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Revealing the Relationship of Human Dimension of Digital Leadership Capabilities and Employees' Performance: The Mediating Role of Managerial Capabilities

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ABSTRACT

In today's fast-paced digital era, in organizations various human dimensions of digital leadership (DLP) capabilities drive digital transformations to ensure sustainable performance at a frenetic pace. This study focuses on empirically testing DLP capabilities, such as digital literacy (DL), positive attitudes (PAs) and knowledge sharing (KS) impact on employee performance (EP) while assessing the mediation effect of managerial capabilities (MCs). This study collected and utilized a sample of 279 from various organizations in Bangladesh who possess knowledge and skills related to digital technology and management. After data collection, we performed the analysis by using SPSS 23 and AMOS 24 to evaluate the outcomes based on a structural model based on social exchange theory (SET) and resource-based view (RBV) theory. The findings specify that DL and PAs did not directly significantly support EP; however, KS directly supports EP. Additionally, MCs partially mediate between KS and EP, whereas MCs fully mediate among DL, PA and EP. Results demonstrate that human-dimensional digital capabilities are vital for enhancing MCs and EP. This study empirically investigates the impact of human dimension capabilities in DLP on EP in developing. It contributes to the existing knowledge of the social exchange capabilities of the digital leaders' influence, enhancing organizational resources and sustainability.

1 | Introduction

The Industrial Revolution 4.0 (4IR) is recognized as a significant disruptor in technological tools and software emerging in the industrial sector to enhance users' experiences with contemporary devices and methodologies; however, insufficient attention has been paid to incorporating innovative digital skills in organizations (Abas et al. 2019). With the pace of mod-

ernization, leadership concepts and applications have changed. Therefore, digitally responsive companies are progressing, and other companies are lagging behind due to late digitalization or adaptation, such as Kodak and Nokia, which have failed to cope with digitalization and suffers a lot for sustainability. However, the efficacy of the digitalization process frequently hinges on the leader's competencies (Senadjki et al. 2023). In this era, new types of leadership have emerged to handle a digitally

volatile and unpredictable environment named digital leadership (DLP). It is a combination of transactional, transformational and authentic leadership (Prince 2018) with digital skills (De Waal and Heijtel 2016). Among the various dimensions of DLP human-related capabilities proposed by Abbu et al. (2022), for example, digital literacy (DL), positive attitude (PA) and knowledge sharing (KS) have been highlighted as key factors that strengthen the leadership power and foster an environment conducive to digital transformation for innovation and performance. However, the empirical examinations of the human dimensions of DLP capabilities are in preliminary stages and yet to be explored. Therefore, the following questions arise: *Do human dimensions of digital leadership capabilities (digital literacy, positive attitude and knowledge sharing) can affect managerial capabilities and employee performance?*

Actually, DLP is practice-oriented rather than merely theoretical (Eberl and Drews 2021). In this perspective, Mugge et al. (2020) have expressed that digital transformation primarily occurs in two situations: one in which the organization is in the process of digital development and another in which it is already in mature stages. As a developing country, Bangladesh has set a goal to become 'Smart Bangladesh' by focusing on digitally transforming through the fundamental four pillars, including smart citizens, smart government, smart economy and smart society (Pal and Sarker 2023). To do so, the Bangladesh government has undertaken 40 megaprojects to bring this transformation into reality. But there is a doubt whether Bangladesh has enough digitally capable (DL, PA and KS) leaders to propel managerial capabilities (MCs) and employee performance (EP). In fact, today's organizational success mostly depends on the DLP and MC of employees. Notably, Abbu et al. (2022) stated theoretically, along with other dimensions, that human-related DLP outlined the need to empirically test based on environmental and contextual fit. Therefore, this study focuses on using the effect of DL, PA and KS on MC and EP in a developing country context. Scholars also concur that in this 21st century, DLP is a crucial competency for personal fulfilment, developing active citizenship, social inclusion and employment development (Littlejohn et al. 2012). Researchers added that leaders with DLP who possess DL and PA are more likely to exhibit high levels of performance, social integration, resilience, flexibility, empathy and creativity (Creusen et al. 2010). In addition, KS is a culture of openness, interconnection and cooperation in the digital realm (Berman and Korsten 2014), and a participative style enhances a leader's ability to develop collaborative skills with fellow team members by solving problems and searching for opportunities (Abbu et al. 2022). Overall, integration of DL, PA and KS has an effect on MC and EP.

Numerous studies on digitally mature organizations (Mihardjo and Rukmana 2019; Mihardjo and Furinto 2018; Sasmoko et al. 2019) have characterized DLP as behavioural, transformational and futuristic. Although DL comprises cognitive, technological and attitudinal elements that are associated with the human need to inquire, comprehend, express and investigate concepts both individually and collectively (Marín and Castañeda 2023). Research found that DL not only has an effect on academic performance (Abas et al. 2019) but also enhances cognitive, motor, social and emotional skills (Eshet 2004). Therefore, these capabilities of digital leaders are crucial for successful digital

transformation and achieving the sustainable development goal. Digitally matured countries have a structure to generate DLP capabilities; however, in developing countries, to develop digitally capable leader, one must start with DL, a positive mind and KS. Though Bangladesh is focusing on being a digitally growing nation, it requires DLP to focus not only on digital and IT skills but also on the fundamentals of DLP, which include DL, PA and KS characteristics. A previous study indicated that leadership competencies can enhance employee skill development and strategic planning, consequently impacting organizational productivity, growth and overall performance (Ladkin and Patrick 2022). Therefore, it is assumed that DLP capabilities (DL, PA and KS) will positively support fostering employee MC and EP.

To accomplish this research goal, there are some motivations behind it. Such as, a lot of research has shown that transactional leadership (Ezzeddine 2023; Kolombo et al. 2021), transformational leadership (Holten et al. 2018; Patiar and Wang 2016) and authentic leadership (Azanza et al. 2018; Gardner and Schermerhorn 2004) are all linked to better organizational performance. DLP is the combination of transformational leadership with digital skills (De Waal and Heijtel 2016). Previously found digital leaders are capable of handling digital environments with proper skills, which are interlinked to enhance organizational performance (Shin et al. 2023). Furthermore, most of the prior studies have concentrated on the DLP qualities of visionary, creative, digitally skilled, adaptable and competent individuals (Zhu 2015). Although researchers have indicated that DLP capabilities encompass cognitive, business, interpersonal and strategic skills (Guzmán et al. 2020), the measurement items for these skills are still in their early stages of development. Additionally, Abbu et al. (2022) theoretically described five human dimensions of DLP capabilities, which include DL skills, a PA towards digital systems, skill acquisition motivation, KS tendency and a participative style of decision-making. These dimensions need to be further explored to understand their impact on organizations.

Though previously Erhan et al. (2022) used DLP in conventional organizations and suggested using it as a core variable considering perspective and situations. In their recommendations for future research, Abbu et al. (2022) articulate the need to create new survey instruments for empirical research in the future. Similar with this, numerous studies have demonstrated a relationship between DLP and performance in a single dimension (Hidayat et al. 2023; Shin et al. 2023; Turyadi et al. 2023). Meanwhile, other research has explored various dimensions of DLP, such as visionary, creative, digitally skilled, learning to change and competent, and its impact on innovation management (Mihardjo et al. 2019a); dynamic capabilities (Mihardjo et al. 2019b); and digital disruption (Mihardjo and Furinto 2018). Senadjki et al. (2023) also noted that the digital transformational context allows for the exploration of workforce capabilities. Thereafter, this research considers MC as worker capacities, which are primarily relevant to the outcomes of employees' capabilities and also associated with DLP. The precise objectives of this research are as follows:

OB1: To examine the effects of human dimensions of DLP capabilities—namely, DL, PAs and KS—on EP.

