

Service Innovation in the IT Service Industry: Social Influence and Relationship Exchange Perspectives

資訊服務業服務創新研究：社會影響與關係交換的觀點

Jun-Yu Zhong, Department of Business Administration, National Chengchi University
鍾君宇 / 國立政治大學企業管理學系

Yu-Cheng Hsieh, Department of Business Administration, National Taipei University
謝友甄 / 國立臺北大學企業管理學系

Peiyu Pai, Department of Business Administration, National Chengchi University
白佩玉 / 國立政治大學企業管理學系

Ting-Ling Lin, Department of Business Administration, National Taipei University
林婷鈴 / 國立臺北大學企業管理學系

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Abstract

Service innovation in the IT service industry involves a collaborative process occurring in actor-to-actor networks in which multiple actors such as team leaders, team members and clients all play a role. Integrating the theories of social influence and relationship exchange, the study examines how Empowering Leadership (EML) and Team-member Exchange (TMX) affect individual innovation performance through two particular psychological mechanisms—informational influence (value congruence) and normative influence (felt obligation). This study employs a multiphase and multisource survey from three major Taiwanese IT companies, and collects 282 individually matched pairs of engineer-leader dyads. Results reveal that value congruence and felt obligation mediate the effect of empowering leadership and team-member exchange on innovation performance through informational and normative influence routes, respectively. Furthermore, the moderating analysis demonstrates that when team members have higher other-orientation characteristics, there is a stronger association between innovation intention and innovation performance. Collectively, this study extends and deepens service innovation literature by modeling intricacies within service employees' innovation decision processes, as well as providing suggestions for practitioners in B2B service contexts.

【 Keywords 】 empowering leadership, other-orientation, service innovation, social influence, team-member exchange

摘要

資訊服務業的服務創新有賴於組織關係網絡中成員的相互合作；包括主管與員工間、團隊成員之間、以及員工與顧客之間的關係。本研究結合了社會影響理論與關係交換理論，探討「賦權式領導」與「團隊成員交換關係」如何影響個體成員的心理機制（亦即透過資訊與規範的影響力），進而提升個人的「服務創新表現」。本研究選擇三家臺灣主要的資訊服務業公司進行兩階段問卷調查，共收集了 282 筆主管與資訊工程師的配對樣本。研究結果顯示：賦權式領導與團隊成員交換關係分別會先驅動成員的「價值一致性」與「責任感」，進而影響個人的服務創新表現。此外，本研究亦發現：具較高程度「他人導向 (other-orientation)」的成員，其創新意願更能夠轉化為創新表現。整體而言，本研究不僅深化了過去服務創新相關的研究，亦提供 B2B 企業若干創新管理實務上的重要建議。

【關鍵字】賦權式領導、他人導向、服務創新、社會影響力、團隊成員交換關係

1. Introduction

Accumulated research has focused on understanding the process of organization innovation development and improvement, and established that innovation contributes to better performance and effectiveness in organizations (Blichfeldt and Faullant, 2021; Lehrer, Wieneke, vom Brocke, Jung, and Seidel, 2018; Skålén and Gummerus, 2023). This process is also referred to as knowledge integration and creation, both of which are beneficial in terms of organizational capability (Lin, Lu, Ozer, and Tang, 2023). More importantly, the topic of individual innovative behavior as a significant source of momentum for organization innovation has gradually gained attention in both academic and practical fields (Kör, Wakkee, and van der Sijde, 2021; Scott and Bruce, 1994). Individual innovative behavior in the IT service industry is defined as the extent to which engineers exert themselves to develop, adopt, and implement novel ideas for products and work methods (Scott and Bruce, 1994; Yuan and Woodman, 2010). Prior studies have viewed individual innovation as an important asset that enables firms to succeed in dynamic business environments (Anderson, Potočník, and Zhou, 2014; Chuang, Lee, Chen, and Yen, 2019).

Although prior researchers from various fields have investigated how employees innovate, the majority of these studies tend to explain innovative behavior mainly from the perspectives of individual motivation, ability, and self-image (e.g., social cognitive theory, motivation theory, and role identity theory). For example, some studies find that individual innovation will thrive when one believes that he or she possesses the knowledge and skills to generate novel outcomes (Gong, Huang, and Farh, 2009; Liao, Liu, and Loi, 2010; Zhang and Zhou, 2014). However, these prior studies neglect that coworkers' and supervisors' expectations, thoughts, and behaviors can act as social influence within groups, positively impacting individual behavior (Homburg, Wieseke, and Kuehnl, 2010). Additionally, social influence also helps to demonstrate the fundamental impact of social factors on human decision-making process and behavior (Li, Shao, Wang, Fang, Gong, and Li, 2022). Therefore, our study aims to explore new insights into the underlying mechanism with social influence theory to gain a better understanding of individual innovation within the IT service industry in Taiwan.

Despite of the importance of individual innovative behavior for IT service firms—particularly engineers of these firms primarily working on group-based projects, prior studies also fail to look after another influential mechanism formed by relational

interactions (see Appendix Table A1) and a crucial research question remains unresolved: In the IT service firms, how do engineers' relational interactions among leaders and team members influence their service innovation performance? To answer this question, this study aims to build a research framework that addresses the social exchanges and social influence associated with encouraging employees' service innovation behavior. In turn, this study proposes a dual mediation model, integrating both social exchange theory and social influence theory, to delineate the effects of Empowering Leadership (EML) and exchange quality (i.e., Team-member Exchange; TMX) on individuals' service innovation performance. The mechanisms under consideration within this model are value congruence and felt obligation, providing a nuanced understanding of the aforementioned impacts. Moreover, this study contributes to the service innovation literature by fulfilling several research gaps.

The first research gap concerns the psychological mechanisms involved in the process of the antecedents affecting employees' innovation performance. Several studies have investigated the direct impacts of internal support resources from a company (e.g., supportive leadership, relationship quality among members, and other supports from management and relationship network). However, empirical findings have been mixed regarding these links (e.g., Kim, Cheong, Srivastava, Yoo, and Yun, 2021; Kör et al., 2021; Sykes, 2015), which mainly stem from overlooking the influence process. More specifically, using only the individual performance as a unit of analysis, these previous studies ignore the psychological mechanisms underlying the relationship between antecedents and outcome variables. On the other hand, following social influence theory, group members (i.e., employees and supervisors) can generate informational and normative influence to affect others' beliefs, preferences, and behaviors (Cialdini and Goldstein, 2004). Other prior studies also find that when individuals belong to a group, their thoughts and values are more likely to be affected by the consequences of any decision the group's members might make (Homburg et al., 2010; Liao et al., 2010). Therefore, the current study deepens aforementioned prior results by concentrating on the importance of understanding the underlying mechanisms behind the causal result.

Another gap pertains to the antecedents of engineers' service innovation intentions. First, some scholars have theorized that coworkers' ties within workplace networks serve as complementary resources that interact to influence their job performance (Cheong, Yammarino, Dionne, Spain, and Tsai, 2019; Huang and Huang, 2021; Lin, Hu, and Shih, 2017; Ter Wal, Criscuolo, and Salter, 2023). While these studies adopt the concept of

network ties, in terms of communication frequency and methods for worksite networks, they often overlook the importance of initial relationship valence. Moreover, they give inadequate attention to investigating the differences in relationships between coworkers and team leaders. Second, prior studies have also argued that the characteristics of leaders and those of the coworkers in organizations are both vital factors that influence the employees' performance (Schepers, Jong, Ruyter, and Wetzels, 2011; Windeler, Maruping, and Venkatesh, 2017), as well as a relational resource exchange that can provide employees with psychological and material supports to facilitate individual performance (Zhang and Bartol, 2010). In the current study, we adopt the perspective of relationship exchange to specifically address the effects of TMX and EML on individual innovation performance.

A final research gap pertains to the stimulating factors in the relationship between innovation intention and employee innovation performance. Previous research indicates job performance can be indirectly affected by employee personality and job enthusiasm (Grant and Wrzesniewski, 2010). Specifically, one's other-orientation involves the degree to which one values and feels concerned about others' well-being (Grant and Wrzesniewski, 2010), leading employees toward providing useful and novel ideas that benefit other employees. In addition, instead of focusing on self-concern and self-relevant consequences, people with high other-orientation tend to search for and process information on group-level attributes (Buch, Kuvaas, and Dysvik, 2019; De Dreu and Nauta, 2009), thereby presenting a stronger link between their service innovation intentions and performance. Our moderation analysis demonstrates the significant role of other-orientation, extending our knowledge on the underlying mechanisms of behavioral intentions that affect behavioral performance in the IT service context. In sum, our study addresses the above oversights to deepen our understanding of the relationships among the antecedents, mediators, and moderators of employees' service innovation behavior in IT industries in Taiwan.

