

ROLE OF INFORMATION TECHNOLOGY IN MANAGING ORGANIZATIONAL CHANGE AND ORGANIZATIONAL INTERDEPENDENCE

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ABSTRACT

This paper sets application of open systems theory for generating propositions regarding the management of organizational change and organizational interdependence by application of IT. The article argues that the survival and growth of organizations in an increasingly turbulent environment would depend upon effective utilization of information technology for the organizational structure with environmental preferences and for creating interorganizational structures.

I. INTRODUCTION

"Information technology is no longer a business resource; it is the business environment." This statement is not far from truth. Ongoing advances in information technology (IT), along with increasing global competition, are adding complexity and uncertainty of several orders of magnitude to the organizational environment. One of the most widely discussed areas in recent business literature is that of new organizational network structures that hold the promise of survival and growth in an environment of ever-increasing complexity. How can IT help the organizations in responding to the challenges of an increasingly complex and uncertain environment? How can IT help the organizations achieve the "flexible" organization structure? These are the topics of discussion in this article.

We are observing a strong trend of convergence of the technologies of computing and telecommunications. Changing technology economics, merging of formerly disparate technologies with different managerial traditions, and the problems of managing each of the phases of IT in different ways.

The article describes the open systems theory as one possible tool for organizational MIS research and practice, using the issues of environmental change, organizational structure and organizational interdependence to illustrate its use. The area of environmental change and organizational IT response is an especially appropriate application area for the open systems theory. The open systems theory is then applied to the study of environmental change and organizational response.

II. ENVIRONMENTAL CHANGE, IT AND ORGANIZATIONAL STRUCTURE

The increasing global interdependencies and the accelerating pace of change demand more flexible and adaptive organizations. Effective implementation of IT would decrease vulnerability by reducing the cost of expected

failures and enhance adaptability by reducing the cost of adjustment. "The organization's response to the environment will continue to be the crucial determinant for its effectiveness." Since postindustrial organizations will be faced with increasing environmental complexity and turbulence, organizations' needs to process information and make decisions will be substantially increased. The capabilities and flexibilities of computer-communication systems make them increasingly relevant to organizations by being able to respond to any specific information or communication requirement.

III. IT AS A SOLUTION TO ENVIRONMENTAL CHANGE A

The cost of IT has plunged since the 1960s resulting in enormous investments in IT applications that have stimulated increasingly complex organizational change. That technology cost-performance improvements will sustain this trend over the next decade. Presently, IT amounts to nearly one-half of US firms' annual capital expenditures and increasingly affects how firms organize, do business, and compete. IT may be considered as comprising of five basic components - computers, communications technology, work stations, robotics, and computer chips. "IT" is considered to be synonymous with the definition of "*advanced information technologies*" provided by Huber (1990):

Devices that transmit, manipulate, analyze, or exploit information; in which a digital computer processes information integral to the user's communication or decision task; and those have made their appearance since 1970 or exist in a form that aids in communication or decision tasks.

IT is becoming all pervasive and is having impact on all industries -- in service as well as in manufacturing. It is affecting workers at all levels of organizations - from the executives to assembly hands and clerks. IT is increasingly becoming an integral component of all types of technologies -- craft, engineering, routine,

IV. IT AND NEW ORGANIZATIONAL STRUCTURES OF INTERDEPENDENCE:

Benjamin and Levinson (1993) emphasized that for IT-based change to be effective, technology, business processes, and organization need to be adapted to each other. Comparing the present information revolution with the Industrial Revolution indicated that the latest changes in IT would lead to the evolution of new technology-intensive organizational structures. They project that the advances in IT would result in dramatic decline in the costs of "coordination" which would lead to new, coordination-intensive business structures.

V. OPEN SYSTEMS THEORY AND ENVIRONMENTAL CHANGE

Why Open Systems Theory? The open systems approach has been chosen to study the above issues because it has been commended for its potential usefulness in "synthesizing and analyzing complexity" (Simon, 1969) in "live" organizations. Comprehension of a system cannot be achieved without a constant study of the forces that impinge upon it (Katz and Kahn, 1966). Leavitt, Pinfield and Webb (1974) also recommended an open-systems approach for studying contemporary organizations which now exist in a fast-changing and turbulent environment. Ramstrom (1974) propounds increased emphasis on systems thinking to comprehend the increased interdependencies between the system and its environment, and between the various parts of the system.

Classical and neoclassical organization theories have been found wanting because of their emphasis on organizations as fragmented and closed social systems acting independent of external forces argued that "the only meaningful way to study organization is to study it as a system" and had observed that the distinctive feature of modern organization theory was in its conceptualization of an organization as an open system. Though several empirical studies have been done for analyzing the impacts of IT at individual level, there is no conclusive evidence if these results would be consistent at the organizational *system* level. "Whether individual performance implies organizational effectiveness?" still remains a moot issue.

VI. LIMITATIONS AND CONCLUSIONS

In terms of empirical research on organizations, the open systems theory has had negligible impact. Though the open systems model has been widely used to label and organizational studies. To appraise the effectiveness of an organization with the aid of systems theory one must measure its performance with respect to the four systemic processes - inputs, transformations, outputs and feedback effects - as well as their interrelationships. Measurement of the various forms of organizational inputs and outputs is pretty much undeveloped. The more commonly accepted approach for organizational research is the goal approach which considers goal achievement or the degree to which an organization attains its goals.

VII. SUMMARY

The future organizations would be facing a shortage and a redundancy of information. To solve the problems of "information-glut" arising from the evermore affordable information and communication technologies that provide for evermore high-capacity, fast, long-distance transmission, organizations would need to introduce methods for "selective dispersion of information" to their various parts.

The design of the organizational structure should take into account and take advantage of the information and information- processing supports which could be designed, and in the not- distant future will be inexpensive.

Unlike the systems theory view of organizational constructs, the most common approach taken by empirical researchers has been in terms of goal achievement or the degree to which an organization attains its goals. While there is much merit in emphasizing the crucial importance of resources - or in, systemic terms, of input processes and input goals - it ignores the other three systemic processes. On the other hand, the economist's bias of measuring outputs in relation to inputs overlooks the other systemic processes that eventually effect the organization's overall survival or growth. Clearly, the systems approach has its advantages. Moreover, the problems encountered in defining an organization's goals can be avoided by indirectly deriving the goals - by positing the three generic goals of input, transformation, and output.

6th International Conference on Recent Innovations in Science, Engineering and Management

IIMT College of Engineering (Approved by AICTE, New Delhi), Knowledge Park III, plot no. 20-A, Greater Noida, Uttar Pradesh (India) (ICRISEM)

20th August 2016, www.conferenceworld.in

ISBN: 978-93-86171-03-0

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