OB2: Find the mediation effect of MCs between DLP capabilities and EP, such as skills development, increased work efficiency and quality.

In summary, this study provides valuable insight into how Abbu et al.'s (2022) conceptual idea of human dimensions comes into practical implications in business and organizations for futuristic decision-making. In addition, this article will contribute through enriching understanding of DLP by emphasizing the human dimension rather than focusing solely on technology or technical skills. By identifying specific behaviours, such as promoting PA and encouraging KS, provide actionable insights for organizations. This research also will help guide the development of DLP training programmes focused on both technical and human skills.

2 | Literature Review and Hypothesis Development

2.1 | Social Exchange and Resource-Based View (RBV) of the Organizations

The present study focuses on the integration of the human dimension of DLP capabilities, MC and EP, by using social exchange theory (SET) and RBV theory. SET theory has different views, but it is the most influential concept for understanding workplace behaviour (Cropanzano and Mitchell 2005). This theory has a key insight that originated from anthropology studies by Malinowski (1922, 1932): that the exchange of resources is symbolic in nature, and here this research exchange means indicating information in terms of DL, PA and KS, which have an influence on enhancing managerial and employee capabilities. On the other hand, Blau (2017) outlined that exchange relations are causally related, and sometimes the specific direction is somewhat ambiguous. In this study, the exchange effect of DL, PA and KS is still valuable and unexplored needs to be explored. This study will focus on how DL, PA and KS are supporting resource generation.

Additionally, the RBV theory, first proposed by Wernerfelt (1984) and refined by Barney (1991), is widely supported in business literature. It indicates that having significant, uncommon and challenging-to-imitate resources and competencies is the key to maintaining a competitive advantage. In this research, we have focused on MC and EP as key competitive advantages and resources. A corporation can devise and/or execute strategies to enhance its efficiency and effectiveness by utilizing valuable resources, which also enable it to capitalize on opportunities and/or mitigate environmental threats (Barney 1991; Capron and Hulland 1999). Here, the exchange of DLP capabilities towards MC is considered a vital resource that can bridge the gap between DLP and EP. Within the framework of this research, DLP exchange competencies may be viewed as important exchanging capabilities for enhancing organizational assets that enhance excellent performance. The impacts of DLP on organizational performance would then be realized through the mediating role played by employees' managerial skills. Therefore, this study's intention is to investigate the role of DLP human competencies on EP using SET and RBV theory.

2.2 | Human Dimensions of DLP Capabilities

2.2.1 | Digital Literacy

In light of the rapid and persistent development of digital technology, requiring people to employ more technical, cognitive and sociological abilities to complete tasks and solve problems (Eshet 2004). Digital leaders actually use this digital knowledge to establish the foundation for their vision and motivate both employees and teams to embrace digital transformation. DL generally signifies an individual understanding of digital systems. In fact, DL is the capacity to utilize digital technology, communication tools and networks to access, manage, integrate, analyse, evaluate and generate information for effective participation in a knowledge society (Tang and Chaw 2016). Additionally, Abbu et al. (2022) also defined DL as 'the assessment of a leader's ability to develop digital competencies within the leadership team in itself'. Therefore, DL can be defined as the capacity to utilize digital technology efficiently, critically and responsibly for the purposes of communication, accessing, evaluating and generating information across diverse digital contexts.

2.2.2 | Positive Attitudes

In the 21st century, achieving organizational goals through managing digital transformation requires leaders to possess a PA and a transformative mind. PA of leaders acknowledges emotions such as recognition, gratitude and praise (Abbu et al. 2022). DLP with PA possess greater resilience, social integration and high-level performance, which lead to expanded helpfulness, adaptability, empathy and creativity (Creusen et al. 2010). More or less, digital leaders who carry out PA are more confident and committed to long-term well-being (Liu et al. 2010). On the other hand, a PA is the capacity of a leader to embody a champion-like demeanour and intentionally exhibit positivism in their behaviour and communication. So, leaders with a positive mentality, always looking for the best interests of the company, feel accountable and committed to the success of the organization.

2.2.3 | Knowledge Sharing

KS is a leader's ability to enable access to knowledge and improve the learning of the employees (Abbu et al. 2022). In reality, KS is a culture characterized by openness, interconnection and collaboration in the digital environment (Berman and Korsten 2014). Here, a digital leader not only encourages their subordinates to share knowledge across firms but also ensures the freedom to freely share any ideas on the floor. Additionally, it means sharing ideas and problems for quick solutions. In this perspective, Holdt Christensen (2007) defined knowledge management as 'identifying existing and accessible knowledge in order to transfer and apply this knowledge to solve specific tasks better, faster and cheaper than they would otherwise have been solved'. Although KS is a mechanism designed to use existing knowledge, it promotes project collaborators in preserving and enhancing the project's outcome (Park and Lee 2014). In fact, KS can manifest through various methods, including interpersonal communication and networking, documentation, organization,

knowledge capture, problem-solving, providing assistance, acquiring new skills and developing competencies from experts and colleagues (Cummings 2004; Sousa and González-Loureiro 2015). In summary, digital leaders use a sharing mindset to enhance knowledge, generate ideas and solve problems.

2.2.4 | Managerial Capabilities

An MC denotes the management skills, knowledge and procedures possessed by organizations, utilized to implement programmes and activities aimed at attaining superior performance (Karabag and Berggren 2016). In this era, digital transformation impacts all business logics and leads to the digitalization of organizational procedures (Barroso and Laborda 2022; Verhoef et al. 2021). Such as MC of digital transformation and handling environmental dynamism leads to innovation and organizational economic performance. Indeed, there is a strong correlation between a leader's abilities and their improved managerial skills. From this perspective, during the digital transformation phase, organizations must possess the necessary managerial skills to consistently maintain stable performance. In the present scenario, dynamic MC includes managerial cognition, social capital and human capital (Helfat and Martin 2015). In sum, MC denotes the capacity to develop, integrate and organize competences and resources (Adner and Helfat 2003).

2.2.5 | Employee Performance

In this era, EP indicates employees are efficient, skilled in their work fields, appropriately understand the task and finish work in a predetermined time by maintaining job descriptions and quality standards. EP can be defined as the degree to which a person can complete the important responsibilities of occupying a position in an organization. According to Kalogiannidis (2020), EP is the behaviour exhibited by an employee while performing a particular task assigned by the employer. In general, when employees possess the necessary skills to successfully complete their tasks, the organization reaps the rewards as EP.

