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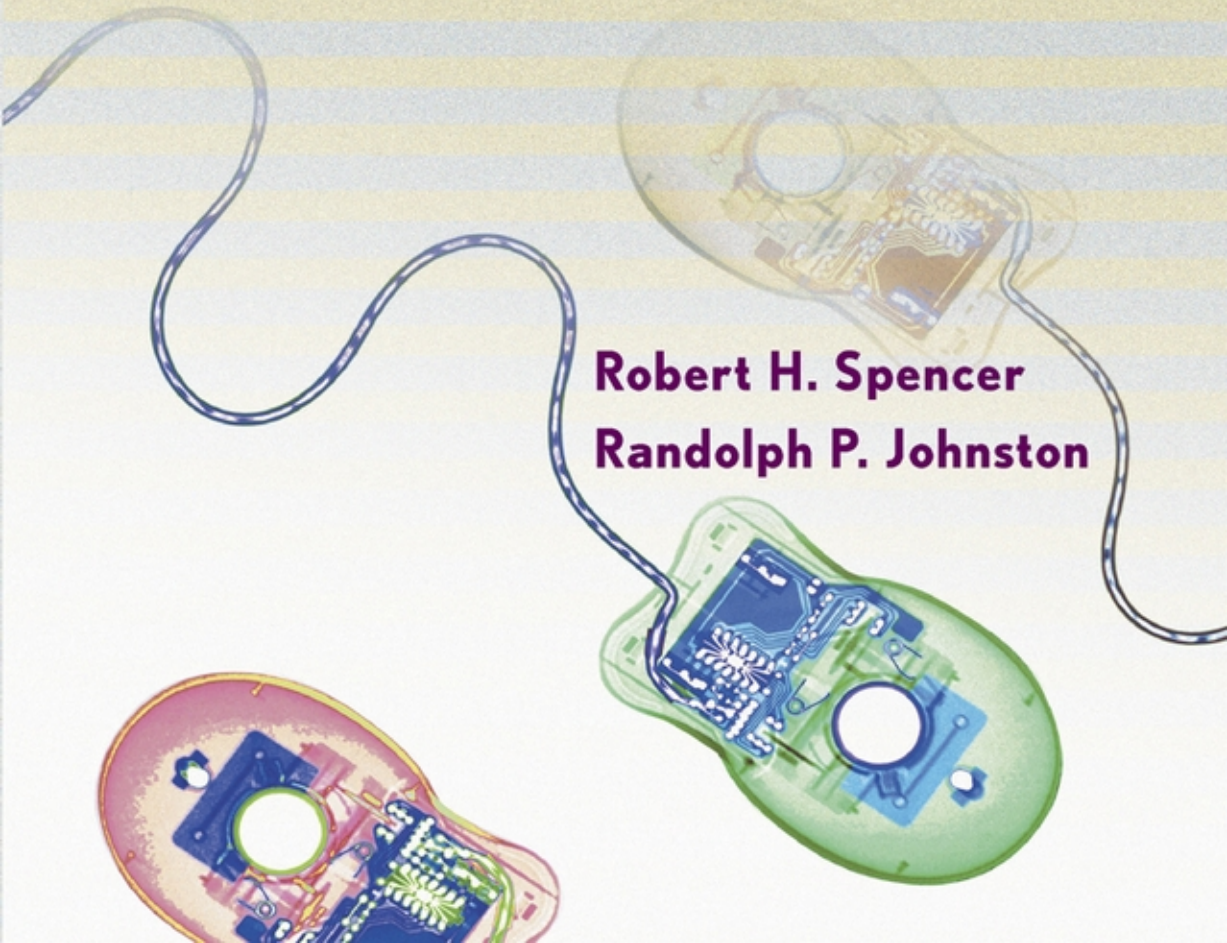
TECHNOLOGY Best Practices



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Technology Best Practices

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Contents

Preface

The problem with writing a book on technology is that new options may become available tomorrow that we have not even dreamed of yet. These new technologies hold out the hope of greater realization, greater profits, and a better world. These promises surface each year with each new innovation. Still, management asks, "Where are the promised profits? What is enough to spend on technology? What is the best way to work smart with technology?"

No matter how much technology has changed over the past 30 years, there are certain unalienable principals and practices that simply do not change over time. These include proper planning and implementation, training, and review of practices. Other procedures and techniques, such as implementing strong security and monitoring how technology is used, deserve consistent attention but are usually ignored until an incident shows the need for diligence. These are the practices this book will endeavor to explore, explain, and present.

