



Title: Re-Engineering: Service-Information Processes.

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Abstract: The era of re-engineering manufacturing processes has matured, while the era of re-engineering service-information processes is in its infancy. Re-engineering and TQM of service-information processes are the biggest topics for the 90's. A poll conducted by ComputerWorld magazine, found re-engineering and TQM were the most important activities to many companies' businesses. The Information Systems (IS) group will be a major player in successful re-engineering of programs in service-information processes. The IS group has the background and knowledge regarding what can be accomplished using computers. For this reason the ideas of re-engineering are explored from the point of view of the IS group. This paper presents 6 principles based on Hammer's principles. All these principles should be kept in mind when starting any re-engineering project.

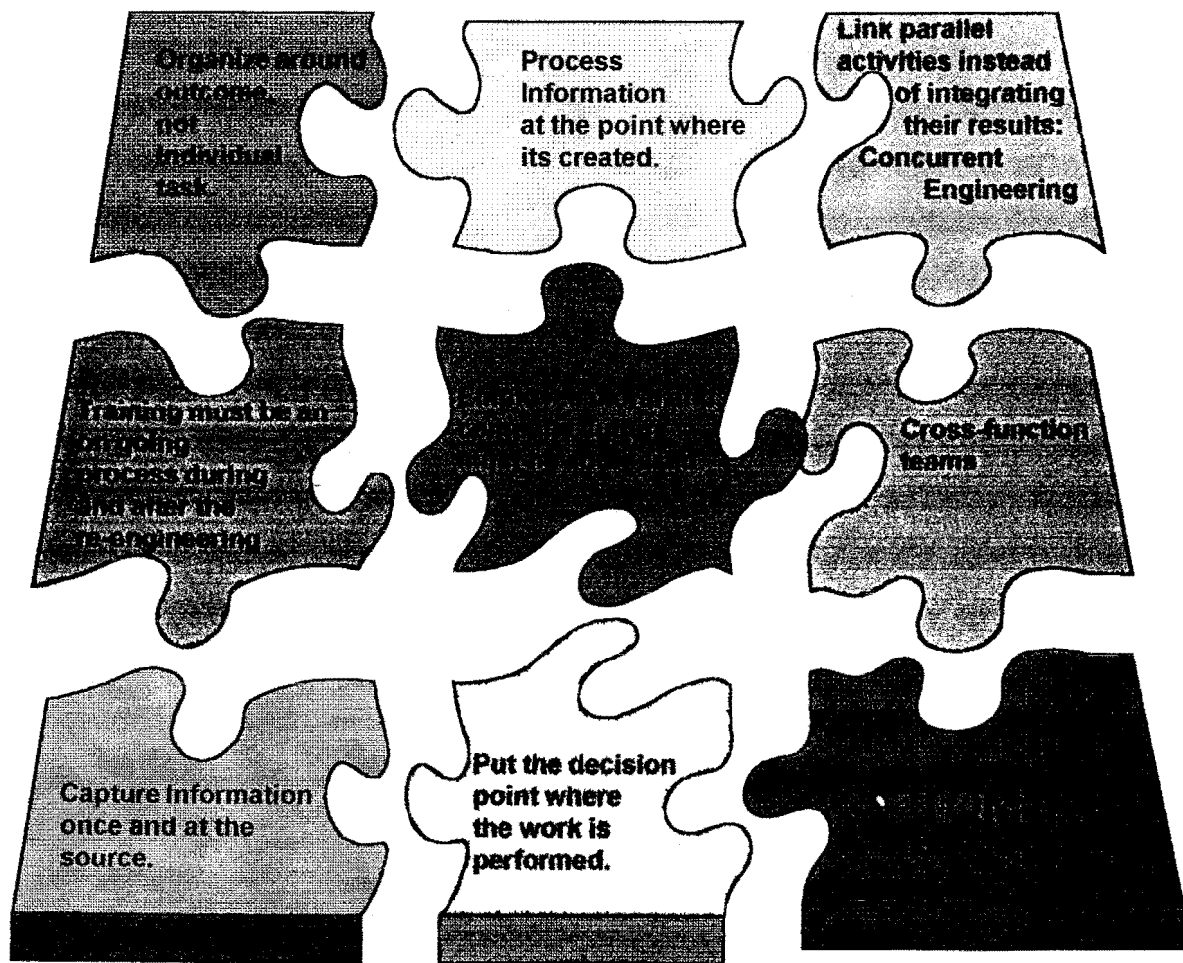
**Re-Engineering: Service-Information Processes**

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**EMP-P9459**

# Re-Engineering: Service-Information processes

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The era of re-engineering manufacturing processes has matured, while the era of re-engineering service-information processes is in its infancy. Re-engineering and TQM of service-information processes are the biggest topics for the 90's. A poll conducted by ComputerWorld magazine, found Re-engineering and TQM were the most important activities to many company's' businesses.

