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Exploring the influence of exploitative and explorative digital transformation on organization flexibility and competitiveness

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Abstract— **Digital transformation processes help integrate digital technologies across all the departments of organizations, as well as to adopt digital technology rapidly in an organization. Enhanced organizational innovativeness, efficiency, and competitiveness might be among the outcomes of digital transformation. While digital transformation could be exploitative and explorative in nature, how such a transformation could impact the flexibility and competitiveness of organizations has not been extensively investigated. Against this backdrop, the main objective of this study is to investigate the influence of exploitative as well as explorative digital transformation on organization flexibility and competitiveness. Building on existing theories and literature, a research model is developed that was later tested using a CB-SEM approach applied to the responses of 312 managers from Indian organizations which are in the process of pursuing digital transformation or have already adopted digital technologies in different departments. The study found that digital transformation helps organizations to become more flexible and it eventually improves the competitiveness of the organizations.**

Index Terms— **Digital transformation, Exploitative transformation, Explorative transformation, Flexibility, Competitiveness, Knowledge, and Skills**

I. INTRODUCTION

Digital transformation has promised to generate value by achieving operational excellence and by catalyzing modern digitally integrated business models [1][2][3]. Digital transformation is considered as the use of digital technologies in the business process of the organizations. The principal objective of digital transformation is to ameliorate values, efficiency, and innovation capabilities of the organizations. It is a strategy as well as a business practice which is gaining attention in the organizations for improving their business processes with the help of different applications of digital technologies. The industry 4.0 agenda along with its integration with digital technologies in the business domain has experienced rapid growth [4]. Digitization elucidates the process which includes shift of analog information to digital data. Again, application of digital is concerned with the paradigm shift of organizations' business models through the usage of digital technologies for improving the business performance [3][5][6][7]. Digitalization provides an opportunity for organizations to work together with several types of industries, but it also invites some entangled challenges [8][9]. Thus, many changes brought by digitalization are found to be competitive, disruptive, and such changes require improved skill and knowledge of the employees of the organizations pushing the organizations for completely redefining their business models [10][11]. Hence, functioning

in the digital environment needs for redesigning the capabilities and resources and to rapidly develop new abilities for integrating, building, as well as reconfiguring both the internal and external competencies which supplements the concept of dynamic capability view (DCV) [12]. Digitalization brings changes in the business style helpful for the organizations to be exploitative as well as explorative for improving their innovativeness, proactiveness, and risk-taking abilities [13][14][15] making the organizations flexible and capable of exhibiting better competitiveness. There are not many studies where extensive investigation has taken place to identify the antecedents of digital transformation from competition, business opportunities, along with employee skills and knowledge perspectives. Moreover, very few studies have examined the impact of digital transformation on the organization flexibility with the support of exploitative and exploratory transformation in the organization and the overall impact on the organizational competitiveness. Thus, there is a gap in the present body of literature that this study has tried to bridge. More specifically, this study has investigated the antecedents of digital transformation from competition, skill, knowledge, and business opportunity perspectives. Also, this work has extensively discussed and examined the impact of digital transformation on the flexibility of the organization mediated through exploitative and exploratory transformation perspective. Last, this study has examined the impact of organizational flexibility on its competitiveness. The aim of this study is to address the following research questions (RQs).

RQ1: How exploitative and explorative digital transformation can influence flexibility in the organizations?
RQ2: To what extent organizational flexibility generated by digital transformation can improve organizational competitiveness?

The remainder of the article is arranged as follows. Section 2 presents the background studies and is followed by the illustration of the theoretical foundations and hypotheses development in section 3. Next, section 4 describes the research methodology followed by the analysis of data. The findings are illustrated in section 5. Thereafter, section 6 includes the discussion of the findings, the implications of this study along with limitations and future research directions.

II. BACKGROUND STUDIES

Digitalization of an organization needs new abilities of the employees whose decision-making process could be supplemented through the help of large volume of data, through the support of effective simulation process, and visualization systems as well as through the help of interactions with the machines and objects[16]. Studies demonstrate that digitalization influences the collaboration

