

Chapter 13: Building Information Systems

Learning Track 2: Primer on Business Process Design and Documentation

Why Business Process Design Is Important

“Business process design has a long history in American management. In today’s digital environment, over 80% of the \$800 billion business consulting industry involves business process design, redesign, and process re-engineering. These business process design activities have grown along with the huge \$1.7 trillion annual spend on information technology hardware and software in the United States. Why is so much attention paid to process design and how is it related to investments in IT/IS?

The concern with business process design is motivated by several findings. The first is that many firms and organizations invest heavily in information systems and technologies, but do not receive anticipated benefits. In fact, it’s quite common. The reason for this variation is that firms receiving high returns on their IT investments are much more likely to have made *complementary investments* in their firms by redesigning their business processes, changing their management and organizational culture, and moving the locus of decision authority downwards in the organization, permitting employees to make better informed decisions, more quickly, with much higher-quality information. Major gains in productivity, quality, and reliability result from developing entirely new business processes that reflect and take advantage of the new technologies. Business firms have learned that in order to reap the benefits of information systems and technologies, they need to re-design how they do business.

A second finding that underscores the importance of business process re-design is that new information technologies enable entirely new business processes that are inconceivable without new technologies. The process of ordering a CD from Amazon.com is entirely enabled by a collection of software tools and computer hardware. Making a purchase at Wal-Mart invokes a collection of business processes all of which are enabled by software (with the exception of the clerk who checks you out). Downloading a track from iTunes is likewise an IT-enabled business process. Each of these are examples of how American firms have used the opportunities afforded by new information technologies to re-design existing business processes, and to create new business models. American business firms have learned to use technology to create new, very efficient business processes.

How to Describe a Business Process

There are two predominant methods of documenting business activities: flow charts and business process modeling. Each of these has very different uses and intentions. Flow charts are a schematic representation of a decision process—not a business process. A *decision process* is a set of *logically and temporally related decisions* that are required to turn inputs into outputs. Flow charts were developed in the late 1950's as a way of documenting the conditional logic and the flow and structure of computer programs. Computer programs are a collection of conditional statements which represent decisions, e.g., “if age is less than 65, retirement category equals 0.” Prior to flow charts, computer programs were a collection of unstructured statements haphazardly organized into what came to be known as “spaghetti code.” Later, flow charts were used in business presentations to help visualize and improve the business decision making process. Flow charts and operations manuals are typically used to guide the decision making process in organizations.

Unfortunately, flow charts tell us nothing about how long a decision process takes, who is involved, what kinds of activities are involved, or how much it all costs. To answer these questions, business process modeling is required.

Business process modeling is very different from flow charting. A business process is a set of *logically and temporally connected activities* in a business that turn inputs into outputs, utilize capital and labor resources, and require time to complete. Business process modeling focuses on the flow of work which transforms raw materials into finished products, inputs into outputs. Business process modeling provides a schematic representation of a production process—not a decision process. Originally developed in early factories, the technique spread to service and “paper-based” organizations such as banks and insurance companies—which were seeking to identify all the steps in production, and the time and resources required at each step. Once time and resources are identified, it is possible to change the business process in order to optimize the process efficiency.

As a technique, and a perspective, business process design is ideally suited to maximizing the returns on investment in information technology because it focuses management attention on the potential for using the new technology to support entirely new, more efficient business processes.

How to Model a Business Process

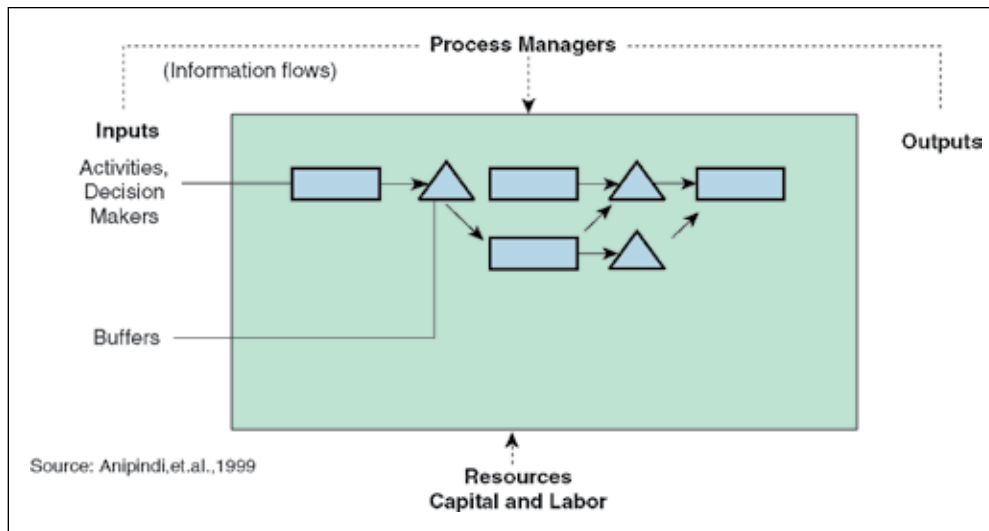
Modeling a business process means two things: (a) describe the business process, and (b) measure the process. Before you can improve a business process, you need to be able to describe it, document it, and measure it.

