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Exploring the Mediating Role of Technology Between Human Realms and Institutional Properties of Organizations with Special Reference to it Industry in India

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Abstract*: With the growing technology influence in to organizations, the study explores the mediating role of technology in organizations. The research framework is based on Giddens Theory of Structuration (1982). The study focuses attention on recognizing the mediating role of information technology between the human realms and institutional properties within organizational contexts. The organizations taken into consideration are from IT Industry .The sample collected is from 100 employees from executive to middle managerial positions. The study reveals that vision collectivism, social collaboration, and functional expertise are the constructs that integrate technology with the social and institutional properties of the organization. The Giddens Structuration Theory for technology has been modified to incorporate the revelations from the study. The study proposes technology as a mediator for integrating independent entities in organization , thus sensitizing to the imperatives of designing a socio- technical systems in organizations for organizational developmental studies in future.

***Index Terms*: Institutional properties, Technology, Social Collaboration, Structure of Dominance, Structure of Ligitimation, Structure of significance.**

I. INTRODUCTION

As organizations are growing the role of technology in organizations is engraving even deeply .Currently the view of technology has been primarily from the objectivist and subjectivist view. This premise of duality to understanding the relationship between information technology and organizations considers that either technology dominates the human at work or people dominate technology use .These extreme views are not able to present a composite role of technology, humans and organizational properties (systems).

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To deal with this dichotomy a integrative view needs to be adopted so that the humans, technology and organizational systems can reside in a conjoint frame.Thus, we construct a theoretical framework in which information technology in organizations is considered to be products of both material and social dimensions of an organizational framework .The paper focuses on the material and social realms of organization through technology as a mediator.

The research framework has been posited, based on Giddens‟ theory of structuration (1982), and it allows us to progress the dichotomies (subjective vs. objective, socially constructed vs. material, macro vs. micro and qualitative vs. quantitative) that exist in the understanding the interplay between organizations and information technology.

This paper seeks to develop further investigation between the relationships between technology and selected properties of organizational structure. By technology we imply the involvement of hardware/software that is used in processes, systems or operations to mechanize work processing in organizations. Organizational structure/Institutional Properties refers to properties essentially organizational systems, procedures, communication, specialization, authority, authorizations etc).The social realms in the study include the social context of the organization like communication, community development, social networking etc. Also from the literature review it is evident that relationships between an organization's technology, social and institutional structure fall into subsets of distinct presence in organizational frameworks , whose interaction is inter-dependable, called socio-technical organizations. The study reveals that technology changes in organizations have phenomenal socio-technical implications in organizational designing .

An understanding of the constructs that evolve from the study namely Vision Convergence, Social Collaboration, Functional Expertise and Ethical /Moral govern the way in which technology through processes, systems, applications help in creating a link between the social and the material (institutional) properties in an organization.

So far the literature review has revealed that there has not been much empirical study ratifying technology role in organizations. The study would using quantitative tools try to explore the validity and appropriateness of Gidden’s Theory with respect to IT industry in India.

The research questions for the study are following:

• Understanding the interplay between technology, social and institutional structure .
• Develop constructs to measure social and organizational properties to understand the role of technology in organizational set up.
• Study the relational model between technology, social and organizational properties.

The paper has been divided in to four parts. The first part addresses the Gidden's Theory of Structuration. Next social and institutional factors that play a dominant role in technology interface which have been studied .The third part involves research design and application of quantitative tool to understand the relational ontology between technology, social and institutional factors. The last part discuses the outcomes of the research and summarizes the research for future implications.

The study could foster better understanding of the technology treatment in organizations so that it can be harnessed for organizational construction and designing social ecosystems that can coexist harmoniously namely social, institutional and technology..

