Organizational Decision Making

Organizations are composed of managers who make decisions using both rational and intuitive processes; but organization-level decisions are not usually made by a single manager. Many organizational decisions involve several managers. Problem identification and problem solution involve many departments, multiple viewpoints, and even other organizations, which are beyond the scope of an individual manager.

The processes by which decisions are made in organizations are influenced by a number of factors, particularly the organization's own internal structures as well as the degree of stability or instability of the external environments. Research into organization-level decision making has identified four types of organizational decision-making processes: the management science approach, the Carnegie model, the incremental decision process model, and the garbage can model.

Management Science Approach

The management science approach to organizational decision making is the analog to the rational approach by individual managers. Management science came into being during World War II. At that time, mathematical and statistical techniques were applied to urgent, large-scale military problems that were beyond the ability of individual decision makers. Mathematicians, physicists, and operations researchers used systems analysis to develop artillery trajectories, antisubmarine strategies, and bombing strategies such as salvoing (discharging multiple shells simultaneously). Consider the problem of a battleship trying to sink an enemy ship several miles away. The calculation for aiming the battleship's guns should consider distance, wind speed, shell size, speed and direction of both ships, pitch and roll of the firing ship, and curvature of the earth. Methods for performing such calculations using trial and error and intuition are not accurate, take far too long, and may never achieve success.

This is where management science came in. Analysts were able to identify the relevant variables involved in aiming a ship's guns and could model them with the use of mathematical equations. Distance, speed, pitch, roll, shell size, and so on could be calculated and entered into the equations. The answer was immediate, and the guns could begin firing. Factors such as pitch and roll were soon measured mechanically and fed directly into the targeting mechanism. Today, the human element is completely removed from the targeting process. Radar picks up the target, and the entire sequence is computed automatically.

Management science yielded astonishing success for many military problems. This approach to decision making diffused into corporations and business schools, where techniques were studied and elaborated. Today, many corporations have assigned departments to use these techniques. The computer department develops quantitative data for analysis. Operations research departments
use mathematical models to quantify relevant variables and develop a quantitative representation of alternative solutions and the probability of each one solving the problem. These departments also use such devices as linear programming, Bayesian statistics, PERT charts, and computer simulations.

Management science is an excellent device for organizational decision making when problems are analyzable and when the variables can be identified and measured. Mathematical models can contain a thousand or more variables, each one relevant in some way to the ultimate outcome. Management science techniques have been used to correctly solve problems as diverse as finding the right spot for a church camp, test marketing the first of a new family of products, drilling for oil, and radically altering the distribution of telecommunications services. As illustrated in the following case, management science techniques can also be applied to a situation as complicated as scheduling ambulance technicians.

**In Practice 11.3 Urgences Santé**

Urgences Santé, the public agency responsible for coordinating ambulance service in the Montréal area, schedules vehicle time and working hours for approximately eighty ambulances and seven hundred technicians. The agency does not own any of the vehicles or directly employ any technicians, but rents these services from fifteen private companies. Urgences Santé wanted to optimize the schedule to keep costs as low as possible, realizing that, with ambulance rental fees at $55 an hour, a daily excess of ten hours represents more than $200,000 a year.

Two types of calls require ambulance service--emergency calls from the public, which occur randomly throughout the day and require immediate attention, and calls from hospitals, which are concentrated in specific time periods and are generally not urgent. In addition, demand for ambulance service is generally higher in the winter, but with more emergency calls on weekends during the summer months. Besides meeting shifting demand, a number of other constraints governed the design of a new schedule, for example, the fair distribution of work hours among the fifteen service companies; the provisions of the union contract; the number of ambulances available; and the quality and consistency of work schedules for technician.

Urgences Santé applied mathematical formulations and techniques to first build work-day schedules for each type of day (weekday or weekend) for each season, then equitably assign workdays to the fifteen service companies, and finally to build individual schedules for the seven hundred service technicians. The agency is able to create at least 85 percent of the individual schedules automatically. Implementing the new system has had two positive effects. First, Urgences Santé was able to meet ambulance demand while cutting rental hours per week by up to 110 hours, thus saving approximately $250,000 a year. Second, the quality of the ambulance technicians' schedules has been vastly improved. This has led to an increase in the number of full-time rather than part-time technicians and a decrease in turnover for the service companies. Impressed with these results, Urgences Santé continues to use management science techniques to adapt to new demands and shifts in operational methods.

Management science can accurately and quickly solve problems that have too many explicit variables for human processing. This system is at its best when applied to problems that are analyzable, are measurable, and can be structured in a logical way.
Management science has also produced many failures. In recent years, many banks have begun using computerized scoring systems to rate those applying for credit, but some argue that human judgment is needed to account for extenuating circumstances. In one case, a member of the Federal Reserve Board, the agency that sets interest rates and regulates banks, was denied a Toys 'R' Us credit card based on his computerized score. One problem with the management science approach, as discussed in Chapter 9, is that quantitative data are not rich. Informal cues that indicate the existence of problems have to be sensed on a more personal basis by managers. The most sophisticated mathematical analyses are of no value if the important factors cannot be quantified and included in the model. Such things as competitor reactions, consumer "tastes," and product "warmth" are qualitative dimensions. In these situations, the role of management science is to supplement manager decision making. Quantitative results can be given to managers for discussion and interpretation along with their informal opinions, judgment, and intuition. The final decision can include qualitative factors as well as quantitative calculations.