2.3 | Hypothesis Development Process

2.3.1 | DLP Capabilities and EP

DLP capabilities, including DL, PA and KS, play a crucial role in augmenting EP with the help of quick adaptation to the evolving digital landscape and improving overall productivity. DL, defined as the proficiency in utilizing digital tools and technology, significantly influences EP. Leaders with high DL can foster a tech-savvy work environment, stimulating the adoption of innovative solutions and streamlining workflows (Ebert and Duarte 2018). Enhancing employees' digital competencies allows leaders to facilitate more efficient task execution and data-driven decision-making, hence increasing both individual and organizational productivity. In addition, DL will enable the individual to assess information, conduct logical analysis and identify value-added solutions (Abas et al. 2019). Moreover, DL empowers leaders to build a compelling vision and motivate people to engage initially (Kane et al. 2019), facilitating the team's

effective utilization of the advantages of digital transformation (Cortellazzo et al. 2019). In this perspective, Abas et al. (2019) added that DL has a substantial impact on the EP of Malaysian oil and gas companies. Similarly, Hamdani et al. (2023) also found that DL increased the EP in Jakarta, Indonesia.

Moreover, a leader with PA helps to create an environment conducive to embracing change. Leaders who exhibit a positive mindset towards digital transformation can mitigate staff resistance to adopting new technology and foster a positive mindset (Bawden and Robinson 2009). This motivational influence promotes elevated employee morale and engagement, which are essential for improving performance (Avolio et al. 2000). A positive mindset towards technology adoption might enhance employees' readiness to acquire new skills and adjust to evolving work processes. Thereafter, by employing PA and a positive leadership approach, leaders can enhance their employees' confidence, dedication and persistent well-being (Liu et al. 2010). Therefore, it can be presumed that PA of the DLP is positively linked with the enhancing EP.

KS is crucial for ensuring an agile and responsive workforce in the digital era. Leaders who push for the sharing of digital knowledge and exemplary practices foster a culture of continuous learning (Nonaka 1998). KS also supports organizations with developing novel knowledge combinations that facilitate innovation (Katila and Ahuja 2002; Leiponen and Helfat 2011), hence enhancing the variety of options accessible for addressing the innovation issues inherent to the organization (Dahlander et al. 2016). Employees in contexts demanding a greater degree of KS are more adaptable to harness their creative potential (Wang and Noe 2010), and a particular method to enhance skills and capabilities is through collaborative learning. A previous study showed that KS enhances employee innovation (Hu and Randel 2014) and creativity (Huang et al. 2014). Innovative work behaviour exerts a highly beneficial and considerable influence on job performance (Purwanto 2021). Moreover, employee creativity positively influences EP (Nasir et al. 2022). So, leaders' KS capacity empowers employees' performance in the organizations. Therefore, the following hypotheses are proposed:

H1a. *There is a positive relationship between DL and EP.*

H1b. *There is a positive relationship between PAs and EP.*

H1d. *There is a positive relationship between KS and EP.*

2.3.2 | DLP and MCs

In this digital transformative era, DL is very essential for managers (Imjai et al. 2024) to keep up to date with current situations. DLP involves leveraging digital skills, tools and mindsets to guide employees to work effectively. On the other hand, an MC infers skills and competencies needed to execute tasks in time, make effective decisions and drive organizational performance. This capacity enables the effective use of digital instruments for data analysis, impact assessment and rapid decision-making (Lundell and Forzelius 2017; Mardiana 2024). Moreover, DL enhances creative cognition and decision-making, particularly in complex scenarios (Sinnaiah et al. 2023). Consequently, it surpasses basic

technological knowledge, highlighting the necessity of understanding its application in various contexts for efficient operations (Hazlehurst et al. 2023).

Moreover, a PA is the capacity of a leader to embody champion-like qualities and deliberately exhibit positive behaviour and communication (Abbu et al. 2022). Digital leaders who carry out PA are confident and committed to the long-lasting well-being of the organizations (Liu et al. 2010). Moreover, PA encourages individuals to be self-confident with enthusiasm and make things happen (Lau and Woods 2009). Besides, PA increases self-confidence, trust and motivation of managers (Wallace and Leong 2020), which leads to effective and efficient management. In this perspective, Dlamini et al. (2023) suggested that cultivating a PA helps a manager construct a cohesive and motivated team to achieve the common goals. Therefore, a future-oriented attitude has a positive and significant effect on managerial ability.

Moreover, KS is described by employees' actions of providing their requisite knowledge for accomplishing certain tasks and collaborating with colleagues to generate innovative ideas, enhance performance and address challenges (Wang and Noe 2010). In a study, Akturan and Çekmecelioğlu (2016) highlighted that KS impacts on creative behaviours in numerous Turkish organizations. In a different study, Wang and Hu (2020) examined the role of KS in supply chain networks and discovered that KS enhanced the collaborative innovation capabilities of managers. In this age, DL, PA and KS together can work for enhancing leaders' acceptability and MC through propelling diversified digital and other skills. A good command over technological know-how makes a leader confident and helps him take bold decisions. Lastly, in this era of digitalization, having DLP capabilities is crucial for improving leaders' management quality and has become an important part of leaders' success. Therefore, this study posited the following hypothesis:

H2a. *There is a positive relationship between DL and MCs.*

H2b. *There is a positive relationship between PA and MCs.*

H2c. *There is a positive relationship between KS and technological MCs.*

2.3.3 | MC and EP

In general, every leader or head of an organization's skills and mindset are supposed to have an effect on MC, which is supportive for organizational performance. Managerial ability and managerial efforts play key roles in the performance of business enterprises (Banker et al. 2024). Better MC leads to robust and improved organizational performance (Alolayyan and Alyahya 2023). Digital leaders' are visionary and capable of handling a digitally volatile environment. On the basis of Sahabuddin et al. (2023), they analysed the ability of management in influencing EP at the Republic of Indonesia Employee Cooperative (KPRI) Pengayoman Makassar City and found that MC has a substantial positive impact on EP. Similarly, Alolayyan and Alyahya (2023) studied the role of MC on performance and found that MC is significant for increasing EP. Moreover, Osisioma Hilda and Ugiagbe (2023) argue that MC influences employees towards

higher performance in firms. On the basis of this discussion and previous literature, DL, PA and KS have a positive impact on MC, and MC enhances EP. Therefore, we posited the following hypothesis:

H3. *There is a positive relationship between MCs and EP.*

H4. *MCs mediates between DLP competencies (H4a.DL, H4b.PA, H4c.KS) and organizational performance.*

2.4 | Research Framework

In the 21st century, digitalization has led to a transformation of organizations and the dimensions of DLP, and the role of human dimensional leadership in developing country perspectives is a burning issue for facing digital transformation. In a study, Erhan et al. (2022) first used DLP in conventional organizations and mentioned that DL can be used in the future while based on the perspective. Although another study, Abbu et al. (2022), has categorized human dimensions of DLP skills into four categories (e.g., integrity, intent, capabilities and results), and human dimensions of DLP capabilities are subdivided into, for example, DL, PA, skills acquisition, KS and participative style. Besides this, Senadjki et al. (2023) mentioned that workforce capabilities can be explored on the basis of a digital transformational context; therefore, this research has considered employee 'managerial capabilities' as mediators and EP as predictors. This research is the first approach to empirically test human dimensions of DLP capabilities as DL, PA and KS in the developing country context.

3 | Methods

3.1 | Research Design

In the era of Industry 4.0, the necessity of DLP is undeniable, and the diversified use of DLP is gradually emerging, for example, visionary, behavioural, digitally skilled, DLP of teachers and the human dimension of DLP capabilities. This study proposed to investigate the impact of human dimensions of DLP capabilities on EP, while also exploring the mediating role of MC in this relationship. Figure 1 shows the proposed (second-order) research model.