2. Literature Review and Hypotheses

2.1 Individual Innovative Behavior

Over the past three decades, the literature on service innovation has grown considerably and diversely, developed in areas such as marketing, economics, information

systems, strategy, and organization management (Liu, Jiang, Shalley, Keem, and Zhou, 2016; Lusch and Nambisan, 2015). More importantly, individual innovative behavior as a significant momentum for firm innovation has gradually gained attention and discussion in both academic and practical fields. Innovative behavior refers to an employee's intention to introduce or apply novel ideas, products, processes, or measures to his or her work role, team, or company (Scott and Bruce, 1994; Yuan and Woodman, 2010). Prior studies (e.g., Farmer, Tierney, and Kung-Mcintyre, 2003; Kör et al., 2021; Scott and Bruce, 1994; Yuan and Woodman, 2010) highlight the significance of new ideas and employees who, solely or collectively, generate, promote, discuss, revise and implement these ideas. As such, innovative behavior can be viewed as the heart of all organizational innovation (Kör et al., 2021; Scott and Bruce, 1994). Innovative behavior at the workplace is an important element that drives competitive advantages, and provides companies with a foundation for maintaining or strengthening high performance (Ng and Wang, 2019; Scott and Bruce, 1994; Yuan and Woodman, 2010).

Besides, several studies have used creativity and innovative behavior interchangeably when investigating innovation-related behaviors (Yuan and Woodman, 2010; Zhou, 2003). However, by definition, creativity differs from innovation because the former refers to individual idea generation, whereas the latter involves idea generation and implementation across the organization (Zhou, 2003); that is, creative behavior can be viewed as a vital component of innovative behavior or subsumed under the outcomes of innovation performance (Amabile, Barsade, Mueller, and Staw, 2005; Yuan and Woodman, 2010). Appendix Table A1 summarizes findings from several major empirical studies on individual innovative behavior.

There are two main streams of research that explore the mediating mechanism underlying the link from antecedents to individual innovative behavior. First, some literature has observed employee innovation performance from the view of social cognitive theory (Farmer et al., 2003; Gong et al., 2009; Liao et al., 2010; Zhang and Zhou, 2014). These studies argue that individual innovation can be affected by the belief that one possesses required knowledge and skills to produce novel ideas. Specifically, according to the self-efficacy theory, individual efficacy beliefs can be nourished by enactive mastery experience and mastery modeling (Bandura, 1997). Hence, prior studies have investigated the impact of leadership and the relationship quality among members (i.e., coworkers and leaders) on employees' self-cognition. For example, high TMX, representing situations where team members tend to provide support and assistance to each other, can be

conducive to innovative self-efficacy through knowledge sharing and mutual assistance (Huang and Tsai, 2019; Liao et al., 2010). Second, some studies have utilized motivation theory to explore individual innovation performance (Chen, Farh, Campbell-Bush, Wu, and Wu, 2013; Lin et al., 2023). Zhang and Bartol (2010) find that individual motivation can be elicited through influences such as EML, characterized as performing a supportive role that drives employees' motivation to engage into innovative behavior. Likewise, Kim et al. (2021) take the interactionist perspective to explain the effects of the supports from the workplace (i.e., supervisor and coworker knowledge sharing) on employee's creative behavior. However, their results note that these support resources do little to explain employees' innovative behavior. Thus, there is a necessity to further examine various mediators in the relationship between support resources and innovative behavior.

The current study draws on two theoretical lenses—social exchange theory and social influence theory—to gain insights into the potential effects of leadership and relationship quality on individual innovation performance. Social exchange features long-term and unspecified mutual obligations (Larson, 1992); the norm of reciprocity is often evoked in exchange relationships and, in turn, may trigger one's obligation toward individuals or organizations (Liao et al., 2010). Prior studies view these exchange relationships in the workplace as a social support resource (Liao et al., 2010). In the workplace, two focal support resources for each employee are those with team leaders and coworkers. The former has been referred to as empowering leadership, involving sharing power with a view toward addressing job significance, participative decision-making, confidence in performing at a high level, and work autonomy (Ahearne, Mathieu, and Rapp, 2005; Zhang and Bartol, 2010). Regarding the support sources from coworkers, team-member exchange refers to social exchanges among coworkers with regard to the mutual help in contributing ideas and providing feedback (Liao et al., 2010; Seers, 1989). Overall, there is growing evidence demonstrating that both of the two support resources can independently strengthen individual innovation performance (Kim et al., 2021; Liao et al., 2010; Yuan and Woodman, 2010; Zhang and Bartol, 2010; Zhang and Zhou, 2014).

Figure 1 presents our conceptual model, derived by synthesizing existing theories with outcomes of a comprehensive review of pertinent research. We posit that social influence functions as a pivotal mediating mechanism within this framework. Moreover, we propose that both value congruence and felt obligation act as fundamental links between EML and TMX, thereby influencing individual innovation performance. Specifically, social influence is conducive to innovation performance for two reasons.

First, within a stressful work environment, positive interpersonal relationships and support resources can provide employees with information about work attitude and role perceptions to reduce uncertainty and strengthen their sense of social adjustment to conform to others' thoughts and behaviors (Pitesa and Thau, 2013). Second, drawing upon the perspective of workplace exchange relationships, employees may perceive a normative obligation to reciprocate the support received from their work teams. This reciprocal interaction often manifests as conformity to the expectations of others, which is seen as a strategy to garner social approval (Cialdini and Goldstein, 2004; Kim, LePine, Zhang, and Baer, 2022). Homburg et al. (2010) also argue that support resources in the workplace can affect social influence among the team members, in turn impacting individual behavior and job performance. Therefore, we adopt the perspective of Cialdini and Goldstein (2004) to divide social influence into informational influence (i.e., value congruence), and normative influence (i.e., felt obligation), advancing our understanding of the underlying mechanism behind the causal result.

2.2 EML → Value Congruence → Innovation Intention

Zhang and Bartol (2010) adopt Ahearne et al. (2005)'s work to provide a psychology-based definition of EML, specifically referring to the implementing conditions that enable leaders to share power with members. These conditions include: enhanced meanings

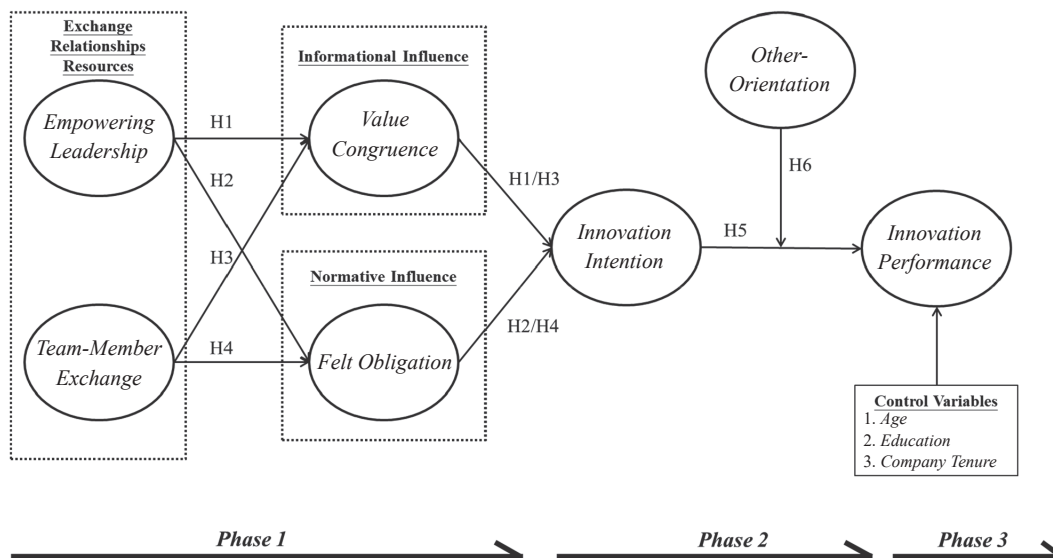


Figure 1 Conceptual Model

through acknowledging employees' works are meaningful; autonomy through removal of barriers to performance that gives employees a sense of empowerment; confidence through supporting abilities to execute tasks well and participation through removal of barriers to joining in decision making. Prior studies have demonstrated leadership empowerment behavior can unleash potential, enhance motivation, and increase adaptive and receptive abilities across various situations (Spreitzer, 1995). Prior studies have also found EML has positive relationships to individual innovation performance from the perspective of psychological empowerment (Cheong et al., 2019; Zhang and Bartol, 2010).

