

# **"REENGINEERING INFORMATION MANAGEMENT & TECHNOLOGY PROCESSES:**

## **SHOULD WE; IF SO, HOW CAN WE?"**

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### **BACKGROUND**

As we move into the 21st Century, change has and will continue to be the norm in both the private (business) and public (government) sectors. Changes in organization, management and technology are becoming more frequent; the world has become more complex and fluid. Change is one of the foremost, if not THE most important business topic today. Today's change activities are ubiquitous and increasingly more participative. Yet from an information technology perspective, we also continue to face the "productivity paradox" in which investments in information technology continue to show little or no meaningful impact on business productivity.

More so than ever, information technology is as much an integral part of our lives as the automobile and airplane. Therefore, one of the primary responsibilities for any enterprise is the effective development, management and use of its information and information technology infrastructure. Yet, the management of information technology will also continue to undergo revolutionary, not evolutionary, change. Future changes to a fundamentally new way of thinking and managing will be driven not only by technology advances, but also by business and social directions, including emphasis on people issues, cost-effectiveness, information dispersal, reporting relationships, and better alignment and effectiveness of business and information technology processes.

To address these rapidly changing critical organizational, management, and technology issues, Business Process Reengineering (BPR) has become the preeminent innovative business performance technique over the past seven years. To make a "positive and successful difference" in their organizations, executives and managers must have the courage to begin and the will to succeed at Business Process Reengineering.

To effectively lead in this era of constant change, both business and information technology people need to educate themselves on the strategic implications of information technology to ensure more productive, effective and profitable enterprises through the strategic use of information and information technology. Executives and managers must also encourage their employees to actively participate and positively contribute to the Business Process Reengineering efforts within their information technology organizations.

### **REENGINEERING CONCEPTS**

Through their extensive research, Michael Hammer and James Champy have done an excellent job in developing the basic tenets for business process reengineering, which emphasize fundamental rethinking, radical redesign, strategic and value-added business processes, dramatic improvements, and critical performance measurements. Others, including Thomas Davenport and Ray Manganelli, have also done extensive work in developing and refining the fundamental concepts of reengineering. Using these reengineering principles as a framework,

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organizations can strive for excellence in providing high-quality products and services at fair prices and reasonable cost in order to fully meet the needs and expectations of both their internal and external customers. They can, determine a better way to do work through their organizational structure, their work processes, their people, and information resources.

In implementing business process reengineering, organizations must realize that, on one hand, tiptoeing through the reengineering maze one process at a time and in a "vacuum" will be most difficult at best. On the other hand, casting reengineering within the organization as the way of life -- a life-time journey to be traveled by all in the organization -- will ensure, although extremely difficult, that all changes as a result of the reengineering effort, all process redesigns, will fit together. Now, in addition to focusing on business processes, organizations must also apply these same reengineering concepts to the activities within their information technology (IT) organizations.

## **FAILURES IN REENGINEERING BUSINESS PROCESSES**

Evidence suggests that many organizational efforts to reengineer business processes have failed -- why? To begin, managers, in general, in both the private and public sectors have only focused on:

- \* Reorganizing: Moving "boxes" from one side to the other, up or down on the organizational chart,
- \* Downsizing: Major reductions in staff just to cut costs to meet quarterly profit/cost goals,
- \* Automating: "Paving over the cowpaths", doing the wrong things efficiently,
- \* Improving: Incrementally, one step at a time through quality circles.

But, is this reengineering -- ABSOLUTELY NOT! Then, perhaps, is breakthrough thinking, as embodied in business process reengineering, something so overwhelmingly and intoxicatingly new? NOT HARDLY, these ideas have existed for centuries. But, business process reengineering is NOT a miracle cure. It offers no quick, simple or painless fix to organizational, managerial or technological challenges. It does entail difficult and strenuous work; and it still raises many questions, including the effective use of information resources, both information and technology.