among the employees of the organizations helpful for developing competencies of the organizations to interact with the distant colleagues [17][18][19]. Digitalization of the organizations has brought in an environment of radical as well as disruptive innovation ensuring dramatic changes in the business practices [20][21]. Accelerated development of digital technologies like big data analytics (BDA), artificial intelligence (AI), blockchain technology, Internet of Things (IoT), cloud computing, and so on have been able to transform the existing traditional economy to intelligent digital economy. Consequently, digitalization of an organization is considered as a critical mechanism for the organization for achieving innovation as well as for ensuring sustainable development [22][23][24]. One of the important consensual uses is that the digitalization may be considered as an important process for the organization to easily gain organizational resilience which is the ability of the organizations to absorb and to be engaged in transformational activities creating disruptive business opportunities, healthy competition, as well as improving the employees' skills and knowledge [25][26][27]. The digital transformation in an organization is perceived to be successful if the organization takes attempts for such transformation in an exploitative as well as explorative way [28]. Exploitative transformation can be interpreted as such transformation which is done by acquiring knowledge that helps to refine as well as rejuvenate the existing competencies whereas explorative transformation of an organization can be explained as such transformation which is actuated by acquiring knowledge helpful to change the nature of the existing practices as well as competencies [29][30]. Studies have demonstrated that for ensuring successful digitalization in the organizations for achieving better flexibility, adaptability, and for remaining competitive, the organizations require to leverage both exploitative and explorative transformational practices in this increasingly emerging and dynamic business environments to address the volatile dynamic needs of the market[31][32].

II. THEORETICAL BACKGROUND AND HYPOTHESES DEVELOPMENT

A. Theoretical Background

It is a fact that digitalization not only provides an opportunity to organizations but also at the same time digitalization process invites some entangled challenges [8]. As a result, various changes brought by digitalization are disruptive, compelling the organizations to redesign their existing business practices [33]. Thus, in such a changed scenario, functioning in the digital environment pushes the organizations to redefine and redesign their competencies as well as resources and leads the organizations for developing new capabilities towards integrating, building, as well as reconfiguring their internal and external resources, the concept of which can be visualized through the lens of dynamic capability view (DCV) [12]. Digital transformation is viewed as an effective facilitator of dynamic capabilities of the organizations such as exploitation as well as exploration. The exploitation and exploration capabilities need to be systematically as well as continuously required to be updated to perform better and to remain competitive in such volatile and dynamic business atmosphere [34]. In terms of the earlier studies, it is contemplated that Warner digital transformation is a trigger towards dynamic abilities which could develop values in direct as well as indirect ways [35][36]. Recent

studies have demonstrated that the industry 4.0 adoption for the digitalization in an organization as a co-valuation of organizational structure, as a learning roadmap of the organization, and as a transformative change process of the organizations [37][38][39]. These transformative processes can be explained through the lens of DCV as opined in several studies [40][41]. Digital transformation aims at transforming organizations and their business models through digital technologies. This entails also engaging with digitalized, participative, and open business models that allow addressing the environmental dynamism through improvement of organizational dynamic capabilities which is in line with DCV. In the context of sensing abilities, it focuses on exploring technologies, seizing abilities focus on building capabilities and mobilizing the resources as well as transforming abilities focus on implementation of chosen technologies as well as exploitation to make the organizations more flexible to gain better competitiveness [40][42]. Thus, digital transformation abilities of the organizations could help the organizations to ensure successful digital transformation of the organizations that helps the organizations to be more flexible towards exploitation as well as exploration which eventually makes the organizations more competitive.

In terms of the inputs from the literature as well as from the knowledge of DCV, a conceptual model has been proposed. It is provided in figure 1.

Fig. 1. The conceptual proposed model from DCV

B. Hypotheses Development

This study aims to explore how different salient antecedents of digital transformation can help facilitate digital transformation in organizations to improve organizational flexibility by ameliorating two mediating contextual critical factors like exploitative transformation and explorative transformation. This study also points out that organizational flexibility could be a critical predictor of organizational competitiveness.

1) Antecedents of digital transformation

It is argued that one of the determinants of digital transformation is competition (COM) with rival organizations. The business competitiveness is interpreted as the ability of an organization for producing goods and services with good quality with reasonable price which also confirms better profitability to successfully achieve the preference of customers over other competitors in the same market [43]. Competitiveness guarantees that the organization is durable as well as sustainable [44][45]. Competition stimulates an organization to reduce their cost in different functionalities in the organizations and helps the organizations to conduct their businesses more efficiently. However, when competition is restricted, such as one organization being involved in agreements on prices with its other competitors, it is always observed that in such case prices are likely to enhance and at the same time the quality is likely to suffer [3][46]. Competition helps an organization to be more profitable and adaptable to changes quickly to remain competitive [47]. Competition also helps an organization to bounce back from failure and compel the organizations to adopt new technologies to remain competitive [44]. Such success is perceived to be achieved by the organization in this digital era if the organization becomes ready to be a part of digitalization journey by using industry

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4.0 technologies [3][48]. Thus, from the above discussion it is hypothesized as follows.

