

**BUSINESS  
PROCESS  
RE-ENGINEERING  
BPR**

*Report produced for the EC funded project*

***INNOREGIO: dissemination of innovation and knowledge management techniques***

by **Sotiris Zigiariis,**  
**MSc, BPR engineer**

**BPR HELLAS SA**

**J A N U A R Y 2 0 0 0**

## Contents

<b>1. Description .....</b>	<b>2</b>
1.1 What is the Business Process Re-engineering IMT .....	2
1.2 Objectives of BPR .....	8
1.3 Methodology of a BPR project implementation / alternative techniques.....	9
1.4 Expected Results / Benefits .....	11
1.5 Characteristics of firms and service providers .....	11
<b>2. Application .....</b>	<b>12</b>
2.1 Where the technique has being applied. ....	12
2.2 Types of firms / organizations that BPR can be applied. ....	13
2.3 Duration and implementation cost of BPR.....	13
2.4 Conditions for implementation (infrastructures required etc.) .....	14
2.5 European Organizations Supporting the Implementation of BPR .....	14
<b>3. Implementation Procedure of BPR .....</b>	<b>14</b>
3. 1 Steps / Phases of a BPR project.....	14
3.2 Partial techniques and tools included in each step .....	17
3.3 Related Software .....	17
<b>4. Bibliographic references.....</b>	<b>17</b>
<b>5. Annexes.....</b>	<b>19</b>
Annex 1. Process management tools .....	19
Annex 2. Workflow management tools.....	21
Annex 3. Re-engineering Methodology - REMORA (sample tables) .....	23

# 1 DESCRIPTION

**Business Process Reengineering** involves changes in structures and in processes within the business environment. The entire technological, human, and organizational dimensions may be changed in **BPR**. Information Technology plays a major role in Business Process Reengineering as it provides office automation, it allows the business to be conducted in different locations, provides flexibility in manufacturing, permits quicker delivery to customers and supports rapid and paperless transactions. In general it allows an efficient and effective change in the manner in which work is performed.

## 1.1 What is the Business Process Re-engineering

The globalization of the economy and the liberalization of the trade markets have formulated new conditions in the market place which are characterized by instability and intensive competition in the business environment. Competition is continuously increasing with respect to price, quality and selection, service and promptness of delivery. Removal of barriers, international cooperation, technological innovations cause competition to intensify. All these changes impose the need for organizational transformation, where the entire processes, organization climate and organization structure are changed. Hammer and Champy provide the following definitions:

- ✓ **Reengineering** is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical contemporary measures of performance such as cost, quality, service and speed.
- ✓ **Process** is a structured, measured set of activities designed to produce a specified output for a particular customer or market. It implies a strong emphasis on how work is done within an organization. " (Davenport 1993).

Each process is composed of related steps or activities that use people, information, and other resources to create value for customers as it is illustrated in the following example.

An example of a business process: **Credit card approval in a bank.**

*An applicant submits an application. The application is reviewed first to make sure that the form has been completed properly. If not, it is returned for completion. The complete form goes through a verification of information. This is done by ordering a report from a credit company and calling references. Once the information is verified, an evaluation is done. Then, a decision (yes or no) is made. If the decision is negative, an appropriate rejection letter is composed. If the decision is positive, an account is opened, and a card is issued and mailed to the customer. The process, which may take a few weeks due to workload and waiting time for the verifications, is usually done by several individuals.*

Business processes are characterized by three elements: **the inputs**, (data such customer inquiries or materials), **the processing** of the data or materials (which usually go through several stages and may necessary stops that turns out to be time and money consuming), and **the outcome** (the delivery of the expected result). The problematic part of the process is *processing*. Business process reengineering mainly intervenes in the *processing* part, which is reengineered in order to become less time and money consuming.

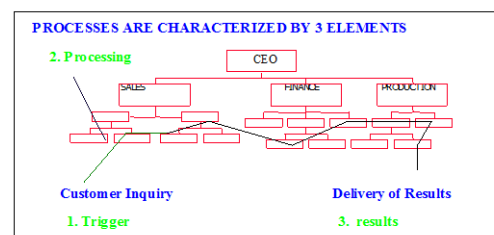


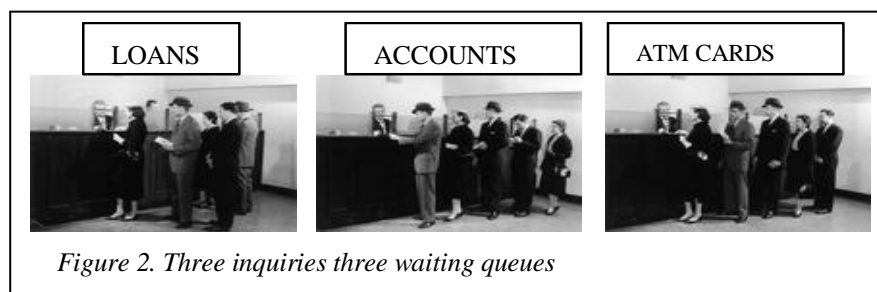
Figure 1. The components of a business process

The term "Business Process Reengineering" has, over the past couple of year, gained Increasing circulation. As a result, many find themselves faced with the prospect of having to learn, plan, implement and successfully conduct a real Business Process Reengineering endeavor, whatever that might entail within their own business organization. Hammer and Champy (1993) define business process reengineering (BPR) as:

*" the fundamental rethinking and **radical** redesign of **the business processes** to achieve **dramatic** improvements in critical, contemporary measures of performance, such as cost, quality, service and speed".*

### An example of BPR application.

A typical problem with processes in vertical organizational structure is that customers must speak with various staff members for different inquiries. For example, if a bank



customer enters into the bank determine d to apply for a loan, apply for an ATM card and open a savings

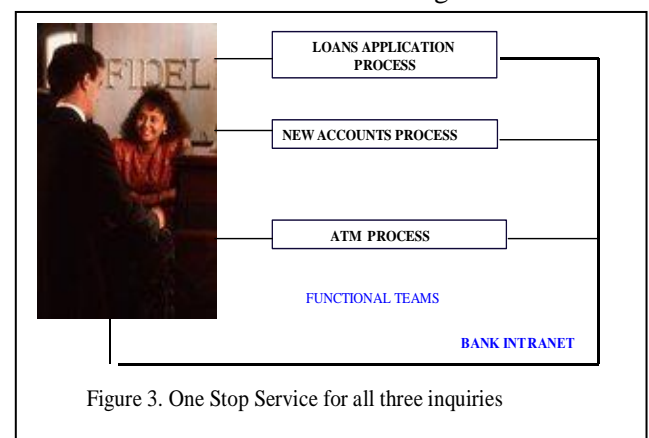
account, most probably must visit three different desks in order to be serviced, as illustrated in figure 2. When BPR is applied to an organization

The implementation of "One Stop Shopping" as a major customer service innovation, requires the close coordination with a team of staff assigned to a process powered by IT for exchanging information and documents in order to service the customer's request. For instance a customer applying for a loan "triggers" a team of staff assigned to service a loan application. The

the customer communicates with only one person, called "case manager", for all three inquiries, shown in figure 3.

manager completes an application for a loan in electronic form, which in turn is submitted through the network to the next team member, the credit control director, who examines the credit status of the customer. If the credit status is not satisfactory the rejection of the loan is approved by the credit manager and a rejection form is filled and it is returned to the case manager. The case manager explains to the customer the reason that his application was rejected.