But, in business process reengineering efforts that have not succeeded, the following categories do represent key reasons for reengineering failures:

- \* Undertaking a "project" or change effort in the name of reengineering, but not following the concepts or principles of reengineering.
- \* Lack of understanding of reengineering concepts and principles by key executives -- bury reengineering efforts in the middle of the "corporate" agenda; unrealistic expectations and lack of adequate resources.
- \* Half-hearted reengineering attempt -- Lack of positive leadership and continuous support, commitment and involvement by executives.
- \* Reengineering effort seen as another cost-cutting, downsizing effort, emphasizing technology over people issues.
- \* Focusing on only a single reengineering effort as a short-term, narrowly-defined project; settle for minor results; neglect people values and beliefs.
- \* Not giving the organization or reengineering team a chance to succeed.
- \* Improper identification and use of process change enablers.
- \* Not using a structured, disciplined reengineering methodology.

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## **CHALLENGES FACING THE INFORMATION TECHNOLOGY (IT) ORGANIZATION**

Past efforts in developing information systems have resulted in today's legacy systems because of the lack of effective IT leadership and management, effective enterprise architecture, coordinated IT plans & policies, and IT standards. As a result, today many organizations are inundated with data and overwhelmed with paper. These same organizations have insufficient or distorted information, and are overburdened with management hierarchy. Yet, the past decade has seen an explosion of new information technologies in all areas -- hardware, software, databases and telecommunications.

This rapid expansion in new information technologies will continue without pause. As a result, the role of information technology is changing. The new information technologies allow organizations to acquire new ideas from anywhere, to reach across markets and compress business response time, and to enable enhanced local presence. Since, all businesses have, in general, access to the same new technologies, organizations now need to emphasize a closer synchronization between the use of information technology and their strategic business policies. To be truly competitive in the marketplace and maintain their competitive posture, organizations not only must understand, but also must use the new information technologies effectively.

But, are businesses effectively using these new technologies? More importantly, are the IT organizations within these businesses effectively developing, implementing and managing these new information technologies to support the businesses in achieving higher levels of effectiveness, efficiency, productivity and profitability?

On the contrary, many business executives still do not fully support the use of information technology within their organization. They are not supportive of the IT organization itself, unhappy with the past performance of the IT organization -- wasn't customer oriented, didn't respond to the business needs and changes. These same business executives see only a limited role for the information technology organization because the strategic use of information technology is not relevant to the business and the return on information technology investments was lengthy or ill-defined.

To further compound the problems for the IT organizations, most IT managers were considered functional specialists unable to significantly contribute to the strategic focus and direction of the organization. Most IT organizations were characterized by a hierarchical and bureaucratic functional structure; a reactive, technology-driven, production-oriented mindset; a focus on "old" core competencies; and a lack of qualified individuals in the new technologies. The IT organizations also lacked any formal, dynamic information management infrastructure and enterprise-wide architecture. With increasing financial pressures to downsize or outsource IT functions, many IT personnel have become preoccupied with their own job security and stability.

On top of all these concerns, many IT organizations have been heavily involved in the various projects to reengineer the business processes within the overall organization. As a result, many IT organizations claim that they are too busy to undertake the reengineering of IT processes or activities -- it would be too difficult given their already heavy work schedules and overworked IT employees.

As an example, a large high tech company attempted to undertake a massive reengineering effort, focusing primarily on the consolidation of its many data processing centers. At the same time that they were implementing over 450 BPR projects, spending over \$1 billion, they also undertook several new major business initiatives, as well as continued a major downsizing effort -- separate and distinct from their BPR efforts. This company tried to do too much, too fast, commingling many different and critical projects on their corporate agenda. Their senior

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executives failed to resolve this "forest versus trees" syndrome, which severely hampered their reengineering efforts. They completely lost focus on their customer. During their reengineering effort, they also decapitated and reassigned much of their executive leadership. As a result, their reengineering efforts have floundered, never achieving all the necessary changes that were initially envisioned. Obviously, there are many lessons to be learned from this case in order to succeed at reengineering IT activities.

