

This chapter appears in: Malone, T. W., Crowston, K. G., & Herman, G. (Eds.)
Organizing Business Knowledge: The MIT Process Handbook. Cambridge, MA:
MIT Press, in press (2003)

8

What Is in the Process Handbook?

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8.1 Introduction

What kinds of things are included in the Process Handbook? How are they organized? And why did we choose to organize them in this way? This chapter gives our answers to these questions.

In developing content for the Process Handbook so far, our primary goal has been to demonstrate that the long-term vision for the project is feasible. That is, we have tried to demonstrate that our basic approach can be used to develop a *comprehensive framework for organizing large amounts of useful knowledge about business*.

In order to achieve these goals, we have focused on creating three primary kinds of entries in the Handbook: (1) generic models of typical business activities (e.g., buying, making, and selling) that occur in many different businesses, (2) specific case examples of interesting things particular companies have done, and (3) frameworks for classifying all this knowledge.

The chapter begins with an overview of the kinds of things that are included, the number of entries of each type, and a description of a sample entry. Then it describes each of the major types of content in more detail: generic models of business activities, specific case examples, and frameworks for classifying activities. Finally, it briefly describes several other kinds of things (e.g., resources and exceptions) that are not themselves activities, but that are represented in the Process Handbook.

8.2 Overview of the Process Handbook Contents

Table 8.1 summarizes the number of entries of different types that were included in the Process Handbook at MIT as of July 2002. Of course, there is an infinite amount of knowledge about business that could, in principle, be included in a repository like ours. In a sense, we have just begun to scratch the surface of what is possible in terms of organizing business content in this way. But we believe that the work we have done so far has achieved our initial goals. That is, so far we have demonstrated the potential of this approach to comprehensively organize large amounts of useful knowledge about business in a richly interconnected, consistent, and powerful way.

Different Versions of the Process Handbook There is no reason why there cannot be multiple versions of repositories like the Process Handbook. For example, as of this writing (July 2002), we have two such versions at MIT: the “research” version of the

Table 8.1
Summary of contents of the MIT Process Handbook (July 2002)

<i>Type of entry</i>	<i>Number of entries</i>	<i>Example entries</i>
Activities		
<i>Generic business activity models</i>		
MIT Business Activity Model	381	Buy, Make, Sell
MIT Business Model Archetypes	30	Produce as a Creator, Produce as a Broker
Comprehensive business process models developed elsewhere	689	International Benchmarking Clearinghouse's Process Classification Framework
Coordination processes	300	Manage by market with bidding
<i>Subtotal</i>	<i>1400</i>	
<i>Case examples</i>		
Supply chain	100	Balance supply chain resources with requirements {Honda}
Hiring	50	Select human resources using agent software {Humana}
e-Business examples	420	Distribute books via electronic store {Amazon}
<i>Subtotal</i>	<i>570</i>	
<i>Classification structure</i>		
Generic verbs and other activity categories	3252	Create, Modify, Preserve, Destroy, . . . Develop, Make product, Provide service
Total activities	5232	
Other kinds of entries		
<i>Dependencies</i>	73	Flow of information
<i>Resources</i>	163	Human agent, software agent, location
<i>Conceptual frameworks for specific research projects</i>		
Exceptions	260	Agent unavailable, resource shortfall
Systems Dynamics elements	200	Goal-gap molecule, backlog molecule
Total non-activity entries	696	
Total entries	5928	

Process Handbook, and the “eBusiness Process Handbook” (ePH). The numbers summarized in table 8.1 are for the research version of the Handbook. This version is where we first introduce experimental new content, and it includes some content that we expect to be of interest primarily to other researchers. This version also uses the original user interface developed in our research project at MIT.

The eBusiness Process Handbook includes a subset of the content in the research version that we expect to be of interest to a broader audience including business school students and managers. This version uses the simpler-to-understand user interface from the commercial software product developed by Phios Corporation

under license from MIT. The screen images included in this chapter come from this version of the Process Handbook (except those from the research version where noted). Both of these versions are currently available to the public over the Web at <http://ccs.mit.edu/ph>

8.3 A Sample Entry in the Process Handbook

Before describing the different types of entries in more detail, it is useful to see a specific example of what a Process Handbook entry looks like. Figure 8.1 shows an example of one such entry: the generic activity called ‘Sell’.

Description In addition to its name (‘Sell’) the first important part of this entry to notice is the description (labeled “Description of Sell”). In this case the description is

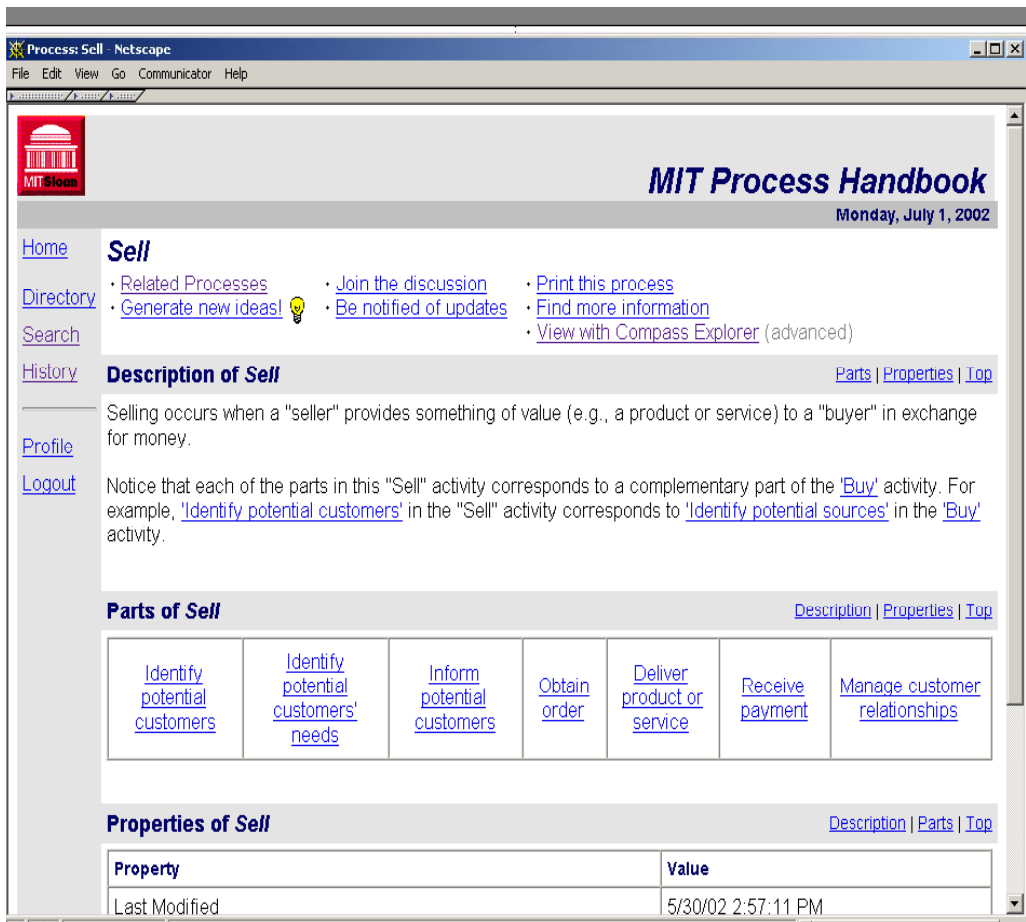


Figure 8.1
Screen image of a sample entry in the Process Handbook

very short: only a few sentences giving a very general definition of selling and some observations about how it relates to buying.

In other cases, especially in the case examples, descriptions may be many paragraphs long. In general, descriptions can include any kind of information the author of an entry thinks will be useful or interesting to readers: definitions, comments, figures, sources for further information, links to other entries, or links to other Web pages.

Parts The second important element of the sample entry is the list of its parts (“Parts of ‘Sell’ ”). In this case the entry shows seven parts (or subactivities) of ‘Sell’: ‘Identify potential customers’, ‘Identify potential customers’ needs’, ‘Inform potential customers’, ‘Obtain order’, ‘Deliver product or service’, ‘Receive payment’, and ‘Manage customer relationships’.

The point of view embodied in this entry is that these activities constitute one possible representation of the “deep structure” of selling. That is, almost all ways (specializations) of selling must somehow perform these basic activities. As we will see later, each of these parts can in turn include subparts that include subparts. In principle, there is no limit to the number of levels of subparts that can be included. In practice, the maximum number of levels included anywhere in the Handbook today is ten.

Properties The third element of the ‘Sell’ activity shown in the figure is a list of its properties (labeled “Properties of Sell”). In this case the only property shown is the date this entry was last modified. However, the authors of entries can define properties to systematically store any other kind of information they want: time required to do the activity, cost of doing the activity, location of the activity, and so on.

Related Processes One unique aspect of the Process Handbook is the way it automatically maintains an extensive network of relationships among different entries. For instance, if you were to select the link called “Related processes” near the top left of figure 8.1, you would see a list of processes that are related to ‘Sell’. This list includes three parts, excerpts of which are shown in figures 8.2a, 8.2b, and 8.2c.

Specializations Figure 8.2a shows some of the different ways ‘Sell’ can be done, that is, its specializations. For example, this list includes possibilities like ‘Sell via store’, ‘Sell via face-to-face sales’, and ‘Sell via other direct marketing’. Many of these entries, in turn, have further specializations of their own representing even more specialized ways of doing things. For example, ‘Sell via store’ has further specializations like ‘Sell via physical store’ and ‘Sell via electronic store’. These further specializations are not shown in this figure. To see them, you could click on ‘Sell via

store’ and then back at its “Related processes.” There is no limit, in principle, to the number of levels of specialization that can be represented in the Handbook. In some cases today the Handbook includes up to 18 levels of increasingly specialized activities

Bundles Notice that there are many different “kinds” of specializations shown in the list in figure 8.2a. Some of the specializations, for instance, focus on *how* something is sold; others focus on *what* is sold. Rather than just lumping all these different kinds of specializations into a single undifferentiated list, we separate them into categories (like ‘Sell how?’ and ‘Sell what?’). We call these categories *bundles*.

A “bundle” in the Process Handbook is simply a group of related specializations.¹ In general, we have found that it is often very useful to create bundles based on the basic questions you can ask about any activity: how? what? who? when? where? and why? For most activities in the Handbook, some subset of these questions provides a systematic and logical way of grouping the different specializations that appear.

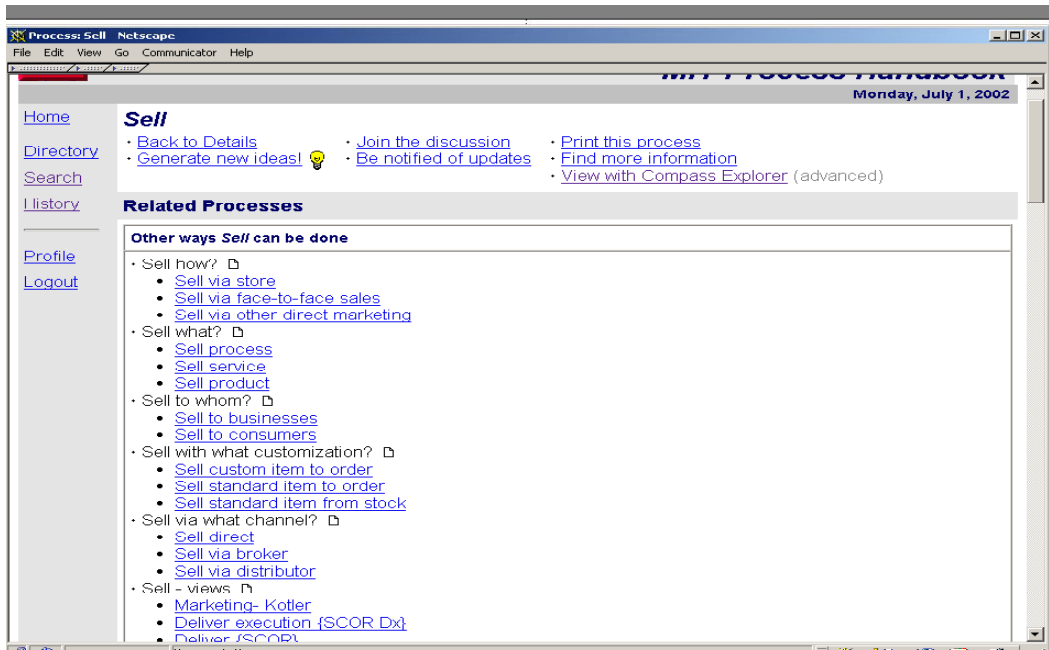
In addition we have adopted the convention of using two other kinds of bundles to group particular kinds of entries: *example bundles* and *view bundles*. *Example bundles* are simply groups of specific case examples. It is often useful to have a variety of different specific cases grouped together.

