SYSTEMS INTEGRATION OPPORTUNITIES IN RE-ENGINEERING

INPUT

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Systems Integration Opportunities in Re-engineering

Abstract

A new buzzword, business processing re-engineering (BPR), is viewed by many business and government leaders as a possible panacea for rapid productivity improvement. Major systems integration firms are moving to adopt BPR as a form of front-end analysis offered as a separate service to promote their SI business. More success stories appear daily of dramatic change in various industries brought about by the BPR approach to basic process review and change.

This report reviews BPR and some of its successes. Further, it looks through the eyes of SI vendors at their vision of the role and impact BPR may have on their future business.

The report focuses on the linkage between BPR and SI from the perspective of vendors: which industries are active, what the user seeks, where the opportunities are and how can they be used strategically. Finally, the role of technology and the impact of growing competition is considered.

The report concludes with a summary and draws conclusions that will assist SI vendors in understanding the place of this philosophy in the systems integration industry.

This report contains 42 pages, 4 exhibits and 3 case studies.

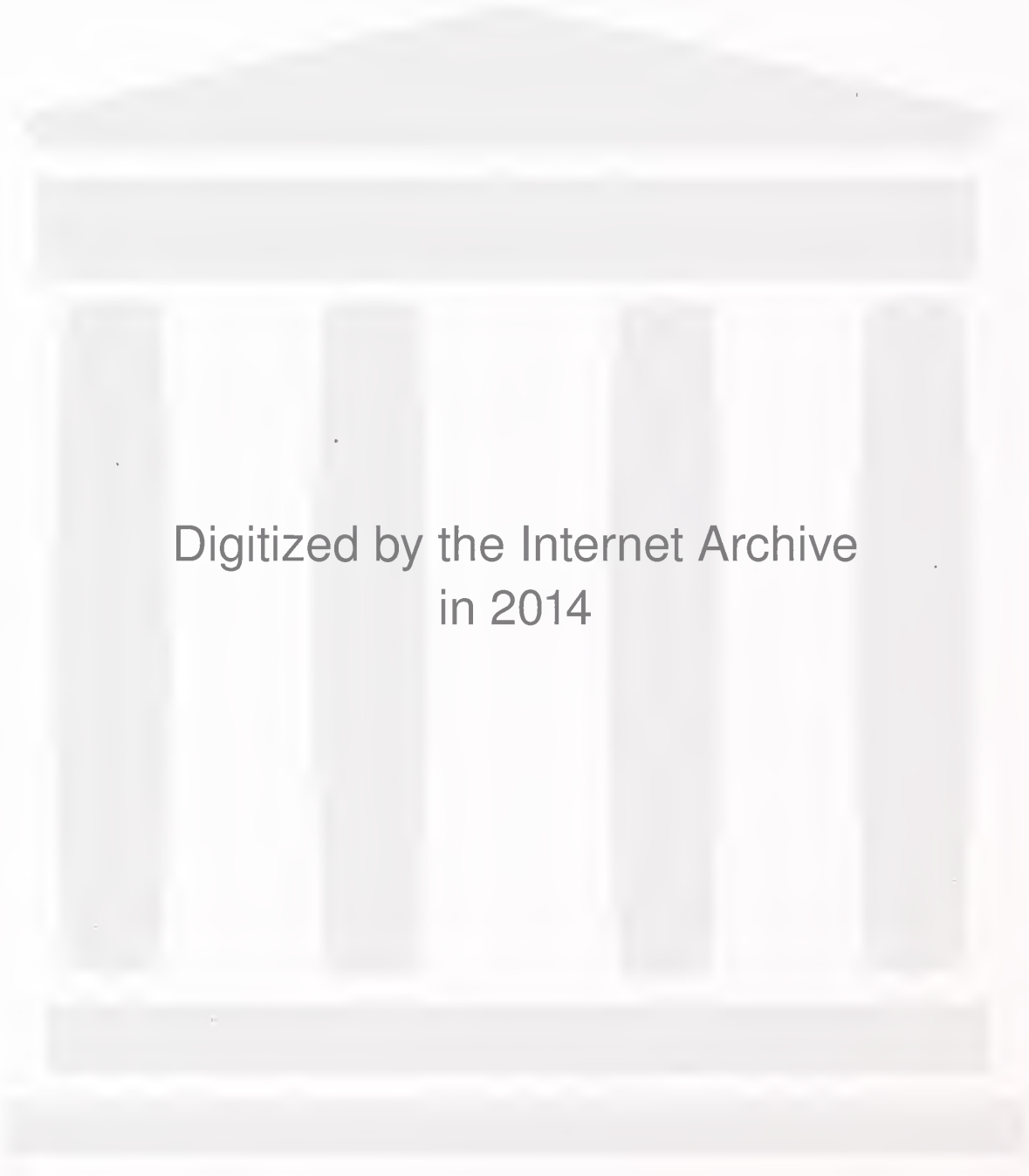

Table of Contents

Table of Contents (Continued)

Exhibits

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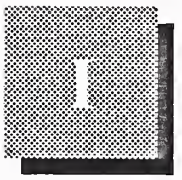

Introduction

A
Objective and Need

The objective of this research is to provide the systems integrator with a current view of business process re-engineering (BPR) and assist vendors to address the market for this potentially new service offering.

The report includes:

- A working definition of BPR, provided along with three case studies, to explore the application of its principles.
- Is BPR linked to SI, and if so, what does it mean for the SI vendor?
- What industries appear to be the most open to the BPR strategic realignment, i.e., where are the current success stories and what industries are showing interest?
- What are the current vendor strategies regarding BPR?
- What are the resources required and how well are vendors positioned to provide support?
- Is this just an SI vendor service, or should other types of vendors be prepared to assist with the systems and technical aspects of enabling the BPR created by other vendors or by the client organizations themselves?

B
Scope and Use

The primary focus of this research project is to determine the extent of linkage between business process re-engineering utilization and the use of systems integration vendors.

