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13.	**Distribution** **Designing Channels of Distribution (HBS Article 9-594-116)**	Article	149 - 160
14.	**Pricing** **CASE 4: Rohm & Haas (A): New Product Marketing Strategy (HBS Case 9-587-055)**	Case	161 - 175
15.	**New Product Pipeline and Corporate Strategy** **CASE 5: Aqualisa Quartz: Simply a better shower**	Case	176 - 193

1. All readings MUST be read before the class sessions start.
2. **Case questions** for analysis would be provided.
3. **There would be a final exam after the course.**
4. **Grading:**
    a. **Article Summary (Total 32 Marks):** One or two paragraphs of brief outline of the main content in the article (8 articles with total 24 Marks; 4 marks for each article marked A1 to A8 in the schedule)
    b. **Class Participation (Total 18 Marks):** 20 points (10 points for each day of class and 1 point for overall participation)
    c. **Cases (Total 20 Marks):** Submission of one paragraph (at most 3 to 4 brief sentences) description of the main issue(s) in each of the 5 cases in the schedule (5 cases with total 15 Marks; 4 marks for each case)
    d. **Final Exam (Total 30 Marks)**

Index	Area	Topics	Time	Readings and Cases
1	Foundations: Customer & Market Analysis	Introduction The New Product Development Process Identifying customer needs for NPD	**<u>Day 0:</u>** Online Sessions (4 hours)	**(A1) Marketing Research** **(A2) Creating New Market Space (HBR January-February 1999)** **(A3) Customer Value Propositions in Business Markets (HBR March 2006)**

				(A4) Matching the Process of Product Development to its Context
2	Concept Testing	Recap: Needs, Market, Value, Segmentation and Targeting	**Day 1:** 8:30 – 10 AM 10:30 – 12 PM (3 hours)	**(A5) Concept Testing** **CASE 1: Techsonic Industries, Inc.: Humminbird**
3	Positioning	Positioning for Differentiation	**Day 1:** 1 – 2:30 PM 3 – 4:30 PM (3 hours)	**(A6) Perceptual Mapping: A Managers Guide (HBS Article 9-590-121)** **CASE 2: Marketing Antidepressants: Prozac and Paxil (HBS Case 502055HCB-ENG)**
4	Product/Solution Design	Product Design via Conjoint Analysis	**Day 1:** 5 – 6PM (1 hour)	**(A7) Analyzing Consumer Preferences (HBS Article 9-599-112)**
5	Product/Solution Design	Product design via Conjoint analysis	**Day 2:** 8:30 – 10:30 AM (2 hours)	**CASE 3: Strategic Industry Model Emergent Technologies (HBS Case 9-592-086)**
6	Distribution	Designing channels of distribution	**Day 2:** 11:00 – 1:30 PM (1.5 hours)	**(A8) Designing Channels of Distribution (HBS Article 9-594-116)**
7	Pricing	Pricing and its role in marketing strategy	**Day 2:** 2:30 – 4:00 PM (1 hour 30 min)	**CASE 4: Rohm & Haas (A): New Product Marketing Strategy (HBS Case 9-587-055)**
8	Product Adoption	Diffusion of New Products	**Day 2:** 1 – 2:30 PM (1 hour 30 min)	**In-class Exercise**
9	New Product Pipeline and Corporate Strategy Review and Summary	New Product Pipeline	**Day 2:** 5 – 6 PM (1 hour)	**CASE 5: Aqualisa Quartz: Simply a better shower**

Harvard Business School

9-592-013

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Marketing Research[1]

What Is Marketing Research?

Marketing research is an essential part of marketing management. It is the process by which marketing information is collected and analyzed. An integral part of the marketing process, it is undertaken when a firm assesses the situation it faces before marketing strategy is formulated.

A host of terms are used to describe aspects of marketing research. Some of these are: environmental scanning, environmental monitoring, scanning systems, marketing intelligence, and situation assessment. However, whereas marketing research is necessarily a systematic activity, marketing intelligence, scanning or situation assessment may not necessarily be so.

Marketing research requires resources, both time and money, so it should only be used when (i) the marketing decision can be put off until the research process is complete, and (ii) the stakes are high enough to warrant expenditure of the necessary funds. Thus marketing research is something you do only when you have the time and the likely benefits outweigh the costs.

Marketing research can be either an ongoing activity or it can involve gathering information regarding a specific decision at hand. Although not restricted to new products, marketing research plays an important role in decisions such as new product introductions to determine answers to such questions as: What is the forecasted demand for this product? Which advertising copy is better? What prices will the consumer be willing to pay?

Marketing research[2] includes the collection of information about customers, channels, competitors, or marketing partners to understand marketing phenomena and/or predict future behavior. Some common objectives of marketing research include forecasting, customer analysis and segmentation, understanding consumer choice, and testing levels of the marketing mix. Marketing research may be qualitative or quantitative.

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[1]Thanks to Professor Bruce Buchanan for comments on this note. This note synthesizes materials found in the following notes: (1) "Marketing Situation Assessment," by Fareena Sultan and Thomas J. Kosnik, HBS note no. 590-006; (2) "Marketing Research, An Overview of Methods," by Robert J. Dolan, HBS note No. 585-039; and (3) "Research Methods in Marketing: Survey Research," by Robert J. Dolan, HBS note No. 582-055. Sections in this note that use material abridged from the above notes are marked [1], [2] and [3], respectively.

[2]This section is abridged from [1]. For a more extensive overview of marketing research methods, see [2].

Professor Fareena Sultan prepared this note as the basis for class discussion.

- *Qualitative* research is most frequently used at the *exploratory stage* of situation assessment as part of a *hypothesis-building* process. Open-ended questions are asked, with lots of interaction among the people asking and answering the questions, in an effort to better understand and develop hypotheses about customers, channels, and competitors behaviors. A widely used qualitative research approach is a *focus group*, a loosely structured discussion among a small group of people. A common focus group application is a discussion led by a moderator involving six to ten customers to determine what they might be looking for in a new product.

- *Quantitative* research is often used at the *confirmatory stage* of situation assessment as part of a *hypothesis-testing* process. More structured questions are asked, and less interaction is required, because the objective is to test specific hypotheses about how customers or channels might behave. An example of quantitative research is an experiment in similar cities to test the effects of different levels of advertising on consumer awareness and trial purchases of a new product.