We use *view bundles* to group specializations that do not represent specific physical activities in the real world, but simply a different way of viewing the same activities. Usually these different views come from different sources. For instance, there is a bundle under ‘Sell’ called ‘Sell-views’. This bundle includes several different models of the general selling process. It includes, for example, parts of a model developed by the International Benchmarking Clearinghouse, a model developed by the Supply Chain Council, and a model from a well known textbook.

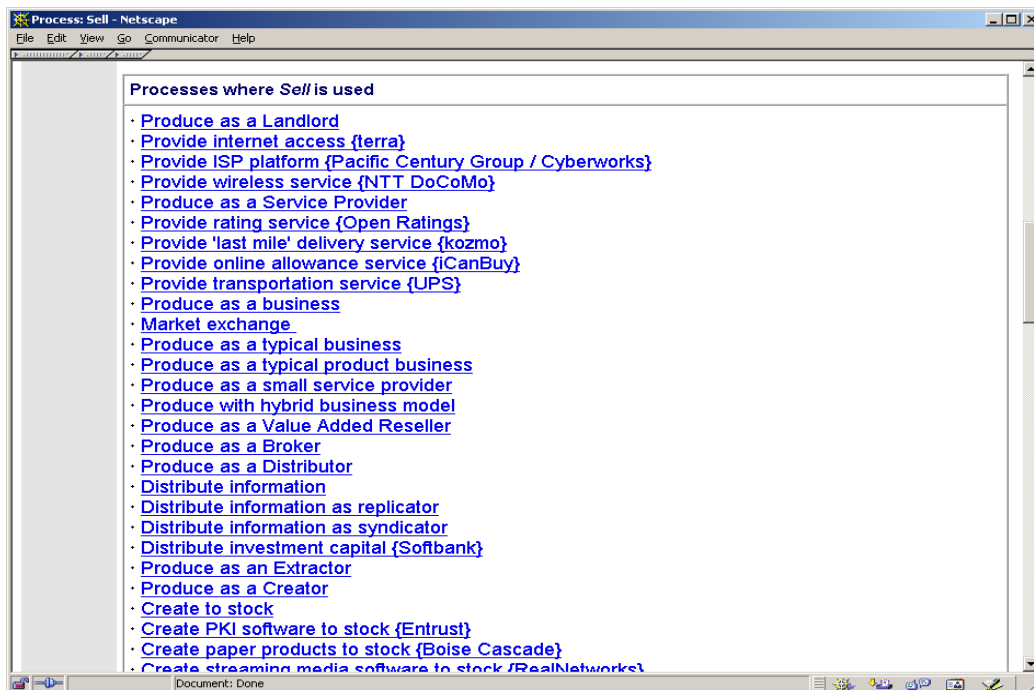
Uses Figure 8.2b shows another set of activities related to Sell. This list shows all the other activities in the Handbook, where the ‘Sell’ activity is used as part of another activity. For activities like ‘Sell’, which are used in many different places, this list can be very long.

Generalizations Figure 8.2c shows the last set of “Related processes” for ‘Sell’. In this case the activities are other processes that are “like” ‘Sell’ because they are *generalizations* of ‘Sell’, or they are other specializations of these generalizations. If we say that a specialization of an activity is like its “child” then this list shows

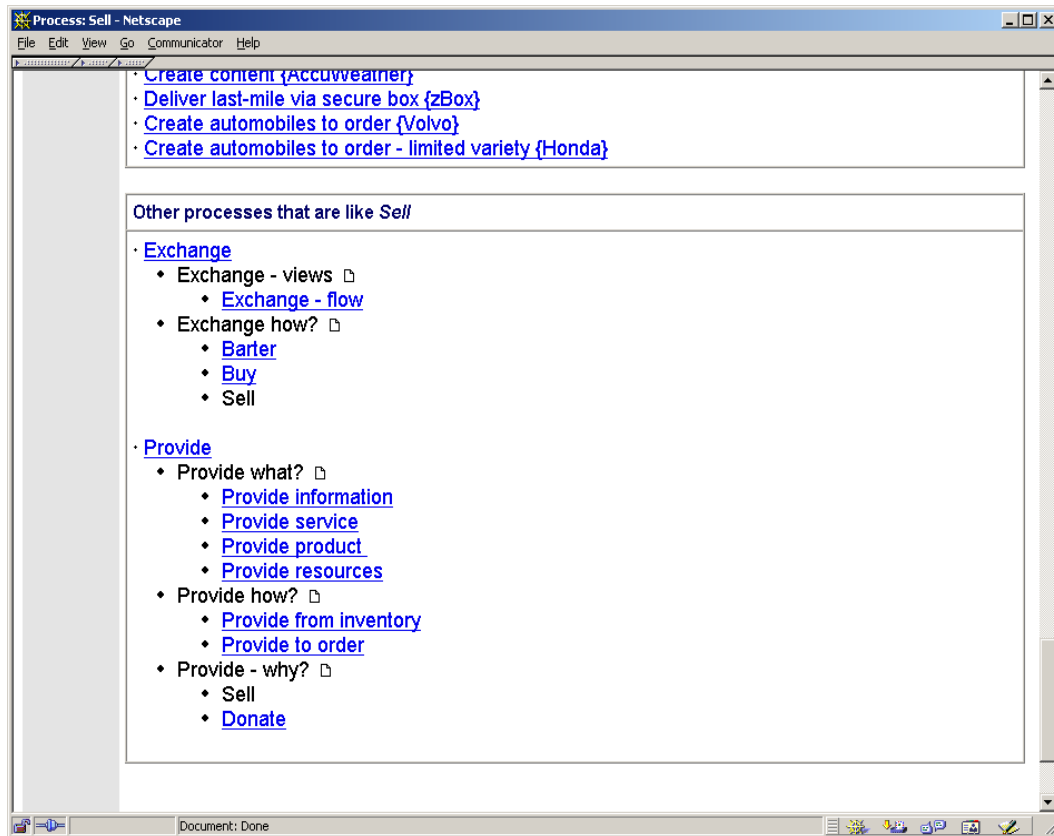
¹ Even though, strictly speaking, bundles are not themselves activities, they are groups of activities, and we have included them in the counts of activities in table 8.1



(a)



(b)



(c)

Figure 8.2a

Excerpt of the “related processes” shown for ‘Sell’: Other ways ‘Sell’ can be done

Figure 8.2b

Excerpt of the “related processes” shown for ‘Sell’: Processes where is used

Figure 8.2c

Excerpt of the “related processes” shown for ‘Sell’: Other processes that are like ‘Sell’

part of the “family tree” of Sell: its “siblings,” “ancestors,” “aunts,” “uncles,” and “cousins.”

For instance, the figure shows that ‘Sell’ has two generalizations. The first one is ‘Exchange’, and ‘Sell’ is included in the ‘Exchange how?’ bundle. This part of the figure represents the fact that selling is one way of exchanging things. Other kinds of exchange shown in the figure include bartering and buying.

The other generalization of ‘Sell’ is ‘Provide’, and ‘Sell’ is included in the ‘Provide-why?’ bundle. This part of the figure represents the fact that selling is one way of providing things. Another way, shown in the figure, is donating them, that is, giving them away for free.

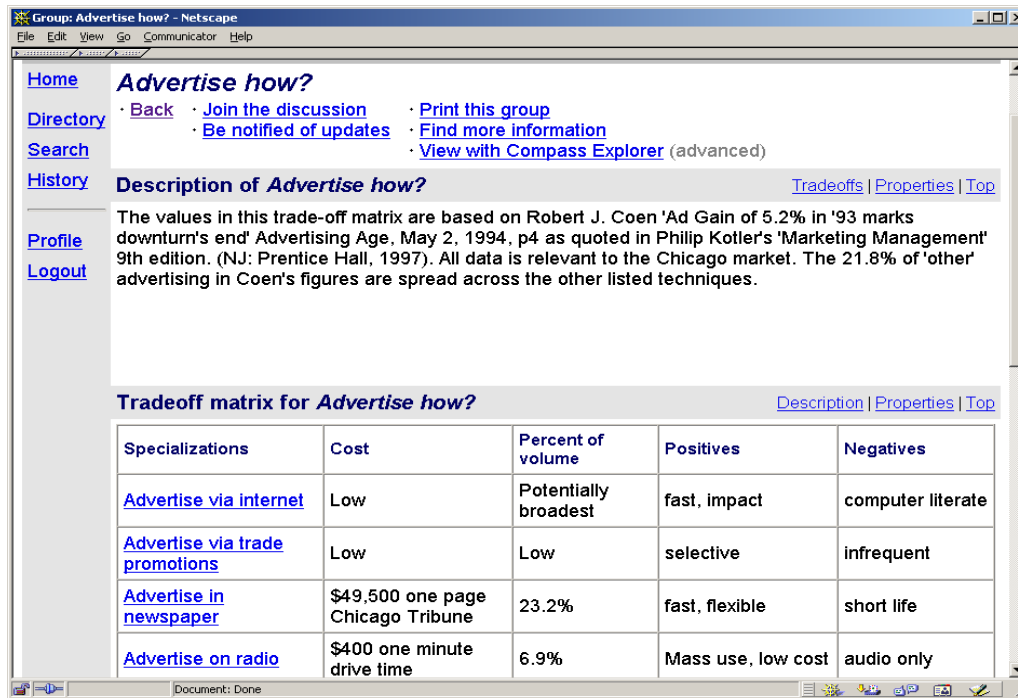


Figure 8.3
Sample trade-off matrix for the 'Advertise how?' Bundle

Of course, each of the generalizations of 'Sell' shown in this figure has generalizations of its own. For instance, to see the generalizations of Exchange you could click on 'Exchange' and then look at its "Related processes."

Trade-off Tables In some cases it is useful to compare the different specializations in a bundle using what we call a *trade-off table*. For example, one of the parts of 'Sell' shown in figure 8.1 is 'Inform potential customers', and one of the specializations of 'Inform potential customers' (not shown in the figure) is 'Advertise'. 'Advertise' includes a bundle called 'Advertise how?' The trade-off table associated with this bundle is shown in figure 8.3.

The rows in a trade-off table are simply the different specializations in the bundle. For example, here they are different ways of advertising, such as 'Advertise via internet', 'Advertise in newspaper', and 'Advertise on radio'. The columns of the trade-off table are selected properties of the entries being compared. For example,

here they include general dimensions like costs, advantages, and disadvantages that can apply to almost any activity. They can also include more specialized dimensions (e.g., percent of volume) that apply only in specific situations.

The values shown in the cells are simply the values of the selected properties for each of the specializations. In some cases, the values shown in a trade-off table represent very general comparisons (e.g., high, medium, and low). In other cases, they may be specific values like the costs for advertising in different media shown in this figure. The sources of values represented in a trade-off table can range from informal judgments by experts to detailed systematic empirical studies. In the example shown here the data come from an article in *Advertising Age*.

Other Information for an Entry In addition to the kinds of information already described, there are several additional kinds of information available through the Process Handbook. For example, as shown at the top of figure 8.1, any entry can be linked to an on-line “threaded” discussion, and users can be automatically notified of changes made to discussions in which they are interested. Users who click on “Generate new ideas” see an automatically generated list of potential new activities whose names are constructed by combining words from the current activity name with words from the names of other activities in the Handbook that are structurally similar to the current activity. (See chapter 13 for further information about this capability.)

Users who click on the “Find more information” link can perform automatic Web searches using the name of the activity they are currently viewing. And users who click on “View with Compass Explorer (advanced)” can explore the information in the Process Handbook with a user interface based on the compass metaphor introduced in chapter 1. For example, the different specializations shown in figure 8.2a can also be viewed with this compass-based interface as shown in figure 8.4. This user interface lets advanced users navigate more easily over long “distances” in the Process Handbook. For instance, this user interface lets you expand and contract lists in outline format. If you want to see the further specializations of a specialization, for example, you can just click on the boxes containing plus signs to expand the next level of specializations.

