, this study can help executives improve the management of IT human capital based on the unique conditions in their organizations. In a digitally disrupted world, non-IT organizations from diverse business sectors such as government agencies, banks, and healthcare organizations increasingly rely on IT professionals for survival, growth, and transformation. Against this backdrop, this study sheds light on how non-IT organizations can effectively tap into this distinct group of professionals by reducing their turnover and



unleashing the potential that IT can offer to their businesses. To realize the business impacts and value of existing IT investments, organizations should leverage the contributions of their IT employees, even though they may not work in the core business. Retaining IT professionals is necessary for organizations to derive value from IT applications, which supports their overall strategic business objectives.

Our study shows that to improve the retention of IT employees, organizations must cultivate a sense of organizational identification among IT employees and form an inclusive culture. The alignment of business strategies with IT strategies plays a vital role in eliciting the high organizational identification of IT employees. While there may be increasing recognition of the strategic value of IT among top management teams, our study suggests that this should be formally and explicitly highlighted in business strategy formulation and implementation. It is critically important for managers to stress the strategic importance of IT in enabling business operations, and this message should be communicated and shared across the organization. The strategic value of IT can be signaled by involving IT employees in decision-making, setting a strategic-level position for IT staff, and reevaluating the organizational structure to reflect the heightened importance of IT employees. For example, organizations could include IT professionals in the development of 10-year strategic plans (Benbya et al., 2019). This inclusion would increase the importance of IT professionals for the organization, enable them to view their daily routines from a higher and broader angle, and improve the likelihood that they would identify themselves as a part of the organization.

The effectiveness of boundary-spanning activities in raising IT employees' organizational identification suggests that organizations need to pay attention to the work assignments of their IT staff. Top management teams are advised to encourage collaborations among IT and non-IT employees and increase IT employees' exposure to non-IT functions and work processes. Job rotations could be scheduled to maximize interactions between IT employees and non-IT work processes and personnel. Organizations could also experiment with a "job experience" day that rotates IT staff and business professionals. This one-day event could help IT staff members better understand business needs and processes across departments and jobs. Knowledge-sharing events are an alternative measure for dissolving the knowledge and communication boundaries that separate IT and non-IT employees (McDermott & O'dell, 2001). These specific practices would enable IT employees to permeate the departmental and knowledge boundaries and heighten their organizational identification.

Our finding of the effect of IT employees' relationship closeness with non-IT employees on IT employees'

organizational identification suggests an alternative way to retain IT employees. Organizations could create opportunities such as social events to encourage IT and non-IT employees to interact and develop intimate professional interpersonal relationships. Commonly, organizations rely on team-building activities (e.g., outdoor survival games) to increase feelings of closeness among staff members (Benbya et al., 2019). Using enterprise social media (Aral et al., 2013) to form an inclusive culture could also be helpful so that IT employees could interact with non-IT peers through personal and professional information exchange via enterprise social media.

Our research also cautions top management teams that close social relations with non-IT employees can undermine the positive effect of boundary-spanning activities on organizational identification when business-IT alignment is low. To alleviate the potentially deleterious effects of close social ties between IT and non-IT employees, executives should first evaluate whether their organization indeed has a strong strategic reliance on IT that has yet to be formally expressed and communicated across the organization. If this is the case, they should try to increase the organization-wide awareness of the strategic value of IT and the critical roles played by IT staff members. If it is not in the best interest of the organization to position IT as a strategic lever, executives should at least avoid projecting IT as a secondary supporting function to that of non-IT employees. Instead, they should promote the image of IT employees by emphasizing their instrumental contributions in delivering competent digital capabilities, which have been extremely important in this technological, economically, and socially turbulent era.

### **6.3 Limitations and Future Research**

This research has several limitations. First, since this study was administered in China, caution should be exercised when interpreting and generalizing our findings because culture plays a critical role in shaping individuals' organizational cognitions and behavior (Hofstede, 1991). Future research should examine whether culture affects the generality of our findings. We encourage researchers to extend our model to other countries to establish its robustness and generalizability. Specifically, we envision two possible avenues to extend our research. First, given that Asian cultures generally focus more on collectivism than Western cultures (Moorman & Blakely, 1995), studies could explore whether the same levels of antecedents would lead Asian and Western IT employees to develop systematically differential levels of organizational identification. Second, relationship closeness between IT and non-IT employees likely depends heavily on culture. Given that interpersonal relationships play a critical role in Chinese

culture, as reflected by the well-known cultural concept of *Guanxi* (Lin, 2001), the effects of relationship closeness on the organizational behavior of Chinese employees may be more pronounced. Thus, future studies could explore whether the effects of relationship closeness on IT employees' organizational identification would be more noticeable for IT employees in China than for those in the West.

Second, based on self-categorization theory, we theorized that business-IT alignment, boundary-spanning activities, and relationship closeness with non-IT employees would affect IT employees' organizational identification by helping IT employees overcome the challenges associated with their existence and legitimacy uncertainty and self-concept. However, we did not explicitly test the mediation process. Future research could empirically investigate the mediating effects of the underlying mechanism.

Third, our study was limited to the turnover intention of IT employees. Although it is a reliable predictor of actual turnover behavior, we nevertheless encourage future studies to find evidence to support the impact of the organizational identification of IT employees on actual turnover behavior. Furthermore, we limited our study to the organizational identification of IT employees. However, there are other social identification targets in organizations (Scott, 2007), and IT employees could experience other identification processes. For example, IT employees might self-identify with the IT profession and/or IT departments. Future studies could specify various identifications of IT employees and test the distinct effects of each type on their turnover behaviors.