Why *Technology Best Practices*? Because one size does not fit all. From our combined 60 years of experience in the technology profession, we have learned that there is a right way and a wrong way to implement technology. The right solution for one user may be the wrong solution for another. So, why *Technology Best Practices*? This same experience teaches there are practices and procedures proven with time that do work when all factors are taken into consideration. As implementers of these practices, we need to know the objectives of the organization at the beginning. Taking short cuts and not funding technology at appropriate levels also consistently result in failures in the extreme. Why? Because a failed network upgrade, software implementation, or communications infrastructure may be catastrophic to the business as a whole. PCs are no longer personal systems that have a limited impact when they fail. Today, PCs are used as network servers, communications servers, database servers, and wide area network gateways. When there is a failure, everyone feels it immediately. In researching this book, we talked with the best of the best in many fields. We have known many of these experts over the years and respect them, not only for their success, but also for how they became successful. This book incorporates insights from both users and abusers of technology.

CHAPTER ONE

Why *Technology Best Practices*?

HOW TO MANAGE THE TECHNOLOGY?

To manage technology, it is necessary to coordinate people, hardware, and software resources. "You can do *anything* with technology if you are willing to spend enough money and time." This statement is not a fantasy and contains a large amount of truth. However, it is important to carefully select, successfully implement, and continuously manage technology to accomplish business goals. So many organizations spend money on technology and do not reap the results because of poor implementation, lack of training, or incorrect selection. It is appalling when technology is implemented for technology's sake. This book can serve as a guide for an organization's decision-making process on technology.

Technical skills are not a prerequisite for managing technology. The desire to ask questions, manage projects, and look at possibilities is a large part of the battle. The *how* of managing technology will be a cooperative effort between a technology steering committee, internal information technology (IT) staff, and contractors who provide installation and support services. A mix of in-house and out-of-house support based on size, response time needs, complexity, and other factors is needed. The *how* of managing technology will be explained with planning, policies, and procedures.

WHO SHOULD MANAGE THE TECHNOLOGY?

The information technology steering committee (ITSC) should manage the organization's technology. Information technology was traditionally managed by a professional data processing staff that managed the centralized mainframe or minicomputer, and provided all of the organization's core IT functions. This is still a reasonable approach for larger organizations, but a balance of people that support core processing as well as productivity work is needed. Regardless of size, the organization must have a strategy to provide help and recovery in the event of failure, and backup on a daily basis. In a small organization, the one person who is considered *computer literate* will often handle all

IT tasks. Organizations of all sizes should have a plan to accomplish the IT items that make sense for the business strategy.

The IT Steering Committee should recommend the strategy of the organization, and the IT manager should execute the projects selected by the IT Steering Committee. The organization, function, and responsibilities of this group are covered later in the book. *Computer gurus* in small organizations can have a small group recommend projects, but will probably manage most of the implementations themselves. It is rare to recommend that an IT or management information systems (MIS) manager control the IT decisions for an organization, although most are quite competent and capable of doing so. The process of discussing IT needs is a way to discover new technologies that can help the business educate, gain agreement, and monitor implementations. If IT makes the decisions unaided, all of the issues, solutions, and needs of the users may not be considered.

The *who* that accomplishes these tasks will have a major influence on the success or failure of the business. Several studies have pointed out that technology automation will make the typical office worker 25 percent more productive and effective. When considering that four people can do the work of five with automation, it should be easy to justify technology expenditures for these gains.

WHAT SHOULD BE MANAGED?

All aspects of technology! This may sound like an exaggeration, but every single aspect of technology in the business, from the copiers to the phone systems to the computers to the software to the training, should be considered. If a business process has any element of technology involved, it should be considered and reviewed on a regular basis. New, better, and potentially less expensive or revolutionary methods should also be considered.

Politics in the organization may be one of the bigger stumbling blocks to comprehensively managing technology. Because of some historical decision, copiers may be under one person's control, while phone systems are the responsibility of someone else and an MIS department may manage IT. However, as shown in the chapters on communications, the organization may be better served by consolidated voice and data over the same lines. From a technology perspective, it is always better to coordinate all aspects of the technology used in a business. In large businesses, it can be very challenging to get your arms around all of the items to be considered. It becomes even more challenging without a technology background and people who are explaining things in *geek speak.* Have the discipline to ask for a simpler explanation, if needed. Use an old management technique of asking questions. With technical people, it is helpful to ask the same question at least three times in different forms to make sure that you understand the answer. Another management technique that works well with technical people is to ask one more question *after* you think you understand everything. This extra question routinely unveils the true issues or complications, and clearly helps your understanding.

Walking into someone else's political territory can, at times, be career limiting. But managing technology correctly is so critical that it is important to be a leader and take the risk.

WHEN SHOULD TECHNOLOGY BE MANAGED?

Continuously! Each project deserves daily or weekly management. The minimum management that makes sense is an annual review. Quarterly or monthly reviews makes even better sense. The technology review does not need to take a lot of time, but it should include a status update on all open projects, any significant issues, and any new technologies that should be considered.