8.3 Generic Models of Business Activities

The ‘Sell’ activity shown in the previous section is an example of the first major kind of content in the Process Handbook: generic models of business activities. These generic models represent important activities that occur--in some form--in lots of businesses.

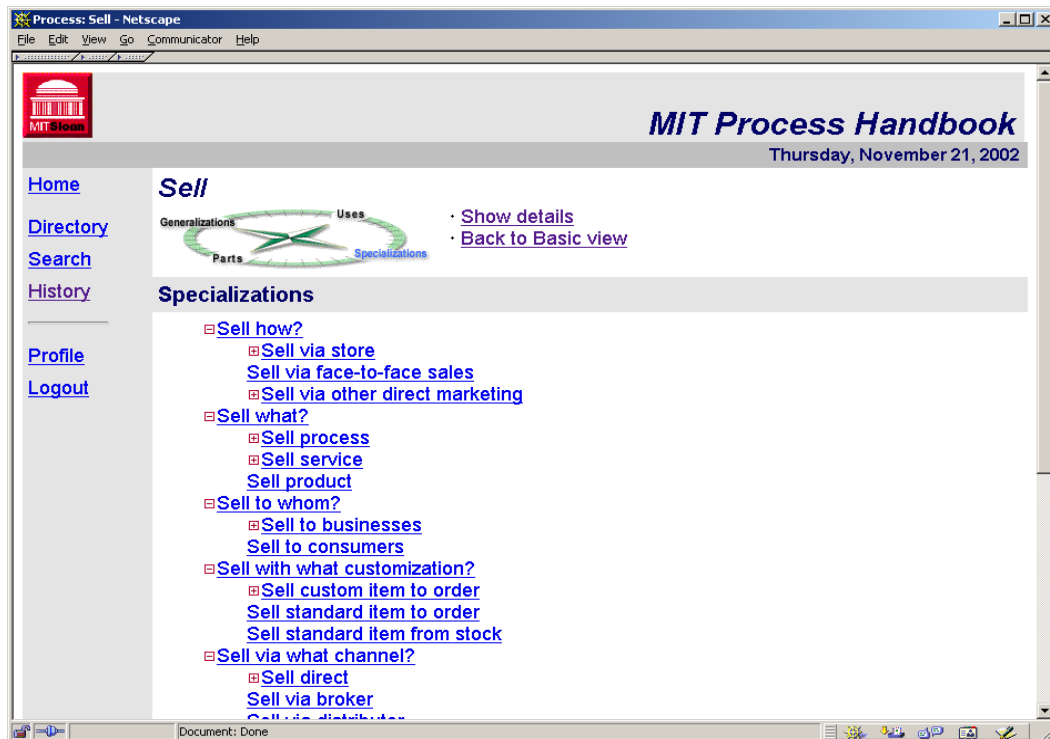


Figure 8.4
Specializations of 'Sell' shown with the compass explorer user interface

The generic models can be used in a number of important ways. First, they can be used as a framework for organizing and grouping many other kinds of business knowledge: case examples, best practices, software tools, contact information for knowledgeable experts, or on-line discussions for communities of practice (e.g., see chapters 15, 16, and 17). Second, they can provide a useful starting point for modeling the specific details of a particular company, process, or software module (e.g., see the chapters in section IV). Third, as a systematic list of process possibilities, they can be used to stimulate new ideas about what is possible that might not have occurred to you otherwise (e.g., see chapters 12 to 14).

The current version of the Process Handbook includes four primary kinds of generic models of business activities: (1) the MIT Business Activity Model, (2) the MIT Business Model Archetypes, (3) a collection of comprehensive business process models developed elsewhere, and (4) models of basic coordination processes.

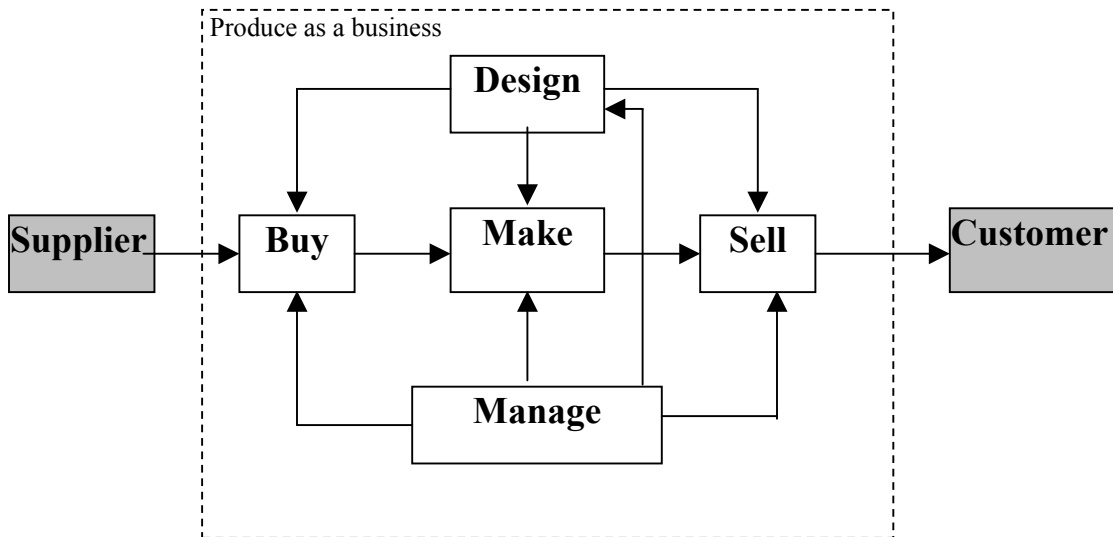


Figure 8.5
The top level of produce as a business in the MIT business activity model

8.4 The MIT Business Activity Model

One of the most important kinds of generic business knowledge included in the Process Handbook is a high-level model of everything that goes on in a business. We call this model the MIT Business Activity Model (BAM). The top level of the model is shown in figure 8.5. The overall activity is called ‘Produce as a business’, and it includes as parts five basic activities that occur-in some form-in most businesses: ‘Buy’, ‘Make’, ‘Sell’, ‘Design’, and ‘Manage’.

As shown in table 8.2, each of these top-level activities, in turn, has subparts. For example, ‘Buy’ includes parts like ‘Identify own needs’, ‘Identify potential sources’, and ‘Select supplier’. Notice that ‘Make’ does not include any subparts because the core “making” activity of a business can vary so widely in different companies and industries. For example, we were unable to find useful subparts of ‘Make’ that would apply in industries as diverse as manufacturing, consulting, leasing, and brokering. However, all the other activities and their subparts appear to be quite general across almost all businesses-large and small, profit and nonprofit-in all industries. To achieve this goal, we have tried to use terms and breakdowns that are generic, enduring, and fundamental, rather than purely arbitrary, current, or industry specific. In other words, we have tried to represent a view of the ‘deep structure’ of business.

In additions to this very generic model, the MIT Business Activity Model also includes a specialization of ‘Produce as a business’ that is called ‘Produce as a typical business’. This model is intended to represent a more detailed view of the things that go on in most large companies, but that might not occur, for instance, in a small grocery store. Our intention here is to still be quite generic, but to focus on activities that are common in, for example, typical large manufacturing companies.

Table 8.2

1. Buy
 - a. Identify own needs
 - b. Identify potential sources
 - c. Select supplier
 - d. Place order
 - e. Receive
 - f. Pay
 - g. Manage suppliers
 - i. Evaluate suppliers
 - ii. Manage supplier policies
 - iii. Manage supplier relationships
 2. Make
 3. Sell
 - a. Identify potential customers
 - b. Identify potential customers' needs
 - c. Inform potential customers
 - d. Obtain order
 - e. Deliver product or service
 - f. Receive payment
 - g. Manage customer relationships
 4. Design
 - a. Identify needs or requirements
 - b. Identify product capabilities
 - c. Develop product and process design
 - i. Develop the characteristics of a product/service
 - ii. Develop the process of producing a product/service
 5. Manage
 - a. Develop strategy
 - b. Manage resources by type of resource
 - i. Manage human resources
 - ii. Manage physical resources
 - iii. Manage financial resources
 - iv. Manage information resources
 - c. Manage learning and change
 - d. Manage other external relationships
 - i. Manage regulatory relationships
 - (1) Manage tax and duty compliance
 - (2) Manage legal compliance
 - ii. Manage competitor relationships
 - iii. Manage societal relationships
 - iv. Manage environmental relationships
 - v. Manage stakeholder relationships
-

Table 8.3

Second level of 'Produce as a typical business' in the MIT Business Activity Model

1. Buy
 - a. (subparts same as in table 8.2)
 2. Make
 3. Sell
 - a. (subparts same as in table 8.2)
 4. Design as a typical business
 - a. Determine customer needs and wants
 - b. Develop offering concept (Typical product design process)
 - c. Develop design with subcomponents
 - d. Modify design
 5. Manage a typical business
 - a. Develop business strategy and organization
 - b. Manage physical resources in a business
 - c. Manage human resources in a business
 - d. Manage information in a business
 - e. Manage financial resources in a business
 - f. Manage learning and change in a business
 - g. Manage other external relationships
-

The models of 'Buy', 'Make', and 'Sell' are identical here to those in 'Produce as a business'. But 'Design' and 'Manage' are represented by more specialized activities and a more detailed breakdown of subparts. The first level of these breakdowns is shown in table 8.3, but each of the subparts of 'Design' and 'Manage' shown in table 8.3 also has an even more detailed breakdown. In most cases, the more detailed breakdown includes one or two additional levels; in a few, it includes three.

8.5.1 Desirable Characteristics of the MIT Business Activity Model

Of course, there are many ways to categorize and organize business activities. We certainly don't believe that our approach is the only way, or even the only good way, of doing so. But our approach does have at least three desirable and important characteristics: it is *comprehensive*, it is *intuitively appealing*, and it is *theoretically based*.

Comprehensive In developing the MIT Business Activity Model, we drew upon the informal knowledge of dozens of MIT students, faculty, researchers, and corporate sponsors. We have also repeatedly tested the model by using it to classify new case examples, student projects, and other process models. Many of these examples are no longer included in the general versions of the Process Handbook because we did not feel they were of general interest, but they contributed to our experience in refining the model.

In addition, as described later in section 8.7, we sought out, analyzed, and explicitly cross-referenced a number of other comprehensive models of business processes. Based on all this experience, we believe that all the important things that go on in business can be “naturally” classified into one of the subparts of the MIT BAM. While such judgments are necessarily somewhat subjective, we feel that all our experience taken together provides substantial evidence for the claim that the MIT BAM is a comprehensive model of business activities.

Intuitively Appealing A judgment that something is “intuitively appealing” is also subjective, and we have not systematically tested people’s reactions to the categories used in the MIT BAM. However, our impression after working with dozens of students, researchers, and others is that many people find the terminology and breakdown of activities in the model to be logical and understandable.

In addition to being understandable, the structure of the model has other intuitively appealing features. For instance, as shown in figure 8.6, there is a “pleasing” symmetry between the breakdown of activities in the ‘Buy’ activity and those in the ‘Sell’ activity. Each of the subactivities in buying and selling has a natural mapping to a corresponding subactivity in the opposite activity. There is a close relationship, for example, between the buyers’ activity of placing an order and the sellers’ activity of obtaining an order.

