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Information technology: BPR tool and organization building block

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Abstract

Information Technology has been central to the development and implementation of redesigned business processes from the first appearance of the term "Business Process Reengineering". Yet, IT has also been found to be the principal impediment to the realisation of redesigned processes, in practice. This paper examines the rôle of IT, both as a BPR project support tool and as an infrastructural enabler of realigned enterprise processes. It presents an holistic view of the organizational infrastructure needed by redesigned processes and explores the difficulties of developing process based information systems.

Introduction

From its first public premiere in the early 1990's, business process reengineering (BPR) has been synonymous with the application of IT to the remodelling of business organizations and extended enterprises. (Davenport & Short, 1990; Hammer, 1990, Kaplan & Murdock, 1991). But while offering a host of technical opportunities for radical redesign, IT has proved to be as much an impediment to process based change as a pivotal enabler (CSC Index, 1994).

For its part, the IT industry has responded rapidly to the challenge of BPR, which has already spawned a host of software tools to aid in redesign efforts as well as creating a lucrative market for enabling information technologies. But, despite the array of BPR tools and technologies, radically redesigned business processes remain difficult to implement and, where successfully realised, have more to do with an altered business logic or organization structure, than with advanced IT. Information Technology has two discrete functions in business process reengineering:

1. support for mapping, analysis and modelling aspects of BPR projects; and
2. provides essential communications and systems infrastructure to facilitate the integration and automation of redesigned work processes.

Computerised BPR Project Support Tools

A host of IT support tools are now available to aid the BPR project team. For the most part, these are based on established techniques, which have been applied successfully in the analysis and design of information systems in both commercial and manufacturing settings for a number of years. An annual survey conducted by this author, using a

consistent baseline of tool definition and scope, has shown an increase from just 4-5 relevant tools in 1992 to 67 in 1996.

It is difficult to generalise about the feature sets, technical dimensions and operational strengths and weaknesses of these tools, as they represent such a wide range of functionality and cost. For instance, the price range of software products generally described as "BPR Support Tools" is of the order \$100 - \$100,000 or more. However, this survey suggests that many of the current BPR tools are based on enhancements to modelling products developed earlier for other, albeit related, purposes, including: software engineering (CASE), workflow modelling, manufacturing simulation, and general graphics. While most of these tools are generic, a handful have been developed by consulting firms to support particular BPR methodologies.

Automated analysis and modelling tools perform useful point solutions in the appraisal and redesign of business processes. The tools are capable of removing much of the drudgery from process mapping and evaluation, and support more sophisticated analyses and higher standard presentation. These tools focus the BPR practitioner's attention upon the most tangible infrastructural aspects of processes, most notably *workflow*, given their philosophical origin in manufacturing process design and information systems development. However, they provide only limited support for the redesign of structures, management, measurement system and human resource aspects of organization.

Implementation of redesigned business processes

Failed BPR projects frequently overlook the organizational difficulties involved in realising new process concepts, and address the redesign as a uni-dimensional workflow or systems project rather than a fundamental re-alignment of the business organization. New process implementation relies upon the comprehensive design of a diverse set of behavioural, technical and managerial factors, including: business procedures, organization structure, accountabilities, measurement systems, management processes, key relationships (both internal and external), staff and skill profiles, work design and workflows, geographic or facility design and IT infrastructure (figure 1). These are the individual building blocks from which a new process logic is realised, and represent the tangible organizational components commonly found in techno-structural or holistic approaches to organization development (Waterman, R.H., Peters, T.J. and Phillips, J.R., 1980; Scott Morton, 1991; Hall, G., Rosenthal, J. and Wade, J. 1993). Re-modelling of the IT component is thus a necessary, but far from sufficient, requirement in the transition towards *process based* business organizations.

The BPR practitioner has a well equipped arsenal of enabling information and communication technologies to support the construction of radically new business processes. But, the implementation of these technologies has been the single greatest impediment to process realisation in BPR practice to date, greater than the other organizational inertial barriers one might expect (CSC Index, 1994). The current installed base of legacy information systems remains a durable artefact of the functional organization, which must be moulded or replaced to suit new process designs. Key

difficulties are the design and development of *process based* (as distinct from functionally based) information support systems, and the migration of existing data and functionality to a new IT architecture.

Conventional IT planning and software development methodologies are based on the functional decomposition of high level abstractions of an enterprise's procedures and information needs, usually achieved through:

1. the refinement of high level statements of procedure, until detailed definitions of functionality can be specified as software modules; and
2. data modelling and analysis, of a high level interpretation of an enterprise's subject areas, data "entities" or "objects", until rational data structures can be specified.

This approach reinforces a functionally designed organization and does little to support the analysis and design of the lateral, cross-functional chains of logically linked activities normally described as *business processes*.

A recent survey conducted by CSC Index in both the US and Europe confirms the predominance of functionally bound software development projects being undertaken today, despite the accumulated experience of 6 years BPR practice and advances in the development of extended enterprise *supply chains* (CSC Index, 1996).

Conclusions

In summary, the IT industry has developed a rich collection of enabling technologies to support the design and integration of enterprise business processes. But while much of the hardware and telecommunications infrastructure is technically advanced, the development of truly process based, enterprise wide organization designs and complementary software applications is still in its infancy. Companies are frequently confronted with technology constraints in implementing newly designed business processes. However, a number of temporary, *transition solutions*, to this dilemma are becoming established in practice. These strategies are necessary to overcome current technology bottlenecks, but are even more essential to the orderly migration from current IT infrastructure and legacy systems to process based IT architectures.

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Figure 1. Organizational building blocks for redesigned business processes.