Most new technology functions added to business can be accomplished in a few weeks to a few months. If the project can be clearly defined, it is a candidate for being outsourced. A project that is outsourced will have to be managed more carefully than one using in-house IT staff.

Other chapters in this book will explain procedures that should be developed and followed every day, week, month, quarter, and year. Some tasks will take a minimal amount of time, and others will require a day or more to complete. However, if the technology is not managed, the outages will cost your organization far more than the time invested to manage the resources properly.

WHY MANAGE TECHNOLOGY?

It is less expensive to manage technology implementations than to leave these resources alone. In an earlier book, the five-component model of computing, originally developed by Dr. David Kroenke, was discussed. This approach to computing explains how all computing systems have five basic components: hardware, software, data, procedures, and people. If any one of the five components fails, the systems will not function properly and not produce the desired results. The five-component model is one approach to managing all of the computing resources. When considering making a change, it is reasonable to ask how the change will affect each one of the five components. For example, there may be a need for a faster, larger capacity tape backup system. If the tape system is upgraded, how does it affect the hardware (probably need to be replaced)? How does the upgrade affect the software (possibly requires an upgrade)? How does the new backup system affect the data (possibly makes old backups inaccessible)? How does an upgrade affect the procedures (perhaps it eliminates some tape rotations, changes or start times)? How does the change in the tape system affect the people (new training, different procedures, down time)? Using the five-component model as a framework to ask questions can answer many of the *whys* of technology.

WHERE SHOULD TECHNOLOGY BE MANAGED?

Everywhere it is used. It goes without saying that technology is becoming more portable and geographically dispersed. These issues alone point out some of the items that need to be managed. For example, what happens if a mobile user's portable computer is stolen? How confidential is the data? How do we get this user productive again as quickly as possible? If this is the third time this year a computer has been stolen from this user, this is a chronic problem.

Communications technologies also change the *where* of computing by allowing Internet Access worldwide, remote access, wireless access, wide area network access, and other options that will be discussed in later chapters. But the key point (or question) for now is: what are the hardware, software, data, procedural, and people factors to be considered when managing the location of technology use? Many companies begin using personal digital assistants to later find that their most valuable company asset, the client database, is loaded on a non-secure handheld device. Other companies implement wireless without turning on the security options, and then realize that hackers can drive by in cars and get access to their local area network and private company information. The technology manager's job is to think about and prevent these situations before they occur.

INSIGHTS AND ADMONITIONS

Technology is such a broad field that there are many opinions on how to accomplish similar tasks. The recommendations for technology best practices reflect what are considered to be the best methods available right now, but there can be dozens of correct ways to do anything recommended. The procedures described and the policies recommended are the best insight currently available.

Since business conditions, legal requirements, and the technology being used will change over time, the supplemental web site for this book *www.technologybestpractices.com* is a source of updated supplemental material. The intent is to always make the best decisions for business, using the best technology available, complying with regulations that result in the best customer service you can provide, augmented by technology. If anything in this material conflicts with that view, be assured that it was not written clearly; new technology has made an old methodology obsolete; or business requirements have changed.

FRAMEWORK OF THE BOOK

The book is divided into two major halves. The first half of the book is focused on technology and contingency planning, policies, procedures, and managing IT resources and people. The second half of the text is focused on understanding the basic components

of technology including software of all kinds, hardware, communications including local area networking, wide area networking, remote access, Internet, and telecommunications. Finally, the book closes with discussions of future technologies to watch. Visit the web site *www.technologybestpractices.com* often to see a current list of recommendations by product category, including pricing.

CONCLUSION

This book is intended to give the reader collective insights from observing and helping companies implement technology, using the best practices available. There are many right ways to implement technology, and there are many wrong ways. Hopefully, this book will provide answers to many of the intriguing issues that that come up while considering the technology to implement for an organization.

CHAPTER TWO

Technology Planning Best Practices

THE PLANNING PROCESS

Research at MIT, conducted by the Sloan Business School, shows that the "likelihood of success in utilizing information technology to increase productivity is a function of several technical and non-technical factors." (*The Profit Initiative,* MIT Sloan School of Management, Cambridge, MA.) To attain success, there are three prerequisites—a careful determination of strategic applications, an intelligent selection of technologies, and an ability to incorporate appropriate changes into the organizational structure. Failure to take into consideration even one of these factors will lead to failures in the overall technology implementation and adoption process.

Despite all of the technological advances during this century, white-collar workers still spend a large amount of their time retrieving information from various sources in order to perform their jobs. Some information resides on computers of different makes and types; some exists on paper and other traditional media, and some must be accessed through personal interactions. The increasing complexity of data processing systems seems to create bottlenecks to information storage and retrieval rather than improving the flow of information. Often the integrity of the data is called into question because of redundant information stored on decentralized systems. Even the validity of information can be questioned because of a lack of integrity checking.