Many business process models are based primarily on descriptions of current processes in typical companies, and they therefore give more emphasis to activities that

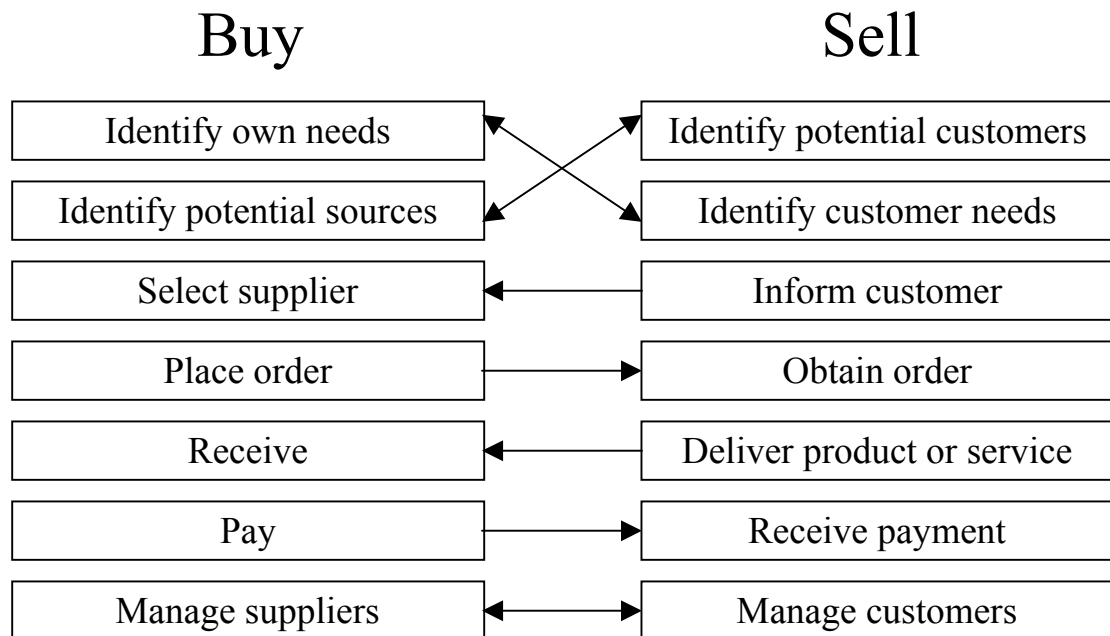


Figure 8.6
The subparts of ‘Buy’ and ‘Sell’ in the MIT business activity model have an intuitive correspondence with each other.

currently require more resources or attention. In the same spirit we have tried to create breakdowns of activities that emphasize important activities. But, unlike many process models, we have also tried to create activity breakdowns that are compelling from a purely logical point of view. For instance, we believe that from a purely logical point of view, it is hard to imagine how anyone could buy or sell anything without somehow doing the activities shown in figure 8.6. This therefore gives us more confidence that we have truly captured a view of the “deep structure” of these activities.

Theoretically Based Another appealing property of the MIT Business Activity Model is that it is based on a theoretical analysis of business from the perspective of coordination theory. In the next section we show how the top-level model (shown in figure 8.5) can be “derived” step by step from a consideration of the basic dependencies that need to be managed in a business.

8.5.2 Deriving the MIT Business Activity Model Using Coordination Theory

To “derive” the MIT Business Activity Model, we begin with one of the simplest possible views of the activities in a business (shown in figure 8.7). We start by assuming that the business consists of only one activity (called ‘Make’), and that this activity involves producing whatever product or service the business sells to a Customer. We also assume that the ‘Make’ activity uses some inputs from another activity (which we call a Supplier). Using the terminology of coordination theory, we can say that this figure includes two dependencies: a “flow” dependency from the Supplier to the ‘Make’ activity, and a “flow” dependency from the ‘Make’ activity to the Customer.

Coordinating the Flow Dependencies: Buy and Sell From the perspective of coordination theory, whenever there is a dependency between two activities there is an opportunity (often a need) to manage it. In this case, the two flow dependencies shown in figure 8.7 need to be managed. In the case of a business, we can call the

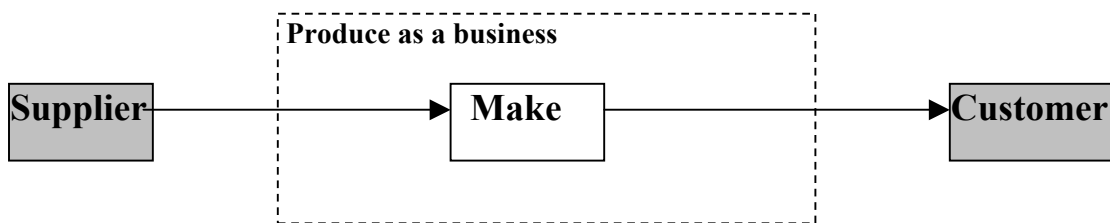


Figure 8.7
One of the simplest possible views of the activities in a business

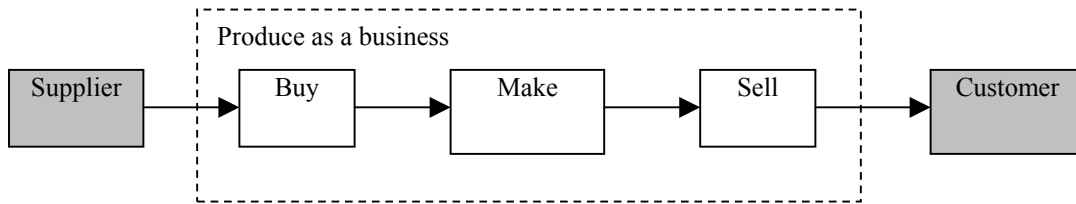


Figure 8.8

'Buy' and 'Sell' activities are needed to manage the input flows and the output flows, respectively

coordination activities that manage these two dependencies 'Buy' and 'Sell', respectively. That is, we can view the buying activity as a way of managing the flow of inputs needed to make whatever the business makes, and we can view the selling activity as a way of managing the flow to the customer of whatever the business makes. Adding these two coordination activities results in the diagram shown in figure 8.8.

It is important to realize, by the way, that the arrows shown in these figures should not necessarily be interpreted as simple one-way flows. In managing the flow dependencies from 'Make' to the Customer, for example, the 'Sell' activity may involve a very complex pattern of two-way communication and flows of products and money. All these lower-level flows, however, are summarized in the diagram by the one-directional arrows that represent the overall flow of the product from the 'Make' activity to the Customer.

Coordinating the Fit Dependency: Many typical process diagrams are flowcharts that show only the flow dependencies in a process. Coordination theory identifies two other types of dependency: fit and sharing. A fit dependency occurs when more than one supplier produces a single resource. In this case there is a fit dependency among all the different activities involved in producing the product or service that is sold to the customer: the results of the different subparts of the 'Make' activity need to fit together, the 'Buy' activity needs to buy inputs that will work together, and the 'Sell' activity needs to be selling what is actually being made using these inputs.

A business needs to somehow manage this complex fit dependency, and we call the activity that does so 'Design'. Figure 8.9 shows the results of adding this activity to the diagram.

Coordinating the Sharing Dependencies: Manage From a coordination perspective there is one more type of critical dependency between the activities shown in figure 8.9. That is the sharing dependencies among all the activities. The activities shown in figure 8.9 have to share resources like money, people, information, and physical

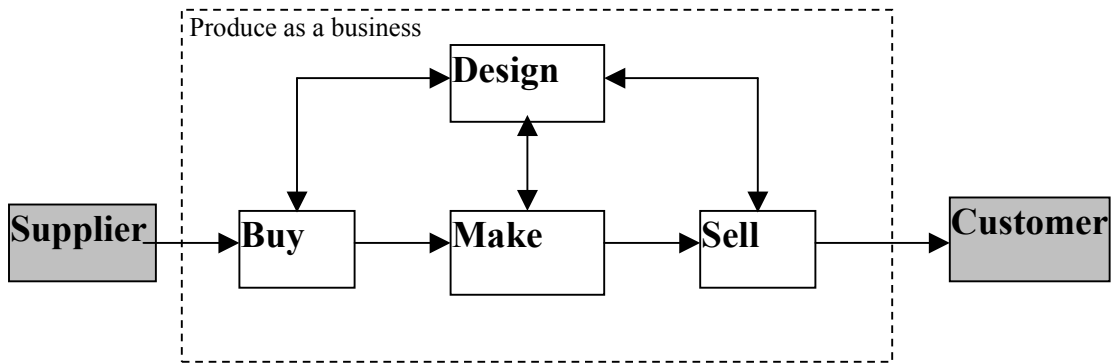


Figure 8.9
 'Design' activity is needed to manage the fit dependency between the different activities that collectively produce the product a customer buys.

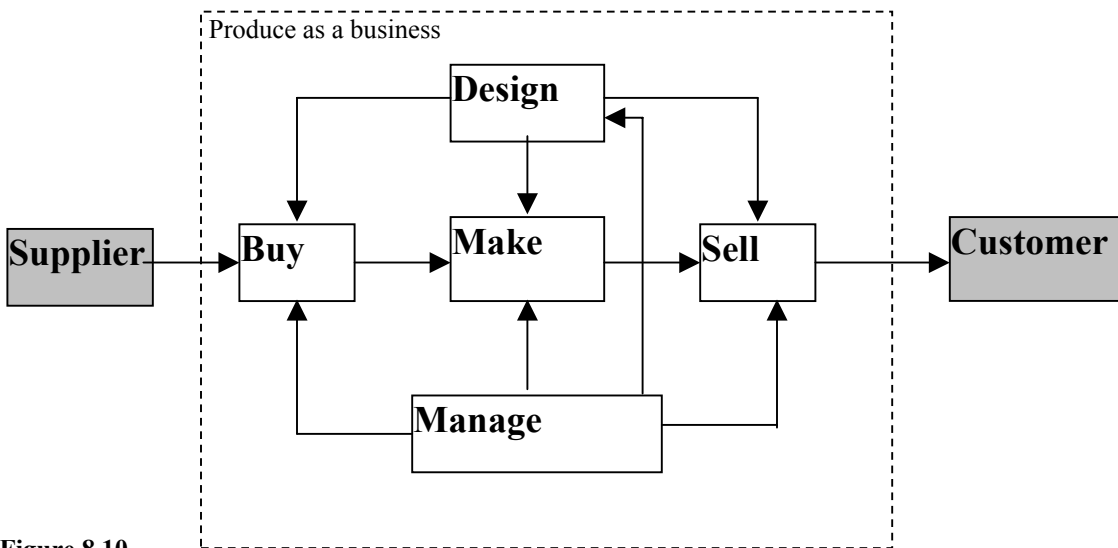


Figure 8.10
 'Manage' activity is needed to manage the sharing dependencies among all the other activities.

facilities. Any business needs to somehow manage all these sharing dependencies, and we call the coordination activity that does so 'Manage'. Figure 8.10 shows the results of adding this final key activity to our basic business activity model.

Deriving the MIT Business Activity Model: Summary This, then, is the derivation of the MIT Business Activity Model from a coordination perspective: the 'Buy', 'Make', and 'Sell' activities manage the flow dependencies in the company's supply chain. The 'Design' activity manages the fit dependencies among the activities that create different parts of the company's product. And the 'Manage' activity manages the dependencies for sharing key resources among all the other activities in the company.

Of course, the MIT Business Activity Model is not the only way to categorize the activities in a business, but the fact that the MIT model can be theoretically derived

from the principles of coordination theory provides one additional piece of evidence for its desirability.

8.6 MIT Business Model Archetypes

In addition to the MIT Business Activity Model, the Process Handbook also includes a set of six different business model archetypes that companies can use. Our hypothesis is that all the different business models companies use can be naturally classified into one of these six types or some combination of them. We call these six models the MIT Business Model Archetypes (for a more detailed description of these models and how they were derived, see Herman, Malone, and Weill 2002).

We define a business model as consisting of two parts: (1) what a business does and (2) how the business makes money from its activities. For example, the traditional part of General Motors' business model is to make and sell automobiles and to make money from the difference between the costs of making the cars and their sales prices. We call this business model a Creator. Walmart, by contrast, distributes products they don't make, and makes money from the difference between what they pay for the products and what they sell them for. We call this business model a Distributor.

Figure 8.11 shows the six different models classified according to the two dimensions that distinguish them: what is sold and how much the inputs are transformed. The definitions of the different models are as follows:

What is sold?	How much transformation of inputs?		
	Lot	Little	None **
Ownership of asset*	Creator	Distributor	Broker
Use of asset*	"Landlord"		
Human effort	Contractor		
Human attention	"Attractor"		

Figure 8.11

MIT business models archetypes (from Herman, Malone, and Weill 2002). "Asset" can be physical, informational, or financial. "None" means broker never takes ownership of what is sold.

