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Enhancing Organizational Learning Capabilities through Digital Transformation: Role of Perceived Organizational Support and Knowledge Oriented Leadership

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Abstract

Digital transformation has become a necessity for organizations due to the speed with which it has prevailed into the lives. However, how it results in developing the organizational learning capabilities has yet not been well established in the literature. Building upon dynamic capabilities theory, perceived organizational support and knowledge oriented leadership were introduced as mediating mechanisms whereas knowledge sharing ability is the conditional variable. This study uses the quantitative approach to examine how and when digital transformation associates with organizational learning capabilities. Samples for two studies were drawn from banking sector of Pakistan. Confirmatory factor analysis using Mplus software was opted to analyze the data set. Findings of the study support the hypotheses that perceived organizational support and knowledge oriented leadership mediate the relationship between digital transformation and organizational learning capabilities whereas knowledge sharing ability moderates the relationship between digital transformation and the two mediators; namely perceived organizational support and knowledge oriented leadership. Full model was also supported. Digital transformation enhances the organizational learning capabilities through perceived organizational support and knowledge oriented leadership provided that the employees possess the knowledge sharing ability.

Keywords: Digital transformation, knowledge oriented leadership, knowledge sharing ability, organizational learning capabilities, perceived organizational support, banking sector.

1. Introduction

In their efforts to sustain and develop in today's competitive environment, organizations build their knowledge management capacity through new and unique techno structural changes. Despite being successful, if organizations want to survive in the long-run they have to continuously integrate new ways of doing things into their activities, processes and system (Wang & Hu, 2024). Digital transformation is different from digitization and digitalization. Digitization is converting the analogue and manual activities of an organization to computer based activities and digital systems, whereas, digitalization is the use of technology and capabilities to change business processes (Hsiao, 2024). Digital transformation is a kind of techno-structural intervention (Hailey & Tüzüner, 2022) that involves transformation at strategic level and impacts not only the organization but economy and society as well (Hsiao, 2024). Not every change effort is successful (Su, Wei, Wang & Liu, 2023). Research on digital transformation has examined a variety of factors that motivate an organization to implement this change, which highlight the need to study the processes and conditions that could be considered to make the process successful by developing organizational learning capability.

First, the extant literature has examined the facilitating role of organizational learning capability that is crucial for positive outcomes like performance and innovation (Gomes, Seman, Burndt & Bogoni, 2022; Escrig, Broch, Chiva & Alcamí, 2023) and little is known about its occurrence. Achieving low costs by building more units is not always a successful strategy. If a knowledge spill over takes place in an industry and knowledge transfer does not occur, enhancing production will not benefit the organization if other firms benefit from an organization's acquired knowledge (Argote, Lee & Park, 2020). Firms need competitive advantage that is unique to them and cannot be imitated by competitors. Implicit and explicit knowledge including skills and expertise of employees is one way to achieve that advantage (Gomes et al., 2022). However, research also suggests that not all employees at all levels are equally capable of bringing out the change due to different learning and sharing capabilities (Khatri, Duggal, Datta, Kumari, Thomas, Brod & Colimoro, 2023).

Second, there are studies that have described varying perspectives on digital transformation (Wang, Hummel & Nandhakumar, 2023). We know less about how digital transformation can be associated with organizational learning capabilities (OLC). Digital transformation requires the organizational members to update their abilities and ways of doing work (Bican & Brem, 2020) and hence, it is an opportunity for them to develop knowledge and skills (Gomes, et al., 2022). Described as techno-economic paradigm revolution (Su et al., 2023) and a pillar of the fourth industrial revolution, digital transformation implies to learn a variety of digital capabilities (Romero, Sanchez & Martin, 2022). There is evidence that digital transformation improves performance (Romero et al., 2022; Wang & Hu, 2024),

innovation, creativity (Zhao, Chen & Yuan, 2024) and impacts knowledge management (Alvarenga et al., 2020) and productivity (Kazmi et al., 2021). We still know relatively less about a wider influence of digital transformation on organizational learning capability.

Third, being compassionate in nature, OLC demands integration of limited resources and competencies to cope with the change (Hailey & Tüzüner, 2022). Hsaio (2024) has identified factors that contribute to OLC through the lens of dynamic capabilities theory (DCT). However, there is insufficient examination of the underlying mechanisms and conditions that explain the relationship of OLC with digital transformation (DT) and the impact of later on OLC.

Fourth, there is scarcity of research in the context of DT and its consequences, particularly in developing countries. Kazmi et al., (2021) suggests that studies must be conducted in this context in different industries and with a different set of factors that impact OLC. Chughtai & Khan (2024) also suggest conducting studies with multi-source and time-lagged data. In order to understand, how OLC is underpinned by dynamic capabilities, requires the examination of a variety of resources involved in the process.

This study, therefore aims to examine when and how digital transformation relates with OLC. For this, we draw our theory on DCT to hypothesize and test a cognitive resource mediation pathway, i.e., perceived organizational support and an internal resource mediation pathway, i.e., knowledge oriented leadership for a better understanding of underlying mechanisms. Perceived organizational support is the extent to which employees in an organization believe that their contributions are valuable to the organization and it is concerned about their well-being (Eisenberger, Huntington, Hutchison & Sowa 1986). Knowledge-oriented leadership (KOL) is a leadership style that focuses on integrating knowledge management and its underlying processes and promotes learning within an organization (Jia, Khassawneh & Mohammad, 2024). Resource perspective assimilates the individual and work centric consideration of the mediating mechanisms (Cao & Le, 2022). Simultaneous examination of the two mediators helps in capturing the multiple resources and organization offers to its members (Gomes et al., 2022). Moreover, DCT suggests that depending on the nature of the pooled resources, dynamic capabilities vary in their motivational effect (Arraya, 2022). As knowledge sharing abilities (KSA) are related to the potential utilization of resources in the organization, we believe it will impact the degree to which employees use the available resources to develop their knowledge and skills in the organization (Cao & Le, 2022). Digital transformation changes the actions and practices of an organization (Wang et al., 2023). Drawing on DCT and complementing with Applebaum et al. (2000) Ability, motivation, opportunity (AMO) theory, this study hypothesizes that KSA moderates the mediated relationship between DT and OLC through perceived organizational support (POS) and KOL. Theoretical framework of the study is depicted in Fig. 1.