In doing marketing research, a marketing manager needs to address the following issues:

- What *research design* will be employed to gather the information?

- What sources and methods of data collection will be used?

- What *models* will be used to interpret the data or test hypotheses?

Research designs Various research methodologies are available to conduct marketing research. One classification scheme for these data collection procedures is described in **Exhibit 1**. The primary distinction is between Experimental Research and Survey Research. In experimental research, the marketing researcher manipulates one or more variables, e.g., the advertising budget or packaging design in order to measure the effect of this change on other variables such as consumer preference or sales. Such manipulations can take place either in a simulated situation such as a marketing research *laboratory* or in the *field* as in test markets. In survey research, the marketing researcher gathers information by questioning respondents in the relevant population. Experimental research and survey research issues are discussed in more detail in later sections.

In some classifications of types of marketing research, a link is drawn between whether the research is quantitative or qualitative, and the research design. Some marketing researchers think that the more fundamental distinction is by the type of research design. In these schemes, research designs are considered to be of three basic varieties. These are:

Exploratory Research which is primarily for sizing up the situation, identifying variables of interest, and learning the language of the customer. It tends to be qualitative (including depth interviews, and focus groups) but quantitative analyses are also possible (such as content analysis of interview transcripts).

Descriptive Research the so-called who/what/when/where/how research. Basically, we use exploratory research to identify the relevant variables in the marketplace, and then descriptive research to ascertain their values. Descriptive research tends to be more quantitative than qualitative but is not entirely so (for example, if you ask an open-ended questions in a survey questionnaire, the research analyst will often simply read all the responses verbatim and when write up a memorandum that captures the "sense" of the data, much as you would write up the results of a focus group).

Experimental Research which examines the causal relationship between one variable (usually from the marketing mix) and another (some form of customer or market response). The results of experiments are almost always analyzed in a quantitative fashion.

The linking of research designs to the qualitative/quantitative distinction highlights the fact that, as the level of uncertainty in the situation is reduced and we move from exploratory to descriptive to causal research, we also tend to move from qualitative to quantitative techniques.

Sources of data Data for marketing research are available from a broad array of sources both internal and external to the firm.[3] There are *primary sources*, individuals or companies whom the marketer contacts directly to collect information, and *secondary sources*, which supply information to the marketer that has been collected previousely by someone else.

Primary sources are particularly effective for information about controllable and influenceable variables. For example, a company wishing to determine the needs of customers for new products is well advised to gather information directly from customers themselves. Secondary sources are unlikely in this case to provide insights that will provide an advantage over competitors, since everyone has access to the secondary data.

Secondary sources are not necessarily the best source of information about customer needs or marketing mix variables. However, they often provide less biased information more efficiently than some primary sources regarding information about uncontrollable variables, such as demographic trends or legal and political developments. For example, our distributors or customers might not be any better able to discern the long-term impact of the deterioration of ozone in the atmosphere than we are. A paper written by researchers in the United Nations might be more likely to give a broader, deeper, and better-informed analysis. Although secondary data can usually be obtained faster, cheaper and easier than primary data, the disadvantage is that secondary data are often not entirely suited to the problem at hand.

Exploratory research tends to use both primary (depth interviews, focus groups) and secondary (industry studies, trade statistics, public polls) data. Descriptive designs rely heavily on secondary data, but also on primary data collected through observations and surveys, which can be one-shot or tracking. Because of the manipulation required, however, experiments almost always require primary data, the exception being naturally occurring experiments such as the effects of the 1970's oil shocks on gas consumption.

The search for information can involve techniques of widely ranging complexity and cost. For example, a "shoestring budget" approach might include having product managers talk to company salespeople or distributors, and clipping magazine articles about competitors. A more complex, "big ticket" approach might include a system with an on-line, computerized database about purchase of the company's products and its competitors' products broken down by customer segment, geographic region, and time period.

Methods of data collection Various techniques are available to collect data during marketing research from a variety of respondents. Respondents may include individual consumers, distributors, executives in buying organizations, or industry observers. Some common data collection techniques include:

- ***Focus groups:*** The marketing researcher meets with a group of respondents and moderates a discussion about their needs or their reaction to different products and services.

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[3]For a comprehensive listing of sources, see "Sources of External Marketing Data," HBS No. 580-107.

- ***Surveys:*** Surveys can be conducted either via *interviews*, on the *phone* or via *questionnaires*.

  - ***Interviews:*** These can be either with an individual or a group of respondents. In on-site interviews, the marketing researcher visits the respondent in person to ask a series of questions.

  - ***Phone surveys:*** The marketing researcher calls the respondent and asks a series of questions, recording the responses manually or with a computer as the interview goes along.

  - ***Questionnaires:*** These can be either mailed or hand-delivered to a respondent with a request to complete and return them. Occasionally a group of respondents are brought to a central facility to fill out questionnaires on their own. The marketing researcher may be present to clarify the meaning of questions.

- **Panels:** These can be either diary panels or scanner panels:

  - ***Diary panels:*** Marketing research firms often maintain panels of individual consumers who agree to report product purchases or media habits. Usually, panels are maintained for frequently purchased products such as grocery items. A company can have a panel constructed to research its specific product category.

  - ***Scanner panels:*** These are a relatively new way of gathering information from end users. Data are collected by means of optical scanners that record items purchased and prices paid at checkout counters. Individual panel members are identified by means of credit cards. Companies such as Information Resources Inc. create, maintain, and sell scanner panel data for most grocery and drug store items. In addition to information on purchase patterns, such panel data can also provide insights into the effectiveness of advertising, promotion, and pricing changes.

In general, marketers must make trade-offs between cost, time, and the type of questions that can be asked during marketing research. Data collection methods that allow broad, interactive questions with customers, channels, and industry observers tend to be more expensive and time consuming than those that ask simpler, more structured questions that respondents can answer on their own. Thus, the cost per respondent both in time and dollars is often greatest for a focus group or on-site interview, less expensive for a telephone survey, and least expensive for mail-in questionnaires. However, if broad issues need to be addressed requiring follow-up questions to probe for details, a mail-in questionnaire may not provide sufficiently useful information even though it may be efficient.

