

**Interaction Between Information Technology and Organizational Studies Fields in Describing
the Outcome of Technological Innovations**

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ABSTRACT

This study investigates the interaction required between organizational studies field and the information systems field to fully understand the adoption of a new information technology. Using the context of paperless office, this study proposes a research plan to empirically test the propositions.

INTRODUCTION

According to Orlikowski & Barley, 2001, changes in the society brought about by technological advancements have been interpreted by the researchers in the information technology field and the organization studies field differently. Due to their built-in differences in evaluating the impact of events on humans and organizations, there is substantial variation in the way information technology field and the organizational studies field have assessed the influence of technological change on human issues and processes. The information technology field has adopted an essentially utilitarian approach in analyzing technological changes and their interactions with human behaviors in the sense that it relies on the nuances in the perceptions of perceived characteristics of the technology with a temporal focus on the present to the future. The organizational studies field on the other hand has adopted a humanistic approach in its efforts to explain the interaction of technology and human issues with a temporal focus trained on the social norms and institutions that existed prior to the existence of that technology. Per Orlikowski & Barley(2001), this is because information technology field and the organization studies field have established their research agendas on two distinct epistemological foundations.

The information technology field has adopted the paradigm of developing systems and understanding the consequences of information technology given specific objectives and conditions of operation. A significant portion of the IT research investigates the design, deployment and use of artifacts that represent tangible solutions to real world problems. As such, IT field has a great deal in common with engineering, architecture and other fields of design. The decidedly utilitarian approach towards technology in the form of “*what works*” has provided the impetus for IT research. The core questions playing a major role in shaping the IT research agenda abound with issues of contemporary organizational problems that can be solved through solutions derived through information technology. Many of these questions are situation specific.

The epistemology of organizational research is more closely attuned to that of a traditional science. It considers as its prime objective the development and testing of parsimonious explanations for broad classes of phenomena. The organizational studies field has adopted as its primary subject matter the human behavior in and between organizations at individual, group and inter-organizational levels of analysis. The core questions driving the research effort in organizational studies is ‘*why*’. The organizational studies field endeavors to create theories of high generality. Its objectives may be considered to be discovery of regularities, articulation of general principles, and identification of causal relationships.

The epistemological contradictions found in the information technology research and the organizational studies research in the form of emphasis on particular and general, practical and theoretical, has led to a disjoint in their research agendas in the past. However, this disjoint provides an opportunity for encouraging greater interaction between the two fields for creating a richer and substantive set of theories that can derive advantage from the respective strengths of the two fields. According to Orlikowski & Barley (2001), the organizational studies field stands to gain more from the enhanced interaction in the two fields since the changes brought about in the nature of work and

organizing can be understood only in the light of the developments occurring in the underlying technology forming the foundations of organizational and economic activities. This fusion in the perspectives of the two fields represents a shift towards interpreting events as techno-social phenomena and not as purely technical or organizational phenomena. The underlying epistemologies of the two fields by themselves lack the ability to describe all the aspects of the impact of technology on organizations today as they have evolved unilaterally with diverse perspectives, each of which tended to interpret events in the light of its own distinct dominant logic and concepts. The close intertwinement of information technology and organizational dimensions is the result of both technological and organizational factors becoming increasingly dependent upon each other for enhancing their contributions to organizational and individual goals. Organizations are providing information technology an ever increasing role in their quest for excellence and growth. The prominence being awarded to information technology in turn defines the issues and problems which information technology is likely to grow toward in future as technology pioneers devote themselves to solving problems organizations consider important.

RESEARCH QUESTION

Based on the idea propounded by Orlikowski and Barley (2001) this study investigates the issue of paperless organization promised by information technology which has not quite lived up to its full potential as yet. This problem is closely aligned to the ideas of Orlikowski and Barley (2001) as it requires an understanding of the interplay between technological and organizational issues in explaining the outcomes which cannot be fully understood by applying the prominent logic of a single paradigm. This problem parallels the lack of widespread acceptance of telecommuting alluded to by the authors wherein they state that neither the information technology nor the organizational studies literature adequately envisions the whole reality of telecommuting. Each field discusses the issue using its own preferred constructs and fails to see outside the boundaries of the framework within which that field operates. Accordingly, the research problem may be stated as such:

An investigation into the reasons leading to low extent of paperless technologies adoption by organizations

Despite being heralded as a revolution in the organizational practices with its promise of enhancing efficiency and productivity apart from expediting information flow and decision making in organizations, the paperless organization is not yet a reality. This study looks at the reasons behind the less than expected acceptance of the technologies promising to deliver organizations from the restrictions and constraints of the paper based communication and record keeping, with its attendant impact on the workers' efficiency and organizational performance. The study pays special emphasis on the interaction between technological and organizational factors that could together provide a more comprehensive explanation of the reasons behind the lack of extensive adoption of paper eliminating technologies by organizations.