Carnegie Model

The Carnegie model of organizational decision making is based on the work of Richard Cyert, James March, and Herbert Simon, who were all associated with Carnegie-Mellon University. Their research helped formulate the bounded rationality approach to individual decision making as well as provide new insights about organization decision-making. Until their work, research in economics assumed that business firms made decisions as a single entity, as if all relevant information were funneled to the top decision maker for a choice. Research by the Carnegie group indicated that organization-level decisions involved many managers and that a final choice was based on a coalition among those managers. A coalition is an alliance among several managers who agree about organizational goals and problem priorities. It could include managers from line departments, staff specialists, and even external groups, such as powerful customers, bankers, or union representatives.

Management coalitions are needed during decision making for two reasons. First, organizational goals are often ambiguous, and operative goals of departments are often inconsistent. When goals are ambiguous and inconsistent, managers disagree about problem priorities. They must bargain about problems and build a coalition around the question of which problems to solve. For example, months of discussion, bargaining, and planning took place before Chrysler decided not to abandon small-car production and began working on the new Neon.

The second reason for coalitions is that individual managers intend to be rational but function with human cognitive limitations and other constraints, as described earlier. Managers do not have the time, resources, or mental capacity to identify all dimensions and to process all information relevant to a decision. These limitations lead to coalition-building behavior. Managers talk to each other and exchange points of view to gather information and reduce ambiguity. People who have relevant information or a stake in a decision outcome are consulted. Building a coalition will lead to a decision that is supported by interested parties.

The process of coalition formation has several implications for organizational decision behavior. First, decisions are made to satisfice rather than to optimize problem solutions. Satisficing means organizations accept a "satisfactory" rather than a maximum level of performance, enabling them to achieve several goals simultaneously. In decision making, the coalition will accept a solution that is
perceived as satisfactory to all coalition members. Second, managers are concerned with immediate problems and short-run solutions. They engage in what Cyert and March called problemistic search.  

**Problemistic Search** means managers look around in the immediate environment for a solution to quickly resolve a problem. Managers don't expect a perfect solution when the situation is ill defined and conflict-laden. This contrasts with the management science approach, which assumes that analysis can uncover every reasonable alternative. The Carnegie model says search behavior is just sufficient to produce a satisfactory solution and that managers typically adopt the first satisfactory solution that emerges. Third, discussion and bargaining are especially important in the problem identification stage of decision making. Unless coalition members perceive a problem, action will not be taken. The decision process described in the Carnegie model is summarized in Exhibit 11.4.

The Carnegie model points out that building agreement through a managerial coalition is a major part of organizational decision making. This is especially true at upper management levels. Discussion and bargaining are time-consuming, so search procedures are usually simple and the selected alternative satisfices rather than optimizes problem solution. When problems are programmed - are clear and have been seen before - the organization will rely on previous procedures and routines. Rules and procedures prevent the need for renewed coalition formation and political bargaining. Nonprogrammed decisions, however, require bargaining and conflict resolution.

One of the best and most visible coalition builders of recent years was former President George Bush, who would seek a broad-based coalition at the start of an important decision process. During the decision process regarding the Persian Gulf War, President Bush kept up a barrage of personal calls and visits to world leaders to gain agreement for his vision of forcing Saddam Hussein from Kuwait and for shaping a "new world order."

When senior managers are unable to build a coalition around goals and problem priorities, the results can be a disaster, as illustrated by the case of Greyhound Bus Lines.

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**Exhibit 11.4**

*Choice Processes in the Carnegie Model*
Everyone agreed that Greyhound Lines had problems. The company was operating on paper-thin margins and could not afford to dispatch nearly empty vehicles or have buses and drivers on call to meet surges in demand. In the terminals, employees could be observed making fun of passengers, ignoring them, and handling their baggage haphazardly. To reduce operating costs and improve customer service, Greyhound’s top executives put together a reorganization plan that called for massive cuts in personnel, routes, and services, along with the computerization of everything from passenger reservations to fleet scheduling.

However, middle managers disagreed with the plan. Many felt that huge workforce reductions would only exacerbate the company’s real problem regarding customer satisfaction. Managers in computer programming urged a delay in introducing the computerized reservations system, called Trips, to work out bugs in the highly complex software. The human resources department pointed out that terminal workers generally had less than a high school education and would need extensive training before they could use the system effectively. Terminal managers warned that many of Greyhound’s low-income passengers didn’t have credit cards or even telephones to use Trips. Despite the disagreements, executives went ahead with the rollout, promising that it would improve customer service, make ticket buying more convenient, and allow customers to reserve space on specific trips.

A nightmare resulted. The time Greyhound operators spent responding to phone calls dramatically increased. Many callers couldn’t even get through because of problems in the new switching mechanism. Most passengers arrived to buy their tickets and get on the bus just as they always had, but the computers were so swamped that it sometimes took forty-five seconds to respond to a single keystroke and five minutes to print a ticket. The system crashed so often that agents frequently had to handwrite tickets. Customers stood in long lines, were separated from their luggage, missed connections, and were left to sleep in terminals overnight. Discourtesy to customers increased as a downsized workforce struggled to cope with a system they were ill-trained to operate. Ridership plunged sharply. As regional rivals continue to pick off Greyhound’s dissatisfied customers, the future of the huge bus company remains uncertain.41

The Carnegie model is particularly useful at the problem identification stage. At Greyhound, a few top executives jumped in with a solution before reaching agreement with other managers regarding the nature of the problem and alternatives for solving it. A coalition of key department managers is needed for smooth implementation of a major reorganization. When top managers perceive a problem or want to make a major decision, they need to reach agreement with other managers to support the decision.42

**Incremental Decision Process Model**

Henry Mintzberg and his associates at McGill University in Montreal approached organizational decision making from a different perspective. They identified twenty-five decisions made in organizations and traced the events associated with these decisions from beginning to end.43 Their research identified each step in the decision sequence. This approach to decision making, called the **incremental decision process model**, places less emphasis on the political and social factors described in the Carnegie model, but tells more about the structured sequence of activities undertaken from the discovery of a problem to its solution.44
Sample decisions in Mintzberg's research included choosing which jet aircraft to acquire for a regional airline, developing a new supper club, developing a new container terminal in a harbor, identifying a new market for a deodorant, installing a controversial new medical treatment in a hospital, and firing a star announcer. The scope and importance of these decisions are revealed in the length of time taken to complete them. Most of these decisions took more than a year, and one-third of them took more than two years. Most of these decisions were nonprogrammed and required custom-designed solutions.

