



NONTRADITIONAL  
RESEARCH

# A Modeling Methodology for Multiobjective Multistakeholder Decisions Implications for Research

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Management sciences currently do not offer a systematic approach to model the dynamics and effects of multiple stakeholders' objectives on corporate decisions. The purpose of this article is to introduce a structured qualitative methodology that provides researchers with a means to systematically model, analyze, and compare cases of context-rich, idiosyncratic organizational decisions that involve multiple sets of objectives of multiple and divergent stakeholders.

The multiobjective multistakeholder decision modeling methodology consists of a stepwise approach for inferring organizational priorities by modeling organizational objectives hierarchies. An objectives hierarchy classifies related, more specific subsets of objectives into higher level categories of broader, more general objectives in a hierarchical tree structure. In the modeling methodology, we combine

qualitative and structured elements to achieve two traditionally exclusive research goals: retain a high level of the decision's complexity and simultaneously provide means for systematic comparisons within one or among several decision cases. With this methodology, we aim to broaden the empirical base of stakeholder theory by expanding its methodological arsenal.

The modeling methodology is nontraditional in that it links two formerly distinct streams of research: (a) multiattribute decision analysis and, specifically, the objectives hierarchies method from decision analysis (Keeney, 1992; von Neumann & Morgenstern, 1947; von Winterfeldt, 1987) and (b) recent descriptive developments in the stakeholder literature (Freeman, 1984; Mitchell, Agle, & Wood, 1997). The objectives hierarchies method creates tree structures that organize the objectives of a decision maker into related

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classifications of objectives with increasing levels of generality. Depending on the research question and the decision context, objectives hierarchies can be modeled for multiple stakeholders to track differences in objectives between stakeholders, or they can be modeled at multiple points in time to track the changes in one organization's priorities.

We first discuss the theoretical foundations of the proposed methodology in greater detail. We then use StarKist's decision to sell only dolphin-safe tuna, an example of a major corporate policy change, to illustrate the modeling methodology. We briefly introduce the case, then provide a detailed, applied description of the six steps composing the methodology: (a) identify decision, critical events, and key stakeholders; (b) compile database; (c) model decision-frame timeline; (d) model objectives hierarchies; (e) validate models; and (f) examine decision. Last, we discuss the findings from the illustrative case and explore potential future research directions resulting from the methodology.

## THEORETICAL AND METHODOLOGICAL FOUNDATIONS

### Stakeholder Approach

The consideration of multiple constituents in organizational decision problems dates back decades (e.g., see Barnard, 1938). It was R. Edward Freeman (1984), however, who gave stakeholder analysis its name and prominence and who provided the definition of stakeholders as "any group or individual who can affect or is affected by the achievement of an organization's purpose" (p. 46). Central to the stakeholder approach is its use "to identify the connections . . . between stakeholder management and the achievement of *traditional* [italics added] corporate objectives" (Donaldson & Preston, 1995, p. 71). Our observations suggest that new corporate objectives are being added to the traditional ones, making the management of divergent interests ever more complex. Clarkson (1995) showed that corporations do in fact actively manage their relationships with stakeholder groups. Corporate offices handling public relations, investor relations, or government relations are standard and indicate that corporations allocate attention and resources to balance multiple constituents. A thorough review of the stakeholder literature can be found in Mitchell et al. (1997). A host of more recent and primarily conceptual articles indicates the vitality of this

area of inquiry (Donaldson, 1999; Freeman, 1999; Frooman, 1999; Gioia, 1999; Jones & Wicks, 1999; Rowley, 1997; Trevino & Weaver, 1999). The influence and power of stakeholders are the subject of articles by several authors. Examples are Rowley (1997), who applies network theory to study the role of structural aspects of stakeholder relationship on stakeholder influence; Frooman (1999), who draws on resource dependence theory for his typology of stakeholder influence strategies; and Mitchell et al., who assess the salience of a stakeholder to management decisions based on power, urgency, and legitimacy.

In contrast to the vitality of the field's conceptual development, empirical work in the stakeholder literature has been relatively sparse (e.g., see Henriques & Sadosky, 1999). We attribute this in part to the field's infancy and the methodological challenges inherent in the empirical study of stakeholder relations. Much of the stakeholder concept's appeal stems from the fact that it casts its conceptual net widely and captures a great variety of organizational relationships theoretically. However, traditional research methodologies that rely on quantitative approaches, such as cross-sectional or laboratory designs, can only capture narrow aspects, prompting calls for additional research designs and methodologies (Frooman, 1999). Qualitative approaches, on the other hand, tend to remain in the stage of early theory building. We contend that our structured qualitative decision modeling methodology is capable of capturing the breadth of conceptual stakeholder models while also allowing systematic comparisons within decisions and between individual cases—a big step toward overcoming this challenge.

To place the methodology in context, we suggest first that the entire realm of organizational decision-making structures, processes, and outcomes is too broad to address with a single method. Our focus here is on structuring major strategic decisions and on modeling the objectives of multiple stakeholders, the decision alternatives, and the evolution of the decision and key events.

Second, although conflict is at the core of many multistakeholder multiobjective decisions, this article does not focus specifically on conflict or the process of negotiation or conflict resolution. Just like daily operational decisions in an organization, strategic decisions require optimization and trading off conflicting objectives; they differ, however, in their greater scope and impact. In some cases, conflict can be superseded by higher level solutions that do not require trade-offs

and thus improve on zero-sum games. In other cases, the decision will generate winners and losers among the stakeholders. Our methodology can shed light on the type of conflict by making differences in objectives and stakes more apparent.

Finally, we take the perspective that the resolution of divergent, sometimes irreconcilable differences of stakeholder interests in corporate decision making is a mix of organizational sense making (Weick, 1969), rational decision making, and chance and that much of it occurs tacitly. Nevertheless, insights for conducting effective negotiations (Raiffa, 1982) can be gained by structuring a decision with our method. Our framework is based on the assumption that we can infer the objectives held by an organization from its actions and the perceptions and accounts of corporate decision makers and that we can furthermore prioritize the objectives into hierarchical structures.