A high EML may enhance individual innovation performance through increasing team member value congruence. Value congruence is the extent to which employees' values are compatible with the values exuded by their team members (Hoffman, Bynum, Piccolo, and Sutton, 2011). Meaningfulness is crucial to the congruence between the behaviors expected by a company and the behaviors that an individual employee values as a part of his/her own self-image (Rich, Lepine, and Crawford, 2010). Team members who experience meaningfulness are more likely to perceive that devoting themselves to their work roles and other team members is worthwhile, useful, and valuable (Kahn, 1990). Under EML, individuals' feelings of psychological empowerment have been enhanced by sharing power, where employees are encouraged to participate in decision making, transmitting values, beliefs, and significance of the work within the team (Spreitzer, 1995; Zhang and Bartol, 2010). In this way, team members learn to cooperate and coordinate tasks, facilitating goal clarity and team consensus (Kearney, Shemla, van Knippenberg, and Scholz, 2019). Lorinkova, Pearsall, and Sims (2013) have also observed interdependent teams established under the influences of EML exhibit more collaborative norms and values among members.

Furthermore, the literature on value congruence, particularly the congruence between individuals and team members, indicates its importance to an organization's development (Rich et al., 2010). The basis of value congruence for consistent beliefs, willingness, and behaviors is linked to experience of psychological meaningfulness (Kahn, 1990). Once employees discover such congruent behaviors, linked with preferred self-image, they tend to perceive such behaviors as attractive, valuable, and worthwhile—becoming more willing to exhibit those behaviors (Rich et al., 2010). While some prior literature on organizational behavior argues that values can be communicated to organization members to clarify the role of value congruence (Rich et al., 2010), Edwards and Cable (2009) find that predictability (derived from value congruence) plays a prominent role in terms of

activating persistent beliefs within the work context. By eliciting the intrinsic nature of value congruence, employees' preferences align with team members. Such conformity lowers uncertainty among all team members, energizing them in their tasks (Maruping, Daniel, and Cataldo, 2019). A high empowering leader helps team members align their values and goals and innovate. In line with this theoretical expectation, prior research indicates empowered employees are motivated to perform well because EML leads team members to generate personal beliefs and values that the task at hand is meaningful and relevant (Chen, Sharma, Edinger, Shapiro, and Farh, 2011). In sum, we propose the following hypothesis:

Hypothesis 1: Value congruence mediates the positive relationships between EML and innovation intention.

2.3 EML → Felt Obligation → Innovation Intention

We propose that EML enhances individual innovation performance by augmenting the felt obligation of team members. Felt obligation for innovation is an employee's perception that he or she is personally accountable for or obligated to bring about customer service innovation (Fuller, Marler, and Hester, 2006; Morrison and Phelps, 1999). In the organization research context, felt obligation is considered a prescriptive belief regarding whether employees should express concern about the firm's well-being and help it achieve its objectives (Eisenberger, Armeli, Rexwinkel, Lynch, and Rhoades, 2001). In other words, such before-the-fact responsibility is normative and future-oriented, reflecting an assumed obligation or willingness for proactive involvement (Fuller et al., 2006). Fuller et al. (2006) also highlight that employees who are willing to take responsibility for their actions are more likely to perceive these actions as beneficial to their teams or companies, thereby promoting a positive and selfless behavior.

According to the principles of EML, a leader eliminates obstacles, affords employees the autonomy and discretion needed to perform their tasks, and establishes the requisite procedures for achieving goals (Ahearne et al., 2005). Such support from a leader nurtures employees' sense of self-determination and fuels their motivation to take initiative and propose constructive solutions to challenges, thus improving processes (Eisenberger, Karagonlar, Stinglhamber, Neves, Becker, Gonzalez-Morales, and Steiger-Mueller, 2010; Huang and Tsai, 2019). Influence over a broad range of decisions encourages a sense of ownership (Parker, Williams, and Turner, 2006) that in turn effectively strengthens a sense of responsibility for tasks and outcomes (Oldham and Cummings, 1996). Additionally,

EML has been regarded as supportive leadership that provides direction to members, treats them fairly, and views employees' investments as valuable (Ahearne et al., 2005). From the perspective of social exchange theory, this stimulates adherence to norms of reciprocity and elicits increased obligations to engage in work (Rich et al., 2010). As such, employees may perceive work innovation as an important way to reciprocate team leaders' support. Previous research confirms empowered employees understand their duties and achievement targets (Kearney et al., 2019; Schilpzand, Houston, and Cho, 2018).

In line with organizational behavior literature, an employee with higher felt obligation is more likely to feel intrinsic work motivation and task satisfaction, and to concern about products or services quality (Eisenberger et al., 2001; Thompson, Bergeron, and Bolino, 2020). Eisenberger et al. (2010) argue such belief is critical to employees' discretionary and extra-role behaviors. Empirical research has also confirmed the role of felt obligation as a critical psychological mechanism improving employees' willingness to perform behaviors that benefit the organization (Liang, Farh, and Farh, 2012). For example, employees are willing to make additional efforts to solve problems, suggest improvements, remove unnecessary procedures, and/or adopt more effective work methods, as these activities will benefit the organization (Morrison and Phelps, 1999; van Dyne and LePine, 1998). Previous research has also found that the employees who are given some power role by a leader would express feelings of trust and obligation that leads to a desire to reciprocate, which results in greater willingness to engage in extra-role performance (Vidyarthi, Liden, Anand, Erdogan, and Ghosh, 2010). Accordingly, we propose the following hypothesis:

Hypothesis 2: Felt obligation mediates the positive relationships between EML and innovation intention.

2.4 TMX → Value Congruence → Innovation Intention

The relationship quality between an individual team member and his/her fellow team members is captured by TMX (Seers, 1989). Kamdar and van Dyne (2007) argue that TMX, due to its high-quality peer relationships, can be described by flexibility, discretion, and open-endedness. Intrinsically, TMX is a social exchange-based relationship characterized by reciprocity, honesty, support, and exchange of information (Banks, Batchelor, Seers, O'Boyle, Pollack, and Gower, 2014). Specifically, TMX represents individual's perceptions of "the reciprocity between a member and his or her team with respect to the member's contribution of ideas, feedback, and assistance to other members

and, in turn, the member's receipt of information, help, and recognition from other team members" (Seers, Petty, and Cashman, 1995). Numerous related studies have offered evidence to the existence of a positive link from TMX quality to job performance. For example, in Scott and Bruce's (1994) study, high-quality TMX exhibits mutual trust and respect while showing a willingness to cooperate, exchange resources, and offer support beyond what is necessary for individual innovation.

The present study posits that high TMX relationships affect employee innovation intention through enhancing value congruence among team coworkers. Farmer, van Dyne, and Kamdar (2015) argue high-quality TMX relationships lead to positive team member workplace interactions, such as coordination and cooperation, encouraging feelings of team cohesiveness. Drawing on social identity theory, Farmer et al. (2015) find these positive group relationships can satisfy a need for assimilation that forms identification with other members, which is a group process generated by social categorization and depersonalization processes (Ehrhardt and Ragins, 2019). This finding aligns with relational system theory literature (Kahn, 1998) that argues high quality work relationships encourage employees to feel connected to the group based on relational needs (Ehrhardt and Ragins, 2019). These needs assist in achieving satisfaction in task completion (instrumental support) and familiarity with the work environment (personal support), which can further augment group members' perceptions of connectedness, as well as feelings of closeness and attachment (Ehrhardt and Ragins, 2019). Given that firms in the IT service industry prioritize internal support and coordination capabilities, high-quality TMX relationships, akin to other social exchange relationships, should foster consistency in team member values.