So let's start with how to describe a business process. There is a great variety of commercially available software tools that are used to graphically describe a business process. For our purposes of teaching the basics about business process modeling, they are too complicated and too sophisticated. We prefer to start with a generic model of the business process that focuses on the key attributes of any business process (see Figure 1 below):

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- ◆ Inputs and outputs
- ◆ Activities (decision makers)
- ◆ Buffers (time delays)
- ◆ Process managers and owners
- ◆ Resources (capital and labor support)

FIGURE 1 A Generic Business Process



A business process is a set of activities that transform inputs into outputs, utilize capital and labor, and require time to complete. Buffers represent time delays in the process where products or information are held until the next activity is ready to receive them.

Next let's think about how to measure a business process. As you can see from the generic model and discussion above, a business model can be measured on the following dimensions:

- ◆ Cost
- ◆ Time
- ◆ Quality
- ◆ Efficiency
- ◆ Flexibility

To see how this all works, let's look at a practical example.

EXAMPLE BUSINESS PROCESS DOCUMENTATION: A PROCUREMENT PROCESSES

ITC Corporation is a regional distributor of electronic connectors and components in Omaha, Nebraska, that services the Mid-West region of Chicago, Denver, Minneapolis and Salt Lake. Procurement, next to customer service, is the most important business process in the firm. The firm receives requests from customers for electronic components, and after a period of interaction with the customer and with internal managers, the Procurement Office issues an order for the

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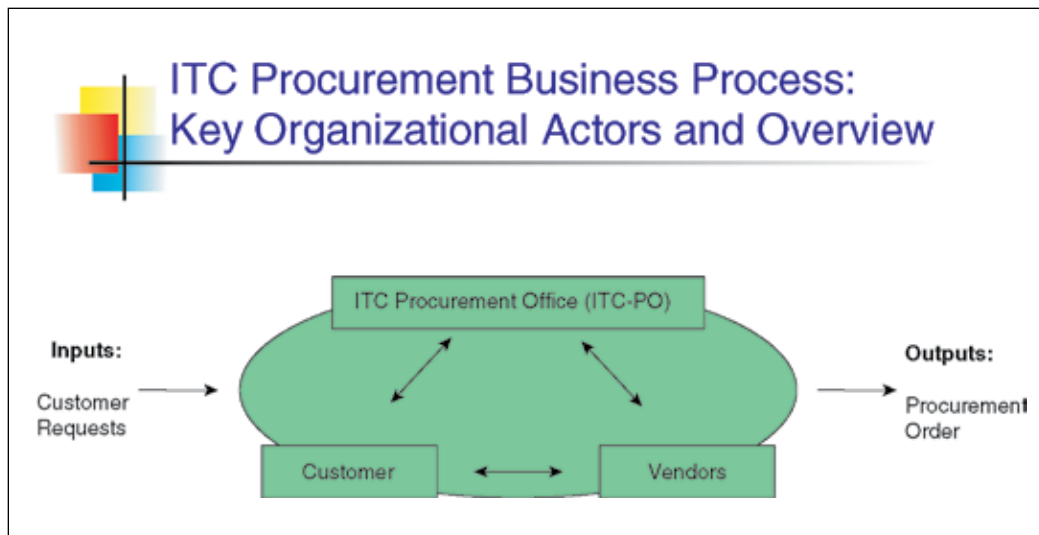
components from one of several manufacturers chosen by ITC on the basis of quality, delivery time, and profitability for ITC. ITC always tries to get the lowest cost products from its suppliers, while also ensuring the customer is satisfied with quality and delivery time.

