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Transnational digital entrepreneurship and enterprise effectiveness: A micro-foundational perspective

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ABSTRACT

Transnational digital entrepreneurship (TDE), the establishment of digital enterprises by combining home- and host-country value creation to serve domestic and foreign customers, is increasing. In order to understand the role of entrepreneurs in transnational digital enterprise effectiveness, we investigate how the competencies of transnational digital entrepreneurs influence social interactions among stakeholders that contribute to enterprise effectiveness. We apply the micro-foundations perspective of management and entrepreneurship and semi-structured interview data from transnational entrepreneurs from six countries—Finland, Sweden, Norway, New Zealand, Australia, and the USA—and their partners in Pakistan. We find that entrepreneurs' digital knowledge, skills, and abilities—versatile cognitive capabilities, digital managerial capabilities, and multicultural capabilities—affect social interactions through four socio-structural mechanisms—structural support, trust-building, knowledge sharing, and resource configuration—that enhance enterprise effectiveness. We discuss the theoretical and practical implications for transnational entrepreneurship, policymakers, and migrant entrepreneurs.

1. Introduction

Research on enterprise effectiveness is not only growing in the digital era (Bertello, Ferraris, Bresciani, & De Bernardi, 2020; Bresciani, Huarng, Malhotra, & Ferraris, 2021; Alberti-Alhtaybat, Al-Htaybat, & Hutaibat, 2019; Troise, Corvello, Ghobadian, & O'Regan, 2022a) but also shifting to examine how transnational entrepreneurs use digital technologies such as 3D printing, big data analytics, and cloud computing to establish their enterprises (Chalmers, Matthews, & Hyslop, 2021; Kraus, Palmer, Kailer, Kallinger, & Spitzer, 2019; Nambisan, 2017; Sahut, Iandoli, & Teulon, 2021; von Briel, Recker, & Davidsson, 2018). The approach often combines value creation originating in both home and host countries to serve international customers (Kerr & Kerr, 2020; Riddle & Brinkerhoff, 2011; Riddle, Hrivnak, & Nielsen, 2010; Saxenian, 2002). This form of transnational digital enterprise (Duan, Kotey, & Sandhu, 2021) combines elements of transnationalism and digital value creation from transnational entrepreneurship (Drori, Honig, & Wright, 2009; Elo, Täube, & Servais, 2022; Sinkovics & Reuber, 2021) and digital entrepreneurship (Kraus et al., 2019; Nambisan, 2017; Nambisan, Wright, & Feldman, 2019). An important aspect is the form of TDE that involves migrants (Duan et al., 2021). For example, extant scholarship in this literature stream suggests that TDE depends on migrant entrepreneurs' individual characteristics (Andreotti & Solano, 2019; Malodia, Mishra, Fait, Papa, & Dezi, 2023; Solano, 2020). In addition, scholars highlight how these migrants leverage diverse social interactions in different institutional contexts as an asset in the pursuit of TDE (Riddle & Brinkerhoff, 2011; Saxenian, 2005).

Nevertheless, there remains a limited understanding of the factors that determine the effectiveness of TDE. Specifically, little is known about transnational entrepreneurs' individual knowledge, skills, and abilities (KSAs) and how they influence transnational digital enterprise effectiveness (Bagwell, 2018; Kloosterman, 2010). In particular, research has neither outlined the digital KSAs of transnational digital entrepreneurs that enable diverse actors to maintain digital and non-digital interactions nor how digital KSAs contribute to TDE effectiveness (Steel, 2021; Sousa-Zomer, Neely, & Martinez, 2020). Even though research has expanded on a digital-centric theoretical lens (Kerr & Kerr, 2020; Nambisan, 2017), there have been limited efforts to capture the individual and socio-interactional micro-foundations through which transnational digital entrepreneurs foster enterprise effectiveness. A

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micro-foundations perspective that involves cognitive, affective, and interpersonal mechanisms remains embryonic (Ferraris et al., 2022; Srour, Shefer, & Carmeli, 2021).

The gap in research is of major concern because TDE undertaken by migrant entrepreneurs contributes to the achievement of the United Nations' sustainable development goals (ITU, 2021). Notably, digital connectivity between people in the home countries and international actors enabling high-tech knowledge exchanges will narrow the digital divide and promote digital inclusion. The outcome is that citizens of developing and developed countries can reap the benefits of the digital economy, thereby lessening poverty and boosting health and well-being (ITU, 2021). Furthermore, transnational digital entrepreneurs provide a wealth of experience and knowledge of different languages (Solano, 2020), markets (Saxenian, 2005), managerial practices (Andreotti & Solano, 2019), digital technologies (Duan et al., 2021), and a distinctive set of KSAs of educational value due to diverse social and professional experiences in the home and host countries (Aluko, Ott, Siwale, & Odusanya, 2022; Elo et al., 2022; Pruthi, Basu, & Wright, 2018). Finally, the embeddedness of transnational digital entrepreneurs in institutional contexts of multiple countries provides entrepreneurs with relational capital that may be deployed to achieve the goals of the TDE (Bagwell, 2015, 2018; Drori et al., 2009).

Addressing the concern with the shortcomings of current research requires examining how entrepreneurs' individual KSAs and their social interactions in the digital context influence TDE effectiveness (Riddle et al., 2010; von Bloh, Mandakovic, Apablaza, Amorós, & Sternberg, 2020). Specifically, we examine how transnational enterprise effectiveness manifests, and also how individual and social interactional (or relational) factors impact TDE effectiveness. We draw on Coleman (1990) micro-foundational framework that captures the interplay of individual and social factors in explaining enterprise-level outcomes (Barney & Felin, 2013; Felin & Foss, 2005). We gather data through online and face-to-face semi-structured interviews of Pakistani transnational digital entrepreneurs operating in Finland, Sweden, Norway, New Zealand, Australia, and the USA. We also interview those informants' partners in Pakistan. Pakistan's information technology industry is responsible for some of the largest flows of emigrants (IOM, 2019).

Our study makes three key contributions to the TDE literature. First, we respond to recent calls for more research on digital enterprise creation among migrant entrepreneurs (Duan et al., 2021; Terjesen, Hessels, & Li, 2016). Second, we propose an integrative framework for TDE effectiveness by integrating theoretical insights on the micro-foundations of entrepreneurship and management. This framework illuminates the multilevel factors (individual and social) that explain enterprise outcomes, thus benefiting TDE scholarship. We have developed this framework in response to calls for context-specific theories on digital enterprise creation (Sinkovics & Reuber, 2021). Finally, we extend the discussion on the importance of transnational entrepreneurial agency (Aluko et al., 2022; Elo et al., 2022) by showing that the KSAs required to deliver effective TDE differ from those required for traditional transnational entrepreneurship. In addition, we accentuate entrepreneurial agency by specifying the socio-interactional mechanisms that foster TDE effectiveness.

We organize the remainder of the paper as follows. To begin, we present the background literature on TDE and the micro-foundations perspective on management and entrepreneurship before outlining our methodology and presenting our findings. We conclude by discussing the implications and limitations of the findings, as well as future research directions.

2. Theoretical background and literature review

2.1. Transnational digital entrepreneurship

Duan, Kotey, and Sandhu (2021) coined the term transnational digital entrepreneurship (TDE) to denote a new subfield of research at the nexus of transnational entrepreneurship (Drori et al., 2009; Elo et al., 2022) and digital entrepreneurship (Nambisan, 2017; Nambisan et al., 2019). The characteristics of both domains are largely shared by the transnational digital enterprises created as a consequence of pursuing this type of entrepreneurship (Duan et al., 2021). First, research on transnational entrepreneurship is primarily concerned with understanding the motivations, strategies, and outcomes of transnational enterprise creation—the establishment of migrant-owned enterprises that spread and coordinate value-creation activities between their home and host countries (Drori et al., 2009; Elo et al., 2022). Such enterprises seek to leverage low-cost human capital from their home countries to develop products and services that can be sold in multiple countries (Elo & Minto-Coy, 2019; Pruthi et al., 2018). Although the value-creation activities of transnational enterprises are usually spread between their home and host countries, their customers may be located in multiple countries (Bagwell, 2015, 2018). Moreover, extant research reveals that transnational enterprises now vary in terms of size (Bagwell, 2015; Zapata-Barrero & Rezaei, 2020), business model, and target customer (Portes & Martinez, 2020).

Second, the digital entrepreneurship research domain focuses on the motivation for digital enterprise creation and also the processes and outcomes of it (Nambisan, 2017; von Briel et al., 2018). Notably, the context for establishing a digital enterprise is more uncertain and complex, requiring that entrepreneurs employ different strategies (Nambisan, 2017). An important feature of digital entrepreneurship is that digital technologies lie at the core of value-creating activities (Kraus et al., 2019). Digital entrepreneurship scholarship further reveals that digital KSAs and digitally enabled network interactions of entrepreneurs are salient to establishing digital enterprises (Sousa-Zomer et al., 2020). Digital KSAs enable entrepreneurs to leverage the resources and capabilities of different actors and platforms to foster the creation of an effective digital enterprise (Zaheer, Breyer, & Dumay, 2019).

Additionally, smooth and conflict-free digital interactions among value-creating actors further facilitate digital enterprises offering optimal customer solutions (Kraus et al., 2019). Given that many transnational entrepreneurs also pursue digital entrepreneurship, transnational digital entrepreneurs constitute a subdomain within the broader transnational entrepreneurship literature. More specifically, TDE is defined as "cross-border economic activities conducted by entrepreneurs based on usage of digital technology (i.e., cross-border e-commerce platforms)" (Duan et al., 2021, p. 2). This definition reveals that while pursuing TDE, value creation is inextricably transnational, and digital technologies are integral to value creation. It is important to emphasize that research on TDE is not entirely new. Some scholars have examined migrant-owned international enterprises broadly meeting the criteria for transnational digital enterprises. In particular, earlier works by Saxenian (e.g., Saxenian, 2005, 2002, 1999) on Chinese and Indian transnational entrepreneurs were instrumental in laying the groundwork for subsequent research. Consequently, Kloosterman (2010) reaffirmed that transnational entrepreneurs can create digital enterprises in the information and technology sector. Riddle and Brinkerhoff (2011) also empirically illustrated how transnational entrepreneurs could manage digital enterprises in their home countries while residing in a host country.

Nevertheless, research suggests that only those entrepreneurs who possess the required digital KSAs and the tendency to engage in social interactions are able to pursue TDE (Steel, 2021; Kloosterman, 2010; Riddle & Brinkerhoff, 2011). Some scholars also argued that transnational digital entrepreneurs generally have higher education, broad working experience, digital expertise, and multicultural capabilities (Arrighetti, Bolzani, & Lasagni, 2014; Brzozowski, Cucculelli, & Surdej, 2017). These entrepreneurial characteristics enable their enterprises to become effective by acquiring and sustaining competitive advantage (Kerr & Kerr, 2020). Nonetheless, interactions with various actors in the home, host, and other countries are also said to be critical for creating

effective transnational digital enterprises (Schøtt, 2018). Nevertheless, extant research in the domain of TDE has not adequately explored how these micro-foundations—defined here as transnational entrepreneurs' digital KSAs—alongside social interactions with various actors— drive transnational digital enterprise effectiveness.