### **Multiobjective Decision Analysis**

The stakeholder approach explicitly considers multiple persons in a relatively context-rich management situation. In contrast, early decision analysis research focused on theoretically modeling a single person's choice among relatively context-free alternatives, such as monetary gambles (von Neumann & Morgenstern, 1947). Later work modeled alternatives with multiple attributes or objectives (Keeney & Raiffa, 1976), such as minimizing adverse monetary and environmental impacts when managing nuclear waste (Keeney & von Winterfeldt, 1994). An extension of modeling the choices of single individuals with multiple objectives is the use of objectives hierarchies (Keeney, 1992; Kirkwood, 1997; von Winterfeldt, 1987) to contrast multiple individuals' or groups' choices (on mining in a tropical rain forest, see Gregory & Keeney, 1994; von Winterfeldt & Edwards, 1986). Although these authors model decisions involving multiple decision makers, multiple objectives, and multiple stakeholders in real time, their purpose is to aid and improve decision making in organizational or public policy settings during individual decision processes. In contrast, we model multiple objectives hierarchies for descriptive, comparative, and theoretical purposes using case methods.

Four limitations have been identified in most decision analysis modeling research and applications (Keller & Ho, 1988, 1990). First, decision analysis provides an organized way of modeling decisions but

provides little guidance on the modeling process for creating the problem structure model. Second, the memory of one individual (or a set of individuals sequentially) is generally the source of knowledge and ideas, rather than an organization's multiple data sources. Third, the resulting models tend not to be dynamically evolving, even though they often include probabilistic uncertainty. Finally, little work has been done to systematically model actual, complex decisions in organizations to make such decisions comparable.

The multiobjective multistakeholder decision modeling methodology addresses these limitations. It offers a detailed process to systematically structure decision problems based on multiple accounts, and it provides an approach to create decision modeling structures for different stakeholders within one decision context, track the evolution of a decision over time, and make multiple decisions comparable. The methodology is flexible and can be applied equally to retrospective and to real-time and longitudinal studies. In this article, we construct stakeholders' objectives hierarchies from retrospective case data. Although the decision aiding literature chronicles a few retrospective uses of objectives hierarchies (on North Sea oil discharges, see Fischer & von Winterfeldt, 1978; on fisheries management, see McDaniels, 1995), the focus is on prescribing ways to aid decisions or normatively identify ideal decisions, whereas the focus of the current modeling approach is on accurately describing decisions (Bell, Raiffa, & Tversky, 1988; Keller, 1989).

In addition to stakeholder concepts and decision analysis research, the multiobjective multistakeholder decision modeling methodology draws on the qualitative case research tradition, which has been developed and applied extensively in recent years (Eisenhardt, 1989; Gersick, 1994; Leonard-Barton, 1990; Miles & Huberman, 1994; Post & Andrews, 1990; Winn, 1995; Yin, 1994). Here we modify traditional case analysis methods to structure and model multistakeholder organizational decision problems. The strategic decision problems best suited for our approach have multiple stakeholders with strong and divergent views, are dynamic over time, involve multiple conflicting objectives, and have high stakes. The following section provides background information for such a case, StarKist's dolphin-safe policy decision. It is followed by a step-by-step description of the modeling methodology. Additional information about the case is woven into the description of the

methodology as we illustrate each step with the StarKist case. A postscript to the case is provided in the appendix.

### STARKIST CASE: BACKGROUND

We demonstrate our multiobjective multistakeholder decision modeling methodology using the widely publicized and controversial strategic decision by StarKist Tuna Company to sell only dolphin-safe tuna. The data that provide the basis for this article were collected by one of the authors; the data collection method is described in the following section. The StarKist case has also been the subject of several other studies (e.g., Frooman, 1999; Vietor, Reinhardt, & Duxbury, 1996; Winn, 1995). The case was set in the United States and involved stakeholders whose highly contradictory objectives highlight conflict between environmental and economic values.

At issue was a tuna fishing method feasible only along the Pacific coast from California to Chile. In this area, schools of dolphins tended to swim near schools of yellow-fin tuna. This peculiar association between tuna and dolphins led to a fishing method referred to as setting nets on dolphins, which used dolphins as indicators for nearby tuna. In the 1960s, so-called purse seine nets were introduced and quickly replaced traditional long-line methods. These nets were released by high-tech fishing boats to encircle a suspected catch of tuna. Once deployed, the bottom was pulled shut with cables acting like purse strings—hence the name. This very effective fishing method yielded rich catches. In the process of encircling and netting tuna, however, dolphins were also captured in the nets and killed either deliberately or accidentally, injured, suffocated, or crushed. One estimate put the number of dolphins killed since the 1960s at 6 million. Legislation introduced by the United States in the 1970s (the Marine Mammal Act) progressively limited the legal number of dolphins killed during tuna fishing. Annual quotas of incidental kills were reduced from an initial number of 78,000 in the 1970s to 20,500 in the 1980s. Fishing boats tried many different approaches to reduce the number of dolphins killed, including the use of small boats and divers who chased dolphins out of the net before hauling the catch aboard.

Despite these improvements, major environmental campaigns were underway, orchestrating consumer

boycotts and mass postcard mailings to put further pressure on U.S. tuna canners and specifically the market leader, StarKist. From the perspective of corporate strategic planners, implementing operational changes to protect dolphins was expected to result in dramatically higher costs to tuna canners, yet consumers of canned tuna were highly price conscious. Price increases to pass the higher cost onto consumers were considered an unlikely option. The fiercely competitive tuna industry operated with tight profit margins, and the economic stakes were high.

### THE MULTISTAKEHOLDER DECISION MODELING METHODOLOGY ILLUSTRATED BY THE STARKIST CASE

We now describe in detail the method for retrospectively modeling the evolution of major strategic decisions and use the StarKist case for illustration. For clarity, the procedure is shown step by step, although the actual modeling proceeds more iteratively. Steps 1 to 4 rely on secondary data that are supplemented with interviews in Steps 5 and 6. The steps progress from highly descriptive (Steps 1 and 2) to a first-level analysis and interpretation (Steps 3 and 4) to deep interpretation and validation (Steps 5 and 6).

#### Step 1: Identify Decision, Critical Events, and Stakeholders

The first task is to identify the decision at issue, critical events related to the decision, the decision maker, and key stakeholders from the overall list of stakeholders. The number of stakeholders examined in depth may be as low as two and can be as high as case and theoretical focus require. As a rule of thumb, we begin by selecting stakeholders with moderate to high levels in at least two of the three categories of power, legitimacy, and urgency (Mitchell et al., 1997).