This report addresses this linkage from several perspectives to assist BPR and SI vendors to maximize potential client opportunities. Organizations that have utilized BPR would be expected to follow through with integrated approaches to systems. Does this foster the use of SI vendors?

Data for the report was derived from both primary and secondary research.

- Secondary data was used to develop a basic understanding of business process re-engineering. Discussions with vendors were used to provide a counterpoint to static definitions.

- Primary data was collected from structured interviews with SI vendors and other experts in BPR services and procedures. A survey questionnaire was developed to cover both objective and subjective questions.

  - Objective questions were oriented toward gaining an understanding of vendor perspectives on which industries are likely to utilize BPR, the normal scope of BPR projects, and which vendor skills are necessary to address BPR services.

  - Subjective questions were directed toward finding out why organizations do BPR, the importance of external forces on the advent and use of BPR and opinions regarding BPR's linkage with SI.

C
Report Organization

Following the introduction, the report is divided into four major sections:

- Chapter II—Executive Overview—provides a summary of the research presented in this report.

- Chapter III—Re-engineering Opportunities—assembles a composite definition of business process re-engineering and explores expected directions and forces that foster use of this philosophy, what user organizations seek and, hence, potential opportunities.

- Chapter IV—Systems Integration Vendor Perspectives—compiles the outlook and initiatives of various types of vendors regarding this form of consulting service and its relationship to Systems Integration services.

- Appendix A—Definitions

- Appendix B—Case Studies

- Appendix C—Questionnaire

D
Related Reports

Systems Integration Technology Trends

Systems Integration Trends and Forecast, 1992-1997

Impact of Downsizing on Systems Integration

Impact of Outsourcing on Systems Integration

Interaction of Downsizing with Outsourcing

Networking Systems Integration Opportunities

Methods for Successful Systems Integration

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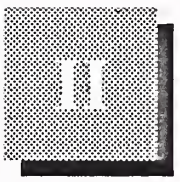

Executive Overview

A Summary

There is a linkage between business process re-engineering and systems integration. The perspective must be clear: BPR is the front-end process change activity and SI is the enabler of these changes.

1. What is BPR?

BPR per se is nothing new. It is a combination of several analytical and planning tasks that should be familiar to most managers:

- Business analysis
- Strategic planning
- Organizational review
- Process effectiveness review

What is new is the packaging of BPR into a front-end analysis and the depth of change within an organization that the analysis prescribes. Also new is the publicity BPR is receiving and its legion of advocates.

Success in BPR is attributed to four factors. Notably missing is mention of technology. The factors are:

- A strategy defined by senior management with the vision and commitment to carry it to completion
- Creation of new models of how the business should function
- Redesign of administrative procedures to accommodate process changes
- The will to effectively manage the change until it becomes institutionalized

BPR is a serious methodology that advocates radical process change within enterprises. The leading business factor driving this initiative is competition.

For the systems integrator, this level of process change means systems and technology changes of enterprisewide proportions. Since these changes will be new, they will be built on a base of current technology. This will probably provide the impetus for rapid growth in new technology implementation. The systems integrator poised to assist in the adoption of these technologies with rapid, inexpensive, flexible development and implementation services will capture a share of this growth.

Will this BPR initiative survive or just become another buzzword? Most vendors believe that BPR will stay. Growth will come as more success stories are created and publicized. Almost all major SI vendors have entered or will soon be seeking entry into the BPR front-end market.

The stories of success in achieving dramatic productivity improvements have customers asking about BPR services. Companies know that to stay competitive they must make similar changes. To stay in business they must improve productivity.

The most successful BPR cases are those in which the entire organization is involved. This is the level that clients must achieve for maximum improvement. Users should be cautioned to avoid the apparent quick fix. Many vendors have adopted the buzzword, but some only look to the modest improvements in existing processes that technologists historically have provided .

2. Where Opportunities Are

Where are the opportunities expected to be? The most active industries currently are: discrete manufacturing, utilities, banking/finance, insurance and retail. These industries are expected to continue to be leaders in adopting this change philosophy. Other vertical industries expected to show rapid growth are: telecommunications, transportation, state and local government and education. A significant common factor in these groups for SI vendor is that three of the top five (discrete manufacturing, banking/finance and insurance) are also the leaders in the use of SI services. The linkage is there for those focused on these industries.

The biggest SI growth story is a testament to the relationship between SI and BPR. Andersen Consulting rose from obscurity a few short years ago to capture the number-two position among SI vendors in 1991. Though there is more to the story than BPR, Andersen has adopted a strategy of using front-end business process analysis to feed work to its SI services unit. One of its successes is a case study—included in Appendix B—involving a dramatic change in health care management.

Where is all of this going? It appears to be moving in several directions at once. All major SI vendors are adding specialized BPR units and services. Management consulting firms that have not traditionally provided SI services believe that their planning specialty will serve them well as they perform BPR engagements. Some SI vendors indicate that they prefer to stick to their core business and not attempt BPR. Alliances, partnerships and acquisitions are and will be used to hedge their bets. INPUT believes that there will be room for all varieties of BPR involvement.

The biggest problem presented to SI vendors is their perception by potential clients. Will the five largest SI vendors be able to accomplish the change required to be considered viable business planners? Among the top five, only Andersen has a reputation in management consulting. This is what clients expect the vendor to supply in business process re-engineering. The other four major SI vendors (IBM, DEC, CSC and EDS) are splitting off units and adding high-level planners so as to reposition their image and become full-service suppliers.

A full-service supplier should be able to provide the full spectrum of services—BPR, SI, change management and systems operations. SI vendors can simulate the full-service supplier by forming alliances or subcontracting.

Why are all the major vendors adding BPR services? Certainly the example of growth accomplished by Andersen Consulting is a factor. But BPR and SI are separate services. Why go to great lengths to add this capability? Fear is one factor. Companies fear that they can be shut out of significant SI business if they do not capture it at the front end. Additionally, a simple SI contract can be turned into something much larger by shifting the relationship to a review of all processes. Finally, the BPR engagement can build the justification, in business terms, for technology implementation that requires system integration.