On the other hand, if the credit status of the customer is satisfactory, the application is submitted electronically to the next team member, who calculates interest rates and payment tables. The application is then submitted to the credit manager for approval using a digital signature. The approval of the application along with the payment table is delivered to the customer by the case manager.



Most importantly, while the loan application team was processing the loan application, the case manager "triggered" the account team to open a savings account and the ATM team to supply the customer with an ATM card. The customer leaves the bank having a response for his loan application, a new savings account and an ATM card, And all these without having to move around the desks for signatures and documents. All the customer's requests were satisfied at the same time in parallel motion.

The difference between the vertical organization (figure 2) and the cross functional organization (figure 3) lies in the way businesses are organized internally. The vertical organization is organized based on **functional units** (e.g. the sales, the accounting department). In cross-functional organizational units the main organizational unit is the **process**. Since "doing business" is mainly running processes, it would be very logical to organize companies based on processes. For instance, the ordering process crosses different departments. The sales department for order taking, the accounting department for credit control and invoicing, the logistics department for inventory control and distribution, and the production department for producing the order.

#### An every day business - customer conversation...

Assuming a customer calls the company to ask why his order has not yet arrived to its premises.

*"Let me transfer you to **the** accounting department to check if the order was invoiced"* responds the telephone operator.

The customer must explain his problem to the accounting department again. *"We had invoiced your order, but I don't now if already shipped to you. You need to call **the** logistics department, unfortunately I could not transfer you since **they** are located in another city"*.

The customer calls the logistics department and explains the situation again. The logistics manager responds *"that although the order should have been distributed to you, I haven't yet received the order from **them** in the production department"*. *"Please hold on a minute, I will try to talk to **them** to find out what happened"*. The inventory manager tried to help out the situation, since he felt that the customer was getting aggravated from the other side of the phone. After a while he said *"Sir I am sorry, it is **the finish department's fault**. **Somebody** had forgotten your order in the finish storage. I will have it send out to you as soon as possible."* After this odyssey the customer was seriously considering whether he would place another order.

Throughout the conversation there is an emphasis on department functions. Each employee is satisfied with the fact that "I have done my job but I do not know what the others did". (see bold characters in the conversation". Nobody would like to take total responsibility. While this situation seems awkward, it is the most usual case in most organizations. Most of the times it is up to the good will of some employees, like the logistics manager, for the customer to receive some type of service.

Using **BPR** the company will be organized based on processes. The company will organize an order processing team, braking the departmental barriers. The team would be composed of a case manager to respond to the customers requests, and employees from

the accounting department, the logistics department and the production department. The process must be designed to trace an order step by a step electronically and provide an answer back to the customer quickly. THE CUSTOMER MUST SPEAK WITH ONE PERSON, the case manager. All internal controls are the responsibility of the order processing team.

BPR focuses on team building operations around processes and building a company mentality to personnel. The objective of the technique is to build **customer-oriented** effective organizations. The customer does not care if the accounting department works adequately, he wants to see his order processed as it should be.

If the management of the company overheard this conversation, they would be desperately seek for a solution to the problem. Most frequently they would change around the organizational chart and would replace people in the company hierarchy or would modify the roles and responsibilities of some employees. Businesses continuously are overcoming some major or minor changes in the way they operate without having the desired outcome. Their effort is crashed on the departmental barriers and the employee mentality to protect their personal or functional interests.

### **How can BPR be applied to an organization?**

When British Telecom had announced their Business Plan, all competitors were eager to find out who would be the new CEO of the organization. To the surprise of all the new CEO it was the **customer**. The company had decided to transform all the operations of the organization the way customers wanted them to operate. The most important action in applying BPR is the company's **strategic** goal to provide customer oriented services. BPR is a technique used to implement this type of organizational structure.

Having the management commitment for change, another very important factor for implementing BPR, is the enabling role of **Information Technology**. The way that businesses are organized around departments is very logical since, for instance, there were physical barriers in the communication of the accounting department with production department. (The warehouse could be in another location in the another part of the city). So it wasn't possible for a cross-functional team to communicate efficiently. In the 90s when telecommunication technologies were becoming abundant and low costing BPR was becoming a world-wide applicable managing technique for business upgrade, enabled by the technology. Employees can easily operate as a team using intranets/extranets, workflow and groupware applications, eliminating distances. We can **work together** even though we are located in **different** places.

**Empowering people.** Empowerment means giving people the ability to do their work: the right information, the right tools, the right training, the right environment, and the authority they need. Information systems help empower people by providing information, tools and training.

**Providing Information.** Providing information to help people perform their work is a primary purpose of most information systems although they provide information in many different ways. Some systems provide information that is essential in informing a business process, such as the prices used to create a customer's bill at a restaurant. Other systems provide information that is potentially useful but can be used in a discretionary manner, such as medical history information that different doctors might use in different ways.

**Providing Tools.** In addition to providing the right information, empowering people means giving them the right tools. Consider the way planning analysts produce consolidated corporate plans based on plans of individual divisions and departments. If the plans are submitted on paper, it is a major task to add up the numbers to determine the projected corporate bottom line. When the plan is changed during a negotiation process, the planning analyst has to recalculate the projected results. With the right tools, the numerical parts of the plans arrive in a consistent, electronic format permitting consolidation by a computer. This leaves the analyst free to do the more productive work of analysing the quality of the plan.

**Providing Training.** Since information systems are designed to provide the information needed to support desired work practices, they are often used for training and learning. As shown by an expert system and a decision simulator, they sometimes provide new and unique training methods.

IBM developed an expert system for fixing computer disk drives. The expert system was an organized collection of the best knowledge about fixing these disk drives, and it fostered rapid and efficient training. Before the system was developed, technicians typically took between 1 and 16 months to become certified, but with the expert system, training time dropped 3 to 5 months.

**Eliminating Unproductive Uses of Time.** Information systems can reduce the amount of time people waste doing unproductive work. A study of how professionals and managers at 15 leading U.S. corporations spent their time concluded that many professionals spent less than half of their work time on activities directly related to their functions. Although the primary function of salespeople is selling, the time breakdown for salespeople averaged 36 percent spent on prospecting and selling, 39 percent spent on prospecting and selling, 3 percent on servicing accounts, 19 percent on doing administrative chores, and 6 percent on training. Better use of information systems could save much of their unproductive time performing chores such as collecting product or pricing information, determining order status for a customer, resolving invoice discrepancies, and reporting of time and expenses.