The procurement system was built twenty years ago for a mainframe environment, and is outdated, slow, and not very good at obtaining and tracking the lowest price parts from manufacturers. As a matter of fact, humans have to review quotations from suppliers, and the system can only really track procurements once they are made. Procurement is a major “pain” point for the firm--costly, error prone, and slow. Strategically, the firm feels without a high quality, modern procurement system it will not be able to meet its financial goals.

Before it can improve the procurement process, ITC needs to thoroughly understand its acquisition business processes. ITC understands it will not achieve its objectives simply by installing new procurement software running on new client server computers. Senior managers understand they will need to rethink how the procurement process is currently organized.

A consulting firm has prepared an high-level macro overview of the procurement process and identified key actors (Figure 2).

FIGURE 2 High-Level Overview of the Procurement Process



A consulting firm has prepared an overview of the procurement process.

The procurement process takes inputs from customers in the form of requests for electronic products. In a process involving an interaction between Procurement Officers (PO), the customer, and vendors, an output is produced in the form of a procurement order.

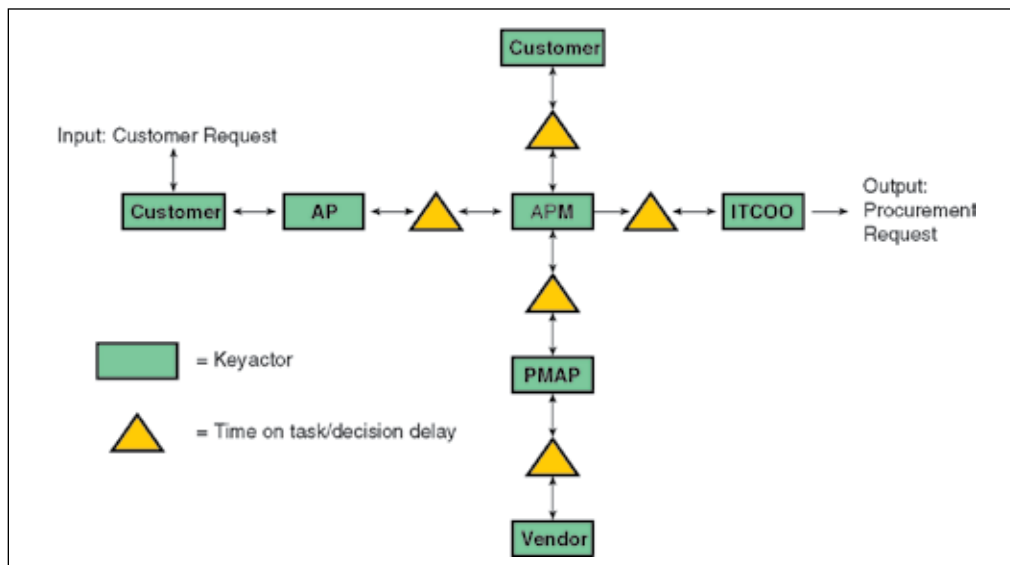
The firm has identified the following key actors:

- ◆ AA: Administrative Assistant
- ◆ APM: Acquisition Program Manager
- ◆ PMAP: Program Management Acquisition Planning Chief
- ◆ CO: Contracting Officer
- ◆ PO: ITC Procurement Office (owner of the process)

The “process owner” is the unit of the firm which creates, manages, and maintains the procurement process. They are the responsible party for this process.

Next the consulting firm spent two weeks in the field interviewing the key actors in the procurement process, including customers, vendors, all employees, and all managers. They wanted to achieve a fairly fine-grained view of the activities, times, and resources, without becoming excessively detailed at this point. They also want a consensus view of the real work flow, not a hypothetical or “rule book” view of the “correct” work flow (Figure 3).

FIGURE 3 ITC Procurement Process Workflow



The consulting firm, working closely with employees, customers, vendors, and managers, produces a more detailed illustration of the procurement business process or work flow.