II. LITERATURE REVIEW

A. Subjectivist and Objectivist Treatment of Technology

In information systems, the subjectivist approach to information technology is typified by those assuming a "social action" perspective on information technology. This believes that technology is the driver for people to behave. The social perspective assumes that technology drives the people dynamics of the organization. Technology driven processes and systems that people work upon for their deliverables is controlled. However every individual would access the same system/process with their own experiences, knowledge and creativity. Research on institutionalization (Iacono and Kling 1988) indicates that technology does escape the control of human subjects, becoming formalized, institutionalized, and reified. Further, streams of research on ergonomics (Turner and Karasek 1984, Shneiderman 1980) and medical technology (Barley 1990) indicate clearly that the computer-mediated workplace is not entirely a social construction, and that material characteristics may seriously affect use and alter social relationships.

The objectivist approach is another perspective of understanding technology in organizations however considering technology as an impact factor in organization would make comparable to an object. The objectivist view of technology considers it to be an actor for work accomplishments or executions without any social implications. However both the views are variants of the single realization that "technology" does matter in organizations and needs to be considered as an integrative part of the organization. To mediate the extremes Giddens Structuration Theory provides an integrative view of technology in organizations.

B. Giddens Structuration Theory

In Giddens‟ theory of structuration assumes that social and material are not distinct entities in organization but there exists interdependability between them. Technology is the link that moderates the social and institutional in the organization .Thus, it is improper to conceive of a social system merely as the product of either deliberate human action or of institutional forces. Giddens proposes what he calls the duality of structure, which refers to the notion that the structure or institutional properties of social systems created by human action, and then serve to shape future human action with or without technology . His theory specifies three modalities that link the human with the He specify three modalities Institutional realm namely : interpretative schemes ,resources and norms. Technology is a mediating factor that balances the link between the human realms and the institutional factors restructuring it continuously to accommodate the changes.

C. Interplay of Social Realms and the Institutional Properties with technology as mediator.

Firstly we define the Institutional Realms with operational definitions as developed from the literature review. The institutional realms constitute Structure of Signification, Structure of Domination, and Structure of Legitimating.

Structure of Signification : Giddens proposed in the theory of structuration that technology and structure of signification means using information systems, users are able to set up knowledge, rules, regulations and abiding laws that govern the working of processes and systems . These define the significance to technology use in organizations like ERP processes, Quality Standards, Benchmarked processes that assist organizations to adhere to a systematic set of procedures. It is the proper mapping of processes that lead to significant work establishments in organization. The following are the sub factors that have been included in the study namely organizational systems, organizational procedures and organizational communication.

•Organizational Systems : The relationships between organizational technology and organizational structure have been tried to explicit. The two aspects particularly Intelligence tools and software's like ERP systems were selected because they are regarded as strategic tools that have redesigned the work designs in organizations thus restructuring the Organizational systems.

•Organizational Procedures: The relationships between organizational technology and organizational processes and systems explore the enterprise software tools that have automated functional businesses processes. Much of the transactional tasks can be completed through such technology assisted enterprise resource planning software's. . In our study we have tried to understand organizational procedures which are influenced by organizational technology. The aspects particularly work/task mapping and workflows .

•Organizational Communication: It is an important contribution structurally to organizations and technology role in the interplay of organizational communication is very vital. Communication media transmit meaning between senders and receivers. Three variables constitute communication namely richness of content, Work linkages for carrying out tasks and social community builders . Communication involves interaction using technology to manage the emotions evoked by the presence of others (Short et al., 1976)) like social media, group blogs etc in organizations. Community which means the social set up of associations among people of organization .Communities outlast friends resulting in community development .

Structure of Dominance: As per Giddens theory of structuration , structure of dominance signifies using information systems, users are bounded to work within the boundaries of rules, systems, regulations that are guided by technology. They define the organizational work boundaries to prevent over lapping of work, levels of authority, reporting structure and detailing of work/tasks to be performed by people in organization. The structure of dominance is defined as follows.

Specialization among tasks: It is defined as the division of tasks such that people specialize to perform in their respective tasks. They assert the division in work in to different departments, due to process mapping different work/tasks can be grouped such that specialized work outcomes may be achieved.

Authority within organizations: A level of authority is defined the power to make decisions in the hierarchy .It involves delegating work to subordinates and getting understanding the reporting structure of the organization.

The ratio of Seniors to Juniors to total people : This would define the span of control within organization, as to how many seniors are controlling juniors in organization.

