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Introduction

How businesses evolve and the technology available to them has changed in response to changing competitive environments. Organizations compete in global markets and must maintain international communication and operations. "In the 1990's, continued globalization and increasingly competitive markets will call for rapid responses and innovative thinking. In this turbulent environment, information technology will leverage time and human resources." (The Landmark MIT Study: Management in the 1990's).

While technology is available to link organizations around the world, the traditional development models and techniques for such systems are outmoded. Current systems analysis and design techniques need to be improved. According to a survey of senior information systems executives, improving the systems-development process is ranked sixth in the top issues facing North America and Europe. Improving information-services personnel is ranked ninth in North America and eighth in Europe (Sager, 1994).

The purpose of this paper is to present a workflow approach of information systems development (WFSAD: Workflow Systems Analysis and Design) that incorporates an emphasis on analyzing business processes to improve processing time and focuses on developing integrated systems throughout and beyond organizational boundaries. A framework for analyzing the impact of the WFSAD approach on the management of information systems personnel is also presented.

Workflow Approach of Systems Analysis and Design (WFSAD)

Traditional systems development models have focused on designing systems to enhance existing business functions. Most systems development models deal within functional boundaries of firms. Systems are typically designed to replace or perform particular tasks within an organization. These approaches have benefits and limitations in terms of the level of the firm, the technological requirements, the support of the organization (from the users and the IS staff) and the fit of the new system into current organizational structures and processes.

Workflow has been defined as: "a tool set for the proactive analysis, compression, and automation of information-based tasks and activities," (Koulopoulos, 1994). Workflow, as described by Koulopoulos, involves redesigning applications. WFSAD focuses on redesigning applications (including flows or transfers) in stages or steps with the ultimate goal being a new 'firm-level' system. It begins with application levels successes and develops into firm level systems. WFSAD does not restrict itself to the application level of analysis. While workflow assesses current applications and systems to improve efficiency and processing time, WFSAD involves assessing and redesigning organizational and interorganizational level systems. It is not assumed that the existing application or system in an organization is necessarily the best configuration to be improved upon. The approach attempts to tie together groups/individuals that have been operating somewhat independently before. While workflow in general attempts to do this, it is attempted from a technological approach (applying new technology to allow individuals to work together) rather than designing the basic system or set of activities to create this interdependence. WFSAD includes the process and the technology necessary to improve the organization's systems in terms of efficiency and time.

WFSAD differs from current systems analysis and design approaches in two main areas: the emphasis on time and the level of analysis. Time can be evaluated in terms of the task itself and the time it takes to transfer information and make decisions. Traditional systems development techniques have focused on the task time and designing or enhancing systems to improve the task time. In the WFSAD approach, the emphasis on time includes task time but goes beyond to include transfer time. WFSAD focuses on the processing time of systems prior to determining the technology that may be prescribed for the system. Transfer time is a locus of the workflow approach and the WFSAD approach.

The level of analysis for the WFSAD approach is the process level. Specifically, existing business processes or tasks must be evaluated in terms of process outcomes such as increased speed, increased accuracy, increased cycle time, and increased numbers of customers served.

Management of Systems Development Process

Implications for systems personnel in the development of integrated, organization-wide systems are discussed in terms of the organizational level and the type of information system. The framework below is proposed for analyzing the impact of the WFSAD approach on the management of the systems development process.

The WFSAD approach calls for changing the ways information systems management and personnel view systems and technology. "The organizational transformation requires transformation of management philosophy and methodology." (Zhao and Steier, 1993) The factors that have to be considered in systems development using the WFSAD approach are dependent upon the level of analysis and the type (or purpose) of information system that is being evaluated.

The proposed framework consists of three organizational levels: functional, intrafirm and interfirm. It is important to note that intrafirm may be across international boundaries but within the international organization. Prior systems development approaches have focused mainly on one level of the organization, functional.

Organizational level and type of information system indicate the technological factors and alternatives to be considered for the development of systems in that area. Orlikowski and Robey (1991) discussed the relationship between information technology and organizations and suggest that organizational structure creates the basis for individual understanding and creation of information systems. Yet, organizational structure also develops from the use of information technology within the firm. In essence, the use of information technology itself helps to recreate organizational processes. Information systems personnel require cross-functional training to be able to analyze existing business processes and recreate these processes to be more efficient and enhance firm performance. Kim (1994) denotes this as building a process architecture.

To analyze, design and implement organization-wide systems, systems personnel will need greater knowledge of technology that may support large integrated systems. Kim (1994) identifies an object oriented methodology and data-oriented development consisting of building a data architecture. Some of the current technology that information systems personnel should be aware of are: electronic document management systems (EDMS) which incorporate image processing, artificial intelligence, text retrieval, networking, workflow, and multimedia issues (Frappaolo, 1994); an underlying platform for forming the basis of a document-based workflow system, such as Lotus Notes (Slofstra, 1994); programming languages such as Microsoft Corp.'s Visual Basic (The, 1994); and image-enabling tools which allow firms to add image capability to general purpose application development environments. "Imaging is also a good alternative for workers who need to share multiple documents simultaneously or if paper spends too much time piled in physical in and out baskets and moving through the mail room." (Strehlo, 1994).

Information systems personnel are expanding their roles in the organization to include the redesigning of business activities and processes and the development of integrated, interfirm level systems to create strategic advantages in firms of the future. The effect of these changes in organizations will be an engaging research area for the future.

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