**Cognitive diversity and team viability: The mediating role of transactive memory and moderating of technology integration.**

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Cognitive diversity and team viability: The mediating role of transactive memory and moderating of technology integration.

# Abstract

**Purpose –**This study advances research on cognitive diversity from the perspective of public employees by studying the effect of cognitive diversity on team viability, the mediating effect of transactive memory systems (TMS), and the moderating effect of technology integration.

**Design/methodology/approach –** We used SmartPLS to analyze a unique data set from 193 public employees. The information was collected through an online questionnaire administered by the LimeSurvey Professional platform. In addition to analyzing the data through partial least squares structural equation modeling with higher-order latent variables, we analyzed mediating and moderating effects.

**Findings –**The results show that TMS act as partial mediators between cognitive diversity and team viability. Although technology integration (for both external diffusion and internal integration) moderates this relationship to mitigate negative effects, technological infrastructure does not.

**Originality/value –**This study expands previous research on TMS and technology integration. Our findings support the significance of TMS and technology integration in a context of cognitive diversity, identify ways to develop good management behavior, and assess the results of these practices for team viability. We recommend that public managers in contexts of cognitive diversity work to create effective workplace environments. Training programs can foster TMS capabilities and support implementation of technology integration to improve team viability and results for public service delivery to citizens.

**Keywords:** technology integration, transactive memory system; cognitive diversity, team viability, public administration, management

**Introduction**

Our current environment is one of human mobility. Statistics confirm that 110 million people per year move from one country to another (Organization for Economic Cooperation and Development, 2024). Similarly, the World Economic Forum notes that we live in a complex, interconnected world, where diversity fostered by globalization and technological advance shapes the environment of today’s organizations. In this scenario, organizations must ask themselves how to respond to and manage our multicultural reality when delivering service. Reports like those by McKinsey, the World Economic Forum, and the OECD—to name a few—confirm that a diverse workforce can be a key factor for innovation and productivity, as well as an essential element for organizations’ success. For example, the most recent study by the Boston Consulting Group indicates that organizations with diverse teams obtain 19% more income due to greater productivity, innovation, creativity, and variety of employee perspectives.

Today’s landscape is thus characterized by great diversity among workers (An and Lee, 2022; Cingolani and Salazar-Morales, 2024; Ding and Riccucci, 2023), requiring much more competence levels of management from the public administration (Cabeza-Pullés *et al.*, 2020; Ding and Riccucci, 2023; Roberge and Alokha, 2022). Given these demands for diversity—specifically cognitive diversity—there is now a greater need to develop capabilities to enable sharing, application, and creation of more viable public service (Cingolani and Salazar-Morales, 2024; Ding and Riccucci, 2023; Kim *et al.*, 2021) to enable public administrations to modernize services (Edelmann and Mergel, 2021). Further, public administrations must set an example and help private organizations—through guides, practices, and policies—to develop a good strategy to manage the diversity that enables them to increase competitiveness.

Cognitive diversity is defined as the difference in the beliefs, ways of thinking, values, knowledge, assumptions, and preferences of an organization’s employees (Miller *et al.*, 1998; Schilpzand and Martins, 2010). To date, scholarly studies of cognitive diversity have been performed primarily in private entities (Qi *et al.*, 2022). Surprisingly, public administration has received less study, even though the public sector is highly diverse and has begun to modernize its human resources (Valle *et al.*, 2001).

Given the needs described above, interest in workforce diversity has increased significantly in public administration (Cingolani and Salazar-Morales, 2024). The great diversity of employees in public administrations today has also contributed to increasing interest in understanding the effects of this diversity (Mousa and Puhakka, 2019), especially in service delivery. It is thus important to determine how modern public administration operates, its basic routines and foundations (Cingolani and Salazar-Morales, 2024; Lapuente and Suzuki, 2020), and the new managerial practices it adopts (Ortega-Egea *et al.*, 2024) to manage this diversity.

Current research on public administration reflects the urgent importance of fostering an inclusive organizational culture that values and respects differences among employees (An and Lee, 2022).Today the public sector faces the challenge of ensuring that its workforce reflects the variety present in the demographic it serves (An and Lee, 2022) and that the design and scope of the public services public employees offer connect with the cognitive diversity and needs of the various citizens (Cingolani and Salazar-Morales, 2024) to whom it delivers its services. Current researchers thus increasingly recognize the importance of diverse cognitive perspectives and the need to take advantage of them (Ashikali *et al.*, 2021).

Despite the foregoing, employee diversity has produced mixed results in public administrations’ performance (Ding and Riccucci, 2023; Qi *et al.*, 2022). Some studies report positive results (Choi *et al.*, 2018; Ding and Riccucci, 2023; Nicholson-Crotty and Li, 2024; Riccucci, 2021), while others argue that diversity among public employees may compromise public administration outcomes (Owens and Kukla-Acevedo, 2012), especially in groups (Moon, 2018; Ritz and Alfes, 2018). The literature to date has not yet shown which of these two effects prevails, and more studies are needed to deepen and advance knowledge in this field (Qi *et al.*, 2022)in the context of public administration. It is thus useful to explore about managerial practices that facilitate new public service designs and incorporation of more diverse preferences (Edelmann and Mergel, 2021), based on the actual diversity of their employees (Cingolani and Salazar-Morales, 2024).

To achieve these goals, public administration is building inclusive environments that promote diversity in their teams and generate stronger, more resilient and transformative administrations (Roberge and Alokha, 2022). The literature argues that public administration is very closed professionally and bureaucratically (Cingolani and Salazar-Morales, 2024), a situation that could jeopardize the cognitive diversity and viability of public work teams. Yet cognitive diversity through variety of perspectives can increase the variety of solutions. Diverse ways of thinking can lead employees to reflect more, and more rigorously, increasing the probability that team members will find more creative, innovative, productive solutions. Little is known about the impacts of diversity on the workforce in the public sector (Cingolani and Salazar-Morales, 2024) and, more specifically, on team viability (Ding and Riccucci, 2023). The reality is, however, that today’s public administrations are more diverse and are constantly searching for organizational mechanisms to enable them to improve team viability despite this diversity. Our study thus focuses on analyzing this relationship of diversity to team viability.

Grounding our investigation in social identity theory (Tajfel and Turner, 1986), we seek to show how the presence of cognitive diversity, may lead to difficulties in relationships among employees, as well as in employees’ coordination and team viability (Chen *et al.*, 2019; Qi *et al.*, 2022). Based on this theory, public employees compare their skills, knowledge, and abilities amongst themselves, potentially creating differences that may positively or negatively affect team viability and thus their delivery of quality service.

