Measuring the Impact of Information Systems on Organizational Behavior

R. Wayne Headrick
New Mexico State University

George W. Morgan
Southwest Texas State University

Information systems design’s traditional concentration on short-term, readily quantifiable functional factors has resulted in the development of systems that are usually quite capable of manipulating data in the desired manner to produce the required output, but often fail to promote the general behavioral climate objectives of the organization. Failure to consider such behavioral objectives in the design process can result in information systems that have an impact that is intrusive in nature on the organization. To design information systems that not only meet functional objectives, but also promote objectives related to the organization’s behavior, their impact on organizational behavior must be understood and quantified. Toward that end, a methodology that can measure the impact of an information system has on the behavioral climate of the organization has been developed and tested. Utilizing pre- and post-implementation assessments of an organization’s behavioral climate, this methodology enables information systems developers to identify specific potential design criteria which, when implemented, will increase the degree to which the organization’s behavioral goals and objectives are met. Consideration of such organizational behavior goals and objectives when designing information systems can result in significant progress toward ensuring the acceptance and long-term survival of those information systems.

Introduction

Information systems, like any other production-oriented system, have as their goal the transformation of raw materials (data) into finished goods (information) in an effective, efficient manner. In the context of information systems, this means meeting informational requirements with a minimum expenditure of available resources. To develop such information systems, design and development strategies ranging from the traditional top-down or bottom-up techniques to Joint Application Design (JAD) to object-oriented have been advanced.

Traditional top-down systems design revolves around the functional decomposition of the business activity under consideration until the resultant sub-activities are of manageable size and complexity. This emphasis on functionality often overshadows other organizational considerations in the information systems design and development process. Along this line, Zmud (1983) noted that in traditional systems design, the use of a set of functional support oriented requirements to aid the design process was considered to be the key to a successful information system, with little consideration given to the impact of the system on the organization.

JAD, one of a number of systems design methods developed to increase user involvement in the design process while ensuring the functionality of the resultant information systems, makes use of a structured mechanism to increase the voice of the user community in the design of the information system. By actively involving the users of the system in the design effort, the focus on business needs they bring to the process should result in a system that is more organizationally relevant than would otherwise be the case.

Although not specifically developed to enhance user
interaction in systems design efforts, object-oriented systems design methods tend to model business operations in such a way that users can more easily relate to and understand them. Because the functionality of individual objects, as well as interactions among them, are based on the actual functions and processes of the organizational activities being modeled, the organization’s behavior should, to some extent, be reflected in the information system developed from the design modeled.

Implicit in this recognition of the need to involve system users in information systems design efforts is the understanding that the system is an integral part of the organization within which it exists. As such, it is important that the system fits into the behavioral climate of that organization.

**Considering Organizational Behavior**

Early advocates of incorporating organizational goals and objectives into information systems evaluation, Ahituv and Neumann (1982) noted that, while functional objectives are important to the development of an information system, such an effort is not merely a technological project; it also has significant managerial, organizational and behavioral implications. Zmud (1983) developed an informal mechanism for appraising expected organizational impacts (both positive and negative) in the specification of system requirements. Atteberry and Doke (1982) suggest that personal/organizational considerations should be included in the evaluation of information systems performance, with user attitude toward the systems and the rate of consumption of human resources being typical of the criteria by which such considerations can be measured.

Burch and Grudnitski (1990) noted that an organization may be readily viewed as a system made up of several subsystems, including an information subsystem. Because the information subsystem is an integral part of the organization, changes in it are likely to affect the entire organization, possibly bringing about changes in the organization’s behavioral characteristics. To understand those changes, the behavioral characteristics of the organization must be identified, quantified and measured.

In an early effort to explain the behavior of social systems such as organizations, Getzels (1958) concluded that the observed behavior of such systems was a function of the interactions between two dimensions that exist within systems, the institutional (nomothetic) dimension and the individual (ideographic) dimension. The two-dimensional model developed by Getzels, graphically depicted in Figure 1, illustrates the interactions, and potential conflicts, between the structural, norm-producing and sanction-bearing features of the institution and the internal motivation systems of the individuals within the organization.

Because the interactions across these two dimensions lead to the observed behavior of the system, supplanting institutional roles and expectations with the processes and/or procedures of an information system creates a parallel model which should help explain the behavioral climate as it relates to an information system. Extending the work of Getzels, Halpin (1966) developed an organizational behavior evaluation measure that focuses on eight factors, four that relate to the behavior of the employee and four that relate to the employee’s perception of the behavior of the organization.

The four factors related to the behavior of the employee are:

- **Disengagement** - refers to the employee’s tendency to be “not with it” or just “going through the motions” with respect to the task at hand.
- **Hindrance** - refers to the employee’s feeling that the system burdens them with requirements that are viewed as unnecessary busywork.
- **Esprit** - refers to the level to which their social needs are being satisfied, and the extent to which they enjoy a sense of accomplishment on the job.
- **Intimacy** - refers to the employee’s enjoying friendly social relations with each other.

The four factors that relate to the employee’s perception of the behavior of the organization are:

- **Aloofness** - refers to formal and impersonal guidance, and is characterized by the use of rules and procedures rather than informal, face-to-face situations in dealing with employees.
- **Production emphasis** - refers to behavior associated with communication that is downward only, with no sensitivity to employee feedback.

**Figure 1: Social systems model**

![Social systems model](image-url)