**Eliminating Unnecessary Paper.** One common way to improve data processing is to eliminate unnecessary paper. Although paper is familiar and convenient for many purposes, it has major disadvantages. It is bulky, difficult to move from place to place, and extremely difficult to use for analysing large amounts of data. Storing data in computerized form takes much less physical space and destroys fewer forests, but that is only the beginning. It makes data easier to analyze, easier to copy or transmit, and easier to display in a flexible format. Compare paper telephone bills with computerized bills for a large company. The paper bills identify calls but are virtually impossible to analyze for patterns of inefficient or excessive usage.

**Eliminating Unnecessary Variations in the Procedures and Systems.** In many companies, separate departments use different systems and procedures to perform essentially similar repetitive processes, such as paying employees, purchasing supplies, and keeping track of inventories. Although these procedures may seem adequate from a totally local viewpoint, doing the same work in different ways is often inefficient in a global sense. Whenever the systems must change with new technology, new regulations, or new business issues, each separate system must be analysed separately, often by someone starting from scratch.

**Minimizing the Burden of Record Keeping, Data Handling, and General Office Work.** Since processing data is included in most jobs, improving the way people process data is



an obvious place to look for information system applications. *Focus on basic data processing tasks:* Reducing the burden of record keeping means being more efficient and effective with the six components of data processing. Those components are capturing, transmitting, storing, retrieving, manipulating, and displaying data. *Capture data automatically when generated:* Capturing data automatically at the time of data generation is especially important in minimizing the burden of record keeping.

In depth, BPR assumes that the current processes in a business are inapplicable and suggest completely new processes to be implemented by starting over. Such a perspective enables the designers of business processes to disassociate themselves from today's process, and focus on a new process. The BPR characteristics - outcomes include the following:

- ⇒ Several jobs are combined into one.
- ⇒ Decision-making becomes part of the job of employees (employee empowerment).
- ⇒ Steps in the processes are performed in natural order, and several jobs get done simultaneously.
- ⇒ Processes have multiple versions. This enables the economies of scale that result from mass production, yet allows customization of products and services.
- ⇒ Work is performed where it makes the most sense.
- ⇒ Controls and checks and other non-value-added work are minimized.
- ⇒ Reconciliation is minimized by cutting back the number of external contact points and by creating business alliances.
- ⇒ A single point of contact is provided to customers.
- ⇒ A hybrid centralized/decentralized operation is used.

BPR is achieving dramatic performance improvements through radical change in organizational processes, rearchitecting of business and management processes. It involves the redrawing of organizational boundaries, the reconsideration of jobs, tasks, and skills. This occurs with the creation and the use of models. Whether those be physical models, mathematical, computer or structural models, engineers build and analyze models to predict the performance of designs or to understand the behavior of devices. More specifically, BPR is defined as the use of scientific methods, models and tools to bring about the radical restructuring of an enterprise that result in significant improvements in performance.

Redesign, retooling and reorchestrating form the key components of BPR that are essential for an organization to focus on the outcome that it needs to achieve. The outcome pursued should be an ambitious outcome (as for instance, are a 24 hour delivery to any customer anywhere in the world, approval of mortgage loans within 60 minutes of application, or ability to have on-line access to a patient's medical records no matter where they are in any major city in the world). These types of visionary goals require rethinking the way most organizations do business, careful redesign. They will additionally need very sophisticated supporting information systems and a transformation from a traditional organizational structure to a network type organization.

In resuming, the whole process of BPR in order to achieve the above mentioned expected results is based on key steps-principles which include redesign, retool, and reorchestrate. Each step-principle embodies the actions and resources as presented in the table below.



<b>REDESIGN</b>	<b>RETOOL</b>	<b>REORCHESTRATE</b>
<ul style="list-style-type: none"> <li>• Simplify</li> <li>• Standardize</li> <li>• Empowering</li> <li>• Employeeeship</li> <li>• Groupware</li> <li>• Measurements</li> </ul>	<ul style="list-style-type: none"> <li>• Networks</li> <li>• intranets</li> <li>• extranets</li> <li>• WorkFlow</li> </ul>	<ul style="list-style-type: none"> <li>• <i>synchronize</i> <ul style="list-style-type: none"> <li>▪ processes</li> <li>▪ IT</li> <li>▪ human resources</li> </ul> </li> </ul>

*The 3 Rs of re-engineering*

Creating the new enterprise involves considerable change in virtually everything to do with people's working lives. Rather than fixing the old, we set out to create the new. There is a fundamental transformation occurring in business - in terms of its structure, processes, people, and technology. The table following presents the changes in that occur in the business under BPR.

<b>Changes in the World of Work</b>	
<b>From Conventional</b>	<b>To BPR</b>
Functional departments	Process Teams
Simple tasks (division of labor)	Empowered employees
Controlled people (by management)	Multidimensional work
Training of employees	Education of employees
Compensation for skill and time spent	Compensation for results
Pay raises based on promotions and seniority	Low pay plus high performance-related bonuses
Advancement based on ability	Advancement based on performance
Protective organizational culture	Productive organizational structure
Managers supervise and control	Managers coach and advise
Hierarchical organizational structure	Horizontal (flat) structure
Executives as scorekeepers	Executives as leaders
Separation of duties and functions	Cross-functional teams
Linear and sequential processes	Parallel process
Mass production	Mass customization

SOURCE: Based on Hammer and Champy, 1993.

In resuming, the whole process of BPR in order to achieve the above mentioned expected result is based on key step-principles which include redesigning, retooling and reorchestrating. Each principle embodies the actions and resources as presented in the table below.

## 1.2 Objectives of BPR

When applying the BPR management technique to a business organization the implementation team effort is focused on the following objectives:

**Customer focus.** Customer service oriented processes aiming to eliminate customer complaints.

**Speed.** Dramatic compression of the time it takes to complete a task for key business processes. For instance, if process before BPR had an average cycle time 5 hours, after BPR the average cycle time should be cut down to half an hour.

**Compression.** Cutting major tasks of cost and capital, throughout the value chain. Organizing the processes a company develops transparency throughout the operational level reducing cost. For instance the decision to buy a large amount of raw material at 50% discount is connected to eleven cross checkings in the organizational structure from cash flow, inventory, to production planning and marketing. These checkings become easily implemented within the cross-functional teams, optimizing the decision making and cutting operational cost.

**Flexibility.** Adaptive processes and structures to changing conditions and competition. Being closer to the customer the company can develop the awareness mechanisms to rapidly spot the weak points and adapt to new requirements of the market.