H1a: Competition (COM) among the rival organizations positively impacts an organization to adapt digital transformation in the organization (DTO).

Disruptive business opportunities (DBO) refer to innovation as well as the use of modern technologies which could help to make sophisticated products and services more affordable to the broader market [47]. Disruptive business opportunities can be availed by application of new technologies, innovative business design, along with a coherent value network which can be ensured by adapting digital technologies for digital transformation in an organization [43][49][50]. Disruptive business opportunities help an organization to use digital technologies like industry 4.0 which helps the organization to grapple broader business market incurring less cost. It helps to reach more customers in a shorter span of time. Disruptive business opportunities help an organization to incrementally improve its operation and business style on a predictable timeframe. Such improvement of operations can be successfully achieved if the organizations use modern industry 4.0 technologies for their operational activities [51][52]. Disruptive business opportunities help an organization to flourish in this digital era. Such new opportunities are perceived to help the organizations to ensure better profitability and quick market access [53][54]. Such innovative ways of doing business can be achieved through digital transformation of the organizations by using new technologies such as industry 4.0 technologies [52]. With such discussion, the following hypothesis is prescribed.

H1b: Disruptive business opportunities (DBO) positively impacts an organization to adapt digital transformation in the organization (DTO).

If an organization intends to adopt digitalization, the skillsets of the employees need to be improved. The employees then cannot feel an impediment to use digital technologies like industry 4.0 necessary for ensuring digital transformation in an organization [55]. To use digital technologies by the employees for ensuring appropriate digital transformation in the organization, their technical knowledge and capabilities are to be revamped commensurate with the needs for using industry 4.0 technologies. This can be achieved by the employees through experience and by leveraging digital courses and readiness materials available in the organizations. Development plan for the employees is to be implemented to enhance knowledge of the employees helpful for the employees to easily use the sophisticated technologies needed to facilitate digital transformation in their organization [52]. For complete digitalization of an organization, skill and knowledge of the employees working in different functions of the organizations need to be enhanced because digitalization will impact business activities of all the departments of the organizations. Better skillsets and knowledge of the employees of an organization can ensure a successful digitally transformed organization. All these inputs help to develop the hypothesis below.

H1c: New skill and knowledge gaining ability (SKA) positively influences an organization to adapt digital transformation in the organization (DTO).

2) Digital transformation of organization (DTO)

Digital transformation of organization is considered a process for conducting business as well as transforming business from legacy mode to digitalization [56]. DTO is related to transformation of business using digital means for transforming a conventional organization to the best performer in the new era of digital economy [57]. Organizations intending to digitally transform their business approach must assess how best they could use industry 4.0 technology and how they could reinvent themselves to remain competitive in the new age of digitalization for doing business [55][58]. Digital transformation of organization can derive several benefits like increasing customer satisfaction, driving of data-based insights, ensuring high quality of user experience, and so on [59] [60] [61]. The process of DTO is the ability of the organizations to become agile including exploitative as well as explorative innovative transformation for solving the contradictions between the opportunities and challenges associated with digital transformation [55][62]. Digitalization needs exploitative transformative process based on existing skills and processes of the organizations because then the organizations will integrate digital technologies with their existing capabilities and skills for optimizing prevailing business process [65]. With the help of intelligent tools for supporting the organizations' product and service portfolios along with supporting the value chain by exploratory transformation process, the organizations can ensure competitive value creation [56]. Besides, digitalization in an organization brings a thorough change in the organizational structural design so that organizations become flexible to address such change in the dynamic market, the idea being supplemented by DCV [12]. Thus, the above discussion helps to derive the below hypotheses.

H2a: Digital transformation of organization (DTO) positively influences the exploitative transformation process (EXT) in the organizations.
H2b: Digital transformation of organization (DTO) positively impacts the explorative transformation process (EPT) in the organizations.
H2c: Digital transformation of organization (DTO) positively impacts organization flexibility (ORF).