One discovery from this research is that major organization choices are usually a series of small choices that combine to produce the major decision. Thus, many organizational decisions are a series of nibbles rather than a big bite. Organizations move through several decision points and may hit barriers along the way. Mintzberg called these barriers decision interrupts. An interrupt may mean an organization has to cycle back through a previous decision and try something new. Decision loops or cycles are one way the organization learns which alternatives will work. The ultimate solution may be very different from what was initially anticipated.

The pattern of decision stages discovered by Mintzberg and his associates is shown in Exhibit 11.5. Each box indicates a possible step in the decision sequence. The steps take place in three major decision phases: identification, development, and selection.

Identification Phase. The identification phase begins with recognition. Recognition means one or more managers become aware of a problem and the need to make a decision. Recognition is usually stimulated by a problem or an opportunity. A problem exists when elements in the external environment change or when internal performance is perceived to be below standard. In the case of firing a radio announcer, comments about the announcer came from listeners, other announcers, and advertisers. Managers interpreted these cues until a pattern emerged that indicated a problem had to be dealt with.

The second step is diagnosis, which is where more information is gathered if needed to define the problem situation. Diagnosis may be systematic or informal, depending upon the severity of the problem. Severe problems do not have time for extensive diagnosis; the response must be immediate. Mild problems are usually diagnosed in a more systematic manner.

Development Phase. The development phase is when a solution is shaped to solve the problem defined in the identification phase. The development of a solution takes one of two directions. First, search procedures may be used to seek out alternatives within the organization's repertoire of solutions. For example, in the case of firing a star announcer, managers asked what the radio station had done the last time an announcer had to be let go. To conduct the search, organization participants may look into their own memories, talk to other managers, or examine the formal procedures of the organization.

The second direction of development is to design a custom solution. This happens when the problem is novel so that previous experience has no value. Mintzberg found that in these cases, key decision makers have only a vague idea of the ideal solution. Gradually, through a trial-and-error process, a custom-designed alternative will emerge. Development of the solution is a groping, incremental procedure, building a solution brick by brick.
Exhibit 11.5 The Incremental Decision Process Model

Selection Phase. The selection phase is when the solution is chosen. This phase is not always a matter of making a clear choice among alternatives. In the case of custom-made solutions, selection is more an evaluation of the single alternative that seems feasible.

Evaluation and choice may be accomplished in three ways. The judgment form of selection is used when a final choice falls upon a single decision maker, and the choice involves judgment based upon experience. In analysis, alternatives are evaluated on a more systematic basis, such as with management science techniques. Mintzberg found that most decisions did not involve systematic analysis and evaluation of alternatives. Bargaining occurs when selection involves a group of decision makers. Each decision maker may have a different stake in the outcome, so conflict emerges. Discussion and bargaining occur until a coalition is formed, as in the Carnegie-model described earlier.

When a decision is formally accepted by the organization, authorization takes place. The decision may be passed up the hierarchy to the responsible hierarchical level. Authorization is often routine because the expertise and knowledge rest with the lower decision makers who identified the problem and developed the solution. A few decisions are rejected because of implications not anticipated by lower-level managers.

Dynamic Factors. The lower part of the chart in Exhibit 11.5 shows lines running back toward the beginning of the decision process. These lines represent loops or cycles that take place in the decision process. Organizational decisions do not follow an orderly progression from recognition through authorization. Minor problems arise that force a loop back to an earlier stage. These are decision interrupts. If a custom-designed solution is perceived as unsatisfactory, the organization may have to go back to the very beginning and reconsider whether the problem is truly worth solving. Feedback loops can be caused by problems of timing, politics, disagreement among managers, inability to identify a feasible solution, turnover of managers, or the sudden appearance of a new alternative. For example, when a small Canadian airline made the decision to acquire jet aircraft, the board authorized the decision, but shortly after, a new chief executive was brought in and he canceled the contract, recycling the decision back to the identification phase. He accepted the diagnosis of the problem but insisted upon a new search for alternatives. Then a foreign airline went out of business and two used aircraft became available at a bargain price. This presented an unexpected option, and the chief executive used his own judgment to authorize the purchase of the aircraft.

Because most decisions take place over an extended period of time, circumstances change. Decision making is a dynamic process that may require a number of cycles before a problem is solved. An example of the incremental process and cycling that can take place is illustrated in Gillette's decision to create a new razor.

In Practice 11.5  Gillette Company

A bright idea developed at Gillette Company's British research facility finally became the Sensor razor thirteen years later, after more twists and turns than shaving a craggy face. The bright idea was to create a thinner razor blade that would make Gillette's cartridges easier to clean (recognition). The technical development cost for the idea ran $200 million.
The technical demands of building a razor with thin blades and floating parts to follow a man's face had several blind alleys. Engineers first tried to find established techniques (search, screen), but none fit the bill. One idea called for the blades to sit on tiny rubber tubes, perhaps filled with fluid, but that was too costly and complicated to manufacture (new option interrupt). Eventually, a prototype was built (design), and five hundred men liked it. The next problem was manufacturing (diagnosis), which again required an entirely new process to laser weld each blade to a support (design).