As we move into the 21st Century, IT organizations are faced with many critical issues. Overall, the five most important challenges that IT organizations must address and resolve include: 1) managing information resources, including information and technologies, strategically, 2) supporting global business requirements, 3) determining an accurate business value of information systems, 4) developing and implementing an enterprise-wide information resources architecture, 5) establishing effective responsibility and control for IT development, implementation and management.

## **INFORMATION MANAGEMENT -- THE OVERALL FOCUS**

How should IT organizations reengineer themselves? What should their focus be? In 1993, Ernst & Young suggested that the following activities should be used to define IT processes: identify IT-enabled business opportunities, develop IT strategy, implement IT component delivery and evolution, conduct IT operations, provide IT customer support, maintain IT infrastructure stewardship, and facilitate IT management. Additional suggestions for consideration in determining a process focus on IT activities include: technology assessment & management, IT human resources, resources management, records management, information & data management, standards development, quality management, systems development & integration, software logistics management & delivery, communications & network management, information security, information processing utility

In the field of reengineering, information technology (or information systems) is generally considered to be a support function/activity within the organization. In a reengineering context in most organizations, information technology is considered to consist of a singular process with various sub-processes and activities included within the overall IT process. IBM called their IT support process, the IT Infrastructure; Xerox -- Information Management; and British Telecom -- Manage Information Resource.

Henceforth, the focus of this paper will be to address reengineering of the IT organization in the context of one IT process which will be labeled, Information Management, in order to emphasize and reflect upon the importance of information as a strategic resource within the organization. The Information Management Process will include various sub-processes and activities as required by an individual IT organization. By applying Michael Porter's Value Chain Concept to the Information Management Process, an organization can develop various strategies to help achieve an information-based environment for the organization. These strategies will focus on: identification of information needs & requirements in the organization, information acquisition & collection, information categorization & storage, information packaging & formatting, information dissemination & distribution, and information analysis & use.

In order to create a reengineered IT environment, many steps must be taken in order to effectively align the information resources within the organization to proactively support the business processes and activities. As an organization begins to reengineer its IT organization and activities, the organization should address six essential characteristics that the Information Management Process should have in order to effectively support the business. The Information Management Process must: 1) have strong executive leadership (business and IT); 2) have a formal information management infrastructure, to include a framework, policies, standards, methods and tools; 3) use integrated information resources models in the context of an enterprise-wide architecture; 4) use a dynamic

migration plan to achieve the new process environment and the implementation of new information technologies; 5) have a flexible & effective IT organizational structure to accommodate process-driven activities; and 6) use highly-skilled & proficient IT individuals.

## **REENGINEERING SUCCESS FACTORS FOR THE IT ORGANIZATION**

From examining the reasons for failed reengineering efforts in business processes and considering the above critical issues within IT organizations, five critical success factors have evolved on which IT organizations must focus in order to be more effective in reengineering the information management process and various sub-processes. These factors include:

1. Educate all the organization's executives, both business and IT, on reengineering.
2. Evaluate your IT organizational environment for reengineering.
3. Effectively identify and use key process change enablers.
4. Effectively use a structured, disciplined reengineering methodology.
5. Implement positive and dynamic change management process and procedures.

## **EDUCATING IT & BUSINESS EXECUTIVES**

IT management must not only do things right, but also do the right things if they are going to succeed in today's fast changing environment. Therefore, IT organizations must educate all of their executives, both business and IT, at the very beginning of the IT reengineering effort on the concepts, principles and focus of reengineering and their reengineering efforts in order to evolve consensus on what lies ahead for the IT organization and the commitment required of the IT executives, as well as the entire organization and all other executives. Not only must IT executives, managers and employees fully understand the anticipated dynamic changes, but they must also understand the methodology for reengineering and the critical role of key process change enablers, including information and information technology. To be prepared and more effective in managing innovative change, the IT executives must also appreciate the common pitfalls and misconceptions in applying reengineering concepts.