Managers continually improve and augment technology in the hope that technology, in itself, will increase productivity and thereby increase profits. Arguably, technology does make a difference. Technology also falls short of meeting expectations. As more and more capital and human resources are committed to technology, management has amplified the need for a greater return on investment (ROI). The hope is that technology can help greatly reduce inefficiencies and waste. Over the past several years, there have been a number of studies released by PriceWaterhouseCoopers, Deloitte & Touche and other consulting firms that seem to confirm:

- Work activity is generally highly fragmented, causing waste and inefficiency.
- Despite substantial investment in information systems, few business processes are truly enabled by technology.

- A large percentage of the time spent on administrative work such as unnecessary reviewing, reworking, and redundant recording and reconciling of data between departments does not add value.

Everyone from the international consulting firms to the ivory towers of academia agrees that more planning must go into the technology acquisition and deployment process. Planning helps determine more than what technology to purchase; it identifies the objectives of the technology to be deployed, how it is to be deployed, and the benefits that are to be derived. Planning requires a lengthy and serious review of the organization from the perspective of how information flows, what is necessary, what is not, and what is redundant. The planning process does not start with identifying the latest and greatest technology, even if that is where many technology professionals like to begin. *Planning begins with determining what your people do, how they do it, and where technology can be used to leverage resources such as people.*

Most companies are not using technology effectively to manage the flow of information through their organization. Technology, in itself, cannot create efficiencies, or inefficiencies. In the tasks they perform, the users create these. The technology planning process documents the existing information flow in the organization, and determines how these processes could be more effective or offer greater returns on the investment. One management theory that emerged in the mid-nineties, the *theory of constraint* (TOC), was first introduced by Eliyahu Goldratt, in *The Goal,* a book about the challenges of maximizing manufacturing performance. Goldratt's theories apply to other industries as well. Constraint theory is based on the reality that every operation's maximum output is constrained by some resource. Tools can help find the constraint(s) and manage them most effectively. TOC has developed into its own academic school of thought on recognizing and solving business constraints. While an in-depth study of TOC is well beyond the scope of this book, TOC does make very interesting reading. There is a plethora of material on the Internet on this subject. TOC reinforces the need to constantly review how tasks are performed and to develop optimum workflows to benefit the organization. Every business benefits from recognizing where it is constrained and then doing something about it.

Identifying constraints can be simply translated as: How can it be determined where procedures are not working well? What processes are not efficient and need to be reengineered so that fewer resources are needed to accomplish a given task? The following information formalizes the process of planning and documenting technology requirements.

USING PROCESS ENGINEERING TO IMPROVE INFORMATION FLOW

"Without process, companies decay into a spiral of chaos and internal conflict." (Michael Hammer, author of *Beyond Reengineering: How the Process-Centered Organization Is Changing Our Work and Our Lives*). During the 1970s and 1980s, process engineering dominated chemical, pharmaceutical, mining and some types of

manufacturing industries. For the past several years, the business community has been applying the principals of process engineering to improve workflow management and better enable the use of technology. In his latest book, *The Agenda: What Every Business Must Do to Dominate the Decade,* Hammer defines process as " . . . a technical term with a precise definition: an organized group of related activities that together create a result of value . . . "

An example of a process might be accounts payable (yes, accounts payable could be composed more than one process. But this needs to be simple, so that readers do not go screaming from the room!) The accounts payable process might be composed of these high-level activities (each high-level activity might be broken down into specific steps with sample forms and the names of each person involved in the activity):

- *Daily.* Receive invoices from vendors.
- *Daily.* Route invoices to inventory control for verification of receipt.
- *Daily.* Enter verified invoices from inventory control into computer.
- *Weekly.* Determine which invoices to pay based on discounts.
- *Weekly.* Make payments and write checks.
- *Monthly.* Report all payments to accounting to close period.
- *Monthly.* Reconcile payments made to bank account balance.
- *Annually.* Summarize all payments and prepare annual reports.

Most departmental activities will be more complicated. The point here is to list all the activities that make up the accounts payable process. Then, list all the activities for each area of the accounting department, then move on to marketing, sales, inventory control, shipping and distribution, and so forth. The next step will be to visually show how documents, or data, move through the organization. Workflow diagramming will be discussed next.

Documenting Processes by Workflow

Workflow defines how information flows through your organization This information is also called transactions; a purchase, a check, a receivable, or a contact are all considered types of transactions in the real world. Experience shows that as physical pieces of paper flow through a business, electronic transactions flow inside your computer network. If the flow of information is cumbersome or inefficient, in the real world, constraints that cost money will be created. The first step in the planning process is to analyze current workflow and how information flows through your organization to determine where the constraints are. Once constraints are identified, more effective ways of accomplishing the activities will be designed.