2.2. The micro-foundations perspective in management and entrepreneurship-focused studies

The micro-foundations perspective encompasses micro-level factors and processes that contribute to the heterogeneity of macro-level outcomes (Coleman, 1990). In management studies, the micro-foundations of enterprise-level outcomes relate to (managerial) individual KSAs, processes, procedures, structures, and decision-making rules (Teece, 2007). The micro-foundations perspective holds that any change to enterprise-level outcomes primarily starts at the individual level, indicating that heterogeneity in individual KSAs leads to varied enterprise outcomes (Felin & Foss, 2005). However, those individual factors do not directly affect enterprise-level outcomes but instead aggregate to enterprise-level outcomes due to various interactions between actors (Barney & Felin, 2013; Linder & Foss, 2018).

Only a few entrepreneurship-focused studies are expressly based on the micro-foundations perspective (e.g., Castellano, Khelladi, Sorio, Orhan, & Kalisz, 2021). Nonetheless, entrepreneurship research has long focused on the characteristics of entrepreneurs and their social interactions—two key elements of the micro-foundations perspective—as critical determinants of enterprise creation (e.g., Davidsson & Honig, 2003), which demonstrates that enterprise creation is a dynamic process rooted in entrepreneurial KSAs and their interactions with diverse actors (Mreji & Barnard, 2021). Entrepreneurship scholars generally agree that entrepreneurs are the most important and influential individuals in entrepreneurial enterprises, and their KSAs play a vital role in this regard (Santoro, Quaglia, Pellicelli, & De Bernardi, 2020).

Given that research in the broader entrepreneurship and TDE domains agrees that entrepreneurial agency and interactions can provide a rich explanation for enterprise-level outcomes, we argue that a micro-foundational perspective can help explain the effectiveness of transnational digital enterprises. The following subsection discusses how the micro-foundations perspective provides a suitable analytical lens for examining how individual KSAs of transnational digital entrepreneurs aggregate to form effective enterprises.

2.3. Toward a micro-foundation framework of enterprise effectiveness for TDE

Enterprise effectiveness relates to an organization's ability to acquire necessary resources and capabilities and process them effectively to accomplish its goals. In short, enterprise effectiveness refers to the extent to which organizations successfully achieve their stated goals (Sharma & Singh, 2019). The primary objective of establishing a transnational digital enterprise is to combine complementary resources and capabilities from the home and host countries to develop internationally competitive digital products and services (Duan et al., 2021). Consequently, transnational digital entrepreneurs can create an effective digital enterprise by combining low-cost human resources from their home countries with their knowledge of international markets. Because transnational digital enterprises digitally coordinate value-creation activities, their effectiveness can be influenced by the institutional environment in their home and host countries, the digital ecosystem, entrepreneurial KSAs, and entrepreneurs' interactions with various actors (Bagwell, 2018; Steel, 2021; Kerr & Kerr, 2020).

The micro-foundations perspective can provide an appropriate lens through which to explore the individual and relational aspects of enterprise effectiveness (Srour et al., 2021). In proposing a preliminary micro-foundational framework to guide our empirical study of enterprise effectiveness for TDE, we draw on the bathtub framework developed by Coleman (1990) and subsequently used by other studies employing a micro-foundations lens (e.g., Ferraris et al., 2022; Hughes et al., 2020; Linder & Foss, 2018; Rodgers, Degbey, Housel, & Arslan, 2020). The underlying idea is to extend our understanding of enterprise effectiveness for TDE (a macro-level outcome) with mechanisms that operate at the micro-level (individual and socio-interactional). According to Coleman (1990) framework, a macro-level phenomenon (e.g., TDE enterprise effectiveness) can be explained through the aggregation (and development) of the actions of individual actors, such as transnational digital entrepreneurs. These enterprise-level outcomes, in turn, are primarily driven by the underlying conditions of individual action, which typically reside within the individual and are only partly influenced by macro-level factors (see also Ferraris et al., 2022). Extending this notion to our study, we suggest that these conditions of individual action can be decomposed into those connected with the ability and motivation of the individual. Here, we stress the ability component while expanding it to include the individual's knowledge and skill (i.e., KSA) (Aklamanu, Degbey, & Tarba, 2016; Ferraris et al., 2021). The KSAs of individual transnational digital entrepreneurs might be driven by their prior experience, cognitive capabilities, social interactions, or a combination of them.

From an individual-level perspective, KSAs relate to the resources and capabilities embedded in the individual transnational digital entrepreneurs, which form the basis of his/her decisions and actions. Prior research highlights that transnational digital entrepreneurs are typically highly educated, well-trained, internationally experienced, and multilingual individuals (Portes & Martinez, 2020; Pruthi et al., 2018; Saxenian, 2002; Solano, 2020). Other scholars argue that other factors capable of influencing the effectiveness of transnational digital enterprises include versatile cognitive capabilities (Baron & Ensley, 2006; Grégoire, Corbett, & Mcmullen, 2011), digital expertise (Santamaria-Alvarez, Muñoz-Castro, Sarmiento-González, & Marín-Zapata, 2018), and multicultural capabilities (Morgan, Sui, & Baum, 2018). This distinctive composition of entrepreneurial KSAs enables transnational digital entrepreneurs to combine resources and capabilities from their home and host countries to establish an effective digital enterprise (Morgan et al., 2018; Sui, Morgan, & Baum, 2015). Moreover, these KSAs are helpful because they are difficult to imitate, given that they are developed based on the past enculturation and acculturation experiences of transnational digital entrepreneurs. Broadly, these research efforts demonstrate that TDE scholarship recognizes the importance of digital KSAs and thus attempts to investigate several significant KSAs. However, given the recent changes brought about by digital transformation, it is necessary to explore and identify digital KSAs more comprehensively. For instance, the digital world is now more complex, uncertain, and interconnected than at any point in history. As a result, transnational digital entrepreneurs need a new set of digital KSAs that apply to the new digital world (Bertello et al., 2020; Bresciani et al., 2021; Brinkerhoff, 2009).

A socio-interactional (relational) perspective emphasizes the critical role of knowledge (Degbey & Pelto, 2021), resources, and capabilities (Degbey, Eriksson, Rodgers, & Oguji, 2021; Zahoor & Lew, 2023) embedded in network relationships in establishing an effective enterprise (Morgan et al., 2018; Riddle et al., 2010). For example, transnational digital entrepreneurs' network interactions in their home and host countries provide them with low-cost human resources and market knowledge, which they combine to form an effective transnational digital enterprise (Saxenian, 2005, 2002). That scenario demonstrates that transnational digital entrepreneurs establish and maintain relationships with diverse actors across multiple countries (Schøtt, 2018). Nevertheless, Santamaria-Alvarez et al. (2018) argue that transnational digital entrepreneurs are very selective in their network interactions. They primarily maintain interactions with trusted partners and staff in their home countries. These entrepreneurs are uniquely positioned to regulate knowledge exchange between various value-creating actors and

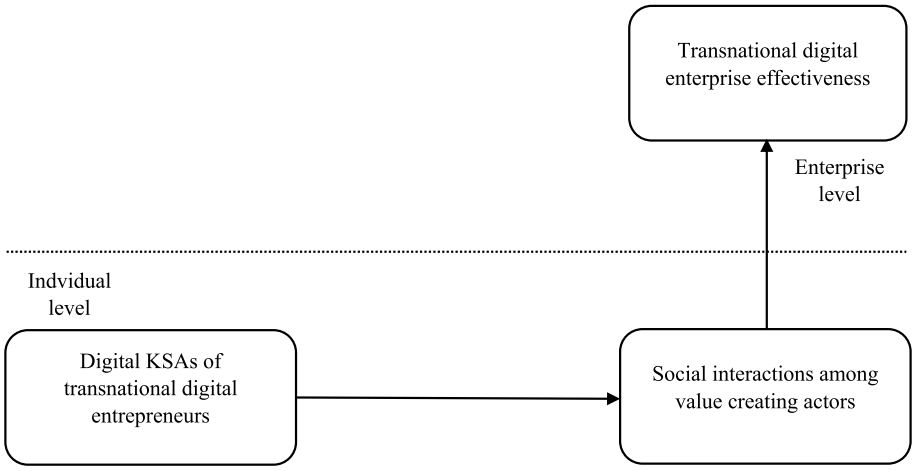

Fig. 1. A micro-foundational framework of transnational digital enterprise effectiveness.

international customers (von Bloh et al., 2020). In so doing, they facilitate interactions between different actors (Zaheer, Lamin, & Subramani, 2009).

Even if we take account of both the individual and socio-interactional perspectives, research addressing how individual digital KSAs affect social interactions is limited. For instance, the literature suggests that transnational digital entrepreneurs with versatile cognitive and multicultural capabilities are better equipped to establish and maintain interactions with actors from diverse backgrounds (Santamaria-Alvarez et al., 2018; Sui et al., 2015). Similarly, educated and internationally experienced transnational digital entrepreneurs who have the opportunity to study or work in professional settings in host countries are able to establish critical professional connections that aid in the subsequent process of enterprise creation (Santamaria-Alvarez et al., 2018). While preliminary evidence has emerged that digital KSAs influence actor interactions (Basu, 2011; Santamaria-Alvarez et al., 2018), the mechanisms enabling them to do so are underexplored. Understanding those mechanisms can inform us about how such enterprises attain effectiveness. Accordingly, we argue that further investigation is warranted that identifies the mechanisms through which digital KSAs impact interactions to engender enterprise effectiveness. Following prior research on the entrepreneurial, interactional, and enterprise creation aspects of TDE, we propose a preliminary micro-foundations framework of transnational digital enterprise effectiveness (see Fig. 1).

The proposed framework illustrates that there is heterogeneity in terms of their digital KSAs among transnational digital entrepreneurs that enhances various actor interactions. Specifically, the preliminary framework indicates that, at the individual level, transnational digital entrepreneurs' digital KSAs influence social interactions among value-creating actors. The result is to spur effectiveness at the enterprise level, described herein as transnational digital enterprise effectiveness.

3. Research design

3.1. Research approach and context of the study

We opted for a multiple case study approach to explore how the micro-foundations of TDE enhance effectiveness among enterprises (cf. Eisenhardt, 1989; Yin, 2001). Since the extant research on the phenomenon is scarce and the aim is to provide a rich contextualized explanation, a case study approach represents the most appropriate choice to perform in-depth analysis (Patton, 1990; Pervez, 2004; Welch, Piekkari, Plakoyiannaki, & Paavilainen-Mäntymäki, 2010; Yin, 2001). Multiple case enterprises were examined to enable broader generalizations than would be possible with a single case research design (Creswell, 2014).

The context of Pakistan's IT industry is appropriate for two reasons. First, Pakistan's IT exports have consistently increased in the last few years. For example, during the Covid pandemic (2020–2021), amidst a general decline in international trade, Pakistan's IT exports surged by 58%, making the sector one of the core contributors to foreign exchange earnings (Hanif, 2021). A recent report released by digital payment platform *Payoneer* highlighted that the earnings of Pakistani freelancers increased by 47% in one year, making it the fourth-ranked factor market for IT-related services. Only three countries (i.e., the USA, UK, and Brazil) are ahead of Pakistan in this ranking list and major economies, such as India and Russia, rank below Pakistan (Clayton, 2019). In addition, studying migrant entrepreneurs of Pakistani origin is pertinent as Pakistan is rated among the top five countries with the largest diaspora. Currently, six million Pakistanis (approximately 3 % of the total population) live outside Pakistan (IOM, 2019). Many emigrants play a major role in Pakistan's development by investing in digital enterprises, particularly in the IT industry (Dawn, 2021).