Marketing models Whereas marketing research is the systematic collection and analysis of marketing data, marketing modeling involves beliefs about cause and effect and involves issues beyond marketing research. Marketing models enable marketers to synthesize and analyze information that has been gathered during marketing research or situation assessment. They provide a simple representation of marketing phenomena. Examples include models of the buying process, of the factors that may affect an individual purchase, or of the overall response of the marketplace to a marketing action such as a new product launch, a major advertising campaign, or a price change.

Marketing models can be either *quantitative* or *qualitative*. Examples of quantitative models include new product forecasting tools such as Bass's (1969)[4] diffusion model. Examples of qualitative models include theoretical models that aim to explain why some individuals are more prone to adopt an innovation than others, and why some innovations are more "adoptable" than others. One such qualitative model is Rogers's (1983)[5] model of the factors that determine the pace with which an innovation spreads through a population over time.

Marketing Decision Support Systems combine marketing data with marketing models in computerized systems. Such systems allow marketing managers to query databases in an intelligent manner by providing fast, up-to-date information. Models are used to express links between various marketing inputs and outputs. At times, managers' judgments can be explicitly incorporated in these models.

We must remember, however, that all models are *abstractions* of reality. They are merely aids in decision making and can never replace the marketing manager's judgment. It is his or her responsibility to understand how best to use models to make better decisions.

Experimental[6] Research

In experimental procedures, the researcher manipulates one or more variables (e.g., the advertising budget) to permit measurement of its effect on other variables of interest. By controlling other elements of the environment, the researcher seeks to establish that the manipulated variable *caused* the change in the other variables. For example, the experimentation with advertising budget levels in the test market attempts to establish advertising as the cause of the share differences. Nonexperimental procedures are distinguished by the lack of researcher manipulation of the environment. For example, when consumers are asked "What do you like most about Life cereal?," it is not experimental because the answer is a function of the normal course of business conduct. The researcher has not manipulated a variable that may lead to a different response than that which would normally occur.

As noted above, the primary distinguishing feature of experiments is that the researcher manipulates the environment with the express intent of measuring the effect of that change. Experiments have been used to assess the effects of many marketing variables. The following questions, for example, have been addressed via experimentation:

1. Does training in the use of computers for sales call planning increase salesperson effectiveness?

2. Does a full-page ad have more "drawing power" than a half-page ad?

3. Does increasing the advertising budget positively affect repeat purchases of a product? trial? awareness?

4. Does having a rainbow package design increase sales over that obtained from a solid red color design?

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[4]Bass, Frank M. 1969. "A New Product Growth Model for Consumer Durables." *Management Science* 15 (January): 215-227.

[5]Rogers, Everett M. 1983. *Diffusion of Innovations*. 3d ed. New York: Free Press.

[6]This section is abridged from [2], "Marketing Research: An Overview of Research Methods," Robert J. Dolan, HBS note No. 585-039, 1984.

5. Does distributing through factory-owned outlet stores instead of independent retailers alone degrade the quality image of a brand?

6. Does "improving" the product via a formula change increase sales if not supported by advertising? If supported by advertising?

7. Does a price increase decrease unit sales?

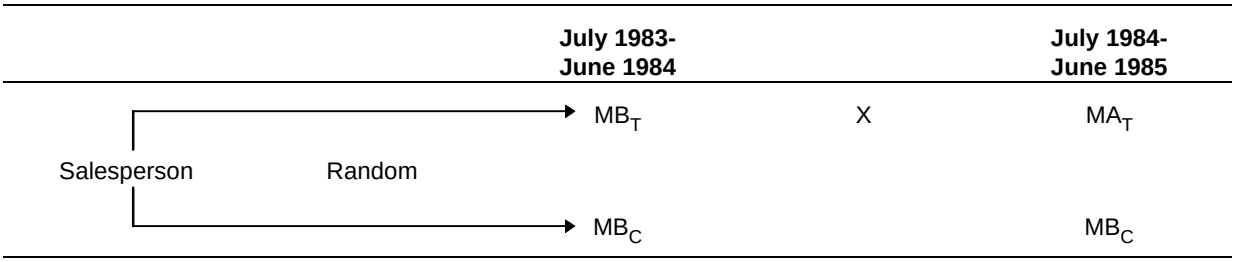
In the language of experimental design, the variable the researcher manipulates is called the "treatment." The other key concept is the "measurement," the observation and recording of the level of sales, awareness, or whatever the variable of interest is. In experimental research the validity of the research depends critically upon the random assignment of subjects to "treatment" and "control groups" (those that do not get the treatment). Typically, one makes both a "before-treatment" and "after-treatment" measurement. For example, in judging the effect of sales force training on computers, we might proceed as follows:

1. Measure the unit sales generated for a salesperson for July 1983-June 1984 (call this MB, designating **m**easurement **b**efore the treatment).

2. Train the persons on computer applications in sales management on June 28, 29, July 2, 3, 1984 (this is the "treatment").

3. Measure the unit sales generated for July 1984-June 1985 (call this MA, designating **m**easurement **a**fter the treatment).

We might then say that the effect of the treatment is MA-MB. Notice the perils in doing this without really thinking about the underlying assumptions of such an assessment, e.g., the company's product line (or competitor's) may change from before to after, or the economy may pick up boosting industry sales. What we would really like to have is not MB to compare MA to, but we would like to know what sales would have been in July 1984-June 1985 if the computer training had not taken place. If we say the effect of the treatment is MA-MB, we are in effect saying that sales in July 1984-June 1985 would have been the same as in July 1983-June 1984 if the computer training had not taken place. Because of the necessity of having a relevant benchmark to compare observed results to, it is usually a good idea to have a "control group" to compare the "test group" results to. In this case, we would randomly assign salespeople to a test group (to receive the computer training) or control group (no training). The scheme can be diagrammed as follows:



MB_T = average sales of test group before training, July 1983-June 1984.

MB_C = average sales of control group for July 1983-June 1984. Note that MB_t and MB_c should be approximately equal due to random assignment to test and control groups.

X = represents the application of the computer training "treatment" to the test group.

MA_T = after treatment measurement for test group, July 1984-June 1985.

MA_C = comparable period measurement for control group.

Now the effect of the treatment can be more properly estimated as:

$(MA_T - MB_T)$	–	$(MA_C - MB_C)$
change in test group performance		change in control group performance

Changes in the economy, the company's product line, competitive actions, etc. all influence the control group as well as the test group. The change in the control group is therefore to be "netted out" of the test group change to arrive at an assessment of the treatment effect.

