



1-04-50 Reengineering Methodologies and Tools

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Payoff

Methodologies and tools can be used to structure, assess, and resolve the issues that business process reengineering (BPR) raises. This article discusses how to realistically define a BPR project and choose methodologies and tools that help ensure the project's success.

Problems Addressed

Sometimes called process redesign or process innovation, business process reengineering (BPR) is now firmly entrenched as a buzzword, if not a concept, in the minds of US managers. Yet there remain disagreements as to what BPR is and how best to accomplish it.

BPR is used in this article to mean the rapid and radical redesign of strategic, value-added business processes—and the systems, policies, and organizational structures that support them—to optimize workflows and productivity in an organization. Business process reengineering has these characteristics:

- BPR is process-oriented.
- BPR concurrently pursues breakthrough improvements in quality, time to market, and cost.
- BPR is holistic, both leveraging technology and empowering people.
- BPR starts with a willingness to abandon current practices.

Because of the broad scope, ambitious reach, and the profound changes BPR projects cause, they are among the most difficult that a company can undertake. Three out of four BPR projects are reported to be unsuccessful. That is why there is heightened interest in approaches to BPR that offer better odds of success. In particular, companies have sought methodologies and tools to facilitate well-disciplined and organized ways of structuring, assessing, and resolving the issues that BPR projects raise.

Methodologies refer to systematic approaches to conducting a BPR project. An effective methodology is like a road map. It helps the company select a destination and then find the best way to get there. Tools are the manual or automated aids to doing the work of the project.

Method Versus Intuition

Not all practitioners agree that a BPR methodology is useful. Some companies rely on a more intuitive approach, shunning analysis in favor of a higher-level understanding. Some practitioners believe that overattention to current practices gets in the way of breakthrough thinking, and they would rather start with a clean slate, depending only on their imagination and experience.



Methodologists believe, on the other hand, that sitting down with a blank piece of paper and no guidance on how to begin is daunting. Methodologists believe that people trained in intuitive approaches frequently become enthusiastic proponents of BPR at the end of their training, but they still do not know how to do it.

Difficulties Measuring BPR Effectiveness

Another distinction is that intuitives maintain that **rules of thumb and general information** about what has been done in other companies is useful, but that formal benchmarking is not. They say that benchmarking constrains the BPR team from finding truly innovative solutions. Methodologists, by contrast, feel that benchmarking can bring breakthrough ideas (when benchmarking outside the organization's own industry) as well as inject reality into the process.

One of the difficulties in assessing the relative value and efficacy of intuitive and methodological approaches to BPR is that most of the reported case studies are of necessity intuitive, because no methodologies existed at the time the projects were done. In fact, the projects were recognized as business process reengineering only after the fact: at the time, they were conceptualized as something else.

A second difficulty exists in assessing the relative cost and effectiveness of **different BPR methodologies**. Consulting firms, most of which promote a methodology, can provide references and examples of successful projects using their preferred methods (as can firms that use an intuitive approach); if they could not, they would be out of business.

Furthermore, in a survey of 500 companies, about half of them that are doing BPR projects are doing so without significant help from consultants. It is hard to define what constitutes success on some BPR projects, because the sought-after improvement goals are never quantified and BPR practitioners are reluctant to discuss their failures. Credible research on the relative merits of intuitive- versus method-based approaches, or of one methodology versus another, are difficult to find. Indeed, **it is difficult to design an objective experiment to measure effectiveness in BPR.**

Tools and Their Use

BPR tools are used more frequently on **methodology-based** BPR projects than on intuitive ones (unless the user counts a piece of paper, a flow chart template, and a pencil as tools). In fact, some methodologies are based on the use of specific tools. For example, Gemini Consulting's Construct reengineering methodology incorporates **an object-oriented toolset** developed by Parc Place Systems. Similarly, Coopers & Lybrand's Break Point BPR methodology uses a proprietary process modeling and simulation tool called SPARKS.

By using tools, the BPR practitioner expects to improve productivity, finish projects faster, produce higher-quality results, and eliminate tedious **housekeeping work in order to concentrate on value-added work**. To produce these benefits, BPR tools should be usable by **businesspeople (managers and professionals), not technicians**. Tools should:

- Enhance the clarity of the BPR team's vision.
- Enforce consistency in analysis and design.
- Permit (ideally) iterative, top-down refinement from the BPR project goals to the solution. For example, if the solution includes a computer system, the refinement should end with a working system.



- Produce an acceptable return on investment .

Six Categories of BPR Tools

Project Management.

These tools are used for planning, scheduling, budgeting, reporting, and tracking projects. Some tools, such as Texas Instruments' IEF/Project Manager, are integrated with other categories of tools, such as modeling, analysis, and systems development. Other project management tools, such as Harvard Project Manager or Microsoft Project for Windows, are standalone.

Coordination.

These tools are used to distribute plans and to communicate updated details of projects. The primary subcategories are E-mail, scheduling applications, shared spreadsheets, bulletin boards, and groupware. Some of these tools, such as Microsoft Excel or Lotus 1-2-3, support a single subcategory. Others, such as Lotus Notes or WordPerfect Office, support multiple subcategories.