To conduct this study, we developed a structured questionnaire based on the extant of existing literature. First, based on the literature review, the identified research gap and the gap research model and questionnaires were developed. There were three parts of the questionnaire: first, notes for the respondents for understanding the research motive; second, adorned with demographic information-related questions where there was no personal or sensitive information. The third part consists of questions related to the proposed research model and hypothesis. There were a total of 24 items with 5 variables, including 3 second-order items for measuring the human dimension of DLP capabilities.

Prior to the final data collection, we had conducted a focus group discussion and a pilot test of collecting 20 samples to ensure the comprehensibility and clarity of the questions. After minor mistakes and solving minor typing problems, finally we

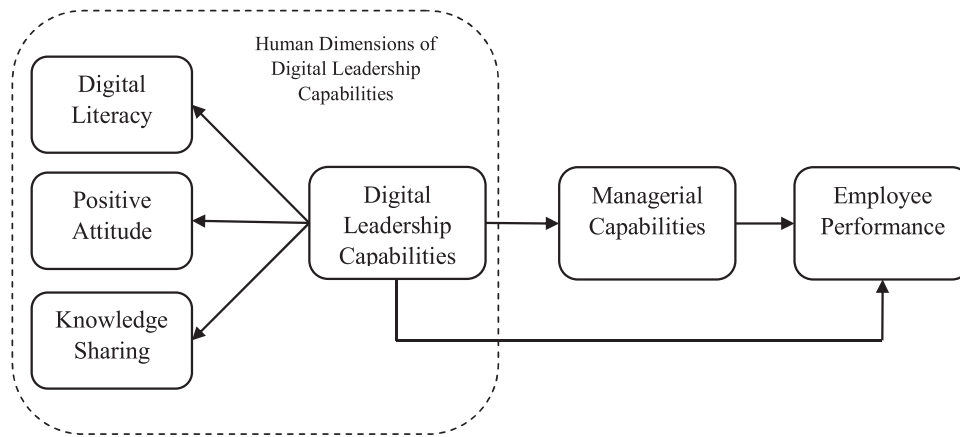


FIGURE 1 | Proposed research framework.

have started our final data collection. We have distributed our questions to 525 potential respondents and received a total of 303 samples, which were gathered with a 57.71 response rate through purposive sampling from the employees of Bangladesh who have knowledge related to these digital activities. Due to the significant outliers, such as all the responses being only 1 or 5, therefore, we have excluded 24 responses through performing necessary cleaning, so 279 remained for the analysis. In the analysis section, this study includes demographic information, common method bias tests, multicollinearity, correlation, reliability and validity by using SPSS 23. Subsequently, we used the measurement model and structural model fit in AMOS 24 to assess the model fit index. Finally, to assess the path model analysis and tested hypothesis, we used the AMOS software program.

3.2 | Sampling and Data Collection

To collect the primary data and accomplish the proposed research goal, an MS Word file as well as an online-based structured questionnaire was prepared by using Google Forms. We sent the Google Form link to the expected respondents through various social media such as Facebook, Imo, WhatsApp, e-mail and other convenient networks from February to July 2024. A total of 303 questionnaires were collected, of which 24 were removed owing to incompleteness, missing data, outliers or other issues, resulting in 279 valid samples retained for analysis in this study. Table 1 depicts the demographic profile of the usable responses.

3.3 | Measurement of Variables

To conduct this research and assess the first-order and second-order constructs, this study adopted a questionnaire from the suggested questions of Abbu et al. (2022) and others for assessing human dimensions of DLP capabilities with some adjustment and considering environmental perspective. We presented all the questions, scales and items in both native Bengali and English languages to enhance comprehension. First, for assessing DL (five items), two items were adopted from Samani et al. (2020) and three items were used from Abbu et al. (2022). The sample items of the question ‘In our organization, learning is made easier by using information and communication technology’. Second, to

assess PA, five items were used, among them three items adopted from Abbu et al. (2022) and two items from Ng (2012). One sample item of the questions is ‘Our organization consistently advocates the best interests of our company’. Third, for measuring KS, four items were adopted from Kordab et al. (2020). Sample items of the question are ‘Our organizations have capabilities to share relevant knowledge among business units or departments’.

Fourth, to assess the MC, five items adopted from Sawy et al. (2020) and Yuniarty et al. (2021). Sample items of the measurement variable are ‘Our company’s management is familiar with digital tools’. Lastly, to assess the EP, this research adopted five items from Riyanto et al. (2021). One sample item of the question is ‘I can finish the job faster than the specified time’. We instructed the respondents to evaluate each available item on a five-point Likert scale, extending from 1 (strongly disagree) to 5 (strongly agree). The response also included respondents’ gender, respondents’ age, educational level, experience and job position in the organizations (see Table 1).

3.4 | Common Method Variance (CMV) Test

To address the CMV test, we have tested the Kaiser-Meyer-Olkin (KMO) and Bartlett’s test sphericity. The value of the KMO measure of sampling adequacy is 0.909, and the Bartlett’s test of sphericity is significant ($\chi^2 = 3281.742$, $df = 406$, $p < 0.05$). This implies that the DL, PA, KS, MC and EP are strongly correlated, and they are not an identity matrix. In addition, Herman’s single-factor test was conducted to confirm the CMV. The results of Herman’s single-factor test show that the single factors account for 32.656% of the total variance, which is less than 50%. This indicates that there are no issues with CMV in this study (Podsakoff et al. 2003).

4 | Results

4.1 | Measurement Model

To assess measurement validity, this research considers determining the reliability and validity of the measurement model, which includes reliability, convergent and discriminant validity (see

TABLE 1 | Respondents' demographic profile.

Categories (total = 279)		Frequency	Per cent (%)
1. Gender	Female	82	29.4
	Male	197	70.6
2. Age	Less than 21 years	3	1.1
	21–29 years	133	47.7
	30–39 years	90	32.3
	40–49 years	41	14.7
	50–59 years	11	3.9
	More than 60 years	1	0.4
3. Level of education	Less than an honour's degree	24	8.6
	Honour's/Bachelor's degree	124	44.4
	Master's degree	129	46.2
	Doctorate	1	0.4
	Others	1	0.4
4. Experience	Less than 1 year	38	13.6
	1–5 years	101	36.2
	6–10 years	59	21.1
	11–15 years	54	19.4
	16–20 years	9	3.2
	More than 20 years	18	6.5
5. Position	Upper management	43	15.4
	Middle management	138	49.5
	Lower management	98	35.1
	Total	279	100.0

TABLE 2 | First-order constructs validity.

Variables	AVE	CR	α	1	2	3	4	5	VIF
1. Digital Literacy (DL)	0.561	0.792	0.731	(0.749)					1.593
2. Positive Attitude (PA)	0.620	0.867	0.793	0.467**	(0.787)				1.522
3. Knowledge Sharing (KS)	0.626	0.834	0.774	0.547**	0.495**	(0.791)			1.660
4. Managerial Capabilities (MC)	0.639	0.898	0.798	0.432**	0.455**	0.450**	(0.800)		1.425
5. Employee Performance (EP)	0.669	0.890	0.860	0.393**	0.363**	0.458**	0.465**	(0.818)	—

Note: Variables in parenthesis are the square root of the AVE of each variable.

Abbreviations: AVE, average variance extracted; CR, composite reliability; VIF, variance inflation factor.