**Quality.** Obsession with the superior service and value to the customers. The level of quality is always the same controlled and monitored by the processes, and does not depend mainly on the person, who servicing the customer.

**Innovation.** Leadership through imaginative change providing to organization competitive advantage.

**Productivity.** Improve drastically effectiveness and efficiency.

In order to achieve the above mentioned adjectives the following BPR project methodology is proposed.

### 1.3 Methodology of a BPR project implementation / alternative techniques

BPR is world-wide applicable technique of business restructuring focusing on business processes, providing vast improvements in a short period of time. The technique implements organizational change based on the close coordination of a methodology for rapid change, employee empowerment and training and support by information technology. In order to implement BPR to an enterprise the followings key actions need to take place:

- Selection of the strategic (added-value) processes for redesign.
- Simplify new processes - minimize steps - optimize efficiency -(modeling).
- Organize a team of employees for each process and assign a role for process coordinator.
- Organize the workflow - document transfer and control.
- Assign responsibilities and roles for each process.
- Automate processes using IT(Intranets, Extranets, Workflow Management)
- Train the process team to efficiently manage and operate the new process
- Introduce the redesigned process into the business organizational structure

Most reengineering methodologies share common elements, but simple differences can have a significant impact on the success or failure of a project. After a project area has been identified, the methodologies for reengineering business processes may be used. In order for a company, aiming to apply BPR, to select the best methodology, sequence processes and implement the appropriate BPR plan, it has to create effective and

actionable visions. Referring to 'vision' we mean the complete articulation of the future state (the values, the processes, structure, technology, job roles and environment)

For creating an effective vision, five basic steps are mentioned below.

- the right combination of individuals come together to form an optimistic and energized team
- clear objectives exist and the scope for the project is well defined and understood
- the team can stand in the future and look back, rather than stand in the present and look forward
- the vision is rooted in a set of guiding principles.

All methodologies could be divided in general 'model' stages:

*The Envision stage:* the company reviews the existing strategy and business processes and based on that review business processes for improvement are targeted and IT opportunities are identified.

*The Initiation stage:* project teams are assigned, performance goals , project planning and employee notification are set.

*The Diagnosis stage:* documentation of processes and sub-processes takes place in terms of process attributes (activities, resources, communication, roles, IT and costs).

*The Redesign stage:* new process design is developed by devising process design alternatives and through brainstorming and creativity techniques.

*The Reconstruction stage:* management technique changes occur to ensure smooth migration to the new process responsibilities and human resource roles.

*The Evaluation stage:* the new process is monitored to determine if goals are met and examine total quality programs.

### Alternative techniques to BPR

*Total Quality management*, often referred to as total quality management (TQM) or continuous improvement process (CIP), refers to programs and initiatives that emphasize incremental improvement in work processes and outputs over an open-ended period of time. In contrast, *Reengineering* refers to discrete initiatives that are intended to achieve radically redesigned and improved work processes in a bounded time frame. The major differences between the two

Comparing TQM and Reengineering		
	TQM	BPR
Case for action	Assumed to be necessary	Compelling
Goals	Small-scale improvements in many places with cumulative effects	Outrageous
Scope and focus	Attention to tasks, steps, and processes across the board	Select but broad business processes
Degree of change	Incremental and continual	Order of magnitude and periodic
Senior management involvement	Important up front	Intensive throughout
Role of information technology	Incidental	Cornerstone

SOURCE: Gulden and Ewers, 1997.

In opposition with the other existing approaches on business process improvement, which suggest gradual and incremental improvements, as for instance the Total Quality

Management approach, BPR does propose dramatic changes. The major differences between process innovation through BPR and incremental improvement through TQM are mentioned on the table that follows.

<b>Process Innovation vs Incremental Improvement</b>		
	<i><b>Process Innovation</b></i>	<i><b>Incremental Improvement</b></i>
<b>Change</b>	Abrupt, volatile	Gradual, constant
<b>Effects</b>	Immediate, dramatic	Long-term, more subtle
<b>Involvement</b>	A few champions	From few to everybody
<b>Investment</b>	High initially, less later	Low initially, high to sustain
<b>Orientation</b>	Technology	People
<b>Focus</b>	Profits	Processes

SOURCE: Merlyn V., Ernst and Young, private communication.

The differences between the two management techniques extend to the organizational structure, the implementation time and results achieved and to the basis upon which the whole procedure towards change and improvement is elaborated, as shown in the table below.

#### 1.4 Expected Results / Benefits

The expected results for a company that implements business process reengineering are the following:

- ✓ Reallocation of jobs and processes so as to be combined into fewer, to be executed in natural order, simultaneously and by the least possible number of employees.
- ✓ Reorganization of the company's structure (downsizing) and employee empowerment.
- ✓ Jobs and processes become flexible so as to be executed according to the needs of each case, company's and customer's need's (hybrid centralized/decentralized operations)

The above changes will bring reductions of costs in the company, better quality (as far as price, promptness of delivery and offerings of related services) in the products and services provided to the customers. BPR shows that there is 'more than one way to skin a cat' and enables a fresh view without ingrained prejudice affecting judgement. It can produce huge initial savings where a business is struggling and often has the affect of turning around an unprofitable operation. Also, it leaves the business with a fully documented model of the operation, which is invaluable if embarking on a quality programme.

The expected outcome from a successful BPR process should be the desired one for the favor of the business concerned. The dramatic changes that are caused involve people's jobs and working relationships as it is very often that jobs are eliminated and the entire process is not as beneficial for all.

#### 1.5 Characteristics of firms and service providers

Several surveys and benchmarking findings reveal the essential role of consultants in the BPR process. Consultants' help and guidance may be extremely beneficial in all stages of the BPR procedure. This is due to the fact that consultants have the following attributes:

- They are objective and immune to internal politics.

- They have followed the process before.
- They bring information and best practices from other companies.
- They are good communication paths between front line workers and customers, and the leaders of the company or organization.
- Consultants, besides their beneficial qualities, can also unintentionally create barriers by: having the solution being viewed as "theirs" and not "yours", and taking too strong a lead role and disengaging the organization.

The consultants may play different roles in the BPR procedure, and this is a matter for the company to decide always taking into account the organizations needs and the specific BPR approach chosen. The role of consultant may be:

- a strong facilitator and experienced practitioner who brings a methodology with them.
- a team member; can be an objective and unbiased contributor to the solution;
- a subject-matter expert with knowledge of performance levels and best practices of similar organizations and processes; able to perform specific tasks for the team.

## 2 APPLICATION

### 2.1 Where the technique has being applied

Many public and private sector organizations and SMEs Word-wide had undergone major reengineering efforts. The technique was applied first to multinational cooperations, such as IBM, AT&T, SONY, GENERAL ELECTRIC, WALL MART, HEWLLET PACKARD, DEC, KRAFT FOODS having as a result major downsizing in their organizational structures.