Through fulfilling both needs, TMX strengthens member value congruence—making it more likely team members will have common beliefs and goals. This in turn increases willingness to exhibit innovative behavior. From the perspective of uncertainty reduction, while high-quality TMX affects the formation of value congruency, team members may feel a sense of safety and positive interpersonal attitudes toward work, increasing engagement in their tasks (Farmer et al., 2015; Liu, 2021). Organizational research on individual-level creativity has observed that when team members share similarities, their close interactions foster positive relationships, thereby facilitating collaborative work-related activities (Liao et al., 2010). Additional research supports the concept that value congruence can enhance the experience of psychological presence and connection, which in turn stimulates further efforts towards achieving team goals (Ehrhardt and Ragins,

2019). In sum, high-quality relational networks within teams enhance intention to engage in innovative behavior through value congruence among members. Therefore, we propose the following hypothesis:

Hypothesis 3: Value congruence mediates the positive relationships between TMX and innovation intention.

2.5 TMX → Felt Obligation → Innovation Intention

In addition to converging team members' beliefs and values, TMX is also a major source of perceived obligation (Anand, Vidyarthi, Liden, and Rousseau, 2010). In keeping with the concept of leader-member exchange, TMX is encouraged in an autonomous work setting. In such a setting, an employee's perception of the obligation among peers is maximized, along with opinions, and assistance intended to support peers while receiving information, feedback, and recognition in return (Seers et al., 1995; Ter Wal et al., 2023; Zhang and Venkatesh, 2017). Employees with high quality exchange relationships view assistance among members as a natural form of reciprocity. It is worth noting that such obligations can be reciprocated at one's discretion without any formal enforcement (Anand et al., 2010). This perception can also be seen as a moral norm of reciprocity, which is driven by TMX (Liang et al., 2012). Specifically, employees who obtain referent information and support in completing a task are likely to feel obligated to those who granted assistance. For example, Farh, Lanaj, and Ilies (2017) suggest that high TMX quality may induce employee reciprocal obligations based on a sense of indebtedness toward their partners.

Employees' perception of high-quality relationship exchange in the workplace positively relates to their willingness to act in ways that benefit others (Anand et al., 2010). From job characteristics theory, an individual who perceives more obligation toward the work role experiences and more intrinsic motivation toward team goals has more job satisfaction, and pays more attention to team work quality (Fuller et al., 2006). Furthermore, Liang et al. (2012) find that team members feel higher levels of obligation to emphasize team benefits and engage in responsible behaviors. Previous research provides evidence that organizational perceived support, stemming from members, leaders, or teams, can elicit an individual's felt obligation to invest effort toward team objectives and benefits, engaging in in-role and extra-role behaviors (Eisenberger et al., 2001). Farh et al. (2017) find that higher TMX relationships can stimulate member feelings of obligation toward enhancing individual performance. In sum, we propose the following hypothesis:

Hypothesis 4: Felt obligation mediates the positive relationships between TMX and innovation intention.

2.6 Innovation Intention and Innovation Performance

Behavioral intention represents an individual's decision to perform a specific behavior and willingness to try regardless of how hard the work is and how much effort needs to be invested (Ajzen, 1991). In line with the theory of planned behavior, an individual's behavioral intention is the central factor influencing the performance of a given behavior, a powerful behavioral predictor and mediator across various research contexts (Ajzen, 1991). Evidence of behavioral intention has been found in numerous research contexts (Bock, Zmud, Kim, and Lee, 2005; Owens, Baker, Sumpter, and Cameron, 2016; Perugini and Bagozzi, 2001). When an employee exhibits intention to engage in a behavior, he/she is more likely to cognitively engage with the practice and perform innovative behaviors (Zhang and Bartol, 2010).

In the organizational context of this study, in which employees display a willingness to engage in innovation, we anticipate the relationship between intention and performance to be important. In line with research on individual innovation (e.g., Zhang and Bartol, 2010), employees with innovation intention are more likely to exert themselves in innovation-related behaviors, like problem identification, information searching and encoding, as well as idea and alternative generation, all of which facilitate work performance. That is, employees will be more likely to concentrate on their jobs and attempt to overcome barriers associated with the service process and achieve requirements demanded by organizational members and customers, strengthening their performance evaluations (Liao et al., 2010; Owens et al., 2016). Therefore, the stronger the intention toward a behavior, the more likely it is to be performed (Ajzen, 1991; Perugini and Bagozzi, 2001). We expect the following hypothesis:

Hypothesis 5: An engineer's innovation intention positively influences his/her innovation performance.

2.7 Moderating Effect: Other-Orientation

Other-orientation is defined as the extent to which employees value and experience concern for the well-being of other people (De Dreu and Nauta, 2009; Grant and Wrzesniewski, 2010; Meglino and Korsgaard, 2004). Individuals with a high degree of other-orientation tend to actualize altruistic ideas that benefit others within the

organization, even if doing so may yield negative feedback and cause harm to their ego and self-image (Grant and Mayer, 2009). Such people are intrinsically affected by social influence (i.e., openness to social influence) and adopt behaviors associated with more heuristics during the judgement process (Korsgaard, Meglino, Lester, and Jeong, 2010). Prior studies have pointed out common traits of people with other-orientation include empathy, prosocial values, and altruistic personalities (Buch et al., 2019). Grant and Wrzesniewski (2010) further argue that other-orientation, by fostering perceptions of caring about others (i.e., team members and customers), raises employee perceived value from work performance.

Conversely, self-orientation is associated with the tendency to search for and process information on individual-level attributes and self-related consequences (e.g., personal needs, states, achievements) (Bobocel, 2013; De Dreu and Nauta, 2009). Because people with high self-orientation are motivated to protect their personal self, they tend to withdraw from stress-inducing events and act with disregard for others (Taylor, Butts, Cole, and Pounds, 2021). Given that service innovation requires a harmonious team relationship and the willingness to consider others' perspectives, employees with high other-orientation can often contribute comprehensively to team work and drive their motivation toward others' opinions (Grant and Berry, 2011). Grant and Wrzesniewski (2010) have further shown that other-orientation encourages individuals to pay closer attention and expend greater effort through self-regulatory mechanisms, leading them toward providing useful and novel ideas that benefit others. Additionally, because employees with higher other-orientation focus on the well-being of others, they may avoid overconfidence in terms of perceiving the benefits they can provide to others through hard work (Buch et al., 2019; Korsgaard et al., 2010). Therefore, these employees are more likely to seek out and collect service-related information that facilitates novel and useful products or services.

However, other-orientation may also decrease the potential for individuals to make inflated assessments and predictions about themselves, decreasing the chance of making promises that exceed abilities (De Dreu and Nauta, 2009). Specifically, employees with higher other-orientation are more likely to extensively consider and adopt others' perspectives to make effective decisions (Grant and Berry, 2011). In contrast, employees with low other-orientation tend to be preoccupied with their own self-interest, and in turn to focus on self-related positive and negative consequences when making decisions (Buch et al., 2019; Korsgaard et al., 2010). As a result, these individuals are more likely to refuse others' perspectives and thereby slow the organization's development. Therefore, the

present study predicts that compared to self-oriented engineers, other-oriented ones will enhance the impact of innovation intention on innovation performance.

Hypothesis 6: An engineer with high other-orientation will exhibit a stronger positive relationship between innovation intention and innovation performance.

3. Methodology

3.1 Sample and Data Collection

The present study targets three major IT service companies in Taiwan. The IT service industry is generally characterized by emphasizing on innovation regarding firm strategy and employees' innovation performance. Thus, having personnel knowledge and skills to provide clients with tailored service will be the core ability for IT service employees. That is, IT service firms have a tendency to focus on the joint application of specialized competences (knowledge of IT domains) to generate value-creation practices (Sun, Fang, Lim, and Straub, 2012). More importantly, for the purposes of this study, Taiwan's IT service industry represents a combination of cooperation, coordination, and innovation, in which both internal exchange relationships (i.e., supervisors and team members) and external resource exchanges (i.e., team members and customers) have an important effect on individual task performance (Ford and Seers, 2006; Zhang and Bartol, 2010). Our samples have customers from both the private sector, including finance, manufacturing, medical care, and communications, and from the public sector, so we believe such varieties can be representatives of the IT service industry in Taiwan.

In response to our research context and objectives, respondents must participate directly in service delivery and interact with coworkers and customers frequently as they provide tailored services. As such, all respondents are engineers, mainly from sales units and customer service departments, working in project teams headed by team leaders (supervisors). They are all familiar with the continuous evolution of this industry and the need to devise and implement useful and effective solutions that meet customers' diverse requirements.