3. Success Factors

Vendors suggested the following primary attributes for success in capturing BPR business:

- Similar engagement experience
- Focus on managing vast changes
- Vertical industry focus

All major vendors are structured in industry-focused teams. Though the process of BPR often models new processes from other industries, industry knowledge is seen as a requirement for entering the business.

Marketing strategies for SI vendors fall into three general categories:

- Follow the lead of the major firms and add a consulting unit to approach clients.
- Provide the service by allying with BPR subcontractors as a prime contractor or letting the BPR vendor be the prime contractor.
- Stick to core business and let the market play itself out as many BPR providers enter and fragment the market.

There should be room for all vendors because no single player is expected to be dominant .

Where does technology fit? As already mentioned, automation is the enabler of the process changes resulting from BPR. Automation also provides the tools, some of which are quite good, for assisting the planning process. One day there may even be an expert system to do business process re-engineering, but it is not available today. BPR currently requires standard analytical tools and talents.

Finally, BPR may have happened because of technology. The history of technology, from a business perspective, has been one of automating the way things were. The improvements that were gained were usually marginal. IS costs have risen to keep pace, but the automators have never been really good at proving the benefit of the changes. BPR should be the movement that extracts the benefits by re-engineering the processes and institutionalizing them through technology.

B
Conclusions

BPR is viewed by BPR advocates as a vehicle for dramatic change in business processes and true productivity breakthroughs. BPR provides value and benefit to the buyer.

BPR can and must be sold at the senior management level of enterprises because of its need to cross traditional organizational boundaries for full effectiveness.

BPR can be the means by which to increase SI business:

- BPR often increases the level of technology change for a given project.
- BPR services are a means by which to sell the benefits of change in terms of business.

- BPR establishes a closer relationship with the SI client at senior management levels.

BPR can be the missing link by which businesses can achieve the true payback from automation that has been promised for so long. The strategy is to sell benefits and value, then introduce the enabling technology provided by the systems integrator.

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To ensure that there is no mistaking this type of business re-engineering, there is a parallel within the realm of systems activities. Integrated systems has traditionally been seen as a data processing, MIS or information services issue. It makes sense to tie the disparate application systems together for better efficiency. The end results will be improved information access, enhanced productivity and better data flow. The history of these projects has generally been incremental improvement of existing business processes. Rarely were processes substantially altered during their original automation or during integration of their parts.

The term re-engineering implies back-to-basics revision. In information services, this term is interpreted as applying to projects that focus on the reworking of outdated, inefficient, poorly documented and, hence, unmaintainable software. In the extreme case, we could call this form of re-engineering the redesign of application systems to take advantage of newer technology, incorporate years of accumulated modifications and leave some room for future change. Though this is an admirable and often necessary activity when confronted by 15- to 20-year-old system designs, this activity focuses on improving current processing support. Normally, only limited gains in overall business productivity are obtained from these exercises.

When we expand the scope of re-engineering to address the totality of business functions and their processes, far greater benefit can accrue to the business. Business process re-engineering (BPR) places the focus of analysis on the business operation. Though technology use is assumed in process design, direct technology issues and solutions are only viewed as process enablers.

Because the IS concept cannot be accurately portrayed without examples, Appendix B contains three case studies that illustrate the full potential impact of BPR. These stories are more useful in exploring the extent of change than any definition can convey.

B
Key Market Factors

INPUT believes that BPR is an effective methodology both to promote significant improvements in the efficiency of business processes and as a preliminary vehicle to encourage integrated systems strategies. It is being driven by competition on a global scale from new competitors who have not been brought up on the wasteful back-office practices of the United States and do not carry the baggage of bloated office systems evolution.

A secondary driver is the desire of enterprise executives to make breakthrough productivity advances while improving quality and customer service. They seek to fulfill the improvements promised by automation, but often have seen only modest enhancements using conventional methods.

Most major SI players are looking to BPR as a primary thrust to rapidly increase their SI business. INPUT believes that they are correct in doing so, since the major changes in processes wrought by thoughtful BPR will require new, integrated systems solutions.

INPUT feels that new systems will be required across the enterprise. They will be built on new technology bases (e.g., client/server, open systems, etc.), and the systems integrator is properly positioned to assist in these technology initiatives with user organizations.

Increased BPR activity by enterprises will yield an increase in SI opportunities over the next few years. Since true enterprisewide BPR is a complex, lengthy and iterative process, there may be a lag in BPR-induced technology activity. It is natural to assume that the new processes will be designed to take advantage of current technology. Systems integrators that are positioned to implement these new technologies and that have exhibited the ability to work closely with systems design people—either within their own firms or with personnel from specialty firms—will capture the larger market share.

What will positively impact BPR?

The single most important factor in increasing the spread of BPR to more industries and enterprises may well be an abundance of success stories. Success stories are proof that this radical form of business restructuring indeed produces promised results. Without such proof, there is too little understanding of the academic principles expounded. Without proven enterprisewide successes, the restructuring movement could easily fall back into the category of improvements to existing functions and processes.

C

Key User Requirements

Users seek the promised results of dramatic improvement that reflect directly on the bottom line. They seek major change that goes beyond incremental improvement created by making existing processes faster. The importance of specific benefits to users of the BPR process is rated by vendors in Exhibit III-1.

EXHIBIT III-1

Benefits of BPR

Benefit	Average Rating*
Faster customer responses	4.8
Better productivity	4.8
Competitive advantage	4.7
Faster product introduction	4.4
Quality improvements	4.3
Cost reduction	4.0
Increase revenue/business	4.0
New process development	3.2
Use of technology improves	2.3

*Rating based on a 1-5 scale where
5 = most important and 1 = least important.

The exhibit clearly shows that improvement in the delivery of services to support the core business is what drives BPR processes. Technology does not play a major role in BPR.