Later, the banking sector began to reengineer with a great degree of success such as CITIBANK , NORTHWESTERN BANK, BANK OF AMERICA and others. Major utility companies used reengineering as a technique to improve service like OTE, ELTA. BPR is also being used to change the organizational structure of public services. First the government cabinet of Egypt reengineered its processes along with many Municipals in Europe. The public health sector is undergoing a major re-engineering in Europe using the CORBA methodology.

As the technique was becoming well known to the business sector smaller enterprises were using the technique for organizational upgrade. Today most SMEs are investigating the re-engineering technique and a lot of them are applying re-engineering, since the technique is [applicable](#) and [affordable](#) to almost all SMEs. This is proved by the increasing demand for BPR consultants in Greece and worldwide.

Most of the times re-engineering is applied as a "must" when innovative IT tools are introduced to SMEs. Tools such as SAP, BAAN and various ERP systems that promote the horizontal organizational structure are the vehicles for re-engineering the organizational structure in order to adapt to the horizontal operational subsystems of the tools. For the first time we can say " that IT does not only support management, IT changes the organizational structure". Today 120 businesses from small to medium size in Greece and thousands in Europe have installed such types of IT systems reengineering also their organizational structure.

## 2.2 Types of firms / organizations that BPR can be applied

BPR could be implemented to all firms (manufacturing firms, retailers, services, etc.) and public organizations that satisfy the following criteria:

- **Minimum Number of employees:** 20 (at least 4 in management positions).
- Strong management commitment to new ways of working and innovation.
- Well formed IT infrastructure (requirements are presented in paragraph 2.4).

Business Process Reengineering could be applied to companies that confront problems such as the following:

- High operational costs
- Low quality offered to customers
- High level of "bottleneck" processes at pick seasons
- Poor performance of middle level managers
- Inappropriate distribution of resources and jobs in order to achieve maximum performance, etc.

## 2.3 Duration and implementation cost of BPR

### Duration

The BPR technique, in general, is not a time consuming process. The duration of each BPR project varies from **6 -to 10 months**. This variation relates to the kind of business and the extend to which BPR is going to be implemented. Moreover, it depends on the techniques and methodology that each consulting company (that usually participates in the procedure) is using. For instance, BPR HELLAS, using the **RE-engineering Methodology Oriented towards Rapid Adaptation (REMORA)** proposes the following time schedule:

<b>BPR PROJECT STAGES</b>	<b>MONTHS</b>					
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
<b>Preparation &amp; coordination for BPR</b>	■					
<b>Business modeling &amp; measurements</b>	■	■	■			
<b>Management of change &amp; controls</b>		■	■			
<b>Technical design of the solution</b>		■	■	■	■	■
<b>Personnel adjustment &amp; training</b>					■	■
<b>Realization &amp; transfer of changes</b>						■

### Implementation Cost

The implementation of a BPR project consists of two stages:

1. The process management and redesign study and consulting stage.
2. The implementation of the redesigned process using IT tools including employee training and introduction of the new processes to the company organizational structure.

The cost of a BPR for projects applied to SMEs for selective processes varies depending on the complexity of the business environment and the number of processes for reengineering. In general, the following cost is applicable for each stage.

Stage	Description	Cost in Euro
1	The process management and redesign study and consulting.	From 4000 to 7000
2	The implementation of the redesigned process using IT tools including employee training and introduction of the new processes to the company organizational structure	From 5000 to 9000
<b>Total</b>		<b>From 9000 to 16000</b>

## 2.4 Conditions for implementation (infrastructures required etc.)

Infrastructure requirements:

- An operating transactional and accounting computerized system inclosing the commercial part of the transactions.
- A network that connects all key personnel.
- Workstations with Windows NT or Windows 1995 system or latest version.
- An exchange server (MS outlook, or MS back office or Lotus Notes)

## 2.5 European Organizations Supporting the Implementation of BPR

The importance and the need for Business Process Reengineering in the small and medium enterprises and to bigger companies as well, is great. The European Commission has acknowledged this situation and promotes BPR and supports the efforts of SMEs to proceed to reengineering. Under the **ESPRIT** and the latest **IST** programmes, there is a number of projects such as the COBRA (URL [www.imsgrp.com](http://www.imsgrp.com)), and ROCHADE (URL [www.gsm.ch/rochade](http://www.gsm.ch/rochade)).

### BPR supporting organizations

**WARIA.** The Workflow And Reengineering International Association. URL <http://www.waria.com>

**BPRC.** Business Processes Resource Centre URL: <http://bprc.warwick.ac.uk/index.html>

# 3 IMPLEMENTATION PROCEDURE OF BPR

## 3.1 Steps / Phases of a BPR project

A BPR project consists of specific steps aiming to a successful outcome.. The necessary steps in a rapid re-engineering methodology are the following as they presented in figure 4.

### **STEP ZERO - preparation and coordination of the project.**

**Duration:** Two days    **Participants:** BPR team, BPR consultants..

#### **Objectives:**

- To establish a strong management support
- To explain to the members of the BPR implementation team the implementation details of the project and their role in the successful outcome in the BPR effort.

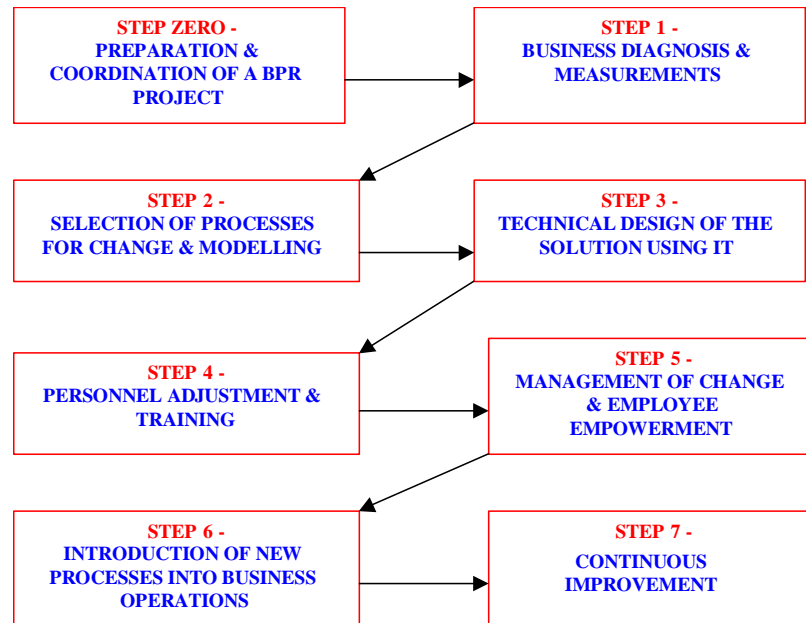
#### **Actions taken:**

- Explain to the top-level management the necessity to commit to the BPR project.
- Allocate the most capable employees to the BPR implementation team and assign roles for each one of them.