To further this inquiry into how to manage diversity properly in the public administration, we have chosen to analyze TMS and technology integration. We first analyze TMS as mediators, because prior studies have shown that TMS strongly influence variables such as team viability and integration of knowledge at work (Liu and Zang, 2010). Because TMS operate as a mechanism to increase likelihood that public workers grant more credibility to their coworkers’ work, trust coworkers more, cooperate with each other more, and develop specialization in areas of knowledge (Cabeza-Pullés *et al.*, 2020; Xiao *et al.*, 2022), TMS may be a tool to mediate the effects (positive or negative) of cognitive diversity on team viability. We find previous studies that foster development of TMS in public employees (Cabeza-Pullés *et al.*, 2020) and the military (Sáiz-Pardo *et al.*, 2021), among others (Liu and Zang, 2010). Ultimately, TMS will enable long-term public employees to build shared cognitive knowledge to improve their daily work interactions (Zhang *et al.*, 2024), potentially influencing their daily work to mediate the effects of cognitive diversity on team viability. Such results could occur because TMS emerge when employees who are closely related share knowledge in a specific area collaboratively and trust each other’s knowledge (Wegner, 1987; Xiao *et al.*, 2022; Zhang *et al.*, 2024). Achieving goals in the public administration thus depends on public employees’ ability to coordinate with each other, achieve cohesion, and trust their colleagues, as these abilities influence team viability.

Second, we have chosen technology integration as moderator because current work models in the modern public administration need technology integration to stay up to date on technological advances that positively impact public work teams’ performance and resilience (Roberge and Alokha, 2022). Technology integration in the public administration is seen as a new way to create public (Panagiotopoulos *et al.*, 2019), because such integration improves bureaucratic professionalism (Cingolani and Salazar-Morales, 2024). The moderating effect proposed analyzes three dimensions of technology integration: external diffusion, or use of technology to interact with the environment; internal integration, or technology use for the public administration’s internal processes; and infrastructure, or the public administration’s technical resources that enable it to implement information technologies successfully (Gao *et al.*, 2020). If developed optimally, these dimensions can enable public employees to access integrated information. Use and exploitation of technology integration can thus enable public administration to mitigate the possible negative effects of cognitive diversity and help it improve public employees’ speed, availability, coordination, and cooperation (Moon, 2018). Technology integration provides new opportunities (Lee *et al.*, 2021) in new public administration scenarios because it has generated smart management tools for work teams. Technology integration in public administration enables implementation of a more current management model to improve public service quality. Based on the arguments outlined above, we define out study´s goals as follows. The first objective is to analyze the positive or negative influence of cognitive diversity on team viability from the perspective of public employees. Our second objective is to analyze the mediating effect of TMS on the relationship between cognitive diversity and team viability. Our third objective is to analyze the moderating effect of technology integration. Achieving these objectives will enable us to identify the positive or negative effects of diversity and the practices organizations should develop in diverse environments to improve team viability, and in turn service quality, in public administration. It is crucial that public initiatives achieve their expected results to improve work team viability, which translates into improvement of public service quality.

By examining these relationships, our study deepens knowledge of the complex effects found in previous studies that analyze the influence of cognitive diversity on team viability in public administration. The effects are complex because public administrations use flexible bureaucratic procedures to manage information and plan collaboratively (Aggarwal and Woolleyb, 2019). Further, confusion in prior studies as to how and when cognitive diversity produces higher or lower team viability (Qi *et al.*, 2022) has led us to examine the influence of moderating and mediating variables. Motivated by this path of analysis, our study seeks to fill this knowledge gap by analyzing the role of TMS and technology integration in public administration. We aim to determine how these factors affect public employees’ results in terms of team viability in cognitively diverse environments.

To achieve these goals, the article is structured as follows. First, we present the literature review, from which we develop the theoretical model summarizing the study hypotheses. Second, we describe the methodology. Third, we present and discuss the results. Finally, we present the study’s conclusions, implications, and limitations, as well as future lines of research.

**Theoretical background**

## Social categorization theory or social identity theory

Research on diversity in the field of public administration has not been driven by any theory (Ding and Riccucci, 2023). In the private sector, in contrast, analyses of diversity have applied social categorization theory or social identity theory (Tajfel, 1982; Tajfel and Turner, 1986), which studies how individuals are separated into groups by race, ethnicity, gender, and other characteristics. Optimal distinctiveness theory, on the other hand, examines individuals’ needs to be similar to or different from others. Although there is no unified theory of diversity and inclusion (Ding and Riccucci, 2023), our study draws on social identity theory to analyze the effects of cognitive diversity on team viability in public administration. Applying this theory shows that public employees compare their skills and abilities to those of others, potentially becoming aware of differences that affect team viability. Social identity theory focuses on the relationships that occur when employees work together and the ways that belonging to a specific group can influence the team’s behavior or even the employee’s self-concept (Burke and Stets, 2009)

## Team viability

Team viability is defined as a team’s capability to adapt to internal and external changes, as well as difficulties that arise and affect the group’s work (Aubé and Rousseau, 2005; Hackman, 1987). Viability may wane due to continuity of the team’s members (Aubé and Rousseau, 2005), but also to other variables, such as cohesion, quality of communication among employees (Cabeza-Pullés *et al.*, 2020), and time they have been working together (Sackett and Fitzsimons, 2021). The longer a public administration’s employees spend working together, the greater the closeness that develops among them (Cabeza-Pullés *et al.*, 2020; Sackett and Fitzsimons, 2021). All these antecedents facilitate rapid coordination and integration of public employees’ efforts, generating good task execution (Cabeza-Pullés *et al.*, 2020) and team viability (Sackett and Fitzsimons, 2021). High levels of team viability guarantee the public administration’s future success (Hackman, 1987). In the long term, organizations that lack team viability experience burnout, unresolved conflicts, and greater division, and are less willing to work on cooperation (Hackman, 1987). Team viability is thus an important variable for modern organizations and public administrations (Cooperstein, 2017).

Given the dynamic nature of public administrations, we must find tools to achieve team viability and prevent burnout. Our study thus aims to analyze the influence of TMS as a tool for achieving team viability.

## Cognitive Diversity

Diversity is the way an organization shares a set of common attitudes, values, and norms. These differences are important concerns for today’s managers, as they can impact public employees’ performance and public administration’s results (Kim *et al.*, 2021; Qi *et al.*, 2022). Cognitive diversity, more specifically, is a double-edged sword that has received little study (Kim *et al.*, 2021; Qi *et al.*, 2022) but has generated diverse perspectives and cognitive resources (Martins *et al.*, 2013). Prior studies indicate that public employees’ cognitive diversity can contribute to heterogeneity, as well as to significant difficulties in communication and coordination (Qi *et al.*, 2022). We thus need to explore in greater depth how and when cognitive diversity influences public administration positively or negatively (Kim *et al.*, 2021) and what variables help to mitigate its negative effects or strengthen its positive ones (Qi *et al.*, 2022).