3) Exploitative (EXT) and explorative transformation (EPT) process

For better ensuring digital transformation, the existing traditional business model needs to be transformed in a comprehensive manner. It is argued that if the transformation is too aggressive, it is apprehended that there is a possibility in the organization of losing the flexibility [66]. There are continuous efforts on how the organizations can effectively be able to control the risks and can improve the flexibility within the organizations during the process of digital transformation. In this situation, studies highlight that organizations typically use both the exploitative and explorative transformation process [63][65]. It has been demonstrated in some of the other studies that the purpose of building digital abilities through digital transformation by using industry 4.0 technology is to keep a balance between internal and external design flexibility, utilization along with maintenance of stable governance and at the same time to take attempts for improving employees' digital skills and

knowledge for the betterment of organizational flexibility [36][66]. Another study also highlights that to adopt exploitative and explorative transformation, it is necessary and significant to successfully address the entangled challenges owing to the gradual closeness and convergence of the physical as well as digital world [67]. The exploitative transformation goes on continuing to extend existing technology as well as knowledge for expanding the quality of the existing products and services. Exploitative transformation process helps the organizations for gaining success through the improvement of existing capabilities to effectively coordinate and integrate the rapidly changing environment due to digital transformation [55][68]. Aim of the exploratory transformation is to assist the organizations to appropriately gain the flexibility by improvement of the organizations' sensing, seizing, and transforming abilities to properly restructure and redesign the organizations' business pattern to address the environmental dynamism corroborating the concept of DCV [12]. As such the following hypotheses are developed.

> *H3a: Exploitative transformation (EXT) for digitalization positively impacts the organization flexibility (ORF).*
> *H3b: Explorative transformation (EPT) for digitalization positively impacts the organization flexibility (ORF).*

4) Organization flexibility (ORF) and competitiveness (COM)

Exploitative and explorative impacts of an organization focus on the present and existing abilities as well as on the future prospect. Organizations need to execute digital transformation with the help of industry 4.0 technology for successfully impacting the flexibility of the organization [52]. It is argued that due to the digital transformation process, organizations should not abandon their existing resources and knowledge. It is also argued that during such digital transformation process, organizations need to increase their adaptability, transform their existing practices and processes to address the dynamic business needs which is supplemented by the concept of DCV [12]. Increase of adaptability will help the organizations to be more flexible so that they can successfully outperform their competitors functioning in a similar market [69, 70]. Thus, from the above arguments, the following hypothesis is established.

> *H4: Organization flexibility (ORF) for digitalization positively impacts competitiveness (COM) of the organization.*

Now, all these hypotheses need to be examined as well as the model needs statistical validation.

IV. RESEARCH METHODOLOGY

For testing the hypotheses and for validating the research model, a survey approach has been adopted by collecting data from the respondents. The respondents were provided with a set of questions (questionnaire). The respondents are supposed to possess sufficient knowledge for replying to the questions covering the impacts of digitalization on the organization flexibility and competitiveness. For this, initially, the research instruments need to be developed.

A. Research Instruments

The questionnaire has been developed with the help of existing literature with slight amendments befitting with the context of this study. To enhance the readability of the questionnaire, opinions of 7 experts were taken. Out of these 7 experts, 5 experts were from the industry having each around 15 years of experience in the digitalization process of the organization. The remaining experts were from academic backgrounds involved in research works in the domain of the present study. The academic experts have possessed more than 10 years of experience in the field of the present study. With the inputs of these experts, the questions were duly modified for enhancement of their readabilities. Next, there was a pilot test which was carried out by analyzing the inputs of 30 respondents selected through convenience sampling approach. These 30 respondents were not included in the final survey. The input of these 30 respondents helped to reconcile, modify, and update the statements of the questions. It helped the respondents do not feel any constraint to respond. It was also expected that by such amendments to the questions, the quality of the responses would be improved as the questions were more understandable. Through this process, 32 questions were finetuned.

B. Process of Data Collection

To collect data from respondents, a list containing the names of organizations was collected from BSE (Bombay Stock Exchange, India). Initially, it was possible to select 30 organizations at random from that list. Thereafter on scrutiny, it was found that out of these 30 organizations, only 23 organizations have fully digitally transformed their organizations, or they are in the process of such transformational activities. Executives from these 33 organizations have been consulted with a request for permitting their employees of different ranks to participate in the survey. The executives were assured that this study is purely academic. They were also apprised that the identity of the participants will be kept confidential. After a long discussion, executives of 19 organizations allowed the employees of different ranks to take part in the survey. The executives of these 19 organizations provided contact details of 741 employees agreeable for taking part in the survey. All the 741 prospective respondents were given the response sheets each containing 32 questions where each participant is to put a tick mark on one option against five options for each question. This is because the responses need to be quantified through a standard scale (5-point Likert scale). This Likert scale has 5 options such as 1 for opting Strongly Disagree (SD) option to 5 for opting Strongly Agree (SA) option. All the 741 potential respondents were provided with two months to respond. Within time, 323 respondents replied. Here the rate of response is found to be 43.58%. On verification, it was found that the responses of 11 respondents were incomplete, and these were ignored. These 11 responses were considered incomplete because all the concerned 11 respondents put tick marks in more than one option against each question. In this study, 312 responses were analyzed against 32 questions. Table 1 provides the statistics of 312 participants.