1. A *Creator* buys raw materials or components from suppliers and transforms or assembles them to create a product (or service) sold to buyers. The product or service may be physical, informational or financial (e.g., an insurance policy). This business model is common in industries like manufacturing and construction.
2. A *Distributor* buys a product and resells the product to someone else. The Distributor may provide additional value by, for example, transporting or repackaging the product, or providing customer service. This business model is common in wholesale and retail trade.
3. A *Broker* facilitates sales by matching buyers and sellers. A Broker may also provide advice to either or both parties. Unlike a Distributor, a Broker does not take possession of the product being sold. The Broker receives a fee from the buyer, the seller, or both. Often this fee is in the form of a commission based on a percentage of the sale price or on volume. This business model is common in a number of industries, such as real estate brokers, stockbrokers, and insurance brokers.
4. A *Landlord* sells the right to use, but not own, an asset. The asset may be a location (e.g., a hotel room, apartment, or amusement park), an event (e.g., a concert), or equipment (e.g., a rental car or recording studio). Depending on the kind of asset, the payments by customers may be called “rent,” “lease,” “admission,” or other similar terms. This business model is common in industries like real estate rental and leasing, accommodation, arts, entertainment, and recreation.
5. A *Contractor* sells a service provided primarily by people, such as consulting, construction, education, personal care, and healthcare. Payment is in the form of a fee for service, often (but not always) based on the amount of time the service requires. Most services involve a combination of both people and nonhuman assets, but if the service being sold involves more nonhuman assets than people, the business model is classified as a Landlord rather than a Contractor.
6. An *Attractor* attracts people’s attention by providing things like television programs or web content and then “sells” that attention to advertisers. The attractor may devote significant effort to creating or distributing the things that attract attention, but their source of revenue is from the advertisers who pay to deliver a message to the audience that is attracted. This business model is common in radio and television broadcasting, some forms of publishing, and some Internet-based businesses.

Of course, many real businesses include some combination of these six business model archetypes, but our experience so far suggests that these models can be used to classify all the different combinations that exist in reality. In a related project (see Herman, Malone, and Weill 2002), we have so far classified over 500 companies

(including over 450 of the Fortune 500) according to the combinations they use of these six business model archetypes. In addition the Process Handbook includes over 200 innovative ebusiness case examples classified according to these categories.

These different business models are included in the Process Handbook as specializations of ‘Produce as a business’ in a bundle called ‘Produce with what business model?’

8.7 Comprehensive Models of Business Processes Developed Elsewhere

In addition to the MIT Business Activity Model and Business Model Archetypes, the Process Handbook also includes a number of other models of business processes developed by other organizations. We have certainly not included all such models, but we believe we have included a representative sample of some of the most comprehensive and well-known alternative models of business processes.

Each of these other models represents a different way of grouping some (or all) of the same physical activities as those included in ‘Produce as a business’. Therefore most of these other models are classified as specializations of ‘Produce as a business’ in a “view” bundle (called ‘Produce as a business-views’).

In addition we have systematically and explicitly cross-referenced several of these other models to the MIT Business Activity Model (BAM) by categorizing all their subparts as specializations of some subpart of the MIT BAM. For example, the International Benchmarking Clearinghouse’s Process Classification Framework includes an activity called ‘Understand markets and customers’. We have classified this activity in the Process Handbook as a specialization of ‘Identify potential customers’ needs’, one of the subparts of ‘Sell’ in the MIT BAM.

By this approach our framework is able to accommodate many different, even contradictory, views of the same basic activities. In contrast to our approach, most previous approaches to classifying business processes are much more rigid, requiring people to use only a single view of the activities. We believe this flexibility of our approach is another one of its advantages.

8.7.1 International Benchmarking Clearinghouse Process Classification Framework

The first, and most comprehensive, alternative model included in the Process Handbook is the Process Classification Framework (PCF) developed by the International Benchmarking Clearinghouse (IBC, part of the American Productivity and Quality Center). The IBC worked with Arthur Andersen and over 80 other organizations to develop this framework in the early 1990s.

The top level of the PCF framework includes 13 activities, such as ‘Understand markets and customers’, ‘Develop vision and strategy’, and ‘Design products and services’. Most of these activities are broken down into two levels of subparts, and a few go down three levels. For instance, the lowest level under ‘Understand markets and customers’ includes activities like ‘Conduct customer interviews’, and ‘Conduct focus groups’. The PCF includes a total of 271 activities in all.

8.7.2 Supply Chain Operations Reference (SCOR) Model

The Supply Chain Council, a trade association of over 400 companies interested in supply chain management (see www.supply-chain.org) developed a model called the Supply Chain Operations Reference (SCOR) model. The top level of this model includes four key activities to represent a company’s supply chain: ‘Plan’, ‘Source’, ‘Make’, and ‘Deliver’.² These activities are broken down into subparts, in most cases down to two additional levels. For instance, the ‘Source’ activity, includes a subpart called ‘Source stocked materials’, which, in turn, includes subparts called ‘Schedule material deliveries’, and ‘Receive and verify material’. The SCOR model also includes standard process definitions, standard terminology, standard metrics, supply chain best practices, and references to enabling information technology. This model includes a total of 215 activities.

8.7.3 Lean Enterprise Manufacturing Model

The Lean Enterprise Manufacturing model was developed by the Lean Aircraft Initiative consortium led by MIT. The portion of the model included in the Process Handbook focuses on the “enabling practices” and metrics that help to promote a “lean” approach to product and process design and manufacture. For instance, it includes high-level activities like ‘Identify and optimize enterprise flow’ and ‘Nurture a learning environment’. The Process Handbook includes a total of 72 activities from this model.

8.7.4 European Foundation for Quality Management (EFQM) Model

This model was developed by the European Federation for Quality Management to help organizations assess their progress along a path to excellence. The portion of the model included in the Process Handbook includes activities in five categories: leadership, people management, policy and strategy, resources, and processes. For

2. The MIT Process Handbook includes version 3.0 of the SCOR model. As of this writing, a later version (5.0) is now available from the Supply Chain Council and has been included in the Phios version of the Process Handbook. This later version adds another activity, ‘Return’, at the top level of the model.

instance, People management includes activities like ‘Plan resources’, ‘Develop resources’, and ‘Review performance’. This model includes 30 activities in the Process Handbook.

8.7.5 Xerox Management Model

As part of their extensive quality improvement program Xerox Corporation developed a comprehensive model of their operational process, and this model is included in the Process Handbook. For instance, it includes a high-level activity called ‘Time to market’ representing the design process and another one called ‘Integrated Supply Chain’ representing the manufacturing and related supply chain activities. Each of these high-level activities is broken down to one more level. For example, ‘Integrated Supply Chain’ includes subparts like ‘Acquire materials’ and ‘Manage inventories’. This model includes 51 activities in the Process Handbook.

8.7.6 Textbook Models

In addition to models developed by other organizations, we have also included representative models from two well-known business school textbooks in marketing and product design.

The marketing textbook we used is Marketing Management by Philip Kotler. We included Kotler’s view of marketing as an alternative “view” (or specialization) of ‘Sell’. It includes top-level activities like ‘Analyze markets’ and ‘Implement market strategy’. ‘Analyze markets’, in turn, includes subparts like ‘Analyze market environment’ and ‘Analyze industry/competitors’. A total of 17 activities are included in the Process Handbook for this activity.

The product design textbook we used was New Product Design by Steven Eppinger and Karl Ulrich. We used this textbook to create a new specialization of the ‘Design’ activity from the MIT Business Activity Model. This new specialization is called ‘Design product {Ulrich/Eppinger by phase}’ and is classified in a bundle called ‘Design-views’. This view focuses on the design of engineered, discrete manufactured products. The five top-level activities in this model are ‘Concept development’, ‘System level design’, ‘Detail design’, ‘Testing and refinement’, and ‘Production ramp up’. Most of these activities have one to three further levels of subparts. For instance, ‘Concept development’ includes subparts like ‘Identify customer needs’ and ‘Establish target product specifications’. This model includes a total of 74 activities in the Process Handbook.

Of course, there are vast numbers of other business textbooks that could, in principle, be included in a repository like this one. We selected these two examples to

illustrate the possibilities, in part because they both included explicit frameworks that could be easily interpreted as activity models.

8.8 Models of Coordination Processes

The final type of generic business activity model in the Process Handbook includes models of different kinds of coordination processes. Since we define coordination as the “management of dependencies among activities” (see chapter 1) the “root” of all this knowledge is an activity called ‘Manage dependency’.

The three basic types of dependencies (described in chapter 1) give rise to the first three specializations of the ‘Manage dependency’ activity: ‘Manage flow’, ‘Manage sharing’, and ‘Manage fit’. In addition the three subparts of managing flow dependencies give rise to three more specializations of ‘Manage dependency’. They are called ‘Manage prerequisite’, ‘Manage accessibility’, and ‘Manage usability’.

Each of these six types of coordination, in turn, has a number of “bundles” which contain further specializations of these generic coordination processes. For instance, ‘Manage sharing’ includes bundles like ‘How is sharing managed?’ ‘What kind of resource is being shared?’ and ‘When is sharing managed?’ Within these bundles are various kinds of sharing mechanisms such as ‘Manage by manager decision’, ‘Manage by market’, and ‘Manage by chance (lottery)’.

In some cases these generic coordination mechanisms even include further specializations that describe specific examples. For example, ‘Manage by market’ includes a specialization called ‘Manage recruiter time by market bidding’ that was added as part of our project about new ways to do hiring (described in chapters 1 and 12).

Much more information about coordination theory is included in section II and detailed descriptions of some of the specific kinds of coordination knowledge included in the handbook are provided in chapter 3.

8.9 Case Examples

One of the most important uses of repositories like the Process Handbook is to help people organize and share examples of innovative or otherwise interesting business case examples. For instance, these repositories can include “best practices,” “typical practices,” and even instructive examples of “bad practices.” They can include cases for benchmarking, for business school classes, and for consulting firm practice development. Organizing case examples in this way can help you find relevant

examples more easily than with, for example, keyword searches, and it can help you easily find and compare examples that have deep similarities, even if the words used to describe the cases are very different.

To illustrate these possibilities, the Process Handbook already includes hundreds of case examples of business activities in specific companies. These case examples were developed by students, faculty, and staff at the MIT Sloan School of Management; students at the London Business School; and staff at Phios Corporation. In most cases these examples were based on previously published descriptions from business journals, magazines, and newspapers. In a few cases the examples were based on original field research in the companies described.

Most of the case examples currently included in the Process Handbook fall into one of three main categories:

1. *Supply chain examples.* The Process Handbook currently includes over 100 case examples of interesting or innovative supply chain practices. For instance, it includes examples like Cisco's use of their corporate intranet for electronic purchasing and Toyota's use of narrowing sets of design possibilities to enhance concurrent engineering.

2. *Hiring examples.* As part of our project to develop innovative ideas for hiring (described in chapters 1, 12, and 13), we added a number of case examples of hiring practices used in different companies. For example, the Process Handbook includes descriptions of Cisco's use of focus groups of current employees to help target on-line recruiting ads, and Marriott's use of automated telephone screening of job candidates. There are approximately 50 of these case examples.

3. *Innovative eBusiness examples.* During the peak of the eBusiness boom, we entered over 400 case examples of innovative uses of eBusiness concepts. These examples include all 70 finalists in the MIT eBusiness Awards program for two years, as well as a number of other examples from other sources. For instance, the Process Handbook includes descriptions of Amazon.com's electronic book distribution and eBay's electronic auctions. To illustrate what these examples look like, an excerpt of the Amazon.com example is shown in figure 8.12.

These eBusiness examples are all organized into the business model categories above (Creator, Distributor, etc.) and thus provide some interesting comparisons across industries. For example, this organization puts Mattel and Dell close together as Creators that allow their end customers to configure their products, even though Barbie dolls and computers are in very different industries.

