

# Role of computer in organization and society

[Technology](#), [Computer](#)



Such a view of information systems in organizations does however fail to include such phenomena as the daily use of information for misrepresentation purposes. The conventional systems analysis methods; whether they be data- or decision-oriented, do not help in understanding the nature of organizations and their ways of processing information. This paper proposes what appears to be a more realistic approach to the analysis and design of information systems. Organizations are seen as networks of contracts which govern exchange transactions between members having only partially overlapping goals.

Conflict of interests is explicitly admitted to be a factor affecting information and exchange costs. Information technology is seen as a means to streamline exchange transactions, thus enabling economic organizations to operate more efficiently. Examples are given of MIS, data base and office automation systems, where both the organization and its information system were jointly designed. These examples illustrate the power of the approach, which is based on recent research in the new institutional economics.

Introduction putters (conflicts, hidden resistance, lack of integration, skyrocketing development cost, education problems, to name a few), there is a growing awareness that theory and practice are still at the mercy of events. Despite the confidence of many in the relentless advancement of computer-based information systems, as witnessed by such innovations as Decision Support Systems, Distributed Data Bases, Expert Systems, Office Automation and suchlike, critics object that "Management Information Systems above the level of simple counting and comparing fail because theory is mammals to make them work" (Williwaws, 1983). Restrictions just

muddle through when analyzing and designing systems. On the contrary, the current state of the art is dominated by a conventional wisdom, which is composed of a comparatively longstanding set of assumptions and frames which me to guide the practical theories and actions of designers.

It is this conventional wisdom which must be explored: its concepts, views and stereotypes must be critically examined and refrained, in order to improve our understanding of such basic issues This is a recent example of skeptical comments on how computers are misapplied in organizations; the earliest criticisms stem from almost twenty years ago with scholars such as Kickoff (1967), who stated: " I believe that these near-and far misses in MIS implementation could have been avoided if certain false (and usually implicit) assumptions on which many such systems have en erected had not been made". why and how is information processed and communicated within and between organizations? Even among the users, I. E. Those who actually operate in organizations and deal daily with the small and large scale problems arising from the introduction of corn- ; what impact does information technology have on organizational processes and structures? 57 because they are based on a view of organizations as perfectly cooperative systems.

The need for an alternative framework based on the new institutional economics is addressed in Section 3: it is shown that by considering organizations as networks of exchanges and contracts between members, both cooperation and conflict can be taken into account together with the various usages of information that individuals employ when cooperating and

conflicting. Also, the specific role of information technology is illustrated as a means to lower transaction costs. In Section 4 the new design principles are discussed using examples drawn from the fields of data bases, office automation and MIS.

The concluding the new framework. ; what organizational models can guarantee that systems analysis and design are sound and effective? Present day designers turn to two theories when addressing the above issues: they either tend to a " data view" of organizations, or, in the case of those most influenced by business needs, to a decision-making view. These two ways of looking at the problems of computerizing are so widely accepted and have been so much taken for granted that they can be said to form the conventional wisdom of today.

The origins of the former can be traced directly back to the EDP field, while the latter stem from the influential work of Herbert A. Simon (AAA). It is somewhat surprising that although information technology has gone through an almost revolutionary process of miniaturization, sophistication and diffusion, the design models and criteria concerning its application in organizations are still based on the concepts of the early sixties. This appears still more puzzling when we examine the fields of sociology, political science, organization theory, economics of information and organizations, which have also undergone a sharp innovative process.

But none of the new developments in these disciplines seems to have filtered through to the field of MIS, apart from such aspects, as the political view of system development (Keen, 1981; Killing, 1980; Markus, 1983). A

Critique of the Conventional Wisdom Two Current Views In order to airframe our understanding of computer-based information systems in organizations, an essential, preliminary step is to discuss two approaches which are at present in good currency: the data approach and the decision approach. According to the data approach, in applying a computer to an organization it is only necessary to consider (I. . Analyze and design) the data flows and files in that organization. The analyst ascertains management information requirements by examining all reports, files and other information sources currently used by managers. The set of data thus obtained is considered to be the information which management needs to computerize (Davis, Munroe, 1977). The data approach ignores the economic and social nature of organizations and is exposed to the hazards of those economic and social processes which characterize the daily life of organizations and which we, as members of organizations, all know (see below). Cent developments in social sciences and economics. The ultimate goal is to define both a new framework and a new language, so that the role of information technology in organizations can be better understood. To anticipate it is argued that a new organizational understanding of information processing must go beyond the individual decision-making paradigm, which at present lies at the core of the conventional wisdom.

The concepts of " exchange" (transaction) 1 and " contract" between at least two individuals or organizational units must become the new center of attention. This alternative tact enables us to use the results of a new paradigm emerging both in institutional economics and the sociology of organizations. The paradigm, known as the transaction costs approach

(Williamson, 1975, 1981), links the notions of information, uncertainty and organization in an original way.

Phenomena such as resistance to change, retention of information are not seen anymore as irrational, unexpected flaws in a structured system design, but as factors and behaviors which can be rationally understood and carefully anticipated; and issues such as centralization versus decentralization can be viewed in a different light. The presentation of the argument starts in Section 2 with a critique of the received tradition and its implicit, but widespread assumptions: it is shown that the data- and decision-making views are inadequate and unrealistic, The second tradition is more sophisticated from an organizational point of view.

It can be traced back to Simon (1977) and was further developed by scholars such as Calibrating (1977), Keen and Scott Morton (1978) etc. According to this approach information technology is support to decision making.

Managers facing complex tasks and environments use information in order to reduce the uncertainty associated with decision making: " the greater the task uncertainty, the greater the amount of information that must be processed among decision makers during task execution in order to achieve a given bevel of performance," states Calibrating (1977).