Issues of experimental design, advanced design possibilities, and data analysis procedures are covered in most marketing research textbooks.[7]

Survey[8] Research [2]

Survey research is a commonly used form of marketing research. Research design in survey research considers the following issues:

Problem Statement:

1. What decision is to be made?
2. What information will assist in making the decision?

Questionnaire Design:

3. What information do we want to collect in interviews?
4. What interview questions can get us that information from respondents?
5. How should those questions be phrased?
6. How are we going to contact respondents?

Sampling:

7. Who should our respondents be?
8. How many should we get?

Data Analysis:

9. How do we tabulate, summarize, and draw inferences from our data?

Stage 1: Problem Statement

You must know the alternatives for action to decide if survey research can be useful and, if so, exactly how to proceed. Consider a pharmaceutical firm with increasing unit sales but decreasing

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[7]An elementary discussion is given in D.S. Tull and D.I. Hawkins, *Marketing Research: Measurement and Method*, 2nd edition, Macmillan Publishing, New York, 1980. D. T. Campbell and J. C. Stanley, *Experimental and Quasi-Experimental Designs for Research*, Rand McNally is the seminal piece in the field, cited in [2].

[8]This section is abridged from [3], "Research Methods in Marketing: Survey Research," by Robert J. Dolan, HBS note No. 582-055.

profits. That's the problem management wishes to address, but you have to break it down before proceeding with any research. The question might be "What proportion of people will respond positively to this new product concept?" This clear statement enables us to see that the answer lies in assessing consumer and competitive reaction to a specific change.

Stage 2: Questionnaire Design

Fundamental laws Questionnaire design deals mainly with controlling measurement error. Most of its important points can be imparted by a fundamental law: Use common sense.

Corollary A: Don't ask a question unless truthful answers to it will provide useful information in making the decision at hand.

Corollary B: If there is more than one way to get a particular piece of information (and there usually is), pick the questions for which respondents are likely to

a. Know the answer

b. Be willing to tell you the answer

This law and its corollaries are pretty simple. Yet, much marketing research collects facts that help the manager make a right decision only accidentally. Before including any question on a survey, ask yourself, "How will I use the data from this question?" If you can't be any more precise than, "I'll analyze it," it's unlikely the data will be worth anything to you. (There are a few exceptions to Corollary A; for example, you may ask some questions to get respondent involvement.)

Each question passing the "information test" should be examined for the burden it places on the respondent: Does he or she have the information you are looking for; will giving a truthful answer embarrass the respondent? Although some marketers consider questionnaire design as tedious work, others consider it a subtle craft. Different types of questions can be addressed via questionnaires. For example, open ended questions provide data that are interesting and "rich", but are difficulty to summarize. Close ended, categorical questions may be easier to summarize but may not be as "rich."

Pretest Mentally putting yourself in the respondent's position helps to uncover questionnaire problems, but a pretest of the questionnaire is usually warranted. In a pretest the questionnaire is administered to a small group of people *like the group to be sampled in the survey*. While filling out the questionnaire, and after they complete it, respondents are asked to explain responses, discuss any ambiguities, and so on. This can reveal unclear or sensitive questions.

Communication mode Finally, there are a number of ways to communicate with questionnaire respondents. They are generally personal interview, telephone, or mail. Many criteria are used in selecting the proper mode, each of which offers obvious relative advantages. For example, in personal interviews we can show things to respondents, ask and explain complicated questions, and generally hold attention, allowing longer questionnaires. Telephone survey results are obtained quickly. Mail surveys are cheap. Some researchers feel that *well-constructed* and *well-administered* questionnaires yield similar results, regardless of the form of interview. Others however feel that different media have different response rates and non-response biases, and hence may lead to different results.

Stage 3: Sampling

After the questionnaire is designed, pretested, and printed, the question is whom do we want as respondents? This question breaks down into a number of parts. There are four population involved in survey sampling. These are:

Inferential the group you wish to study and to which you would like to project sample results,

Target the group that you actually choose to study due to cost, feasibility, etc.,

Frame those individuals in the target population who have some chance of being selected,

Survey those members of the frame population who would participate in the survey if asked to do so.

For example, if we were introducing a new microwave soup, we might define our inferential population as all potential users of the product, but our target population might be all those who use microwave ovens, either at home or at work. Such a target specification might exclude some members of the inferential population (those who would start using microwave ovens *because* of the availability of the product), and include some non-members (those who use microwaves only for heating water, or making popcorn, but who would never prepare "real" food in one). The target population, in a sense, operationalizes the characteristics of the inferential population, and is likely to do so imperfectly. The difference between frame and survey populations reflects the effect on non-response: not everyone contacted will consent to participate in the survey, and as the response rate goes down, the threat of non-response bias goes up.

Sample selection After population and frame selection, we must specify the mechanism for selecting the members of the population to be included. The many ways of selecting a sample can be grouped into two categories:

1. Probability sampling
2. Nonprobability sampling

In probability sampling, each unit of the population has a predetermined chance of being included. A common nonprobability sampling procedure is the *convenience sample*, where sampled units are selected not for a representative population, but for ease in getting their response.[9]

Sample size Having decided whom to have as respondents and how to select the sample, we can determine how many respondents we should have, or what we are entitled to predict given a specified number of respondents. In practice, the second form of the question may be more relevant because in many cases sample size determination is rather ad hoc. Specifically, the sample size is determined by dividing the negotiated budget by the cost of obtaining a respondent. Sample size determination is, however, an economic question that should be analyzed.

Increasing the sample size reduces random sampling error but does nothing to reduce biases, which are the result of improper procedures. Thus to reduce random sampling error you have to be rich, but to reduce sampling bias you have to be smart. There is diminishing return of extra respondents. The basic rule is that to halve the random sampling error (in other words, to double the precision) we have to quadruple the sample size. Thus going from 25 respondents to 100 doubles precision, but to double it again we must add another 300 subjects (to 400) and to double it again we

[9]For details see [3].

have to add another 1,200 (to 1,600). For this reason, we rarely see surveys with more than about 1,000 respondents.