The trend in the literature that finds positive effects of cognitive diversity stems from the idea that different cognitions stimulate public employees’ need to gather information, knowledge, and ideas to perform their tasks better and achieve integration to improve results (Qi *et al.*, 2022). Researchers in the field of diversity argue that people are attracted to others who are similar to them, since such individuals strengthen their values and preferences (Qi and Armstrong, 2019). Similarity in cognitive style strengthens interpersonal relations because employees analyze problems in very similar ways and have similar ways of thinking about and acting on their environment (Qi and Armstrong, 2019). Finally, cognitive diversity influences public employees’ behavior (Kanchanabha and Badir, 2021) because cognitive congruence is associated with higher-quality work relationships (Mitchell *et al.*, 2019).

Cognitive diversity can also produce negative effects, however, such as problems of integration and participation (Narayan *et al.*, 2021). If such problems are not handled properly, they can generate less-positive attitudes in public employees. Such attitudes translate into relationship conflicts (Qi and Armstrong, 2019) due to differences in the ways public employees relate to each other (Kim *et al.*, 2021; Qi and Armstrong, 2019). Cognitive incongruence also gives rise to conflicts (Buffinton *et al.*, 2002) that threaten results and team viability (Mello and Delise, 2015) in public administration.

## Transactive memory systems

Transactive memory systems (TMS) are defined as the cooperative division of work that occurs among unit members in the different tasks they perform (Lewis, 2003; Wegner, 1987). TMS are a well-established way of explaining how public employees divide coding, storage, retrieval, and communication in different knowledge domains (Lewis, 2003). Lewis (2003) proposes three dimensions of TMS: specialization, credibility, and coordination. Specialization is the differentiation of public personnel’s knowledge in organizations (Cabeza-Pullés *et al.*, 2018; Sáiz-Pardo *et al.*, 2021; Yan *et al.*, 2021). It involves the members of a department or service in public administration developing specialized activities that adapt to each other (He and Hu, 2021), with each member specializing in a function or task. Credibility, in contrast, occurs when the members of the department or service in public administration trust each other’s knowledge (Yan *et al.*, 2021). Finally, coordination indicates public employees’ creation of awareness of who knows what, and how and when to access this knowledge in a coordinated way (He and Hu, 2021). That is, public employees coordinate properly so that their work is efficient, effective, and fluid (Yan *et al.*, 2021).

Prior studies of TMS have associated it with better employee performance, product quality and punctuality, creativity (Gino *et al.*, 2010), innovation (Cabeza-Pullés *et al.*, 2018), and success of new products (Akgun *et al.*, 2006). TMS can also optimize an organization’s general performance through more efficient management (Heavey and Simsek, 2017). To date, however, little research has studied the impact of TMS on public administration (Cabeza-Pullés *et al.*, 2018; Sáiz-Pardo *et al.*, 2021), especially on its relation to diversity.

## Technology integration

In public administration, technology integration has become a necessary condition for improving public service (Panagiotopoulos *et al.*, 2019). The literature on diffusion of innovation (Rogers, 1995) argues that the process of implementing technologies in public administration involves innovation in organizations, as such implementation must spread the use of new methods, processes, or systems for delivering services. Further, prior research on technology diffusion recommends differentiating between internal integration and external diffusion, which encompass range from internal organizational activities to interorganizational processes that extend beyond firm boundaries (Cooper and Zmud, 1990; Fichman and Kemerer, 1997; Ramamurthy *et al.*, 1999; Ranganathan *et al.*, 2004). Our study defines internal integration operationally as the extent to which technology is integrated with key internal organizational activities and applications. External diffusion, in turn, is the extent to which public administration integrates its transactions with citizens and other departments. Successful integration of technologies into public administration also requires infrastructure (Fiedler *et al.*, 1996; Zhu and Kraemer, 2005). Zhu et al. (2003) argued that technologies are quite unlikely to become an integral part of the organization if the organization lacks the necessary technological infrastructure. Our study thus includes the dimensions of internal integration, external diffusion, and infrastructure, understood as technologies that provide a foundation for delivering service to citizens.

## Hypothesis development

*Cognitive diversity and team viability*

The existing literature identifies two paths for understanding and managing cognitive diversity. One path proposes that cognitive diversity affects employees positively, based on the theoretical perspective of cognitive improvement, which can improve team viability. The other path proposes that cognitive diversity affects team viability negatively, based on the theoretical perspective that it weakens relationships, due fundamentally to conflicts, which can jeopardize team viability.

For this reason, the direct effects of cognitive diversity are currently a critical research topic (Kim et al., 2021). Little research has been performed, however, to test the double-edged sword quality (positive and negative effects) of cognitive diversity (Chen et al., 2019; Kim et al., 2021). Although either of these effects may prevail or be counteracted, it is still not clear which predominates (Chen et al., 2019).

Prior studies report that cognitive diversity can generate innovative ideas and increase creativity, improve learning among diverse employees, stimulate motivation at work, and play a positive role in team survival (Choi et al., 2018; Ding and Riccucci, 2023; Mathuki and Zhang, 2022; Nicholson-Crotty and Li, 2024; Riccucci, 2021). Such results encourage team viability, because the presence of diverse cognitive perspectives promotes generation of novel ideas (Hoever et al., 2012) and improves the knowledge exchange process (Qi and Armstrong, 2019). Further, cognitive diversity stimulates motivation to participate in different tasks (Qi and Armstrong, 2019) and entertain multiple perspectives (Mathuki and Zhang, 2022), thus also encouraging team viability. Thus, working in a climate that accepts diversity fosters information exchange in public administration (Enwereuzor, 2021), creativity (Cao and Zhang, 2020), acceptance of diverse approaches to knowledge, skills, and ideas for work tasks. Such employees are thus more likely to accept diverse approaches to knowledge, skills, and ideas for work and to improve team viability (Carron et al., 2002).

Cognitive diversity also has negative effects that can affect team viability. For example, cognitive diversity change workplace relationships between employees, creating task and relationship conflicts (Moon, 2018; Owens and Kukla-Acevedo, 2012; Ritz and Alfes, 2018). Public employees must struggle with others’ differing opinions and face daily challenges involving cognitive diversity (Lauring et al., 2022; Torchia et al., 2015). Such a varied situation is likely to damage team viability, as the members do not agree with each other, generating hostility that weakens employees’ day-to-day cooperation (Lauring et al., 2022). In sum, tensions and confrontations due to cognitive diversity damage the relationships and skills (Lee et al., 2019) needed to achieve team viability. Diverse opinions and disagreements—which are negatively related to effective group decisions (Olson et al., 2007) decrease creativity (Jiang and Zhang, 2014), generate intergroup bias (Kanchanabha and Badir, 2021; Narayan et al., 2021), affecting team viability.