*Decision, critical events, and stakeholders.* StarKist Tuna Company was the de facto decision maker in this case. In 1990, the company was the market share leader with almost 40% of U.S. canned tuna sales. Major competitors, Bumblebee Tuna and Chicken-of-the-Sea, held a combined market share of another 40%. Other main stakeholders were the consumers of canned tuna; the fishing fleets working on a contract basis with canners like StarKist to supply tuna fish; the media, especially television; and finally,

environmental interest groups such as the Earth Island Institute in San Francisco. In this article, we narrowed our focus on to StarKist, the fishing fleet, and the environmental groups. We chose these stakeholders (a) because the contrast between their values and objectives appeared to be maximal, thus highlighting fundamental differences between them and (b) because as a result of the stark contrasts, the impact of dynamic changes in the respective levels of power, legitimacy, and urgency could be traced more easily throughout the decision-making process.

## Step 2: Compile Database

Next, we expand the data collection and compile a comprehensive database, drawing from the full range of case study methods (e.g., see Miles & Huberman, 1994; Yin, 1994). Textual materials can include meeting agendas, press reports, annual reports, and policy manuals. Other data sources are audio, video, or computer files as well as direct observation of current operations or facilities. A second important use for these data in Steps 5 and 6 is to validate the responses of top managers gathered in interviews and to identify any social desirability response bias on their part.

Then, decision dates, alternatives, stakeholders' objectives, possible probabilistic events, and the alternative actually chosen are systematically identified and verified. A case narrative is generated to organize disparate data sources in chronological order and to provide a rich case description. It connects the qualitative and the structured aspects of our methodology and can be as extensive as a full background article (portraying the strategic context, historical background, and decision-making process from multiple perspectives) or as brief as a timeline in bullet form. In high-visibility decisions, extensive media coverage and other public sources can provide ample information for the narrative. We follow Yin's (1994) principles for good data collection—first, multiple sources of evidence are needed to corroborate facts; second, we construct a case study database with case notes, documents, and a narrative (a feature added by the authors for the current methodology); and third, in reporting case study and supporting documents, a chain of evidence should be maintained to link the derivation of conclusions to evidence in the database. Our method shares features of the investigative work that characterizes other case study approaches. What is unique is the specific focus on creating a structured model of stakeholder objectives and decision elements. Ideally,

the information search proceeds in iterations of gathering and interpreting data suitable for the modeler to paint a consistent and complete picture of the decision case.

*Data sources.* Data were collected from extensive interviews, video footage, news, and archival records from StarKist and its corporate parent, H. J. Heinz; from environmental groups, primarily from the San Francisco Bay area; from television and print media; and from the San Diego area fishing fleet. The data collection included archival documents, company newsletters, annual reports, media coverage, and multiple personal interviews with key stakeholders.

*Key decision dates.* In the late 1980s, the purse seine net fishing method became widely known when a videotape filmed aboard a tuna boat documented brutal treatment of dolphins and shocked the public. In protest, consumers boycotted tuna companies, and thousands of postcards from children and protest letters flooded tuna canners. Pressure from environmental groups and consumers to stop the killing of dolphins grew, amplified by extensive media coverage. As Earth Day II was about to take place in April 1990, boycott campaigns and rallies were expected to further publicize and polarize the dolphin issue. StarKist Tuna Company, the largest and most visible supplier of canned tuna, was especially targeted. It was in this general business climate in the winter months of 1989 to 1990 that StarKist's top management systematically examined its strategic options to take decisive action. The final decision, in early 1990, was the culmination of an intense, secret executive decision-making process that examined many options, spanned several months, and included multiple actors.

*Alternatives.* Three alternatives were identified: (a) to maintain the status quo and to stay within and below the legal limits of dolphins killed, (b) to aggressively limit the number of dolphins killed in the process of fishing, and (c) to cease any fishing that involved setting nets on dolphins, thereby becoming dolphin safe.

*Stakeholder objectives.* To deduce underlying objectives, we searched for references to values, goals, interests, and changes in any of these, drawing on all data, including public documents and company records (in Step 5, we use interviews to validate the preliminary findings). We used content analysis meth-

TIME PHASE	PROBLEM RECOGNITION	PROBLEM CLARIFICATION			DECISION MAKING
<b>OBJECTIVES HIERARCHIES</b>	Table 1. StarKist's Bus.-as-Usual O.H.	Table 2. Env. Groups' O.H.	Table 3. Fishing Fleet's O.H.	Table 4. SK's Strategic Planning O.H.	Table 5. StarKist's Crisis Mode O.H.
<b>ALTERNATIVES (&amp; RANKINGS) FOR STAKEHOLDER</b>	Status Quo (SQ) ? Ltd.Mortality (LM) ? Dolphin Safe (DS) ?  For StarKist	SQ 3 <sup>rd</sup> LM 2 <sup>nd</sup> DS 1 <sup>st</sup>  For Env. Groups	SQ 1 <sup>st</sup> ? LM 2 <sup>nd</sup> ? DS 3 <sup>rd</sup>  For Fishing Fleet	SQ 3 <sup>rd</sup> LM 2 <sup>nd</sup> ? DS 1 <sup>st</sup> ?  For StarKist	SQ 3 <sup>rd</sup> LM 2 <sup>nd</sup> DS 1 <sup>st</sup>  For StarKist
<b>POWER-URGENCY-LEGITIMACY (P-U-L) OF STAKEHOLDERS W/STARKIST</b>	Env. Groups Fishing Fleet  P-U-L P-U-L	Env. Groups  P-U-L	Fishing Fleet  P-U-L	Env. Groups Fishing Fleet  P-U-L P-U-L	
<b>ACTUAL EVENTS</b>	Video of Dolphin Kills in Tuna Fishing; Consumer Letter Writing Campaign	Meetings with Env. Groups; Meetings with Fishing Fleet; StarKist Executives' Closed Door Meetings			StarKist chooses Dolphin Safe Option; Announcement: Week before Earth Day II, April 1990
<b>POSSIBLE EVENTS</b>	<i>Boycott Threat</i>	<i>Competitors Might Move First; Threat of Regulation</i>			

Figure 1: StarKist's decision frame timeline

ods to deduce objectives from text sources; these objectives became the basis for constructing objectives hierarchies in Step 4.

*Possible events.* Possible events with substantial economic impact for StarKist were growing consumer boycotts, environmental group actions, and potentially preemptive decisions by competitors, such as moving first to curtail tuna fishing operations.

*Alternative chosen.* As is widely known, StarKist chose the third alternative and adopted what later became known as the dolphin-safe policy. The official policy statement from the 1991 StarKist Dolphin-Safe Brochure reads, "StarKist will not buy any tuna caught in association with dolphins in the Eastern Tropical Pacific."