Research findings of the study make significant contributions to dynamic capabilities and organizational learning research. First, the study extends the understanding of OLC by content specification in the particular context. The endeavor is worthwhile as developing OLC is a fundamental and persistent challenge in the wake of high-tech world. Second, the study identified the mediating mechanisms related to valuable dynamic resources through which digital transformation relates with OLC. The findings are a source of important insights into the role of POS and KOL. Third, this study adds to the limited but growing body of knowledge on digital transformation by introducing organizational resources as mediating factors and examining their impact on outcomes. A more nuanced approach was followed in this direction by adding a conditional factor, i.e., KSA related to the effect of DT on learning capabilities through limited resources. The boundary conditions introduced as KSA enrich the understanding so as we know when digital transformation has a stronger or weaker influence to resources and subsequent outcomes. The findings also provide an insight into how to develop OLC. In the following sections, this research paper gives the literature review, methodology, results, discussion and limitations of the study along with future research directions.

2. Literature Review

2.1 Digital transformation (DT) and Organizational Learning Capabilities (OLC)

Lack of understanding between the similar concepts like digitalization and digital transformation may lead to an unfocused approach towards strategy (Reisberger, Reisberger, Copuš, Madzík & Falát, 2024). Digital transformation is the use of information and digital technologies by the organizations to enhance their innovation and learning, competitiveness and capabilities. It involves the transformation of business processes, models, methods of delivery and value creation (Liu, Dong & Qion, 2024). It is "the digitalization of previously analog machine and service operations, organizational tasks, and managerial processes" (Pagani & Pardo, 2017, p.185). OLC are the organization's abilities to generate and implement ideas through learning processes. Commitment to learning and transfer of knowledge are important factors that influence OLC (Hailey & Tüzüner, 2022). From the perspective of dynamic capabilities theory, to be successful and to respond to the dynamic environmental changes, organizations need certain capabilities which can be achieved by modifying, developing and integrating their resource base (Teece, David, Pisano & Gary, 1994).

Digital transformation is a strategic way for organizations to incorporate technology based systems and operations to develop the skills of people and turn them into more capable individuals (Hsiao, 2024). Transforming to digital transformation requires employees to update their knowledge and abilities (Kazmi et al., 2021). Use of digital technologies usually change the way business was carried out prior to digital transformation. The change requires new systems, platforms and enabled processes for successful transformation to take place (Bican & Brem, 2020). Integration of any strategic change into the system requires the alignment of developing and implementation phases. Those who have to carry

on the processes need a smooth transition from existing to current protocols that requires updating their skills and abilities (Wang & Hou, 2024). Hence, it is proposed that

- H1: Digital transformation has a positive relationship with organizational learning capabilities.

2.2 The Mediating Role of Perceived Organizational Support (POS)

To explain the relationship of digital transformation with OLC, we draw from dynamic capabilities theory (DCT) which emphasizes the role of different phases of strategic management in properly developing, integrating and aligning organizational skills, competencies and resources in a dynamic environment (Teece et al., 1994). Perceived organizational support (POS) has been introduced as a mediating mechanism in this study. It represents a resource such that people believe that their organization considers their contributions as valuable and is careful towards their well-being. It is considered as a source to fulfill their socio-emotional needs. Based on DCT, we predict that POS evolves by digital transformation which in turn makes employees more capable at workplace.

Digital transformation is a means to increase support from the organization that employees perceive as valuable and beneficial for them. Any change in the organization must be supported and adopted by the top management to make it successful (Cummings & Worley, 2014, p.23). Embedding the processes into the organizations paves the way for innovative outcomes never experienced before (Karp, 2023). POS provides the opportunities to develop knowledge and skills. The skill development paves the way towards capability enhancement in a changed environment (Otioma, 2023). Strategic response and changes are initiated by the organization and directed towards employees (Liu et al., 2024). The support from the organization can pace-up the change process (Bican & Brem, 2020). According to DCT, people adapt to the dynamic changes easily when they perceive that organization is willing to support and the change will bring mutual gain for all of them (Hauke-Lopes., Ratajczak-Mrozek, & Wieczerzycki, 2023).

Traditional organizations need to adopt new ways of doing daily activities to sustain in the competitive environment (Lopes et al., 2023). In the process of unlearning conventional methods and learning new technology based processes, continuous support from the organization is needed by the employees (Wang & Hou, 2024). Previous studies show that when people are not treated well in the organizations and management is focused only on task fulfillment, the response of employees to any change initiative would not be positive (Zhao et al., 2024). Support from the leaders and organization help employees to gain knowledge and develop skills. Supportive organizations develop the capabilities and conditions that help employees in achieving strategic goals (Kazmi et al., 2021). Transforming to digital operations and processes requires organizational members to learn new knowledge and skills (Gomes et al, 2022) which becomes conducive with the support of others in the organization (Wu & Liu, 2022). Subsequently, resources needed to digitally

transform enhance the organizational support (Alvaringa et al., 2020) to the employees which in turn enhances organizational learning capability (Hailey & Tüzüner, 2022). The motivation to learn dynamic capabilities in DCT activates the pattern of learning behaviors that result in OLC.

The quality of learning depends upon the resources available to learn and develop certain abilities (Hsiao, 2024). Employees who receive support from organization in the context of digital transformation are likely to engage in activities necessary for skill and capability development and evolve into skilled individuals with collective organizational learning capability. To summarize, according to DCT which links internal and external resources, dynamic capabilities and potential to learn, the study suggests that organizational learning capability is enhanced when employees experience a more supportive organizational resources when an organization is going through a strategic level techno-structural change. Hence, it is proposed that

- H2: Perceived organizational support mediates the relationship between digital transformation and organizational learning capabilities.

2.3 The Mediating Role of Knowledge Oriented Leadership (KOL)

Next, knowledge oriented leadership was studied as an internal resource associated with transforming the organizational from manual functions to digital ones. In the process of transformation, it explains the relationship between digital transformation and OLC. Knowledge-oriented leadership (KOL) is a leadership style that focuses on facilitating knowledge management and promoting innovation within organizations (Manzoor & Zang, 2024). Knowledge based leadership creates, organizes, transfers and develops knowledge (Sadegi & Rad, 2018).

The extant literature reveals that change processes like digital transformation must engage leaders who are well aware of the importance of knowledge oriented leadership. These leaders must be able to model the behavior that is expected of employees (Arraya, 2022). Learning oriented leaders serve as a resource in the organization (Romero et al., 2022). Employees trust and rely on them to build their skills and capabilities as leaders are the role models for other members of the organization (Escrig et al., 2023). Leaders are the change agents, so they have a better insight into the transformation process than anyone else in the organization (Bican & Brem, 2020). Introduction of new technologies while replacing the existing analogue systems requires them to build the necessary skills and capabilities before other employees (Romero et al., 2022). After learning the process, they become the resource that other members look towards for guidance and coordination throughout the change process. Once leaders are ready to initiate the change, they will be able to train and develop the required capabilities among organizational members (Chaar & Easa, 2020).