Simon writes in a similar vein about programmable and unpin- 58 agreeable decisions (Simon, 1977) (see also for applications Kickoff (1967); Keen, Scott Morton (1978); Sprague (1980); papa (1982); Huber (1984)). Individualistic. Decision-oriented design strategies focus on the information needs and

cognitive styles of the individual decision maker facing a complex and uncertain task.

Take, for example, Rocket's design method based on the analysis of the Critical Success Factors, which stresses the investigation of current information needs of individual managers" (Rocket, 1979). While it is worth investigating the role that computers play in individual problem solving, a manager in a particular organization cannot be seen as a solo chess player whose only opponents are the " technology," a " random environment" or " nature". In organizations the key issue is collective, coordinative problem solving (Schilling, 1980) (Turnoff, Hilt, 1982).

Though this obvious consideration is beginning to make its way in the recent ADS literature (Huber, 1981), few practical suggestions are provided regarding its implications in systems analysis and design (Sprague, 1980; De Sanctis, Gallup, 1985). It could be argued that the diffusion of communications and data processing technology poses some limits to the scope of the decision-making view, which emphasizes control and feedback rather than communication processes. But, of greater interest here are some puzzling organizational phenomena which challenge that view and invite the suspicion that it is incomplete.

Consider the following evidence by scholars in the field of organizations: information is gathered and taken into account only after the decision has been already made, that is to say, as an a posteriori rationalization (many computer print-outs are used as high- each cosmetics to already made resolutions), much of the information gathered in response to requests is not

considered in the making of those decisions for which the information is requested (Feldman, March, 1981), Secondly, the decision-making control model ignores the fact that organizations are mixtures of cooperation and conflict between participants; its implicit reference is in fact to man-machine systems (Simon, 1977). When dealing with collective problem solving, the model assumes that/ODL the participants share common goals (I. E. , a team, Marsha, Reader 1972): information problems related to task execution and coordination are once again considered to be caused by environmental or technological uncertainty only.

It is, however, more realistic to say that all coordinative problem take place in a mixed-interest context (Figure 1). A minimal respect for the well-known confliction processes existing in organizations would indicate that there are other incentives to gather and use information, apart from task uncertainty: information can be misrepresented; promises and commitments can be false; data incomplete; tracks covered etc. , all in order to induce others to make decisions cost benefiting us in the first place. Or, another possibility is that information can be selectively disclosed to persuade and bias; what this in fact means is that it can be used as an instrument of power to win or gain a better position in the daily organizational games. cost of the information generated and processed in organizations is open to misrepresentation, since it is gathered and communicated in a context where the various interests conflict, when, on the other hand, organizations are informational transparent, as many EDP specialists wish, it has been shown that the decision makers in woo different departments, say Production and Sales, could be playing never-ending information games which lead to overall



suboptimal (Kickoff, 1967), information is not only used as an input for the individual decision maker, but is also used to persuade and induce the receiver to action. It could indeed be argued that this use of communication is the essence of authority and management (Floors, Ludlow, 1981).

Thus information is not simply interpreted data, rather it is an argument to convince other decision makers to be effective it must have attributes other than exactness, lariat, etc. : rather than being purely objective, it must be convincing and adequate to the situation at hand. Flaws in the Decision Making View The upshot is that in collective coordination and action there is a distinct form of uncertainty besides that characterizing the task, the technology or the environment: it is an uncertainty of behavioral, strategic nature, which has its origins in the conflict of interests between organize- We now turn to an analysis of the reasons why the conventional decision-making view cannot explain phenomena such as those just described: 59 Figure 1

Consider the introduction of computers in organizations. At present this process tends to be regarded as a bargaining process between conflicting parties, the decision-making taking place during system implementation is looked at from a political perspective (Keen, 1981; Markus, 1983). However, even these very authors, when considering a specific managerial decision for automation, (for example a ADS for budgeting) switch the analysis framework back to the conventional wisdom: the Thirdly, the conventional wisdom is one-dimensional: it takes hierarchical organizations for granted, thus ignoring many important facets of the economics of organizing.

For example, it must be embedded that the boundary and structure of an organization are not indefinitely fixed: they change every time a manager implements a make-or-buy decision, or he/she decides to integrate or disintegrate a stage of the production process, an office or a department. Moreover, it is insufficient to conch decision maker is seen as a component of a control system, where the system is uncertain and complex, and factual information is needed to keep it under control (Keen, Scott Morton, 1978). How can one agree with such a contradictory treatment of two organizational processes, the implementation of a system and the use of information for managerial decision making? If the former is a bundle of political decisions, why should the latter represent a neutral, purely algorithmic exception?

The political view of system implementation has had the merit of breaking the ice and showing that, in certain areas at least, organizations cannot be analyzed and changed by using frameworks exclusively derived from systems theory and computer science, but what they in fact require are investigation and design methods which consider political, economic and sociological phenomena. This particular point of view has not however succeeded in providing a complete and f diverse, specialized activities, is solved differently in a hierarchy or the firm. In a firm, market transactions are 'eliminated and in their place we find an intercommunication's who is the authority who directs production (Cease, 1937).

Markets and firms are thus substitutes and the replacement of one by the other is a common event. Think again of any make-or-buy decision. A market contract displaces a bureaucratic contract when a travel agency replaces its

ticket delivery person with a messenger service. A hierarchy supplants a market when a firm begins photocopying its own circulars rather than eyeing for the services of a printer (Hess, 1983). Given the case with which an economic system, with its essential functions of coordination and control, can flow from market to hierarchical organization and back, it should be clear that there is a need for a framework for defining the special role of computer-based information systems in such a diverse organizational context.