Process Definitions Process definitions are defined as the defining of the processes and the systems in the organization. They are the mechanisms or rules which an attempt to define the systematic roles and responsibilities of people / role doers and their work requirements.

Structure of legitimation : As per Giddens Structuration Theory, legitimating is the rightful obligation of the tasks specified to an employee in the organization. It considers the authorizations given to access/change/update systems, processes and procedures within organizational contexts. Following measures have been considered in the above namely:

Authorization : It is defined as the authority given in a particular role to make changes in the system.

Privacy: Privacy of employees due to technological surveillance is a lot in discussion. It is defined as the personal rights at work that due to electronic camera, digital I cards etc get tracked every second controlling employee actions and movement in organization.

Ethics : Ethics define the dos and don'ts in the organization.

Social realms which constitutes the other aspect of study is defined by the social systems that are created by people in organizations from networking, transparency, social blogging, feeling of trust, dependability etc. These constitute the social characteristics of an organizational framework that are created with humans in workplace.

In the study we try to unite the extremes namely institutional properties with human realms through technology intervention.

III. RESEARCH METHODOLOGY

This study used a descriptive design. In this study, we focused on exploring the Institutional Properties and the Social Realms with technology as a mediator. The target populations for the study were 100 executive to middle level managers from MNC'S in Indian IT sector , questionnaire was administered to these respondents and responses were recorded. The questionnaire was designed to capture the responses of the Social and Institutional Properties that interplay with technology use in organizations.

I : Respondents Profile

		Yrs_of_experience		
		1-5yrs	5-10yrs	10-15yrs
Role	Executive	12	10	5
	Manager	20	8	5
	IT Developer	15	5	5
	IT Support	10	5	5

A. *INSTRUMENT*

A total of nine constructs were selected for the study. These nine constructs were identified from literature review. A structured questionnaire was constructed utilizing these nine measure items namely organizational systems, organizational properties, organizational communication, Specialization, authority within organizations , Process definition , ratio of seniors to juniors , Organizational Authorizations , Privacy and Ethics .For each section of the questionnaire for the collection of data on the study. The questionnaire was specifically designed to understand the constructs at play when technology is used in process / systems in organizations.

The first section addresses the personal details, the second part of the questionnaire measures the social constructs and the third part of the questionnaire measures the institutional constructs. 19 items were scored on a five-point Likert scale ranging from 1 "I strongly disagree" to 5 "I strongly agree".

The questionnaire was filled by the research community belonging to middle managerial level and Executive Level from two IT companies . Construct & Measures – Interplay of Social Reams and the Institutional Properties with technology as a mediator would discuss the constructs and measures in the study in Table I.

I: Constructs and measures

	Measure Items	Question Items
Significance/ Meaning : Organizational Systems and Procedures	1.Organizational Systems	1.1.Adoption of Best Business Practices through ERP's and Structured Softwares.
		1.2 Business Intelligence and Analytics tools that have elevated business performances.
	2.Organizational procedures	2.1 Mapping of tasks/jobs for execution of the processes . 2.2 Designing work flows for tracking and policing work performance.
	3. Organizational Communication	3.1 Richness: Technology impact on the message content of the information shared. 3.2 Linkage: Technology has resulted in interpersonal Broadcast, Matrix linkages. 3.3: Cognitive processes : Impact or influence of personal/informational/community development
Domination: Organizational Structures	4 Specialization	4.1 Technology has defined an s set of roles and responsibilities that need to be adhered for goal attainment.
	Authorization	5.1 Defined as the power to delegate work to subordinates
	6.The ratio of superiors to juniors	6.1. A superior in organization is defined as an incumbent who acquires apposition of authority
	7. Process Definition	7.1 The detail with which processes are mapped on to the systems. The precise flow of activities and tasks.
Legitimation : an agreed form of social interaction that persists	8. Organizational Authorizations	8.1 The power to control /access given to supervisors to change/update data.
	9. Privacy and Ethics	9.1 Privacy : it is defined as the power to infringe the private space of employees like surveillance by camera etc. 9.2Ethics The do's and don't's that are applicable to data management and other security related issues .