In line with prior research practice, we distributed the questionnaires in three phases to minimize common method bias (Podsakoff, MacKenzie, Lee, and Podsakoff, 2003). In the Phase 1 survey, we asked engineers about their views on the level of EML, TMX, value congruence, and felt obligation displayed in their teams. In the Phase 2 survey, one

month later, we asked respondents to the Phase 1 survey to evaluate innovation intention and the moderator. The Phase 3 survey took place two weeks after the Phase 2 survey, and asked team supervisors to rate each team member's service innovation performance.

To mitigate the risk of social desirability bias, each participant was provided with a questionnaire and a return envelope. We made it clear that all completed questionnaires should be sealed in the envelopes before being placed in a designated collection box to ensure confidentiality. As an incentive to participate, a gift worth NTD 300 was offered to those who completed both questionnaires. Of the 403 employees and 13 supervisors who responded to our surveys, we excluded 121 engineers' responses due to incomplete data or because their tenure at their current firms was six months or less.

Our methodology resulted in a data set consisting of 282 individually matched pairs of engineer-leader dyads. Of this population, 53% were male, and 41% had earned at least one bachelor's degree. The average company tenure of the respondents was 3.88 years (standard deviation [SD] = 3.25), while the average industrial tenure was 5.53 years (SD = 4.41).

3.2 Measures

The surveys in this study utilized Likert scales ranging from 1 ("strongly disagree") to 7 ("strongly agree") for all variables. We adopted both translation and back-translation procedures, and translated all English items into Chinese (Brislin, 1986) since we administrated the survey in Taiwan. Table 1 presents a full list of measurement items.

Employees' innovation performance was evaluated by their direct managers or department supervisors. Innovation performance was rated based on the overall innovative behavior that employees search techniques and process to generate and implement new ideas. To measure employees' willingness of adopting innovative behavior, we used the three items from the scale of the Theory of Planned Behavior (TPB) (Perugini and Bagozzi, 2001). We used the three-item value congruence scale developed by Hoffman et al. (2011) to measure the extent employees perceived alignment between their values and those of their team members. Consistent with Fuller et al. (2006), we utilized a felt obligation scale to reflect employees' desire to repay their team by adopting behaviors designed to improve customer service and innovation. Nonetheless, the scale developed by Fuller et al. (2006) reflects employees' felt obligation to repay their companies through general positive organizational behavior, whereas our employed three-item scale reflects the extent to which employees felt obligated to repay their teams by using flexible and

innovative ideas to deal with team tasks. We used four items based on Zhang and Bartol (2010) to measure EML. We asked respondents about the extent to which they perceived individual empowerment based on the four dimensions of leadership: (1) enhancing the meaningfulness of work; (2) fostering participation in decision making; (3) expressing confidence in high performance; and (4) providing autonomy by removing hindrances. To measure TMX, we used four items developed by Seers (1989). We asked respondents to rate the strength of TMX with their team.

To account for potential influences on individual innovation performance, we controlled for employees' education level, company tenure, and age. For example, employees with advanced degrees may exhibit a wider array of ideas at work, those with longer tenures at the same company may be more adept at generating novel ideas (Zhang and Bartol, 2010), and older employees may bring a wealth of work- and life-related experiences that could be advantageous in their tasks (Scott and Bruce, 1994). Education level was categorized as follows: middle school or below, senior high school, junior college, university, and postgraduate studies. Company tenure was measured by the number of months an employee had worked at the company.

4. Research Analysis

According to the two-step approach of Anderson and Gerbing (1988), we perform both measurement model evaluation and structural model evaluation. We first assess the measurement properties of the latent constructs by running a Confirmatory Factor Analysis (CFA); we then test all hypotheses of the conceptual model by conducting a structural equation analysis.

We use LISREL 8.80 to run our research models, and evaluate the goodness-of-fit of the models using chi-square tests, the Non-normed Fit Index (NNFI), the Root Mean Square Error of Approximation (RMSEA), and the Comparative Fit Index (CFI). The results also show good model fit, requiring nonsignificant chi-square tests, the values of RMSEA less than or equal to .08, and the values of NNFI and CFI greater than or equal to .90 (Bagozzi and Yi, 1988). The present study also conducts χ^2 -difference tests to verify the effects of mediation and moderation.

4.1 Construct Validity

We adopt LISREL 8.80 to perform a CFA and determine the validity and reliability

Table 1 Summary of Measures

Constructs	Measures	Standardized Factor Loading
<i>Innovation Intention</i> CR ¹ = .87 AVE ² = .69	(1) I am planning to provide my customers with novel service and ideas during the next two weeks.	.84
	(2) I intend to provide my customers with novel service and ideas during the next two weeks.	.90
	(3) I will expend effort on providing my customers with novel service and ideas during the next two weeks.	.74
<i>Source: Perugini and Bagozzi (2001)</i>		
<i>Value Congruence</i> CR = .74 AVE = .50	(1) My personal values match my team members' values and ideals.	.70
	(2) The things that I value in life are similar to the things my team members value.	.79
	(3) My team members' values provide a good fit with the things I value.	.60
<i>Source: Hoffman et al. (2011)</i>		
<i>Felt Obligation</i> CR = .80 AVE = .58	(1) I feel a personal sense of responsibility to bring about novel and different service.	.85
	(2) I feel obligated to try to provide new services where appropriate.	.86
	(3) I feel obligated to challenge or change the present form of customer service.	.54
<i>Source: Fuller et al. (2006)</i>		
<i>Empowering Leadership</i> CR = .88 AVE = .64	Enhancing the meaningfulness of work:	
	(1) My team leader helps me understand the importance of my work to the overall effectiveness of the company.	.80
	Fostering participation in decision making:	
	(2) My team leader makes many decisions together with me.	.82
Expressing confidence in high performance:		
(3) My team leader expresses confidence in my ability to perform at a high level.	.82	
Providing autonomy from bureaucratic constraints:		
(4) My team leader makes it more efficient for me to do my job by keeping the rules and regulations simple.	.75	
<i>Source: Zhang and Bartol (2010)</i>		
<i>Team-Member Exchange</i> CR = .89 AVE = .66	(1) Other members of my team provide support and encouragement to me.	.81
	(2) Other members of my team frequently recognize my efforts.	.81
	(3) Other members of my team frequently take actions that make things easier for me.	.86
	(4) When I am busy, others members of my team often volunteer to help me out.	.77
<i>Source: Seers (1989)</i>		

Note: 1. CR is composite reliability.
2. AVE is average variance extracted.

of the study constructs. The results of the measurement model evaluation display a very good fit with the data: $\chi^2(157) = 284.72$, $p \approx .00$, RMSEA = .052, NNFI = .97, CFI = .98, AGFI = .87. The factor loading of each item on its representative construct exceeds .5 ($p < .001$), which demonstrates adequate validity and reliability. Because the present study uses multi-item scales to measure each construct, we examine the internal consistency of these measures through Composite Reliability (CR) and Average Variance Extracted (AVE) (Bagozzi and Yi, 1988). Both well exceed the respective standard benchmarks of .60 and .50, which suggests good internal consistency. We also use three different methods to evaluate discriminant validity among all the constructs. First, as shown in Table 2, the square roots of the AVE for each latent variable can be seen on the diagonal. These values should be greater than the bivariate correlations between the latent variable and all other latent variables; that is, the diagonal values (square roots of the AVE for each construct) are greater than non-diagonal elements in that same row or column. Second, also shown in Table 2, the 95% confidence interval of the correlation between any two latent variables did not include one (Anderson and Gerbing, 1988). Finally, for each pair of factors, χ^2 -value for a measurement model constraining their correlation to one is compared with a baseline measurement model without this constraint. We perform a χ^2 -difference test for 15 pairs of variables (see Appendix Table A2), and each test results in a significant difference. The above tests demonstrate that all of the construct measures in the measurement model achieved discriminant validity.

4.2 Results

The structural model evaluation provides a satisfactory fit with the observed data ($\chi^2 [173] = 337.23$, $p \approx .00$; RMSEA = .057, NNFI = .96, CFI = .97, AGFI = .86). Table 3 displays all the indexes of model fit. Figure 2 indicates the path coefficients of the structural model.