Fourth, we acknowledge that there were some limitations in our measurement instruments. The first limitation pertains to the fact that we only surveyed IT employees; thus, the measurements of the extent of boundary-spanning activities and the relationship closeness only captured the perceptions of the IT employees, whereas non-IT employees' views were not gathered. However, the importance of this limitation is perhaps attenuated by our research being based on the perspective of IT employees. The second limitation relates to the coding of relationship closeness. We coded the closeness score for respondents who did not generate names from non-IT departments as 1. The interval between this scale point and the next point (the lowest closeness score of 2) may not be equal to other intervals that were clearly defined for the respondents. We believe that this does not seriously threaten the validity and reliability of our findings for three reasons. First, the interpoint spaces in survey responses using Likert scales often deviate from the design of the researcher and are unequal from the respondent's perspective, which could partially alleviate the concern about the potentially unequal spaces within our coding scheme. Second, only 20 (12%) of the respondents did not generate non-IT contacts (closeness

mean was 4.13 and SD 1.45, after removing the 20 respondents, the mean changed to 4.58 and SD 0.87). The low percentage of such respondents reduces the potential threat to our findings. Third, we reran the regressions after removing the respondents who did not generate non-IT contacts. The patterns of the results remained largely the same. In particular, the main effect of relationship closeness was significant ( $b = 0.17, t = 1.98, p < 0.05$ ) with the absence of the three-way interaction but became not significant ( $b = 0.14, t = 1.72, p > 0.1$ ) with the presence of the three-way interaction. The three-way interaction was still significant ( $b = 0.19, t = 1.97, p < 0.05$ ). This additional analysis attests to the reliability of our findings and alleviates the potential threats associated with the coding. Nevertheless, researchers should be reminded of this limitation in our coding scheme and future studies could use an alternative measure for the relationship closeness construct.

Lastly, the cross-section data we used limits our ability to claim causality between the study variables. However, we attempted to mitigate the potential endogeneity issue in the design of our questionnaire using multiple time windows. We measured organizational identification before all other research constructs, we assessed the boundary-spanning activities of the respondents for the previous six months, and we asked the respondents about their future turnover intentions. Nevertheless, cross-departmental interpersonal relationships and organizational identification may have a reciprocally reinforcing relationship. Given this, a longitudinal design could help clarify the directionality of the connection between cross-departmental interpersonal relationships and organizational identification.

## 7 Conclusion

Recognizing that the unique work context in non-IT organizations may lead to low organizational identification for IT employees, this study proposes a new theoretical perspective for understanding the turnover culture in the IT profession. It shows that organizations can enhance the organizational identification of IT employees to mitigate their turnover intentions. Moreover, this study affords insight into the antecedents that can specifically promote an inclusive organizational identification for IT employees. Practically, this study sheds light on how to tackle the turnover issue of IT professionals by fostering their organizational identification in order to unleash the potential that IT can offer to non-IT organizations.

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## Appendix A: Summary of Relevant Literature on Organizational Identification

Research	Target employees	Key theory	Key antecedents
Anteby (2008)	Mainstream employees	N/A	Identity incentives
Bartel and Dutton (2001)	Mainstream employees	Self-categorization	Comparisons with clients and internal members
Bartel et al. (2012)	Mainstream employees	Respect/social status	Physical isolation
Besharov (2014)	Mainstream employees	N/A	Member interactions and manager enactment
Clark et al. (2010)	Executives	Sensemaking and sensegiving	Transitional identity
Clark et al. (2010)	Mainstream employees	Self-concept orientations	Different facets of self-concept
Dutton et al. (1994)	Mainstream employees	Social identity theory	Organizational images
George and Chattopadhyay (2005)	Contract workers	Social identity and self-categorization theory	Perceived characteristics of the organization and social relations within the organization
Gleibs et al. (2008)	Mainstream employees	Social identity theory and self-categorization theory	Organizational membership and perceived fairness
Ravasi and Schultz (2006)	Mainstream employees	Social actor perspective and social constructionist lens	Organizational culture
Schaubroeck et al. (2013)	Mainstream employees	Social exchange theory and social identity theory	Cognition-based trust and affect-based trust in peers and leaders
Sluss et al. (2012)	Mainstream employees	Generalization perspective	Relational identification
Smidts et al. (2001)	Mainstream employees	Social identity theory	Employee communication and perceived organization prestige
Vough (2012)	Mainstream employees	Sensemaking and sensegiving	Organizational ideology, organizational support, prestige, individual input
Wiesenfeld et al. (1999)	Mainstream employees	Information richness theory	Communication and virtual status

## Appendix B: Summary of Relevant Literature on Professionals in Nonprofessional Organizations

Research	Research question / topic	Research context	
		Professional organizations	Nonprofessional organizations
Gunz & Gunz (2007)	Ethics dilemmas faced by professional employees	Lawyers	NPOs in public and private sectors
Hekman et al. (2009)	Professional employees' adoption of organization-prescribed work behavior	Primary care professionals	NPO health maintenance organization
Sorensen & Sorensen (1974)	Professional employees' job dissatisfaction and job migration	CPAs	Bureaucratic organizations
Wallace (1995)	Professionals' organizational commitment	Lawyers	Government and private corporations



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