Knowledge oriented leadership is the core job of a knowledge oriented leader. It is a significant step in knowledge management process (Zhao et al., 2024). When an

organization decides to transform its processes, activities and operations to digitalized substitutes, its leaders must be fully knowledgeable and equipped with latest tools to monitor and implement the transformation process (Wang & Hu, 2022). From the perspective of DCT, the dynamic resources are being utilized at optimal potential.

There is also support that change processes fail because of lack of interest from top management. As a result of that change agents are not skilled and lack the necessary knowledge to transform the organization (Arraya, 2024). Learning abilities of employees are hampered as a result (Escrig et al., 2023). Organizations that want to transform digitally, but do not provide necessary support to the employees (Escrig et al., 2023) in the form of knowledgeable and skilled leaders cannot easily develop the learning capabilities (Cao & Le, 2022) among employees. In the absence of normative behavior, employees cannot receive the resources from leaders necessary to develop dynamic capabilities, hence exhibiting reduced ability to learn. In contrast, leaders serving as a knowledgeable resource have important impact for learning capabilities. When employees see that organization is putting efforts and resources to develop their abilities, they assess that there are more benefits in learning new skills and knowledge (Arraya, 2024). According to DCT, people are willing to give their best when they are motivated by the fact that ample resources are available to go through a process that they have never experienced before (Cao & Le, 2022). In this sense, employees who cannot develop new skills and learn new knowledge are at a disadvantage in making any significant effort in transforming the organization. Hence, in presence of availability of dynamic resources, members must endeavor to learn the new ways of doing things to reap the mutual benefits. Therefore, we propose the following:

- H3: Knowledge oriented leadership mediates the relationship between digital transformation and organizational learning capabilities.

2.4 The Moderating Role of Knowledge Sharing Ability (KSA)

We expect that digital transformation involves knowledge oriented leadership that is necessary for organizational learning capability. DCT suggests that people differ in their abilities to learn and share. They can experience different outcomes. A major consideration here is that people with lesser ability to share the knowledge are less motivated to take advantage of organizational resources (Cotta & Salvador, 2020). At the workplace, an individual level factor that could affect resource utilization is knowledge sharing ability. It is a component of Applebaum et al. (2000) ability, motivation, and opportunity (AMO) framework. Knowledge sharing ability has been defined as the ability of an individual to share and transfer knowledge (Arraya, 2022). An individual would not be able to share the knowledge if he/she does not have the ability to do so (Cotta & Salvador, 2020). Studies have found that according to DCT, positive consequences are considered as a valuable resource (Romero et al., 2022) which requires an individual to have this ability. This study supplements DCT with AMO framework to argue that knowledge sharing

ability moderates the relationship between digital transformation and the two mediators, i.e., POS and KOL. Higher level of ability to share knowledge motivates employees to perform better at learning as they intend to share the learned knowledge. Sharing their explicit and implicit knowledge is a way to gain recognition (Fischer, 2024). In this context, performance of employees would be synonymous to learning new knowledge and developing new skills. It will ultimately enhance the collective learning capabilities of all members and hence, the organization (Arraya, 2022). If knowledge is withheld by the owners and is not shared and/or the knowledgeable individuals lack the efficacy to transfer knowledge, then it will not serve as a source to build capability (Dzenopoljac et al., 2024). As knowledge sharing occurs at individual and team level, attention must be given at both levels as a high-performance goal at the organizational level. At higher levels of KSA, if organizational resources are not ample and there is minimal support, members may not take benefit form knowledge oriented leadership (Argote et al., 2020). It might be the case that in absence of resource infra-structure, other internal resources are not recognized by the employees (Hailey, 2022). We can summarize it as, in presence of organizational and leadership support, when an organization is going through transformation phase, KSA of employees would be utilized at maximum potential. As AMO framework assumes, when employees have the opportunity to share knowledge and they are motivated to do so, the factor that can hinder sharing is the lack of ability to share. In other words, ability to share knowledge alone cannot help an organization to transform digitally, if the dynamic resources are not available.

In addition, higher levels of KSA would lead people to be motivated to utilize the opportunities to learn (Cao & Le, 2022) and develop themselves according to the demands of change efforts (Hsiao, 2024). Therefore, when an organization is undergoing a strategic level transformation process, members become more sensitive to sharing knowledge with others so that they can mutually help each other learn and feel advantageous about utilization of resources. In contrast, at lower levels of KSA, employees do not feel confident and do not believe that they can share their knowledge in an effective way (Cotta & Salvador, 2020), so they care less about the change process, change agents and the related resources (Bican & Brem, 2020). They feel strongly about loss of resources when they have high level of KSA and vice-versa. It strengthens and weakens the influence of digital transformation on perceived organizational support and knowledge oriented leadership. Therefore, it is proposed that

- H4: Knowledge sharing ability moderates the relationship between digital transformation and perceived organizational support (such that high knowledge sharing ability increases the positive influence of digital transformation on perceived organizational support and vice-versa).

Fundamental idea of AMO framework describes that ability to share knowledge has significant importance, as in absence of KSA, organizational resources would be less meaningful to utilize. Resources in the form of support, organizational functions,

technology, equipment, tools and leadership directing towards learning and integrating knowledge would be less advantageous, if the employees who are expected to learn and share find it cumbersome to share their expertise.

As mentioned above, KSA is a motivator for members to utilize resources for learning and sharing (Dzenopoljac et al., 2024). However, research has found that the outcomes of KSA do not necessarily specify the learning behaviors in the organizational learning context (Arraya, 2022). Few of the studies provide evidence about the knowledge sharing behavior of KSA in OLC (Chaar & Easa, 2021). Employees with higher levels of KSA will exert more efforts to use this opportunity to develop their skills and expertise as compared to those low on KSA. Doing so will help them recognize as updated, learned and skilled among others (Escrig et al., 2023). This will affect resource allocation as employees are willing to utilize the valuable dynamic resources on learning and development, an area directly associated with learning capabilities. Tasks that are less significant need not the efforts and resources to be directed towards them (Gomes et al., 2022). Therefore, a high level of KSA means employees have a high potential to transfer implicit and explicit knowledge by utilizing resources in the best way. When this occurs, it is more likely that in the process of digital transformation, employees will be able to take benefit of dynamic resources through their efficacy to share knowledge. Therefore, it is proposed that

- H5: Knowledge sharing ability moderates the relationship between digital transformation and knowledge oriented leadership (such that high knowledge sharing ability increases the positive influence of digital transformation on knowledge oriented leadership and vice-versa).