Because cognitive incongruence can cause conflicts (Buffinton et al., 2002), the negative influences of cognitive diversity on conflict and cohesion threaten team viability (Mello and Delise, 2015). Cognitive diversity can thus obstruct work relationships (Qi and Armstrong, 2019). Having different perspectives can reduce the strength of attraction that keeps employees united (Harrison et al., 1998), leading to low levels of cohesion (Harrison et al., 1998) and thus affecting team viability. Cognitive diversity in public employees can also make them dislike working together and reduce their ability to achieve joint goals, further decreasing team viability. It is thus reasonable to expect a negative impact of cognitive diversity on team viability in public administration.

Based on the foregoing arguments, our study develops two paths to study the double-edged effect of cognitive diversity on team viability. We therefore postulate the following hypothesis:

*H0: Cognitive diversity is directly and negatively or positively related to team viability in public administration.*

## Cognitive diversity and TMS

TMS are the knowledge exchange that occurs among individuals who work together, share the responsibility to code, store, and retrieve information from different areas, and share awareness of each member’s knowledge (Wegner, 1987). TMS arise from a process of compiling each person’s different experience by combining and complementing these experiences like pieces of a puzzle to form a whole (Rong and Xie, 2021; Xiao et al., 2022).

The positive version of cognitive diversity can thus encourage TMS. The literature affirms that individuals with diverse knowledge and skills benefit from TMS formation (Gino et al., 2010). Successful TMS must include trust in others’ knowledge and identification of each employee’s different knowledge (Lewis, 2003; Sáiz-Pardo et al., 2021; Xiao et al., 2022) despite their cognitive diversity. Because cognitive diversity has a direct influence on employees’ motivational and behavioral reactions (Harrison et al., 2002; Kanchanabha and Badir, 2021), it plays an important role in the way employees and public services function (Ashikali and Groeneveld, 2015).

Paradoxically, however, units composed of diverse employees are less likely to develop TMS than are homogeneous units, because diversity leads to higher levels of discord and causes conflicts (Showkat and Misra, 2022; Cronin and Weingart, 2007; Pelled et al., 1999). Such research predicts that differences generate tensions, disagreements, and hostilities that can interrupt the team’s learning and collaboration processes, inhibiting formation of TMS (Cronin and Weingart, 2007; Pelled et al., 1999). Diverse cognitive perspectives can thus cause problems among public administration employees (Kim et al., 2021) and weaken the processes by which TMS form. Exposing employees to diverse ways of thinking, knowledge, and skills can also affect motivation and behavior (Kim et al., 2021), either positively or negatively affecting TMS.

Public employees must contend with the different opinions of others and face daily challenges due to cognitive diversity. If the negative effects of cognitive diversity outpower its positive effects, conflicts could damage the shared system for storing and retrieving information, as hostility, tension, and disagreement will divide the members (De Wit et al., 2012) in public administration. In sum, tensions and conflicts due to cognitive diversity in relationships and skills can change the processes of TMS, preventing each member of the administration from connecting to the others’ knowledge. These problems could make more cognitively diverse public employees less able to achieve positive effects in TMS processes, as these processes involve each member committing to the area of work in which they specialize and contributing their knowledge to the service as a whole (Sáiz-Pardo et al., 2021). It is impossible to foster cohesiveness, coordination, and credibility among the other members (He and Hu, 2021) of public service unless the positive effects of cognitive diversity prevail over the negative effects. Based on this understanding of cognitive diversity as a double-edged sword, we hypothesize that:

*H1:* *Cognitive diversity is directly and negatively or positively related to the transactive memory system in public administration.*

## TMS and team viability

Prior literature supports the positive effect of TMS on task performance (He and Hu, 2021; Nawata et al., 2020; Cabeza-Pullés et al., 2018; Khan et al., 2020). Organizations that develop TMS have a larger set of knowledge and skills than those that do not (Nawata et al., 2020), and organizations with powerful TMS help their members to access and exploit each person’s key knowledge (Cabeza-Pullés et al., 2018). Public administrations that develop TMS can thus reduce time lost searching for information and increase team viability (Khan et al., 2020).

The credibility, specialization, and coordination that occur in TMS can improve public workers’ behavior (Rong and Xie, 2021), increasing the speed with which they perform tasks and improving behavior and team viability (Sáiz-Pardo et al., 2021). We thus expect TMS to lead to team viability, which may in turn lead to development of successful actions in public administration.

TMS enable public employees to feel that they can trust others, relate better to them, and help each other more when they run into difficulties. Such employees are likely to have a stronger positive feeling at work and implicitly coordinate their individual efforts better (Nawata et al., 2020). TMS can also improve motivational state and is a decisive factor in employees’ positive perception (Rong and Xie, 2021) and thus in improving team viability. Developing TMS can help members of the public administration greatly to coordinate with each other, better exploit their colleagues’ specialization, and learn to trust each other’s knowledge. These effects further help them to be more cohesive, achieving team viability. We therefore propose that:

*H2: The transactive memory system is directly and positively related to team viability in public administration.*

## The mediating role of TMS

Few studies have analyzed TMS in mediation relationships, and even fewer have studied the public sector (Cabeza-Pullés et al., 2018; Sáiz-Pardo et al., 2021). The previous studies identified in our literature review foster development of TMS among employees in the public university (Cabeza-Pullés et al., 2020) and the military (Sáiz-Pardo et al., 2021), among other contexts (Liu and Zang, 2010). The main studies are of the private sector (Nawata et al., 2020).

We propose that TMS are good mediators of the relationship of cognitive diversity to team viability because they help to mediate the positive or negative effects of cognitive diversity on team viability. Positive cognitive diversity encourages TMS. Employees who work together and have different knowledge and skills coordinate well, trust their colleagues’ knowledge, and benefit from TMS formation (Gino et al., 2010; Xiao et al., 2022). If we analyze cognitive diversity as negative, however, we argue that diverse employees are less likely to develop TMS, potentially generating conflicts (Showkat and Misra, 2022). As the presence of TMS in the relationship between these variables could either decrease these negative effects or increase the positive effects, we predict that cognitive diversity in public employees will be more effective when they achieve TMS to mediate the relationship to team viability, thereby neutralizing its effect as a double-edged sword.

To understand this mediating process, we propose analyzing the contribution of each dimension composing TMS (specialization, credibility, and coordination) to the mediation process. More specifically, development of TMS first intervenes in the process through development of employees’ specialization. Employees adapt among themselves and recognize how to access each employee’s specialized knowledge (Khan et al., 2020), making TMS mediate between cognitive diversity and team viability. Second, credibility in TMS explains the conditions under which an organization’s members trust and believe in each other’s knowledge (Aggarwal and Woolleyb, 2019). Credibility encourages employees to support each other in skills and knowledge. The greater the trust in others’ skills and knowledge, the greater the possibility of delegating and integrating within the group (Cabeza-Pullés et al., 2018)—actions that should mediate between cognitive diversity and team viability.