Top management gave the go-ahead to develop manufacturing equipment (judgment, authorization). Then a conflict broke out between two groups of Gillette executives. One group wanted to orient the product toward inexpensive disposables, whereas the other group fought for a heavier, more permanent razor (internal interrupt). Then Gillette was threatened with an outside takeover, reducing resources allocated to the project (external interrupt). A new executive vice president made the choice to deemphasize disposables (judgment). A nine-member task force was then authorized to live with the razor for fifteen months to get it to market (authorization). Another $100 million was authorized for advertising and marketing promotions.

The razor has been a smashing success, smoothly sliding off shelves, and Gillette expects to recover its huge investment in record time. Now Gillette is starting the process over again, experimenting with a curved blade and perhaps a new ceramic blade, moving ahead in increments until the new razors are ready, probably not before the turn of the century.\textsuperscript{47}

At Gillette, the identification phase occurred because executives were aware of the need for a new razor and became aware of the idea for floating, thin blades. The development phase was characterized by the trial-and-error custom design leading to the Sensor. During the selection phase, certain approaches were found unacceptable, causing Gillette to recycle back, redesign the razor, and reappraise whether it should be a permanent or disposable razor. Advancing once again to the selection phase, the Sensor passed the judgment of executives, and manufacturing and marketing budgets were quickly authorized. This decision took thirteen years, reaching completion in January 1990.

**Integrating the incremental Process and Carnegie Models**

At the beginning of this chapter, decision making was defined as occurring in two stages: problem identification and problem solution. The Carnegie description of coalition building is especially relevant for the problem identification stage. When issues are ambiguous, or if managers disagree about problem severity, discussion, negotiation, and coalition building are needed. Once agreement is reached about the problem to be tackled, the organization can move toward a solution.

The incremental process model tends to emphasize the steps used to reach a solution. After managers agree on a problem, the step-by-step process is a way of trying various solutions to see what will work. When problem solution is unclear, a trial-and-error solution may be designed.

The two models do not disagree with one another. They describe how organizations make decisions when either problem identification or solution is uncertain. The application of these two models to the stages in the decision process is illustrated in Exhibit 11.6. When both parts of the decision process are highly
Exhibit 11.6
Organizational Decision Process When Either Problem identification or Problem Solution is Uncertain

<table>
<thead>
<tr>
<th>Problem Identification</th>
<th>Problem Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>When problem identification is uncertain, Carnegie model applies</td>
<td>When problem solution is uncertain, incremental process model applies</td>
</tr>
<tr>
<td>Political and social process is needed</td>
<td>Incremental, trial-and-error process is needed</td>
</tr>
<tr>
<td>Build coalition, seek agreement, and resolve conflict about goals and problem priorities</td>
<td>Solve big problems in little steps</td>
</tr>
<tr>
<td></td>
<td>Recycle and try again when blocked</td>
</tr>
</tbody>
</table>

uncertain simultaneously, the organization is in an extremely difficult position. Decision processes in that situation may be a combination of Carnegie and incremental process models, and this combination may evolve into a situation described in the garbage can model.

Garbage Can Model

The garbage can model is one of the most recent and interesting descriptions of organizational decision processes. It is not directly comparable to the earlier models, because the garbage can model deals with the pattern or flow of multiple decisions within organizations, whereas the incremental and Carnegie models focus on how a single decision is made. The garbage can model helps you think of the whole organization and the frequent decisions being made by managers throughout.

Organized Anarchy. The garbage can model was developed to explain the pattern of decision making in organizations that experience extremely high uncertainty. Michael Cohen, James March, and Johan Olsen, the originators of the model, called the highly uncertain conditions an organized anarchy, which is an extremely organic organization. Organized anachnies do not rely on the normal vertical hierarchy of authority and bureaucratic decision rules. They are caused by three characteristics:

1. **Problematic preferences.** Goals, problems, alternatives, and solutions are ill defined. Ambiguity characterizes each step of a decision process.
2. **Unclear, poorly understood technology.** Cause-and-effect relationships within the organization are difficult to identify. An explicit database that applies to decisions is not available.
3. **Turnover.** Organizational positions experience turnover of participants. In addition, employees are busy and have only limited time to allocate to any one problem or decision. Participation in any given decision will be fluid and limited.

The organized anarchy describes organizations characterized by rapid change and a collegial, non-bureaucratic environment. No organization fits this extremely organic circumstance all the time. Many organizations will occasionally find themselves in positions of making decisions under unclear, problematic cir-
cumstances. The garbage can model is useful for understanding the pattern of these decisions.

**Streams of Events.** The unique characteristic of the garbage can model is that the decision process is not seen as a sequence of steps that begins with a problem and ends with a solution. Indeed, problem identification and problem solution may not be connected to each other. An idea may be proposed as a solution when no problem is specified. A problem may exist and never generate a solution. Decisions are the outcome of independent streams of events within the organization. The four streams relevant to organizational decision making are as follows:

1. **Problems.** Problems are points of dissatisfaction with current activities and performance. They represent a gap between desired performance and current activities. Problems are perceived to require attention. However, they are distinct from solutions and choices. A problem may lead to a proposed solution or it may not. Problems may not be solved when solutions are adopted.
2. **Potential solutions.** A solution is an idea somebody proposes for adoption. Such ideas form a flow of alternative solutions through the organization. Ideas may be brought into the organization by new personnel or may be invented by existing personnel. Participants may simply be attracted to certain ideas and push them as logical choices regardless of problems. Attraction to an idea may cause an employee to look for a problem to which the idea can be attached and, hence, justified. The point is that solutions exist independent of problems.
3. **Participants.** Organization participants are employees who come and go throughout the organization. People are hired, reassigned, and fired. Participants vary widely in their ideas, perception of problems, experience, values, and training. The problems and solutions recognized by one manager will differ from those recognized by another manager.
4. **Choice opportunities.** Choice opportunities are occasions when an organization usually makes a decision. They occur when contracts are signed, people are hired, or a new product is authorized. They also occur when the right mix of participants, solutions, and problems exists. Thus, a manager who happened to learn of a good idea may suddenly become aware of a problem to which it applies and, hence, can provide the organization with a choice opportunity. Match-ups of problems and solutions often result in decisions.