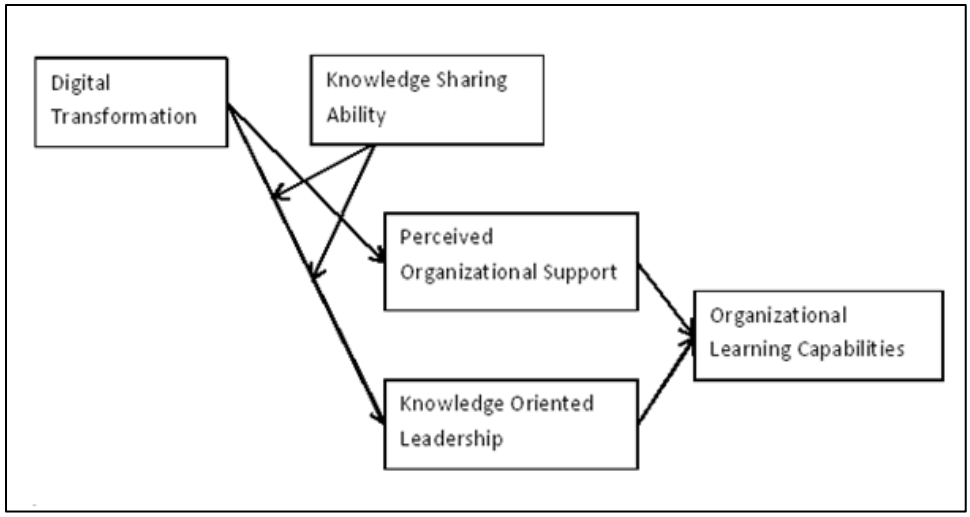

Figure 1: Theoretical Framework

Figure 1 shows the theoretical framework of the study. It is a moderated mediation model that has been developed on the basis of literature review and the knowledge gap given above. Independent variable, i.e., digital transformation influences the dependent variable through the mediating variables introduced as perceived organizational support and knowledge oriented leadership in the framework. The relationship between independent variable and mediators is stronger in presence of the moderating variable, i.e., knowledge sharing ability and weaker when it is low.

2.5 Overview of Studies

The hypotheses were tested in two studies. Study 1 tested H1, H2 and H4. It tests the mediation process through POS. Study 2 tested the pathways adding the mediation process of KOL. Thus, the model as given in figure 1 was tested in study 2 building upon study 1. Study 2 is more rigorous as it introduced the related control variables as well as the second mediator for testing the hypothesized model.

3. Methodology (Study 1)

3.1 Sampling and Procedure

Population of the study consists of a sample of employees and their immediate supervisors in banking sector of Pakistan. Data collection was done through a group of HR professionals among the network of the authors. The data was collected at multiple points in time with a difference of minimum three weeks to avoid common method variance. Thus the data was multi source and time lagged (Podsekoff , McKenzie & Podsekoff, 2012). Initially, 600 employees were selected from with the help of HR managers in specific banks. Initial survey explaining the purpose of study, ensuring their anonymity was administered. Data was collected for digital transformation, KSA and the demographic variables. Of the 500 employees and 117 teams, size of usable survey was 351 individuals from 70 teams were received, contributing to response rate of 70%. In the next stage of data collection, follow-up survey was conducted with 351 employees to provide data on mediating variable POS. Surveys complete in all respects were received from 293 employees, turning to a response rate of 83%. Lastly, again with the assistance of HR managers, 73 supervisors were identified of 293 employees. Supervisory survey for OL was sent to them asking them to evaluate the employee's OLC. 61 supervisors responded as complete surveys. Among 293 employees, 52.3%were men, 19.3% were under age 26, 54.7% were single, 30.5% over age 45, 36.8% had a minimum of 14 years qualification and only 13.7% had tenure with current organization of less than 1 year.

3.2 Measures (Study 1)

The questionnaire was developed in English language as the minimum level of participants was 14 years of education. They had enough knowledge of the language to comprehend and respond. To measure the variables, 5-point Likert type scale was used with 1 for strongly disagree to 5 for strongly agree.

3.2.1 Digital Transformation

This is a dimension of digital transformation. 4-item scale developed by Kontic and Vidicki (2018) was adopted to measure digital transformation. The item included, “Employee monitor operations in real time.” Cronbach alpha that measures reliability of the scale was 0.89.

3.2.2 Perceived Organizational Support

Perceived organizational support was measured using eight-item scale developed by Eisenberger et al. (1986). The items include “My organization strongly considers my goals and values,”. Cronbach alpha was 0.9

3.2.3 Knowledge Sharing Ability

This study adopted the scale used by Siemsen et al (2008) to measure KSA using the 4-item scale. The scale included items like, “I have a lot of good ideas worth sharing.” Cronbach alpha was 0.88.

3.2.4 Organizational Learning Capabilities

This study used the scale from Spicer and Sadler-Smith (2006) to measure organizational learning capabilities. It is a 7-item scale. It includes items like, “We view our customers as a regular source of information.” Cronbach alpha was 0.91.

3.3 Control Variables (Study 1)

Demographic variables were controlled in this study like gender, age, qualification, tenure with the current organization, and marital status. Later was controlled because it has been found to have an effect on emotional perceptions and cognitive processes in previous studies (Arraya, 2022).

3.4 Data Analysis – Confirmatory Factor Analysis (Study 1)

Mean, standard deviation, reliabilities and correlations of study 1 are shown in Table 1. Mplus 8.3 was used to perform statistical analysis, i.e., multi-level confirmatory factor analysis (CFA). As shown in Table 2, the hypothesized model for study 1 is a four factors model (Digital transformation, POS, KSA, OL) that is a good fit to the data well ($\chi2[224] = 315.46$, $\chi2/df = 1.41$, RMSEA = 0.03, TLI = 0.97, CFI = 0.97, SRMR within = 0.04, SRMR between = 0.07). The results of CFA show that the proposed model is a good fit to the data. For a multi-level research design, the study followed the procedure suggested by Goodman and Blum (1996). While running multiple logistic regression, time was taken as dependent variable and other variables in the hypothesized model as independent variables. Some of the regression coefficients were significant while others were insignificant. Across time, mean differences in study variables were assessed. T-tests showed that there was no significant difference between means. Hence, attrition was not a serious issue.