Why do constraints occur in the first place? There are many reasons: organizational layering, a high reliance on paper for decisions and transactions, excessive points of control, and redundant operations that develop over time. Essentially, people view the organization in which they work not as a complete system, but as a series of distinct departments and functions. While it is important to dissect an organization and analyze

specific workflows, it is critical to put the pieces back together and evaluate the integration of individual workflows. Evaluating how these support the business operating model as well as continually identifying potential constraints is key for improvement.

In the accounts payable example above, an invoice received for payment is forwarded to inventory control to be validated. Someone has to validate that the item was received and disbursed. The process analysis of accounts payable did not include what happened to the invoice in inventory control. That will be picked up later when the inventory control department processes are analyzed. Yet, at some point how that document got to inventory control and back to accounts payable must be considered. The process might flow better if either inventory notifies accounts payable every time they receive inventory, or if all invoices should are routed to inventory control before going to accounts payable to create a much more efficient flow of information. The complete analysis should show a total, holistic view of your organization. If more businesses took the time to analyze the activities of their employees and created processes that made everyone more efficient, the result would be greater productivity and less cost.

So, why does business not view the organization holistically and spend the time to develop more efficient workflows? When planning for technology, the inclination is to approach technical issues such as hardware, software and communications first. Technology professionals are well prepared for and comfortable with these types of activities. When management says that the network is too slow, or people are not entering transactions quickly enough, the tendency is to turn to the hardware and software to solve the problem. However, before technology professionals can develop an overall strategy for the organization and determine the technology that will best support the organization's business model, management must insure that time is taken to flow the processes and identify the activities performed by users.

A workflow consists of a collection of activities that support a specific process. Classic examples of a workflow can range from tracking the activities in the accounts payable department as shown above or a claim management in an insurance company. What about production scheduling in a manufacturing company or patient care within a hospital? Within each of these larger workflows, there exist micro-workflows. Each department or group within an organization has many workflows that move information through an organization. Some of these workflows may appear to be independent of each other, such as an accounts payable process and an inventory control process. However, as shown in the example above, they are not independent. It is rare to find a process in an organization that has a significant economic impact and is also isolated; all workflows flow together. Finding activities in workflow diagrams that are not linked to other processes should set off flashing lights and sirens! Most processes should tie together and should be highly structured and highly repetitive. The objective of strategic technology planning is to improve the efficiencies of performing processes through automation and create productivity gains.

Today, the definition of workflow is much broader, and not only encompasses the traditional *production* workflow areas, but also includes administrative and ad-hoc processing as well. Administrative workflow is structured and repetitive, but usually includes fewer participants and lower throughput. Consider an accounting department with accounts payable, receivable, and payroll functions. The tasks to complete each of

the accounting support functions may be performed by multiple participants in the accounting department, or a few who perform specific tasks at given times. In all cases, the tasks performed are repetitive in nature and should be performed the same way each time they are executed. Ad-hoc tasks are considered unstructured and spontaneous, again with a low number of participants and low volume. Many organizations have procedures for structured tasks, such as insurance claim filing, manufacturing processes, or processing a mortgage application. However, virtually no documented procedures exist for administrative and ad-hoc workflows in many organizations.

The objective of this book is not to teach you how to design effective workflows, but to introduce workflow management as a best practice for diagramming, or flowing the processes you identified in the organization. Those who would like to delve more into the subject can consult the Workflow Management Coalition (*www.wfmc.org*). This group has developed standards as well as a framework for establishment of workflow standards. While this level of workflow analysis and flow diagramming are beyond most small businesses, there is valuable information available through the coalition. For purposes here, readers only need to understand the concept of workflow, to have the basic skills to diagram the activities in a process and to then tie multiple processes together. With this level of understanding, critical processes can be flowed, analyzed, and improved. This diagramming can be done using simple tools such as Microsoft Visio. It is also fine to prepare the diagram by hand using a simple flow chart template from your local bookstore or art shop. Samples of such diagrams are included later in this chapter.

What Kind of Benefits Can You Expect from Process Engineering?

Now that the terminologies and tools are understood, the reasons an organization begins a process engineering project can be considered. Technology professionals will often find themselves needing to convice management to fund a processing engineering project. Such projects nearly always result in increased productivity, reduction of operating costs, and improved performance, good reasons to consider process engineering as a strategic process. Process engineering does not have to be performed by a high-level consultant, but does require a disciplined approach. The people managing the project should know the business and the industry.