## **EVALUATING THE IT ORGANIZATIONAL ENVIRONMENT**

In order to give the IT organization and the IT reengineering team a better chance to succeed at their reengineering effort, the IT executives must ensure that the IT organizational environment, primarily internal, is first evaluated with respect to reengineering, BUT before the reengineering is undertaken. This evaluation should address many key issues as they would affect an IT reengineering effort. General categories for evaluation include the reengineering focus in the IT organization; the IT organizational culture and its acceptance of or resistance to reengineering; the support, commitment and involvement of IT executives, managers and employees in their reengineering effort; the attitude, experiences and knowledge of the IT reengineering leaders and team; and finally the time and support to be devoted to the IT reengineering effort. The overall organizational environment within which the IT organizations functions should also be evaluated.

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The goal is to establish the best possible environment in which to undertake the IT reengineering effort. Through the evaluation, on one hand, IT organizational strengths will be identified which then can be leveraged to support the IT reengineering effort. On the other hand, IT organizational weaknesses will be identified which could have an adverse impact on the IT reengineering effort. Once identified, courses of action should be developed and implemented to address these weaknesses before the IT reengineering effort starts in order to give the IT reengineering team and the IT organization a fighting chance to succeed at reengineering.

## **ENABLING PROCESS CHANGE IN THE IT ORGANIZATION**

IT organizations can successfully develop and implement a new information management process and sub-processes through the use of positive and powerful key process change enablers -- factors that can shape and drive technological, behavioral and organizational change within the IT environment. These enablers will provide the means to successfully undertake the process of reengineering and contribute significantly to the successful implementation of the new, reengineered information management process.

Yet, IT managers must also realize that each powerful process change enabler can both enhance and disable the IT organization's reengineering efforts. Therefore, IT managers must ensure the judicious and careful use of process change enablers in exploiting new structural, cultural, management and technological capabilities. To succeed at reengineering, all process change enablers, including information and information technology, used in the reengineering effort must be aligned and in balance. They must work hand in glove with each other. To neglect a change enabler's importance or place more weight on the use of any given change enabler will prove detrimental, if not catastrophic, to the overall IT reengineering effort.

Process change enablers that should be considered within the IT reengineering effort include: people, education, communications and marketing, organizational structure and culture, funding, information, and information technologies. The concept of information resources includes many of these process change enablers. Yet, other process change enablers may also be chosen depending upon the organization's mission, environment and situation. The IT organization must determine for itself which process change enablers will successfully support their reengineering effort; but information resources will certainly play a key role in their reengineering effort. Let's consider for a moment each of these process change enabler categories:

**PEOPLE.** By far and away, the most important process change enabler. Reengineering efforts will succeed or fail based upon the people, both employees and managers -- their skills, experiences, and attitudes. Attitude towards and motivation for reengineering will be crucial. Effective, dynamic and flexible teamwork will be essential in undertaking reengineering, as well as empowering all individuals involved in the reengineering efforts to "think out of the box"; to break away from old traditions and paradigms; and to be imaginative, innovative, inductive and simply outrageous in their ideas for changing the way work is done through the creative use of key process change enablers. Proper education and training must be provided to ensure that all IT employees and managers are properly prepared to participate in the process of reengineering and the future reengineered information management process within their organization.

Positive, dynamic leadership is a must -- all IT executives and managers must be supportive, committed and involved if the reengineering effort is to succeed. IT management must ensure a positive approach toward all human resource issues, including positive motivation, in order to use the full potential of all individuals in the IT organization.