TABLE I
DEMOGRAPHIC STATISTICS (N=312)

V. Analysis of Data and Results

The proposed theoretical model possesses a moderate degree of complexity. Hence, by using multilinear regression analysis, there is a possibility of having increased autocorrelation, heteroskedasticity, and endogeneity [72]. As such, to address these issues, for testing the hypotheses, covariance-based structural equation modelling (CB-SEM) approach is followed. It is deemed to be helpful for analyzing both exploratory and confirmatory modeling to assess the values of R^2 for all the dependent variables. It could also help to estimate the explanatory power of the model [71].

A. Assessment of Loading, AVE, CR, and α

For estimating the convergent validity, loadings of all the items have been assessed. To examine if the constructs are valid and reliable, average variance extracted (AVE), and composite reliability (CR) of all the constructs have been computed. To determine the internal consistency of each of the constructs, Cronbach's alpha (α) of all the constructs has been calculated. The results provided in Table 2 highlight that all the parameters are within the scheduled range [72][73].

TABLE II
MEASUREMENT PROPERTIES

B. Discriminant Validity Test

A discriminant validity test needs to be conducted to make sure that the focal constructs are not closely correlated. If the constructs are correlated so far as their interpretations are concerned, the rigor of the study might be compromised. As per the recommendation by Fornell and Larcker (1981) [74], the square roots of AVEs have been calculated and it has been found that the respective bifactor correlation coefficients are all less than the corresponding square roots of AVEs. It has satisfied the above-mentioned criteria. Hence, by this approach, the discriminant validity of the constructs has been verified. Table 3 provides the results.

TABLE III
TEST FOR DISCRIMINATION VALIDITY

C. Common Method Bias (CMB)

The present study has been based on survey data. So, the possibility of CMB cannot be overruled. As a procedural measure, during preparation of questions they were made simple, readable, and understandable. Besides, during the survey, it has been assured to the respondents of the survey that their identities will be kept confidential. This was done to get unbiased responses. Moreover, to assess the severity of CMB, Harman's Single Factor Test (SFT) was conducted, and the measures indicated that the first factor came out as 22.69%. It is within the stipulated value of 50% as per Podsakoff et al. (2003) [75]. However, for testing CMB, Harman's SFT is not very robust test [76]). Thus, marker test has been also performed [77]. The analysis through Harman's SFT and Marker correlation ratio test could not highlight any evidence of bias and, as such, it can be safely inferred that CMB does not pose a major concern in this study.

D. Effect size f^2 test

Effect size f^2 values are assessed to verify if there exist any effective contributions of the exogenous variables to the concerned endogenous variables. f^2 values are known to be weak (0.020-0.150), they are known to be medium (0.150-0.350), and they are known to be large (>0.350) (Cohen, 1988). The results demonstrate that the effect size f^2 of COP on DTO is 0.158 (M), DBO on DTO is 0.206 (M), SKA on DTO is 0.261 (M), DTO on EXT is 0.289 (M), DTO on EPT is 0.312 (M), DTO on ORF is 0.241 (M), EXP on ORF is 0.279 (M), EPT on ORF is 0.318 (M), and ORF on COM is 0.412 (L).

E. Test of Hypotheses (Structural Equation Modelling)

For testing the hypotheses, CFI (comparative fit index), NFI (normed fit index), TLI (Tucker Lewis fit index), ratio of chi square and degree of freedom and RMSEA (root mean square error of approximation) have been estimated. The estimated values are 0.915, 0.952, 0.976, 2.002, and 0.039 respectively. All these values are within the specified range. Hence, the model is fit. Through this process, the path coefficients (β-values), p-values, and R^2 values could be estimated. Table 4 provides the results.

TABLE IV
STRUCTURAL EQUATION MODELLING (SEM)

With all these inputs, the validated model is provided in figure 2.