Finally, coordination ensures that members’ work processes are in harmony. Only so can members integrate their different skills, experience, and knowledge (Rong and Xie, 2021). As such action translates into efficient, effective, fluid coordination, we conclude that TMS can mediate the relationship between cognitive diversity and team viability.

We thus suggest that TMS create distributed memory, in which each public employee takes responsibility for an area of knowledge. Such distribution strengthens and generates coherence to integrate other employees and decrease the problem of having to know and work on everything (Cabeza-Pullés et al., 2018; Sáiz-Pardo et al., 2021). Well-developed TMS substantially improve work despite cognitively diverse employees. Further, TMS help public administration employees to understand who knows what, obtain what they need, and make their work effective. TMS organize public employees’ diverse cognitive thinking, enhancing the relationship between cognitive diversity and team viability (whether this direct relationship is negative or positive). As the mediation of TMS in this relationship is important because TMS can make better use of members’ cognitive diversity, we argue that this mediating effect increases public administration employees’ capability to learn and transfer relevant information that enables them to develop TMS, affecting the relationship of cognitive diversity to team viability.

We therefore pose the following hypothesis:

*H3: The transactive memory system mediates the relationship (positive or negative) between cognitive diversity and team viability in public administration.*

## The moderating role of technology integration in TMS

Technology integration is currently booming in public organizations. It helps organizations to expand their limits and generate more data as they perform the organization’s activities (Mazzucchelli *et al.*, 2021). It also enables the capture of information not previously available (Jean *et al.*, 2021) and improves public organizations’ abilities to connect activities, both inside and outside the organization (Zou and Zhao, 2022). For this reason, technology integration, analyzed in three dimensions, could have a perfect moderating effect in the context of public administration, as it spans the internal and external technologies needed for public service operations (Zou and Zhao, 2022). Public administrations can only conduct online transactions if they provide the necessary technologies and preexisting conditions needed to train their employees and identify internal and inter-institutional processes (Liu and Yuan, 2015).

The moderating effect we propose for technology integration in public service is composed of three dimensions: external diffusion, internal integration, and infrastructures. First, external diffusion is the degree to which the organization integrates citizens when using technologies to perform transactions that exchange operating data (Lin and Lin, 2008; Pu *et al.*, 2019; Ranganathan *et al.*, 2004). It is the organizational effort that enables dissemination of the right technology integration in the community (Lin and Lin, 2008) and includes all interorganizational processes beyond the established limits of the organization (Ranganathan *et al.*, 2004; Zou and Zhao, 2022).

External diffusion can create a broad knowledge base, enabling the organization to gather signals from the environment and adapt to changes (Pu *et al.*, 2019). Such a base improves the relationship between cognitive diversity (positive or negative) and formation of TMS. Despite the presence and effects of cognitive diversity, this moderating effect can keep all interested parties connected with each other and thus also encourage TMS formation. We attribute this moderating effect to better organization of the information—that is, to the influence of external diffusion.

Second, internal integration is the extent to which technologies integrate different activities (Lin and Lin, 2008; Pu *et al.*, 2019). Its moderating effect helps to foster intrarorganizational relationships (Ranganathan *et al.*, 2004), despite the presence of cognitively diverse employees, thus encouraging TMS. The goal of internal integration is to give the organization the capability to coordinate and synchronize its technology-based internal processes (Bala and Venkatesh, 2007), enabling standardization of information exchange. Internal integration thus helps reduce time and effort and enables improvement of internal processes, preventing distortion of information (Venkatesh and Bala, 2012).

Internal integration optimizes response capability and enables information exchange during performance of internal activities, positively affecting TMS formation in the public administration (Cabeza-Pullés *et al.*, 2018; Jean *et al.*, 2021) regardless of employees’ cognitive diversity. Finally, infrastructure is the set of technical resources shared and available in an organization (Byrd and Turner, 2000). In public administration, infrastructure provides a base for implementing and developing applications that improve the organization’s capability to respond to new and emerging opportunities and to neutralize possible threats (Ray *et al.*, 2005), both internal and external. Infrastructure is thus essential to successful implementation of information technologies (Fiedler *et al.*, 1996). Its fundamental purpose is to provide consistent equipment to support the whole organization (Matook and Maruping, 2014). Infrastructure not only helps organizations automate their activities but also remodels and redesigns their processes (Bala and Venkatesh, 2007).

Based on the foregoing, we propose a moderating effect of infrastructure in the relationship between cognitive diversity and TMS. Infrastructure includes technical resources that enable administrations to share and improve information (Bhatt, 2000), despite the cognitive diversity of their workers. Having good infrastructure speeds up work and increases availability of resources and organization of information, enabling employees to coordinate, specialize, and know each employee’s knowledge domains better. These abilities foster TMS, regardless of cognitive diversity among employees.

In sum, technology integration can influence this relationship to help mitigate potential problems or negative effects of cognitive diversity, increasing people’s capability to cooperate effectively with those who are very different from themselves (Gyngell and Easteal, 2014). Technology integration can positively moderate the relationship between cognitive diversity and TMS, because it helps automate processes and information flows throughout the organization’s development of its activities. Technology integration also generates an integrated, uniform base that all employees can access. It mitigates the negative effects of cognitive diversity by exploiting technological assets to improve and develop TMS. We therefore pose the following hypotheses:

*H4: Technology use for external diffusion of information moderates the relationship (positive or negative) between cognitive diversity and the transactive memory system in public administration.*

*H5: Technology use for internal diffusion of information moderates the relationship (positive or negative) between cognitive diversity and the transactive memory system in public administration.*

*H6: Technological infrastructure moderates the relationship (positive or negative) between cognitive diversity and the transactive memory system in public administration.*

Based on the foregoing, we present the theoretical model, which summarizes the seven hypotheses relating the variables analyzed (see Figure 1).

**Insert Figure 1**

**Methodology**

## Sample and procedure

We analyzed public employees who worked in teams belonging to two ministries under the Executive Branch of Peru’s public administration—the Ministry of Economy and Finance and the Ministry of Culture. We chose these ministries because they are the most advanced units of the public administration in issues related to integration of information technology. They are also the ministries that do the most teamwork; in other ministries, the work is more individualized.

Data were collected through a structured questionnaire (see Table II) administered virtually on the LimeSurvey Professional platform. We attached a cover letter that explained the goal of the study. Separate questionnaire sections were created, each with its own instructions, to avoid response fatigue. We obtained 301 surveys that recorded employees’ perceptions of the variables analyzed. Incomplete surveys were eliminated, leaving 193 valid surveys for analysis (see Table I).