3.2. Selection of case enterprises

We chose ten case enterprises from Pakistan's IT industry with their founders permanently residing in six different countries (Finland, Sweden, Norway, New Zealand, Australia, and the USA). We selected the case enterprises by following the recommendations of Eisenhardt (1989) that case studies be chosen based on their theoretical rationale. Applying this approach to TDE, we have selected those enterprises that meet the criteria of transnational entrepreneurship (Bagwell, 2018; Drori et al., 2009; Elo et al., 2022) and digital entrepreneurship (Nambisan, 2017; Sahut et al., 2021; Troise, Ben-Hafaïedh, Tani, & Yablonsky, 2022b). Accordingly, consistent with the definition of TDE provided by (Duan et al., 2021), we have selected transnational digital enterprises that meet three criteria: 1) they were started and managed by Pakistani migrant entrepreneurs living outside Pakistan, 2) the value-creation activities of these enterprises are primarily based in Pakistan and host countries, while their customers are in multiple countries, and 3) interactions with the value creators and customers are mainly managed through digital technologies.

To identify transnational digital enterprises, we employed a combination of theoretical and snowball sampling (Corley & Gioia, 2004; Eisenhardt & Graebner, 2007). The first step identified multiple actors related to the IT industry in Pakistan by exploring relevant social media pages and websites, visiting appropriate public offices (e.g., Pakistan software export board, Plan X, Plan 9) and IT campuses in Pakistan's major cities, connecting with university alumni offices in leading IT universities in Pakistan (e.g., Quaid-i-Azam University, FAST, Punjab

Table 1
Details of case enterprises and data collection.

Enterprise code	Interviewee code[1]	Enterprise start year	Customer countries	Host country	Number of employees	Interview duration (minutes)
A	TE-A	2016	Finland, France, Germany, Switzerland, Australia, USA	Finland	15	85
B	TE-B	2015	Sweden, South Korea, USA, Africa	Sweden	20	interview 1:90 interview 2:45
C	TE-C	2016	Norway, Germany	Norway	8	interview 1:75 interview 2:40
D	TE-D PP-D	2017	Norway, Austria, Pakistan, USA, Canada	Norway	7	interview 1:80 interview 2:75interview 3:75 (PP-D)
E	TE-E	2015	New Zealand, Australia, Malaysia, France, USA	New Zealand	30	interview 1: 95 interview 2:45
F	TE- F PP1-F PP2-F	2015	Australia, Austria, France, Belgium, Slovakia, UK, USA	Australia	22	interview 1:70 interview 2:60interview 3:120 (PP1-F)interview 4: 85 (PP2-F)
G	TE-G PP-G	2002	USA, UK, Singapore, Middle East, Australia, Pakistan, Kuwait	USA	70	interview 1:95 interview 2:70interview 3:65 (PP-G)interview 4:40 (PP-G)
H	TE-H	2010	USA, UK, Australia, Saudi Arabia, UAE, Africa	USA	145	65
I	TE-I PP-I	2009	USA, EU, Australia, Malaysia, UAE, and 20 other countries	USA	48	interview 1:85 interview 2:45interview 3: 50 (PP-I)
J	TE-J PP-J	2011	USA, UK, Australia, UAE, Qatar	USA	38	interview 1:65 interview 2:60interview 3:120 (PP-J)

[1] A = enterprise A; B = enterprise B; … J = enterprise = J; TE = transnational entrepreneur; PP = Pakistani partner.

University), and using the personal connections of the lead author. These connections introduced us to the migrant entrepreneurs of Pakistani origin who successfully ran digital enterprises meeting the three criteria above. Altogether, we selected ten case enterprises with Pakistani founders in six countries (the USA, Australia, New Zealand, Norway, Finland, and Sweden) and their back-end operations in three Pakistani cities (Lahore, Gujranwala, Islamabad). While doing so, we ensured maximum variance regarding age, size, and geographical spread of case enterprises (See Table 1).

3.3. Data collection

We collected data primarily by conducting 25 semi-structured interviews with the transnational digital entrepreneurs and their Pakistani business partners (13 were face-to-face and 12 online). The lead author conducted the interviews between September 2017 and December 2019. The interviews varied in length from 45 to 120 min. The lead author also had the opportunity to interview some of the participating transnational digital entrepreneurs twice. In addition, short follow-up calls to fill information gaps and ascertain the state of affairs relevant to our theoretical interest were made between 2019 and August 2022. The research was further enhanced by reviews of the enterprises' websites and secondary documents.

The interviews were shaped by a detailed interview guideline shared with the informants prior to the interviews that outlined possible interview themes. However, in practice, the discussions were rather natural and interactive, with minimal interference by the interviewer. In line with Patton (1990), the informants were allowed to independently explain their stories, reflections, and opinions with minimal interference from the interviewers. The form of the interviews ensured that we obtained detailed information on the experiences and reflections of the informants. The aim was to ensure that we would be analyzing sufficiently rich information to support theorization (Welch et al., 2010).

All interviews were conducted in Urdu, Pakistan's national language, to allow the informants to explain their reflections comprehensively and comfortably. The interviews were recorded and transcribed into English by the lead author. In addition, to enhance the trustworthiness of the findings, the transcripts were finally refined based on the feedback of informants for any factual errors, misrepresentations, or inaccuracies. Overall, the interviews produced 600 pages of transcript data for analysis. Furthermore, the lead author visited the back-end operations of all case enterprises in Pakistan to conduct personal observations, held informal conversations with various employees, and conducted interviews with partners/key managers in Pakistan. All observations were immediately recorded to ensure their accuracy.

We enhanced the trustworthiness of the data through data and researcher triangulation (Halinen & Törnroos, 2005). As noted above, we complemented the primary (interview) data with available secondary data derived from internal firm documents, websites, and the social media pages of the enterprises and their founders (Welch et al., 2010). Researcher triangulation relied on two of the researchers initially analyzing the data independently and later discussing their interpretations to arrive at consensus (Miles & Huberman, 1994).

3.4. Data analysis

During data analysis, we followed the abductive logic of reasoning by combining induction and deduction via theoretical thinking (Dubois & Gadde, 2002; Welch et al., 2010). Although the study used a preliminary framework for data analysis, several analysis phases were inductive, allowing new insights to emerge from the data. The process was iterative, so novel insights were compared with the preliminary framework several times until the final model was developed. We used QSR NVivo

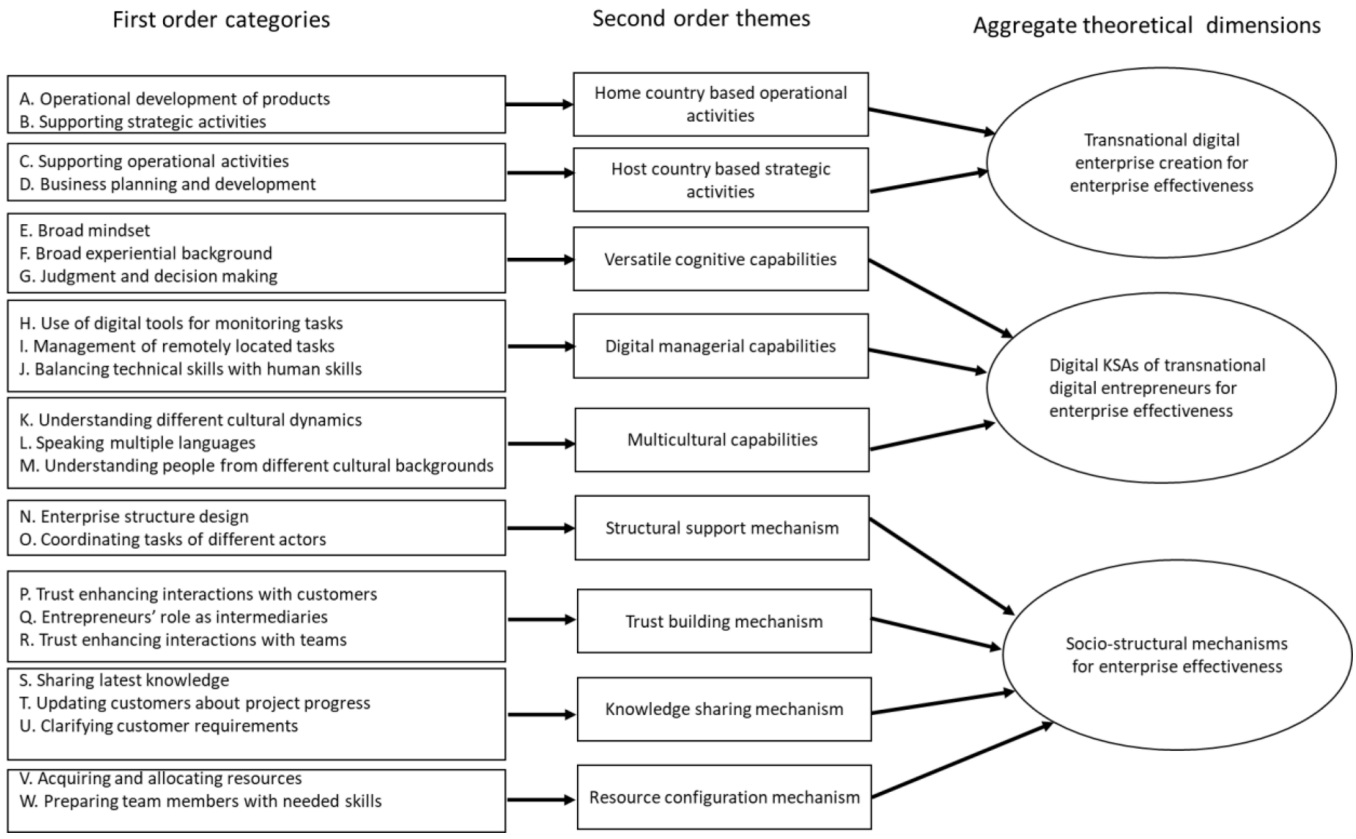

Fig. 2. Empirical data structure for transnational digital enterprise effectiveness.

to help us organize the data and facilitate coding during the analysis. More specifically, we focused on task-level analysis to examine all value-creation activities to understand how transnational digital enterprises create value.

Below, we identify the individual KSAs of transnational digital entrepreneurs and explore how—and through which mechanisms— those KSAs facilitate the interaction of value-creating actors and enterprise effectiveness. We followed the three-step analytical procedure to open-code the first-order categories from transcripts, merge the categories into second-order themes based on content similarity, and combine second-order themes into aggregate theoretical dimensions (Ferraris, Erhardt, & Bresciani, 2019; Gioia, Corley, & Hamilton, 2012). First, we developed a preliminary codebook for activities, individual KSAs, social processes, and key mechanisms to cover the influence of individual KSAs on interactions and enterprise effectiveness. We read the transcripts in detail to classify the interview statements into preliminary categories. Those initial categories were defined, refined, and deleted multiple times, depending on the new information elicited from reading new transcripts. Second, we compared the first-order categories and merged them into second-order themes by looking at the content similarity. Third, we further abstracted the second-order categories into aggregate dimensions that formed the basis of a model of entrepreneurial micro-foundations for transnational digital entrepreneurial enterprises (Corley & Gioia, 2004; Gioia et al., 2012). Fig. 2 below shows the data structure based on the analysis.