With the concept of four streams, the overall pattern of organizational decision making takes on a random quality. Problems, solutions, participants, and choices all flow through the organization. In one sense, the organization is a large garbage can in which these streams are being stirred, as illustrated in Exhibit 11.7. When a problem, solution, and participant happen to connect at one point, a decision may be made and the problem may be solved; but if the solution does not fit the problem, the problem may not be solved. Thus, when viewing the organization as a whole and considering its high level of uncertainty, one sees problems arise that are not solved and solutions tried that do not work. Organization decisions are disorderly and not the result of a logical, step-by-step sequence. Events may be so ill defined and complex that decisions, problems, and solutions act as independent events. When they connect, some problems are solved, but many are not.
Consequences. Four consequences of the garbage can decision process for organizational decision making are as follows:

1. Solutions may be proposed even when problems do not exist. An employee may be sold on an idea and may try to sell it to the rest of the organization. An example was the adoption of computers by many organizations during the 1970s. The computer was an exciting solution and was pushed by both computer manufacturers and systems analysts within organizations. The computer did not solve any problems in those initial applications. Indeed, some computers caused more problems than they solved.

2. Choices are made without solving problems. A choice such as creating a new department may be made with the intention of solving a problem; but, under conditions of high uncertainty, the choice may be incorrect. Moreover, many choices just seem to happen. People decide to quit, the organization's budget is cut, or a new policy bulletin is issued. These choices may be oriented toward problems but do not necessarily solve them.

3. Problems may persist without being solved. Organization participants get used to certain problems and give up trying to solve them; or participants may not know how to solve certain problems because the technology is unclear. A university in Canada was placed on probation by the American Association of University Professors because a professor had been denied tenure without due process. The probation was a nagging annoyance that the administrators wanted to remove. Fifteen years later, the non-tenured professor died. The probation continues because the university did not ac-
quiesce to the demands of the heirs of the association to reevaluate the case. The university would like to solve the problem, but administrators are not sure how, and they do not have the resources to allocate to it. The probation problem persists without a solution.

4. A few problems are solved. The decision process does work in the aggregate. In computer simulation models of the garbage can model, important problems were often resolved. Solutions do connect with appropriate problems and participants so that a good choice is made. Of course, not all problems are resolved when choices are made, but the organization does move in the direction of problem reduction.

The effects of independent streams and the rather chaotic decision processes of the garbage can model can be seen in the production of the classic film Casablanca.

In Practice 11.6  Casablanca

The public flocked to see Casablanca when it opened in 1942. The film won Academy Awards for best picture, best screenplay, and best director, and is recognized today by film historians and the public alike as a classic. But up until the filming of the final scene, no one involved in the production of the now-famous story even knew how it was going to end.

Everybody Comes to Rick's wasn't a very good play, but when it landed on Hal Wallis's desk at Warner Brothers, Wallis spotted some hot-from-the-headlines potential, purchased the rights, and changed the name to Casablanca to capitalize on the geographical mystique the story offered. A series of negotiations led to casting Humphrey Bogart as Rick, even though studio chief Jack Warner questioned his romantic appeal. The casting of Ingrid Bergman as Ilsa was largely by accident. A fluke had left an opening in her usually booked schedule. The screenplay still wasn't written.

Filming was chaotic. Writers made script changes and plot revisions daily. Actors were unsure of how to develop their characterizations, so they just did whatever seemed right at the time. For example, when Ingrid Bergman wanted to know which man should get most of her on-screen attention, she was told, "We don't know yet-just play it, well ... in between." Scenes were often filmed blindly with no idea of how they were supposed to fit in the overall story. Amazingly, even when it came time to shoot the climactic final scene, no one involved in the production seemed to know who would "get the girl"; a legend still persists that two versions were written. During filming, Bogart disagreed with director Michael Curtiz's view that Rick should kiss Ilsa good-bye, and Hal Wallis was summoned to mediate. Because the cast received their scripts only hours before filming began, they couldn't remember their lines, causing continual delays.

Some industry analysts predicted disaster, but the haphazard process worked. Ingrid Bergman plays it "in between" just right. Bogart's characterization of Rick is perfect. The tale of love and glory and heartbreaking romance couldn't have been told better than it was in Casablanca. In addition, fortuitous circumstances outside the studio contributed to the film's commercial success. Just eighteen days before the premiere on Thanksgiving Day, 1942, the Allies invaded North Africa and fought the Battle of Casablanca. Then, when the film opened nationwide, President Franklin D. Roosevelt and Prime Minister Winston Churchill presided over the Casablanca Conference, a historical coincidence that was clearly a boon to the film, helping to push its initial gross to $3.7 million. 50

The production of Casablanca was not a rational process that started with a clear problem, and ended with a logical solution. Many events occurred by
chance and were intertwined, which characterizes the garbage can model. Everyone from the director to the actors continuously added to the stream of new ideas to the story. Some solutions were connected to emerging problems: the original script arrived just when Hal Wallis was looking for topical stories; and Bergman was surprisingly available to be cast in the role of Ilsa. The actors (participants) daily made personal choices regarding characterization that proved to be perfect for the story line. Other events that contributed to Casablanca's success were not even connected to the film—for example, the invasion of North Africa only eighteen days before the premiere. Overall, the production of Casablanca had a random, chancy flavor that is characteristic of the garbage can model. As evidenced by the film's huge success and continuing popularity after more than fifty years, the random, garbage can decision process did not hurt the film or the studio.