IV. ANALYSIS AND RESULTS:

The exploratory factor analysis was performed using SPSS .Loading of variables recognized in the component, and Varian orthogonal approach was used to interpret the variables. Subsequently, the confirmatory factor analysis was used through rotation method : Varimax with Kaiser. Normalization.

The rotation converged into 6 iterations. The results are as follows in Table III.

III: Rotated component matrix results

Rotated Component Matrix[a]

	Component					
	1	2	3	4	5	6
Bestpracticesadoption	.794					-.361
Businessintelligenceatwork	.711				.464	
Mappingoftasks	.460			.641	-.405	
Workflowintegeration	-.543				.707	
Bettercommunication			.766			
Bettersocialnetwork				-.727		
Communitydevelopment			.922			
Goalenlargement	-.343	.724				.530
Goalcircumscribed	.821					
Levelofauthority					-.826	
Ratioofsupervisor						.892
Specificationrules_regulations		-.355	.525			-.416
Controlling	-.595			.509		
Privacy_encroachment		-.787		.360		
Ethics_awareness		-.318		.817		
Technology_role		.939				

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 17 iterations.

The factor analysis shows that 6 factors were emergent namely :
Factor 1: Functional Expertise: Best practices, Business intelligence, Mapping of tasks
Factor 2: Vision Convergence: Goal enlargement
Factor 3: Social Collaboration:organizational communication,community development
Factor 4: IT Governance and Ethics :Ethics, Privacy control.
Factor 5:Work flow Integeration : Work flow Integeration
Factor 6:Leader-Member Connect : Ratioofsupervisor,level of authority.
After identification of the factors that interplay with technology and the social and institutional properties of the organization , a regression analysis was conducted to understand from the emergent factors that are impacted highly with technology in social and institutional properties of organization . The Table IV provides the R and R2 values. The R value represents correlation and is 0.957, which indicates there is a high degree of correlation between the variables. The R2 value indicates how much of the total variation in the dependent variable i.e. Technology can be explained by the independent variables namely Leader_membereffect, Workflow_integeration, ITGovernance_ethics, Social collaboration, Vision_covergence, and Functional_expertise. In this case it is 91.7%, which is very high, thus showing that the model is robust.

IV : Model Summaries

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.957[a]	.917	.833	.31012	2.621

a. Predictors: (Constant), Leader_membereffect, Workflow_integeration, ITGovernance_ethics, Social collaboration, Vision_covergence, Functional_expertise
b. Dependent Variable: Technology_role

The above table is the **ANOVA** table, which reports how well the regression equation fits the data (i.e., predicts the dependent variable) and is shown below:

Table V depicts the results of ANOVA, which details the regression equation fit (i.e., how well the independent variables predict the dependent variable) and is shown below:

VI: Coefficients Table

Coefficients

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	2.923	0.086		33.985	0
	Functional_expertise	0.087	0.09	0.114	0.97	0.37
	Vision_covergence	0.714	0.09	0.939	7.97	0
	Social collaboration	0.071	0.09	0.094	0.796	0.456
	ITGovernance_ethics	-0.031	0.09	-0.041	-0.345	0.742
	Workflow_integeration	0.073	0.09	0.097	0.819	0.444
	Leader_membereffect	0.027	0.09	0.036	0.304	0.772

a. Dependent Variable: Technology_role

The Coefficients Table VI illustrates standard coefficients for Leader_membereffect,Workflow_ integeration Governance_ethics,social_collaboration, Vision_covergence, Functional_expertise .
The value of beta , tells us whether these independent variables contributes statistically significantly to the model and which have a more significant role to play . As seen vision convergence contribution has a huge contribution through technology use in organizations. Workflow integration and functional expertise also are independent variables that are significantly important with use of technology in organizations.

V. RESULTS

The exploratory factor analysis was performed with maximum probability approach and the variables were interpreted with Varimax rotation approach. The results showed that six factors came out from the study of Interplay of Social Reams and the Institutional Properties with technology as a mediator . The regression model fit has been robust with an R value as .957.Amongst the emergent factors Vision Convergence has been a very dominant factor that has a major impact due to technology use in organizations.