Re-engineering	4.30
Total Quality Management	4.23
Application Downsizing	3.20
Globalization	3.15
Decentralizing	3.12

Scale: Most important =5; Least important =1

Source: Computerworld<sup>4</sup>

Firms across the US are reevaluating how they do business, and how information technology can help them to do it better as they respond to increasing competitive pressures. (page 97)<sup>1</sup> As the amount of information grows and the access to data becomes easier, new ways will need to be found to utilize this data. The old outdated methods need to be readdressed and more efficient ways discovered. Consider a process you are using. Did someone sit down and plan out the process, or did it just happen? The hodgepodge of special cases and quick fixes has been passed from one generation of workers to the next and is now set in stone. A major problem with most processes we use today is that they originated before the advent of modern computer and communication technology.

The computer's products and ideas that will have the biggest impact on this new business strategy are listed in the following table. (page 110)<sup>2</sup>

High-speed networking	4.31
Client/server computing	4.11
Graphical User Interface (GUI)	3.89
Open systems	3.57
Portable computers	3.40
Image processing	3.35
Advanced desktop O.S.	3.21
Object-oriented programming (OOP)	3.13

Scale: Most important =5; Least important =1

Source: Computerworld<sup>4</sup>

Re-engineering of service-information processes and TQM are not diametrically opposed, but rather re-engineering is a part of TQM. The collection and analysis of data are a key element of TQM. Information is critical to TQM. Successful companies agree that information technology (computer hardware) and information systems serve as the keys to quality success. (Page 65)<sup>3</sup> After data is collected and analyzed, it must be put into a form that can be easily understood by the users.<sup>2,4</sup> This use of data is what a company should be striving for when re-engineering a service-information process. "If re-engineering is the name of the game, TQM is the playbook," says Thomas Charbonneau, manager of corporate information service/business administration at Natick, Massachusetts-based Bose Corp. (page 108)<sup>5</sup>

The Information Systems (IS) group will be a major player in successful re-engineering of programs in service-information processes. The IS group has the background and knowledge regarding what can be accomplished using computers. For this reason the ideas of re-engineering will be explored from the point-of-view of the IS group. In Michael Hammer's article, "Reengineering Work: Do not Automate, Obliterate," he stated 7 principles of re-engineering, which are a good starting point<sup>2</sup>. This paper will present 6 principles based on Hammer's principles. All these principles should be kept in mind when starting any re-engineering project.

### ***Organize around outcomes, not individual tasks.***

A company must re-engineer a process from the perspective of the outcomes, not from the perspective of the individual tasks. A process is made up of a number of individual tasks. To speed up any one of these tasks would speed up the whole process, but greater gains in performances can be achieved if a number of tasks are eliminated. Delays and errors are inevitable when work is handed off from person to person, department to department, or broken down into individual tasks. The elimination of some individual tasks would lessen the likelihood of errors.<sup>2</sup>

Before Mutual Benefit Life (MBL) re-engineered their application process it took an estimated 5 to 22 days and spanned 5 departments, involving 19 people. As each person handled the application, the possibility of errors increased. MBL estimated that an application was worked on for a total of 17 minutes during its 5 to 22 day waiting period. Besides the time it took to process

an application there were a number of errors in the process that caused delay and unhappy customers. (page 108)<sup>2</sup>

MBL put together a cross-functional team to improve the application process. Their mission was to reduce the time and errors occurring in the application process. The team realized that a shared database and a computer network could make many different kinds of information available to a single person, while an expert system could help people with limited experience make sound decisions. The team looked at the outcome not each task. A computer could have improved the performance of any one of the 19 people's tasks but this would not really make the application process easier or more efficient. At the end of the re-engineering project, the application process was handled by one person, the Case manager. The Case managers are now able to perform all the tasks associated with an insurance application, because he/she is supported by a PC-based workstation that runs an expert system and connects to a range of automated systems on a mainframe computers. MBL can now complete an application on an average of 2 to 5 days with a decrease in the number of errors.(page 108)<sup>2</sup>

At Motorola University they have gone to image scanning of evaluation sheets. Advanced Evaluation Participant Technology (AdEPT) system, was used to automate the collection and reporting of all training course evaluations forms. Not only was the old system expensive, approximately \$35 to process just one student evaluation through the system, but it took 17 business days to produce a final report. And because of typing errors, mistakes occurred.(page 70)<sup>6</sup> The use of image scanning systems has reduced the number of errors produced and decreased analysis time. One part-time employee now does the work of four full-time employees. The reports are sent out weekly and monthly to all business units.