Table 1: Descriptive Statistics of Study 1

Variable	Individual		Team		1	2	3	4	5	6	7	8	9	10
	Mean	SD	Mean	SD										
1.Size			4.51	1.07							0.25**	0.22**	0.21**	0.04
2.Gender	0.51	0.49	-	-	-	-	-	-	-	-	-	-	-	-
3.Age	1.57	1.16	-	-	-	0.05	-	-	-	-	-	-	-	-
4.Qualification	1.53	1.08	-	-	-	0.04	-	-	-	-	-	-	-	-
5.Marital Status	0.46	0.50	-	-	-	-0.01	-	-	-	-	-	-	-	-
6.Tenure	1.83	1.2	-	-	-	0.07	-	-	-	-	-	-	-	-
7.DT	3.81	0.52	3.81	0.49	-	0.02	-0.01	0.01	-0.03	0.01	**0.89**	0.54**	0.51**	0.01
8.OLC	3.38	0.46	3.38	0.51	-	0.01	-0.01	0.02	0.04	0.02	0.41**	**0.91**	0.54**	0.12*
9.POS	3.72	0.74	3.72	0.61	-	0.03	0.02	-0.01	-0.02	-0.02	0.28**	0.41**	**0.90**	0.02
10. KSA	3.62	0.82	3.62	0.50	-	0.01	0.04	0.03	0-0.03	0.01	0.02	0.03	0.05	**0.88**

n = 61 teams;, *n* = 293individuals. Team and individual correlations are above and below the diagonal. Diagonal bold values are reliabilities, α. *$p < 0.05$, **$p < 0.01$. DT=digital transformation, POS=perceived organizational support, KOL=knowledge oriented leadership, OLC=organizational learning capabilities, KSA=knowledge sharing abilities

Table2: CFA Results Multi-level Study 1

	$\chi 2$	df	$\chi 2$/df	TLI	CFI	RMSEA	Within SRMR	Between SRMR
Model 1: 4 factor model	315.46	224	1.41	0.97	0.97	0.03	0.04	0.07
Model 2: 3 factor model	1261.71	230	5.49	0.73	0.77	0.11	0.13	
Model 3: 2 factor model	2083.54	232	8.98	0.53	0.59	0.14	0.16	0.24
Model 4: 1 factor model	2773.17	234	11.85	0.38	0.46	0.17	0.19	0.24

CFA=Confirmatory Factor Analysis. (1) a three-factor model combined OLC and KS Ability into one factor; (2)a two-factor model combined OLC, KS Ability and POS into one factor; and (3) a one-factor model

3.5 Hypotheses Testing

A multilevel moderated mediation model was tested in study 1 to identify the empirical associations between digital transformation and organizational learning capabilities through perceived organizational support contingent on knowledge sharing ability. Table 3 shows the results of hypotheses of study 1. Direct effect of digital transformation on organizational learning capabilities was ($\beta = 0.41$, se = 0.19, $p < 0.01$). H1 was supported. Digital transformation was positively related to perceived organizational support ($\beta = 0.5$, se = 0.07, $p < 0.05$).

Table 3: Results of Hypothesis of Study 1

	Perceived Organizational Support (POS)				Organizational Learning Capability (OLC)			
	Estimate	SE	*p*	95% CI	Estimate	SE	*p*	95% CI
Within level								
1.Gender	0.03	0.01	0.22	[-0.05,0.20]	-0.01	0.02	0.31	[-0.11,0.23]
2.Age	0.02	0.01	0.63	[-0.09,0.17]	0.01	0.02	0.35	[-0.05,0.22]
3.Qualification	-0.01	0.02	0.67	[-0.04,0.06]	0.02	0.03	0.42	[-0.14,0.08]
4.Marital Status	-0.02	0.01	0.65	[-0.05,0.08]	0.04	0.03	0.51	[-0.01,0.42]
5.Tenure	0.07	0.03	0.61	[-0.06,0.04]	0.02	0.04	0.57	[-0.09,0.50]
6. POS	-	-	-	-	0.54**	0.1	0.00	[-0.45,-0.08]
Between Level								
7. Size	0.01	0.05	0.55	[-0.06,0.16]	-.02	0.04	0.63	[-0.13,0.27]
8.POS	-	-	-		0.28**	0.08	0.00	[-0.55,-0.20]
9. DT	0.5*	0.07	0.04	[-0.95,0.08]	0.41**	0.19	0.00	[0.01,0.31]
10. OLC	0.04	0.06	0.6	[-0.17,0.15]				
11. DT*KSA	1.41*	0.47	0.03	[-1.74,-0.27]				

Note: DT=Digital Transformation, POS=Perceived Organizational Support, OLC= Organizational Learning Capability. KSA= Knowledge Sharing Ability. n = 61 team, n = 293individuals. *p < 0.05, **p < 0.01

Further, perceived organizational support was positively related to OLC (β = 0.28, se = 0.08, p < 0.01). H_2 proposed a mediation relationship between digital transformation and OLC through perceived organizational support. The indirect effect was significant (β = 0.14, se = 0.08, p < 0.01) supporting H_2. Next, the study tested the conditional indirect effect of knowledge sharing ability on the relationship between digital transformation and perceived organizational support.

Table 3 shows that the interaction term was significant (β = 0.41, se = 0.07, p < 0.05) and positively associated with perceived organizational support. The plot of interaction term is shown in Figure 2. At a high level of knowledge sharing ability, the relationship between digital transformation and was stronger (β = 0.39, se = 0.30, p < 0.05) and at lower level of knowledge sharing ability, the relationship between digital transformation and was weaker (β = 0.19, se = 0.37, p<0.05). H_4 was supported.

The moderated mediation index (index = 0.40, p < 0.05, 95%CI [0.00, 0.80]) shows that the conditional variable knowledge sharing ability significantly moderates the relationship between digital transformation and OLC through perceived organizational support.

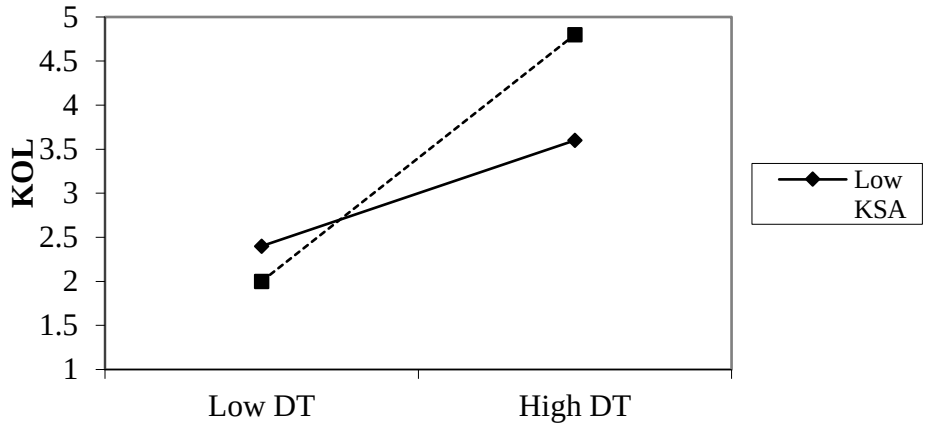

Figure 2: Moderating Effect of KSA on the Direct Relationship of DT and KOL

Figure 2 shows the moderating effect of knowledge sharing ability (KSA) on the direct relationship between digital transformation (DT) and knowledge oriented leadership (KOL). The two-way interaction plot shows that the direct relationship between DT and KOL is stronger when KSA among employees is higher. At low levels of KSA, the direct relationship between DT and KOL is weaker. It can be further interpreted that employees having knowledge sharing ability would be able to take benefit of digital transformation more as compared to those having low levels of KSA.