4. Findings

This section presents the analysis of the empirical data and the resultant findings. It demonstrates how transnational digital entrepreneurs establish digital enterprises to facilitate enterprise effectiveness and how individual and socio-interactional micro-foundations can bolster that effectiveness. Table 2 (see Appendix A) illustrates the relationship between data and interpretation by showing the data analysis structure alongside the selected empirical evidence. Following (Pratt, 2008), we have illustrated the data analysis using a combination of power and proof quotes. The body of this section includes power - quotes that demonstrate the points made in the text, while the proof quotes capture the illustrative findings presented in Table 2.

4.1. Transnational digital enterprise creation

Our task analysis revealed that transnational digital entrepreneurs establish digital enterprises by locating operational activities (i.e., software design and development, customer search, and initial negotiations) in Pakistan and strategic activities in the host countries. Moreover, partners/key managers and value-creating employees from Pakistan provide operational support to deliver strategic activities. Similarly, transnational digital entrepreneurs support operational activities in Pakistan.

> I have two partners in Pakistan, and they are running day-to-day operations. I look from a strategic perspective if the company plans to launch some new product or wants to own some product. I am also responsible for talking and interacting with the customers for business development. I build the relationship, and they perform the rest of the work in Pakistan. (TE-G).

We further found that customers of all the case enterprises were based in multiple countries, including the host countries. In addition, these customers operated in various industries (e.g., health, finance, retail, services, and educational services), demonstrating the variety of sectors requiring software development. Typically, transnational digital entrepreneurs design their enterprises so that Pakistan-based value-creating employees are responsible for searching for international customers through online channels and undertaking initial negotiations. After this, the transnational digital entrepreneurs will be invited to take

the negotiations to the next level and finalize the deal. Transnational digital entrepreneurs are also responsible for managing customer interactions during the project and after completion.

> After we have found the specific need of the customer with whom we have established the initial connection [our partner from the USA] will take the discussion to a higher maturity level. (PP-J).

Furthermore, the findings indicate that digital technologies lie at the core of all interactions between transnational digital entrepreneurs, value creators in Pakistan, and customers. The use of digital technologies is essential to combine value creation because all actors are located in different countries. As a result, transnational digital entrepreneurs can create transnational digital enterprises with value-creation activities spread in their home and host countries.

> Mostly we work through Skype, WhatsApp, Dropbox, and email. There is various software through which you can coordinate with your team, and customers can have real-time access to monitor the progress. (TE-C).

4.2. Digital KSAs of transnational digital entrepreneurs

The findings concerning individual micro-foundations indicate that transnational digital entrepreneurs possess three digital KSAs—versatile cognitive capabilities, digital managerial capabilities, and multicultural capabilities—that can enhance enterprise effectiveness.

4.2.1. Versatile cognitive capabilities

Our findings reveal that the versatile cognitive capabilities of transnational digital entrepreneurs are reflected in their various mindsets. The mindset of transnational digital entrepreneurs demonstrates a mix of technical, managerial, operational, strategic, and international thinking. Consequently, they are well equipped to anticipate various challenges that may arise in the pursuit of TDE. They have a comprehensive understanding of internal (e.g., technical, operational, strategic) and external (e.g., markets, cultures, and customers) dynamics that help them drive enterprise effectiveness.

> We have colleagues from many countries with different cultures, histories, and religions…Now I feel that my thinking has broadened because I can appreciate the non-technical aspects of personal and professional life. (TE-D).

We noted that the versatile cognitive capabilities of transnational digital entrepreneurs are built over time based on their diverse educational, professional, and social experiences in both the home and host countries and, on occasion, in other countries. For example, all the transnational digital entrepreneurs interviewed applied the learning from their university degrees in IT and their professional experience of developing software applications early in their careers to develop their technical mindset. In addition, the managerial experiences of transnational digital entrepreneurs enhanced their managerial and strategic mindset, enabling them to appreciate the human aspects of work in addition to technical tasks. We also found that transnational digital entrepreneurs have experience in interacting with people from various cultures in their professional and social settings, which makes their mindset more international.

> It was a multicultural working environment. There were people who were from different countries and also from the EU. Even when you go out in these societies, you get an opportunity to interact with people from different cultures and backgrounds. I really feel that these experiences played an immense role in changing my thinking, which became more international in nature. Now I am able to grasp the business ideas that can connect Pakistan with other countries. (TE-A).

In sum, our empirical observations show that the typical situations that aided the development of versatile cognitive capabilities among transnational digital entrepreneurs are: their higher education and early careers in Pakistan, social interactions with family members, relocating permanently to the host country, working with international customers, and managing international teams via digital means. Additionally, the findings indicate that versatile cognitive capabilities enable transnational digital entrepreneurs to make optimal judgments to create effective transnational digital enterprises while considering challenges and opportunities in Pakistan and the host countries. For instance, most entrepreneurs are aware of the challenges in Pakistan (e.g., inadequate infrastructure, widespread corruption, institutional voids, inadequate government support, and the absence of international payment gateways like PayPal) while appreciating the availability of talented, dedicated, competent, loyal, and learning-oriented workers. Accordingly, their final decision to locate value-creation activities is primarily based on the availability of human resources.

> People in Pakistan do good work. If you are talking about Pakistan, then the workforce is superb, simply superb. They are very good. They are intelligent. They want to learn and grow. They are loyal. To some extent, the people who work with me are good. (TE-E).

Similarly, interviewees cited several disadvantages in their host countries, including a lack of financial resources, the higher cost of hiring a workforce, pre-existing negative perceptions of migrants among natives, a lack of linguistic expertise, and cultural differences. However, on the plus side, they mentioned having access to information about cutting-edge technologies, a well-developed infrastructure, a multicultural learning environment, the convenience of international traveling, and being close to customers as essential factors.

> It is not surprising to me, and I expected such issues. But, being an entrepreneur, we have to take a risk. When making such decisions, there is a bottom line: the benefits are higher than the costs. So, we are getting enough support, which is needed to provide quality products at competitive prices. (TE-H).

Combining diverse mindsets enables transnational digital entrepreneurs to acquire and process information cues from the complex and uncertain environments of multiple countries, most notably from the home and host countries. Consequently, they can make sense of and connect disparate pieces of information to envision TDE with value-creation activities spread across the home and host countries.

> I feel that broadening my thinking horizons has enabled me to understand the value of performing certain tasks in Pakistan and others in the USA. I think people like me who know both countries can think of this kind of international business. (TE-I).

4.2.2. Digital managerial capabilities

Our findings indicate that transnational digital entrepreneurs can digitally manage value-creation activities based in Pakistan while living in the host countries by dividing activities into smaller tasks, assigning them to employees, and monitoring their progress using digital technology.

> Another task is to monitor the progress after assigning a task to the most relevant person. To monitor the progress, I use a tool, Redmine, also known as GEERA. There are some other tools on the market, but GEERA is one of the most prominent. All this is an entirely new field [digital management], and now after using it [GEERA] multiple times, we have mastered it. (TE-D).

Informants generally agreed that digital management is a different experience than on-site management. In the digital environment, transnational digital entrepreneurs can easily misread cues used by value creators. In addition, they cannot fully understand the environment in which value creators are embedded.

> This is quite a different experience from managing and monitoring the work in the same location. [There] you can see physical movements and easily see if they face some issues. You can get a real feel of the environment and thus can better guide them [Pakistani actors]. (TE-A).

Digital management becomes more difficult because value creators from Pakistan are generally not very professional. However, a deeper understanding of the people and culture of Pakistan confers a unique advantage for transnational digital entrepreneurs in digitally managing the teams while residing in the host countries. Nonetheless, transnational digital entrepreneurs must engage closely with the value creators to ensure that the developed products meet international standards. Typically, however, this engagement occurs indirectly via a partner/key manager in Pakistan or digital technologies. Furthermore, transnational digital entrepreneurs also regularly visit Pakistan to spend time in the physical presence of Pakistani value creators to gain a true sense of the working environment and cement their understanding of human-related issues.

> There is nothing like personal visits when you can have extensive meetings with the team members and can feel the issues. I also traveled frequently to Pakistan throughout the year to personally meet my team there and spend time with them. (TE-H).

Accordingly, transnational digital entrepreneurs are well-equipped to lead digital value creation on technical and human levels. All the entrepreneurs interviewed had university degrees in IT-related disciplines and also refined their skills in their early careers as software developers. Currently, all the entrepreneurs are competent in using the latest information technology, such as artificial intelligence, to complete their projects. Moreover, they learned about the human side of digital management during their prior managerial experiences of working in internationally renowned companies in Pakistan and the host countries. Notably, some transnational digital entrepreneurs were specifically engaged in leading digital value creation internationally, either during their previous jobs or their roles as entrepreneurs.

> I think leading teams and working in managerial positions, which added management thinking to my approach, made me more confident that I could start and operate my own business. If I had stayed in the technical field, I might have been thinking, even until now, about technical programming and algorithms rather than about idea scanning for better solutions to problems. I give complete credit to my managerial jobs and to my learning aptitude, which transformed my thoughts and actions. (TE-A).

Our findings also show that transnational digital entrepreneurs continuously upgrade their digital management KSAs to prepare them to deal with rapid changes in the IT environment. The Pakistani partner of enterprise 'F' pointed that out.

> The IT field is ever-changing, and it's common to find innovations and developments appearing every day. It's very important to stay in touch with these developments. It is also critical to update or train the team on new techniques and software because customers demand the latest technologies. We cannot keep working with the old ways and techniques because we must change at all costs; otherwise, we will be pushed out of the market. (PP-F).

4.2.3. Multicultural capabilities

Our investigation demonstrates that their early career experience in Pakistan means transnational digital entrepreneurs comprehend the intricacies of cultural dynamics, such as values, beliefs, and human psychology, in both Pakistan and the host countries. Therefore, transnational digital entrepreneurs possess the necessary cultural competencies to collaborate effectively with Pakistani value creators.

> I am from the same culture. I spent a large part of my life with the same people. I spent my childhood there, studied there, and worked there. I had my parents and friends there. So, I know about people there and how to manage them. (TE-F).

Our findings indicate that transnational digital entrepreneurs' efforts to integrate into the host societies significantly enhance their understanding of the cultural nuances in those countries. In addition, because most developed countries where transnational digital entrepreneurs reside permanently have a significant proportion of foreigners, transnational digital entrepreneurs engage with people from various backgrounds. Those multicultural experiences mean transnational digital entrepreneurs can usually discern differences in cultures and understand the needs of international customers. Moreover, they can communicate with customers more effectively during all phases of project completion.

> Before coming here, I thought that all of Europe was the same. But now, I feel that's not the case. Even within Norway, you can detect regional differences. (TE-D).
>
> With my entry into the company, the communication gap between customers and developers in Pakistan was greatly reduced. I could take accurate customer requirements and relate them [to actors in Pakistan] in Urdu. They can then easily understand the requirements and develop software that meets customers' expectations. (TE-I).

We also found that transnational digital entrepreneurs can speak multiple languages that allow them to coordinate value-creation activities. In addition, the findings show that although most of the customers are well versed in English, transnational digital entrepreneurs pay special attention to learning the local language of the host country if they reside in a non-English-speaking country. They feel that learning the host-country language or having a local partner offers them a true understanding of local culture and greatly facilitates interactions with customers, communities, and institutions. In addition, multicultural exposure, particularly in English-speaking countries, significantly improves the English language abilities of transnational digital entrepreneurs, allowing them to fully understand customer needs and deliver products accordingly. This improved communication reduces miscommunication among value creators and improves the chance customers will accept projects.