Kodak has recently installed a software system that integrates order processing with manufacturing, financial distribution and operations. All these departments used to be independent groups doing their specialized tasks. Now they work together to get the process completed faster and with fewer errors. (page 94)<sup>7</sup>

### ***Process Information at the point where its created.***

Information is generated in one department but processed in another is the standard operating producers in most US companies. In the past companies established departments to do nothing but collect and process information that other departments created. This arrangement reflects the old rule about specialized labor and the belief that people at lower organizational levels are incapable of acting on information they generated.<sup>2</sup> Having the people who produce the information process it at the point of creation, would cut out many unneeded tasks. Two sub-principles on this point are: Capture information once and at the source and Put the decision point where the work is performed. These two sub-principles are related to this principle in their use of information and decision making.

#### **Capture information once and at the source.**

The need to collect the same data at multi-points in a process is not needed anymore with the advent of on-line databases, bar coding, relational databases and Electronic Data Exchange (EDI). These make it easy to collect, store and transmit information.<sup>2</sup> The multi-point collection of data stems from the idea that each group/department/employee are a self-sufficient group that needs to collect its own data, because "that other group always collects the wrong data". If a process is looked at as one complete task and not as a set of separate tasks, this idea of collecting information at the source and storing it in a common database makes sense.

#### **Put the decision point where the work is performed.**

Empowering the worker to make decisions on the front line is needed in a newly re-engineered process. Ford Motor Company used five times as many employees and steps in their accounts receivable process as Mazda Motor Company, Why? Mazda empowered their employees to make decisions and removed the rechecking of information.<sup>2</sup> Ford has now empowered the receiving clerk to approve payment for goods received. Ford does not want to receive a bill from the suppliers to check the invoices against. Ford trusts that their receiving clerk has already checked the invoice to the order and approved payment.<sup>2</sup>



All kinds of companies are finding that by empowering the workers, problems are solved faster and customers are happier. At Agway , a farm products store, management is finding that by getting more information to the sales representatives they are better able to serve the customer. Agway has also made each employee responsible for resolving questions that come to them.<sup>8</sup>

### ***Centralize geographically dispersed processes.***

With decentralized processes a company has redundancy, bureaucracy and specialized department. With the advances in computer technology, like email, client/server, networks and telecommunication the only thing keeping people in different parts of the world apart is time differences. A cross-functional team do not have to be centralized at one location any longer. The team can perform it jobs from different geographic locations. Sales and purchasing are two classic examples of processes that are decentralized to each location. The use of networks and computers and centralized databases for suppliers and customer information can take care of this problem. Levi Strauss & Co., San Francisco, integrated their US operations with those overseas and developed their first client/server system for tracking shipment around the world.<sup>2,7</sup> Hewlett Packard's purchasing department went to a centralized database system to store vendor information. This database was then used by each department to order their own equipment. HP did away with 50 separate purchasing departments and moved more of the ordering to the different departments. This change had a payoff of 150% improvement in on-time deliveries, 50% reduction in lead time, 75% reduction in failure rate, and a significantly lower cost of goods purchased.(page 110)<sup>2</sup>