**Step 3: Model Decision Frame Timeline**

If data for a period of time are collected in Step 2, they can now be organized into a decision frame timeline to create a sequence of snapshots of the decision frame over time. A decision frame consists of the decision context, which defines the type of alterna-

tives considered for a specific decision situation, and fundamental objectives, which express the values important in that decision context and define the class of consequences of concern (Keeney, 1992). In cases with complex probabilistic uncertainties, chains of uncertain events may be represented by decision trees or influence diagrams. Keller and Kirkwood (1999) provide an example of a decision frame timeline in their multiobjective analysis of options to merge two professional societies. The modeler's focus will determine whether a grounded approach is chosen or whether stages of decision making suggested in the literature are used as an a priori theoretical lens.

*Decision frame timeline.* Figure 1 contains the StarKist decision frame timeline, including decision phases and key decision elements in each phase. Elements of the decision include alternative actions; StarKist's objectives; stakeholder objectives; power, urgency, and legitimacy of stakeholders; and events. Notable in this timeline is the sense of urgency experienced by StarKist executives in the face of the boycott threat on Earth Day. We identified an early Problem Recognition Phase, an intermediate Problem Clarification Phase, and a final Decision-Making Phase. Subjective modeling choices are a key feature of our mod-

eling approach (e.g., our choice to divide the timeline into three phases) and rest on detailed knowledge of the raw data.

#### **Step 4: Model Objectives Hierarchies**

This step structures the fundamental objectives of stakeholders into objectives hierarchies. Adopting Keeney's (1992) terminology, we define an objective as something one desires to achieve that is set within a decision context and has a direction of preference (e.g., for the StarKist decision context, one objective is to save more dolphins' lives, and more lives saved is preferred to fewer lives saved). The modeling process extracts and examines objectives from the gathered information in greater depth and attempts to reconcile conflicting stories. Inaccurate, biased, or incomplete information can result from cognitive errors, faulty memory, or different viewpoints; triangulation and corroboration of data interpretation are accepted methods to minimize these potential sources of error (Yin, 1994).

In addition, the data search has to balance the need for information sufficiently rich to infer and validate decision components with considerations of access and cost. Semistructured interviews with decision makers, triangulated with interviews of others close to the decision, tend to richly capture the unique aspects of the decision. Interviews can also be structured to elicit the objectives and objectives hierarchy directly (similar to decision analysis to aid a decision). Keller and Ho (1988, 1990) summarize techniques for eliciting elements of the decision structure. According to Keeney, objectives should be essential, controllable, measurable, operational, decomposable, concise, and understandable (Keeney, 1992, pp. 82-86). We then use case study (Miles & Huberman, 1994; Yin, 1994) and content analysis methods (Weber, 1990) to search textual case materials (transcribed interviews, written documents) for indicators of decision elements.

Objectives hierarchies are structured from the bottom up, starting with a comprehensive list of objectives and then combining them into related, more general categories. Next, related categories are connected. Objectives hierarchies can also be structured from the top down, starting with major categories of objectives and then subdividing into more specific objectives. Finally, a sequence of top-down and bottom-up iterations is useful (Buede, 1986; von Winterfeldt & Edwards, 1986).

In constructing objectives hierarchies, it may become evident that one stakeholder requires multiple hierarchies that differ in important fundamental objectives. This may (a) reflect different worldviews held by different people within the stakeholder organization or (b) indicate that a stakeholder's decision frame changes over time as the decision evolves.

*Objectives hierarchies.* We modeled separate objectives hierarchies for the decision maker StarKist, the fishing fleet, and the environmental groups (see Tables 1 to 5). Starting from the bottom up, comprehensive lists of possible objectives were compiled from multiple data sources, then structured into hierarchies. Hierarchies were then refined in several iterations from the top down and the bottom up. Logic was used to sort subordinate and superordinate objectives, which were then validated in multiple iterations of data analysis.

*Business-as-usual objectives hierarchy for decision maker.* When the issue of danger to dolphins first heated up publicly in late 1989, StarKist's response in this problem recognition phase appeared to be in a business-as-usual mode, shown in the objectives hierarchy in the first column of Table 1.<sup>1</sup> Here we list objectives and subobjectives in table form; they can also be portrayed in the form of objectives trees (see Figure 2). We grouped objectives in six categories: minimize cost, maximize revenue, optimize industry competitive position, minimize legal and regulatory interference, maintain favorable stakeholder relations, and maintain reputation as a good corporate citizen.

This objectives hierarchy reflects a generic set of objectives that StarKist likely applied to a wide variety of strategic decisions. We show in the following, however, that this business-as-usual approach was not sufficient for StarKist to reach a decision. Letter campaigns, favorable and frequent media exposure, and the approach of Earth Day had increased the influence and legitimacy of the environmental groups as well as raising the urgency of their claims, with Earth Day becoming a deadline for action. As a result, the objectives of the environmental groups and the fishing fleet were explicitly considered by StarKist, and objectives hierarchies modeled for StarKist in the latter stages of the firm's decision making represented more comprehensive sets of objectives.

*Objectives hierarchies for other stakeholders.* During the problem clarification phase, a search for additional

Table 1  
Decision Alternatives Rated With StarKist's Business-as-Usual Objectives Hierarchy

Objectives Hierarchy	Decision Alternative		
	Keep Status Quo	Reduce Dolphin Mortality	Go Dolphin Safe
Maximize profit	?	?	?
B1. Minimize cost			
B1.1. Minimize cost of tuna	+	-	-
B1.2. Minimize cost of canning operations	+	-	-
B1.3. Minimize cost of transportation logistics	+	+	-
B1.4. Maximize quality of tuna and operations	+	+	-
B2. Maximize revenue			
B2.1. Maintain and expand brand loyalty	?	0	+
B2.2. Increase customers with differentiated product line	?	?	?
B3. Optimize industry competitive position			
B3.1. Capture first mover advantages	-	0	+
B3.2. Hold market share leadership	?	?	?
B4. Minimize legal and regulatory interference			
B4.1. Minimize legal liabilities	?	0	0
B4.2. Minimize regulatory intervention	-	-	+
B5. Maintain favorable stakeholder relations			
B5.1. Maintain good supplier relations	+	0	-
B5.2. Maintain good shareholder and banking relations	?	?	?
B5.3. Maintain good relations to corporate headquarters	?	?	?
B6. Maintain reputation as good corporate citizen	-	-	+

Note: + = favorable, - = unfavorable, ? = insufficient information, and 0 = neutral or balanced.