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**EDUCATION.** Everyone in the IT organization, including senior IT management, must be apprised of what reengineering is -- the concepts, methodology, techniques and tools -- and what reengineering actions will be taken. Everyone must be made aware of the importance and focus of the reengineering effort. In order to make positive contributions to the IT reengineering effort, all IT individuals must be kept informed. Education must begin during the initial phase and continue throughout the journey of reengineering within the IT organization.

**COMMUNICATIONS and MARKETING.** IT managers must ensure that communication channels are kept open with everyone in the IT organization. Information on the IT reengineering effort must be timely and accurate in order to create and maintain the necessary buy-in and commitment from the IT employees and managers. IT management must gain their support, trust and confidence. IT managers must also communicate openly with the IT organization's external stakeholders, including their suppliers and customers, in order to gain the necessary support and to ensure consistency of purpose.

**ORGANIZATIONAL STRUCTURE.** The IT management infrastructure will either support or significantly hinder reengineering efforts. Within reengineering, focus will be placed on managing process/sub-process boundaries; thus clarity in roles and authority must be clearly established. Emphasis will be on self-managed teams; thus the relationships, composition and location of the IT reengineering team will be key.

**ORGANIZATIONAL CULTURE.** The historical culture within the IT organization must change if reengineering efforts are to succeed. The new culture must be fluid, flexible and adaptable, embracing change as the way of life, rather than maintaining the status quo and resisting any change. IT management must emphasize individual initiative, imagination and innovation within the IT reengineering effort. They also must empower more individuals in the IT reengineering decision-making process.

**FUNDING.** IT reengineering can not be done on the "cheap". Sufficient funding must be provided and maintained to see the IT reengineering effort through to its completion. Continued funding must be provided if IT reengineering is to become the way of life within IT organizations.

**INFORMATION.** Today, most organizations, including the IT organization, are inundated with data - a state of data overload. Yet, many organizations continue to automate the current chaos and confusion that exists within our management and organizations without any focus on information.

Many individuals in both the public and private sectors, including in the IT organizations, still do not understand or appreciate the significant role that information can play in their organizations. Most use the words \*data\* and \*information\* interchangeably; yet, data is not information. In order to consider information as a key process change enabler for IT reengineering, let us consider an information paradigm and the characteristics of information-based IT organizations, as defined by Peter Drucker in 1987 and Shoshana Zuboff in 1991. Drucker wrote that information is data with purpose and relevance. At that time, he also declared that organizations were in a state of information blackout since individuals were not taking or accepting information responsibility. Has anything really change? Zuboff argued that organizations needed to informate, not automate, in order to understand, manage and create value from information.

The information paradigm begins with raw, uncollected data that exists everywhere. Within IT organizations, individuals determine various parameters such that selected data can be collected and organized from the available raw data. Once data is collected (electronically in various types of databases or manually) or assimilated, individuals in the IT organizations can now apply unique meaning and value to very specific data, defined as information, as they require its use within their work. Individuals will gain knowledge in the use of this information

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through positive or negative results. Through the accumulation of knowledge, individuals gain wisdom in the use of specific information.

In order for our society -- IT individuals and organizations, in both the private and public sectors -- to effectively and fully evolve into the Information Age, we must understand and use information as data which has meaning and value to IT individuals, not organizations. Each IT individual will consider and view data differently, defining it as information only when they assign a unique meaning and value to the data as they need or use it. Specific roles for which IT individuals can use information include: measuring and monitoring process performance, coordinating process activities, customizing processes to meet customer needs, and decision making. It is in decision making that information will play its most important role. IT individuals in the public and private sectors can use and leverage information, not just any data, to assist them in making positive decisions within their information management process. To do so, will require timely, accurate and relevant information.

To be truly effective, all IT individuals must become fully aware of and assume responsibility for information -- its identification, acquisition, storage, analysis, use, and distribution -- a critical requirement for information-based IT organizations. These IT organizations can more effectively use information by opening up the information base of the IT organization to all people at all levels in the IT organization. This will require greater discipline and responsibility by all IT individuals, and will place greater emphasis on relationships and communications between individuals in the IT organization. For information-based IT organizations to be successful, they must emphasize the development of intellectual skills, the strategic integration of information, and a dynamic learning environment. It will require positive, flexible leadership and continuous IT management support and commitment.