Do clients want a single-source vendor? The risk and responsibility for full implementation placed with one vendor is a potential negative factor. Firms that have the capability to offer "womb to tomb" services believe that clients will want this. INPUT feels that some clients will choose this direction, but clients must be deeply involved for the process to provide the best results.

Do clients seek the best providers of each service, i.e., one vendor for planning and change management and another to provide SI as a separate, but necessary implementation tool? Don't let your plumber do design or let your architect connect the pipes. Though this splits responsibility, some users state that this approach is preferred by clients.

Many clients are sophisticated and accustomed to dealing with multiple vendors. INPUT sees this as a viable approach for some clients; SI-only vendors may find BPR vendors seeking them out for alliances.

To many vendors, BPR comes in several variations. Re-engineering conducted at departmental and divisional levels, though providing some incremental benefit, will lack the organizational breadth to seriously impact what is accomplished. The true BPR thrust must be enterprisewide to achieve maximum process transformation and bottom-line benefit.

D
System Integration Re-engineering Opportunities

Business process re-engineering is an active market. Most vendors—of all sizes and types—say they have the capability and have been engaged by clients for this activity. Some vendors merely modified their marketing literature and are only using BPR as the current buzzword, while they continue to provide incremental improvement for existing processes. These efficiency experts only cloud the issue for clients. They can be a danger to true BPR initiatives because their definition and orientation is the task itself, not a wholesale restructuring of the process. The danger is that the so-called BPR vendors will fail to produce breakthrough success in the name of BPR and will destroy the initiative before it can show real progress.

1. Industry Classification

The beginnings of BPR are traced by some to the JIT (just in time) type of process change that originated in manufacturing. The implementation of this philosophy has forever altered the process and inventory systems of major industries. The proof of the value of JIT, and the downside risk also, is in the short time it takes for a break in the chain to close down the entire process. As an example, the General Motors parts suppliers' strike caused the shutdown of plants within two days and, though not publicized, severely impacted suppliers and manufacturers up the supply chain.

Because of this history and the long-term global competitive pressure that is focused on discrete manufacturers, they will continue to be leaders in BPR usage. Other industries now actively pursuing BPR, in order of mention, include utilities, banking and finance, insurance, and retail distribution.

- Utilities - conservative management structures can no longer avoid new technologies like RDBMSs, imaging technology and GISs that improve efficiency, productivity, and lower operating costs. Public demands for improved operations and business service applications are requiring the utility industry to re-think its work flow processes and supporting IS structures.

- Banking and finance - industry players are re-engineering existing processes to provide full relationship-based integrated services for users and customers. Financial institutions now need on-line, real-time data and analyses at all branch locations. Data base, imaging and networking technologies in addition to client/server architectures provide the means to develop new applications to support rising competitive demands. For some institutions, re-engineering of operations translates to outsourcing all or some IS functionality.

- Insurance - industry changes in types of services and global access requirements are driving BPR at insurance companies. Re-engineering efforts are giving rise to new systems that offer productivity increases and can position carriers more competitively. As in the banking and finance industry, imaging, artificial intelligence/expert systems and data base products play a key role in automating many resource-intensive business processes.

- Retail - this industry is being hard hit by the U.S. recession. Establishments realize they must aggressively embrace IT to improve demographic merchandizing and financial reporting to strengthen their competitive positions in a sluggish economy. BPR is being employed to dramatically redesign outdated pricing and distribution channels. Use of new technologies such as EDI, point-of-sale (POS) devices and optical systems can lower overall operating costs and improve profit margins.

Vendors expect additional demand for BPR to be shown in four other vertical industries:

- Telecommunications - turmoil in this industry—blending of information services among the participants, such as telephone/cellular/cable/data suppliers, competition for households, and potential government regulation—will require its vendors to rethink how they address their markets.

- Transportation - heightened competition, the impact of BPR events from customers—e.g., EDI—and the potential of mergers will escalate the costs of addressing these changes to the industry and require major process change.

- State and local government - more pressure to provide more services with fewer funds is developing. This will cause organizations to adopt the BPR process and alter the way business is done and services are provided.

- Education - this industry is expected to begin re-engineering as the numbers of traditional customers dwindle and business/government pressures change how educational services are provided. INPUT believes that the opportunity presented by process change in educational entities will be minimal because the academic community has and will continue to implement change on its own.

2. Types of Services

Though most SI vendors are adding BPR as a service for their clients, not all see it as a service separate from their primary business. Their comments portray a range of attitudes:

- "Many of our clients ask us about BPR and indicate that they want a single vendor to do the whole process right through the systems integration."
- "No, we do not really expect to offer it as a separate engagement. It is intended to lead into the rest of our services."
- "No, BPR has very little to do with computers. It is ludicrous to expect that SI people could do the front-end job. That would be like asking a plumber to architect the building."
- "We believe that management consultants and process experts can fulfill the task of BPR. By achieving the new process design and specifying the systems, the task can be turned over to systems integrators."
- "The future of BPR shall be based on perceptions. Technology people will still be expected to find systems solutions, only those known for business consulting will get a significant share of this market. If they also do systems integration, they may catch the system changes also."
- "You are missing the issue if you only see technology or even process re-engineering. The biggest issue is managing 'across the board' change, even outside the enterprise. Structures, relationships, compensation, organization, the human stuff, that's the issue here."

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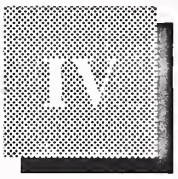

Systems Integration Vendor Perspectives

A
Re-engineering Alternatives

The systems integrator has at least two basic options in taking advantage of the growth in business process re-engineering. Many systems integrators are attempting to build a BPR service as a front end to their traditional systems integration services. Others are preparing themselves to address the systems integration needs that are expected to result from BPR activities done by others.

1. BPR as a Service

There is a twofold perception problem for many vendors as they attempt to enter the market for BPR services. A primary issue is the history of the vendor organization and the perception that history gives to the potential customer.