- Run an 8-hour workshop having as participants the members of the BPR implementation team. The consultants will present the project step by step, as well as, the role of the implementation team in the success of the project.

### **STEP 1 - Business diagnosis & measurements.**



*Figure 4 - Steps in the implementation of a BPR project*

**Duration:** 4 weeks     **Participants:** BPR team, BPR consultants, personnel involved with processes

**Objectives:**

- To diagnose & identify problematic areas in the current processes
- To measure the performance characteristics of the current processes based on measurable factors such as average cycle time, delays, number of mistakes or number of customer complaints.

**Actions taken:**

- Diagram each process using a process management tool such as OPTIMA, ADONIS or BONAPART (see annex A-1).
- Record physical on the site measurements for each step of a process related to time, resources spent or efficiency (see annex A-3).
- Input all measurements in the process management tool for further evaluation and analysis.
- Identify added value processes that have a major impact on customer service.

### **STEP 2 - Selection of processes for change and modeling.**

**Duration:** 7 weeks     **Participants:** BPR team, BPR consultants.

**Objectives:**

- To identify the strategic processes that are feasible to change
- To redesign and model the selected processes

**Actions taken:**

- Set the characteristics of the processes that are more important to the organizational goals
- Based on the characteristics identify the processes that will change based on the added value they provide and their feasibility for change. (see annex A-3).
- Redesign processes based on the characteristics that serve the organizational goals
- Simulate the processes in running environment using the process management tool (see annex A-1)
- Model the new process using the diagramming tool of the process management tool

### **STEP 3 - Technical design of the solution.**

**Duration:** 10 weeks

**Participants:** BPR team, BPR consultants, IT experts.

**Objectives:**

- To automate modeled business processes (step 2) using networks and workflow tools
- To redesign and model the selected processes

**Actions taken:**

- Establish network connections between process team members.
- Prepare intranet applications to exchange forms and documents between team members
- Prepare workflow application that will implement each step in the redesigned process automatically.(see annex A-2).

### **STEP 4 - Personnel adjustment & training.**

**Duration:** 10 weeks

**Participants:** Process team members, process coordinator, trainers.

**Objectives:**

- To train personnel in the new ways of working using IT in the redesigned processes.
- To redesign and model the selected processes

**Actions taken:**

- Adjust each position according to skills needed in the new process.
- Provide training in the operation of new processes, so employees will feel comfortable in the changing job environment

### **STEP 5 - Management of change & employee empowerment.**

**Duration:** 1 week

**Participants:** BPR team, BPR consultants, process team, executive management.

**Objectives:**

- To establish a positive attitude for the change between employees
- To minimize the resistance to change between employees by empowering their position based on performance appraisal and bonus systems.

**Actions taken:**

- Establish executive management determination for change and determinate any attempts of resistance to change.
- Facilitate the change process outlining the positive effects of change

### **STEP 6 - Introduction of new processes into business operations.**

**Duration:** Day and time are set by executive management

**Participants:** The whole business organization

**Objectives:**

- To set the time and date of operating under the new processes, emphasizing the fact that working under the old processes is not an acceptable practice.

**Actions taken:**

- Prepare and test all background resources (IT, documents, equipment)
- Set time and date for operating under the new processes.
- Do not allow any non-conformities in the operations of new processes

**STEP 7 - Continuous improvement.**

**Duration:** Runs dynamically and continuously after the end of the project

**Participants:** BPR implementation team

**Objectives:**

- To capitalize from the BPR project and develop internal experts for other BPR projects

**Actions taken:**

- Periodically evaluate the performance of business processes
- Plan the time and the resources for the next reengineering project.

**3.2 Partial techniques and tools included in each step**

The tools and techniques are explained in each step in paragraph 3.1 with related references to the annex.

**3.3 Related Software**

There are two categories of software used in implementing a BPR project

1. Process management tools, used for the design, performance evaluation of process (see annex A-1).
2. Workflow applications for implementing modeled processes (see annex A-2)..

**4 BIBLIOGRAPHIC REFERENCES**

1. "15 Principles for Better Business Engineering" Daniel S. Appleton, **Business Engineering Newsletter**, Volume 1, Issue 2
2. "Achieving Breakthrough Improvement Through Business Process Reengineering" Michael S. Yoemans and Janice L. Beckett, **Armed Forces Comptroller**, Winter, 1996
3. "After Reengineering: Taking Care of Business" Jeff Moad, **Datamation**, Oct 15, 1994
4. "After the Reengineering Hype, An Ambiguous Legacy" Jeffrey Zack, **American Banker**, April 1, 1996
5. "Applying Information Technology to Reengineering" Tim R. Furey, Jennifer L. Garlitz and Michael L. Kelleher, **Planning Review**, Nov-Dec 1993
6. "Automating Business Process Reengineering:" **National Productivity Review**, Winter, 1994
7. "Beating the Risks of Reengineering" Michael Hammer and Steven Stanton, **Fortune**, May 15, 1995
8. "Bell Atlantic Reengineers Payment Processing" Scott Humphrey, **Enterprise Reengineering**, Oct/Nov, 1995
9. **Business Reengineering**: Dorine C. Andrews and Susan Stalick, Prentice Hall, New York, 1994
10. "Canada Institute Reengineers Document Delivery, The" Judy Bassett, **Enterprise Reengineering**, June/July 1995
11. "Change Requires Reengineering" **Industry Week**, June 20, 1994