> I am fluent in Norwegian. But it took a lot of time to learn it. It was challenging. It was like six years in education and then practicing it later in practical life. I studied Norwegian in language school, then did my bachelor's and master's degrees in Norwegian. (TE-C).

We noticed that the multicultural capabilities of transnational digital entrepreneurs are based on their prior educational, social, and professional experiences in Pakistan, their host countries, and occasionally in other countries. These multicultural capabilities allow them to fully understand customer requirements, successfully communicate their vision to employees, anticipate customer needs, and effectively manage them. As a result, transnational digital entrepreneurs are able to develop and implement management actions to guide the behavior of value creators in Pakistan. Accordingly, the multicultural capabilities of transnational digital entrepreneurs place them in a unique position to establish an effective enterprise combining value-creation activities from the home and host countries and to coordinate with international customers.

> Spending my early years in Pakistan and frequent visits afterward helped me to know both the positives and negatives of Pakistan. Similarly, I understand people in the USA very well now. That was why I understood the value of performing certain tasks in Pakistan and the rest in the USA. (TE-I).

4.3. Digital KSAs and socio-interactional mechanisms for enterprise effectiveness

Consistent with the socio-interactional component of the micro-foundations perspective, we found that digital KSAs of transnational digital entrepreneurs can enhance enterprise effectiveness via the impact of actor interactions. These interactions mainly occur between transnational digital entrepreneurs, value creators in Pakistan, and international customers. We identified four socio-structural mechanisms—structural support, trust-building, knowledge sharing, and resource configuration—through which the digital KSAs of transnational digital entrepreneurs contribute to developing an effective transnational digital enterprise.

4.3.1. Structural support mechanism

The first mechanism through which the digital KSAs of transnational digital entrepreneurs influence interactions among actors is designing an appropriate enterprise structure and specifying the rules and guidelines for interactions. An important skill of transnational digital entrepreneurs is to establish an enterprise structure permitting enterprise objectives to be divided into daily activities and then combined across departments. The enterprise structure also clarifies the roles and expectations of various actors and increases the trust among them. As a result, experts from different functional areas can collaborate to develop products acceptable to international customers. The enterprise structure also enables the delegation of non-strategic tasks to other actors, allowing transnational digital entrepreneurs to devote more time to strategic tasks.

> I divided tasks into different departments and recruited people for different tasks led by experts in those domains. This allowed me more time to focus on new initiatives, and as a result, we expanded from one company to a level where we have five subsidiaries. (TE-H).

Typically, the structure of a transnational digital enterprise is designed so that a partner/key manager in Pakistan is assigned the responsibility to lead value-creating interactions in Pakistan. They are responsible for ensuring that transnational digital entrepreneurs and international customers receive the necessary knowledge and updates on a timely basis. The partner/key manager role is particularly vital for these enterprises because the transnational digital entrepreneurs are not physically present in Pakistan.

> It is my responsibility to check the quality of the project I sent to them. In case of some issues or progress, I give feedback to my team leader in Pakistan, and he is responsible to lead the team members. (TE-C).

However, since transnational digital entrepreneurs are distant from the Pakistani value-creating actors and international customers, digital technologies and tools are crucial to all interactions between them and all other actors. For example, they may use digital monitoring software that records which employees dealt with which tasks and the time spent on them. Such technology enables transnational digital entrepreneurs to monitor progress and ensure that actors in various parts of the enterprise cooperate productively.

> We also have software now which can give international customers real-time access to monitor the progress of their work and give directions during the project implementation. There are lists of tasks in the software. The task list is defined in the software, and the duties are assigned to all the team members…who must do what according to the given timelines and quality standards. (TE-J).

Along with establishing an appropriate structure, transnational digital entrepreneurs are responsible for developing the rules and guidelines that govern different interactions. However, these rules and guidelines are rarely codified in writing and instead exist as informal practices. For instance, most case enterprises have a well-defined procedure to deal with international customers. Actors from Pakistan conduct initial customer searches and discussions, while transnational digital entrepreneurs become involved in the negotiations at the advanced stages. Furthermore, to enhance interactions, these enterprises use an agile methodology for project coordination and provide real-time access to their ongoing projects to international customers.

> We also follow the agile methodology in which the work on different project components starts simultaneously and is combined later as one project. The customers have access to each process and component. They can guide us immediately if anything deviates from their specifications. (TE-C).

The prior experience of transnational digital entrepreneurs working in international companies, notably in the host countries, enhances their ability to design enterprise structures and specify governance rules and guidelines. Hence, by combining the learning from their professional experiences, transnational digital entrepreneurs design enterprise structures conducive to smooth interactions among all parties.

> This was the exposure I got when I left Pakistan. I learned that there are some other jobs apart from the traditional hierarchy dominant in Pakistan. You have a similar path from a junior developer to a senior developer and perhaps project leader. But I was working as a solution architect here, which I had never heard of in Pakistan. (TE-A).

Accordingly, conflicts between actors can be avoided or mitigated by structuring the enterprise and defining the rules and guidelines for internal and external interactions. As a result, value-creating actors demonstrate a shared understanding, which aids in developing an effective transnational digital enterprise.

4.3.2. The trust-building mechanism

The digital KSAs possessed by transnational digital entrepreneurs also improve interactions among various parties by establishing a trustworthy environment. We found that most international customers do not trust value creators based in Pakistan. They fear value creators may handle their data inappropriately, resulting in data privacy and security breaches. The transnational digital entrepreneurs residing permanently in the host country significantly mitigated this reputational disadvantage. Customers are more likely to sustain relationships with transnational digital enterprises because their founders take complete responsibility for the project completion and are contactable in the host countries if there are issues with the project.

> It gives them confidence that the main person is very near to them and can be reached any time if there is some problem…if you are in Pakistan and dealing with customers in some other markets, let's say, Finland, your customers cannot do anything if you have suddenly switched off everything and have decided not to contact them. (TE-A).

Our findings show that interactions with international customers are challenging because they are usually knowledgeable and demanding. They typically demand products that are developed using the latest digital technologies. Hence, the relationship with customers can be complicated because, on the one hand, Pakistani value creators lack international exposure, and, on the other hand, customers are unfamiliar with the dynamics in Pakistan. Transnational digital entrepreneurs are well positioned to mitigate such disparities because they are familiar with the people and cultures of both countries and have a thorough understanding of how businesses operate. They establish a trustworthy environment that facilitates communication between home-country value creators and customers.

> These customers need intermediaries like us who not only know the dynamics and mindset of those people (home-country value creators) but can also ensure work meets their standards. (TE-F).

In addition, transnational digital entrepreneurs' presence in host

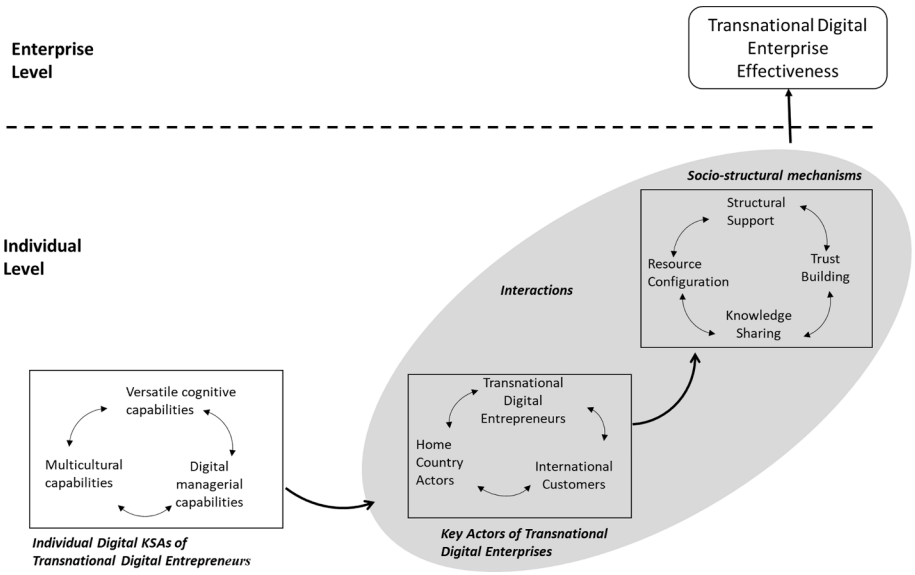

Fig. 3. A micro-foundational integrated framework for transnational digital enterprise effective.

countries allows them to participate physically in conferences and business events, which is especially beneficial for developing trustworthy relationships with host-country customers and other actors. Entrepreneurs who only search for customers online find it challenging to nurture relationships on a deeper level.

> The main benefit of staying in Australia is meeting the customer after the initial contact. When you approach some customers online, through your referrals, or whatever is the way, and you tell them that you are in Australia, they are more willing to meet you and work with you. (TE-F).

Because the transnational digital entrepreneurs are away from Pakistan, they also need a trustworthy partner or key manager there who can take care of all value-creating activities. That person should be capable of understanding the vision of the entrepreneurs and implementing it. Moreover, the partner/key manager is the primary point of contact for transnational digital entrepreneurs, international customers, and home-country value creators. Transnational digital enterprises foster trust by giving those managers the resources, autonomy, and powers to operate independently. In addition to partners or key managers, trust among value creators working in various departments is critical because the whole enterprise functions as a system. A lack of mutual trust will reduce the enterprise's effectiveness; conversely, greater trust among the parties will likely make the enterprise more effective.

> You need an expert manager in Pakistan who can manage all the operations, and it's good to have a partner who also has a stake in the business. He has complete control over whatever way he chooses, is best to get the project done, and I do not interfere too much in operational matters. (TE-D).

Overall, the transnational digital entrepreneurs advocated creating a trustworthy environment characterized by smooth interactions among value-creating actors that ultimately enhances enterprise effectiveness. However, the absence of trust results in interactions that are characterized by conflicts and a lack of cooperation which eventually hinders the enterprise's effectiveness.

4.3.3. Knowledge sharing mechanism

Our analysis reveals that transnational digital entrepreneurs also facilitate actor interactions by sharing their knowledge of advanced technologies, management practices, and customer needs that value creators in Pakistan generally lack. Pakistani value creators may misunderstand the precise needs and demands of international customers, resulting in their developing a product that customers may reject. Misunderstandings can also occur due to the inability of Pakistani value creators to accurately understand the dialect, accent, or content of international customers' communications.

> When I was in Pakistan, I often faced issues with understanding what international customers say. Now, after years of experience in the host country, I have become more proficient in communicating and interacting with customers. Now, I can easily understand the customer requirements and convey them to my team members in Pakistan who are working on the development of software applications. (TE-J).

Transnational digital entrepreneurs facilitate knowledge exchange between Pakistani value creators and international customers. They can understand the requirements of international customers due to their personal acculturation experiences in the host countries and can share that knowledge with value creators in Pakistan and clarify any confusion over customer requirements. Such knowledge sharing ensures that Pakistani value creators develop products that reflect customer expectations. In addition, transnational digital entrepreneurs update international customers on the progress of their projects. To maintain these interactions, transnational digital entrepreneurs primarily rely on digital tools to exchange knowledge with value creators and international customers.

> Interestingly, there has been little software involved, which has made it easy for all of us to share and collaborate. We use social media and other online channels to coordinate and exchange information about progress. (TE-A).

Our findings show that transnational digital entrepreneurs are the most knowledgeable individuals within the enterprise and are aware of emerging technological, managerial, and market trends. Their prior employment in well-known IT companies and permanent residence in technologically advanced countries contribute notably to developing that knowledge base. By sharing their understanding of digital tools and technology (i.e., big data, AI, and robotics) and best management practices, they can assist Pakistani partners/managers and value creators in meeting international standards.