Modeling.

These tools are used to make a model of something in order to understand its structure and workings. Most of the tools in this category are integrated Computer-Aided Software Engineering (ICASE) toolsets for integrated analysis, design, and development of computer systems. These include Texas Instruments' IEF, KnowledgeWare's IEW, Popkin System ARchitect, and S/Cubed DAISYS. There are also useful partial solutions, including spreadsheets.

Business Process Analysis.

These tools are used for the systematic reduction of a business into its constituent parts and the examination of the interactions among those parts. In general, the same tools used for modeling are used for business process analysis. Indeed, analysis is necessary for modeling, although not vice versa.

Human Resources Analysis and Design.

Tools used to design and establish the human or social part of reengineered processes are mostly standalone, partial solutions for specific, sometimes overlapping applications. One subcategory of these tools is used for requisition/candidate tracking and position history. Examples include Revelation HR-Applicant Track and Spectrum HR: AM/2000. Other subcategories include skills assessment(Performance Mentor), team building (Supersynch), compensation planning (Hi-Tech Employee Evaluation and Salary Manager), and organization charting (Corel Draw, Harvard Graphics).



Systems Development.

These tools automate the reengineered business processes. Subcategories include the Integrated CASE tools as well as visual programming (Microsoft Visual Basic), application frameworks (Borland Application Framework, Gupta Structured Query Language Base, and SQL Windows), coding workbenches (MicroFocus Cobol/2 Workbench, IBM OS/2 Workframe 2), object reuse libraries (Digitalk Smalltalk V, Borland Object Vision), and test harnesses (McCabe & Associates Codebreaker, Software Research M-Test).

Learning, Integration, and Cost Issues

An organization must consider three important and related issues before selecting a BPR toolset: learning, integration, and cost.

Ideally, a toolset would be easy to learn and easy to use, but most are neither. Some toolsets—object-oriented ones, for example—require a new way of thinking as well as the use of a new technique. (One toolset's user manual introduces each chapter with a reference to a book with which the reader is presumed familiar.) Some tools use techniques that are arbitrary replacements for those that the user may already be using.

A toolset is easier to learn and use if each tool has the same standard look and feel. Then the user need not learn and remember several different sets of interfaces.

Anyone who uses tools on a BPR project will quickly discover the need to move the data that is output from one tool into another, as well as into more common tools such as word processing and spreadsheets. There are four basic ways of satisfying this need:

- Manually transcribing data from one tool to another. This option places the least constraint on tool selection, but is tedious and error-prone.
- Selecting one vendor's integrated toolset. Integrated tools cover several, but not all, of the potential BPR tool applications.
- Selecting nonintegrated tools from one or more vendors that support common data formats like SYLK or dBASE in order to move data from one to another.
- Selecting nonintegrated tools and using the capabilities of the operating system platform (e.g., Microsoft Windows) for cutting and pasting data among the tools.

Many tools, especially the integrated ones, are fairly expensive, and the initial purchase price is only the beginning. Experience shows that the total tool cost can easily be 10 to 15 times the initial purchase price over the first five years of use.

Understanding the Environment

To properly resolve these BPR tool issues, the organization must consider the context in which the tools are to be used.

Number of Projects Planned.

If the company is considering one-time use of new tools for a single project, it may better to select only the simplest tools. Use of tools may actually reduce productivity on the



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first project by as much as 40%. It is usually not until the second or third project (for each tool user) that the more complicated tools begin to save time.

Fit with Systems Development Methodology.

Will the same toolset be used from the process analysis and design phases all the way through systems development? Does the toolset support the current systems development methodology as well as the BPR methodology chosen? If the answer to either of these questions is no, then the value of the toolset is considerably reduced.

Role of Consultants.

If IS selects a consulting firm's methodology and proprietary toolset, it is generally committing to heavy dependence on the consultant's personnel. IS should also consider whether it is possible to continue using the tools without using the consultant. The flip side of this issue is whether the company is using consultants with someone else's tools and thus investing in training the consultant's people. **Each company contemplating a BPR project should find its own answers to these questions.**

How to Apply a BPR Methodology

To illustrate some of these points, Gateway's Rapid Re methodology for BPR, which is taught in American Management Association **seminars**, is used as an example. The five stages of the methodology are as follows:

- **Preparation.** The purpose is to mobilize, organize, and energize the people who will perform the reengineering project.
- **Identification.** The purpose is to develop a customer-oriented process model of the business.
- **Vision.** The processes to reengineer are selected and the redesign options capable of achieving breakthrough performance are formulated.
- **Solution.** The purpose is to define the technical and social requirements for the new processes and develop detailed implementation plans.
- **Transformation.** The reengineering plans are ready to implement.
[Exhibit 1](#) is a schematic of the 54 tasks included in the five stages.

Stages and Tasks in the **Rapid Re Methodology**

The methodology is customized to the needs of each BPR project, because that is what generally happens in practice. An individual project might skip, rearrange, or recombine tasks to meet its needs or give greater or lesser emphasis to some tasks. For example, in an ideal project, stages 1 and 2 (preparation and identification) consider all key processes within a company and conclude with a step that sets priorities for the processes to



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reengineer (see [Exhibit 2](#)). Then stages 3, 4, and 5 (vision, solution, and transformation) are executed repeatedly for each process (or group of processes) selected for reengineering.