The garbage can model, however, doesn't always work—in the movies or in organizations. A similar haphazard process during the filming of Waterworld led to the most expensive film in Hollywood history and a decided box-office flop for Universal Pictures. 

CONTINGENCY DECISION-MAKING FRAMEWORK

This chapter has covered several approaches to organizational decision making, including management science, the Carnegie model, the incremental decision process model, and the garbage can model. It has also discussed rational and intuitive decision processes used by individual managers. Each decision approach is a relatively accurate description of the actual decision process, yet all differ from each other. Management science, for example, reflects a different set of decision assumptions and procedures than does the garbage can model.

One reason for having different approaches is that they appear in different organizational situations. The use of an approach is contingent on the organization setting. Two characteristics of organizations that determine the use of decision approaches are (1) goal consensus and (2) technical knowledge about the means to achieve those goals. Analyzing organizations along these two dimensions suggests which approach will be used to make decisions.

Goal Consensus

Goal consensus refers to the agreement among managers about which organizational goals and outcomes to pursue. This variable ranges from complete agreement to complete disagreement. When managers agree, the goals of the organization are clear and so are standards of performance. When managers disagree, organization direction and performance expectations are in dispute. One example of goal uncertainty occurred among cabinet members and presidential advisors during the Cuban missile crisis. Participants fought intensely over what goals should be pursued. Another example of goal uncertainty occurred within the Penn Central Railroad after it went bankrupt. Some managers wanted to adopt the goal of becoming more efficient and profitable as a railroad. Other managers wanted to diversify into other businesses. Eventually, a strong coalition formed in favor of diversification, and that goal was adopted.

Goal consensus tends to be low when organizations are differentiated, as described in Chapter 3. Recall that uncertain environments cause organizational
departments to differentiate from one another in goals and attitudes to specialize in specific environmental sectors. This differentiation leads to disagreement and conflict about organizational goals. When differentiation among departments or divisions is high, managers must make a special effort to build coalitions during decision making.

Goal consensus is especially important for the problem identification stage of decision-making. When goals are clear and agreed on, they provide clear standards and expectations for performance. When goals are not agreed on, problem identification is uncertain and management attention must be focused on gaining agreement about goals and problem priorities.

Technical Knowledge

Technical knowledge refers to understanding and agreement about how to reach organizational goals. This variable can range from complete agreement and certainty to complete disagreement and uncertainty about cause-effect relationships leading to goal attainment. An example of low technical knowledge was reflected in market strategies at 7-Up. The goal was clear and agreed on—increase market share from 6 percent to 7 percent, but the means for achieving this increase in market share were not known or agreed on. A few managers wanted to use discount pricing in supermarkets. Other managers believed they should increase the number of soda fountain outlets in restaurants and fast-food chains. A few other managers insisted that the best approach was to increase advertising through radio and television. Managers did not know what would cause an increase in market share. Eventually, the advertising judgment prevailed at 7-Up, but it did not work very well. The failure of its decision reflected 7-Up's low technical knowledge about how to achieve its goal.

Technical knowledge is especially important to the problem-solution stage of decision-making. When means are well understood, the appropriate alternatives can be identified and calculated with some degree of certainty. When means are poorly understood, potential solutions are ill defined and uncertain. Intuition, judgment, and trial and error become the basis for decisions.

Contingency Framework

The contingency decision-making framework brings together the two organizational dimensions of goal consensus and technical knowledge. Exhibit 11.8 shows how these two variables influence the decision situation. Goals and technical knowledge determine the extent to which problem identification and solution stages are uncertain. Depending on the situation, an organization may have to focus on gaining goal consensus, increasing technical knowledge, or both. Low uncertainty means that rational, analytical procedures can be used. High uncertainty leads to greater use of judgment, bargaining, and other less systematic procedures.

Exhibit 11.9 describes the contingency decision framework. Each cell represents an organizational situation that is appropriate for the decision-making approaches described in this chapter.

Cell 1. In cell 1 of Exhibit 11.9, rational decision procedures are used because goals are agreed on, and cause-effect relationships are well understood. Decisions can be made in a computational manner. Alternatives can be identified and
the best solution adopted through analysis and calculations. The rational models described earlier in this chapter, both for individuals and for the organization, are appropriate when goals and technical means are well defined. When problems occur, a logical process can be used to decide on the solutions.

Cell 2. In cell 2, bargaining and compromise are used to reach consensus about goals and priorities. Diverse opinions are present in this situation. Achieving one goal would mean the exclusion of another goal. The priorities given to respective goals are decided through discussion, debate, and coalition building.

Managers in this situation should use broad participation to achieve goal consensus in the decision process. Opinions should be surfaced and discussed until compromise is reached. The organization will not otherwise move forward as an integrated unit. In the case of Penn Central Railroad, the diversification strategy was eventually adopted but only after much bargaining. During the Cuban missile crisis, debate finally led to the goal of establishing a blockade to prevent Soviet ships from reaching Cuba. At Gillette, much debate surrounded the struggle between executives favoring disposable versus permanent Sensor razors, eventually consolidating toward the permanent.

The Carnegie model applies when there is dissension about organizational goals. When groups within the organization disagree, or when the organization is in conflict with constituencies (government regulators, suppliers, unions), bargaining and negotiation are required. The bargaining strategy is especially
relevant to the problem identification stage of the decision process. Once bargaining and negotiation are completed, the organization will have support for one direction.