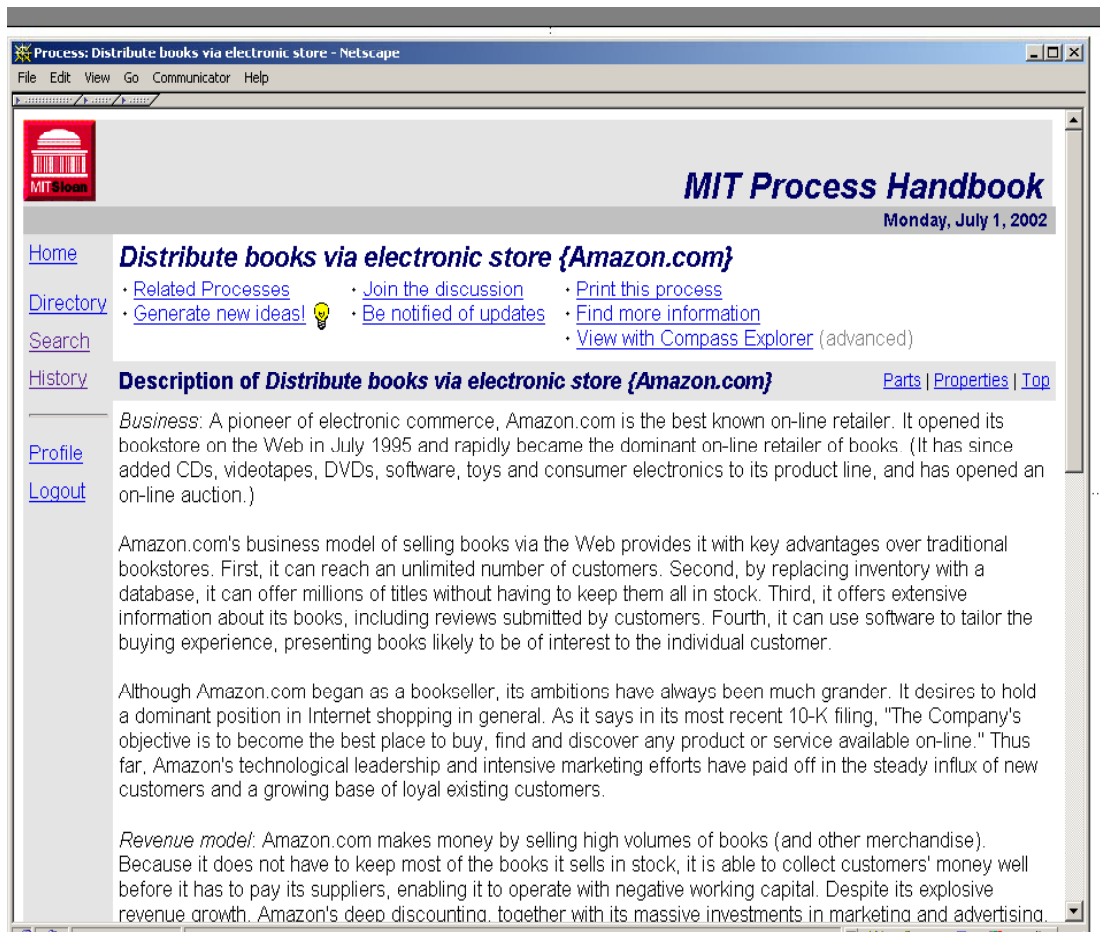


Figure 8.12

Sample case example describing the way [Amazon.com](http://www.amazon.com) distributes books via the Internet.

8.9.1 Updating the Database of Case Examples

We believe that most of the current content of the Process Handbook (e.g., the generic business activity models and the classification structure) has enduring value over long periods of time. It is unlikely, for example, that significant new forms of business will be invented that do not involve some form of buying and selling.

But other parts of the Process Handbook, especially the case examples, have much shorter “half-lives” of usefulness. A number of the companies whose eBusiness case examples we entered a few years ago, for instance, have already gone out of business. In some of these companies there is still value in seeing the basic ideas and, perhaps, the lessons to be learned from their failures. But the value of a topical database of case examples depends critically on it being continually updated.

8.10 Classification Structure for Activities

It would be possible to use the generic kinds of business knowledge and the case examples we have already discussed without any further categorization. If one wants to find knowledge about a particular business function, for example, one could just find that business function in the MIT Business Activity Model and then look at its specializations. Or one could do conventional searches of the knowledge base using names, keywords, or other dimensions like date, company, industry, and so forth.

It is also useful for human editors to be able to manually group Process Handbook entries in various ways to help readers find the things they want. We call such linkages navigation links, and the Handbook includes a number of them. For instance, there is a group of links to “eBusiness Case Examples” that occur in various parts of the Handbook, and there are other manually created links to examples of various business functions (e.g., Procurement, Supply Chain Management, and Marketing). All these conventional ways of organizing and searching the Process Handbook are certainly useful.

But some of the most powerful and interesting capabilities of the Process Handbook require more extensive use of the specialization hierarchy. For example, finding other entries that are “like” a given entry (as shown in figure 8.2c) or finding “distant analogies” (as described in chapter 12) depends on having the entries classified in a “family tree” of increasingly general types of activities. These capabilities of the Process Handbook work only on activities that are classified in useful ways in the specialization hierarchy. Therefore, to take full advantage of these capabilities, it is desirable to have as many entries as possible classified in the specialization hierarchy.

To make this as easy as possible, the Process Handbook includes an extensive classification structure for the specialization hierarchy. This classification structure (including over 3,000 activities) provides “logical” places for you to classify any business activity whatsoever. In fact, at its most general levels, this structure can even be used to classify any activities, whether or not they involve business.

To see how this structure works, let us start with an example of the ‘Sell’ activity we saw in section 8.3. Figure 8.13 shows all the direct and indirect generalizations of this activity (all its “ancestors” in the specialization hierarchy). This figure uses the Compass Explorer view, which shows more information than the standard view in figure 8.2c, and shows the information in a different format.

Since ‘Sell’ has two generalizations (‘Exchange’ and ‘Provide’), two complete generalization paths for ‘Sell’ are shown in the “Ancestors” part of the figure. The first path, for example, shows that ‘Sell’ is a specialization of ‘Exchange’ (with ‘Sell’ being in the bundle called ‘Exchange how?’). ‘Exchange’, in turn, is a specialization of

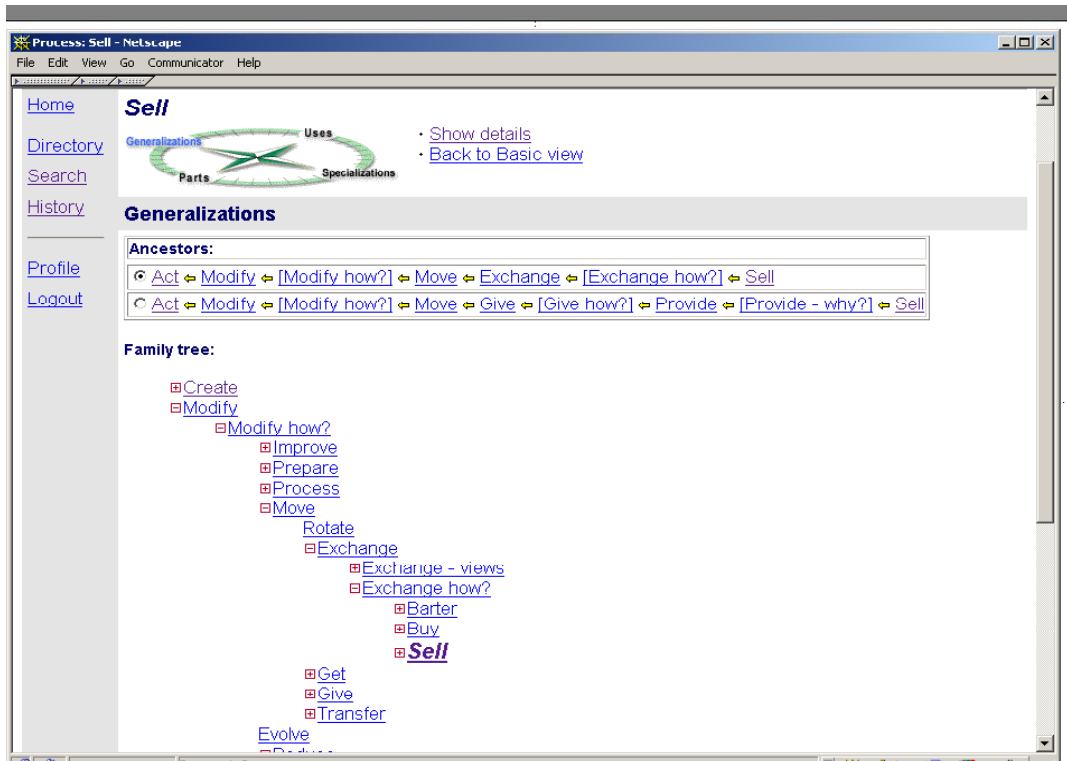


Figure 8.13

Generalizations of ‘Sell’ (shown in the compass explorer view). The “Ancestors” part of the figure shows the direct and indirect generalizations of ‘Sell’. The “Family tree” part of the figure also shows some of the other relatives of ‘Sell’ in the specialization hierarchy.

‘Move’, and ‘Move’ is a specialization of ‘Modify’ (in the ‘Modify how?’ bundle). And, finally, ‘Modify’ is a specialization of ‘Act’. ‘Act’ is the most general activity of all. All the activities in the entire Process Handbook are either direct or indirect specializations of ‘Act’.

But if ‘Act’ is the “root” of all activities, what is the next level of specialization below ‘Act’? Are there hundreds of different kinds of activities at the next level? We have actually organized the entire Process Handbook with only nine entries at the next level. We call all but one of these entries “generic verbs.”

8.10.1 The Generic Verbs

Figure 8.14 shows the next level of specializations of ‘Act’. The first eight of these entries are generic verbs: ‘Create’, ‘Modify’, ‘Preserve’, ‘Destroy’, ‘Combine’, ‘Sepa-

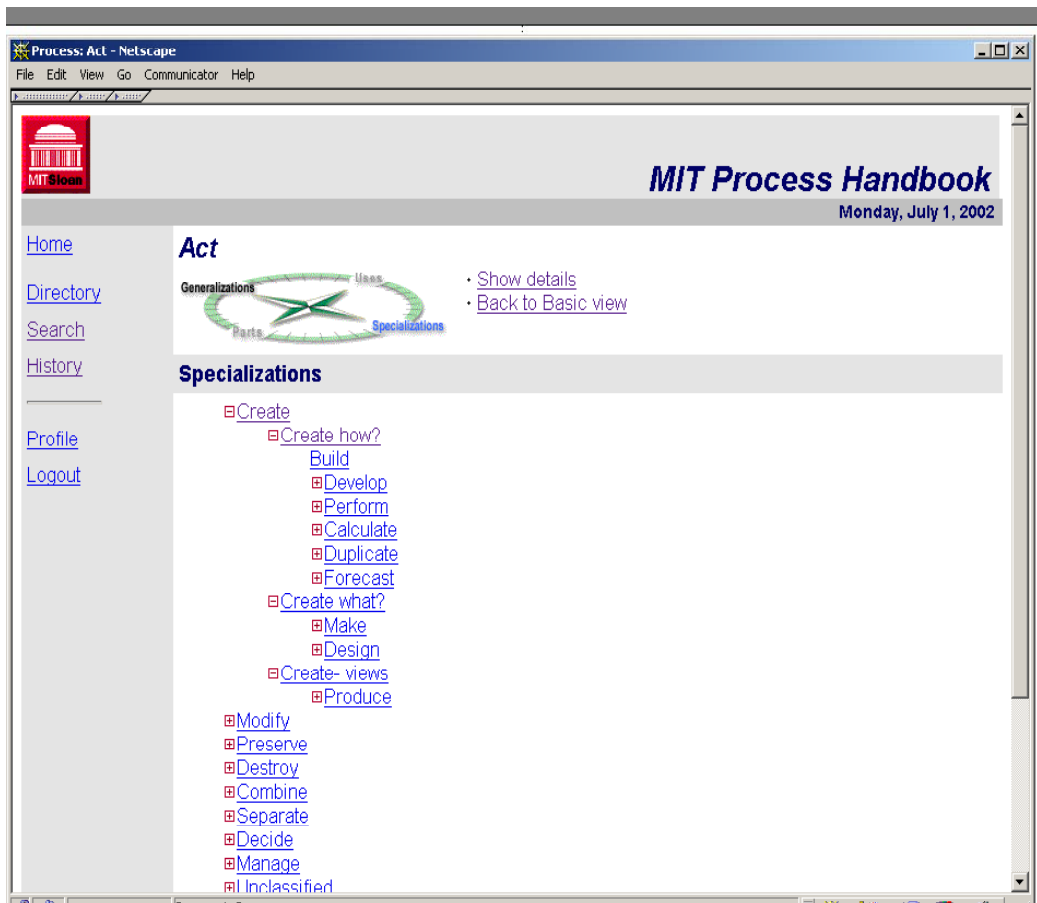


Figure 8.14

First-level specializations of ‘Act’ (shown in the compass explorer view). The next two levels of specialization under ‘Create’ are also shown here.

rate’, ‘Decide’, and ‘Manage’. The first four (‘Create’, ‘Modify’, ‘Preserve’, and ‘Destroy’) are actions that can occur for any object. The next two (‘Combine’ and ‘Separate’) are actions that can occur when multiple objects are involved. And the final two verbs (‘Decide’ and ‘Manage’) are informational actions that could have been included under the earlier verbs but that are given special emphasis here because of their importance in business. The last entry ‘Unclassified’ is simply a place to put entries that the author doesn’t want to classify further (or which will be further classified at a later time). All these entries have many more levels of specialization. To illustrate what these further levels of specialization look like, the next two levels of specialization under the first entry, ‘Create’, are shown expanded in the figure.