Table 2  
Decision Alternatives Rated for Environmental Interest Groups

Objectives Hierarchy	Decision Alternative		
	Keep Status Quo	Reduce Dolphin Mortality	Go Dolphin Safe
Protect marine mammals	-	?	+
E1. Stop killing of dolphins			
E1.1. Protect intelligent large marine mammals	-	-	+
E1.2. Protect species from extinction	-	?	+
E2. Stop cruelty to dolphins			
E2.1. Prevent herding by helicopter and detonations	-	?	+
E2.2. Prevent harm from entangling	-	-	+
E3. Generate positive public image for cause			
E3.1. Maximize favorable media coverage	+	+	+
E3.2. Generate positive public sentiment	+	+	+
E4. Improve prestige of special interest group			
E4.1. Increase financial support	?	?	+
E4.2. Gain support from celebrity spokespersons	+	?	+

Note: + = favorable, - = unfavorable, and ? = insufficient information.

information coupled with pressure from other stakeholders led StarKist to pay closer attention to the most conflicting objectives. To highlight conflicting objectives, we next modeled objectives hierarchies for the two stakeholder groups with the most divergent perspectives, environmental groups and the fishing fleet (see first columns of Tables 2 and 3). The environmental groups' prime objective, to protect marine mammals, contained four main subobjectives: stop killing of dolphins, stop cruelty to dolphins, generate posi-

tive image for cause, and improve prestige of interest group. The fishing fleet's prime objective, to maintain a viable business, contained these main subobjectives: maintain profitability, maintain livelihood, maintain quality of life in the local community, and protect positive image as a good global citizen.

*Strategic planning objectives hierarchy.* The strategic planning hierarchy in Table 4 represented StarKist's situation near the end of the problem clarification



Table 3  
*Decision Alternatives Rated for Fishing Fleet*

<i>Objectives Hierarchy</i>	<i>Decision Alternative</i>		
	<i>Keep Status Quo</i>	<i>Reduce Dolphin Mortality</i>	<i>Go Dolphin Safe</i>
Maintain viable business	+	+	-
F1. Maintain profitability			
F1.1. Maintain lucrative fishing grounds	+	+	-
F1.2. Maintain lucrative fishing methods	+	?	-
F1.3. Avoid foreign competition	+	?	-
F2. Maintain livelihood			
F2.1. Maintain fishing grounds in Eastern Tropical Pacific	+	+	-
F2.2. Protect large investments in boats	+	+	-
F2.3. Prevent fishing grounds from depletion	?	+	-
F3. Maintain quality of life in local community			
F3.1. Protect family-owned small businesses and heritage	+	+	-
F3.2. Maintain positive image in community	?	+	+
F4. Protect positive image as good global citizen			
F4.1. Legitimate fishing methods involving dolphins	?	0	-
F4.2. Publicize successes in reducing dolphin mortality	0	+	+

Note: + = favorable, - = unfavorable, ? = insufficient information, and 0 = neutral or balanced.

phase, close to the impending deadline of Earth Day in April 1990. The refined subobjectives in this revised hierarchy indicated that the existence of the dolphin-safe option was gaining more focused attention in considering the objectives. Compared with the business-as-usual objectives hierarchy, the range of objectives had broadened and the specificity of subobjectives had deepened, reflecting increased consideration of the positions and objectives of the fishing fleet and the environmental groups.

The first major subobjective, minimizing operational changes and restrictions, is made up of two subdivisions reflecting fishing fleet concerns. It was desirable to minimize restrictions on (or relocation of) fishing territories and the negative impacts from reduced yields on profit. Similarly, for StarKist, it was important to maintain good supplier relations, whether that meant monitoring fishing methods of distant fleets or mitigating strained relations with the local fleet. The second subobjective, maintaining profitability, required that costs be kept low and revenue levels be maintained. Third, StarKist could protect its favorable industry competitive position by holding its leadership in market share and acting as the first mover (Lieberman & Montgomery, 1988) in setting a dolphin-related policy. The latter would capture the advantages of maximizing discretion in setting future industry standards (for increased power), optimizing favorable media coverage (for increased legitimacy), and justifying a higher price for dolphin-safe tuna to absorb higher operating costs. The fourth

subobjective was to minimize government regulation of tuna fishing. This could benefit StarKist by minimizing cost increases, minimizing constraints on management discretion, and minimizing uncertain outcomes on cost structure and operational requirements. Finally, consideration of the environmental groups' and fishing fleet's objectives deepened the subobjective of improving firm reputation and public perception; it also led to the addition of another subobjective, minimizing short-term and long-term negative impact on marine life.

This strategic planning objectives hierarchy illustrates the high level of complexity of the decision. The comprehensiveness demonstrated here is more likely to occur when a decision is critical for an organization and the investment of considerable time and resources for systematic planning is possible. The hierarchy further illustrates that achieving some of the objectives will require giving up others (e.g., minimizing operational changes may not maximize goodwill).

*Environmental crisis mode objectives hierarchy.* Finally, in the decision-making phase, StarKist executives seemed to operate in a crisis mode (see Table 5). A key change was the greatly increased urgency, a result of rapidly approaching Earth Day, increased media coverage, and concern for competitors' preemptive moves. The objectives are similar to those in the strategic planning objectives hierarchy from the problem clarification phase. Both objectives hierarchies contain comprehensive lists of the fundamental objectives