The reason to begin the process engineering project may be to define current problems, needs, and applications in order to improve your business or increase productivity. Once completed, it is a good idea to update your diagrams and documentation every five to ten years to correct workflow errors that creep into an organization because of change, mergers or acquisition. This happens, for instance, when an operation moves to a new location, building, or warehouse. Employees will attempt to apply the processes they know, but because the flow changes in the new location, the old workflow does not work efficiently. Costly errors will be introduced without anyone realizing it. New employees, or reassignment of employees who are not correctly trained for their new position, also introduce changes in the workflow and create activities that do not flow properly, resulting in inefficiencies and reduced productivity.

Best Practice Examples—*What Not to Do!*

After 25 years in the same location, a large financial institution built a new large building across town. The new facility had all the modern conveniences and the most current technology money could buy. New furniture, new phone system, new computers—it was a great working environment. A few weeks after the bank relocated its staff, the president called, explaining that they were having problems with their accounting software and asking for help fixing the problems.

A definition of the problems and an assessment of the current operating environment was the place to begin. The problem appeared to be that invoices were not getting posted and paid. The bank was losing discounts, as well as being close to incurring some serious fines from other institutions. To assess the current operating environment, staff interviews were conducted and the workflow processes were observed for a few days. Based on this review, the technology was working just fine. It was the workflow in the new building that had created bottlenecks and caused documents to be lost, or data not to be entered on a timely basis.

Accounting staff, who had worked next to each other for many years, were now at opposite ends of the building. Workflow that had developed over many years was suddenly interrupted because of the new location. Staff, who had communicated simply by turning toward the other person asking a question or passing a form by hand, found that asking questions and sharing common documents was now cumbersome.

In designing the new location, individual needs such as well lighted offices and ample work space were top on the list. But, management and the designers had failed to conduct a process review and to flow these processes in the new building. They did not fully consider the actual tasks being performed and had not created new workflows to meet the new building design. After meeting with the appropriate staff and flowing transactions across the operations, the payable problem was resolved. As an added benefit, other potential problems were uncovered and corrected before they became an issue. And, other activities were made more efficient. No change in technology was needed.

In another example of how costly not having a well-defined workflow process can be, a large company asked for assistance in identifying a new accounting solution. This company was successful and had done a good job of managing their manufacturing and inventory control area, but had never really focused on the processes in accounting and marketing. The management of this process engineering project began by developing the *As Is* document showing the current critical workflow processes and defining activities that key people performed. The *As Is* and *To Be* procedures will be more fully defined later in this chapter. They are the flow diagrams that help visualize what people do and how they interface with each other—they are workflow diagrams. The process of flowing invoices through the payment process showed that the invoice receipt clerk logged the invoice, compared it to the original purchase order, and then made a copy. The clerk filed the copy in the vendor's folder prior to sending the original to accounting to be paid. Then, an accounts payable clerk entered the invoice data into the accounts payable accounting software, and literally passed the hardcopy invoice to a second clerk in the next cubicle. The second clerk was responsible for pulling up the

transaction on a computer screen and comparing what was entered to the hardcopy invoice for data entry errors.

Once the data verification was complete, the second accounts payable clerk made another copy of the original invoice. The clerk filed the copy in a vendor file kept in accounts payable, before sending the original back to the invoice receipt clerk. When the original hardcopy receipt returned, the invoice receipt clerk removed the copy they had made only hours earlier, threw the copy in the trash and filed the original! After observing and diagramming this process, we asked "Why?" The explanation was that at least eight years ago, an invoice had been lost from a vendor who was very good friends with the CEO. This had developed into a major incident causing the CEO to come down to accounting and say some very unpleasant things.

As a result of this incident, the controller put in place a procedure to ensure that each department tracked an invoice all the way through the process and that everyone had *covered* themselves, so that such a thing never happened again. (After all, no one wants too many visits from the CEO!)

The copies made by accounts payable were kept until the file cabinets were filled, then they were boxed and sent to an off-site storage facility where, to the best of our knowledge, they were stored, for a fee, forever! Add to this the lost productivity by having three people enter the same information in two different parts of the system; processing an invoice was a very expensive and resource-intensive activity.

After diagramming the workflow for this process, we worked with management and staff to make changes to the company's software and developed new written procedures for paying invoices. Now invoice data is only entered once at the point of origin and verified in accounts payable before a check is issued. Simple modification to workflow not only saved a lot of money, it shortened the time it takes to pay vendors and process invoices.

Both companies described above were so impressed that they approved and funded an expanded process engineering project for all departments and the development of new written procedures. The cost savings were significant.

Nine Steps to Best Practice Process Engineering

As the two examples show, the results of process engineering are improved workflows. The process engineering methodology requires that the activities that create processes be *engineered* rather than be allowed to simply evolve, as is usually the case. As an organization matures, procedures develop over time. A process engineering effort must address all parts of the organization: jobs, skills, structure, information technology, management systems, business processes, and even values and beliefs. An undertaking of this magnitude probably seems overwhelming. However, the process engineering methodology is scalable; that is, it can be applied within a single department or process, or it can be applied to the entire organization.