### ***Link parallel activities instead of integrating their results: Concurrent Engineering.***

Concurrent engineering strives to create successful products/services by bringing together as early as possible all the company's resources and experiences in design, marketing, development, service, and sales. The capabilities are then focused on the project to deliver the highest-quality, lowest cost product that meets the company's and customer's needs.(page 23)<sup>9</sup> Concurrent

engineering destroys a concept used in most U.S. companies. The concept of “over the wall” is an old standard phase used in U.S. companies. This is where one department throws their product “over the wall” to the next and hope’s that it’s something the next department can use.(page 23)<sup>9</sup> This system of departmentalized processes was developed before the introduction of computers, communication networks, shared databases and teleconferencing.(page 111)<sup>2</sup> With advances in those fields, everyone can communicate at any time, and information is accessible to anyone in the company. Kodak found that everyone from the engineer to the sales representatives are very happy with the new development strategy. In the serial engineering process, designs would be thrown over the wall to the next department, and if there was a change, it had to go back over the wall the other way. But now that CAD tools and all the information pertaining to a product is available to anybody on the design team, people in different locations can use the same design at the same time, and they all know the relationship between the parts and the overall product. (page 151)<sup>8</sup> Forge links between parallel functions and coordinate them while their activities are in process rather than after they are completed. Communication networks, shared databases, and teleconferencing can bring independent groups together so that coordination is ongoing.(page 111)<sup>2</sup>

### ***Training must be an ongoing process during and after the re-engineering.***

The addition of new computer equipment and processes is only as good as the training received by the people who will use them. A major factor in the lack of success with computers and new processes is the lack of training for the operators. When Ford re-engineered its accounts receivable the receiving clerk on the dock had to learn to use computer terminals to check shipments, and make decisions about whether to accept the goods. Purchasing agents also had to assume new responsibilities -- like making sure the purchase orders they entered into the database had the correct information about where to send the check. (page 112)<sup>2</sup> At Connecticut Mutual they found that they needed to have open communication and ongoing training programs to help combat the fear of a re-engineering project. In 1991, Connecticut Mutual provided its employees with 15,000 hours of training in Windows, PCs and imaging. In 1992, the figure rose to 25,000 hours. Other

communication activities included regular newsletters, informational videos and company sponsored technology days when employees could experiment with different hardware and software. (page 150)<sup>8</sup>

Agway did initial training, but did not continue the training after the re-engineering process was well along. The IS department added new software without more training and the end-users were having problems and had to do a kind of hunt and peck to learn the new software. (page 151)<sup>8</sup> This hurts productivity and employee attitudes towards the re-engineering project. You have to convince people of the need to change. Share the issues with employees. Do not keep them in the dark. (page 64)<sup>10</sup>

Beside technological training, many TQM and re-engineering professionals recommend schooling employees in team building and general business skills as well as technology matters. (page 74)<sup>10</sup> This training will give the company a common language (to discuss a re-engineering project), which will reduce the amount of miscommunication and time in meetings discussing the meaning of some terminology. It is important that the terminology be relevant, consistent, accurate and can be defended. This terminology development creates an environment that allows business and software managers to get in a room and understand each other. (page 98)<sup>11</sup> The language of an organization communicates its culture. It is a unifying and sustaining force. It tends to perpetuate the existing culture. In order to change the culture, the language must change. (page 1)<sup>12</sup>

### ***Employee morale and company culture must be addressed.***

The basic nature of people is to resist change. In order to have a re-engineering project work, upper management must address the morale of the company before and during the re-engineering project. Trying to keep information from employees will only create distrust and poor morale in the employees. The water-cooler communication channel is the best communication channel in a company. Employees will find out about the re-engineering project and it is best that the information is correct and not rumors or half-truths. Employees want to know why management is trying to change their jobs. It is difficult for employees to understand the need for and the rationale for change. (page 151)<sup>8</sup> You have to convince people of the reason to change. Share the issues with

employees.(page 64)<sup>10</sup> The organization is communicating its culture continuously. Most are not aware of the message being transmitted (page 2)<sup>12</sup>.

In the beginning of a re-engineering project, there will be tension and clinging to hierarchy.(page 150)<sup>2</sup> Resistance is a big problem in the initial work-flow analysis stage. When you cross-examine people about their jobs, there is a gap between what they say they are doing and what is happening. The idea is to mislead because they know you are going to change the work flow. Employees fear that if they tell their managers what they do, the new process will eliminate their jobs. Another reason employees dig in their heels is their conviction that if they share what they know, their importance to the company will vanish. (page 83,84)<sup>13</sup> Employees see computers as enemy-number-one when comes to their jobs. Employees will always be thinking, "What about the new computer system -- will it automate me out of a job?"(page 86)<sup>14</sup> This is going to one of the hardest things management will have to overcome during a re-engineering program.