12. "Chasing the BPR Tool Market" Randy Barrett, **Enterprise Reengineering**, March, 1996
13. "Getting Past the Obstacles to Successful Reengineering"  
Dr. Winford E. Holland and Sanjiv Kumar, **Business Horizons**, May-June, 1995
14. "Going Horizontal" **Chief Executive**, May 1996
15. **Government Business Process Reengineering (BPR) Readiness Assessment Guide**  
General Services Administration, 1996
16. "Hocus-Pocus of Reengineering, The" Paul A. Strassmann, **Across The Board**, June, 1994
17. "How Benchmarking Can Improve Business Reengineering"  
Theodor Richman and Charles Koontz, **Planning Review**, Nov-Dec 1993
18. "How BPR Can Go Awry" Thomas G. Cody, **Enterprise Reengineering**, March, 1996
19. "How to Reshape Your Business to Fit the Future" Robert M. Randall, **Planning Review**, Jan-Feb., 1995
20. "Human Resource Management Lessons From A Decade of Total Quality Management And Reengineering" **California Management Review**, Summer, 1994
21. "Human Resources: First Stop for Reengineers"  
Larry Willets, **Enterprise Reengineering**, July 1996
22. "Human Resources: Requirement for Reengineering" **Management Review**, June, 1994
23. "Putting the Engine into Reengineering"  
Elaine M. Mandrish and Robert H. Schaffer, **National Productivity Review**, Spring 1996
24. "Reality of Business Reengineering, The: Pacific Bell's Centrex Provisioning Process"  
Donna B. Stoddard, Sirkka L. Jarvenpaa and Michael Littlejohn, **California Management Review**, Spring 1996
25. **Reengineering** A. Strassmann, Information Economics Press, New Canaan, CT, 1995
26. "Reengineering Administrative Logistics"  
Ellen Metaal and Bruce Gladwin, **Enterprise Reengineering**, September, 1995
27. "Reengineering Aetna"  
Glenn Rifkin, **Forbes ASAP**, 6/7/93
28. "Reengineering and Information Resources Management"  
Dr. Sharon L. Caudle, **Public Manager: The New Bureaucrat**, Winter 1994
29. "Reengineering Challenge:"  
**Planning Review**, Nov-Dec, 1994
30. **Reengineering for Results: Keys to Success from Government Experience**  
Dr. Sharon L. Caudle, Nat'l Academy of Public Administration, Wash.D.C., 1995
31. **Reengineering Handbook, The**  
Dr. Raymond Manganelli and Mark M. Klein, American Management Association, 1994

## Annexes

### Annex 1: Process Management tools

WorkFlow Analyzer is an industry leading BPR tool that combines process modeling and simulation in one integrated package. Using WorkFlow Analyzer, you can study your current business process in detail, pinpoint critical paths and bottlenecks and identify opportunities for improvement. Before you implement any changes, WorkFlow Analyzer lets you predict the effects of those changes. And after your new process is up and running, WorkFlow Analyzer lets you modify it in response to changing conditions.

#### Structured Visual Modeling

- ☐ Facilitates communication between business analysts and IT professionals
- ☐ Captures the complexity of actual business processes

#### Automatically Generates Simulation Model From Business Process Model

- ☐ Produces simulation results with ease
- ☐ Validates new design
- ☐ Ensures consistency

#### Integrates BPR and Workflow Production

- ☐ Builds operational workflows automatically
- ☐ Reduces implementation time and cost

#### Graphical Reporting Plus Animation

- ☐ Results that everyone can understand
- ☐ Bottleneck analysis
- ☐ Performance measurement
- ☐ Cost-benefit tradeoffs
- ☐ Activity based costing

#### Scaleable and Modular

- ☐ Use same tool for both large and small projects
- ☐ Promotes model re-use
- ☐ Facilitates model maintenance

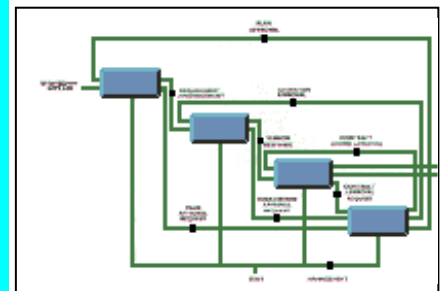
#### Open Interface - PC and Workstation Based

- ☐ Integrates with existing IT infrastructure

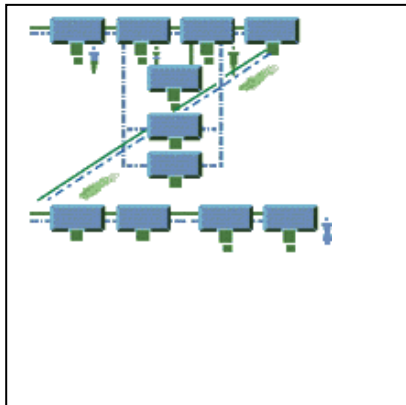
---

#### Model of Procurement System

A large organization is using WorkFlow Analyzer to redesign its procurement system. To launch the BPR project, a model of the original process is built. WorkFlow Analyzer's simple visual methodology captures complex workflows and critical path dependencies.



### Procurement System - "As Is Scenario"



WorkFlow Analyzer automatically generates the simulation model used to study the procurement system. In the original process, all supplies were handled identically. Simulation reveals the long- and costly- approval delays for inexpensive items.

#### WorkFlow Analyzer Lets You:

- Whether you are improving an existing operation or designing a new one from scratch, you begin by describing the process. WorkFlow Analyzer lets you model complex processes with ease. Its simple visual vocabulary is ideally suited to capturing and expressing the characteristics of a business process — from staffing and equipment requirements to workflows and critical path dependencies. And its hierarchical representation lets you describe that process in whatever level of detail you need.
- Are your design assumptions valid? Are you getting the performance you need? Are you deploying personnel to best advantage? You can't improve what you can't measure. WorkFlow Analyzer's powerful simulation engine gives you answers, not approximations. It allows you to analyze the way your business processes actually work, without having to master a laborious simulation language. And by displaying simulation results through animation and other innovative graphical methods, WorkFlow Analyzer lets you instantly assess key factors, such as bottlenecks, resource utilization and operating costs. This means you spend your time solving business problems, not programming problems.
- Once your solution has been designed and verified, WorkFlow Analyzer lets you make a rapid and error-free transition from BPR analysis to business process solution. WorkFlow Analyzer integrates seamlessly into your existing IT environment, and interoperates with other components of your corporate information infrastructure. For workflow automation systems, WorkFlow Analyzer automatically generates routing information and flow logic directly from your business model—eliminating the intermediate manual programming step and assuring consistency between your design and your implementation.
- Once the process is running, WorkFlow Analyzer lets you feed actual operating parameters back into the model to update the assumptions you made in the initial simulation. This means you can refine your implementation as your business changes.
- The knowledge that makes your company run is distributed throughout your organization. WorkFlow Analyzer transforms that often ephemeral knowledge into a tangible business asset, a collection of reusable business models that everyone across

your enterprise—analysts, IT professionals and end-users—can easily understand. And Meta's Business Model Repository allows you to accumulate and preserve those models, and pass them on to the next BPR team. With WorkFlow Analyzer, you never have to start from scratch. Every new project can build on the lessons and successes of previous projects .

#### Specifications

WorkFlow Modeler 4.1 requires Microsoft Windows 95, Windows 98 or Windows NT 4.0. For minimum hardware, you should have a Pentium, 32 MB of RAM (64 MB RAM recommended), and 15 MB of hard disk space.

#### Other similar products

CACI Products Company: SIMPROCESS®

Feith Systems And Software, Inc. Workflow

IA Corporation: WorkVision

Interfacing Technologies Corporation: FirstSTEP

Mentor Graphics: WorkXpert Tool Suite: FlowXpert™ - FlowXpert™

XpertBuilder™ - XpertBuilder™

PowerCerv: FLOWBuilder

Staffware - production based workflow software

SAP AG:R/2

## Annex 2: Workflow management tools

#### Overview

ActionWorks™ Process Builder-Designer Edition enables rapid design of e-processes. Process Builder-DE is all you need to design an online business process. Use Process Builder-DE to map workflows, define roles, specify rules and design web forms. Discover the bottlenecks that create breakdowns for the business. Communicate these to the team and seek their feedback. Then, improve the process in order to compete more effectively. Process Builder-DE's drag-and-drop mapping tool, design wizards and workflow templates help you design a process quickly and easily.