H1 and H3 predict that EML and TMX positively influence innovation intention through value congruence. We find both EML and TMX have a significant relationship with value congruence ($\gamma = .39$, $p < .001$; $\gamma = .37$, $p < .001$, respectively). Additionally, we also find that value congruence is positively related to innovation intention ($\beta = .29$, $p < .001$). Our results thus support H1 and H3. Similarly, H2 and H4 propose that EML and TMX positively influence innovation intention through felt obligation. We find both EML and TMX have a positive relationship with felt obligation ($\gamma = .52$, $p < .001$; $\gamma = .14$, $p < .1$, respectively). The results also indicate that felt obligation has a positive impact on

Table 2 Means, Standard Deviations, and Correlations among Variables

Variables	Correlation								
	1	2	3	4	5	6	7	8	9
1. <i>Innovation Performance</i>	-								
2. <i>Innovation Intention</i>	.30 (.06) ²	.83¹							
3. <i>Value Congruence</i>	.17 (.05)	.44 (.05)	.70						
4. <i>Felt Obligation</i>	.12 (.06)	.44 (.06)	.53 (.05)	.76					
5. <i>EML</i>	.29 (.05)	.51 (.05)	.55 (.05)	.58 (.06)	.80				
6. <i>TMX</i>	.00 (.05)	.18 (.05)	.59 (.05)	.43 (.05)	.56 (.05)	.81			
7. <i>Education Level</i>	.06 (.06)	.03 (.05)	-.07 (.05)	-.04 (.06)	-.08 (.05)	-.03 (.05)	-		
8. <i>Age</i>	.29 (.06)	.12 (.05)	.17 (.05)	.14 (.06)	.22 (.05)	-.05 (.05)	-.13 (.06)	-	
9. <i>Company Tenure</i>	.31 (.06)	.19 (.05)	.16 (.05)	.18 (.06)	.29 (.05)	.03 (.05)	-.30 (.06)	.51 (.07)	-
Mean	-	5.15	4.30	4.77	5.24	5.64	4.06	4.01	3.88
Standard Deviation	-	.98	1.24	1.32	1.24	1.11	.69	1.43	3.25

Note: 1. Diagonal elements are square roots of AVE.

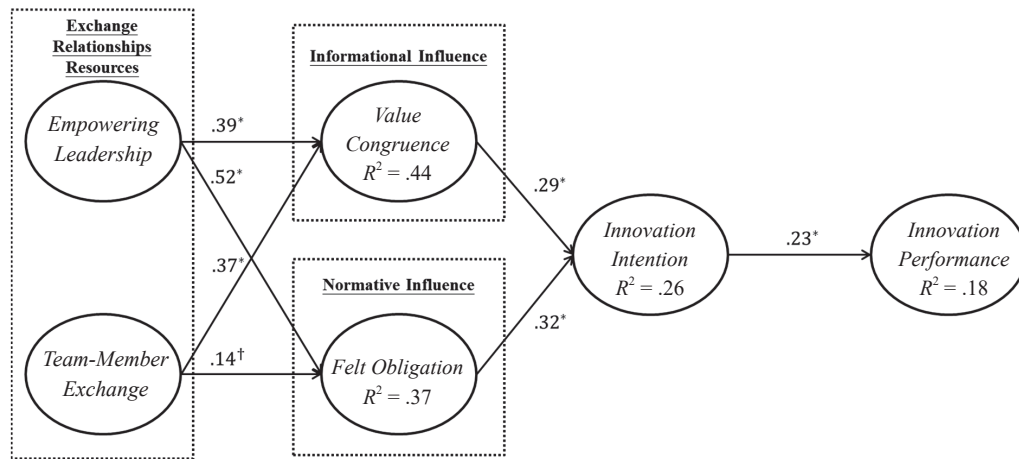
2. Standard errors in parentheses.

innovation intention ($\beta = .32, p < .001$). H2 and H4 are also supported. Finally, H5 posits that innovation intention is positively linked to employees' innovation performance. Our results support this hypothesis ($\beta = .23, p < .001$).

4.3 Tests of the Effects of the Mediating Mechanism

To better understand the direct and indirect effects of the relationships among the mediating variables in our research model, we decompose the effects of the mediating mechanism. As depicted in Model 2, we test a direct effect of value congruence on employees' innovation performance by putting one direct path from value congruence to innovation performance. We obtain an adequate fit to the data from this model, but the value is not significantly better than the baseline model (i.e., the model as pictured in Figure 1) ($\Delta\chi^2 [1] = .13, n.s.$). For the model tests and their fit indexes, see Table 3.

As the difference is not significant, we conclude that the direct path from value congruence to innovation performance is insignificant; therefore, innovation intention fully mediates the effect of value congruence on innovation performance. Similarly, we



Note: † $p < .1$ * $p < .001$

Figure 2 Results for the Hypothesized Paths

also add the direct path from felt obligation to innovation performance. As depicted in Model 3, doing so provides an adequate fit to the data, although again it is not significantly better than the baseline model ($\Delta\chi^2 [1] = .49$, n.s.); we therefore determine that innovation intention fully mediates the effect of felt obligation on innovation performance.

We also test the possibility that the two social influences, value congruence and felt obligation, together fully mediate the relationships between EML or TMX and innovation intention. Table 3 depicts Models 4 and 5 with direct paths added in the relationships between EML or TMX and innovation performance. Both tests of rival hypotheses for the direct effects are insignificant; that is, the mediating mechanism composed by value congruence, felt obligation, and intention fully mediate the effects of EML and TMX on innovation performance. In summary, we provide additional evidence of the robustness of our conceptual model through these tests of mediating effects.

4.4 Moderating Influences

We conduct multiple-group analyses (Jöreskog and Sörbom, 1996) to test our hypothesis pertaining to the moderating effect of other-orientation on the relationship between innovation intention and engineers' service innovation performance. We measure other-orientation with two items previously used by Grant and Berry (2011), and ask respondents to indicate the degree to which they value and demonstrate concern for the well-being of other people: (1) "I like to work on tasks that have the potential to benefit

Table 3 Results for Mediation Tests

Model	Goodness-of-Fit	Tests of Hypotheses
M1: Baseline Model: Hypothesized Paths (Figure 1)	$\chi^2(173) = 337.23$ ($p \approx .00$) RMSEA = .057; NNFI = .96; CFI = .97; AGFI = .86	-
M2: <i>Value Congruence</i> → <i>Innovation Performance</i>	$\chi^2(172) = 337.10$	M1-M2: $\chi^2_d(1) = .13, p > .72$
M3: <i>Felt Obligation</i> → <i>Innovation Performance</i>	$\chi^2(172) = 336.74$	M1-M3: $\chi^2_d(1) = .49, p > .48$
M4: <i>EML</i> → <i>Innovation Performance</i>	$\chi^2(172) = 335.18$	M1-M4: $\chi^2_d(1) = 2.05, p > .15$
M5: <i>TMX</i> → <i>Innovation Performance</i>	$\chi^2(172) = 336.89$	M1-M5: $\chi^2_d(1) = .34, p > .56$

others,” and (2) “It is important to me to have the opportunity to use my abilities to benefit others.” We asked respondents to rate these two items on a seven-point Likert scale with one meaning strongly disagree and seven meaning strongly agree. We calculate the composite score of each member and distinguish a high-score subgroup from a low-score subgroup using a median split ($N_{high} = 147$; $N_{low} = 135$). To test H6, we establish two structural models for the high-score and low-score subgroups and employ moderating tests to compare the differences between the hypothesized path coefficients. According to the baseline model, the effect of intention on innovation performance is permitted to vary across groups. Next, we perform the constrained effect to be equal across subsamples in the second model. Finally, by comparison with the path in the low-score subsample ($\gamma_{N=135}^L = .12, n.s.$), the path from innovation intention to innovation performance in the high-score subsample ($\gamma_{N=147}^H = .35, p < .001$) shows a significantly higher coefficient. Thus, H6 is supported ($\Delta\chi^2 [1] = 3.94, p < .05$).

5. Discussion and Conclusions

Drawing on social exchange theory and social influence theory, this study develops and empirically examines a research model on individual service innovation performance in the context of the IT industry in Taiwan. We begin by discussing research centered on explanations for individual innovation performance that address the importance of the relationship quality among coworkers and leadership, highlighting how these perspectives may act as determinants of why important relational factors impact an engineer’s

innovation performance within the IT service industry. We then draw from social influence theory to describe how informational influence and normative influence from team members and leaders play dual mediating roles in terms of relationships between the antecedents and innovation performance. From the perspective of external influences, the meditational mechanisms may complement prior research, which uses a relatively narrow view of the self (e.g., job involvement, engagement, and intrinsic motivation) to explain individual innovation. We also identify individual characteristics (i.e., other-orientation) to describe how individual innovation can be strengthened and explained by individual differences. Finally, we outline the practical significance of our findings and discuss the research implications.