Eliminating positions and dealing with widespread worker anxiety over losing jobs were the toughest challenges Customer Service Vice President, Karen Wetherell, faced at Connecticut Mutual. "It's difficult to implement change and ask people to be enthusiastic about it when they are anxious about losing their jobs." As the company restructured jobs, Wether says, she found that the best way to approach colleagues was directly. "If we planned to convert files to optical disc, we would tell them their jobs would be gone in six months," she says. "By doing that, we developed trust. Employees knew they wouldn't be taken by surprise. They were thankful to us because they could prepare and seek other employment." Communication is the underlying item to all employee morale issues. Employees do not like to be in the dark about what is happening to their life. Employees know re-engineering, by definition, means major change, which can be threatening and disruptive to an organization and their lives. (page 65)<sup>8</sup>

Kathleen Pogg at Connecticut Mutual, used to spend a great deal of her working day rifling through file cabinets, only to find incomplete paperwork, "I do not know" was her honest answer to many questions. A backlog of three, four and even five weeks was common. Today, the backlog is gone. Pogg now has electronic access to all policy data as well as to legal documents, letters and other correspondence. "It feels good to go home at the end of the day knowing that I got a lot done. I am a lot less stressed out. I am not going from drawer to drawer or desk to desk to find something

all the time. I can do all my work myself, and I know everything I need is right there in my computer center.” A re-engineering project can energize and excite people to new levels in their careers, especially when you start talking to people about what they do and how it can be improved. (page 150)<sup>8</sup> Employees also know that after a correctly implemented re-engineering project their jobs will be more rewarding and easier to understand.

Those in charge of the project realized that users, despite possible benefits, were likely to resist sweeping changes in the process of technology. So to foster a sense of ownership, they made users part of the re-engineering project, right from the start, (page 73)<sup>15</sup> thus building the attitudes of teams which is the last principle and may be one of the most important to the re-engineering project.

### ***Cross-functional Teams***

“The single greatest advantage re-engineering has afforded Kodak engineering is a consistent source of information, which enables each person involved in a project to know precisely how his/her work impacts others on the team”, according to Woody Noxon, director of the System Engineering Division and manager of CAD technology at Kodak.(page 151)<sup>8</sup> You can hear this same idea echoed from every successful re-engineering project that companies implement. The re-engineering project needs to be team designed and to be re-engineered around teams. This idea of team work will also be one of the hardest to get the employees to buy into. For who knows how long we have worked with the idea that “I have a job to do and should keep my nose out of the next person’s business.” In some jobs it becomes even worse when the employees get a “we-they” attitude.

As a first step in getting team work implemented into a company the management must form cross-functional teams to run the re-engineering process. These teams must have the authority to make changes. One way to kill a re-engineering project is to form teams and then give no authority to make change or to have management overrule all the recommendations the team makes. If the teams are given the authority and time to do their job, the power of the team will become very

strong very quickly and the team will come together around the common goals of the company.(page 151)<sup>8</sup>

The idea of a cross-functional team is a classic point of any TQM program. It does not matter which TQM expert that you follow, they all agree teamwork must be implemented. One of the things employees at Kodak do not miss at all about the old way of doing things is the finger-pointing that goes on between departments. "Now it is the team that succeeds or fails." (page 151)

<sup>8</sup> Team attitudes will motivate employees to work for a team (company) to accomplish a common goal of improving the methods/processes/products that a company uses.

### ***Think before acting***

One factor that is necessary for re-engineering to succeed is executive leadership with real vision. Companies have the tools to do what is needed in a re-engineering project. Information technology offers many options for reorganizing work. But our imaginations must guide our decisions about technology - not the other way around. (Page 112)<sup>2</sup> A company needs to take a very deep look at a process before starting any re-engineering program. If they do not, the benefits from the program will be far less than would have been received if the process was re-engineered not automated.

Re-engineering is part of an overall TQM program. To re-engineer just to cut overhead cost will hurt the company in the long run. If a re-engineering project is not managed correctly from the start, it will destroy everything that TQM stands for. One bad re-engineering project will be remembered longer than all the good re-engineering projects in a company. Management needs to address the seven points in this paper if they wish to successfully execute a re-engineering project.

ComputerWorld Magazine gives each year, an Excellence in Re-engineering award. This award is to recognize an organization's outstanding use of information technology to improve business processes or dramatically transform the way it does business<sup>7</sup>. The ideas of re-engineering in the service-information business is being drive by the growth in information technology: Expert systems, client/servers, telecommunication, database. Where these changes will take us is anyone's guess, but a company will have to change if they want to stay competitive.

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THINK BEFORE ACTING