** $p < 0.01$.

Table 2). To measure the measurement model's reliability, two reliability measures were used to ensure the internal consistency of the model. One is Cronbach's alpha, whose value ranges from 0.731 to 0.860 ($\alpha > 0.70$), and composite reliability (CR), the value of which ranges from 0.792 to 898 ($CR > 0.70$), which specifies a satisfactory level of internal consistency (Hair et al. 2010). Additionally, the average variance extracted (AVE) of the variable is greater than thresholds ($AVE > 0.50$) and factor loading (> 0.60). In this perspective, Comrey and Lee (2013) suggested that if the cut-off value is 0.55, it is good, and 0.63 is very good. The inter-variable correlations are evaluated using the square root

of the AVE to determine discriminant validity, with the greatest correlation value required to be smaller than the square root of AVE (Hair et al. 2010). Besides this, to assess the multicollinearity issue, this study assessed the variance inflation factor (VIF), where the threshold value should be below 10 (Hair et al. 2014) and within 3 (Kock 2015; Kock and Lynn 2012). Here, the VIF value of our research findings falls below 2, indicating that there is no multicollinearity issue for this study.

Moreover, Figure 2 exhibits the first-order measurement model, and indices of the findings revealed that $\chi^2 = 206.09$, $\chi^2/df = 1.45$

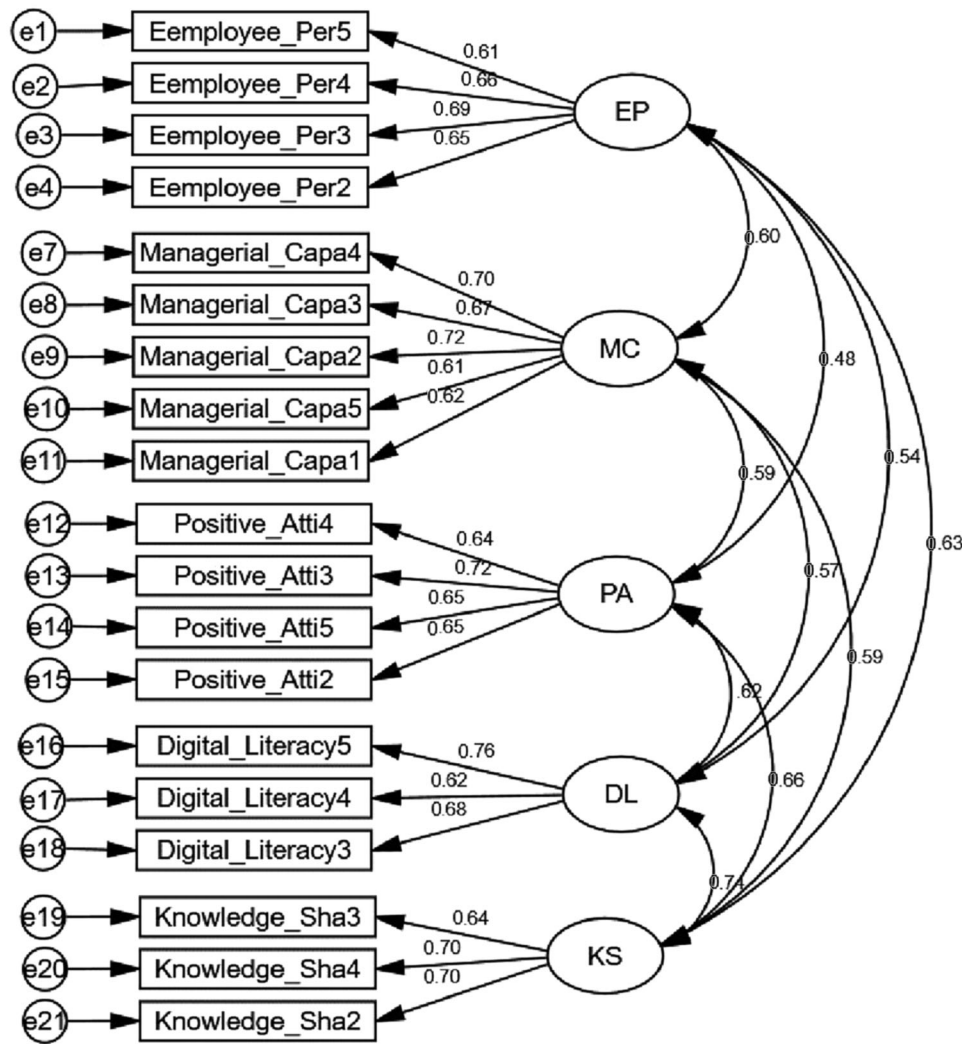


FIGURE 2 | First-order measurement model. DL, digital literacy; EP, employee performance; KS, knowledge sharing; MC, managerial capabilities; PA, positive attitude.

and GFI = 0.930. AGFI = 0.906, RMR = 0.020, RMSEA = 0.040, CFI = 0.961, TLI = 0.953 and $P_{\text{Close}} = 0.913$. If the AGFI > 0.8, they are statistically suitable for confirmatory factor (CFA) analysis (Anderson and Gerbing 1988).

Then, Model two (Figure 3) is depicted with second-order reflective constructs with DLP capabilities, MC and EP. The human dimension of DLP capabilities includes sub-dimensions, such as DL, PA and KS. The second-order sub-dimensions are evaluated on the basis of their corresponding factors, which leads to DLP capabilities. Table 3 demonstrates that all these second-order dimensions substantially reflect the human dimensions of DLP capabilities. Other constructs of MC and employee management are assessed on the basis of first-order methods. The consequences show that the reliability, convergent validity, discriminant validity, multicollinearity and model fit indices are depicted within threshold values. The second-order model fit indices revealed that $\chi^2 = 210.08$, $\chi^2/\text{df} = 1.44$ and GFI = 0.928. AGFI = 0.906, RMR = 0.021, RMSEA = 0.040, CFI = 0.961, TLI = 0.954 and $P_{\text{Close}} = 0.928$. Therefore, this second-order model is also statistically suitable for CFA analysis.

4.2 | Structural Model Fit

In this study, we assessed measurement model fitness through SEM (Figure 4) to test the pathway model of the hypothesis. The structural model fit yielded the following results: $\chi^2 = 210.007$, $\chi^2/\text{df} = 1.439$, GFI = 0.928. AGFI = 0.906, RMR = 0.021, SRMR = 0.043, RMSEA = 0.040, IFI = 0.961, TLI = 0.954 and CFI = 0.961.