5.1 Theoretical Implications

Following past literature on service innovation and organization, this study extends the understanding of IT service innovation by building and testing a conceptual model to explore the causality of individual-level innovation performance more deeply. Although most prior researchers agree that innovation plays a critical role in improving enterprises' performance and growth, specifically by supporting work-related systems and technology intense knowledge to service delivery (e.g., Carlo, Lyytinen, and Rose, 2012; Trantopoulos, von Krogh, Wallin, and Woerter, 2017), relatively few studies on service innovation have delved into the importance of individual contributions to organizational performance. Previous literature on organizational performance indicates that novel thoughts and behavioral flexibility of individual employees can positively impact a company's ability to take advantage of opportunities and fundamentally contribute to an organization's innovation, effectiveness, and survival (Amabile et al., 2005; Oldham and Cummings, 1996; Scott and Bruce, 1994). Kör et al. (2021) and Scott and Bruce (1994) also highlight the importance of individual actors within a company (e.g., employees and leaders) during the service process. Our theoretical model indicates that internal factors of an organization and critical psychological mechanisms associated with engineers can both influence the fundamentals underlying innovative outcomes.

Through multi-period and multi-source data collection and research model examination, the current study makes following theoretical contributions: First, this study deepens the theory and literature on individual innovation performance by incorporating social influence theory (i.e., informational and normative influence) to highlight the mediating mechanism in our research model. Of the studies listed in Appendix Table

A1, a plurality adopts the perspectives of social cognitive theory and motivation theory to investigate individual innovative behavior, but few incorporate the perspective of social influence theory. For example, owing to previous studies that focus on cognitive mechanisms, Lin et al. (2023) adopt knowledge sharing as the behavioral mechanism to predict innovation performance. However, their results are mixed and the explanatory power for individual innovative performance is low. Conversely, based on the perspective of social influence theory, the current study demonstrates that value congruence and felt obligation can jointly drive one's innovation intention, which in turn advances his/her innovation performance. Noticeably, the mediation test results reveal that value congruence and felt obligation fully mediate the relationships between two exchange relationship resources and innovation performance. In the IT service industry context, coworkers and supervisors can influence team members to form common goals and values, and also motivate one to engage in innovative behavior (Li et al., 2022). This result also advances Sykes' (2015) work by explaining the links between peers, management, and individual performance, as well as promotes a more theorized appreciation of the channels of the IT service context than those provided in the literature to this point.

Second, we extend research on the distal factors of employees' innovation performance by integrating social exchange theory. Specifically, the results show that team leaders who characterize EML and members who emphasize positive interaction among coworkers are likely to increase employees' willingness to execute activities that contribute to innovation. Prior research argues that high quality leader-member exchange and TMX can be viewed as relational sources to help strengthen members' performance (Liao et al., 2010; Windeler et al., 2017). However, neither of these studies considers the view of leadership, which can take the form of leader-member relationships, and also act as a resource for relationship exchange. Extending on prior studies to better understand an individual-level phenomenon, this paper demonstrates how individuals' varying quality of ties with team leaders and coworkers can influence their effectiveness as complementary resources that impact their performance in the workplace. That is, we suggest that a better comprehension of EML associated with meaning, competence, self-determination, and impact can be an accurate and theoretical antecedent that accounts for team members' behavioral intention and work performance.

Third, by investigating personal tendencies regarding work cognition and altruism (i.e., other-orientation), this study advances our understanding of the effect of behavioral intention on individual performance. Prior research has demonstrated that individual

performance can be moderated by several task and institutional dimension factors (Ozer and Vogel, 2015); however, these moderators are not necessarily likely to have the anticipated impacts. We suggest addressing this issue by further investigating personal factors. Our findings reveal that the effects of interest in others' well-being extend to individual work behavior. Our results confirm that employees' intention to engage in innovative behavior is positively related to their innovation performance as assessed by their direct supervisors; the relationship is particularly strong when employees are high on other-orientation. As other-orientation is known to focus information search and processing on group-level attributes, social cues, and consequences (Taylor et al., 2021), this study exemplifies high other-orientation, rather than high self-orientation, facilitates employees' innovative outcomes. That is, empirical verification of the specific link from innovation intention to employees' innovation performance, including alternative moderating effects on the relationship between intention and performance, is required. In comparison with prior works, our findings highlight the alternatives associated with predicting individual innovation performance; moreover, employees' characteristics can serve as an indirect impetus for their willingness to transform these effects into performance.

5.2 Practical Implications

Our results generate several insights of value to managers. First, EML is a strong driver of value congruence (informational influence) and felt obligation (normative influence) for team members in terms of facilitating their innovation performance. The work characteristics of the IT service industry involve mutual support and decision-making flexibility (Barro and Davenport, 2019). Empowering leaders cannot merely focus on each leader-member relationship: they need to facilitate their employees to develop the individual capacity to better manage service projects, and to play supportive roles to focus on each member's individual needs. Additionally, based on social factors such as shared affinities, interests, and values, leaders can establish core teams to further trigger emotional connotation, particularly for members who crave deeper connections to their supervisors or coworkers.

Second, in comparison with EML, our results suggest that TMX has a highly significant impact on value congruence, but a less desirable effect on felt obligation; that is, a high-quality relationship exchange may be extended to engineers to build up their own resource networks. Management efforts in areas such as building task teams to develop cooperation awareness, encouraging employees to participate in team activities

designed for knowledge and skills training to better understand each other's personalities and abilities, and providing engineers with the necessary resources to perform their jobs can help generate a high relationship quality work environment. Additionally, in order to help employees advance their social skills and develop reciprocal social relationships with leaders and coworkers, companies can hold training events regularly to provide platforms for interactions. Previous research finds that autonomous work environments where employees are more likely to take charge of work activities guidance and coordination can be beneficial to the development of high-quality TMX (Farmer et al., 2015). Accordingly, organizations can implement procedures to enhance job autonomy within teams, thereby improving the quality of intra-team processes and interactions.

Third, our findings also highlight that the relationship between innovation intention and performance is strengthened when employees demonstrate a higher degree of other-orientation. In terms of member recruitment, human resource departments can integrate other-orientation into aptitude testing for new recruits. After becoming formal staff, team leaders can continually encourage team members to pay more attention to affairs outside of the job via corporate social responsibility events that inspire them. Furthermore, leaders can create opportunities that support perspective taking. For example, managers may periodically reorganize teams to revitalize the quality or frequency of interactions among team members (Laker, Patel, Budhwar, and Malik, 2020), or facilitate interactions between team members and the clients or end users of their work to gather interesting and beneficial ideas (Grant and Berry, 2011).

5.3 Limitations and Suggestions for Further Research

Our study has some limitations. First, although we use objective appraisal data from team leaders, the innovation performance evaluations might be subject to single-informant bias. A reasonable argument can be made that when a team leader rates the work performance of team members, the ratings might be affected by employees' tenure in the firm, or other personal factors. Future research should seek multiple sources of data from both customers and team coworkers to avoid this problem. Second, because our study centers on engineers' innovation performance in the IT service industry, the conceptual model is based on variables at the individual level. Consequently, we may lack an overall perspective to explain individual innovation. For example, we did not investigate the levels of employees' innovative self-efficacy. Indeed, researchers have suggested that service employees likely use their self-perception of innovative self-efficacy to gauge

their performance, determine the level of effort to exert, and decide how long they will persist in the face of obstacles or challenges during the service creation and delivery processes (e.g., Tierney and Farmer, 2002). Gong et al. (2009) argue that employees' service innovation self-efficacy reflects their intrinsic motivation to engage in creative activities, which in turn influences their innovation performance. In addition, group and organizational level influences are also important for the innovation outcomes of individuals (Chen et al., 2013). We suggest that future research should examine team-level or contextual factors (e.g., team climate, team-efficacy, or team-level leadership), which may also affect individual innovation performance. Third, while this study offers valuable insights to deepen our understanding of engineers' innovative behavior, our focus remains on the relational resources within firms. It is important to acknowledge the existence of other relationship resources in the workplace, such as the role of customer relationships in innovation performance and the impact of varying degrees of customer participation. We also recognize that the impact of EML on TMX warrants deeper investigation. In response to the editor's recommendation and inspired by Cheong et al. (2019), we incorporated a new path into the original model (EML→TMX). After adding this path, we found that the structural model evaluation displayed a satisfactory fit with the observed data, and we identified a significant association between EML and TMX, suggesting that this area merits further exploration in future research. Finally, our Taiwanese research context may limit the generalizability of our findings: Farmer et al. (2003) argue that individuals' thoughts and behaviors diverge across different cultures, regions, and countries. It would be useful to understand the effects of proximal factors on individual innovation performance in different cultures. Thus, future researchers are encouraged to examine these linkages in different cultural contexts.