Fig. 2. Validated Model (SEM)

VI. Results, Findings, and Discussion

A. Results and Findings

The present study has demonstrated that digital transformation using industry 4.0 technology needs that organizations should completely redesign and restructure their business style for integrating, building, and reconfiguring internal and external resources as well as competencies. The current study has also discussed that for ensuring digital transformation, the organizations must possess the sense of healthy competition with their counterparts functioning in the same market. The organizations should be able to successfully avail themselves of the disruptive business opportunities and need to improve the skill and knowledge of the employees to gain dynamic abilities to address the dynamic market, this idea being supplemented by DCV. This study has highlighted that through exploitative and explorative transformation process, an organization possesses a paradoxical relationship. This research has also realized that these two patterns of business processes are found to be often achieved by the organizations simultaneously so that they can successfully balance each other for making the organization more flexible to address the changing needs of the customer. This argument is supported by another study [64] which investigated how digital transformation could improve organizational reliance and flexibility. The present research work has shown that for

digitalization, the organizations must be flexible to address any situation in a better way compared to their competitors to ensure better market share and competitiveness. This idea seems to have received support from another study [80]. The study [80] highlighted that for digitalization, the skills and knowledge of the employees are to be improved to appropriately respond to volatile hyper market. This study found that that DTO can be explained by COP, DBO, and SKA that conjointly explain 37% of the variance ($R^2=0.37$). DTO can explain EXT and EPT separately to the tune of 43% ($R^2=0.43$) and 45% ($R^2=0.45$) respectively. Again, ORF could be explained by EXT, DTO, and EPT simultaneously to the tune of 51% ($R^2=0.51$) whereas ORF could explain COM to the extent of 69% ($R^2=0.69$) which is the explanatory power of the proposed theoretical model.

B. Theoretical Contributions

This study has extended the concepts of various theories. First, this research work has documented that digitalization in organizations needs to be considered as a reconfiguration of business models based on several digital technologies that can allow to create and deliver business value. Second, the study showed that digitalization is concerned with the usage of different applications of digital technologies for radically improving organizational structure, flexibility, by leveraging digital technologies such as analytics for inter and intra business processes. Third, the study has demonstrated that healthy competition, identification of disruptive business opportunities and improvement of employees' skills and knowledge could ensure successful implementation of digital technologies in the organization. Fourth, the study highlighted that digital transformation could improve organizational flexibility that is conducive to improve competitiveness, provided the organizations embrace exploitative and explorative transformation processes towards successful digitalization. So far it is known that no other studies are known to have examined and analyzed these salient points simultaneously for understanding the contributions of digital transformation to ensure organizational flexibility as well as competitiveness. Further, it highlighted that digital transformation could improve organizational flexibility helpful for betterment of competitiveness provided the organizations take recourse to exploitative and explorative transformation process towards successful digitalization. No other studies have investigated these critical issues simultaneously to examine the contributions of applications of digitalization using industry 4.0 technology to ensure organizational flexibility and competitiveness. Hence, this endeavor is a special contribution to theory so far this research work is concerned. While explaining the effects of digital transformation for maintaining organizational competitiveness, the present study has extended the concept of DCV [12]. Fifth, this study has argued that DCV can provide a clear explanation on how and why organizations perceive its need to successfully adapt to the changes in volatile business environments [81]. The perspective extensively posits that competitiveness of organizations principally depends on a cyclical transformation of processes, competencies, resources for appropriately responding to the dynamic business changes. In such a scenario, it is argued that such transformation in an organization should be construed to be a dynamic need for

effectively addressing the threats posed due to dynamism in the changing business environments. Not only that, for rapidly combating the needs of the dynamic markets, this study has argued that the organizations must have appropriate flexibility and to achieve such flexibility to conform competitiveness, the organizations need to proceed with the exploitative and explorative transformation process to address the dynamic business environments. This idea is claimed to be a novel attempt towards successful digitalization in an organization in this digital era. Several studies has investigated how an organization can transform their business process using digital innovation with the applications of industry 4.0 technology to achieve success [59] [60] [61]. This concept is extended to demonstrate how the exploitative and explorative digital transformation process could impact flexibility and competitiveness in an organization. This has enriched the existing literature.