4 Methodology (Study 1)

4.1 Measures and Sampling and Procedure

4.1.1 Measures - Knowledge Oriented leadership

This study used the Collins & Smith (2006) scale to measure knowledge oriented leadership. It is an 8 items scale with items included, "Leadership has been creating an environment for responsible employee behavior and teamwork". Cronbach alpha was 0.86.

4.1.2 Sampling and Procedure

In study 2, building upon study 1, the full hypothesized model was tested. Mediation process of KOL was introduced. The three major banks were selected in study 2 who have their branches network spread all across Pakistan. There are number of public sectors, private sector and Islamic banks in Pakistan. Only three of the banks were selected who are operational in larger cities of Pakistan. Banks and the employees were ensured anonymity of responses. The banks selected for two studies were different from each other to enhance the validity of the studies. These were not included in study 1 and by developing liaison with HR managers; survey was administered among 90 work teams with 600 employees. Data of employees available at each selected branch was used to randomly

select employees. The employees rated digital transformation and KSA at T1. 467 employees from 73 teams responded making a response rate of 78%. Two weeks later POS and KOL at T2 were measured. Follow-up survey was sent to employees using the same procedure as in study 1. At time T33, supervisors of 467 employees were sent surveys to rate the OL of employees. From 80 supervisors, 68 responded with complete surveys. In the end, 68 teams with 379 individuals were used in the data analysis. Response rate was 81%. In the final analysis, data from 129 teams and 672 employees was used. Among the 672 employees, 53.37% were men. 51.7% were single, 20.4% under age of 26 years, 28.7% had at least 14 years of education, 21.05% had a tenure of less than one year with current organization.

4.2 Descriptive Statistics and Confirmatory Factor Analyses Study 2

Mean, standard deviation, reliabilities and correlations of study 1 are shown in Table 4. Mplus8.3 was used to perform statistical analysis, i.e., multi-level CFA. Values of Cronbach alpha are given on the diagonal.

Table 4: Descriptive Statistics of Study 2

Variable	Individual		Team		1	2	3	4	5	6	7	8	9	10	11
	Mean	SD	Mean	SD											
1.Size			5.15	0.83	-	-	-	-	-	-	.21**	.13**	.24**	.28**	.11
2.Gender	0.50	0.49			-	-	-	-	-	-	-	-	-	-	-
3.Age	1.81	1.11			-	.12*	-	-	-	-	-	-	-	-	-
4.Qualification	1.25	0.99			-	.11	-	-	-	-	-	-	-	-	-
5.Marital Status	0.51	0.49			-	0.08*	.11*	.21*	-	-	-	-	-	-	-
6.Tenure	2.05	1.09			-	.08	-.10	.11	-.07	-	-	-	-	-	-
7.Digital Transformation	3.80	0.50	3.80	0.21	-	0.03	-0.01	0.02	0.05	-0.01	**0.89**	0.41**	0.37**	0.21**	0.57**
8.OLC	3.36	0.44	3.36	0.32	-	0.01	-0.02	0.04	0.06	-0.02	0.23**	**0.90**	0.31**	0.09*	0.56**
9.POS	3.70	0.81	3.70	0.57	-	0.01	-0.04	-0.03	0.11*	0.02	0.34**	0.36**	**0.90**	0.33**	0.61**
10. KS Ability	3.78	0.79	3.78	0.42	-	0.01	0.02	0.04*	-0.01	0.03	0.01	0.02	0.11*	**0.89**	0.10*
11. KOL	3.58	0.47	3.58	0.23	-	0.02	-0.01	0.03	0.06	-0.03	-0.01	0.31**	0.25**	0.14**	**0.86**

Team level, $n = 68$; individual level, $n = 379$. Team and individual correlations are above and below the diagonal. Diagonal bold values are reliabilities, α. *$p < 0.05$, **$p < 0.01$*$p < 0.05$, **$p < 0.01$. DT=digital transformation, POS=perceived organizational support, KOL=knowledge oriented leadership, OLC=organizational learning capabilities, KSA=knowledge sharing abilities

4.3 Hypotheses Testing

Table 5: CFA Results Multi-level Study 2

	$\chi 2$	df	$\chi 2$/df	TLI	CFI	RMSEA	Within SRMR	Between SRMR
Model 1: 4 factor model	396.27	302	1.31	0.97	0..99	0.03	0.02	0.07
Model 2: 3 factor model	867.82	324	2.68	0.93	0.97	0.05	0.03	0.08
Model 3: 2 factor model	1671.91	338	4.95	0.88	0.87	0.08	0.06	0.26
Model 4: 1 factor model	2275.42	350	6.50	0.71	0.76	0.11	0.09	0.29

Table 5 shows Study 2's confirmatory factor analysis. As in Study 1, we also used Mplus8.3 to perform MCFA, which showed that the hypothesized four factor model fit the data better ($\chi 2[302] = 396.27$, $\chi 2/df = 1.31$, RMSEA = 0.03, CFI = 0.99, TLI = 0.97, SRMR within = 0.02, SRMR between = 0.07) than alternative models given in Table 5). The results of CFA show that the proposed model is a good fit to the data. Similar to study 1, same procedure was used to address potential attrition bias. Some respondents leave the study when data is collected in waves or at different intervals. Some respondents stay till the end and do not leave. Due to this, bias may be introduced in the data, that is called attrition bias. Logistic regression coefficients were insignificant and t-tests showed no significant differences in means. Hence, attrition bias was not an issue.