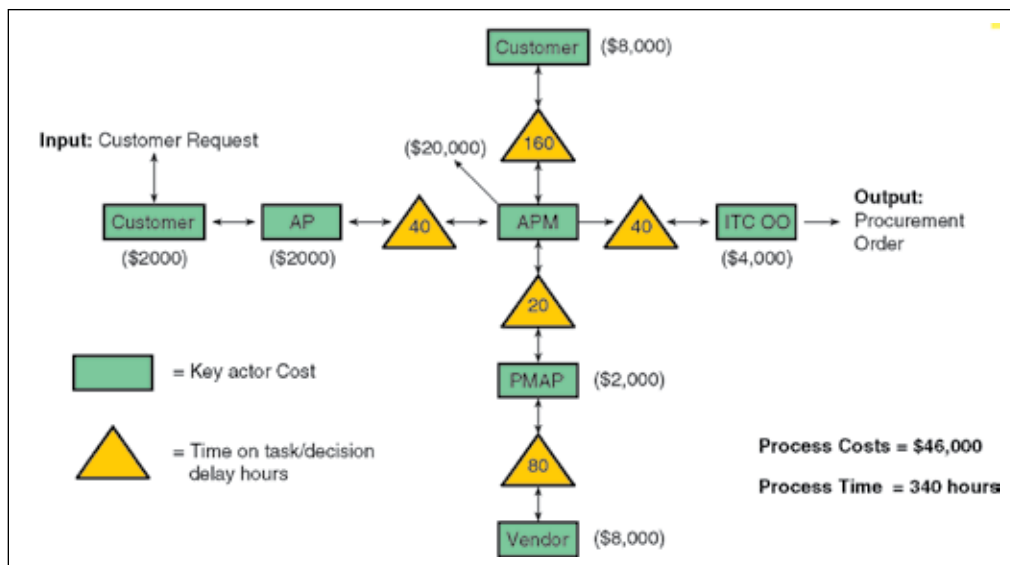
Now finally we get a sense of how the process works. Customers fax or email requests for components to the Administrative Assistant (AA). The AA works with the customer to clarify the order, and later in the process continues to coordinate the information that flows between procurement officers and customers. After a period of time, the AA creates a physical file and forwards it to the desk of the Acquisition Program Manager (APM). The APM reviews the request for completeness (delivery date, shipment method, and payment schedule). The APM interacts directly with the customer at this point to clarify details. When the request has been reviewed, the APM

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forwards the file to the Acquisition Management Director (AMP). The AMP reviews the request and begins the search for possible vendors. Once vendors are identified, the AMP issues a request for bid, and receives from multiple vendors price quotations and delivery dates. Once a vendor is identified, the information and file is passed back to the APM for a brief review, and then forwarded to company's Contracting Officer (CO). The CO reviews the documents and issues a procurement order to the selected vendor.

Once a consensus is achieved about how the process works in the real world, the next step is to measure the process. The consulting firm spent additional time in the field gathering information from participants on how many hours of labor they spend on a single procurement in the \$1 million dollar range. They also gather information on the time required for each of the steps, and the amount of hours documents and information spend waiting for the next step to be taken (buffers). Using salary data supplied by the firm, they were able to convert the hours employees spent on task into a direct dollar cost to the firm. They then produced a preliminary business process model which estimated the cost and time required to complete a typical \$1 million procurement (Figure 4).

FIGURE 4 ITC Business PProcess Workflow: Typical \$1 Million Purchase



In their preliminary estimate of the procurement business process, the consultants estimate the process for a million dollar procurement requires about \$46,000 in direct labor costs, and about 340 hours to complete from start to finish.

The consultants estimate the typical million dollar procurement costs about \$46,000 and takes 340 hours. Because this is the first time the firm has ever looked at the process, and attempted to measure it, senior managers are somewhat incredulous it could cost this much, and take this long. They want to know how to cut the time in half, and reduce the direct labor cost to less than \$20,000. Do you have an ideas?

Business Process Modeling Tools

Simple business processes can be modeled with a pen and paper, or spreadsheet and PowerPoint slides. With more complex processes, and when there are multiple divisions, and when the information has to be shared widely throughout an organization, it is much better to use a software tool specifically designed for business process analysis, and that has both strong graphics and reasonable, built-in, spread sheeting tools to keep track of financial and other quantitative data. In this way, a common set of graphical symbols is used to describe all processes across the enterprise; the quantitative data can be simultaneously entered into the same software tool as descriptive and graphical information; and the results can be shared across networks to facilitate rapid team-based responses, and collaboration across functional, departmental, and geographic boundaries.

There are many low cost, PC-based, business process modeling tools available. A basic tool that is strong on graphics and basic data analysis is FlowCharter by iGrafx (<http://www.igrafx.com/products/flowCharter/>). A more advanced tool that has strong graphics and strong modeling capabilities is ProcessModel by Processmodel, Inc. (<http://www.processmodel.com/>). You can explore the Web for more options.

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