C. Managerial Implications

The findings of this study could serve as useful guidelines to help business leaders and managers willing to digitalize their organizations. First, we suggest that prior to investing in any digitalization process, business leaders and managers need to carefully assess and evaluate the organizational capabilities for sensing the rapid development of the internal and external business environments. This might help them identify and discover potential opportunities appropriately. Second, as the study shows that digital transformation in an organization could impact organizational flexibility more effectively provided the organizations engaged in digitalization process through exploitative and explorative transformational processes. Managers intending to transform and upgrade the business practices should try to bring in incremental changes in the existing business practices for successfully ensuring digital transformation. Third, as we found that business leaders and managers can engage with digitalization process by adopting industry 4.0 technologies, we suggest that business leaders and managers should organize frequently appropriate training for their employees to make sure that they can update their skills, expertise, and knowledge. Fourth, the leaders and managers need also to assess if the organizations possess the capabilities of reconfiguring their intangible and tangible assets for sustaining competitiveness. The present study has demonstrated that digital transformation in an organization could impact the organizational flexibility in a better way provided the organizations try to proceed for digitalization through the help of exploitative and explorative transformational process. Thus, managers and leaders while intending for digital transformation should try to bring in incremental changes in the existing business practices by successfully adopting different applications of digital transformation, that is, by making some changes in the organizations' current technological abilities to enable such transformation. Fifth, the managers should also try to fundamentally change the technological trajectory. Thus, both by using the existing technologies with some adjustments and by using new technologies, the leaders and managers should try to enhance the organizational flexibility helpful for digitalization.

D. Limitations with future scope

The present study is not free from all limitations though it has provided some laudable theoretical and managerial contributions. This study is based on data which are cross-sectional. This creates issues of causality between the inter-relationships among the constructs giving rise to endogeneity defects. Future researchers are suggested to conduct longitudinal studies which could help to eliminate the above-mentioned defect. In this study, DCV [12] has been used though it is associated with defects of context insensitivity [80]. DCV cannot properly find the appropriate conditions under which the abilities of the organizations are found to be most valuable [81]. Hence, future researchers can further investigate the optimum conditions under which the digital transformation could help provide better sustainable competitiveness to the organizations. The findings of the present study depend on the responses of the respondents who are based out of India. Therefore, there exists external validity issue. To remove this defect, it is recommended that future researchers should obtain feedback from the respondents based out of different parts of the world. This could have projected the results with more generalizability. In this study, 312 responses were used to arrive at the results. This is not a representative figure for the entire population. The future researchers should obtain more responses which could help to arrive at a more generic result. The predictive power of the present proposed model is 69%. Future researchers may explore the possibility of inclusion of other constructs as well as boundary conditions. This might help to improve the explanative power of the proposed model.

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Authors' Biography

Sheshadri Chatterjee is a post-doctoral research scholar at the Indian Institute of Technology. Kharagpur, India. He completed the PhD from Indian Institute of Technology Delhi, India in 2018. He has worked at Microsoft Corporation, Hewlett Packard Company, and IBM. He has also published research articles in several reputable journals. Dr. Chatterjee is also a certified project management professional (PMP) from Project Management Institute (PMI), Newtown Square, PA, USA, and completed qualifications in PRINCE2, OGC, London, UK, and ITIL v3 London, UK.

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Figures and Tables

Fig. 1. The conceptual proposed model from DCV
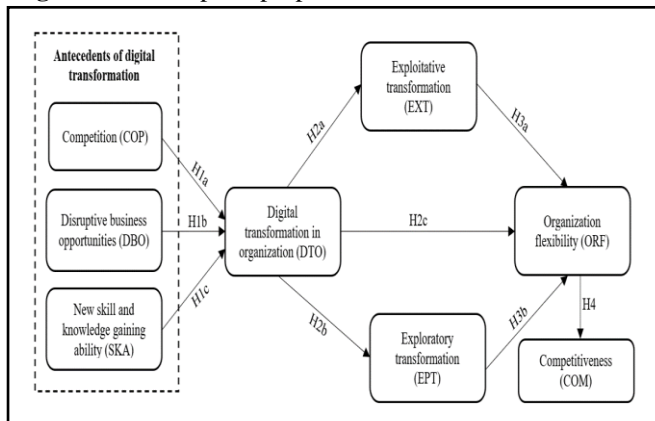
Fig. 2. Validated model (SEM)
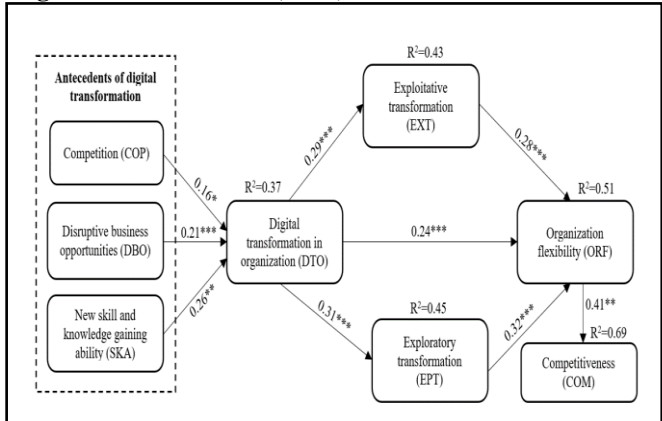
Table 1: Demographic statistics (N=312)