Table 6: Results of Hypothesis of Study 2

Variables	POS				KOL				OLC			
	B	SE	*p*	95% CI	B	SE	*p*	95% CI	B	SE	*p*	95% CI
Within level												
1.Gender	0.05	0.04	0.25	[-0.05,0.21]	0.02	0.04	0.63	[0.04,0.51]	-0.01	0.02	0.31	[-0.11,0.23]
2.Age	0.02	0.05	0.07	[-0.19,0.02]	0.05	0.05	0.51	[0.08,0.47]	0.01	0.02	0.35	[-0.05,0.22]
3.Qualification	-0.01	0.03	0.18	[-0.07,0.05]	-0.02	0.01	0.33	[-0.17,0.21]	0.02	0.03	0.42	[-0.14,0.08]
4.Marital Status	-0.04	0.02	0.82	[-0.06,0.64]	-0.04	0.02	0.21	[-0.02,0.16]	0.04	0.03	0.51	[-0.01,0.42]
5.Tenure	0.05	0.02	0.71	[-0.06,0.04]	0.03	0.02	0.47	[0.06,0.38]	0.02	0.04	0.57	[-0.09,0.50]
6. POS									0.49**	0.05	0.00	[0.39,0.59]
7. KOL									0.21**	0.05	0.00	[0.11,0.32]
Between Level												
8. Size	0.01	0.05	0.55	[-0.03,0.04]	-0.02	0.03	0.33	[-0.12,0.06]	0.02	0.07	0.61	[-0.16,0.31]
9. DT	0.41**	0.21	0.00	[0.29,0.51]	0.47**	0.11	0.00	[0.36,0.58]	0.48**	0.08	0.00	[0.33,0.63]
10. POS									0.35**	0.09	0.00	[0.20,0.50]
11. KOL									0.51**	0.13	0.00	[0.35,0.66]
12. OLC												
13. KSA	0.31**	0.07	0.00	[0.20,0.41]	-0.02	0.05	0.53	[-0.21,0.11]				
14. DT*KSA	0.78*	0.06	0.02	[0.69,0.89]	0.67**	0.19	0.00	[0.52,0.82]				

Team level, $n = 68$; individual level, $n = 379$. *$p < 0.05$, **$p < 0.01$ *$p < 0.05$, **$p < 0.01$. DT=digital transformation, POS=perceived organizational support, KOL=knowledge oriented leadership, OLC=organizational learning capabilities, KSA=knowledge sharing abilities

Table 6 shows the results of hypotheses testing of study 2. The direct effect of digital transformation on organizational learning capabilities was ($\beta = 0.48$, se = 0.08, $p < 0.01$). H1 was supported. Digital transformation was positively related to perceived organizational support ($\beta = 0.`141$, se = 0.21, $p < 0.01$) which in turn was positively associated with organizational learning capabilities ($\beta = 0.35$, se = 0.09, $p < 0.01$). H2 which proposed a mediation mechanism between digital transformation and organizational learning capabilities perceived organizational support was supported. Significant indirect effect was 0.18 (se=0.10, $p<0.05$). Digital transformation was positively related to knowledge oriented leadership ($\beta = 0.48$, se = 0.11, $p < 0.01$) and in return knowledge oriented leadership was positively related to organizational learning capabilities $\beta = 0.51$, se = 0.13, $p < 0.01$). H3 which hypothesizes a mediating role of knowledge oriented leadership between digital transformation and organizational learning capabilities was supported with indirect effect (indirect effect =0.24, se=0.10, $p<0.05$). Further, the study examined the moderation of knowledge sharing ability on the relationship between digital

transformation and perceived organizational support. Interaction term was significant as shown in Table 6 and was positively related to perceived organizational support ($\beta = 0.78$, se = 0.06, $p < 0.05$). H4 was supported. The interaction term between digital transformation and knowledge sharing ability on knowledge oriented leadership was significant ($\beta = 0.67$, se = 0.19, $p < 0.01$). Figure 3 shows the plot of interaction effect. H5 was supported. Next, we tested moderation mediation effects. Moderated mediation indices through perceived organizational support (index = 0.33, se = 0.11, $p < 0.05$) and knowledge oriented leadership (index = 0.22, se = 0.10, $p < 0.05$) were significant. It shows that both mediators played a significant role between digital transformation and organizational learning capabilities contingent upon the conditional variable knowledge sharing ability.

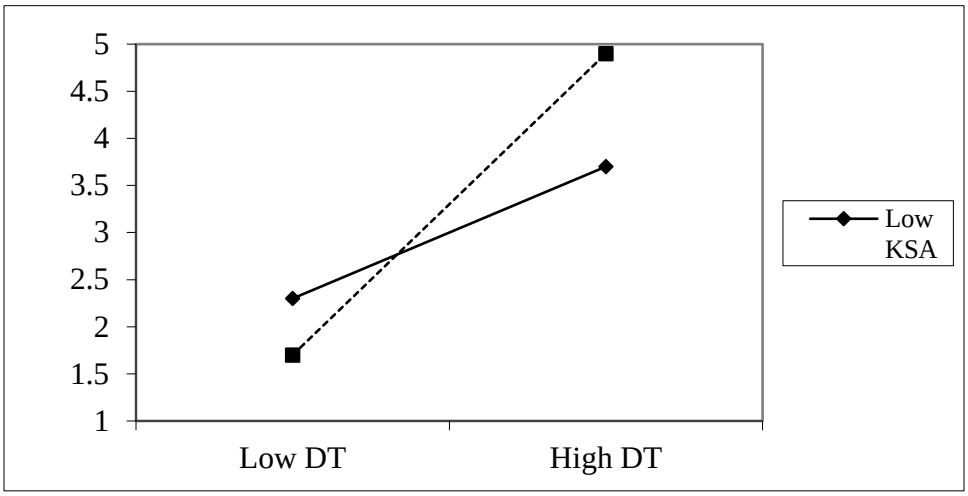

Figure 3: Moderating effect of KSA on the Direct Relationship of DT and POS

Figure 3 shows the moderating effect of knowledge sharing ability (KSA) on the direct relationship between digital transformation (DT) and perceived organization support (POS). The two-way interaction plot shows that the direct relationship between DT and POS is stronger when KSA among employees is higher. At low levels of KSA, the direct relationship between DT and POS is weaker. It can be further interpreted that employees having knowledge sharing ability would be able to take benefit of digital transformation more as compared to those having low levels of KSA.

5.Discussion

This study aimed to examine the conditional factor and mediating mechanisms that impact the relationship between DT and OLC. As mentioned in the results section, findings of the study support the hypotheses. The direct effect of digital transformation on organizational learning capabilities was ($\beta = 0.48$, se = 0.08, $p < 0.01$). H1 was supported. This is in line

with the results by (Bican & Brem, 2021). H2 which proposed a mediation mechanism between digital transformation and organizational learning capabilities perceived organizational support was supported. In the previous studies, different mediating mechanisms might have been tested but there were mixed results and scarcity of studies that examined cognitive pathways. However, previous studies suggested that POS provides the opportunities to develop knowledge and skills. The skill development paves the way towards capability enhancement in a changed environment (Otioma, 2023). Results of the study are in line with previous studies as POS was introduced as mediating mechanism and the effect was significant. H3 proposed that knowledge oriented leadership mediates the relationship between digital transformation and organizational learning capabilities. There was little literature available on KLO, but different leadership styles have been found to be associated with enhancing OLC. Studies have found that change processes fail because of lack of interest from top management. If the change agents are skilled and have the knowledge to transform the organization, the process would lead to positive outcomes (Arraya, 2024). Yet others provide evidence about the knowledge sharing behavior of KSA in organizational learning capabilities (Chaar & Easa, 2021). Results of study show that in presence of support from leadership, employees considerably develop their OLC. H4 and H5 proposed that KSA moderates the relationship between DT, POS and KOL such that high knowledge sharing ability increases the positive influence of DT on POS and KOL. KSA has been examined in various studies, but the findings of the studies involving KSA are mixed (Cotta & Salvador, 2020). However, findings of this study revealed that KSA moderates the relationship between DT and the mediators.