Stage 4: Data Analysis

We've finally reached the stage where the data have been collected from the specified number of respondents of a certain type. Examination of the raw data doesn't produce many useful insights. We need to transform, summarize, and "massage" the data to produce a few numbers based on the hundreds we've collected. The data collected will be useful in assisting a marketing manager in decision making only if adequate thought and care has been given to the research design and the data collection process.

The advent of computers and personal computers has made data analysis of large data bases possible in relatively short periods of time. Nevertheless, the choice of the type of analysis to conduct is dictated by the objectives of the research, the constraints of time, budget, and expertise available to the marketing manager.

Sources of Errors and Bias in Marketing Research[10]

In marketing research we ask questions, collect and analyze information, and reach conclusions that will ultimately affect marketing decisions. There are a number of pitfalls that may render our conclusions inaccurate. These sources of errors and systematic biases are shown in **Exhibit 2**.

On the left of the exhibit are the *explicit choices* that may lead to flawed conclusions. The *models* we use may be incorrect, leading to biased results or causing us to focus on the wrong things. For example, a marketing model that forecasts the sales response of a shampoo product to advertising expenditures may not be very helpful for a brand that relies heavily on retailer "push" programs and price promotions to influence buyer behavior at the point of sale. The *research methods* may create bias in the data collected. For example, use of a telephone survey for research on a consumer product systematically excludes people without telephones or those with unlisted numbers. The *measures* used may introduce bias. For example, a question that asks consumers to rank order a set of brands does not give them the opportunity to say that none of the brands is good enough to consider purchasing. The *sampling scheme* may lead to systematic errors in results. Asking only current users of your brand to discuss why they buy it may never uncover the reasons why non-users *don't* buy.

The right-hand side of **Exhibit 2** lists some of the major *implicit choices* that may corrupt our marketing research conclusions. First, the *choice of questions* asked during marketing research will ultimately influence all of the visible choices in **Exhibit 2** as well as our conclusions. For example, focusing our questions for the marketing intelligence system on the activities of customers and competitors may lead us to conclude prematurely that we are in a strong position. Neglecting to ask other questions may lead us to be surprised by a new technological development or by the regulatory action of a government agency that drastically changes our market position.

The *values* of the people doing marketing research can also shape conclusions in subtle ways. For example, many market research studies for innovative products have a "pro-innovation" bias—a belief that the innovation in question has value, making it less likely that they will conclude that the product should not be launched.

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[10]This section is abridged from [1], "Marketing Situation Assessment," by Fareena Sultan and Thomas J. Kosnik, HBS note no. 590-006.

The *judgment* of marketing researchers will influence the way they interpret the data from marketing research and the conclusions that managers draw from the findings. This creates two possible problems. First, because judgment is rooted in the past experience of the decision maker, there is a risk that the findings from a new situation will be misinterpreted, especially when the environment has changed in fundamental ways. Second, because the past experience of a professional marketing researcher is often very different from that of the manager who will make the decisions, there is a risk that the two parties will draw different conclusions from the same information. This can lead to conflict, dissatisfaction with the process, and the rejection of recommendations that may be quite sound, but are so surprising from the marketing manager's point of view that they lack credibility.

The *politics* of a situation can have a major effect on the way conclusions are drawn from marketing research. Researchers concerned about their professional reputations, consultants worried about the prospect of winning follow-on business, and marketing professionals facing the conflicting demands of their customers, performance targets, and personal principles will sometimes conclude one thing and communicate another. The direction of the bias is difficult to predict; on some occasions, the results may be interpreted too optimistically and, in other cases, too conservatively. Both types of bias are risky. This may seem curious in the face of the popular wisdom among many marketing professionals that a "conservative approach" is best. In many situations, however, being too conservative during marketing research can lead to severe problems, as the marketing process moves too timidly to keep up with competition, customer needs, or other forces in a rapidly changing environment.

This discussion has two important implications. First, choices made in marketing research, both explicit and implicit, will have a profound effect on the conclusions reached, and the decisions made, during the strategy formulation phase of the marketing process. Second, the environment never remains static. Multiple environments should be considered. Those environments may be the situations in different market segments, different countries, or alternative scenarios that the marketing organization may face in an uncertain future. A marketing strategy based on a marketing research study in only one environment may be as dangerous as one that has ignored the environment entirely.

Errors and biases in marketing research can result either from improper techniques or improper inferences. Improper technique will produce biased results, but even with good results people make incorrect inferences (this is especially true for so-called sophisticated techniques like perceptual mapping or conjoint analysis). With proper training and the right budget, a marketing researcher can minimize errors of technique, but to minimize errors of inference he or she must convey the results fully and accurately. This is often a problem. The values of the firm, the politics of the situation, and any existing prejudices all conspire to create biases at this stage.