**Insert Table I.**

Hair et al. (2017) recommend using the program G\*Power to determine whether the sample is the right size for the proposed model. G\*Power is specifically suited to studies that use structural equations modelling with partial least squares (PLS-SEM). G\*Power 3.1.9.7 recommended a minimum sample size of 107 for our study, with an 5% probability of error and a statistical power of 0.95. From our convenience sample of 301 public employees, we eliminated incomplete questionnaires, obtaining a final sample size of 193 questionnaires. This number is well beyond the minimum sample required.

*Measurements*

The scales employed were adapted from existing scales in the literature (see Table II). The scale for cognitive diversity was composed of 4 items adapted from Kim et al. (2020). Team viability was measured using a scale of 5 items adapted from Tekleab et al. (2009). All items were assessed on a 7-point Likert-scale.

To measure TMS,we used a 15-item scale from Lewis (2003). This variable was treated as a second-order reflective construct based on its three dimensions: specialization, credibility, and coordination (5 items for each dimension). Finally, we measured technology integration as a construct defined by 3 dimensions—infrastructure, internal integration, and external diffusion—using 11 items adapted from Lin and Lin (2008). The dimension of infrastructure was composed of 3 items that measured the extent to which an organization adopts the infrastructure needed to implement new information technology successfully. The dimension of internal integration was composed of 4 items that measured technology use for intraorganizational systematization in the organization. Finally, external diffusion was composed of 4 items that measured interaction with external agents electronically linked to the organization and thus increasing the organization’s external connectivity. All items for TMS and technology integration were assessed on 5-point Likert scale.

Prior research on team viability has used age, education, and experience as control variables. As this approach has been used in various studies of team viability (Aubé and Rousseau, 2011; Costa *et al.*, 2014; Nandan Prabhu *et al.*, 2019; Quinteiro *et al.*, 2016), we include the following control variables in our study: age, profession, education level, time employees had been working in their team, and years working in public administration and the ministry. Age can influence employees’ fatigue or motivation, affecting team viability. Educational and professional level can also affect team viability, as the higher employees’ level, the more likely they are to want to satisfy individual needs for growth. Finally, the longer employees have been working in their department and in public administration—that is, the greater their experience—the more we expect them to stay with the organization. Work experience is thus another factor likely to influence team viability. Finally, we do not expect the ministry to which the public employees belong to influence their professional aspirations.

**Insert Table II.**

**Results**

*Measurement model*

We used partial least squares (PLS) to validate the first-order constructs (Appendices 1 and 2). The tests provide evidence of reliability and validity of the measurements for all first-order constructs (Ou *et al.*, 2014). The steps for the reflective measurement models are based on the following criteria: (1) all values obtained for the Alpha Cronbach must be above the recommended value of 0.7 (Cohen, 1992), (2) values for composite reliability must be above 0.7 to ensure internal consistency (Hair *et al.*, 2019), and 3) average variance extracted (AVE) must take values above 0.5. Our results guarantee convergent validity at construct level (Gefen *et al.*, 2000).

First, we examine the individual reliability of each item by reviewing the loading or simple correlation. Since these values should be above 0.7 (Henseler *et al.*, 2015), we eliminated cognitive diversity items (SQ003), TMSs (SQ002), TMScr (SQ004), TMScr (SQ005), TMSco (SQ003), TMSco (SQ005), TIinf (SQ001), and TIed (SQ003), ensuring that all items fulfill the criteria for individual reliability. Second, all measurement scales had Alpha Cronbach values above the recommended threshold of 0.7 (ranging from 0.724 to 0.933), demonstrating internal consistency. Third, the values for composite reliability of the first-order constructs generated by PLS were all above 0.865, suggesting acceptable internal consistency (Ou *et al.*, 2014).

Fourth, the AVE showed values above 0.5 in all cases, guaranteeing convergent validity at construct level (Gefen *et al.*, 2000) and thus high correlation among the composites estimated reflectively (Dijkstra and Henseler, 2015). Finally, we analyzed discriminant validity using the heterotrait-monotrait ratio (HTMT) (see Appendix 2). We eliminated TMSco (SQ004) from the first-order analysis because it did not take values below 0.9 and significantly different from 1 (Franke and Sarstedt, 2019). These results demonstrate acceptable convergent and discriminant validity for all first-order constructs.

For the second-order analysis, we repeated the procedure described above, with TMS as a second-order construct. As discussed above, TMS is operationalized through its three dimensions: specialization, credibility, and coordination (Lewis, 2003). The scale is consistent and valid in our study, as it yields an Alpha Cronbach of 0.840 (Cohen, 1992). Individual reliability also took values above 0.7. Composite reliability was 0.924, well above the values recommended in the literature (≥ 0.7) (Hair *et al.*, 2019). Finally, convergent validity, measured by AVE, was 0.759, above the threshold of 0.5 (Fornell and Larcker, 1981). Our tests thus guarantee reliability and validity of TMS (Appendix 1). This analysis confirms the reliability and validity of the measurement elements used, as they fulfilled the same criteria as those analyzed for the first-order elements. Table III summarizes the results obtained for the statistics on reliability and validity of the second-order reflective latent variables. As the table shows, TV (SQ005) was eliminated to improve the scale’s discriminant validity.

Table IV summarizes the results for assessment of discriminant validity using the HTMT criterion with the second-order variables.

Finally, we performed two statistical tests to assess whether common method bias was a problem. The first was Harman’s single factor test, widely used in the literature (Podsakoff *et al.*, 2003). As the variance explained was below 50% (36.741%), common method variance is not a substantial concern. Second, we performed exploratory factor analysis for all constructs. The results show that 7 factors with values above 1 represented 80.186% of the total variance and that the first factor did not explain most of the variance (38.007%). As in the previous test, we conclude that common method variance is not a problem (Podsakoff *et al.*, 2003).

**Insert Table III and IV**

*Structural model*

To evaluate the structural model, we explored multicollinearity of the constructs. To verify whether problems of multicollinearity affect our results, we calculated the variance inflation factor (VIF). For Hair et al. (2019), VIF values greater than 3.3 indicate high multicollinearity. The VIF values in our study were well below 3 (taking values of 1.125 to 2.476), confirming that multicollinearity is not a problem in our model and indicating the absence of bias (Hair *et al.*, 2019). Appendices 3 and 4 display the VIF values for the structural model and the correlation matrix for the multicollinearity values obtained through PLS.

To analyze the structural model, we examined statistical significance, relevance of the path coefficient, and effect size f2 and then estimated the coefficient of determination R2 (see Table V). Finally, we measured the model’s overall fit and predictive relevance (Hair *et al.*, 2019) (see Figure 2).

**Insert Table V.**

**Insert Figure 2.**

Following Cohen (1992), we found a strong effect for the cases in both H1 (effect of f2 was 1.417) and H2 (effect was 0.696). To conclude the structural analysis, we evaluated the Standardized Root Mean Square Residual (SRMR), which measures fit of the empirical data to the theoretical model. The value for the saturated model was 0.085 and for the estimated model 0.089. The SRMR shows good fit (<0.10) from a less conservative perspective (Williams *et al.*, 2009), indicating that the model is suitable for validating and explaining the data analyzed (Benitez *et al.*, 2020).