The underlying components of the research question are:

- 1) Role of information technology in influencing organizational practices.
- 2) Perceptions of organization members on adopting paper eliminating technologies.
- 3) Impact of paper eliminating technologies on information flows in an organization.
- 4) Influence of institutional factors on paperless technology adoption.

REVIEW OF LITERATURE

The term paperless organization offers the seductive image of a harmoniously streamlined and highly efficient workplace that has vanquished the chaos and disorder related to coping with the never ending paper trail. It promises, at least theoretically, the onset of a new era in office management where no document ever gets lost and where any information, no matter how obscure, is available at the press of a button. Information technology has made stupendous strides in its drive to make the previously described scenario a reality. The rapid progress made in imaging technologies and the precipitous fall in computer storage costs have brought the cherished aim of establishing a truly paperless organization within the realm of possibility over the previous few years. Many organizations, which decided to cross the Rubicon towards establishing a paperless organization, have reaped rich dividends from such moves. Straub (1998) provides description of the benefits accruing to a health organization that made such a move. According to Straub, elimination of paper based transactions led to: reduction in staff costs, reduction in retrieval time from minutes and hours to seconds, streamlined workflow, simultaneous use of records by multiple users, savings of space, enhanced confidentiality of private documents, reduction in transaction times, drop in incomplete transactions, and increased efficiency in operations. Such comprehensive positive benefits arising from eliminating paper based transactions would indicate a far more widespread adoption of such technologies, however it has not taken place in reality (Swartz, 20004).

The reasons behind lack of adoption of technologies allowing for a paperless organization have to take into account factors that fall in the domain of information technology as well as organizational studies. An emphasis solely on either one of the fields to the exclusion of the other is likely to provide insufficient explanation of the phenomena as creating a paperless organization is contingent on the interplay between human and organizational factors and the attributes of the technology. Drastic advances in the information technology have allowed employees in organizations the ability to avoid use of paper in conducting business transactions. However, it has also provided employees with the ability to print documents at low cost and large quantities effortlessly (Turner, 2003). Thus simultaneous advances in the two technologies with diagonally opposite implications has brought the relationship between technology and nature of work in sharp focus toward understanding the process of creating paperless organizations. Sellen and Harper (2002), intrigued by the failure of the organizations to discard paper based transactions undertook a research project to study this phenomenon. According to Sellen and Harper, the emergence of knowledge economy is primarily to blame for the lack of decline in paper use in organizations as the knowledge workers in fact consumed 300% more paper than their other counterparts. They further state that paper and digital technologies each has certain affordances the other lacks, in that one afforded certain capabilities, functions and conveniences that the other could not. For instance, paper could be easily marked on; its tangible and provides a sense of security, multiple paper documents could be browsed at the same time whereas digital technology offered the facility to search large number of documents at the same time and store vast information easily. Hence the task-technology relationship becomes salient in the process of introduction of paperless transactions. Some of the key aspects of task-technology combination are controllability, predictability and complexity (Gerwin, 1981). The relationship between paper eliminating technologies and their relationship to the tasks performed by employees, when evaluated in terms of the advantages afforded by the technology versus the controllability, predictability and complexity would influence the decision to adopt them. Thus, a technology provides capability, but employees evaluate it in terms of how it can best be incorporated in their work practices based on their perceptions of its centrality to the tasks performed by them.

Apart from the technology specific factors applicable in the context of paper versus digital, one also needs to consider more general factors related to human tendencies in adopting technological change which fall within the domain of organizational studies.

According to Keen (1981) institutional inertia is a contributing factor to the processes hindering change at the organizational level. He further states that main causes of inertia in relation to adopting a new information technology are likely to be:

- a) Human information processing is experiential and relies on simplification. New advances in information technology need to be absorbed and understood in terms of the existing measures of usefulness subscribed to by the organizational actors.
- b) Organizations are complex and change is incremental and evolutionary given bureaucratic hindrances to spread of new ideas and innovations.
- c) Data are not merely an intellectual commodity but also a political resource, whose redistribution through new information systems affects the interests of particular groups.