Keep in mind that because process engineering crosses departments and impacts individuals throughout the organization, a process engineering team must represent the various departments affected equally to get the buy-in needed to succeed. Members of

the project team must feel empowered to challenge old assumptions; there must be an executive-level sponsor who can move across departments to resolve issues that arise (and they will), and a project manager who can lead the group and keep them moving forward.

In an article by Frank Tait titled "Enterprise Process Engineering: A Template Tailored for Higher Education," published by *Cause/Effect* (*www.educase.edu*), a practitioner's journal about managing and using Information resources on college and university campuses (Volume 22, Number 1, 1999), the author identifies nine steps necessary to ensure successful Enterprise Process Engineering. We have taken those nine steps identified by Tait and adapted them into nine best practice steps that fit general business as follows:

1. Create the process engineering team.
2. Identify strategic objectives.
3. Define how to measure success.
4. Diagram existing workflow—the As Is.
5. Identify affected and involved parties.
6. Design new workflow—the To Be.
7. Model business processes.
8. Apply best practices.
9. Review and refine on a recurring basis.

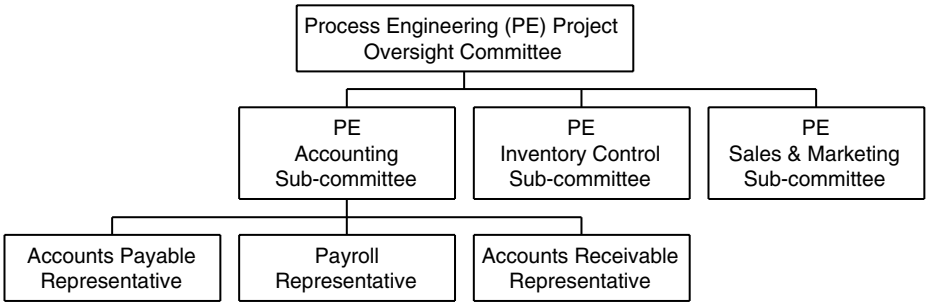
1. Create the Process Engineering Team.

Process engineering begins, as most projects begin, with a committee. Information technology staff should not attempt this project by themselves. The committee should also include as many representatives of each department as appropriate. It is best to start small, perhaps with the accounting department, or inventory control, and then expand to encompass other areas.

The committee should have representatives from the functional areas of the department, or departments, being reviewed. Input from as many people as possible is useful, but the committee needs to be small enough to be manageable. For a small business, three to five people could represent the entire company. For larger organizations, it may be necessary to have a supervisory committee that has oversight for functional area subcommittees. Experience has shown that three to five is the right number, and certainly no more than seven. With more than seven, you do not have a committee, you have a mob!

The diagram in Exhibit 2.1 shows a small process engineering planning team with a few sub-committees. These organization charts are easy to prepare using the Microsoft Organization Chart 2.0 object in Word. (From Word click on Insert/Object and then scroll down until you see chart object and press enter. Word 2002 users have a nice new tool for creating a number of organization and process diagrams.) Other drawing or diagram tools can also be used to diagram the committee and list the responsibilities clearly. The diagram should have details on the members and their areas of responsibility.

Exhibit 2.1



2. *Identify Strategic Objectives.*

Depending on the scope of the process engineering initiative, the strategic objectives could be broad and apply to the entire organization. Defining strategic objectives could be limited to a single department, such as improving the payroll process but could also encompass the strategic business objectives of the entire organization as well. These could be as broad as expanding plant facilities, adding additional products or services, integrating new departments or staff from a potential merger or acquisition. Or, objectives may be more efficiency oriented and focus on improving workflow to reduce costs as demonstrated in the examples earlier.

It is best to begin with the organization's business plan and review the overall objectives of the company. Then, dissect these to determine how broad objectives can be achieved by improving narrow processes performed in each department. Success in this phase will be determined by the group's ability to document objectives at all levels.

As functional areas define their objectives, information technology professionals will need to listen closely as team members discuss current problems or needs so that they can offer technology-based solutions or tools to help engineer new activities, thus creating new workflows.

3. *Define How to Measure Success.*

In his article, Frank Tait refers to a similar step he calls *Determine important metrics.* These are referred to as successes in the business world, and successes are usually measured in positive financial results. The process engineering team must determine how to measure if the process engineering project is successful. Tait says that measurements can be determined in part by creating a set of questions that relate to the objectives of the organization, global and departmental, and then answering these questions. The questionnaire might include, "How do we know when we're successful?" and "How will we know if we did something better than it was done before?" Examples of measurements include the time it takes to complete a process, such as creating an order, processing an order, making payments, running payroll, responding to customer inquiry, changing a product specification and so forth.