Unfortunately, we have only scratched the surface in understanding the effective role of information within IT organizations much work must be done in educating IT individuals on its importance within reengineering and information-based IT organizations. More focus must be placed on the meaning and value of information. A distinction must be made between information and data, and between information and information technology. As defined, information can be a powerful process change enabler; and, therefore, information should be considered as one of the most important strategic resources of any IT organization, in both the private and public sectors.

**INFORMATION TECHNOLOGIES.** With the explosion of information technologies, the overall question must be asked: what direction is or should information technology be headed? Are we closing the gap between business requirements and information technology capabilities, or are we just "rearranging the deck chairs on the Titanic"? The past is replete with complex and undefined IT processes with functions supported through vertical systems development by using proprietary hardware and software -- today's legacy systems in private businesses and in public organizations.

Rather than just automating old functions and processes with new information technologies, new capabilities must be determined in order to apply current and future information technologies more effectively in support of reengineering efforts. Information technologies must be placed in the proper perspective within reengineering -- not as a sole "driver", but as a contributing enabler to allow us to do things in our information management process that we are not already doing.

To be most effective across an IT organization, information technologies used as process change enablers must be fully integrated into an enterprise-wide information resources architecture. The focus on and use of specific information technologies must be driven by the IT organization's data requirements which, in turn, should be driven by the accumulated information requirements of all individuals within the IT organization. In this manner, both

information and information technologies can be effectively used to enable the new information management process, thus enhancing the strategic posture of the IT organization.

## **IMPLEMENTING REENGINEERING WITHIN THE IT ORGANIZATION**

To address an enterprise-wide approach to reengineering the information management process, a simple and straightforward, yet structured and disciplined methodology must be used in order to give an IT organization, and its people, a better opportunity to succeed in their reengineering effort. The following eight-phased methodology is an example of such an approach which may be used to implement reengineering within the IT organization.

\* **PLANNING:**

Set foundation for future change activities; increase awareness, understanding and support for reengineering; and establish mandate and provide direction for change.

\* **ORGANIZING:**

Mobilize, organize and train IT people to do reengineering; develop reengineering plans; initiate communication activities; and manage change.

\* **EVALUATING:**

Identify, measure and evaluate current IT functions and activities; and ask the tough, yet fundamental questions of why and necessity.

\* **IDENTIFYING:**

Identify and prioritize reengineering opportunities; complete process mapping analyses; and establish reengineering project framework.

\* **VISIONING:**

Create vision of ideal information management process; determine success criteria for new process; assess gaps between current and ideal process; and gain approval.

\* **DESIGNING:**

Identify process change enablers; develop, test and evaluate process design alternatives; undertake detailed process design; and gain approval.

\* **IMPLEMENTING:**

Initiate pilot project; develop implementation plan; evaluate and train IT people; implement new information management process; and measure and evaluate process performance.

\* **MANAGING:**

Maintain reengineering infrastructure; evaluate reengineering effort; develop future reengineering objectives and priorities; and implement continuous quality improvement programs.

This methodology -- planning, organizing, evaluating, identifying, visioning, designing, implementing, and managing -- will allow an IT organization:

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- \* To build the necessary "bridge" from the on-going corporate IT strategic planning efforts to the process of reengineering -- to tie its reengineering effort to its strategic direction and control;
- \* To address its current IT practices;
- \* To develop the vision and design for its future process-oriented information management infrastructure, emphasizing IT management, organizational, technical, and human resource issues;
- \* To coordinate all IT reengineering activities, providing flexibility and feedback throughout the process of reengineering;
- \* To build the "bridge" from the implementation of the reengineered information management process to the long-term management of this process -- to positively manage and continuously improve its new information management process;
- \* And to emphasize IT executive involvement and decision making throughout the IT reengineering effort.