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Appendix Table A1 An Overview of Previous Research on Individual Innovative Behavior

Study	Theoretical Foundation	Independent Variables	Dependent Variables	Moderators	Data and Empirical Context
Scott and Bruce (1994)	-Psychological climate theory	Antecedents: -Leader-member exchange -Leader role expectations -Team-member exchange -Intuitive problem-solving style -Systematic problem-solving style Mediators: -Support for innovation -Resource supply	-Innovative behavior	None	172 respondents including engineers, scientists, and technicians employed in a large, centralized R&D facility of an industrial corporation.
Farmer, Tierney, and Kung-McIntyre, (2003)	-Role identity theory	Antecedents: -Perceived coworker role expectations for creativity -Self-views of past creative behavior -Exposure to the stronger U.S. creativity culture Mediator: -Creative role identity	-Employee creativity	-Perceived organizational valuing of creativity	166 employees from 11 Taiwanese companies complete the questionnaire and their supervisors rate employee creativity.
Gong, Huang, and Fairh (2009)	-Transformational leadership theory -Social cognitive theory	Antecedents: -Learning orientation -Transformational leadership Mediator: -Self-efficacy	-Employee creativity -Job performance	None	Longitudinal, multisource data from 200 employees and 111 immediate supervisors in the financial industry.
Liao, Liu, and Loi (2010)	-Social cognitive theory	Antecedents: -Leader-member exchange -Team-member exchange Mediator: -Self-efficacy	-Team member's creativity	-Team's LMX differentiation -Team's TMX differentiation	Longitudinal, multisource data from 828 employees in the manufacturing industry.
Zhang and Bartol (2010)	-Empowering leadership theory -Motivation theory	Antecedent: -Empowering leadership Mediators: -Psychological empowerment -Creative Process Engagement -Intrinsic Motivation	-Employee creativity	-Empowerment role identity -Leader encouragement of creativity	367 usable responses from both direct supervisors and employees, from an IT company headquartered in China.
Yuan and Woodman (2010)	-The expectancy theory of motivation -Leader-member exchange (LMX) theory -Self-affirmation theory	Antecedents: -Perceived organization support for innovation -Supervisor relationship quality -Innovativeness as a job requirement -Reputation as innovative -Dissatisfaction with the status quo Mediators: -Expected image risks -Expected image gains -Expected positive performance outcomes	-Individual innovative behavior	None	425 full-time employees and their 96 direct supervisors, from four different industries (IT service, computer system development, furniture design/manufacturing, chemical instrument development/manufacturing).

Study	Theoretical Foundation	Independent Variables	Dependent Variables	Moderators	Data and Empirical Context
Schepers, Jong, Ruyter, and Weitzels (2011)	-Social cognitive theory	Antecedents: -Supervisor encouragement -Peer encouragement -Competitors' use -Customer appreciation Mediator: -Perceived virtual team efficacy	-In-role service performance -Extra-role innovative service performance	-Task process interdependence	192 respondents representing 28 teams from an international, high-tech company.
Chen, Faif, Campbell-Bush, Wu, and Wu (2013)	-Motivation theory	Antecedents: -Transformational leadership -Proactive personality Mediators: -Support for innovation climate -Role-breadth self-efficacy -Intrinsic motivation	-Individual innovative performance	None	Multisource data from 428 team members of 95 research and development (R&D) project teams from 37 firms from several industries.
Zhang and Zhou (2014)	-Empowering leadership theory -Social cognitive theory	Antecedent: -Empowering leadership Mediator: -Creative self-efficacy	-Employee creativity	-Trust -Uncertainty avoidance	Time-lagged and multi-source data from 322 employees and their supervisors in the manufacturing industry.
Newman, Herman, Schwarz, and Nielsen (2018)	-Social cognitive theory	-Creative self-efficacy	-Innovative behavior	-Entrepreneurial leadership	Through multi-level data from multiple sources, namely, 66 middle-level managers and their 346 subordinates from the transportation manufacturing sector of a Chinese state-owned enterprise.
Kim, Cheong, Srivastava, Yoo, and Yun (2021)	-Interactionist theory	-Supervisor knowledge sharing -Coworker knowledge sharing	-Employees' creative behavior.	-Promotion focus -Prevention focus	217 full-time employees and their direct supervisors in various industries.
Lin, Lu, Ozer, and Tang (2023)	-Motivation theory	Antecedents: -Approach motivation orientation -Avoidance motivation orientation Mediators: -Explicit knowledge sharing (KS) -Implicit knowledge sharing	-Innovative performance	-Perceived organizational support -Psychological knowledge sharing	331 employees and their supervisors in two firms in China
The current study	-Social influence theory -Social exchange theory	Antecedents: -Empowering leadership -Team-member exchange Mediators: -Value congruence -Felt obligation	-Innovation performance	-Other orientation	The three-phase surveys produced 282 individually matched pairs of engineer-leader dyads in three IT service companies.

Appendix Table A2 χ^2 Statistics Regarding Discriminant Validity of Factor Pairs

Variables	1	2	3	4	5	6
1. <i>Innovation Performance</i>						
2. <i>Innovation Intention</i>	$\chi^2_d(1) = 354.95$					
3. <i>Value Congruence</i>	$\chi^2_d(1) = 387.15$	$\chi^2_d(1) = 359.86$				
4. <i>Felt Obligation</i>	$\chi^2_d(1) = 382.41$	$\chi^2_d(1) = 343.96$	$\chi^2_d(1) = 345.18$			
5. <i>EML</i>	$\chi^2_d(1) = 361.23$	$\chi^2_d(1) = 342.30$	$\chi^2_d(1) = 350.00$	$\chi^2_d(1) = 332.60$		
6. <i>TMX</i>	$\chi^2_d(1) = 414.58$	$\chi^2_d(1) = 389.64$	$\chi^2_d(1) = 343.10$	$\chi^2_d(1) = 350.04$	$\chi^2_d(1) = 339.28$	

Note: The difference in the chi-square values of the two models (i.e., the baseline and the constrained model), with one degree of freedom.

Author Biography

Jun-Yu Zhong

Jun-Yu Zhong is a Post-doctoral Researcher at the Department of Business Administration of National Chengchi University. He received his Ph.D. degree from National Taipei University. His research interests include human-computer interactions, online word-of-mouth, and service innovation. His research has been published in *European Journal of Marketing*, *Service Industries Journal*, *Management Review*, *Journal of Technology Management*, *Journal of Information Management*, *Journal of Management & Systems*, and been presented at several international conferences.

Yu-Cheng Hsieh

Yu-Cheng Hsieh is a Ph.D. Candidate at the Department of Business Administration of National Taipei University. Her research interests include e-commerce, consumer behavior, and employee innovation performance. Her research has been presented at several international conferences.

Peiyu Pai

Peiyu Pai is an Associate Professor at the Department of Business Administration of National Chengchi University. She received her Ph.D. degree from Warwick Business School, the University of Warwick. Prior to her Ph.D. study, she worked for an academic publisher in Taiwan as the marketing manager. Her research interests include online community cultivation, socialization process in virtual settings, customer relationship management, and service marketing. She has publications in *Journal of the Association for Information Systems*, *Decision Support Systems*, *Information & Management*, *International Journal of Human-Computer Studies*, *European Journal of Marketing*, *Service Industries Journal*, and presentations at several international conferences.

*Ting-Ling Lin

Ting-Ling Lin is a Professor at the Department of Business Administration of National Taipei University. She received her Ph.D. degree from National Taiwan University. Her

*E-mail: tingling@mail.ntpu.edu.tw

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research areas include Small and Medium Enterprises (SMEs) marketing, competence based growth strategy. Her research papers have been published at *Industrial Marketing Management*, *Entrepreneurship and Regional Development*, *Journal of Brand Management*, *Journal of Management*, *Sun Yat-Sen Management Review*, *NTU Management Review*, *Management Review*, *Industry and Management Forum*, and been presented at several international conferences.