8.10.2 Desirable Characteristics of the Generic Verbs

Where did these eight generic verbs come from? Is this the only way to organize a repository like ours? Why should things be organized this way? We don't think that this is the only possible way to organize a repository like ours, but we believe this organizational structure has the same desirable characteristics we discussed earlier in section 8.5.1: it is *comprehensive*, it is *intuitively appealing*, and it is *theoretically based*.

Perhaps the best way to see how the framework has these characteristics is to consider the process by which we developed the framework. We began by searching widely in the literature of linguistics, philosophy, library science, computer science, and elsewhere for an existing taxonomy of actions that we could use. We were unable to locate any existing taxonomy that seemed suitable for our purposes: comprehensive, parsimonious, broadly understandable, intuitively appealing, and potentially relevant to business.

We therefore embarked on the task of developing our own such taxonomy. Our first step was to find a comprehensive list of actions that would need to be encompassed by our taxonomy. To do that, Jintae Lee (a member of our project team) located and searched an extensive on-line dictionary (more precisely, a "lexical database") called Wordnet that was developed by cognitive scientist George Miller and others at Princeton University (see <http://www.cogsci.princeton.edu/-wn/>). Lee analyzed the dictionary to find all the verbs that did not have any generalizations ("hypernyms") shown. This resulted in a list of about 100 to 200 verbs.

All the other verbs in the dictionary had generalizations, so they were all-directly or indirectly-specializations of the verbs in this list. In a sense, then, this list of 100 to 200 verbs subsumed all the verbs in the English language represented in this on-line dictionary.

We next took this list and reduced it further by removing all the verbs that seemed to us to be direct specializations of other verbs already there. In other words, we removed words for which we felt a generalization had incorrectly been omitted in the on-line dictionary.

Then we continued refining the list of verbs by grouping the remaining verbs into hierarchies with more general verbs subsuming more specific ones. We did not insist, in these cases, that the general verbs be strict generalizations for all the verbs grouped under them, but we tried to make groupings for which there was at least a plausible, intuitive connection. For example, we grouped all the following verbs under 'Create': 'Build', 'Develop', 'Perform', 'Calculate', 'Duplicate', 'Forecast'. All these verbs are, in some sense, ways of creating things.

We continued in this way until we finally arrived at a hierarchical structure with the eight generic verbs shown above as the top level of our hierarchy and the more specialized verbs grouped hierarchically under them. As shown in figure 8.14, for example, the lower-level verbs ('Build', 'Develop', 'Perform', etc.) are now included in the Process Handbook at various levels of specialization below the highest-level generic verbs.

Of course, there was a substantial amount of subjective judgment in this grouping process. Other reasonable people might certainly have made different choices about the details of how to group specific verbs. Even in cases where a given action might be sensibly classified in multiple ways, however, the value of the Process Handbook is not eliminated. You just get the benefits of all the connections that are represented, and not of the ones that are not.

Overall, we feel that this structure provides an intuitive and logical way of grouping all possible actions that can be described in the English language. It thus, of course, includes all actions that can occur in business. We have now used this structure to classify thousands of entries developed by dozens of people, and we believe that all this experience provides substantial evidence that our theoretically based structure is comprehensive and intuitive.

8.10.3 Classifying All the Other Entries in the Process Handbook

To see how the generic verbs can be used to classify even the most detailed actions in business, consider the specializations of 'Create' shown in figure 8.15a. The figure shows how various views and case examples of negotiating contracts are all classified as ways of "discussing"-which is in turn classified as a way of "developing" which is itself classified as a way of "creating." Figure 8.15b shows how Produce as a business is also a specialization of 'Create' through the bundle called 'Create-views'.

As figure 8.15 illustrates, we have, in general, tried to maintain a branching factor of about "7 plus or minus 2" in the specialization hierarchy. This number comes from the psychological study of the limits of human short-term memory,³ but we use it primarily as a rough guideline for editing the Process Handbook. In general, also, we have tried to create logical groupings at each level. We have tried, for example, to create groupings at each level that include alternatives that seem "comparable" to each other and that have roughly equal importance. Wherever possible, we have tried to create groupings that constitute a mutually exclusive and exhaustive partitioning of the possible specializations of that activity.

3. George A. Miller, The magical number seven, plus or minus two: Some limits on our capacity for processing information, *Psychological Review* 63 (1956): 81-97.

To visualize how all the elements of the Process Handbook are connected, recall the metaphor of the Process Compass (as described in chapter 1). From any activity in the repository, you can think about going in any of the four directions shown on the compass: down to the parts of the activity, up to the activities of which this one is a part, right to the specializations of this activity, and left to the generalizations of this activity.

Using this metaphor, you can think of all the actions in the Process Handbook as a vast, interconnected web (see figure 8.16). The most general activity of all, ‘Act’, is at the far left and the next level of generic verbs is just to the right of it. Then the links spread out into a very complicated, tangled web of more and more specialized activities. This web includes, not just the classification structure, but all the business activities represented in the Process Handbook, all the way down, in principle, to even the most detailed things that go on in business.

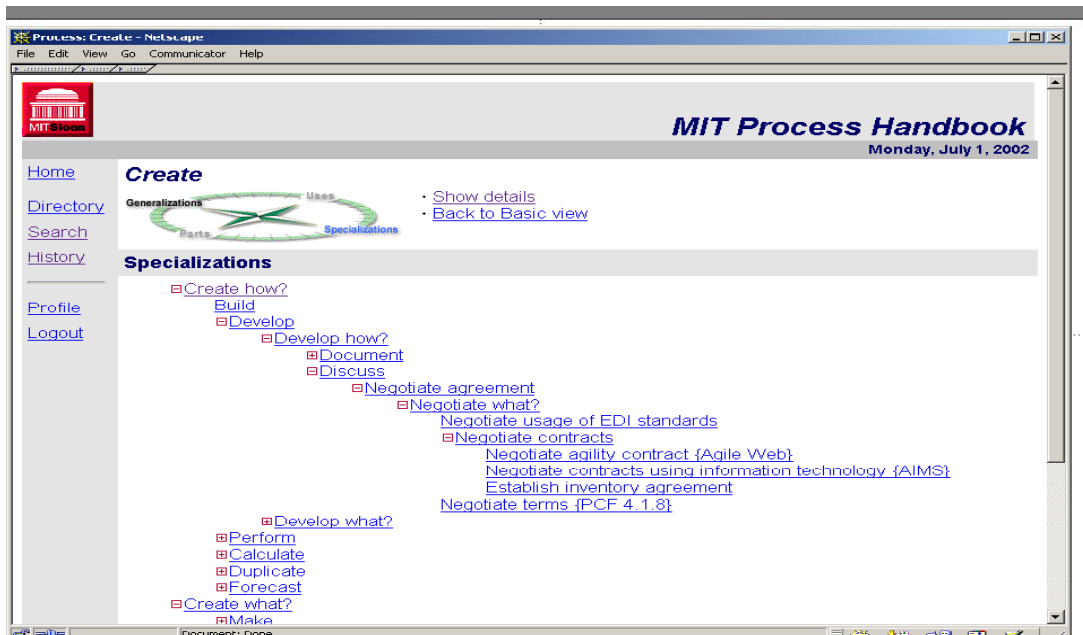
Along the top fringe of the web are the various specializations of ‘Produce as a business’. These entries are at the top because many other things are part of them, but they are not part of anything else.

8.10.4 Naming Conventions for Activities

As you may have noticed in the figures so far, almost all of the activities in the Process Handbook have names that begin with a verb. Most of the activities also include other modifiers or objects as part of their names. Usually these additional parts of the name give information about some dimension of the activity, such as how, who, when, and where.

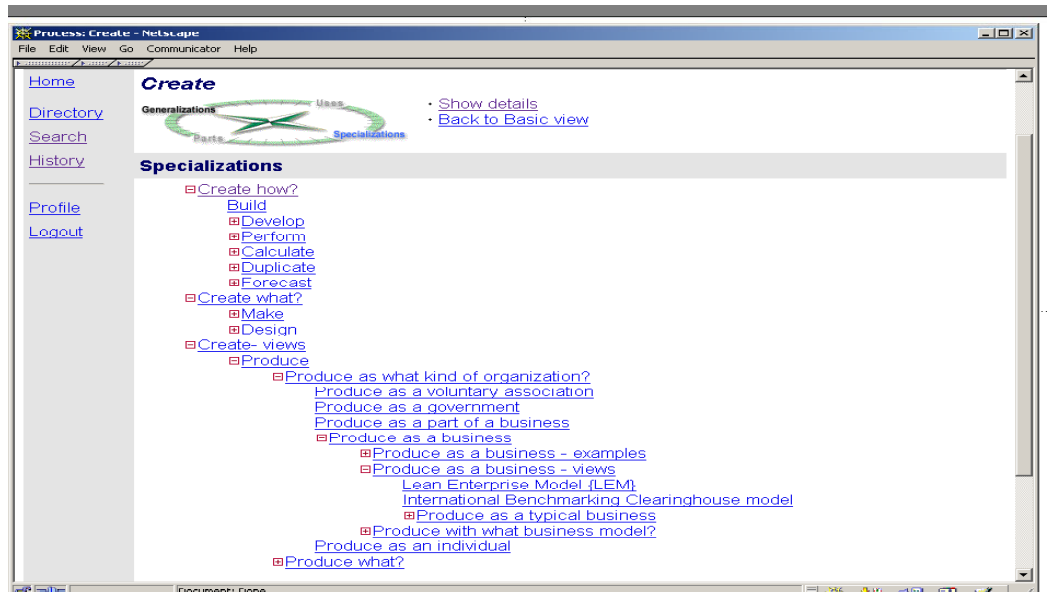
Some of the activities also include a further description in {curly brackets} after the name. We use these bracketed suffixes for several purposes: (1) to represent the names of specific companies in case examples, (2) to give the source of models developed by other organizations (e.g., the Supply Chain Council’s SCOR model), and (3) to distinguish between any other easily confused activities that would otherwise have the same name.

While we have not followed these naming conventions in every single case, we have used them in all cases where we did not see some compelling reason to do otherwise. In general, we have found that these naming conventions are useful for several reasons: First, they result in lists of activities that seem consistent and comparable. Second, they emphasize the action-oriented perspective that is embodied in a structure based on activities. Third, they usually provide enough information in the names of activities shown in a list to allow one to determine which activity to examine in detail.



(a)

Figure 8.15a
Part of the specialization hierarchy below ‘Create’ going all the way down to specific views and case examples of negotiating contracts.



(b)

Figure 8.15b
Part of the specialization hierarchy below ‘Create’ showing ‘Produce’ as a business and some of its specializations.

8.11 Other Kinds of Entries

While we have focused most of our effort on representing various business processes and activities in the Process Handbook, the basic structure of the repository is general enough to include any other kinds of entities authors and editors want to define. In this section we will briefly review several other types of entries included in the Handbook.

8.11.1 Dependencies

As described in chapter 2, dependencies play a central role in coordination theory, and they can be represented in the Process Handbook as shown in figure 8.17. The dependencies are classified as specializations of the three basic dependency types: flow, fit, and sharing.

8.11.2 Resources

Resources are the inputs and outputs of a process. Resources define a dependency, in that a dependency exists when a resource produced by one activity is consumed by another activity.