Table 4  
*StarKist's Strategic Planning Objectives Hierarchy*

<i>Objectives Hierarchy</i>	<i>Decision Alternative</i>		
	<i>Keep Status Quo</i>	<i>Reduce Dolphin Mortality</i>	<i>Go Dolphin Safe</i>
Maximize profit	?	?	+
S1. Minimize operational changes and restrictions			
S1.1. Manage profit-related changes	+	+	-
S1.1.1 Minimize restrictions on fishing territory	+	+	-
S1.1.2 Maintain yield	+	+	?
S1.2. Maintain good supplier relations			
S1.2.1 Maintain control over distant fleet	+	+	-
S1.2.2 Minimize strain on relations with local fleet	+	+	-
S2. Maintain firm profitability			
S2.1. Minimize cost (closely related to S1.1.)	+	+	-
S2.2. Maintain revenue stream	?	?	+
S2.2.1. Hold tuna price down	+	+	?
S2.2.2. Avoid boycotts of canned tuna	-	-	+
S3. Maintain favorable industry competitive position			
S3.1. Remain market share leader	?	?	+
S3.1.1. Hold leadership position	?	?	?
S3.1.2. Lead industry on pricing and policy	?	?	+
S3.1.3. Hold leadership-related brand loyalty	?	?	+
S3.2. Capture first-mover advantages	-	?	+
S3.2.1. Set industry standard on dolphin policy	-	+	+
S3.2.2. Maximize positive media coverage	-	-	+
S3.2.3. Maintain profit margin with higher price	-	?	+
S4. Minimize government regulation			
S4.1. Minimize regulation-induced cost increases	-	+	+
S4.2. Minimize constraints on managerial discretion	-	?	+
S4.2.1. Avoid compliance or forced reactive mode	-	-	+
S4.2.2. Avoid regulation-related bureaucracy	-	?	+
S5. Improve firm reputation and public perception			
S5.1. Enhance image of good corporate citizen	-	?	+
S5.1.1. Maximize goodwill	-	?	+
S5.2.2. Ensure perceived legitimacy (firm and industry)	-	?	+
S5.2. Avoid negative press	-	?	+
S5.3. Minimize uncertainty from regulation	?	?	+
S6. Minimize impact on marine life			
S6.1. Minimize short-term impact	-	?	+
S6.1.1. Decrease dolphin mortality	-	+	+
S6.2.2. Reduce tuna fishing in Eastern Tropical Pacific	-	-	+
S6.2. Minimize long-term impact	?	?	?
S6.2.1. Reduce threat of gill net fishing	?	?	?
S6.2.2. Avoid long-term depletion of tuna	?	?	?
S6.2.3. Avoid opening waters to foreign gillnetters	?	?	?

Note: + = favorable, and - = unfavorable, and ? = insufficient information.

that entered into consideration during the prolonged, difficult, and top secret decision-making process at StarKist. The objectives hierarchies differ, however, in how the objectives are organized and configured. The differences reflect shifts in the levels of urgency, power, and legitimacy of how each stakeholder was perceived and point to the dynamic nature of stakeholder relations (see Figure 1).

The urgency of acting increased as positions became more polarized, conditions surrounding the decision became more critical, and the survival of

StarKist itself was at issue and thus was elevated to the most important and overriding objective. Three subobjectives were sustaining long-term profitability, maintaining organizational legitimacy in the public eye, and minimizing interference from governmental regulation. Subordinate objectives under sustaining profitability covered many of the major categories from the two earlier StarKist objectives hierarchies. Subobjectives under organizational legitimacy were deeper than earlier hierarchies, reflecting increased concerns in this area. Making such changes apparent

Table 5  
*StarKist's Crisis Mode Objectives Hierarchy*

<i>Objectives Hierarchy</i>	<i>Decision Alternative</i>		
	<i>Keep Status Quo</i>	<i>Reduce Dolphin Mortality</i>	<i>Go Dolphin Safe</i>
Ensure firm survival	–	?	+
C1. Sustain profitability			
C1.1. Maintain favorable industry competitive position	–	+	?
C1.1.1 Maintain viable cost structure	+	+	?
C1.1.2 Maintain revenue stream	–	?	+
C1.2. Ensure technological and operational feasibility	+	+	?
C2. Minimize interference from government regulation			
C2.1. Minimize regulation-induced cost increases	–	+	+
C2.2. Minimize constraints on managerial discretion	–	?	+
C3. Maintain organizational legitimacy			
C3.1. Maintain image as good corporate citizen	–	?	+
C3.1.1. Maximize environmental citizenship image	–	?	+
C3.1.2. Maximize social citizenship image	–	?	+
C3.2. Minimize negative perception at critical events	–	–	+
C3.2.1. Minimize negative environmental perception	–	–	+
C3.2.2. Minimize perception of negative social impact	–	?	?

Note: + = favorable, – = unfavorable, and ? = insufficient information.

is one of the benefits of this methodology; we will examine the implications for theory development in the discussion section.

### Step 5: Validate Decision Frame Timeline and Objectives Hierarchies

Next, the decision frame timeline and objectives hierarchies are systematically validated. Where possible, they are presented to decision makers, stakeholders, and close observers for comments. Although the purpose is to reach additional insights, there is the risk that the model superimposes a structure on the decision that—due to the organized image it paints—looks plausible to the decision maker in retrospect, even if it is not an accurate reflection of the actual decision process. Such hindsight errors of retrospective sense making (Fischhoff & Beyth, 1975; Weick, 1969) need to be reduced through continuing internal and external triangulation of data and data interpretation (Yin, 1994). Cross-comparisons among different case records ensure internal consistency of the story and external consistency with the data. As mentioned earlier, these procedures are part of the iterative process of gathering data, of assessing the need for additional sources, and of modeling and refining the timeline and objectives hierarchies.

*Validation.* We reviewed all data in multiple iterations to validate the modeled timeline and hierarchies;

follow-up interviews with StarKist executives and other stakeholders helped to refine the timeline and objectives hierarchies and to improve the accuracy of our account of the decision evolution.

### Step 6: Examine Decision

The final step is to examine how the major options available at the time of the decision rate in terms of the objectives expressed in the objectives hierarchies. This allows an overall assessment of the quality of each decision alternative and provides a means to evaluate the effectiveness of the organization's decision process and final choice in light of its objectives. Unlike in decision aiding, where weights on objectives are assessed and each alternative is scored on each objective to compute a composite weighted average of the scores of each alternative, full quantification of the evaluation is not generally possible in the retrospective examination. However, the structure of the objectives hierarchies makes alternatives accessible to systematic qualitative examination.

*Examination of decision.* The evolution of the structure and content of the firm's objectives hierarchies suggests that StarKist's decision frame shifted over time, from business as usual to strategic planning to an environmental crisis mode. Also, as shown below, the relative ranking of the alternatives shifted over time and between stakeholders.