EXHIBIT IV-1

Perception of Vendors by Class

Class	Perception
1-Hardware Manufacturer (IBM, DEC, etc.)	Will treat problem as a systems issue with their hardware solution
2-Communications company (AT&T, RBOCs, etc.)	Not a viable focus for BPR, except within industry
3-Consulting-based professional services (McKinsey, Andersen, etc.)	Proper perception for BPR
4-IS-based professional services (TSC, CTG, etc.)	Viewed as systems integrators not business professionals
5-Systems operations (EDS, CSC, etc.)	Viewed as systems operators, but have good feel for business issues
6-Aerospace companies (Boeing, TRW, etc.)	Not viable focus for BPR, except within industry
7-Software suppliers (Microsoft, etc.)	All they know are software solutions
8-Other, BPR specialists (CSC Index, Oasis, etc.)	New breed created to address this planning need

Of the listed classes of systems integration vendors, most (1, 4, 5 and 7) would not be perceived as potential BPR practitioners, except possibly within their own industry classification (i.e.. 2 and 6). Only consulting-based professional services firms and BPR specialists are considered capable of BPR engagements. However, vendors in every class indicate that they have added high-level consultants. Many have also established or purchased separate subsidiaries or units to address the level of business consulting required to enter the BPR market.

INPUT believes that some of these new entrants will be successful in revamping the perception of their vendor class. Successful vendors will be those who utilize their existing relationships to extend leadership assistance to the client's management and who can establish and publicize successful engagements.

2. BPR as a Feeder to Systems Integrators

Some vendors have chosen to concentrate on their base systems integration business, though interestingly, some have added business consulting staff. They state their position thus:

"We do not believe that any vendor can effectively offer more than one core product. Fundamentally, BPR and systems integration are two separate businesses."

This philosophy is espoused by management consultants who do not offer systems integration services. These non-SI vendors believe that enterprise leaders will look to those with established track records in business and strategy planning for assistance in BPR-oriented engagements. They feel that the real competition will be from the new specialty BPR providers, not from the Big 6 or the systems integrators, who will try to move to strategic and management consulting.

As for the technology and systems work that may result from non-SI BPR engagements, these firms expect to specify functions required and turn over systems integration projects.

INPUT feels that there is considerable room for the establishment of working relationships, either as formal alliances or informal understandings for sharing, between these two vendor groups (i.e., BPR consultants and non-BPR-capable systems integrators).

B
Vendor Capabilities

BPR is universally and accurately seen as a separate product/service from SI services. Beyond that statement there is a basic split among the vendors regarding direction.

Many SI firms, representing all types of vendors, feel they must offer BPR services to avoid being eliminated from a portion of the systems integration business. They believe that the BPR firm that also performs systems integration services will have an inside track for follow-on activities. A sole source responsible for process strategy through implementation is preferred. INPUT believes that those who enter the BPR service business solely from fear of elimination from the market may harm rather than help their business. To be successful, the firm must adopt an appropriate planning methodology, staff it with the proper skills—including change management tools—and give BPR corporate attention.

Specialist and management consulting firms that offer BPR and usually do not perform systems integration adopt the opposite strategy. Enterprises will hire the best vendor for each activity. These firms are prepared to carry automation requirements through to functional designs, then turn over the client to a systems integrator. They feel that the current trend toward single-source providers will not bring expected success levels, and clients will return to the specialized expertise offered by management consulting firms.

Regardless of this dichotomy, both groups are hedging their positions by hiring experienced talent to compensate for their lack of strength.

INPUT believes that vendors with an established "management consultant" base and whose clients perceive them as management consultants are positioned to garner the most meaningful BPR business. Only time can resolve the dichotomy of opinion offered by vendors. INPUT believes there is room for both entrants.

Vendor discussions indicated several other elements that are very important in establishing a successful BPR service set. These elements are listed in Exhibit IV-2.

An ability to chronicle success in similar engagements was indicated as the primary element necessary for success in selling BPR engagements.

EXHIBIT IV-2

Vendor Success Elements in BPR Engagements

Element	Average Rating*
Similar engagement experience	4.4
Vertical industry focus	3.7
General BPR knowledge	3.4
Tools and methodologies	3.4
Change management focus	2.9
Program management	2.7
General business knowledge	2.6
Existing client relationship	2.5
Cost-effective consulting	2.4
Application knowledge	2.3
Systems integration service	2.0
Technical knowledge	1.7

*Based on a 1-5 scale where
5 = most important and 1 = least important.

Participation in industry-oriented teams was indicated as the second most important requirement of a viable BPR vendor. These teams typically are led by industry specialists and include BPR-experienced consultants as well as professionals having expertise in the various disciplines required, e.g., compensation, technology, etc.

The third requirement, really allied with the first, is to have a stable of BPR professionals and to promote their activities. Also, tools and methodologies are required, which are supporting elements in effectively conducting the engagement.

Fourth is to recognize that a primary issue in the success of a BPR engagement is change management. This goes beyond the analysis and determination of new processes into overhauling the basic enterprise structure. New processes have a better chance of success when they institutionalize associated changes such as those in compensation, administrative practices, education for new operations, facilities, etc.

Significant in the ratings is the relatively low position given technical aspects. The three technical elements received the lowest ratings. INPUT believes this clearly shows the disconnection between BPR and SI for success in the marketing of BPR.

Finally, some vendors stated that although the market requires industry knowledge, clients often look for techniques from other industries. Manufacturing has taken the lead with its floor process re-engineering. It is perceived as the source of processing ideas for back-office operations.

C
Market Strategies

Marketing of BPR is aimed at the very top executive levels of the enterprise. Successful relationships with IS executives and CIOs (chief information officers) will not ensure the success of BPR within an enterprise. These executives simply do not have the clout to execute BPR across all functional lines. Full commitment from the company's senior management must be obtained for the process.

Secondarily, vendors should give BPR presentations that include a definition of the process itself, to implant appropriate ideas. This form of education is needed to explain the process and its benefits to the potential customer. Education is spiced with real case studies to explore the extent of the possible changes, the necessity of cutting across all functions and, most importantly, the benefits that can accrue if BPR is done properly. Helping potential clients envision these achievable results will sell this type of process re-engineering.