The Process Handbook currently distinguishes two specific types of resources:

1. *Actors*-resources that perform activities. Actors can be people, organizations, software agents, and so forth. The Process Handbook currently includes a limited taxonomy of actors, including people, organizations, and software agents.

2. *Locations*-places at which activities occurs. The current taxonomy of locations includes physical locations and virtual (cyberspace) locations.

8.11.3 Exceptions

Process models typically describe the “normal” or expected flow of events. In reality, however, there are often complications. During the enactment of a process, deviations from the ideal sequence of events often occur. We call these deviations *exceptions* (Dellarocas, Klein). As described in much more detail in chapters 14 and 16 of this volume, Dellarocas and Klein have developed a taxonomy of exception types

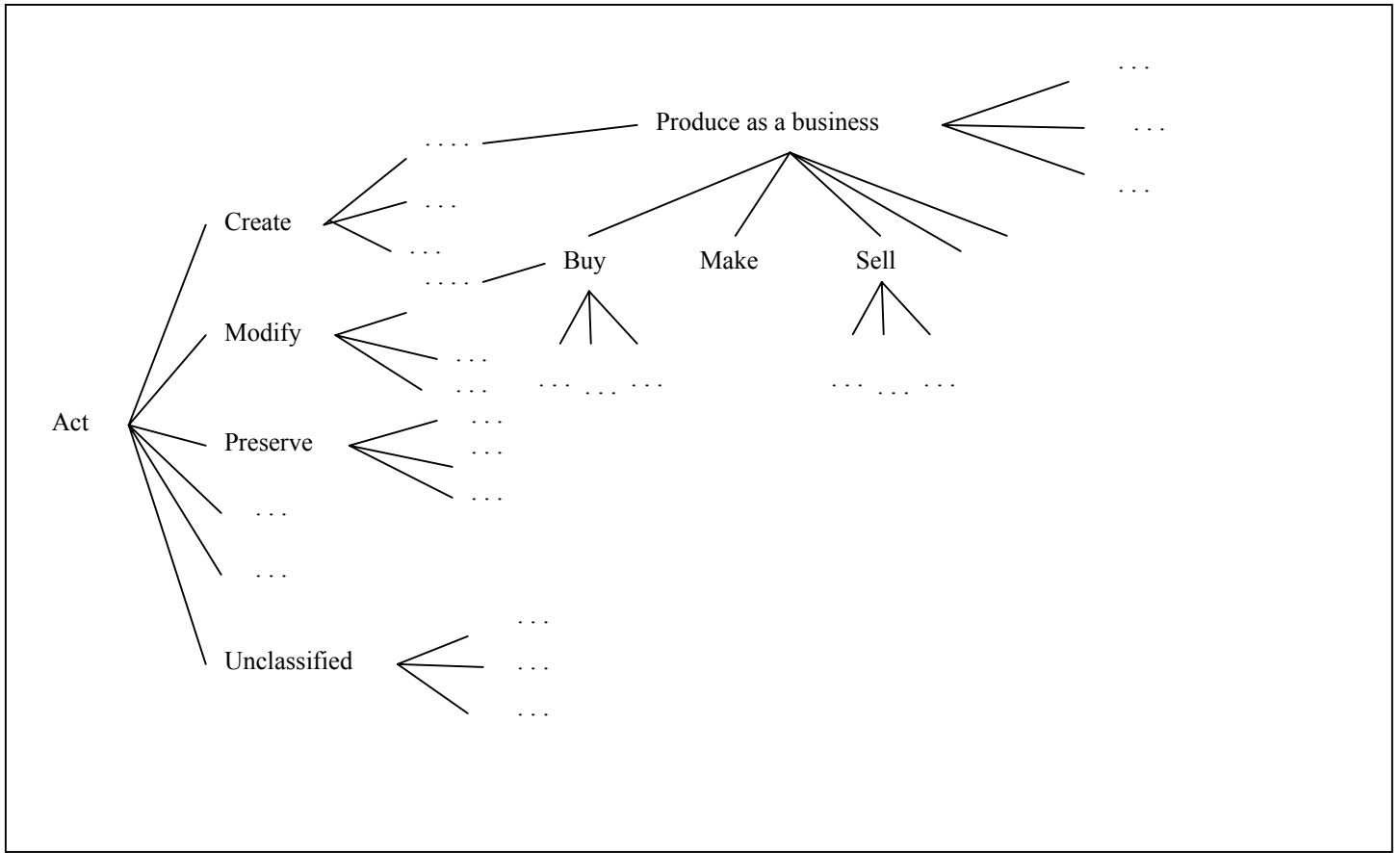


Figure 8.16
Simplified map of the entire network of activities in the Process Handbook

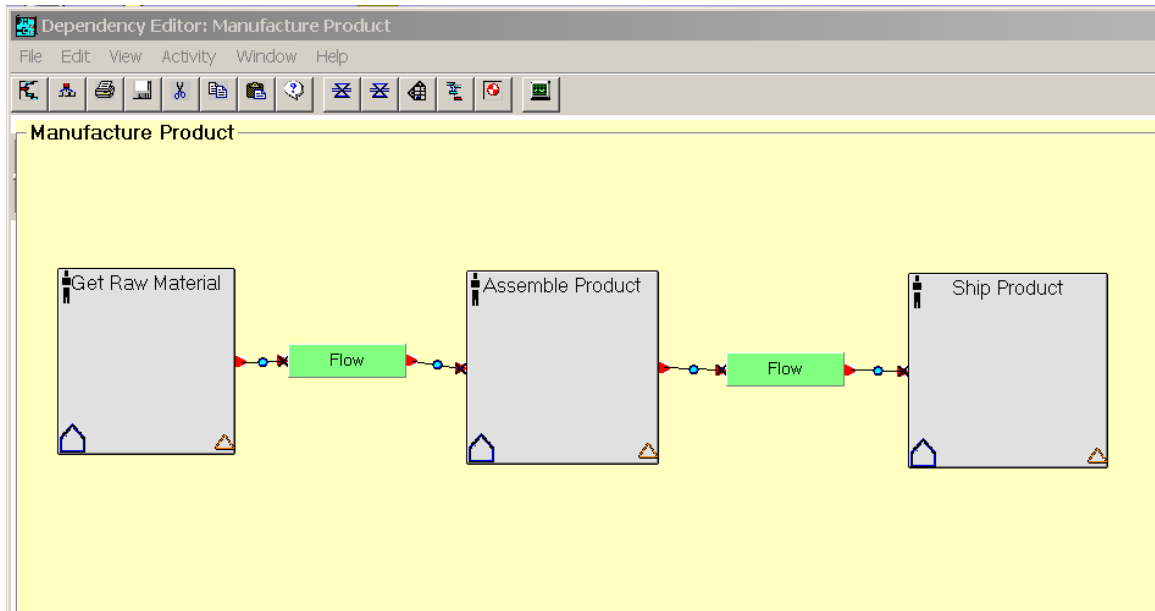


Figure 8.17

Sample dependency diagram showing two flow dependencies connecting three activities in an example of a process to manufacture a product. (This figure is from the “research” version of the Process handbook)

and the ways in which these exceptions can be detected, anticipated, avoided, and/or resolved.

This taxonomy and a variety of tools for using it are included in the research version of the Process Handbook. For example, the Process Handbook can represent a relationship or link between activities and the types of exceptions that are associated with it (“has exception”). In addition exceptions can be linked to the ways in which they can be addressed (“handled by”). This allows for a powerful connection between the ideal process flow, its exceptions and ways to handle those exceptions without “cluttering” up the ideal process flow representations. (See chapter 14 for a more detailed explanation of the kinds of exceptions represented and how they can be used.)

8.11.4 Systems Dynamics Elements

Many process representations tend to be developed to support a “discrete” view of the world—a sequence of activities to perform an iteration of some task. The feedback inherent in a system is not captured in this discrete view. As part of a current project on “supply chain visualization,” we are expanding the Handbook to be able to support a systems dynamics view of processes too (see Goncalves et al. 2002).

To do this, we are creating a taxonomy of reusable systems dynamics components or “molecules.” While the systems dynamics discipline had considered these, by creating a taxonomy, we have been able to highlight “missing” molecules. In this ongoing work we are exploring how this taxonomy allows for easy building of systems dynamics models using the same techniques incorporated in the handbook for building discrete models (see figure 8.18).

8.12 Conclusions

We believe that the work we have done so far on the Process Handbook has achieved our initial goal of demonstrating the potential of this framework for comprehensively organizing large amounts of useful knowledge about business in a richly interconnected, logical, and consistent way. We also believe that our conceptual framework for doing this was both intuitive and theoretically based. Finally, as we have shown in the other parts of this book, when business knowledge is organized in this way, powerful software tools to access and manipulate it can significantly increase its value.

We do not believe that our approach is the only useful way of organizing business knowledge. There are certainly other useful ways of organizing business knowledge

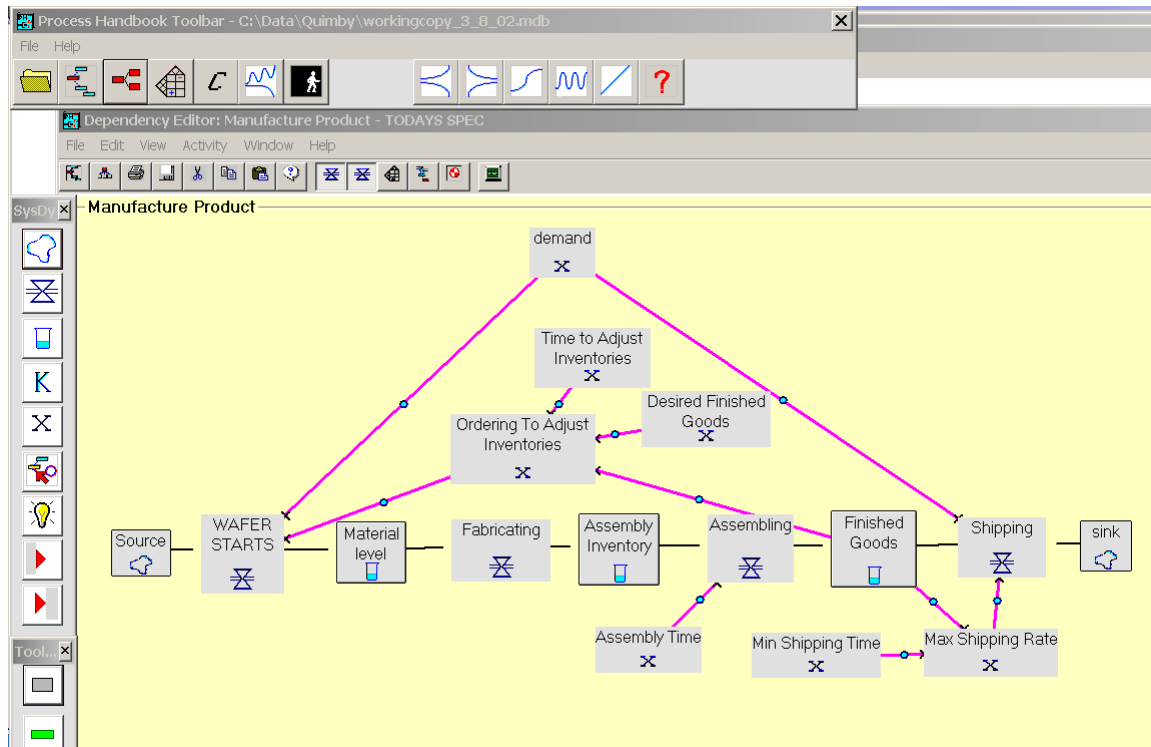


Figure 8.18
Systems dynamics diagram. (This figure is from the “research” version of the Process Handbook.)

for various purposes. But we do not know of any other approach to organizing business knowledge that is as comprehensive and powerful as ours, nor any that has been as extensively developed.

As researchers and educators, we have already devoted substantial resources to developing and updating the Process Handbook knowledge base. But we believe that the long-term potential of such a knowledge base can never be realized by the work of a single academic institution. Instead, we believe that there are many opportunities for other researchers, educators, and commercial enterprises to cooperate in the long-term, large-scale, development of a knowledge base like the Process Handbook. We hope that the publication of this volume will help stimulate such an endeavor.