Decision processes in organizations tend to be mimetic and overvalue process reliability at the expense of experimentation (Miller 1965). Coupled with the bias towards process reliability, Keen's (1981) description of the political implications of redistributing data indicates the social dimensions of regressive forces operating in organizations that counter efforts to incorporate change. In same vein, Markus (1983) raised the issues related to the interaction between the existing organizational roles and communication patterns and the characteristics of the system being introduced. Introduction of a new information system could influence the organizational roles and the communication and coordination around the division of labor. According to Markus, new information systems may prescribe a division of roles and responsibilities at variance with existing ones and may structure patterns of interaction that are at odds with the prevailing organizational culture. Organizational researchers would be more likely to consider the role of the technology as instrumental to the objectives of the organizational actors and not much more.

Considering the integrated view of the information technology related factors and organizational studies related factors, it becomes evident that the two are closely intertwined with each other when considering their impact on technology acceptance and integration in work roles. The information technologies, by reshaping the way transaction are conducted, also influence the existing relationships existing within the organizations. The asymmetric distribution of decision making roles and bureaucratic power influences the impact of technological capability on organizational outcomes. Any perceived threats to the ability of the organizational actors to shape information flows resulting from the introduction of a paperless technology would hinder the spread of such technology within that organization. Even if favorably perceived by employees per the task-technology perspective, a new paperless technology could make the easier availability of digitalized information threaten the existing information broking practices in use in an organization. A new paperless technology might therefore offer a new capability that undermines the power equation while offering convenience and therefore violate the usefulness per the pre-existing measures of usefulness. Ability to control the availability of a document could overwhelm the inclination to preserve it in a manner that makes retrieval, distribution and storage of such documents much more easy and convenient.

Therefore, in the words of Orlikowski and Barley (2001), unless considered in a techno-social perspective, any understanding of the reasons behind lack of zeal in adopting paperless technologies will be tainted with the dominant perspective of the either paradigm. Technology proponents,

enthused with the capabilities and advantages offered by the paperless technologies could overestimate their adoption potential. The organizational constraints, inertia and impact on existing information exchange relationships would have to be considered as well to make a more realistic assessment of the adoption potential of such technologies. From the organizational studies perspective, the organizational actors could consider a new technology as a mere instrument, not necessarily something imperative to their roles. Therefore, researchers trying to understand the reasons behind lack of adoption of paperless technology within organizations will have to consider the manner in which introduction of technology influences existing organizational roles and relationships, information exchange mechanisms, bureaucratic inertia and the existing measures of usefulness in use by that organization. A new technology alters not only the processes that utilize it, it also alters the relative importance of the roles of the individuals engaged in those processes.

PROPOSITIONS

In accordance with the issues discussed above the following propositions are proposed:

P1: The decision to replace paper based transactions with digital systems is positively related to perceptions of benefits of such move by the potential users.

P2: The task related aspects will influence the adoption of the paperless transactions.

P3: The more drastic the changes introduced by the paperless technology on existing roles of the adopters, the more the resistance to such adoption.

PROPOSED RESEARCH METHOD

Survey methodology would be employed in this study. For a clearer understanding, those who would be using the technology and those who would be actually making the decision to deploy the technology will be surveyed to include maximum possible shades of perspectives in the study. Survey results would be analyzed through the structural equations methodology, employing Amos software package in order to derive the significant relationships.

SAMPLE

A sample would consist of staff and supervisory staff as also the decision makers at medium sized and large organizations which clearly stand to benefit from introduction of paper eliminating technologies. A diverse sample would consist of people engaged in different streams of work, such as accountants, business analysts, engineers and software programmers as also division managers, vice presidents and other senior managers.

JUSTIFICATION OF RESEARCH APPROACH

This research approach puts equal emphasis on both the technical and the organization perspectives. According to Orlikowski and Barley (2001), organization studies have not paid adequate attention to the role of technology in influencing outcomes related to organizational performance. They argue that organization studies field has more to gain from the information technology field because unless the ability of the technology in reshaping role relationships within the organizations is better understood, the existing research effort will be unable to shed sufficient light on factors leading to outcomes. This research design agrees with Orlikowski and Barley (2001) and makes information technology related factors the underpinning based on which the organization related issues operate . In this study the impact on organizational processes and organizational actors is predicated upon the technological context in which they are embedded.

EXPECTED CONTRIBUTIONS OF THE STUDY

The proposed study will further the understanding of the issues related to adoption of paper eliminating technologies by organizations that stand to gain from such a move. The study should

place equal emphasis on the organizational factors apart from the information technology related factors since otherwise the results will not be truly representative of the complex, interrelated situation. Paperless technologies are beneficial both to the organizations as also to the environment, and their diffusion should be beneficial to the information technology industry as also the organizations.

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