Analysis of the structural model provided empirical support for the hypotheses (see Figure 2). First, cognitive diversity was negatively related to TMS (ß=-0.667, p=0.000, f2=1.417), confirming H1. The results also showed a positive relationship between TMS and team viability (ß=0.568, p=0.000, f2=0.696), confirming H2. We examine the mediation hypothesis (H3) and moderation hypotheses (H4, H5, and H6) in separate sections, due to their importance and contribution to the research.

Finally, the control variables (years working in the public sector, age, profession, and ministry) showed no significant differences. We did, however, find significant differences for the variables years working with one’s department and education level.

*Mediation and moderation analyses*

*Mediation*

To analyze the mediating effect of TMS on the relationship of cognitive diversity to team viability (H3), we first analyzed the direct relationship. Table VI presents the results for both direct and indirect effects. The direct relationship between cognitive diversity and team viability was significant and negative (ß=-0.392, p=0.000). The indirect effect of TMS on this relationship was also significant (ß=-0.379, p=0.000), confirming H3. These results suggest that TMS acts as a partial mediator, since it also exerts a direct effect.

**Insert Table VI**

*Moderation*

We used orthogonalization to measure the moderating effect (Hair et al., 2019). Hair et al. (2019) propose that values higher than 0.025 indicate strong effects (see Table V). The moderating effect of technology integration on cognitive diversity and TMS is explained in H4, H5, and H6 (0.042 for H4, 0.258 for H5, 0.005 for H6). These results (ß=0.142, p=0.003, f2=0.042) confirm the relationships proposed in H4. The values obtained also confirm H5 (ß=0.383, p=0.000, f2=0.258). Finally, we reject H6 (ß=0.055, p=0.246, f2=0.005). Taken together, these results confirm that the relationship between cognitive diversity and TMS is stronger in the presence of external diffusion (H4) and internal integration (H5), fulfilling the first two hypotheses. We do not confirm H6, however; infrastructure does not moderate the relationship proposed.

**Discussion**

First, we confirmed a direct negative relationship between cognitive diversity and team viability (H0), because the mix of different perspectives and levels of analysis seem to stimulate public employees to develop unique ideas. Our study thus reinforces prior studies that find that cognitive diversity influences public employees’ attitudes, values, and beliefs (Kim *et al.*, 2021), thinking styles and skills (Shin *et al.*, 2012), underlying assumptions about questions, information, knowledge, and perspectives (Showkat and Misra, 2022). Such differences generate conflicts, lack of unity, and little integration, negatively impacting team viability. Our results thus support a current in the literature that describes cognitive diversity as also having negative effects (Kanchanabha and Badir, 2021; Narayan *et al.*, 2021), whereby differences lead to relationship conflicts (Kim *et al.*, 2021; Qi and Armstrong, 2019).

Second, we confirmed a direct negative relationship between cognitive diversity and TMS (H1). The mix of employees’ different perspectives and levels of analysis does not stimulate formation of TMS. To create TMS, one needs unity and similar thinking skills (Shin *et al.*, 2012) that enable credibility, coordination, and integration of information. Cognitive diversity in this case decreases the potential for workers to create links and improve team viability in public administration.

Third, we find a direct positive relationship between TMS and team viability (H2). Workers’ formation of TMS enables better teamwork because TMS favor coordination among employees. TMS also strengthen specialization in the different areas of knowledge and credibility of each employee’s knowledge, properties that positively influence team viability. Our results are thus consistent with the literature describing the positive effects of TMS (Cabeza-Pullés *et al.*, 2018; He and Hu, 2021; Lewis, 2003; Sáiz-Pardo *et al.*, 2021).

Fourth, the main findings include the following: TMS operate with partial mediators between cognitive diversity and team viability (H3). The presence of TMS mediates the link and provides points of leverage that enable public administrations to maximize the positive effects of their employees’ cognitive diversity. TMS play a significant role as mediator, because public employees’ mutual affinity enables them (despite any cognitive diversity) to work together in pursuit of goals for the department to which they belong (Qi and Armstrong, 2019). We can thus think of TMS as the force that unites public employees, rendering their cognitive diversity insignificant as an obstacle to the team viability required (Cabeza-Pullés *et al.*, 2018; Mello and Delise, 2015). The public sector must thus develop TMS if it wants to achieve good team viability, as TMS reduce the negative effects of employees’ cognitive diversity on team viability. Because TMS they enable cooperative storage, retrieval, and transmission of transactive memory related to the knowledge of two or more persons (Cabeza-Pullés *et al.*, 2018) within the administration. Although transactive memory exists in the mind of each public employee, TMS exist among the different employees, based on their individual memory transactions (Lewis, 2003). TMS are thus the sum total of all transactive memories of the public employees composing them (Lewis, 2003; Sáiz-Pardo *et al.*, 2021). This totality improves work specialization, coordination, and trust in colleagues’ work, making cognitive diversity matter less.

Fifth and finally, we discuss an important finding concerning the moderating effect of technology integration and its three dimensions (infrastructure, external diffusion, and internal integration) in the relationship of cognitive diversity to TMS (Hypotheses H4, H5, and H6, respectively). Our study finds that infrastructure does not moderate the relationship between cognitive diversity and TMS.

Our results show that the dimension technology infrastructure exerts no moderating effect on the relationship between cognitive diversity and TMS. We believe that this result is due to the very specific characteristics of the sector. That is, other factors beyond technology infrastructure are needed to mitigate the negative effects of cognitive diversity on creation of TMS among public employees. According to diffusion of innovation theory, public administration’s investment in physical technology implementation will only have the expected effect if it is accompanied by training, human knowledge, or technology integration.

This result may also be due to the fact that the public administration imposes this technology on employees in their day-to-day work. In such cases, the technology is unlikely to help mitigate the negative effects of this relationship. Study of the phases needed for successful implementation of technology—internal integration and external diffusion—helps to explain this finding, as greater employee involvement helps to create TMS in diverse public administrations. These results thus confirm that infrastructure is a necessary condition but cannot in itself help to form specialized, coordinated, integrated work groups in diverse organizations.

Our study also shows that the dimensions of external diffusion and internal integration do moderate the relationships that help to mitigate negative effects, since the operating data that integrate external and internal functioning (Mazzucchelli *et al.*, 2021) in public administration help to channel and improve employees’ diversity. External diffusion and internal integration, enables information capture (Jean *et al.*, 2021), helping to expand organizations’ skills in connecting activities both inside and outside the organization. More specifically, external diffusion generates a knowledge base that enables public organizations to gather signals from the environment to promote their adaptation (Pu *et al.*, 2019) to change and to the environment for which they work. They can thus also improve transparency of information and coordination (Kumar and Ganguly, 2020). Internal integration, in contrast, integrates the different internal processes (Lin and Lin, 2008; Pu *et al.*, 2019) that support intraorganizational relationships (Ranganathan *et al.*, 2004), giving the public organization the capability to coordinate and synchronize all of its internal processes (Bala and Venkatesh, 2007) and avoid distortion of information (Venkatesh and Bala, 2012). Internal integration is responsible for collecting, integrating, and organizing internal information.