Case Example: ABC Toy Company

Goals					
Process	Regain Market Share	Capture 70% Share	Maintain Gross Profit	ROI 20%	
Develop Product	0	8	5	5	
Manufacture	9	9	7	7	
Fulfill Orders	8	9	9	9	
Service Customers Request	6	8	5	5	
Maintain Customer Accounts	3	3	3	3	
Develop Human Resources	4	6	4	4	
Compensate	3	5	3	3	
Fund	3	3	3	3	
Comply	1	1	1	1	
Acquire Customer Orders	7	7	8	8	
Resources					
Process	Full-Time Equivalent	Cost (\$)			
Develop Product	15.0	2,500,000			
Manufacture	375.0	29,300,000			
Fulfill Orders	22.5	2,500,000			
Service Customer Request	9.0	700,000			
Maintain Customer Accounts	8.5	1,000,000			
Develop Human Resources	11.5	1,350,000			
Compensate	6.5	1,060,000			
Comply	7.0	825,000			
Acquire Customer Orders	36.0	5,000,000			
Factors					
Process	Time	Cost	Risk	Social	Priority
Develop Product	Med.	\$\$	High	Easy	5
Manufacture	Long	\$\$\$\$	Med.	Hard	4
Fulfill Orders	Med.	\$\$	Med.	Med.	1
Service Customer Request	Short	\$	Low	Easy	2
Maintain Customer Accounts	Short	\$	Low	Easy	
Develop Human Resources	Long	\$	Med.	Hard	
Compensate	Med.	\$	High	Hard	
Fund	Med.	\$	Med.	Easy	
Comply	Med.	\$	Med.	Med.	
Acquire Customer Orders	Med.	\$\$\$	High	Med.	3
KEY:					
0= No Impact					
10= Maximum Impact					



Sometimes, depending most often on who is sponsoring the BPR project, **the scope of the project is not the entire company**. It may be a business unit, a division, or even a functional department. (Actually, the scope must be the processes within the department or whatever other unit is involved.) Alternatively, the specific processes to be reengineered may have been preselected. In these cases, the way in which the reengineering team is organized, and the way in which it uses the methodology, will differ from the model.

The methodology does not require a specific consulting involvement. A BPR project team should include both insiders, who have knowledge of current practices and an understanding of company culture, and outsiders who have the creative **naivete** to ask why things are done a certain way. Project teams also need leadership and facilitation. If they are going to use a methodology, the project team members must be trained. Rapid Re does not require that companies retain Gateway or any other consultants to work on a BPR project. The process is designed for use by managers and professionals found in all kinds of settings in US companies so it is accessible to the layperson.

For the same reason, the methodology requires few tools. It can be used with a pencil, paper, a flow charting template, and a few paper forms. Spreadsheets can be used for all of the quantitative tasks, as well as for the presentation of qualitative data in tabular form. Project management systems can be used not only for planning and tracking the BPR project, but also for simple process flow diagrams. The methodology can be used with any or all of the categories of BPR tools. **Flexibility is essential if the methodology is to be useful in a broad range of environments.**

The overhead associated with the methodology is low and it is easy to learn, requiring only two or three days of training. The fully worked-out example in Exhibit 2, the ABC Toy Company, illustrates its use.

Recommended Course of Action

BPR project teams should include various personality types and people with different functional specializations, education, experience, and levels of responsibility. A methodology may be what is needed to enable such a diverse group to work together effectively.

The BPR practitioners must select the approach and tools that best meet their needs and those of their company. In so doing, they should begin by taking the following actions:

- **Defining what kind of BPR project the organization is undertaking.**
 - Is it a one-time effort, a pilot, or one of a series of similar projects?
- **Defining the scope of the project.**
 - Is it companywide or business unit-wide, or does it have a narrower scope?
 - Who is sponsoring the project? Is it being driven from the top down or bottom up?
- **Deciding who is likely to be on the BPR team.**
 - How much of their time can they spend on the project? For how long?
 - What is the state of the team's readiness to do the work of the BPR project?



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What kind of support will the team members need?

- **Determining the role, if any, for consultants.**
 - What will the consultants bring to the project—methodologies? tools? experience? resources?
 - How long will the consultants be needed?
 - How will the organization ensure a transfer of know-how to its own staff? How will it wean itself from dependence on the consultants?
- **Managing management's expectations of BPR.**
 - Is the BPR project an experiment, or is management looking for substantive gains?
 - How long does management expect it to take? How much to cost?
 - How radical a change will the organization's management entertain?

It is only within the constraints set by the answers to these questions that an organization can realistically define a BPR project and choose the methodologies and tools that help ensure its success.

Author Biographies

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Mark M. Klein is senior vice-president and managing director of management consulting services at Gateway, a Swiss Re company, and coauthor of the *The Reengineering Handbook* (New York: AMACOM, 1994).