**Cell 3.** In a cell 3 situation, goals and standards of performance are certain, but alternative technical solutions are vague and uncertain. Techniques to solve a problem are ill defined and poorly understood. When an individual manager faces this situation, intuition will be the decision guideline. The manager will rely on past experience and judgment to make a decision. Rational, analytical approaches are not effective because the alternatives cannot be identified and calculated. Hard facts and accurate information are not available.

The incremental decision process model reflects trial and error on the part of the organization. Once a problem is identified, a sequence of small steps enables the organization to learn a solution. As new problems arise, the organization may recycle back to an earlier point and start over. Eventually, over a period of months or years, the organization will acquire sufficient experience to solve the problem in a satisfactory way. Solving the engineering and manufacturing problems for the Sensor razor, described earlier, is an example of a cell 3 situation. Gillette engineers had to use trial and error to develop an efficient manufacturing process.

The situation in cell 3, of senior managers agreeing about goals but not knowing how to achieve them, occurs frequently in business organizations. If
managers use incremental decisions in such situations, they will eventually acquire the technical knowledge to accomplish goals and solve problems.

**Cell 4.** The situation in cell 4, characterized by low consensus and low technical knowledge, occurs infrequently but is difficult for decision-making. An individual manager making a decision under this high level of uncertainty can employ techniques from both cell 2 and cell 3. The manager can attempt to build a coalition to establish goals and priorities and use judgment or trial and error to solve problems. Additional techniques, such as inspiration and imitation, also may be required. **Inspiration** refers to an innovative, creative solution that is not reached by logical means. **Imitation** means adopting a decision tried elsewhere in the hope that it will work in this situation.

For example, in one university, accounting department faculty were unhappy with their current circumstances but could not decide on the direction the department should take. Some faculty members wanted a greater research orientation, whereas others wanted greater orientation toward business firms and accounting applications. The disagreement about goals was compounded because neither group was sure about the best technique for achieving its goals. The ultimate solution was inspirational on the part of the dean. An accounting research center was established with funding from Big Eight accounting firms. The funding was used to finance research activities for faculty interested in basic research and to provide contact with business firms for other faculty. The solution provided a common goal and unified people within the department to work toward that goal.

When an entire organization is characterized by low goal consensus and low technical knowledge and many decisions are characterized by a high level of uncertainty, elements of the garbage can model will appear. Managers may first try techniques from both cells 2 and 3, but logical decision sequences starting with problem identification and ending with problem solution will not occur. Potential solutions will precede problems as often as problems precede solutions. In this situation, managers should encourage widespread discussion of problems and idea proposals to facilitate the opportunity to make choices. Eventually, through trial and error, the organization will solve some problems.

**SPECIAL DECISION CIRCUMSTANCES**

In a highly competitive world beset by global competition and rapid change, decision making seldom fits the traditional rational, analytical model. To cope in today's world, managers must learn to make decisions fast, especially in high-velocity environments, to learn from decision mistakes, and to avoid escalating commitment to an unsatisfactory course of action.

**High-Velocity Environments**

In some industries today, the rate of competitive and technological change is so extreme that market data is either unavailable or obsolete, strategic windows open and shut quickly, perhaps within a few months, and the cost of a decision error is company failure. Recent research has examined how successful companies make decisions in these **high-velocity environments**, especially to under-
Comparing successful with unsuccessful decisions in high-velocity environments suggests the following guidelines.

• Successful decision makers track information in real time to develop a deep and intuitive grasp of the business. Two to three intense meetings per week with all key players are usual. Decision makers track operating statistics about cash, scrap, backlog, work in process, and shipments to constantly feel the pulse of what is happening. Unsuccessful firms were more concerned with future planning and forward-looking information, with only a loose grip on immediate happenings.
• During a major decision, successful companies began immediately to build multiple alternatives. Implementation may run in parallel before finally settling on a final choice. Slow-decision companies developed only a single alternative, moving to another only after the first one failed.
• Fast, successful decision makers sought advice from everyone and depended heavily on one or two savvy, trusted colleagues as counselors. Slow companies were unable to build trust and agreement among the best people.
• Fast companies involved everyone in the decision and tried for consensus; but if consensus did not emerge, the top manager made the choice and moved ahead. Waiting for everyone to be on board created more delays than warranted. Slow companies delayed decisions to achieve a uniform consensus.
• Fast, successful choices were well integrated with other decisions and the overall strategic direction of the company. Less successful choices considered the decision in isolation from other decisions; the decision was made in the abstract.

When speed matters, a slow decision is as ineffective as the wrong decision. As we discussed in Chapter 8, speed is a crucial competitive weapon in a growing number of industries, and companies can learn to make decisions fast. Managers must be plugged into the pulse of the company, must seek consensus and advice, and then be ready to take the risk and move ahead.

Decision Mistakes and Learning

Organizational decisions produce many errors, especially when made under high uncertainty. Managers simply cannot determine or predict which alternative will solve a problem. In these cases, the organization must make the decision-and take the risk-often in the spirit of trial and error. If an alternative fails, the organization can learn from it and try another alternative that better fits the situation. Each failure provides new information and learning. The point for managers is to move ahead with the decision process despite the potential for mistakes. "Chaotic action is preferable to orderly inaction."

In many cases, managers have been encouraged to instill a climate of experimentation, even foolishness, to facilitate creative decision-making. If one idea fails, another idea should be tried. Failure often lays the groundwork for success, as when technicians at 3M developed Post-it Notes based on a failed product—a not-very-sticky glue. Companies such as Pepsi-Cola believe that if all their new
products succeed, they're doing something wrong, not taking the necessary risks to develop new markets. Only by making mistakes can managers and organizations go through the process of decision learning and acquire sufficient experience and knowledge to perform more effectively in the future. Robert Townsend, who was president at Avis Corporation, gives the following advice:

Admit your mistakes openly, maybe even joyfully. Encourage your associates to do likewise by commiserating with them. Never castigate. Babies learn to walk by failing down. If you beat a baby every time he falls down, he'll never care much for walking.