4.3 | Hypotheses Testing

We evaluated the measurement model fit, both first-order and second-order, before assessing the structural model fit. Hypothesis was tested using the SEM model. Chin (1998) suggested that the coefficient of determination (R^2) of the endogenous latent variables is the preferred metric for assessing the structural model. The study revealed that this model explained 29.8% of the variation in MC and 30.7% of the variation in employees' performance. This study has also used bootstrapping of 5000 with a confidence interval of 95% that was corrected for bias resamples to appraise the statistical significance of path coefficients (Hair

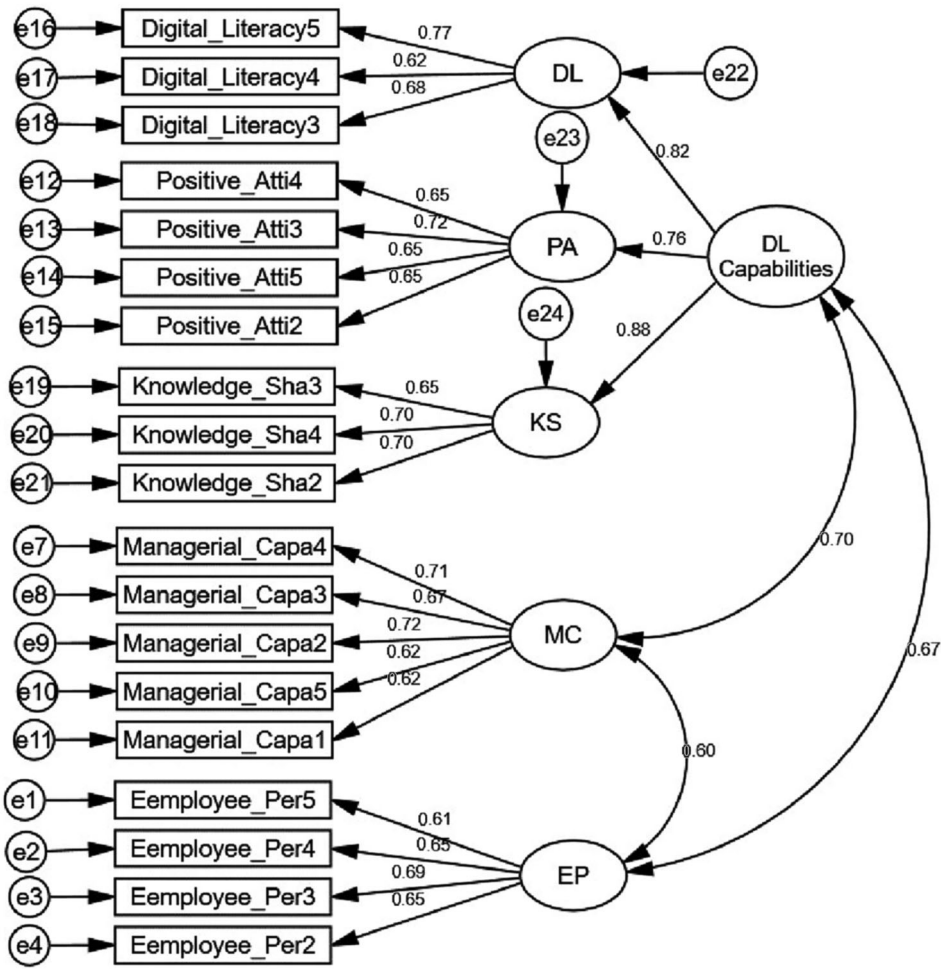


FIGURE 3 | Higher order measurement model. DL, digital literacy; EP, employee performance; KS, knowledge sharing; MC, managerial capabilities; PA, positive attitude.

TABLE 3 | Higher order constructs validity analysis.

Variables	AVE	CR	α	1	2	3	VIF
1. Digital Leadership Capabilities	0.896	0.962	0.748	(0.946)			1.418
2. Managerial Capabilities	0.639	0.898	0.798	0.543**	(0.800)		1.419
3. Employee Performance	0.669	0.890	0.860	0.494**	0.465**	(0.818)	—

Note: Variables in parenthesis are the square root of the AVE of each variable.

Abbreviations: AVE, average variance extracted; CR, composite reliability; VIF, variance inflation factor.

** $p < 0.01$.

et al. 2010). The present study consists of a total of 10 hypotheses, 7 direct and 3 mediation analyses (see Table 4).

5 | Discussions

This study has successfully conducted an empirical test of the human dimension of DLP capabilities effect on MC and EP. First, the present literature has been used to support the hypothesis H1a ($\beta = 0.111$; $p > 0.05$), which infers that DL hasn't substantial positive influence on EP. The previous study acknowledged that

leaders who are digitally literate have a greater influence on EP (Abas et al. 2019; Hamdani et al. 2023). However, the present study differs from the previous. Though DL fosters team efficiency and benefits the digital transformation (Cortellazzo et al. 2019) through enhancing digital skills, knowledge, networking, and communication to manage information systems and become collaborative to solve any problems. The reason behind this is without full model estimation, the direct effect of DL is statistically significant ($\beta = 0.106$; LLC = 0.051 and ULC = 0.167, $p < 0.05$), inferring that in developing countries like Bangladesh,

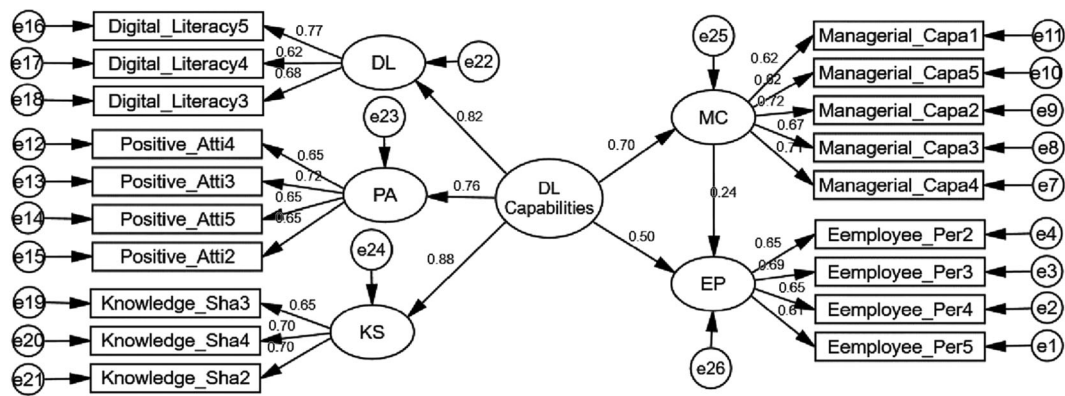


FIGURE 4 | Structural model fit analysis. DL, digital literacy; EP, employee performance; KS, knowledge sharing; MC, managerial capabilities; PA, positive attitude.

TABLE 4 | Hypothesis testing.

Hypothesis and pathways		Standardized estimates		95% confidence interval		p value	Results
		Direct effect	Indirect effect	Lower bound	Upper bound		
H1a.	DL → EP	0.111		−0.018	0.236	0.154	Not supported
H1b.	PA → EP	0.065		−0.046	0.163	0.384	Not supported
H1c.	KS → EP	0.239**		0.108	0.374	0.002	Supported
H2a.	DL → MC	0.194**		0.077	0.299	0.007	Supported
H2b.	PA → MC	0.258***		0.126	0.385	0.001	Supported
H2c.	KS → MC	0.216		0.022	0.385	0.064	Not supported
H3.	MC → EP	0.280*		0.109	0.414	0.006	Supported
H4a.	DL → MC → EP		0.037*	0.013	0.072	0.006	Supported
H4b.	PA → MC → EP		0.061*	0.027	0.116	0.002	Supported
H4c.	KS → MC → EP		0.048*	0.006	0.116	0.047	Supported

Abbreviations: DL, digital literacy; EP, employee performance; KS, knowledge sharing; MC, managerial capabilities; PA, positive attitude.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

DL is sufficient. Actually, due to the mediation effect of MC, the direct effect of DL on EP turned out to be insignificant. This study proved that skilled leaders are capable of making the perfect strategic plan, therefore influencing the organization's output, improvement and overall performance (Ladkin and Patrick 2022).