Particulars	Category	Number (N)	Percentage (%)
Gender	Male	211	67.6
	Female	101	32.4
Employee hierarchy	Senior manager (Leadership)	36	11.5
	Midlevel manager	64	20.5
	Junior manager	94	30.1
	Individual contributor	118	37.9
Organization type	Service	220	70.5
	Manufacturing	92	29.5

Table 2: Measurement properties

Constructs / Items	Mean	SD	Loadings	AVE	CR	A	t-values
COP				0.78	0.84	0.87	
COP1	2.11	1.17	0.87				21.29
COP2	3.17	1.19	0.85				31.17
COP3	4.13	1.11	0.92				24.12

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Item	Mean	SD	Loading	α	CR	AVE	t-value
COP4	3.92	1.14	0.87				33.06
DBO				0.80	0.82	0.85	
DBO1	3.27	1.21	0.85				26.67
DBO2	3.05	1.73	0.93				29.11
DBO3	4.87	1.41	0.89				24.57
DBO4	4.41	1.48	0.96				26.44
SKA				0.81	0.83	0.86	
SKA1	3.22	1.56	0.95				19.12
SKA2	4.14	1.26	0.90				38.77
SKA3	3.66	1.35	0.80				34.10
SKA4	3.98	1.44	0.85				21.92
DTO				0.85	0.87	0.88	
DTO1	3.11	1.17	0.95				22.18
DTO2	4.13	1.19	0.94				37.17
DTO3	3.37	1.24	0.83				24.12
DTO4	4.52	1.46	0.96				26.01
DTO5	3.91	1.78	0.90				29.79
EXP				0.75	0.81	0.84	
EXP1	3.25	1.22	0.78				35.11
EXP2	4.14	1.31	0.85				34.67
EXP3	3.37	1.37	0.90				37.97
EXP4	4.62	1.92	0.87				35.11
EXP5	3.51	1.61	0.91				34.08
EPT				0.86	0.88	0.89	
EPT1	3.15	1.17	0.86				37.32
EPT2	4.17	1.19	0.88				34.37
EPT3	4.28	1.31	0.84				33.61
EPT4	3.07	1.11	0.97				34.17
EPT5	4.23	1.47	0.96				39.19
ORF				0.85	0.87	0.88	
ORF1	3.37	1.37	0.88				32.27
ORF2	4.19	1.48	0.91				29.18
ORF3	3.92	1.43	0.96				26.17
ORF4	3.35	1.77	0.92				37.89
ORF5	4.26	1.12	0.95				32.21
COM				0.86	0.88	0.89	
COM1	3.52	1.19	0.86				34.73
COM2	3.47	1.18	0.97				35.17
COM3	4.01	1.39	0.98				39.11
COM4	4.26	1.44	0.88				28.64
COM5	3.77	1.33	0.84				33.33

Table 3: Test for discrimination validity

Constructs	COP	DBO	SKA	DTO	EXP	EPT	ORF	COM	AVE
COP	0.88								0.78
DBO	0.37	0.89							0.80
SKA	0.48	0.22	0.90						0.81
DTO	0.43	0.32	0.24	0.92					0.85
EXP	0.31	0.34	0.26	0.23	0.87				0.75
EPT	0.26	0.41	0.17	0.25	0.37	0.93			0.86
ORF	0.19	0.33	0.19	0.21	0.26	0.33	0.92		0.85
COM	0.17	0.21	0.32	0.39	0.41	0.30	0.21	0.93	0.86

Table 4: Structural equation modelling (SEM)

Paths	Hypotheses	β-values	p-values	Remarks
COP→DTO	H1a	0.16	p<0.05(*)	Supported
DBO→DTO	H1b	0.21	p<0.001(***)	Supported
SKA→DTO	H1c	0.26	p<0.01(**)	Supported
DTO→EXT	H2a	0.29	p<0.001(***)	Supported

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DTO→EPT	H2b	0.31	p<0.001(***)	Supported
DTO→ORF	H2c	0.24	p<0.001(***)	Supported
EXP→ORF	H3a	0.28	p<0.001(***)	Supported
EPT→ORF	H3b	0.32	p<0.001(***)	Supported
ORF→COM	H4	0.41	p<0.01(**)	Supported