Exhibit 1 Marketing Research Designs

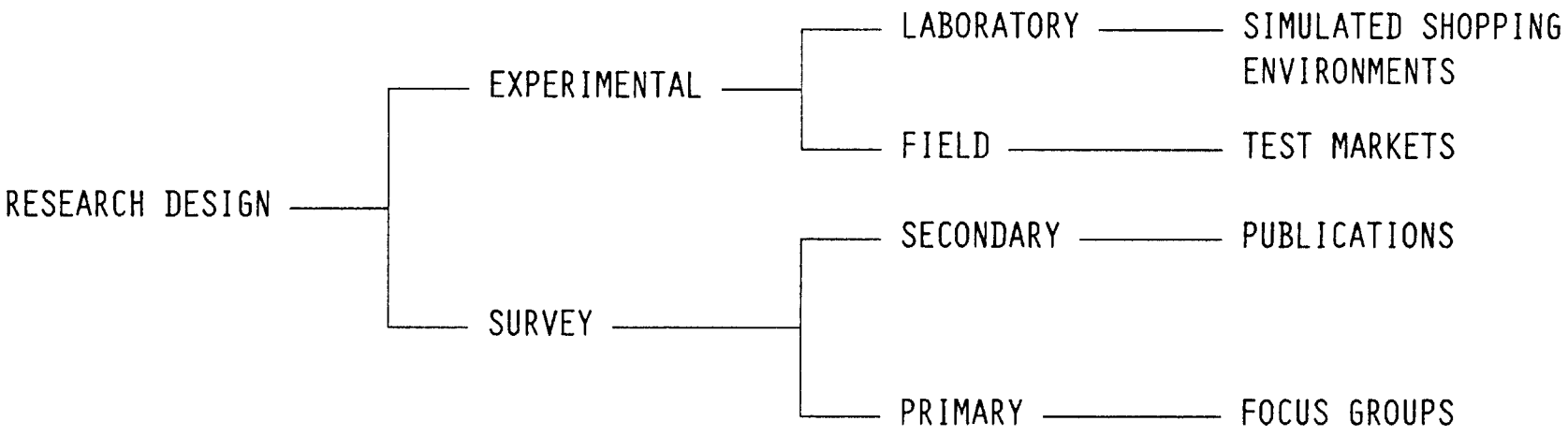

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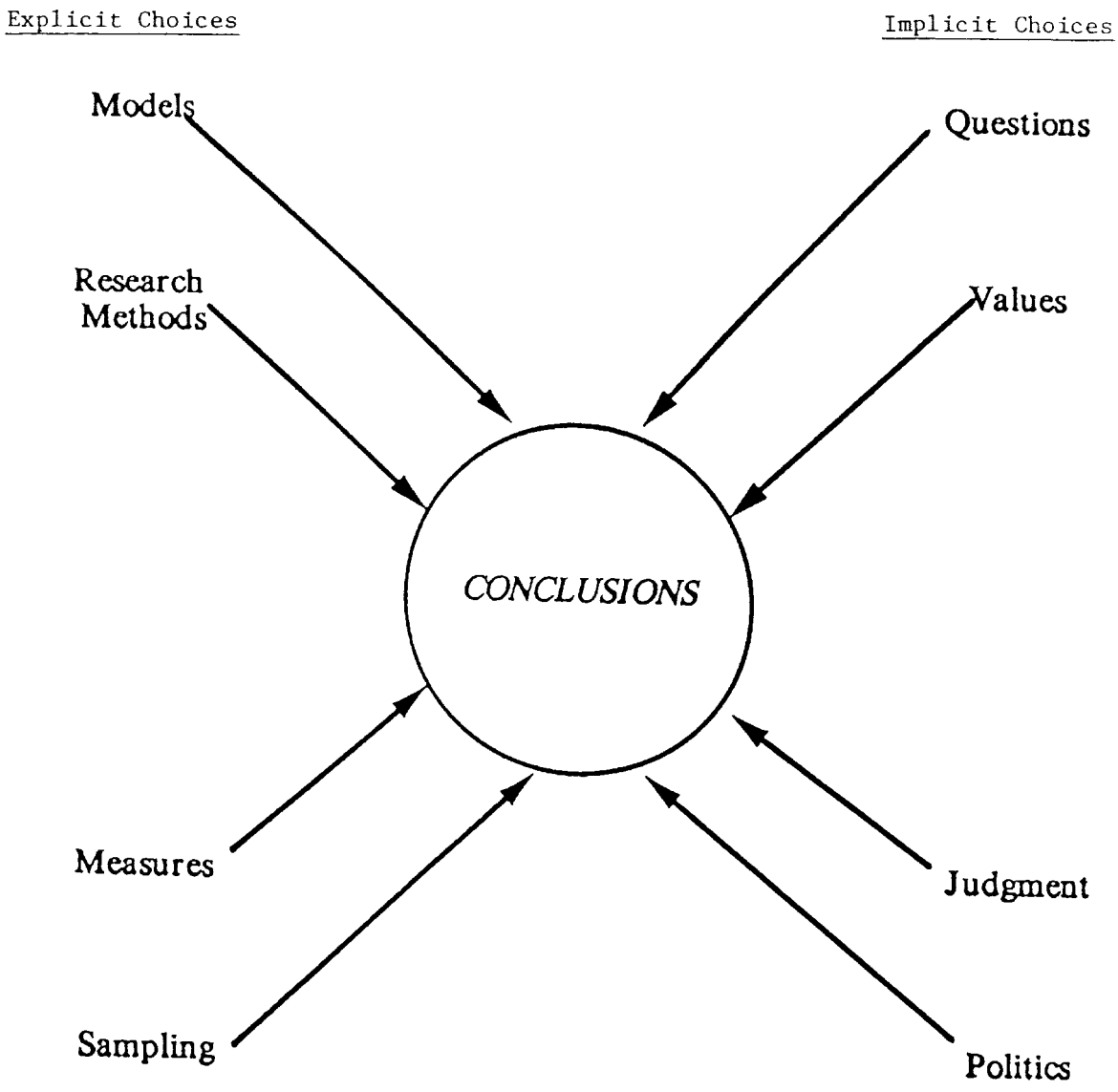
Exhibit 2 Choices that Shape Our Conclusions During Marketing Research



CREATING NEW MARKET SPACE

A systematic approach to value innovation can help companies break free from the competitive pack.

by W. Chan Kim and Renée Mauborgne

COMPETING HEAD-TO-HEAD CAN BE cutthroat, especially when markets are flat or growing slowly. Managers caught in this kind of competition almost universally say they dislike it and wish they could find a better alternative. They often know instinctively that innovation is the only way they can break free from the pack. But they simply don't know where to begin. Admonitions to develop more creative strategies or to think outside the box are rarely accompanied by practical advice.

For almost a decade, we have researched companies that have created such fundamentally new and superior value. We have looked for patterns in the way companies create new markets and re-create existing ones, and we have found six basic approaches. All come from looking at familiar data from a new perspective; none requires any special vision or foresight about the future.

Most companies focus on matching and beating their rivals, and as a result their strategies tend to converge along the same basic dimensions of competition. Such companies share an implicit set of beliefs about "how we compete in our industry or in our strategic group." They share a conventional wisdom about who their customers are and what they value, and about the scope of products and services their industry should be offering. The more that companies share this conventional wisdom about how they compete, the greater the competitive convergence. As rivals try to outdo one another, they end up competing solely on the basis of incremental improvements in cost or quality or both.

Creating new market space requires a different pattern of strategic thinking. Instead of looking within the accepted boundaries that define how we compete, managers can look systematically across them. By doing so, they can find unoccupied territory that represents a real breakthrough in value. This article will describe how companies can systematically

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pursue value innovation by looking across the conventionally defined boundaries of competition – across substitute industries, across strategic groups, across buyer groups, across complementary product and service offerings, across the functional-emotional orientation of an industry, and even across time.