My batting average on decisions at Avis was no better than a .333. Two out of every three decisions I made were wrong. But my mistakes were discussed openly and most of them corrected with a little help from my friends.

Escalating Commitment

A much more dangerous mistake is to persist in a course of action when it is failing. Research suggests that organizations often continue to invest time and money in a solution despite strong evidence that it is not working. Two explanations are given for why managers escalate commitment to a failing decision. The first is that managers block or distort negative information when they are personally responsible for a negative decision. They simply don't know when to pull the plug. In some cases, they continue to throw good money after bad even when a strategy seems incorrect and goals are not being met.

An example of this distortion is the reaction at Borden when the company began losing customers following its refusal to lower prices on dairy products. When the cost of raw milk dropped, Borden hoped to boost the profit margins of its dairy products, convinced that customers would pay a premium for the brand name. Borden's sales plummeted as low-priced competitors mopped up, but top executives stuck with their premium pricing policy for almost a year. By then, the company's dairy division was operating at a severe loss. Other companies have done the same, such as when Emery Air Freight Corporation acquired Consolidated Freightways, Inc. In the year since acquiring Consolidated, Emery lost $100 million on it, but executives were reluctant to admit it was a bad choice, believing things were about to get better. Negative information often doesn't sink in.

As another example, consider the increasing investment of the Canadian Imperial Bank of Commerce in the ill-fated Canary Wharf project, an $8 billion development in London's remote Docklands area. CIBC had already lent over $1 billion for Canary Wharf to the now-failed Olympia & York Developments Ltd. and its subsidiaries. Despite loads of negative information that led CEO Al Flood to pronounce Canary Wharf a project that "would not meet our lending criteria today," CIBC turned around and invested an additional $36 million in the project. Flood said the move was designed to "protect our investment ... and try to make the project work." These additional millions now seem like a terrible choice.

A second explanation for escalating commitment to a failing decision is that consistency and persistence are valued in contemporary society. Consistent managers are considered better leaders than those who switch around from one course of action to another. Even though organizations learn through trial and
error, organizational norms value consistency. These norms may result in a course of action being maintained, resources being squandered, and learning being inhibited. Emphasis on consistent leadership was partly responsible for the Long Island Lighting Company's refusal to change course in the construction of the Shoreham Nuclear Power Plant, which was eventually abandoned—after an investment of more than $5 billion—without ever having begun operation. Shoreham's cost was estimated at $75 million when the project was announced in 1966, but by the time a construction permit was granted, LILCO had already spent $77 million. Opposition to nuclear power was growing. Critics continued to decry the huge sums of money being pumped into Shoreham. Customers complained that LILCO was cutting back on customer service and maintenance of current operations. Shoreham officials, however, seemed convinced that they would triumph in the end; their response to criticism was, "If people will just wait until the end, they are going to realize that this is a hell of an investment."

The end came in 1989, when a negotiated agreement with New York led LILCO to abandon the $5.5 billion plant in return for rate increases and a $2.5 billion tax write-off. By the time Governor Mario Cuomo signed an agreement with the company, LILCO had remained firmly committed to a losing course of action for more than twenty-three years.62

Failure to admit a mistake and adopt a new course of action is far worse than an attitude that encourages mistakes and learning. Based on what has been said about decision making in this chapter, one can expect companies to be ultimately successful in their decision making by adopting a learning approach toward solutions. They will make mistakes along the way, but they will resolve uncertainty through the trial-and-error process.

**SUMMARY AND INTERPRETATION**

The single most important idea in this chapter is that most organizational decisions are not made in a logical, rational manner. Most decisions do not begin with the careful analysis of a problem, followed by systematic analysis of alternatives, and finally implementation of a solution. On the contrary, decision processes are characterized by conflict, coalition building, trial and error, speed, and mistakes. Managers operate under many constraints that limit rationality; hence, intuition and hunch often are the criteria for choice.

Another important idea is that individuals make decisions, but organizational decisions are not made by a single individual. Organizational decision-making is a social process. Only in rare circumstances do managers analyze problems and find solutions by themselves. Many problems are not clear, so widespread discussion and coalition building take place. Once goals and priorities are set, alternatives to achieve those goals can be tried. When a manager does make an individual decision, it is often a small part of a larger decision process. Organizations solve big problems through a series of small steps. A single manager may initiate one step but should be aware of the larger decision process in which it is embedded.

The greatest amount of conflict and coalition building occurs when goals are not agreed on. Priorities must be established to indicate which goals are important and what problems should be solved first. If a manager attacks a problem
other people do not agree with, the manager will lose support for the solution to be implemented. Thus, time and activity should be spent building a coalition in the problem identification stage of decision-making. Then the organization can move toward solutions. Under conditions of low technical knowledge, the solution unfolds as a series of incremental trials that will gradually lead to an overall solution.

The most novel description of decision-making is the garbage can model. This model describes how decision processes can seem almost random in highly organic organizations. Decisions, problems, ideas, and people flow through organizations and mix together in various combinations. Through this process, the organization gradually learns. Some problems may never be solved, but many are, and the organization will move toward maintaining and improving its level of performance.

Finally, many organizations must make decisions with speed, which means staying in immediate touch with operations and the environment. Moreover, in an uncertain world, organizations will make mistakes, and mistakes made through trial and error should be encouraged. Encouraging trial-and-error increments facilitates organizational learning. On the other hand, an unwillingness to change from a failing course of action can have serious negative consequences for an organization. Norms for consistency and the desire to prove one's decision correct can lead to continued investment in a useless course of action.
Bibliography