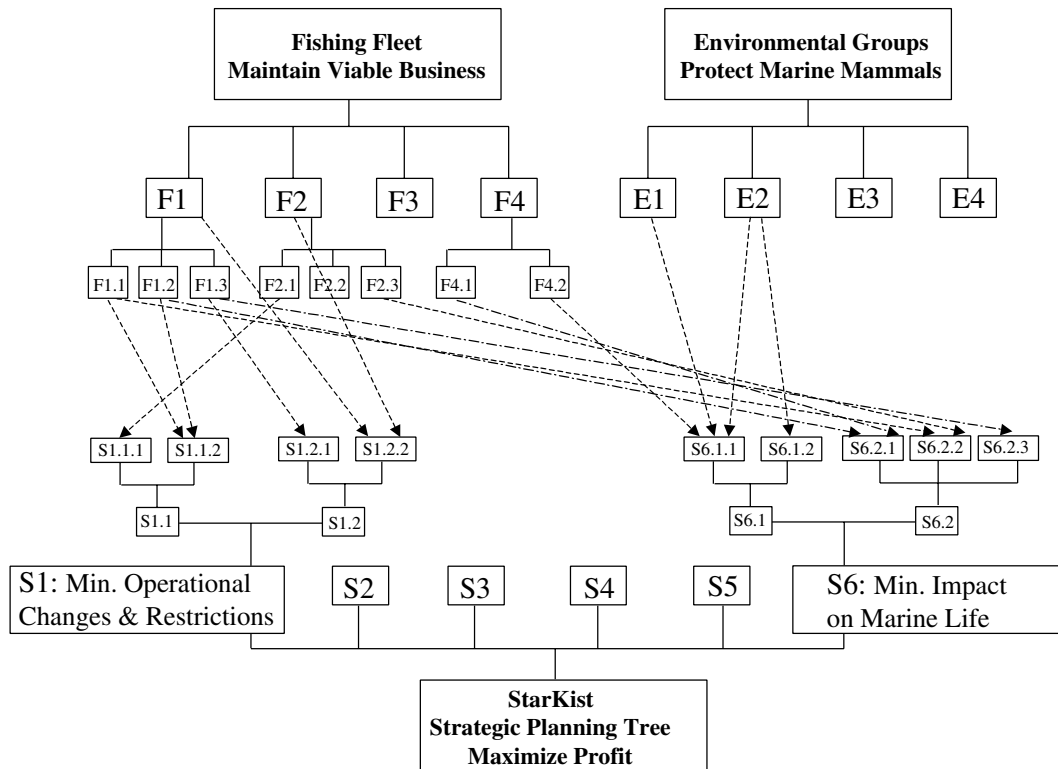


Figure 2: Examples of linkages between objectives in StarKist's strategic planning objectives hierarchy and objectives hierarchies of environmental groups and fishing fleet

As shown in Tables 1 to 5, we evaluated StarKist's decision alternatives in terms of their expected effects on the objectives hierarchies of StarKist and the other stakeholders. Each alternative (continue as before, aggressively reduce dolphin mortality further, or opt for zero mortality) was rated as favorable, neutral, or unfavorable to each objective. The business-as-usual hierarchy (see Table 1) highlights the difficulty of a decision problem when objectives are conflicting (the option of going dolphin safe would protect dolphins but adversely affect costs and relations with the fishing fleet that supplied the tuna), and no option emerges as clearly dominant. Tables 2 and 3 show the conflict in values between environmental groups, who favored the dolphin-safe option, and the fishing fleet, who favored the status quo or the limited mortality option. The absence of a clear ranking of options in StarKist's business-as-usual hierarchy highlights the need to move from the problem recognition phase to the problem clarification phase. A new iteration of reexamining its main objectives and gathering additional information on objectives and outcomes provided StarKist with an enriched perspective, reflected in the strategic planning objectives hierarchy (see Table 4).

As Earth Day neared, urgency and pressure to act before the competitors did increased. As StarKist entered this final decision-making phase, executives seemed to reframe the situation into a crisis mode (see Table 5). From this crisis decision frame, the choice of the dolphin-safe option was clearly the best alternative. Overall conditions of heightened urgency and the increase in power and legitimacy of the environmental stakeholders over time (see Figure 1) appeared to correspond with decreasing consideration of the decision's impact on the other key stakeholder group, the fishing fleet.

Modeling StarKist's decision evolution isolated several key factors. First, the objectives of the fishing fleet and the environmental groups were highly conflicting, eliminating the compromise choice of limited mortality as a good option. Second, by teaming up with consumers and media, environmental groups generated a very real threat to StarKist's public legitimacy and, with the prospect of a consumer boycott, a threat to its financial viability. The nature of the relationship between the environmental groups and StarKist shifted when the firm entered into direct dialogue with this stakeholder group. Concurrently, StarKist radically redefined its relationship with the

fishing fleet, effectively eliminating it as a stakeholder and accepting the need to find new suppliers.

### DISCUSSION OF FINDINGS AND IMPLICATIONS FOR RESEARCH

We showed in the previous section how the decision frame timeline in our model of StarKist's multiobjective multistakeholder decision evolution allows the examination of the objectives of stakeholders and of changes over time. We now look more closely at the benefits of using objectives hierarchies to (a) construct multiple objectives hierarchies over time for a decision maker, (b) construct objectives hierarchies for comparing and highlighting conflicting objectives of multiple stakeholders, and (c) examine interactions between objectives hierarchies. Finally, we use the StarKist case as an example to show how the methodology can be used to trace changes in the levels of stakeholders' power, urgency, and legitimacy (Mitchell et al., 1997), thus providing insight into stakeholder interactions and dynamic changes in stakeholder salience.

First, comparing multiple hierarchies for one stakeholder can illustrate changes in the scope or level of abstraction of a problem as perceived by the decision maker. Changes in breadth of sets and subsets of objectives signal scope changes, and changes in depth of objectives hierarchy levels signal changes in degree of abstraction. For example, StarKist's strategic planning objectives hierarchy (see Table 4) contains two new major objectives categories that did not appear in the business-as-usual hierarchy (see Table 1): minimizing operational changes and restrictions (S1) and minimizing impact on marine life (S6). The crisis mode objectives hierarchy (see Table 5) combines the six main objectives categories from the strategic planning objectives hierarchy into three main categories, with the third category, maintaining organizational legitimacy (C3), containing a broader focus than in the earlier objectives hierarchy.

Second, constructing objectives hierarchies for each of several stakeholders highlights their divergent perspectives and makes them comparable (e.g., by number and type of fundamental objectives held in common or in conflict or through evaluation of alternatives from different perspectives). This highlights potentially contentious areas and clarifies the extent of agreement and disagreement between conflicting positions. Tables 2 and 3 show that the objec-

tives of the environmental groups and the fishing fleet had very little in common. The fleet strongly opposed the dolphin-safe option that was strongly favored by the environmentalists.