5.1 Theoretical Contributions

This study adds to the body of knowledge on OLC by describing OLC in relation to digital transformation in the organizations. Findings suggest that DT contributes to OLC in diverse ways. Although unplanned and poorly executed interventions can turn into a loss of resources, if employees are not ready for change and they are not provided opportunities to learn new knowledge, it would be detrimental in developing organizations according to changing dynamics (Su et al., 2024). Knowledge of the predictors of OLC helps in specifying what and how factors contribute to OLC. Abandoning traditional ways of doing work and adopting new technology based systems require organizations to properly equip the employees before implementing the change. While organizations can change the processes and operations to align with the needs of DT; at the same time, organizations can share knowledge, expertise, resources and associated technologies to deal with the challenges of strategic level techno-structural change.

5.2 Theoretical Implications

First, the study provides an in-depth insight into the underlying mechanisms that are related to the influence of DT on OLC. Existing studies have examined the direct effect of DT on OLC (Gardner, 2022; Konopik et al., 2022) without identifying the mediating mechanisms. Others have studied the impact of DT on factors like productivity (Kazmi et al., 2021),

knowledge management (Alvaringa et al., 2020), innovation (Gomes et al., 2022). There are studies who have examined the influence of organizational capabilities on digital transformation (Hsiao, 2024). This study helps to specify the range of resources that come into play as a result of DT. In this way, it is a contribution to the growing volume of literature on DT by utilizing DCT and how it influences a range of cognitive and behavioral outcomes of DT. This study enriches the knowledge of DT by showing that DT is the first step towards building learning capabilities employing a variety of resources.

Second, this study contributes to the literature of DT by hypothesizing and testing the underlying processes that transform DT into OLC relation. Mediating role of POS and KOL is demonstrated through lens of DCT. As mentioned above, researchers have studied the direct impact of DT on knowledge management and its processes like sharing, creating, storing and retrieving knowledge (Alvaringa et al., 2020); capabilities, innovation, productivity and performance (Kazmi et al., 2021). Building upon DCT, this study introduced two resource related paths in the relationship between DT and OLC. Findings show that DT enhances the POS (a cognitive resource) and KOL (internal resource pathway) that leads to development of OLC. Findings contribute to explain and broaden the understanding of how digital transformation influences OLC specifically in the domain of organizational change efforts.

Third, extant literature has tapped into few mediating mechanisms in isolation in relation to DT, for instance, knowledge management (Alvaringa et al., 2020), total factor productivity (Su et al., 2024), earning management and performance (Wang & Hou, 2024) through the lens of social learning theory (Pinho et al., 2020), knowledge management practices (Alvarenga et al., 2020) and qualitative modeling techniques (Wang & Hou, 2024). They focused on the importance of resources through which members respond to DT and suggest that DT has an impact on valuable resources employees have. The existing literature, however, has yet not tapped the multiple resources required to develop an individual in the organization the needed capabilities. The availability and quality of resources available in the work context influences the employee's attitude towards work and the organization. Skilled and knowledgeable leaders are a resource to build the potential among employees and to develop them into more capable members that could become the human capital and serve as a source of competitive advantage for the organization. Both mechanisms are important yet under-explored in the context of DT.

5.3 Practical Implications

The findings suggest that organizations should take measures to enhance, monitor and promote digital transformation due to its advantages for organization and employees in this era of technology. For example, organizations should recognize the importance of digital technologies which links to develop the organizational learning capabilities through valuable resources. Doing so, it will ultimately become a source of competitive advantage for the organization. We further recommend that the organizational leaders that have to

serve as a pillar in the DT process must be hired and selected with great care. They must have the knowledge and experience of the organizational interventions and must be aware of their role as a facilitator and change agent. They must be trained as a source of knowledge oriented leadership and role model in the context of organizational development and change.

We also recommend that organizations should pay attention to the processes through which employees build their perceptions about different activities, operations and changes. Research shows that employees are keen to learn new skills and knowledge when they know that they are being provided with learning opportunities and have the support from management and organization during the learning process. The quality of knowledge and skills they will develop with the support will influence their collective capabilities to work as individuals and teams. Learning abilities of individuals will impact the performance of capabilities of teams they are working with.

As far as the underlying processes are important, the conditions under which employees are to learn new skills and build expertise is also important. Skills and abilities can be developed through training. Thise employees who have ample learning opportunities must be trained to share and transform the implicit and explicit knowledge they have gained. Practices should be developed into systems and culture that help employees to feel confident in sharing their knowledge. Those practices must be avoided that intend to hold the knowledge. Unhealthy culture that hinders sharing knowledge must be discouraged as DT in the form of communication and information technology has a large potential of return for businesses. In this way, full potential of knowledgeable and capable employees would be utilized.

5.4 Limitations and Future Research Directions

Like most of the research, this study is not without limitations that must be considered while interpreting the findings. First, the data for hypothesis testing is from one sector. The level of adaptation and change could be different across industries and sectors. Therefore, future studies may expand their sample across different populations. Second, although, in both studies, the data were time lagged and collected at different points in time. But we should be thoughtful to causality claims. Therefore, in future research, experimental designs or longitudinal studies may be considered to test cause and effect relationships. Third, future research may use different set of mediators to examine the impact of DT on OLC, e.g., different leadership styles, formal and informal knowledge sharing mechanisms, organizational culture etc. Lastly, while exploring the conditional variables for the study, we only examined the role of knowledge sharing ability. Future research may consider other individual (conscientiousness) or situational variables (compatibility) while specifying boundary conditions to study the effect of DT on OLC.

5.5 Conclusion

This research has its focus on DT, a techno-structural change phenomenon that is growing in importance for its wide spread organizational benefits. Based on dynamic capabilities theory, this study examined a theoretical framework explaining the relationship of DT with OLC. This study provides insights from academic and practical lens on the progressive effects of DT on OLC through POS and KOL contingent upon knowledge sharing ability. The findings add to the literature of DT by suggesting that DT paves the way to developing collective learning capabilities of people through utilization of dynamic resources. Opportunities and support by the organization facilitate the change process to bringing positive learning behavior in the organization.

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