Leverages pre-defined process maps for a quick-start on your own process design

Provides Open Process Mapping for unparalleled ease of process definition, analysis and continuous process improvement

Focuses on customer satisfaction as a goal for every process

Supports knowledge worker processes, with the ability to handle negotiations, exceptions and ad-hoc workflows

Features integrated process design and application development (available in the Process Builder-Developer Edition, purchased separately)

#### Process Design

Process Builder-DE lets you start your process design with a pre-defined business process map, or you can create a new one. Building the business rules that define a process is fast and easy because it's simply a matter of answering questions contained in a series of templates and protocol wizards. The aim throughout is to design a streamlined process that enables your organization to deliver better products and services to satisfied customers.



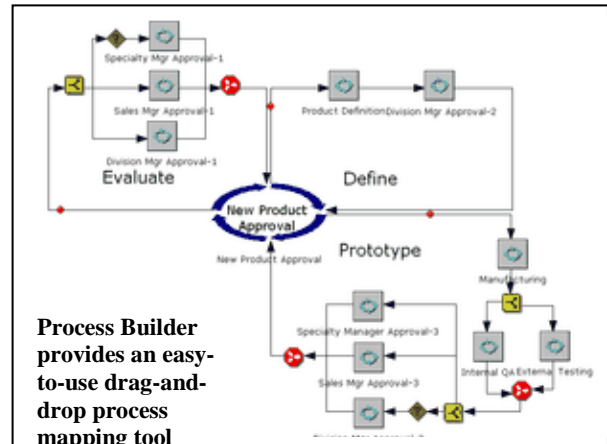
You now have a process map built on the patented Business InterAction model that underpins all Action Technologies' solutions. The customer requests a task; the performer performs it. Next, it's the developer's task to build the complete web-based application with the Process Builder-Developer Edition. Finally, you can completely automate your business process and deploy it online with the ActionWorks Metro server.

#### Features

With Process Builder-DE, business analysts and application designers can design e-processes using the following significant features:

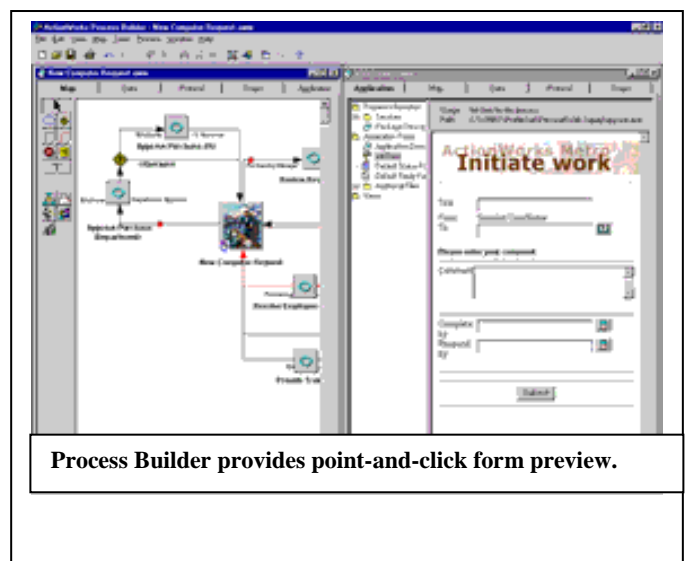
#### Process Mapping

Drag-and-drop process mapping tool  
Pre-defined business process maps with workflow, roles and rules  
Workflow objects that define business interactions  
Sub-process maps  
Agent Performer functions that describe automated software agents  
Process cycle times computation  
Organizational roles and identities definition  
Rich, flexible work management features including workflow protocols (workflow restart, new acts, simple acts and control of "acts" per state)  
Process documentation and management  
Automatic consistency checking  
Rendezvous, splitter, and conditional flow objects



#### Application Design

Point-and-click form layout including field data, controls and attribute definition  
Form preview for initiate, status and reply forms  
Custom views with cascading style sheets and filters display and manage work  
MailLinks (e-mail notification) are pre-configured and can be customized easily through templates  
Comment history enables discussions and track various business process events  
Shared Work Offices manage team-based work  
Attachments are added to business process through a point-and-click interface  
Extranet initiation enables customers, partners or suppliers to initiate business processes from the Web  
Timing services remind, follow-up and escalate work  
Component assembly environment speeds development and enables the reuse of common objects such as address books and calendars in the form of Java applets or ActiveX components (available in the Process Builder-Developer Edition)  
The code for all these application services is generated automatically (available in the Process Builder-Developer Edition)



## System Requirements

PC-compatible Pentium computer

64 MB of RAM

32 MB of available hard disk space

Microsoft Windows 95, 98 or Microsoft Windows NT

Microsoft Internet Explorer 4.02 or above (must be pre-installed)

**Other similar products**

GFI Communications - GFI Emailflow for Exchange/

DIaLOGIKa GmbH: multiDESK Access

JetForm Corporation: JetForm

Digital Equipment Corporation: Expeditor -

Eastman Software: Workflow

FileNet: Visual WorkFlo

IBM: MQseries Workflow

TeamWARE Flow

Open Text Corporation: Livelink Workflow

Portfolio Technologies, Inc.: Office.IQ

Remedy Action Request System

COSA ® Workflow

ViewStar Corporation: ViewStar

METEOR Enterprise Application Suite

**Annex 3: Re-engineering Methodology - REMORA (sample tables)**

ABC COMPANY					
Process No.	Ability to change	Opportunity	Impact on organization	Impact on clients	Total

Rating 0<sub>MIN</sub> - 10<sub>MAX</sub>

Table A-3.1 Process evaluation table

ABC COMPANY								
	OPPORTUNITIES				COST	FACTORS		
Process No	Creation of ONE-STOP-SHOP	REDUCTION OF PROCESS TIME	CUSTOMER SATISFACTION	PRODUCTIVITY	FTE	TIME	RISKS	PRIORITIES

Table A-3.2 Opportunity /cost table

ABC COMPANY					
Process					
Steo No	Related Document	Repeation	Workflow		
			SEQUENTIAL	PARALLEL	AYTONOMOUS

Table A-3.3 Workflow / document table

ABC COMPANY																	
Process No																	
POSITION TRANSFORMATION			SKILLS					KNOWLEDGE UNITS					ORIENTATION				
FROM	TO																

Table A-3.4 Employee upgrade table