## MANAGING CHANGE IN THE IT ORGANIZATION

To effectively manage change through reengineering, IT executives and managers should understand why and how organizations, both public and private, have succeeded in implementing reengineering through the effective use of key process change enablers, including information resources, and a dynamic methodology. Key success factors include:

- \* Gain and maintain IT, including business, management support, commitment and involvement; select the right IT people to undertake reengineering; have an IT reengineering champion;
- \* Have the "will" to undertake reengineering -- absolutely critical; require extraordinary belief, dedication and effort -- a huge, tough job;
- \* Recognize that change is a way of life, a value system, not just a process or project; recognize that reengineering affects every person and every part of the IT organization;
- \* Focus on the customer at all times; focus on process before technology; focus on people before technology;
- \* Focus on strategic, value-added activities; use key process change enablers; focus on IT organizational core competencies;
- \* Provide a realistic reengineering mission, clear direction and sufficient resources; organize properly; use disciplined reengineering methodology; educate, train and communicate on continuous basis;

Lessons can be learned from many organizations which have been successful in implementing their IT reengineering initiatives. For example:

\* In 1994, Walter Viali from the Information Systems Department at Texaco, Inc. indicated that Texaco was successful in reengineering its IT environment. To overcome serious quality problems in their IT projects and customer service, Texaco focused their IT reengineering efforts in the following areas: computer operations, telecommunications, applications development & support, LAN services, IT human resources, and IT administration. Their IT reengineering efforts resulted in greater empowerment at the team level, greater control of information at the individual level, accelerated redevelopment of legacy mainframe applications, and enhanced support for reengineering business processes.

\* Also in 1994, George Hare, Chief Information Officer at the Canadian Imperial Bank of Commerce, outlined the IT reengineering successes at the Bank. In the late 1980s, the Bank was experiencing severe business and IT problems, including a lack of executive leadership, a lack of policies and plans, a lack of an enterprise-wide

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architecture, lack of effective data administration, lack of an effective information systems development cycle methodology, and a significant information systems development backlog. As a result of their overall reengineering efforts, the Bank established business, process and resource architectures. These architectures allowed the Bank to focus its efforts on providing effective IT support for the various banking processes and activities through upgrades in the technology infrastructure, establishment of an enterprise architecture, and development of information resource plans, policies, standards and responsibilities.

The new reengineered IT environment -- the Information Management Process -- will be characterized by an active and continuous executive, business and IT, involvement in IT activities; information customers/consumers who will be responsible for the accuracy, consistency and timeliness of data; information vision that provides the focus & direction for architecture models and plans; effective, quality-oriented management of information; and effective resource management within the IT organization.

Reengineering can be done and done successfully within the IT organization. However, as a "new" pioneering tool with many uncertainties, IT management must have the knowledge to understand, the courage to begin, and the will to succeed at reengineering if they are going to make a "positive and successful difference" in their IT organizations. To do so, IT managers must be able to move from having great thoughts about reengineering to making these ideas happen.

Successfully managing innovative change within the reengineering framework in the IT organization will require a heavy dose of the 4 C's: commitment, coordination, communication, and cooperation. All levels of IT management must be fully committed to their reengineering effort. Internally, they must work very closely together, engaging in active dialogue, ensuring full and active participation, and actively and positively supporting the reengineering effort. Externally, IT managers must actively communicate with their organization's stakeholders to gain their support and cooperation.

Lastly, to be successful at reengineering through the use of a sound methodology and the effective employment of key dynamic process change enablers, including information resources, IT management at all levels must exercise positive and dynamic leadership. They must maintain a high degree of flexibility and bring a dose of common sense to the "reengineering" table. And, above all, they must always focus on their people as the most important resource -- the most important process change enabler -- to address within their reengineering efforts.