Looking Across Substitute Industries

In the broadest sense, a company competes not only with the companies in its own industry but also with companies in those other industries that produce substitute products or services. In making every purchase decision, buyers implicitly weigh substitutes, often unconsciously. Going into town for dinner and a show? At some level, you've probably decided whether to drive, take the train, or call a taxi. The thought process is intuitive for individual consumers and industrial buyers alike.

For some reason, however, we often abandon this intuitive thinking when we become sellers. Rarely do sellers think consciously about how their customers make trade-offs across substitute industries. A shift in price, a change in model, even a new ad campaign can elicit a tremendous response from rivals within an industry, but the same actions in a substitute industry usually go unnoticed. Trade journals, trade shows, and consumer rating reports reinforce the vertical walls that stand between one industry and another. Often, however, the space between substitute industries provides opportunities for value innovation.

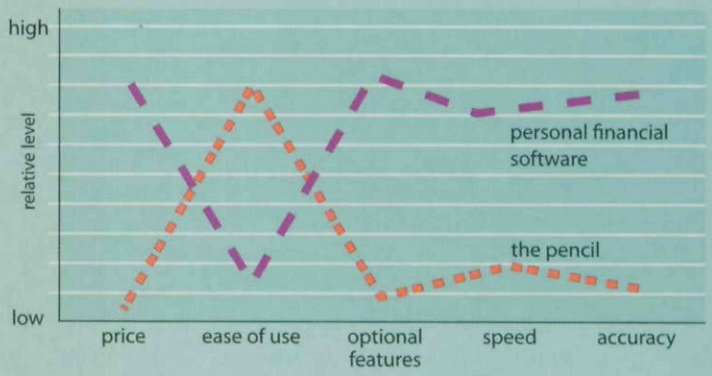
Consider Home Depot, the company that has revolutionized the do-it-yourself market in North America. In 20 years, Home Depot has become a $24 billion business, creating over 130,000 new jobs in more than 660 stores. By the end of the year 2000, the company expects to have over 1,100 stores in the Americas. Home Depot did not achieve that level of growth simply by taking market share away from other hardware stores; rather, it has created a new market of do-it-yourselfers out of ordinary home owners.

Creating a New Value Curve

The value curve – a graphic depiction of the way a company or an industry configures its offering to customers – is a powerful tool for creating new market space. It is drawn by plotting the performance of the offering relative to other alternatives along the key success factors that define competition in the industry or category.

To identify those alternatives, Intuit, for example, looked within its own industry – software to manage personal finances – and it also looked across substitute products to understand why customers chose one over the other. The dominant substitute for software was the lowly pencil. The value curves for these two alternatives map out the existing competitive space.

The Value Curves in Personal Finance Before Quicken



The software offered relatively high levels of speed and accuracy. But customers often chose the pencil because of its advantages in price and ease of use, and most customers never used the software's optional features, which added cost and complexity to the product.

There are many explanations for Home Depot's success: its warehouse format, its relatively low-cost store locations, its knowledgeable service, its combination of large stores and low prices generating high volumes and economies of scale. But such explanations miss the more fundamental question: Where did Home Depot get its original insight into how to revolutionize and expand its market?

Home Depot looked at the existing industries serving home improvement needs. It saw that people had two choices: they could hire contractors, or they could buy tools and materials from a hardware store and do the work themselves. The key to Home Depot's original insight was understanding

The key to discovering a new value curve lies in asking four basic questions:

Reduce

What factors should be reduced *well below* the industry standard?

Eliminate

What factors should be eliminated that the industry has taken for granted?

New Value Curve

Create

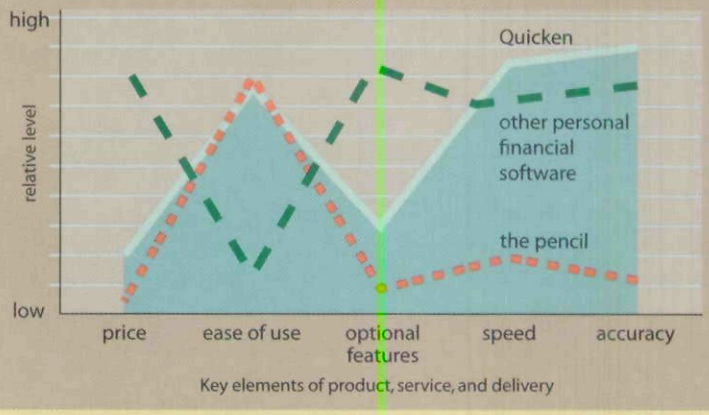
What factors should be created that the industry has never offered?

What factors should be raised *well beyond* the industry standard?

Raise

Quicken's Value Curve

Answering the four questions led Intuit to create a new value curve, which combines the low price and ease of use of the pencil with the speed and accuracy of traditional personal-financial software.



why buyers would choose one substitute over another. (It is essential here to keep the analysis at the industry, and not the company, level.)

Why do people hire a contractor? Surely not because they value having a stranger in their house who will charge them top dollar. Surely not because they enjoy taking time off from work to wait for the contractor to show up. In fact, professional contractors have only one decisive advantage: they have specialized know-how that the home owner lacks.

So executives at Home Depot have made it their mission to bolster the competence and confidence of customers whose expertise in home repair is limited. They recruit sales assistants with significant trade experience, often former carpenters or painters. These assistants are trained to walk customers through any project – installing kitchen cabinets, for example, or building a deck. In addition, Home Depot sponsors in-store clinics that teach customers such skills as electrical wiring, carpentry, and plumbing.

To understand the rest of the Home Depot formula, now consider the flip side: Why do people choose hardware stores over professional contractors? The most common answer would be to save money. Most people can do without the features that add cost to the typical hardware store. They don't need the city locations, the neighborly service, or the

nice display shelves. So Home Depot has eliminated those costly features, employing a self-service warehouse format that lowers overhead and maintenance costs, generates economies of scale in purchasing, and minimizes stock-outs.

Essentially, Home Depot offers the expertise of professional home contractors at markedly lower prices than hardware stores. By delivering the decisive advantages of both substitute industries – and eliminating or reducing everything else – Home Depot has transformed enormous latent demand for home improvement into real demand.