In sum, both dimensions improve the public administration’s response capability through their moderating effect. They do so by enabling exchange of internal and external information throughout development of activities, improving efficiency (Jean *et al.*, 2021) and, in turn, TMS. Because they are supported by technology, the moderating effects of both these dimensions of technology integration help to improve communication among employees (Champy, 2002), impacting TMS. Further, automatization of processes and information flows throughout development of activities generates a uniform, integrated foundation that employees can access, moderating negative effects on the relationship between cognitive diversity and TMS. All of the foregoing demonstrates the value of technology in improving and developing work capabilities (Nevo and Wade, 2010), thus also improving the formation and development of TMS.

Finally, integrative analysis of the study hypotheses demonstrates that public servants can strengthen team viability if they develop TMS while accepting that cognitive diversity exists. Although cognitive diversity will always be present among workers and affect their behavioral reactions, it is important to realize that fostering TMS improves motivation (Harrison *et al.*, 2002). A very cohesive set of employees provides a more stable environment for members, increasing the importance of TMS in achieving greater team viability (Kim *et al.*, 2021) supported by technology integration.

**Theoretical implications**

First, this study responds to the calls for more research on the double-edged (positive and negative) effects of cognitive diversity. We therefore provided information on the two existing paths for explaining and managing cognitive diversity. One path expects positive effects, based on the theoretical perspective of cognitive improvement, which can improve team viability. The other expects negative effects, based on the theoretical perspective that difference weakens relationships among members due to task and relationships conflicts, jeopardizing team viability. Our results thus help to establish a solid foundation for the literature on cognitive diversity management and its character as a double-edged sword. Framed and strengthened by the interactionist theory of social identity proposed by Tajfel and Turner (1986), the findings indicate that cognitive diversity is negatively related to TMS, specifically in public administration.

In studying the relationship of cognitive diversity to other variables—in this case, to TMS and technology integration—our study also contributes to understanding how other variables can intervene to support management and mitigate the possible negative effects of cognitive diversity (Yamauchi and Sato, 2023).

Second, we extend research on TMS by demonstrating their importance as a mediator between cognitive diversity and team viability. Our findings suggest that TMS processes—such as greater specialization, shared knowledge of distributed experience, and use of specialized information among public administration employees—facilitate team viability. We hope that our findings stimulate more research on TMS as a mediator in diverse environments to deepen understanding of its properties that facilitate integration.

Third, the findings show that technology integration moderates the relationship between cognitive diversity and TMS. Although technology integration has been studied in private firms and is composed of different dimensions, our study explains the relevance of three dimensions (infrastructure, internal integration, and external diffusion) to effective achievement of technology integration. To the extent of our knowledge, this is the first empirical study to link technology integration to cognitive diversity and TMS, particularly in public administration. The findings suggest that better implementation of technology integration—analyzed through the dimensions of infrastructure, internal integration, and external diffusion in organizations where cognitive diversity is present—promotes access to an integrated information base that enables employees to improve their capabilities (Zou and Zhao, 2022).

Finally, we contribute to the integration of three knowledge fields by providing a multidisciplinary result. First, we integrate the fields of human resources management and social psychology to strengthen the importance of the training and interaction of individuals in work units. Second, we integrate human resources management and information technologies to support the current importance of technology integration and its emerging use in organizations. All of these findings position technology integration as an important variable constituting a field of study with much to explore.

**Practical implications**

From the practical perspective, TMS and technology integration are important variables in the relationship between cognitive diversity and team viability. First, technology integration functions as a moderating variable to decrease the effects of the negative relationship between TMS and technology integration. Second, we argue that TMS are a perfect partial moderator in the relationship between cognitive diversity and team viability in public administration employees. TMS enhance the functioning of public employees’ motivations, attitudes, and behavior when they work together (Xiao *et al.*, 2022), fostering team viability. TMS are thus an important resource that fosters individual and team participation in public employees, even when they show cognitive diversity regarding tasks defining and related to team viability.

These are positive results for the functioning of human capital because they show that implementing both variables positively affects public administrations. Our study thus identifies a development opportunity for public administrations. We recommend that public managers implement models and work environments suitable for fostering TMS capabilities and support technology integration implementation to improve public services results delivered to citizens, even when their employees are cognitively diverse.

Our study also suggests the importance of managing cognitive diversity in the workplace to ensure proper management of its possible negative effects. Finally, we must remember that cognitive diversity also has positive effects on the organization.

We currently live in a profoundly changing world that requires rethinking the ways we manage diversity. Training programs could be created to help develop the skills that we propose (TMS and technology integration), skills that workers need for team viability. Managing the paradox of cognitive diversity will help to improve team viability, and such programs will help to achieve better adaptation to today’s complex world.

**Limitations and lines of future research**

Like all research, our analysis has some limitations. First, the findings are based on a sample from Peru’s public administration. Second, the study is longitudinal and analyzes only employees’ perceptions.

We therefore propose the value of pursuing future lines of research on several topics. Research should analyze whether other interrelated variables influence the relationships analyzed. It would also be interesting to replicate the model as other ministries advance in implementing and integrating information technologies. Further, analysis of other ministries would enrich our results by making them more complete and generalizable. It would be interesting to perform future studies with a much larger sample size, as they would enable us to replicate the effects identified.

The field would also benefit from studying the role of leadership, specifically of servant and ambidextrous leadership. Analyzing models of conflict management would further enrich the results. Overall, we hope that future studies will continue this line of research and expand its perspective to include other disciplines and research knowledge.

Finally, it would be interesting to contrast these results with long-term and multilevel studies that evaluate the results’ sustainability and incorporate managers’ perspectives. Having data on these variables over several years would enable us to determine whether employees’ behavior evolves over a period of time, improving the solidity of the results and our ability to extrapolate from them to public administration in general. All of the foregoing would help to contrast the implications of the model proposed in this study. Finally, future studies should analyze other countries.

**Conclusion**

We conclude that TMS are an important mediating variable in the relationship between cognitive diversity and team viability, as they mitigate the negative relationship between these two variables. Strengthening TMS can benefit public sector employees by helping to make them more cohesive, thus improving the functioning of human capital in public administration. Further, our study’s findings on technology integration as a moderating variable recommend implementing technology integration, as technology integration positively affects the relationship between cognitive diversity and TMS. This finding thus identifies an opportunity for development in public administration.

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