Two strategies have been identified for systems integrators in prior sections: build the staff and capability to offer BPR or remain with the core SI business and seek the increased business potential resulting from BPR projects done by other vendors or by the client's internal staff.

1. Direct BPR Marketing to an Existing SI Client

A common tactic for the systems integrator is to suggest a process review prior to major systems work. This can be presented as a normal step to assure that the funds expended for the system will provide maximum business impact. With an existing client, this can expand and provide a

base for more value-added services from the SI vendor. Whether the SI vendor has the appropriate staff or subcontracts the review activity to a more qualified firm, it will be seen as having been a more valuable supplier.

2. Direct BPR Marketing

Management consulting firms and specialty BPR providers have positioned or will position themselves to exploit direct BPR market potential. They also have the advantage of being perceived as business strategy and planning specialists with high-level client contacts.

Other SI firms must cross several hurdles before they can be perceived as viable providers. The keys are:

- BPR success stories - These can be gained by working on BPR with existing clients (tactic number one, above) or by hiring experienced BPR staff.

- Industry experience - Utilize your existing strengths repositioned in industry rather than technology terms.

- Change management focus - Provide clients with the skills to manage change across their organization. This may be the most difficult area, since specialists are required who are not normally found in SI firms. Additionally, a methodology must be developed to proceed along this path.

The most difficult problem to overcome is the perception created by the vendor's history. Several vendors, like hardware manufacturers, have acquired or established separate subsidiaries to provide objective distance from their core business. This can be successful when properly executed.

INPUT believes that there will be some successes in creating a new service product. Successful vendors will have added the appropriate skills, exploited their strengths and established a credible business process unit.

3. Indirect Marketing

Vendors who choose not to establish a BPR service capability, yet wish to capture more of the BPR resultant SI business than they would through existing client relationships, must take some strategic steps:

- Establish relationships with BPR-only suppliers who need qualified SI vendors to follow through on their process changes.

- Utilize existing client sponsors to introduce BPR ideas and add more value to your SI project; potentially subcontract any BPR work.
- Expand and deepen strengths, capabilities and products, e.g., industry, technology, networks, etc., with the intention of establishing prominence within a niche vertical industry or market.

D
Competitive Environment

INPUT currently counts some 39 companies that had SI business in excess of $50 million during 1991. Five vendors captured 44% of SI market share, with IBM far in front at 17% (see Exhibit IV-3). The big five (IBM, Andersen, EDS, Digital and CSC) all have taken or are taking steps to address the potential market for BPR. Even though all of their core businesses do not assure an unbiased systems solution, they share the ability to gain access to executive suites based on their prior business reputations.

EXHIBIT IV-3

U.S. Systems Integration Market Share, 1991

Vendor	Percent (Share)
IBM	17
Andersen Consulting (1, 2)	9
EDS/GM	8
Digital	6
CSC(2)	5
SAIC	5
Hughes/GM	5
Martin Marietta	4
Unisys	4
TRW	4

(1) Includes imputed equipment expenditures
(2) Adjusted to calendar year 1991

IBM has formed ISSC, a separate subsidiary, to provide SI and offer a full range of support services that includes systems operations outsourcing. In part, the restructuring was to avoid client concerns over equipment-based solutions. IBM's shift to full service is a move to regain primary vendor status with its extensive customer base and capture lucrative business in each vendor class.

The growth of Andersen Consulting as a systems integrator shows the power of getting a front-end analysis engagement. In a few short years Andersen has gone from a minor SI vendor to number two in the total systems integration market. Andersen's competitive advantage was forged based on its strength in BPR and the inside track it has created for resulting SI projects. Its success is partially responsible for the rush by other SI vendors to provide BPR.

EDS has expanded its professional services units to add BPR services to its SI capability. This adds a front-end capability to its offerings, putting EDS closer to being a full-service provider. EDS has yet to overcome its image of being primarily an outsourcing vendor, though it is taking aggressive marketing steps to do so.

Digital is a full-service supplier with roots in manufacturing, which is the home of JIT, a simpler form of BPR. Digital can be a force in other industries based on the breadth of its customer base. If Digital is lacking in any way, it is in not establishing a separate professional services unit and not marketing its experience in BPR. The restructuring currently going on at DEC will be closely watched to see if the company indeed remedies these problems.

CSC's future strength is in its client base, the public sector market, which is predicted to be a strong BPR and SI growth area, and its acquisition of a number of consulting units and strategic consultants in the commercial area.

INPUT believes that the actions taken by the big five will allow them to hold their positions, if not improve their shares. However, the market for BPR services is expected to become fragmented. Because all players are offering an apparently similar service, clients are expected to follow existing relationships and use industry knowledge for selection in the short term. This could contribute to slowing in Andersen's growth, as the company's front-end advantage will be duplicated by the other players.

Where there is shared dominance in the SI market, there is none in BPR service. Opportunities will exist for vendors in niche markets based on individual strengths. These opportunities may be to take advantage of alliance potentials with firms in other SI classes that would benefit from the addition of the BPR vendor's strength. Additionally, BPR-only firms will be seeking quality SI vendors to complement their systems engineering efforts.

E
The Role of Technology

What has technology to do with business process re-engineering? The following is a summary of the collective expressions of vendor respondents:

All vendors expressed the opinion that the primary role of technology as it relates to BPR is to enable the process changes and to institutionalize changed processes.

INPUT believes there is a role for technology in supporting the planning process related to BPR, but tools are not central to the process. Some vendors see it as imperative to leverage their methodology and allow planning practitioners with less seniority to do the re-engineering work. Dr. Michael Hammer disdains the need for tools. "Tools are the technologist's automatic answer to problem resolution." Though no current planning can replace knowledgeable consultants, the "expert system" for planning may provide a planning tool in the future that will greatly enhance the abilities of trained consultants.