Third, interactions between hierarchies can be seen in the number of new entries derived from the incorporation of stakeholder values into the decision maker's own objectives hierarchy. The evolution of StarKist's objectives hierarchies appears to indicate such heightened consideration of stakeholders' objectives. Figure 2 illustrates the linkages between the two new major categories in StarKist's strategic planning objectives hierarchy and the objectives of the environmentalist groups and the fishing fleet, with arrows pointing from objectives of StarKist's stakeholders to corresponding objectives in its own objectives hierarchy.

Fourth, we observe changes in stakeholder salience in favor of the environmental groups, when StarKist began to pay attention to impacts on dolphins (see Table 4, S6.1.1.), then accepted the power of environmental values (see Table 5, C3.1.1) and proceeded to examine options in the light of supplier relations and operational restrictions involving the fishing fleet (see Table 5, C1.1.1.). Mitchell et al. (1997) explain changes in salience by the power, urgency, or legitimacy of the stakeholder's claim. Our decision modeling methodology provides the means to systematically model changes in stakeholder salience by tracing changes in the relative levels of power, urgency, and legitimacy. Figure 1 portrays varying levels of power, urgency, and legitimacy (P-U-L) of two stakeholders vis-à-vis StarKist in each time phase. Initially, the levels of the environmentalists' power, urgency, and legitimacy are moderate, then they steadily increase to very high near the decision point. The fishing fleet's power begins moderately high and then falls dramatically in the final phase. Its legitimacy is high at the beginning as well but erodes over time. The urgency of the fleet's claim increases to a peak in the final phase, followed by the loss of its traditional means of making a living due to the dolphin-safe decision. It appears that the extreme urgency near the decision point forced StarKist to fundamentally reconsider its relationship with the fishing fleet, leading to a severance of relations and the acceptance of costs associated with developing new suppliers.

Making high-quality multistakeholder decisions requires a means to effectively evaluate the costs and benefits of various decision alternatives and their impacts on relevant stakeholders. Combining the con-

ceptual classification system proposed by Mitchell et al. (1997) with the modeling approach proposed here permits such systematic evaluation and offers contributions to theoretical stakeholder analysis and practical stakeholder management.

In summary, the multiobjective multistakeholder decision modeling methodology offers an approach to develop and systematically compare decision structures of different stakeholders at different points in time. Due to space constraints, we do not demonstrate a comparison among several decision cases here. However, the methodology was applied to the decision of forestry giant MacMillan Bloedel to phase out the practice of clearcutting old-growth forest in another article (Winn & Keller, 1999; see also Winn, 1999; Winn & McArthur, 1999). A cross-case comparison between the two cases, StarKist and MacMillan Bloedel, might focus on corporate decisions to radically change operating practices (e.g., to cease fishing the Eastern Tropical Pacific by StarKist's fishing fleet and to switch from clearcutting to selective harvesting by MacMillan Bloedel's loggers). In both cases, environmentalists (aiming to protect marine mammals and old growth forests, respectively) were key stakeholders whose claims peaked in power, urgency, and legitimacy as the decision point neared. A systematic comparison could further theory building in this area.

Whether working with existing or new cases, the methodology permits the development of propositions for multiobjective multistakeholder decisions. Objectives hierarchies can be constructed for competitors, governmental agencies, or other key stakeholders. For instance, the application of this method to strategic alliances might shed insights on competitive dynamics and relationships. Because the purpose of this article was to introduce the methodology and show its potential for research and theory development, rather than actually developing theory, our propositions are intended as examples.

- In decisions involving highly conflicting objectives between key stakeholders or strong disagreement on decision options, firms are more likely to take a stance with one or more stakeholders and at the expense of others than to choose a compromise solution.
- The more similar the expressed values of the decision maker and key stakeholders become over time, the more likely is the decision to remain in place.
- A firm is more likely to choose decision options favored by the stakeholder with greatest power, urgency, and legitimacy than to choose options

favored by stakeholders with less power, urgency, and legitimacy.

- Media have the ability to amplify or reduce the levels of power, legitimacy, and urgency of other stakeholders' claims and thus differ qualitatively from other stakeholder groups.
- If, in a decision involving trade-offs between environmental and economic concerns, a firm has successfully incorporated a long-term strategic perspective, it is more likely to do so in similarly contentious decisions than are firms with a short-term economic perspective.
- If a firm's earlier decision satisfactorily addressed a particular stakeholder group's objectives, future decisions are more likely to be affected by that stakeholder group's objectives than by those of other stakeholders.

## CONCLUSION

We have presented a multiobjective multistakeholder decision modeling methodology to retrospectively model structures of strategic decision cases and have used StarKist's decision to fish for tuna without risk to dolphins to illustrate the methodology's application. The resulting decision frame timeline models the evolving structure of a decision frame of one stakeholder by tracing changes in options and their evaluation, stakeholder characteristics, stakeholder objectives hierarchies, and events. Our methodology, when combined with stakeholder identification concepts, has the potential to shed light on the complexity and dynamic nature of critical corporate decisions and to contribute to a richer, dynamic theory of multistakeholder decision making with improved predictive capacity and increased practical relevance.

## APPENDIX

### Postscript on the StarKist Case

With great fanfare, StarKist announced the dolphin-safe decision 1 week before Earth Day in April 1990. Media coverage was extensive and all major U.S. television networks celebrated the decision. Thanks to extensive and thorough preparations, cans of tuna with new dolphin-safe labels appeared on grocery shelves almost immediately. The publicity generated a very positive response from consumers, allowing StarKist to temporarily raise prices for tuna. However, the two main competitors followed this lead within weeks, rapidly eroding StarKist's initial pricing advantage. Consequently, the main competitors, their market shares, and pricing remained the same, whereas costs increased as fishing was moved to other waters.

The San Diego fishing fleet was largely driven out of business. Foreign boats continued to fish for yellow-fin tuna in the Eastern Pacific, voluntarily improving dolphin safety so that 99% of dolphins caught are released from an escape hatch in the net. An estimated 4,000 dolphins were killed in 1995 by foreign fishing, out of a population of 11 million in the area. However, U.S. legislation banned the sale of foreign fleets' tuna if caught with any risk to dolphins. With the North American Free Trade Agreement, the ban on Mexican tuna imports continued to be controversial. Apparently unrelated to the dolphin-safe decision, StarKist's California office was later closed, and employees were relocated or lost their jobs. Two years after the decision, most of the executives involved in the decision no longer worked for StarKist.

## NOTE

1. Dyer and Larsen (1984) found profitability, long-term growth, and security to be three generic objectives of management in decision analyses that used objectives hierarchies as decision aids for marketing and oil exploration strategies.

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