Second, the results proved that PA is not statistically significant to EP ($\beta = 0.065$; $p < 0.05$). Therefore, H1b is not supported. However, without full model estimation, the direct effect of DL is statistically significant ($\beta = 0.147$; LLC = 0.080 and ULC = 0.233, $p > 0.05$), inferring that in developing countries like Bangladesh, DL is quite sufficient. This implies that MC fully mediates the relationship between PA and EP. This investigation also supports the previous study that PAs towards digital systems make leaders more resilient, flexible, empathetic, supportive, socially integrated and creative and lead to higher performance (Creusen et al. 2010). Along with this, these results proved that a PA encourages subordinates to perform tasks (Saleem et al. 2021) and enriches team output. Third, H1c ($\beta = 0.293$; $p < 0.001$) is also

empirically supported. Again, this research revealed that digital leaders' capabilities to share knowledge increase organizational effectiveness (Boe and Torgersen 2018) and also formulate a culture of openness, connectivity and collaboration with the digital world. Therefore, this study proved that internal as well as external KS enhances leaders' capabilities to cope with super-fast environmental changes.

Fourth, results proved H2a ($\beta = 0.194$; $p < 0.05$) is statistically supported. This once again proved that good command of DL makes digital leaders confident, which also enhances and enhances creative thinking and decision-making, particularly in intricate scenarios (Sinnaiah et al. 2023). It is supported by the previous study that DL capability facilitates the efficient application of digital instruments for data analysis, outcome assessment and rapid decision-making (Haleem et al. 2022; Lundell and Forzelius 2017). Therefore, DL is supportive of enhancing employee MC. Fifth, H2b ($\beta = 0.258$; $p < 0.05$) also proved that the PA of the digital leaders significantly affects MC. Practically, PA of

the employees towards the technology and diving into it and the ability to quick adaptation enhance employees' capabilities and confidence. It is also supported by the previous study that AP grows confident and committed to enduring well-being (Liu et al. 2010). Previous studies have demonstrated that it not only enhances managers' trust and motivation (Wallace and Leong 2020) but also positively affects their managerial ability.

Sixth, H3c ($\beta = 0.216$; $p > 0.05$) proved that KS has an insignificant effect on employees MC. Though practically, intra-knowledge and external KS surge the confidence of the employees to face unknown situations. Therefore, these findings are also supportive of the previous findings that KS has the capability to directly influence the individual behaviour of employees (Jung et al. 2014) and that they are closely interconnected (Bilginoglu and Yozgat 2018). Although employees within organizations are sharing knowledge, it does not significantly impact their MC. In a different way, we can say that peer KS culture is not always rich in developing countries due to the high competition and snatching of innovation and performance by the peers or seniors. Seventh, H3 ($\beta = 0.280$; $p < 0.05$) found that MC has an effect on EP. This research theoretically and practically matches the previous study that better managerially capable employees contribute to robust and improved organizational performance (Alolayyan and Alyahya 2023).

Lastly, we have tested the mediation effect of MC hypothesis H4a between DL and EP and found ($\beta = 0.037$; $p < 0.05$) significant; hypothesis H4b between PA and EP ($\beta = 0.061$; $p < 0.05$) significant; and hypothesis H4c between KS and EP ($\beta = 0.048$; $p < 0.05$) is also significant. It infers managerial capacities mediate between those human dimensions of DLP and employees' performance in developing countries. Previous discussions have proven that DL influences MC (Hamdani et al. 2023), PA influences MC (Saleem et al. 2021), KS influences MC (Purwanto 2021) and MC influences EP (Alolayyan and Alyahya 2023). Finally, this study proved that MC mediates between DLP humanistic dimension capabilities and EP. Altogether, MC develops bridges between DLP capabilities and EP.

5.1 | Theoretical Contributions

This study provides a significant theoretical contribution through emphasis on the critical role of the human dimension of DLP, such as DL, PA and KS, which are propelling MC leading towards EP. These results emphasize the critical implications, refinement, and application of SET and RBV theory, providing valuable insights for organizational leaders and managers for improving employees' capabilities to face the forthcoming challenges and moving at a frenetic pace with digitalization, strengthening employee capabilities and performance in the hyper-competitive era. These results reveal that, theoretically and empirically, social exchange has a pivotal role in enhancing organizational capabilities.

Blau (2017) mentioned that SET posits that associations within organizations are based on reciprocal exchanges reflected through building trust and commitment. On the basis of Barney's (1991) conception results, depicted that human capital and digital capabilities are the organizations unique resources

actively supporting sustainable competitive advantage. Additionally, SET also described that DLP at the middle management level enhances the organizational management system and fosters a trust-based exchange relationship (Li et al. 2024), where a previous study, Avolio et al. (2014), expressed that DLP fosters employee commitment and engagement, consequently improving organizational performance. So, this research added value to the existing research by showing how human-centric DLP capabilities, mediated by managerial skills, provide strategic advantages in EP through empirical investigation by unlocking the human dimension of DLP. This integration also shows how the relational and resource-oriented aspects of leadership complement one another, offering a comprehensive view of DLP in modern organizations.

5.2 | Practical Contributions

This study makes a substantial contribution to the body of knowledge regarding DLP and its influence on the EP in the organizations by depicting a framework (Figure 1) in this study that is pertinent not only to Bangladesh but also applicable to other emerging economies. This research finding has some significant practical contributions. First of all, though most of the prior research related to DLP has been conducted in mature organizations (Mihardjo et al. 2019b), consider the visionary or behavioural (Shin et al. 2023) aspects of DLP from different perspectives in diverse organizations. However, the impact of digital leaders human dimension competency, for example, DL, PA and KS, is applicable for strengthening DLP transformational capacity and getting output as social exchange enhances employees MC and EP. Second, this research contributes by addressing three previous research limitations. The empirical application of the theoretical model of Abbu et al. (2022) and Erhan et al. (2022) is suggested to use DLP as independent variables. Therefore, this research has used the second order of DLP based on a human dimensional perspective. Third, Senadjki et al. (2023) study suggested exploring the employee skills or capabilities effect in the organizations. Thereafter, we have tested the MC of the employees as a mediation between DLP (second-order) capabilities and EP.

Fourth, this study uncovers a direct and mediating effect among the latent variables, offering new insight for achieving EP in the organizations. The acquired knowledge provides practical benefit to professionals aiming to improve their digital transformation undertakings. Moreover, in Industry 4.0, organizations can enhance their EP through the strategic allocation of resources and investment. In addition, this study emphasizes the significance of choosing competent digital executives who can accelerate digital transformation and provide organizations with a competitive advantage in the digital age. Fifth, this research provides valuable insights for Bangladeshi enterprises that are considering the implementation of digital technologies. Such results can contribute support to the governmental and other organizations efforts to expedite the process of digitalization and the implementation of Industry 4.0. Here the organization can arrange different training to enhance DL, train employees on how they can be positive in coping with digital environmental changes, motivate and facilitate employees for skill acquisition, and encourage them to be proactive in case of KS and collaborative style of decision-making. Policymakers should adopt a proactive stance to enhance

DLP by including school-, college- and university-level students in training for acquiring and mastering DLP competencies.