Technology is not directly an issue in BPR. Dr. Hammer is the most outspoken respondent on this matter, and most vendors agree with his statement. Technology-driven SI firms should be cautious. They might see technology as the reason for and the end result of the planning and design stage. It is not. It is the changing of processes that were overlooked during the incremental advances of the early days of automation that will yield the greatest process improvements.

BPR should be called the necessary design of processes, not redesign, because few processes are truly designed in the first place. Because new systems are built on current technology, BPR could be the agent of change that stimulates rapid utilization of the new technologies in the marketplace.

The history of technology in business appears to be a factor in the emergence of and need for this radical form of "corporate surgery." Over time, the thrust of technologists has been to "automate manual systems," which has served to institutionalize the processes of old. This was particularly true of the 1960s and 1970s, when mainframe and even departmental computing was a reinforcement of "the way things are done." Even DP or information processing, though a relatively new departmentalized activity, had carved a corporate niche similar to others, like accounting. The DP motto was: "We will take care of the mysteries of the computer, just tell us what you need."

The advent of personal computers in the early 1980s, followed by the routine use of computers in schools, removed the computer mystery and has led to a desktop revolution in the processing of information. Technologists intent on holding onto their "fiefdoms" are responsible for focusing on "things as they were done." Technologists' inflated claims for computer-induced savings, excessive spending for more computer power and staff to automate, the lifting of the perplexing shroud around computing and lack of ingrained support have led corporate officers to probe for better systems directions. The demand for business process re-engineering is the result.

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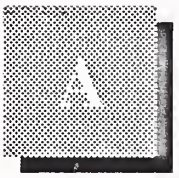

Definitions

Integrated systems - A multifunction or networked set of disparate systems to form a connected base of information and processing capability.

Systems integration (SI) - A service in which one vendor takes total responsibility for providing the complete solution to complex business problems, and usually including: selection and delivery of equipment, software, networks, and professional services, and responsibility for management of the project and any subcontractors.

Business process re-engineering (BPR) - The radical redesign of business process and associated management mechanisms and organizational strategies to achieve drastic performance improvement.

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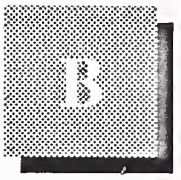


Case Studies

Although the case studies that follow may be familiar to some readers, they are offered as clear cases of business process re-engineering, not just the automation of existing processes.

One underlying theory in the United States is that the normal worker only spends about 10% of his/her time doing value-added work that has customer impact. The bulk of work time is not spent talking and taking breaks, but performing tasks that are required by existing business practices.

This theory can be invalidated if:

- Radical change is introduced in the way target processes are done, which requires senior-level management leadership
- Technology is used as an enabler of the process change
- The level of systems integration effort, though not featured in the studies, is greater because of the BPR front-end work done on a particular process

Case Study 1

Ford - Accounts Payable (Hammer & Company)

Problem: Ford management was expecting to cut about 20% of its 500-person accounts payable staff by reworking its process and installing a new computer system. News that Mazda operated with a staff of only 5 in accounts payable caused Ford to re-examine its business process.

Old process: Management analysis showed that the purchasing department wrote purchase orders and placed orders with suppliers based on requests from other departments. A copy of each order was sent to accounts payable to be held until more paperwork regarding the order arrived. When the order was received, the receiving clerk created a receiv-

ing document and sent a copy to accounts payable. The other document required by accounts payable was an invoice from the supplier. All three documents were manually brought together from their temporary files and verified for 14 different data items. Finally, a check was written and sent to the supplier when the data is verified.

New Process: The new process dispenses with much of the wasted effort. Purchase orders are now entered into a computer accessible by receiving clerks. As shipments are received, the receiving clerk looks up the purchase order in the computer files and marks it as received if three data elements match. If no match is found, the order is not accepted. This eliminates the former time-consuming task of having accounts payable research mismatches. Accounts payable now issues a check based on receipt confirmation noted in the computer files, without invoices.

Benefits: Accounts payable is now staffed with about 100 people, an 80% reduction. Payments are made promptly, less paper is created and shuffled, and personnel are no longer frustrated with time-consuming processes.

BPR: Though the computer system is central to the new process, it is only an enabling force. Before new technology could be implemented, the old process had to be analyzed, a new process designed, new procedures written, people retrained or replaced, confidence built, compensation schedules altered, egos soothed, and a whole structure disassembled. Above all, a committed leader in the senior management ranks championed the change.

Case Study 2

Himont - Chemical Manufacturer (Price Waterhouse)

Problem: Himont Chemical (a subsidiary of Montedison-Italy) was faced with competition problems evidenced by eroding market share and tightening margins. Himont's goal was to reduce waste, improve effectiveness and restore its competitive position.

Approach: Consultants and management embarked on an analysis of the entire corporation, assessing almost 300 different processes. They created a model of current processes, analyzed those processes, designed new processes using world-class models, established a target organization and developed a plan for process implementation. No business processes were left outside the scope of the study.

New Processes: Teams identified which processes should be eliminated and which needed improvement. The aim was to determine the right steps to take and how to implement them. About 90% of the processes were significantly redesigned, so their input and output requirements changed.

Benefits: Estimated bottom-line annual savings of $50 million were realized, with no staff reductions. Other benefits include:

- Quality improved by 50% to 60%
- Customer responsiveness was improved by 75%
- The product development cycle was reduced from 3 years to 1
- Inventory needs dropped by 50%
- The order process cycle went from days to minutes
- Payment processing went from days to seconds

BPR: The written report that resulted from this engagement makes no mention of technology, though it was part of implementing the results. Instead, the report talks of process changes. Most of the staff offered suggestions on how to improve the business processes. Communication between departments was greatly improved. The results were, again, dramatic because the scope of revision was businesswide.

Case Study 3

Lee Memorial Hospital- World Class Healthcare (Andersen)

Problem: Lee Memorial Hospital wished to deliver health care services with more emphasis on patient service.