> I want to empower and enrich the people of Pakistan who are working in our team. By working on projects, young people learn about the latest technologies, which are game changers. So, they are

Table 2
Analysis of empirical data.

Aggregate theoretical dimensions	Second-order themes	First-order categories	Illustrative data quotes
Transnational digital enterprise creation for enterprise effectiveness	Home-country-based operational activities	Operational development of products	"The team in Pakistan is responsible for all types of operational development, which my partner leads there." (TE-I)"All of our projects are being developed in Pakistan. We have hired a complete team there which comprises designers, software developers, content writers, and social media marketers." (TE-B)
		Supporting strategic activities	"After we have got to know that there is a specific need of the customer with whom we have been able to establish the initial connection [our partner from the USA] will take the discussion to a higher maturity level." (PP-J) "We also get support in marketing and other strategic activities from our Pakistan office." (TE-F)
	Host-country-based strategic activities	Supporting operational activities	"It is my responsibility to check the quality of the project which I sent to them. In case of some issues or progress, I give feedback to my team leader in Pakistan, and he takes work from all team members." (TE-C) "The team members in Pakistan individually talk about their operational plans in a short, recorded video every day. I made my own notes and guided everyone on all those points causing problems. I also ensure that they have the required resources to complete their jobs." (TE-E)
		Business planning and development	"We have our head office in the USA, where I spent most of my time with our marketing and business planning team. We are responsible for business development, international customer support, marketing, and finalizing project deals." (TE-J)"Our basic aim is to develop a marketing and research center in Finland, which will be responsible for all customer-related issues and research for new ideas. While an expert person is leading all development and technical operations in Pakistan." (TE-A)"I have two partners in Pakistan, and they are running day-to-day operations. I look from a strategic perspective if the company plans to launch some new product or wants to own some product. I am also responsible for talking and interacting with the customers for business development. I build the relationship, and they perform the rest of the work in Pakistan." (TE-G)
Digital KSAs of transnational digital entrepreneurs for enterprise effectiveness	Versatile cognitive capabilities	Broad mindset	"I was well recognized in the company as one of the best people in the company who has well-developed technical expertise and mindset." (TE-A)"I was hired as development manager, and there was a team that was working under my direct supervision. This team was working from offshore. I was responsible for looking after that team both technically and none technically. This working experience enabled me to think from a management perspective." (TE-F) "We have colleagues from many countries who are carriers of different cultures, histories, and religions [……]. Now I can feel that my thinking has broadened because I can appreciate the non-technical aspects of personal and

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Table 2 (*continued*)

Aggregate theoretical dimensions	Second-order themes	First-order categories	Illustrative data quotes
			professional life." (TE-D)
		Broad experiential background	"When you correlate these aspects with your own culture to see positives and negatives, there is huge learning in it. The benefit of all this traveling is that now if you meet a customer from a culture you have already explored, you are in a better position to communicate because of being more aware of the highs and lows of that culture." (TE-B)"International experience greatly influences my thoughts and created a huge difference. I learned a lot because of these versatile experiences." (TE-C) "It was a multicultural working environment. There were people who were from different countries and also from the EU. Even when you go out in these societies, you get an opportunity to interact with people from different cultures and backgrounds. I really feel that these experiences played an immense role in changing my thinking, and they became more international in nature. Now I am able to grasp the business ideas that can connect Pakistan with other countries." (TE-A)
		Judgment and decision-making	"It is not surprising to me, and I already expected such issues. But, being an entrepreneur, we have to take a risk. When making such decisions, there is a bottom line: the benefits are higher than the costs. So, we are getting enough support, which is needed to provide quality products at competitive prices."(TE-H) "I will say that this extensive experience of working in both countries in Pakistan and Australia as well as managing offshoring projects gave me the needed confidence to quit the job and start my own venture." (TE-F)"I feel that this broadening of thinking horizons has enabled me to understand the value of performing certain tasks in Pakistan and others in the USA. I think only people like me who know both countries can think of this kind of international business" (TE-I)
	Digital managerial capabilities	Use of digital tools for monitoring tasks	"Another task is to monitor the progress after giving a task to the most relevant person. To monitor the progress, I am using a tool, Redmine, aka GEERA. There are some other tools in the market, but one of the most prominent ones is GEERA. So, we do work this way. All this is an entirely new field [digital management], and now after using it [GEERA] multiple times over time, we have been able to use it." (TE-D)
		Management of remotely located tasks	"This is quite a different experience than managing and monitoring the work in the same location. You can see physical movements and easily see them if they face some issues. You can get a real feel of the environment thus can better guide them [Pakistani actors]." (TE-A)"It became easy because my other two partners are in Pakistan who were working full time there to look after all the operations personally. We have a very good relationship, and we are able to discuss any issues. This has really helped me remotely manage all the operations without being personally present at the workplace." (TE-F)"We are also in the process of

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Table 2 (*continued*)

Aggregate theoretical dimensions	Second-order themes	First-order categories	Illustrative data quotes
			departmentalizing the operations and hiring professional people to head these. I think it will help in developing the standard practices which will help our business to grow further." (TE-J)
		Balancing technical skills with human skills	"I think leading the teams and working in managerial positions, which added management thinking to my approach, made me more confident that I could start and operate my own business. If I had stayed in the technical field, I might have been thinking, even until now, about technical programming and algorithms rather than about idea scanning for better solutions to problems. I completely give credit to my managerial jobs and to my learning aptitude, which transformed my thoughts and actions." (TE-A)
			"The IT field is ever-changing, and it's common to find innovations and developments coming every day. It's very important to stay in touch with these developments. It is also critical to update/train the team about new techniques and software because customers demand the latest technologies. We cannot keep working with the old ways and techniques because we had to change at every cost; otherwise, we would be pushed out of the market." (TE-F)
	Multicultural capabilities	Understanding different cultural dynamics	"I am from the same culture. I spent a large part of my life with the same people. I spent my childhood there, studied there, and worked there. I had my parents and friends there. So, I know about people there and how to manage them." (TE-F)
			"I hail from KPK, Pakistan, and if you ask me about its culture, dynamics, customer thinking, behaviors, life patterns, culture, etc. I am more expert in understanding and explaining those factors." (TE-A)
			"Before coming here, I thought that all of Europe was the same. But now, I feel that's not the case. Even within Norway, you can differentiate regional differences." (TE-D)
		Speaking multiple languages	"I have become a better communicator now, and we are benefiting in the form of higher customer satisfaction and more projects." (TE-D).
			"I am fluent in Norwegian. But it took a lot of time to learn it. It was challenging. It was like six years in education and then practicing it later in practical life. I studied the Norwegian language in language school, then did my bachelor's and master's degrees in Norwegian." (TE-C)
			"With my entry into the company, the communication gap between customers and developers in Pakistan greatly reduced. I could take accurate customer requirements and tell them [actors in Pakistan] in Urdu. They easily understand the requirements and develop software that meets customers' expectations." (TE-I)
		Understanding people from different cultural backgrounds	"Spending my early years in Pakistan and frequent visits afterward helped me to know both the positives and negatives of Pakistan. Similarly, I understand people in the USA very well now. This was why I understood the value of performing certain tasks in Pakistan and the rest in the USA. " (TE-I)"But there are

(*continued on next page*)

Table 2 (*continued*)

Aggregate theoretical dimensions	Second-order themes	First-order categories	Illustrative data quotes
			positive sides of doing business with Pakistanis. Generally, Pakistanis are very talented and passionate about learning new things. I have been working with several teams, and I am telling you that Pakistanis are very good developers." (TE-I)"There is no doubt that if I were only in Pakistan, then I may not have such exposure as I have now. Here in Norway, people have a completely different mindset, and the requirements are entirely different." (TE-C)
Interactional mechanisms for enterprise effectiveness	Structural Support mechanism	Enterprise structure design	"We must build a hierarchy so that a specific person is hired for specific work and a senior person supervises the work of that person and reports to his senior, who is appointed by management." (TE-G) "I divided tasks into different departments and recruited people for different tasks that the experts of these domains lead. This allowed me more time to focus on new initiatives, and as a result, we expanded from one company to a level where we have five subsidiaries." (TE-H) "I have designed the structure of the business in this way that my partner takes care of all operational matters. He has complete control and authority to take any decisions which he considers are necessary to get the projects done." (TE-C)
		Coordinating tasks of different actors	"We also have software which can give real-time access to the international customers for monitoring the progress of their work and give directions during the project completion. There are lists of tasks in the software. Tasks list is defined in the

Table 2 (*continued*)

Aggregate theoretical dimensions	Second-order themes	First-order categories	Illustrative data quotes
			software, and the duties are assigned to all the team members who need to do what according to the given timelines and quality standards." (TE-J) "We also follow the agile methodology in which the work on different project components starts simultaneously and is combined later as one single project. The customers have access to each process and component. They can guide us immediately if there is anything which deviates from their specifications." (TE-C)
	Trust-building mechanism	Trust enhancing interactions with customers	"It gives them confidence that the main person is very near to them and can be reached any time if there is some problem…if you are in Pakistan and dealing with customers in some other markets, let's say, Finland, your customers can not do anything if you have suddenly switched off everything and have decided not to contact them." (TE-A)"The presence of [our USA partner] has been beneficial in this process to generate trust among the clients because when they receive a call from a local number, it raises the client's confidence level. They feel more comfortable because they know that if any blunder or mistake occurs during the work completion, they can talk to someone locally present. So, it boosts the confidence of clients." (PP-G)
		Entrepreneurs' role as intermediaries	"We tackle this problem by the way that our senior tech persons are sitting here in Sweden, and we will have one-to-one meetings with customers on any of the issues. Whatever is happening in offshore development is completely our

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Table 2 (*continued*)

Aggregate theoretical dimensions	Second-order themes	First-order categories	Illustrative data quotes
			headache, so customers do not face any problem due to it because they are served from the base in Sweden." (TE-B) "But the main problem for the Australian or other western-based companies is that they can not directly interact with people in developing countries. They have entirely different mindsets, and usually, they find it very challenging to interact with those people. Secondly, people from those countries usually are not very professional and do not meet the quality requirements in the developed countries […] So, these customers need intermediaries like us who not only know the dynamics and mindset of those people, but they can properly understand their requirements." (TE-F)
		Trust enhancing interactions with teams	"You need an expert manager there in Pakistan who can manage all the operations, and it's good to have a partner who also has stakes in the business. He has complete control over whatever way he chooses is better to get the project done, and I do not interfere too much in operational matters." (TE-D)"We expect that the Pakistani team must solve this issue at their end, and if we have a problem in our international team here in Australia, we sit together to reach the primary cause of the problem. It is a system, and a problem in one part impacts the functioning of the other parts. So, I try to help create a system where all actors trust each other. " (TE-F)
	Knowledge sharing mechanism	Sharing latest knowledge	"We are here to share the best practices with them and monitor their progress. We cannot micromanage

Table 2 (*continued*)