5.3 | Limitations and Future Research Directions

Digital transformation is an ongoing process which reflects that the Bangladeshi employees are facing challenges of digital transformation from inside and outside of the organizations. This study is a successful empirical accomplishment of the human dimensions of DLP in developing nations. Despite this study's successful implications and contributions to the existing knowledge world, it is not without its limitations. First, Abbu et al. (2022) proposed five human dimensions: DL, PA, skills acquisition, KS and participative style. However, due to the cross-loading in the rotated component matrix, this research was bound to eliminate skills acquisition and participative style from the second-order construct and conducted this study with the remaining three second-order constructs. Though this is a limitation, however, it provides novel contributions on the function of DLP human dimensions, MC and their impact on EP.

Second, this research has been conducted on the basis of the cross-sectional data with 279 existing employees of the different organizations. In the future, this research may be extended with more data and multilevel or multi-level data based on the research objectives and perspective, which may add value to the existing research fields. Third, although the present quantitative study and sample of participants provide valuable insights, qualitative research may apply to enhance these results. Fourth, this study investigated only one mediation effect of MC and DLP as they develop in the ever-changing digital environment. In the future, additional variables such as organizational learning, team collaboration, organizational support and employee engagement factors could be explored to broaden the research area based on different perspectives. Finally, in the future, investigations may transcend geographical and temporal limitations by conducting longitudinal studies that span multiple countries and sectors.

6 | Conclusions

This study sheds light on the significance of DLP in human dimensions, including DL, PAs and KS, and how they influence MC and EP in developing countries. This study highlighted that DL, PA and KS are prevailing for enhancing EP, but skill acquisition and participative culture still do not exist in every organization. It enhances the understanding of the impact of DLP human dimension capabilities on enhancing employees' performance, which is the key to sustainable EP. The results depict that the theoretical foundations of the human dimension of DLP have now been practically tested, demonstrating significant value in the growing body of research on DLP. In order to propel digital transformation, prevent potential risks and adjust to the ever-changing digital environment, it is essential that leaders possess the requisite digital proficiencies, encounters, foresight and consistency. Additionally, effective leadership is crucial in fostering digitally competent organizations that are capable of navigating technological advancements and establishing a psychologically secure environment during an age of digital transformation. Therefore, theoretically and practically,

it implies that DLP capabilities affect EP through developing MC. It is concluded the role of DLP is vital because of the adaptation to a changing environment and staying competitive. Last but not least, this study has contributed to Abbu et al.'s (2022) suggestion that the empirical investigation of the human dimension of digital leaders' capabilities be applied through empirically explored. Additionally, consider Erhan et al. (2022) and Senadjki et al. (2023) future research recommendations to explore the effect of DLP and workforce capabilities based on the digital transformational context. Finally, a digitally literate individual will retain a range of digital skills, knowledge of the principles of computing devices, and skills in using computer networks for organizational sustainability. It can be concluded that in the ever-growing digital world, the human dimension of DLP plays a crucial role in fostering organizational sustainability by enhancing employee engagement, KS and innovation.

Ethics Statement

Ethics clearance for this study was obtained from the University of Barisal, Department of Management Ethics (IRB) committee with protocol number: IQAC/MBA-HRM-23-010/2023.

Consent

Informed consent is obtained from all stakeholders included in the study.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The dataset used in this study is available from the corresponding author on reasonable request.

Peer Review

The peer review history for this article is available at: <https://publons.com/publon/10.1111/issj.12570>.

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Appendix 1
Questionnaire

Construct	Items	Sources
Digital literacy	DL1. In our organization learning is made easier by using ICT DL2. In our organization ICT allows us to produce more in the time we have DL3. In our organization all of the direct report team has the necessary skills to implement our strategy DL4. Our organization regularly seek outside resources (advice of thought leaders, joint research projects etc.) to help maintain the organization's talents DL5. Our organizations make sure the entire leadership team is knowledgeable with the strategic and operational benefits of digital age	Samani et al. (2020) Abbu et al. (2022)
Positive attitude	PA1. Our organization consistently advocates the best interests of our company PA2. As an employee I take digital system learning on myself to be accountable PA3. As an employee, I am committed to the success of our company PA4. As an employee, I like using ICT for learning PA5. As an employee I am more motivated to learn with ICT	Abbu et al. (2022) Ng (2012)
Knowledge sharing	KS1. Having the capability to share relevant knowledge among business units or departments KS2. I give every employee the opportunity to present 'what they are learning/have learned' to the rest of the organization KS3. I have implemented cultures that encourage experimentation and explore the new knowledge KS4. Having necessary steps of sharing knowledge capabilities with the stakeholders	Kordab et al. (2020)
Managerial performance	MC1. Our company's management is familiar with digital tools MC2. Our company's management has a clear vision for utilizing digitality in the future MC3. Our company's management supports the utilization of digitality in our company MC4. Digitality improves the prioritization of actions, projects and objectives MC5. Digitality Improve the alignment of strategy and operations	Sawy et al. (2020) and Yuniarty et al. (2021)
Employee performance	EP1. Finish the job faster than the specified time EP2. Have skills in the field of my work EP3. Understand the task that must be done EP4. Complete work according to a predetermined schedule EP5. Complete work according to company quality standards	Riyanto et al. (2021)

Appendix 2

Rotated Component Matrix

	Components				
	1	2	3	4	5
Managerial_Capa4	0.753				
Managerial_Capa3	0.717				
Managerial_Capa2	0.688				
Managerial_Capa5	0.666				
Managerial_Capa1	0.647				
Positive_Atti4		0.766			
Positive_Atti3		0.743			
Positive_Atti5		0.714			
Positive_Atti2		0.576			
Eemployee_Per5			0.759		
Eemployee_Per4			0.702		
Eemployee_Per3			0.700		
Eemployee_Per2			0.640		
Digital_Literacy5				0.752	
Digital_Literacy3				0.735	
Digital_Literacy4				0.683	
Knowledge_Sha3					0.735
Knowledge_Sha4					0.662
Knowledge_Sha2					0.594
Extraction method: Principal component analysis Rotation method: Varimax with Kaiser normalization					
a. Rotation converged in 6 iterations					

Total variance explained						
Components	Initial eigenvalues			Extraction sums of squared loadings		
	Total	(%) of variance	Cumulative (%)	Total	(%) of variance	Cumulative (%)
1	9.470	32.656	32.656	9.470	32.656	32.656
2	2.197	7.577	40.233			
3	1.683	5.802	46.036			
4	1.289	4.445	50.481			
5	1.055	3.640	54.120			
6	1.005	3.465	57.586			
7	0.956	3.297	60.882			
8	0.909	3.134	64.016			
9	0.858	2.958	66.974			
10	0.807	2.783	69.757			

(Continues)

Total variance explained						
Components	Initial eigenvalues			Extraction sums of squared loadings		
	Total	(%) of variance	Cumulative (%)	Total	(%) of variance	Cumulative (%)
11	0.763	2.631	72.388			
12	0.685	2.363	74.752			
13	0.608	2.097	76.848			
14	0.596	2.054	78.902			
15	0.585	2.017	80.920			
16	0.538	1.856	82.775			
17	0.516	1.780	84.555			
18	0.508	1.751	86.306			
19	0.472	1.628	87.934			
20	0.461	1.588	89.522			
21	0.456	1.574	91.096			
22	0.422	1.455	92.551			
23	0.384	1.324	93.875			
24	0.337	1.164	95.039			
25	0.330	1.136	96.176			
26	0.311	1.074	97.250			
27	0.281	0.968	98.218			
28	0.265	0.915	99.133			
29	0.251	0.867	100.000			
Extraction method: Principal component analysis						