Measurements must address the question to each manager involved, "What's in it for me?" Since process engineering is an expensive and resource intensive activity, the team must have buy-in from each department, as well as the entire organization. And buy-in only comes if the participants believe that the process will result in positive results, such as improved workflow, increased profits, or reduced costs. Showing management a defined way to measure the success of this project will go a long way toward being able to expand and continue the project throughout the organization.

4. *Diagram Existing Workflow—the As Is.*

Where tasks are being reengineered, it is necessary to flow the current processes first in order to visually show how tasks are currently accomplished and to identify steps to be re-engineered. The workflow diagramming process is not usually done by the committee, but is assigned to a person, or persons (who may also be committee members), knowledgeable with the area(s) being evaluated. The committee defines how the workflow analysis is to be done and the person(s) performing the diagramming is to proceed. This is important to insure that, as each area is diagrammed, the methodology is consistent throughout the organization. A best practice is to involve those with a wider range of knowledge and with no preconceived prejudices; this may be outside consultants or other knowledgeable persons who have been through a similar project and have some good experience to share.

Where individuals were asked to create diagrams (simple flow charts) to show how they performed their duties, critical steps were left out because the steps had been taken for granted. An exercise used in seminars is for the attendees to take a blank piece of paper and write a very detailed procedure on how to accomplish the process of tying a shoelace. They must include a diagram (flow chart) of all the steps (activities) in the process. This is an activity that almost everyone has each done daily, for many years. In fact, the process is so second nature that trying to describe the steps and diagram it becomes extremely tedious.

When someone too close to the actual process is assigned to document and diagram it, there is an extremely high amount of errors. Here a team approach may be better, with the person documenting the process interviewing the workers and making notes. They then document and diagram the process. With input from the workers, the end result will be more complete and much more accurate.

This step is extremely labor intensive, but probably the most critical. The team responsible for flowing existing processes must record processes, sub-processes, and tasks, and then review each one. This can be done manually with paper and pencil, with software that automates the process, or with a combination of manual efforts and software to complete the diagrams. The team needs to ask how people downstream are using the information and the work generated by each task and determine who does what and why. This process is also referred to as business-process-review (BPR) or *as-is analysis.*

In addition, the team should assign each process a name that clearly reflects what the process does. Some authors use an *end-to-end* naming convention, such as *approve payables and issue check,* or *accounts payables.* This convention can become unwieldy,

but it has the advantage of conveying a continuous flow. The team also must clarify every term associated with the process by developing a data element dictionary so that naming conventions are standardized throughout. For example, what is the precise definition of *customer, order approval,* and so forth? Smaller companies with limited resources do not need to go to this level of exactness, but larger companies or holding companies with several operating companies should consider the benefits of standardizing their approach.

5. *Identify Affected and Involved Parties.*

Process engineering is about change, and where there is change, someone will be affected. The achievement of the team's strategic objectives depends upon success across the organization. The team must consider ahead of time anyone who might be an affected party in the change process and attempt, where appropriate, to include them in the design process. Tait's article identified owners, actors, and stakeholders, titles that fit just as well in business as they do in academia. I have adapted the roles Tait defined as follows:

Process owners perform and own the process. For example, the people in the accounting office are the primary process owners in accounting; salespersons are often the owners of sales processes such as writing orders, or checking on inventory balances. A process owner can be a person or an organizational entity. All processes identified must have at least one owner.

Process actors are the *customers* or *suppliers* of the process who are outside of the process owner's organization. For example, a vendor, or client might be an actor to one of the organization's processes. For example, a vendor would be a supplier. A vendor could also be a customer at the same time, but is performing a different role, so do not get confused. These are just labels we attach to help focus on the participants.

Process stakeholders are process actors who have a special, mission-critical interest in the process, either as process-output recipients, or as super process owners. For example, while the federal government may be an *actor* in the *payroll tax payment* process, it is not a stakeholder. However, in a manufacturing or sales process, the marketing department is a stakeholder because part of its mission depends on the proper execution of manufacturing or sales related processes.

In this phase, everyone affected by the project has a chance to review the As Is documentation and diagramming and make comments. This is also where the committee will receive input on changes that would improve workflow, make activities more efficient, and improve operations. Be careful. Many *actors* and *stakeholders* are quick to comment on processes they do not own, or to criticize other *owners,* but sometimes are reluctant to consider the processes they own as having problems. This is where things start getting a little sticky and you need to review *Basic Diplomacy 101.*

6. *Design New Workflow—the To Be.*

According to Michael Hammer, a process is "a related group of activities that together create a result of value to a customer." According to PricewaterhouseCoopers, "Process engineering deconstructs processes and rebuilds them in a way that creates the most