Aggregate theoretical dimensions	Second-order themes	First-order categories	Illustrative data quotes
			everything, so they must feel responsibility" (TE-F)"I want to empower and enrich the people of Pakistan who are working in our team. By working on projects, young people learn about the latest technologies, which are game changers. So, they are learning about artificial intelligence, big data, cloud computing, and similar things instead of only working on low-end products only in old technologies." (TE-A)
		Updating customers about project progress	"Interestingly, there has been little software, which has made it easy for all of us to share and collaborate. We use social media and other online channels to coordinate and exchange information about progress." (TE-A)"At this time, my second responsibility was to routinely update the client on the progress of each completion stage of the project." (TE-E)
		Clarifying customer requirements	"What I do is I engage my top manager and keep on sharing with him the progress with the intention to prepare and equip him to independently manage the tasks in Pakistan." (TE-H) "I am more expert in understanding and explaining those factors to the team in Pakistan." (TE-A) "If employees do not understand something, they can contact me directly, and I will explain to them what the customers actually need so that they are clear about the exact customer requirements." (EC)
	Resource configuration mechanism	Acquiring and allocating resources	"We do not have huge financial resources, nor have we applied for any external funding, so I have put my whole savings into the projects." (TE-A) "Apart from that, I

(*continued on next page*)

Table 2 (*continued*)

Aggregate theoretical dimensions	Second-order themes	First-order categories	Illustrative data quotes
			also had to manage another task here, the management and allocation of financial resources. So, I am responsible for allocating the budget for various activities and for thinking mentally about all activities, which a project manager and other employees should do." (TE-E)
		Preparing team members with needed skills	"It may not be that critical in some other industries, but it is a matter of survival in IT. No company can survive without updating its skills profile and portfolio. Technology is changing so rapidly, so we must catch up with new things." (TE-B)
			"When we hire someone, we make a complete assessment about the skills and learning of that person and accordingly develop an in-house training plan, and even if some online courses or external support is needed, we arrange for that, but our main target is that everybody must be equipped with the needed skills. No doubt, it adds to our company costs, but it's better to do so than be embarrassed by international customers due to low-quality projects later." (TE-I)
			"Then it is in Pakistan, and people will leave the job very quickly, so it is a continuous war that we are fighting, and even until now, we are fighting this war. In the IT field, it is challenging to find and retain new employees because if you have a technical skill, you can easily start your own business." (TE-G)

learning about artificial intelligence, big data, cloud computing, and similar things instead of only working on low-end products solely in old technology sectors. (TE-A).

Access to advanced knowledge makes value creators better prepared to create and maintain valuable interactions. Notably, it also enhances interactions and develops shared understanding among the value creators. Knowledgeable value creators are more inclined to resolve interactional conflicts and mutually support each other in performing their roles. Transnational digital entrepreneurs also share knowledge by providing timely and accurate feedback to Pakistani actors that facilitate streamlining the behaviors of the value-creating actors.

> So, we have enough competent people in Pakistan who have the potential to develop products of international standards provided they get the right kind of training environment. We usually need to give a lot of training and guidance to newcomers because they are not well prepared for the industry requirements. We guide them on international standards, and they are usually very responsive and learn very quickly about new things. (TE-I).

4.3.4. Resource configuration mechanism

Finally, the digital KSAs of transnational digital entrepreneurs facilitate actor interactions by optimally configuring resources. We noted that transnational digital entrepreneurs are the people best equipped within transnational digital enterprises to decide how resources should be acquired and allocated to accomplish the enterprise's overall goals. Transnational digital entrepreneurs are primarily responsible for acquiring the necessary financial, human, and digital resources for the effective functioning of their enterprises. Empirical evidence demonstrates, for instance, that transnational digital entrepreneurs provide the necessary financial resources without relying on governments or other external financial institutions. Similarly, in terms of human resources, they ensure that firms have the required number of well-equipped value creators who can contribute to developing internationally acceptable products. In addition, they guarantee that the appropriate digital infrastructure is in place to assist value creators perform effectively. Equipping all actors with the latest reliable digital tools and technologies is critical because most value-creation activities are coordinated digitally. A transnational entrepreneur from enterprise 'A' illustrated their role in the acquisition of financial resources when stating:

> We do not have substantial financial resources, nor have we applied for any external funding, so I have put my whole savings into the projects. (TE-A).

In addition to supporting the acquisition of resources, transnational digital entrepreneurs contribute to establishing an effective enterprise through the prudent allocation of resources to various personnel and departments. Their digital KSAs enable transnational digital entrepreneurs to make sense of relevant resources and coordinate them effectively. Doing so requires they consider that different actors need different resources to create value and then allocate them to ensure tasks are completed independently and collectively.

> Apart from that, I also had to manage another task here, the management and allocation of financial resources. So, I am responsible for allocating the budget for various activities. (TE-E).

Furthermore, resource allocation is also critical to retaining skilled employees, who must be incentivized because they are in high demand in the job market. In addition, digital KSAs allow transnational digital entrepreneurs to anticipate employee training needs and allocate the required resources to arrange adequate internal or external training. Most transnational digital entrepreneurs believe training investment is significant because human resources are initially not sufficiently trained to meet international customers' demands. They further highlight that Pakistan's university education is incompatible with modern standards and inadequately prepares graduates. This challenge is compounded because transnational digital entrepreneurs are operating at a distance from the enterprise, and rapid information technology changes can

quickly make employee skills obsolete. Accordingly, it is the digital KSAs of transnational digital entrepreneurs that enable them to accurately diagnose the problem of ill-preparedness affecting human resources and allocate more resources for training in the latest skills.

> When we hire someone, we make a complete assessment of the skills and learning of that person and accordingly develop an in-house training plan, and even if some online courses or external support is needed, we arrange for that, but our main target is that everybody must be equipped with the necessary skills. No doubt, it adds to our company costs, but it's better to do so than to be embarrassed by international customers due to low-quality projects later. (TE-I).

Overall, we found that transnational digital entrepreneurs bear the main responsibility for acquiring resources for, and allocating them to, various parties. The provision of required resources and capabilities enables value-creating actors to engage in efficient and fruitful interactions that create a shared understanding and improve enterprise effectiveness. A value creator who is ill-resourced and less capable may not be able to gauge the dynamics in the relationships and may even create friction with other value-creating actors and international customers. On the contrary, well-prepared employees with the latest skills can better assess the dynamics of interactions and develop commonalities. This shared understanding among value creators leads to establishing an effective enterprise that can offer the right solutions to the customers.

> We can only do it with the help of our team. If our team has outdated skills, we cannot compete internationally. We cannot offer the right solution to the customers. (TE-I).

5. Discussions

5.1. Theoretical implications

The current study explores the factors driving transnational digital enterprise effectiveness. Specifically, it answers 1) how a transnational enterprise is set up to achieve effectiveness and 2) how individual and social interactional (or relational) factors impact enterprise effectiveness in the context of TDE. In addressing this important issue, we combined our empirical analysis with the extant literature on TDE and the micro-foundations perspective on entrepreneurship and management. In so doing, we make the three key contributions. First, we developed an integrated framework that serves as an analytical tool to examine transnational digital enterprise effectiveness (see Fig. 3).

The current research is grounded on the micro-foundations perspective of entrepreneurship (e.g., Castellano et al., 2021) and management (e.g., Barney & Felin, 2013; Linder & Foss, 2018), leading to its presenting a context-specific framework accentuating the importance of entrepreneurial agency in explaining enterprise-level outcomes (enterprise effectiveness). This framework fosters a comprehensive understanding of the micro-level factors that are key to creating an effective transnational digital enterprise. This framework proposes that the characteristics of transnational digital entrepreneurs (their digital KSAs) and the quality of interactions are critical in creating effective transnational digital enterprises. Accordingly, while agreeing with the earlier research highlighting the importance of entrepreneurial KSAs and social interactions (e.g., Bagwell, 2018; Riddle & Brinkerhoff, 2011), our micro-foundations framework suggests that individual KSAs and their interactions should be studied together rather than in isolation. These assertions resonate with the arguments that understanding enterprise creation is a complex phenomenon better understood by examining multilevel factors (Srour et al., 2021). Accordingly, the micro-foundations perspective on TDE fosters synthesizing individual and interactional factors to explain enterprise effectiveness among transnational digital enterprises (Mreji & Barnard, 2021).

Second, our findings offer novel insights related to the impact of digital transformation on enterprise creation in the context of TDE. We extended a line of argument that many transnational entrepreneurs now create digital enterprises (e.g., Kerr & Kerr, 2020; Riddle & Brinkerhoff, 2011). Our empirical evidence strengthens the arguments that the recent wave of digital transformation has considerably transformed all aspects of enterprise creation (Duan et al., 2021). As a result, many transnational digital entrepreneurs now use digital technologies to interact with actors in multiple countries and coordinate value creation from their home and host countries (Steel, 2021). Earlier research on transnational entrepreneurship also highlighted a similar pattern of spreading value-creation activities in the home and host countries (Pruthi et al., 2018). However, the fundamental difference is that transnational digital enterprises primarily develop only digital products, and their target market is international customers beyond the home and host countries. The increased use of digital technologies enables transnational digital enterprises to achieve rapid scalability by offering products and services to customers in multiple markets (Bagwell, 2015, 2018). This study responds to the calls for more research on the patterns of digital enterprise creation among various entrepreneurs (Andreotti & Solano, 2019; Duan et al., 2021) and does so by empirically examining enterprise creation in the context of TDE. Earlier research only mentions that transnational digital entrepreneurs spread value-creation activities between their home and host countries. However, we lack an understanding of the pattern of enterprise creation. In other words, we need to identify which activities are based in the home country and which are in the host country. While the issue of spreading value-creation activities internationally has been widely studied in the offshoring stream of research (Doh, Bunyaratavej, & Hahn, 2009), this study illuminates it in the context of TDE. Based on the analysis of tasks and their geographic location, our results highlighted that transnational digital entrepreneurs mainly spread *operational* activities in their home countries. In contrast, all *strategic* activities are based in the host countries. However, all activities are interconnected and interdependent, meaning that the successful completion of all home-country-based operational activities needs support from the transnational digital entrepreneurs based in the host country. Similarly, all strategic activities in the host countries require support from operational staff in the home countries. That configuration permits transnational digital entrepreneurs to combine low-cost human resources with their advanced knowledge, allowing them to develop internationally acceptable products and services (Elo & Minto-Coy, 2019).

Third, our study delineates vital individual and social interactional micro-foundations that foster transnational digital enterprise effectiveness. From an individual aspect of micro-foundations, it suggests that transnational digital entrepreneurs possess a combination of traditional and digital capabilities that prepare them for creating an effective enterprise (Steel, 2021; Sousa-Zomer et al., 2020). That combination of KSAs is based on the prior enculturation and acculturation experiences of transnational digital entrepreneurs in their home and host countries (Elo et al., 2022). Accordingly, the heterogeneity of KSAs among transnational digital entrepreneurs contributes to enterprise effectiveness. Prior literature suggests that transnational digital entrepreneurs are generally highly educated individuals with a broad range of experience and the ability to speak languages of the home and host countries (Arrighetti et al., 2014; Brzozowski et al., 2017). Nevertheless, the current study has expanded this important research angle by empirically identifying digital KSAs that underpin transnational digital enterprise effectiveness. These digital KSAs are versatile cognitive capabilities, digital managerial capabilities, and multicultural capabilities. Highlighting these digital KSAs is critical, given the increased use of digital tools and technologies by transnational digital entrepreneurs to create an effective transnational digital enterprise.