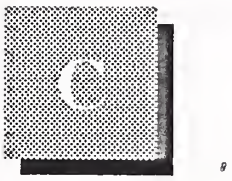
Old process: Most of us are familiar with the normal hospital approach. There are many care providers, admissions are a hassle, patients are hustled from place to place and must wait for information, and no one has time to really care about each patient. It is estimated that during a normal stay each patient comes into contact with between 60 and 105 health care employees.

New process: The basic approach is borrowed from the work team systems established in manufacturing. The entire 608-bed hospital has been reorganized into 10 separate care centers, each with 10 to 12 staff specialists covering each of a patient's need areas. At a simplified admission process, each patient is assigned to one center for his/her entire stay. Most of the treatments are delivered to the patient by cross-trained medical specialists, rather than by moving the patient. Bedside terminals allow each team member to review earlier test results and enter new orders.

Benefits: The hospital expects to save in excess of $12 million annually. The radically different approach provides happier—maybe even healthier—patients, a more satisfying staff atmosphere, and a more efficient operation.

BPR: Computers assist the new process, but they are not central to the dramatic changes achieved. More significant is the enterprise leadership with a vision that allowed a radically different process to be attempted. In addition, redesigning procedures, training staff for the new implementa-

tion skills needed, managing the change, addressing the established culture and building multi-professional teams all had to be addressed by the BPR facilitator. These factors were all instrumental in making this level of change possible—change that achieved so much progress that Lee Memorial is becoming the new model for health care.



Questionnaire

Hello, this questionnaire is from INPUT, the international information services mark research consulting company.

We are conducting research regarding *Business Process Re-engineering (BPR)* and its relationship to the delivery of systems integration and similar professional services. For our purposes, BPR is not systems and technology re-engineering, but the re-engineering of the fundamental processes of the business without regard for traditional organizational lines.

The following questions are designed to assist our research. Your responses will be held in the strictest confidence. All data will be reported without attribution and presented in aggregate form.

INPUT will be pleased to share a summary of the research results with you. Your prompt response via fax is requested, since our deadline for report preparation is rapidly approaching.

Your Name: _____

Title: _____

Company: _____

Address: _____

_____

_____

Phone: _____ Fax: _____

From: INPUT
Phone: (703) 847-6870
FAX: (703) 847-6872

1. Based on the above definition, does your company currently offer BPR as a service to its customers? Yes____ /No____

   If no, do you expect to offer it over the next 3 years? Yes____/No____ Why? _____

_____

2. Do you feel that BPR services are a means to sell more or expand systems integration customer relationships? Yes ____/No____

   Please briefly explain why. _____

_____

_____

3. Do you see BPR as part of a systems integration project or a separate engagement? Integral____/Separate____

   Why? _____

_____

_____

4. What portion of your company's total SI and consulting efforts are oriented toward BPR? ____ % How about in 3 years? ____ %

5. Where have you seen or conducted BPR projects and where do you expect to see them in the next few years?

	CURRENT	3 YEARS
None	_____	_____
Discrete Manufacturing	_____	_____
State and Local Government	_____	_____
Utilities	_____	_____
Banking/Finance	_____	_____
Process Manufacturing	_____	_____
Retail Distribution	_____	_____
Health Services	_____	_____
Telecommunications	_____	_____
Insurance	_____	_____
Transportation	_____	_____
Wholesale Distribution	_____	_____
Education	_____	_____
Business Services	_____	_____

6. What is the scope of the BPR engagements that your company has encountered:

Consulting/a little at a time _____
Consulting/function _____Which _____
Divisionwide _____Which _____
Corporatewide/top down _____Industry _____
Part of SI process _____
Other, please explain _____

_____

7. How do you see the scope changing? _____

_____

_____

8. What do you feel are the reasons that organizations choose to perform BPR? Please rate the importance (1 is least important and 5 is most important).

Cost reduction	5	4	3	2	1
Develop new process	5	4	3	2	1
Improve quality	5	4	3	2	1
Faster customer responses	5	4	3	2	1
Improved productivity	5	4	3	2	1
Faster product introduction	5	4	3	2	1
Increased revenue/business	5	4	3	2	1
Competitive advantage	5	4	3	2	1
Improved use of technology	5	4	3	2	1
Other, please explain _____	5	4	3	2	1

Why do they choose not to? _____

_____

_____

9. Beyond being an enabling element, what is the role of technology in BPR? _____

_____

_____

10. What do you see as the key elements for vendor success in BPR (1 is least important and 5 is most important)?

General business knowledge	5	4	3	2	1
Vertical industry knowledge	5	4	3	2	1
Application knowledge	5	4	3	2	1
General BPR knowledge	5	4	3	2	1
Similar engagement experience	5	4	3	2	1
Tools and methodologies	5	4	3	2	1
Cost-effective consulting	5	4	3	2	1
Program management	5	4	3	2	1
Systems integration services	5	4	3	2	1
Technical knowledge	5	4	3	2	1
Existing client relationship	5	4	3	2	1
Other, please explain _____	5	4	3	2	1

11. What are the business re-engineering alternative sources? And what is in the future for this technique?

	CURRENT	3 YEARS
It will not be done	_____	_____
Internal resources	_____	_____
Hardware manufacturers (IBM, DEC, etc.)	_____	_____
Consulting-based firms (Big 6, etc.)	_____	_____
IS professional services (AMS, etc.)	_____	_____
Systems operators (EDS, etc.)	_____	_____
Aerospace companies (BCS, TRW, etc.)	_____	_____
Software suppliers (Microsoft, etc.)	_____	_____
New Specialist firms (do BPR only)	_____	_____
Other _____	_____	_____

In your opinion who are the premier suppliers? _____

_____

_____

12. What elements in the U.S. business environment do you *believe are* having an effect on BPR and why?

RANK

_____ _____

_____

_____ _____

_____

_____ _____

_____

_____ _____

_____

13. What single thing will affect the future of BPR services over the next 3 years? _____

_____

_____

_____

14. What else would you like to share about the market for BPR services? _____

_____

_____

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