Employees in the organizations felt that with use of technology their information availability, accessibility to management information was also credible and transparent. Especially organizational portal and ERP uses in organization had made the organizational system high in transparency resulting as drivers to develop convergence in organizational growth prospects. Employees also felt that goal cascading for employee performance was also more logical and as per work flow with the use of ERP's making the reporting structure in organization transparent. Workflow integration and functional expertise have further contributed by use of technology interfaces has resulted in better organizational wellbeing further attributing to vision convergence. A unilaterally aimed organization that can propel employee force through a common vision of organizational growth is an important evolution from study . This is majorly attributed to presence of technology as a social collaborator and organizational processes and systems (institutional properties). The Giddens Model of Structuration with the analysis and results above can be modified as depicted in Fig2.

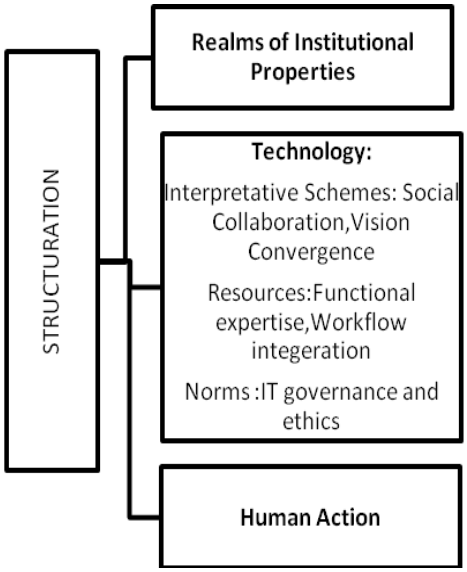

Fig.1: Modified Giddens Model of Structuration (Author)

Thus as visible from Fig.1 above technology as a mediator to social and institutional realms extends as interpretive schemes through social community building and vision convergence. The meaning derived through technology in business operations have not just transactional processing or resourceful benefits but also have implicated social modifications in the social framework. Next technology extends as a mediator to social and in situational properties through resourcefulness like functional expertise and work flow integration which has been majorly technology contribution in organizations. Lastly technology as a mediator links the social and the material /institutional properties of the organization through Norms. Technology creates certain prescribes regulations and rules through processes and systems mapped on technology that authorizes certain powers of access to users. Thus technology acts as a controller for employee actions in organizations so that they conform ethically. However ethics and IT governance as a factor was the least contributor's as per the regression coefficients model. As ethics is a way of life unlikely dependant on technology , either a person is ethical or he is not .It is a phenomenon whether an individual possesses or does not irrespective of the medium of use in work whether it is technology skilled or not.

VI. DISCUSSIONS

Thus our study has suggested that information technology in organizations have a significant role to play. In organizations social , institutional and technology are not comprised of independent entities but inter-dependable. Technology as from the study evolves as a mediator to bring the distant entities of social and institutional properties together. Thus role of technology needs to be interpreted not just as functional but social builders in organizations. Understanding of the social contribution of technology in organizations can sensitize technology developers, leaders and organizational designers to accommodate all aspects of organizations in to a symbiotic growth.

VII. MANAGERIAL IMPLICATION

This study has been performed to understand the role of technology in HR functions with special area of concern ie. Social factors that interplay with technology use in organizations. Understanding the nuances of relationship between technology and social order would provide a big eye view to further implementation and acceptability of technology in the organization. Challenges and opportunities combated with the HR functionaries can provide a better understanding of technology changes and influences that can be productively churned for practices and policies that lead to interpretive ,integrated and unilateral growth of organizations.

VIII. CONCLUSION

Technology is an important entity in the organization. It contributes not just as a functional expertise builder but also a social collaborator and vision converge as explored in the research. Thus organizations can benefit to organize people movements, change management, and other growth initiatives driving technology as a propeller. Thus role of technology is ingrained in the way organizations can best optimize .Technology is now embedded in to social framework so deeply that organizations need to sensitize these changes in the upcoming workforce and try to accommodate the web linkages between social , material and technology so that they can be converged for organizational growth .

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