While exploring individual KSAs, our findings enhanced the understanding of entrepreneurial cognition among transnational digital entrepreneurs. Although the vein of research on cognitive capabilities is quite rich in entrepreneurship (Baron & Ensley, 2006; Grégoire et al.,

2011), only a handful of studies have explored it in the context of transnational entrepreneurship, more specifically, in TDE. Our empirical findings suggest that transnational digital entrepreneurs' versatile cognitive capabilities emanate from their broad social, academic, and professional experiences in their home and host countries. Versatile cognitive capabilities demonstrated through various mind-sets—technical, operational, managerial, strategic, and international—allow transnational digital entrepreneurs to assess problems from multiple angles and make valuable judgments under uncertainty and in complex situations. Consequently, transnational digital entrepreneurs are equipped to understand their enterprises' internal and external dynamics and combine diverse information derived from multiple countries to drive the effectiveness of those enterprises.

Further, in addition to versatile cognitive capabilities, the digital managerial capabilities of transnational digital entrepreneurs are key to creating transnational digital enterprise effectiveness. Transnational digital entrepreneurs manage value-creation activities based in their home country while they reside in a host country. Accordingly, transnational digital entrepreneurs are usually experienced in the technical and human aspects of managing value creation in the digital context. That experience begins with their academic and early career professional experience that primarily contributes to their digital expertise and is subsequently reinforced by professional experiences that foster the human aspects of digital management. Consequently, transnational digital entrepreneurs are able to help establish an effective transnational digital enterprise (Santamaria-Alvarez et al., 2018).

Furthermore, the multicultural capabilities of transnational digital entrepreneurs help them understand the needs of various parties in different countries. That understanding helps them establish and maintain working interactions with actors from different ethnic and non-ethnic backgrounds (Santamaria-Alvarez et al., 2018). For example, transnational digital entrepreneurs' ability to speak the languages of their home and host countries gives them an advantage in coordinating value creation from both home and host countries. In addition, transnational digital entrepreneurs view enterprise creation differently than mono-cultural entrepreneurs because of their multicultural capabilities (Riddle et al., 2010). The aspect of multicultural capabilities has been widely studied in transnational entrepreneurship (e.g., Arrighetti et al., 2014; Brzozowski et al., 2017), and we corroborate those assertions in the digital context. Hence, transnational digital entrepreneurs' multilingualism and understanding of the underlying cultural values of value-creating actors and customers greatly facilitate appropriate decision-making.

Our study has moved one-step further from extant research on the micro-level determinants of TDE by specifying the socio-interactional mechanisms through which digital KSAs influence enterprise effectiveness. Although prior research emphasizes that KSAs and the broad interactions of transnational digital entrepreneurs are key to creating an effective transnational digital enterprise, the understanding of how entrepreneurial characteristics (e.g., digital KSAs) help enterprises maintain important network interactions remains limited (Basu, 2011). We have identified that the digital KSAs of transnational digital entrepreneurs improve interactions among various parties through four socio-structural mechanisms: structural support, trust-building, knowledge sharing, and resource configuration. Accordingly, the heterogeneity of digital KSAs may help smooth the interactions among actors and reduce conflict, resulting in enterprise effectiveness (Santamaria-Alvarez et al., 2018).

By designing an appropriate enterprise structure and specifying rules and guidelines for interactions, transnational digital entrepreneurs ensure that value-creating actors are assigned responsibilities appropriate to their skills and engage in mutually supportive interactions. Since different actors engage in various project completion steps, structural support from transnational digital entrepreneurs ensures that the necessary support is provided to all actors when needed (Felin & Foss, 2005). In addition, transnational digital entrepreneurs make better than their own prior decisions about when to delegate tasks, to whom, and how digital technologies can enhance those interactions. When staff members are clear about their roles in the enterprise and the rules of interaction, they can collaborate effectively to strengthen enterprise effectiveness.

Further, the digital KSAs of transnational digital entrepreneurs also enable them to create a trusting environment where all actors demonstrate a shared understanding. Consistent with extant research, our empirical observations showed that transnational digital entrepreneurs play a crucial role as intermediaries between value creators in the home country and international customers (Elo et al., 2022; Elo & Minto-Coy, 2019; Elo & Vincze, 2019). The situation is referred to as the in-betweenness advantage (Brinkerhoff, 2009) and is what allows transnational digital entrepreneurs to connect value-creating activities from the home and host countries. Without transnational digital entrepreneurs intermediating, interactions between home-country value creators and international customers are likely to be characterized by mutual misunderstanding and a lack of mutual trust. A situation of distrust may arise because value creators in the home country are not well trained and equipped to fully understand international customers' demands. Moreover, international customers can have reservations about data privacy and security when working with people from developing countries.

Furthermore, transnational digital entrepreneurs can also enhance trust among their home-country partners and value creators by giving them autonomy and delegating authority to complete their jobs. Moreover, our findings show that digital KSAs can impact enterprise effectiveness through a knowledge-sharing mechanism (Lin, Lu, Liu, & Zhang, 2016). Since transnational digital entrepreneurs are considered the most knowledgeable individuals within the transnational digital enterprise, they can shape all interactions among home country actors by sharing their knowledge of the latest management practices, technological developments, and international markets. Additionally, they mitigate misunderstandings between value creators and customers by sharing the customers' requirements with value creators and by sharing the operational updates with the customers. Accordingly, transnational digital entrepreneurs act as gatekeepers of knowledge exchanges to ensure that all actors interact smoothly to foster transnational digital enterprise effectiveness.

Finally, digital KSAs help enhance interactions by guiding entrepreneurs to acquire the necessary resources and allocate them appropriately. These findings resonate with earlier evidence in the literature that transnational digital entrepreneurs, like other transnational entrepreneurs, must manage resources derived from different actors in the home and host countries (Elo & Vincze, 2019; Riddle et al., 2010). We extend this aspect of existing research by highlighting that transnational digital entrepreneurs must arrange financial, human, and digital resources. Furthermore, they need to address resource acquisition and allocation to ensure that all actors have the resources to perform their jobs and, ultimately, to advance enterprise effectiveness.

5.2. *Practical implications*

The findings of this study offer some important insights for policymakers and transnational entrepreneurs engaging in creating enterprises. First, policymakers must understand that migrant entrepreneurs are no longer restricted to operating in low-value-add sectors. Host countries should devise new immigration policies to attract, integrate and support migrant entrepreneurs in the digital domain to ensure they play more effective international roles. An important policy implication is that host countries should create an enabling business environment for the growth of migrant businesses through policy formulation and implementation. Policymakers should focus on mobilizing resources and capabilities in such a way that a supportive ecosystem is created where digital entrepreneurs can develop their skills and abilities. The three underlying digital KSAs highlighted in this paper can guide the

allocation of resources and capabilities.

Host-country governments and other institutions should attempt to develop a shared understanding to ensure holistic support mechanisms are offered. Although it is logical to argue that all businesses require a level playing field, migrant businesses warrant more attention in view of the unique challenges many face. In addition, successful migrant businesses have the potential to contribute to the sustainable development goals that enhance the welfare of migrant workers in host and home countries. Transnational digital entrepreneurship has the potential to provide decent work and economic growth. To reduce inequalities by providing people with a livelihood in both the host and home countries and to reduce poverty in the developing countries from which the migrant entrepreneurs came. Businesses positively influence issues affecting society and local communities (Glavee-Geo, Burki, & Buvik, 2020; Peterson, 2013). Transnational digital entrepreneurship can enhance the sustainability of cities, communities, and society.

Furthermore, the findings have implications for the countries of migrants. The paper should improve the understanding of how a skilled diaspora can be engaged to attract investment and foster knowledge sharing in the home countries. By highlighting support mechanisms, policymakers on both sides can enrich their understanding of exactly how digital KSAs have an impact. As a result, they can clarify the immigration policy and proceed to develop and utilize the talents of skilled migrant entrepreneurs with confidence. The recognition and development of skilled migrant entrepreneurs or entrepreneurs from the diaspora can be a source of job creation, given transnational digital entrepreneurs' enormous potential in their home and host countries. Policies that enhance the entrepreneurial potential of immigrants in host countries should be encouraged. Such policies would have important implications for international business and entrepreneurship.

As transnational digital entrepreneurs are considered the most knowledgeable individuals in the enterprise, they are able to enhance interaction among actors by sharing their knowledge about the latest managerial practices, technological advancements, and changes in international markets. Knowledge sharing with employees enables them to develop products and services that are more likely to be accepted by international customers. Transnational digital entrepreneurs also play a vital role by sharing operational updates with international customers and passing on knowledge about the exact requirements of international customers to employees. Transnational digital entrepreneurs' experience derived from both the home and host countries makes them knowledgeable about developing products and services for international markets with a strong product-market fit, which enhances growth, scalability, and international expansion. In addition, increased knowledge sharing among various actors creates a shared understanding that improves enterprise effectiveness (Lin et al., 2016).

Finally, interactions between important parties also depend on the resource configuration decisions of transnational digital entrepreneurs. Ensuring that all value-creating actors have the required resources and capabilities to perform their jobs fosters their interactions being mutually supportive. Optimal resource configuration should help enterprises retain highly skilled employees and train others, thus advancing overall enterprise effectiveness.

6. Research limitations and conclusion

6.1. Limitations and future research directions

While this study offers a rich contextualized understanding of the micro-relational foundations of enterprise effectiveness in the context of TDE, it has some limitations that offer fruitful avenues for future research. One limitation of our study is the use of a single home country (Pakistan) and industry (information technology). Further research might consider multiple contexts and industries. More studies across other settings and contexts would be useful to increase our understanding of the issues in focus.

Future research should consider transnational digital enterprises in home countries in other developing economies, such as those in Africa, the Middle East, Latin America, and Southeast Asia, and emerging economies such as the so-called BRICS group of Brazil, Russia, India, China, and South Africa in relation to developed host economies. In addition, comparative studies based on multiple host countries and industries have the potential to provide contrasting features, reveal idiosyncrasies, and increase understanding. Furthermore, it would be interesting to conduct quantitative research to operationalize and measure the KSAs isolated here and explore their mechanisms. Large-scale surveys have the potential to increase external validity, while quantitative longitudinal research studies and simulations might predict long-term enterprise effectiveness dynamically.

6.2. Conclusion

This paper explores the factors that drive the effectiveness of transnational digital enterprises. Specifically, it focuses on 1) how transnational enterprises are set up to achieve effectiveness and 2) how individual and social interactional (or relational) factors impact enterprise effectiveness in the context of TDE. The study first explained that transnational digital entrepreneurs create digital enterprises by spreading their value-creation activities in their home and host countries while coordinating such transnational value-creation activities using digital tools and technologies. These actions of transnational digital entrepreneurs illuminate unique patterns of digital enterprise creation among migrant entrepreneurs that reinforce arguments that the recent wave of digital transformation has markedly transformed all aspects of enterprise creation. Second, our study identified three important individual KSAs of transnational entrepreneurs in the digital context—versatile cognitive capabilities, digital managerial capabilities, and multicultural capabilities. These individual KSAs, in turn, are reinforced by four socio-structural mechanisms—structural support, trust-building, knowledge sharing, and resource configuration—to spur transnational digital enterprise effectiveness. Third, our study has proposed an integrated framework of transnational digital enterprise effectiveness, which delineates a multilevel emergence perspective propelled by a micro-relational foundation.

CRediT authorship contribution statement

Muhammad Sufyan: Writing – original draft, Methodology, Formal analysis, Data curation. **William Y. Degbey:** Writing – review & editing, Writing – original draft, Formal analysis, Conceptualization. **Richard Glavee-Geo:** Writing – review & editing, Writing – original draft. **Baniyelme D. Zoogah:** Visualization, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A

See Table 2.

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