Intuit, the company that changed the way individuals and small businesses manage their finances, also got its insight into value innovation by thinking about how customers make trade-offs across substitutes. Its Quicken software allows individuals to organize, understand, and manage their personal finances. Every household goes through the monthly drudgery of paying bills. Hence, in principle, personal financial software should be a big and broad market. Yet before Quicken, few people used software to automate this tedious and repetitive task. At the time of Quicken's release in 1984, the 42 existing software packages for personal finance had yet to crack the market.

Why? As Intuit founder Scott Cook recalls, "The greatest competitor we saw was not in the industry. It was the pencil. The pencil is a really tough and resilient substitute. Yet the entire industry had overlooked it."

Asking why buyers trade across substitutes led Intuit to an important insight: the pencil had two decisive advantages over computerized solutions – amazingly low cost and extreme simplicity of use. At prices of around $300, existing software packages were too expensive. They were also hard to use, presenting intimidating interfaces full of accounting terminology.

Intuit focused on bringing out both the decisive advantages that the computer has over the pencil – speed and accuracy – and the decisive advantages that the pencil has over computers – simplicity of use and low price – and eliminated or reduced everything else. With its user-friendly interface that resembles the familiar checkbook, Quicken is far faster and more accurate than the pencil, yet almost as simple to use. Intuit eliminated the accounting jargon and all the sophisticated features that were part of the industry's conventional wisdom about "how we compete." It offered instead only the few basic functions that most customers use. Simplifying the software cut costs. Quicken retailed at about $90, a 70% price drop. Neither the pencil nor other software packages could compete with Quicken's divergent value curve. Quicken created breakthrough value and re-created the industry, and has expanded the market some 100-fold. (See the exhibit "Creating a New Value Curve.")

There is a further lesson to be drawn from the way Intuit thought about and looked across substitutes. In looking for other products or services that could perform the same function as its own, Intuit could have focused on private accounting firms that handle finances for individuals. But when there is more than one substitute, it is smart to explore the ones with the greatest volumes in usage as well as in dollar value. Framed that way, more Americans use pencils than accountants to manage their personal finances.

Many of the well-known success stories of the past decade have followed this path of looking across substitutes to create new markets. Consider Federal Express and United Parcel Service, which deliver mail at close to the speed of the telephone, and Southwest Airlines, which combines the speed of flying with the convenience of frequent departures and the low cost of driving. Note that Southwest Airlines concentrated on driving as the relevant substitute, not other surface transportation such as buses, because only a minority of Americans travels long distances by bus.

Looking Across Strategic Groups Within Industries

Just as new market space often can be found by looking across substitute industries, so can it be found by looking across *strategic groups*. The term refers to a group of companies within an industry that pursue a similar strategy. In most industries, all the fundamental strategic differences among industry players are captured by a small number of strategic groups.

Strategic groups can generally be ranked in a rough hierarchical order built on two dimensions, price and performance. Each jump in price tends to bring a corresponding jump in some dimension of performance. Most companies focus on improving their competitive position *within* a strategic group. The key to creating new market space across existing strategic groups is to understand what factors determine buyers' decisions to trade up or down from one group to another.

Consider Polo Ralph Lauren, which created an entirely new and paradoxical market in clothing: high fashion with no fashion. With worldwide retail sales exceeding $5 billion, Ralph Lauren is the first American design house to successfully take its brand worldwide.

At Polo Ralph Lauren's inception more than 30 years ago, fashion industry experts of almost every stripe criticized the company. Where, they asked, was the fashion? Lacking creativity in design, how could Ralph Lauren charge such high prices? Yet the same people who criticized the company bought its clothes, as did affluent people everywhere. Lauren's lack of fashion was its greatest strength. Ralph Lauren built on the decisive advantages of the two strategic groups that dominated the high-end clothing market – designer haute couture and the higher-volume, but lower-priced, classical lines of Burberry's, Brooks Brothers, Aquascutum, and the like.

What makes people trade either up or down between haute couture and the classic lines? Most customers don't trade up to haute couture to get frivolous fashions that are rapidly outdated. Nor do they enjoy paying ridiculous prices that can reach $500 for a T-shirt. They buy haute couture for the emotional value of wearing an exclusive designer's name, a name that says, "I am different; I appreciate the finer things in life." They also value the wonderfully luxurious feel of the materials and the fine craftsmanship of the garments.

The trendy designs the fashion houses work so hard to create are, ironically, the major drawback of haute couture for most high-end customers, few of whom have the sophistication or the bodies to wear such original clothing. Conversely, customers who trade down for classic lines over haute couture want to buy garments of lasting quality that justifies high prices.

Ralph Lauren has built its brand in the space between these two strategic groups, but it didn't do so by taking the average of the groups' differences. Instead, Lauren captured the advantages of trading both up and down. Its designer name, the elegance of its stores, and the luxury of its materials capture what most customers value in haute couture; its updated classical look and price capture the best of the classical lines. By combining the most attractive factors of both groups, and eliminating or reducing everything else, Polo Ralph Lauren not only captured share from both segments but also drew many new customers into the market.

Many companies have found new market space by looking across strategic groups. In the luxury car market, Toyota's Lexus carved out a new space by offering the quality of the high-end Mercedes, BMW, and Jaguar at a price closer to the lower-end Cadillac and Lincoln. And think of the Sony Walkman. By combining the acoustics and the "cool" image of boom boxes with the low price and the convenient size and weight of transistor radios, Sony created the personal portable-stereo market in the late 1970s. The Walkman took share from these two strategic groups. In addition, its quantum leap in value drew into the market new customers like joggers and commuters.

Michigan-based Champion Enterprises found a similar opportunity by looking across two strategic groups in the housing industry: makers of prefabricated housing and on-site developers. Prefabricated houses are cheap and quick to build, but they are also dismally standardized and project an image of low quality. Houses built by developers on-site offer variety and an image of high quality but are dramatically more expensive and take longer to build.

Champion created new market space by offering the decisive advantages of both strategic groups. Its prefabricated houses are quick to build and benefit from tremendous economies of scale and lower costs, but Champion also allows buyers to choose such high-end options as fireplaces, skylights, and even vaulted ceilings. In essence, Champion has changed the definition of prefabricated housing. As a result, far more lower-to-middle-income consumers have become interested in purchasing prefabricated housing rather than renting or buying an apartment, and even some affluent people are being drawn into the market.

Looking Across the Chain of Buyers

In most industries, competitors converge around a common definition of who the target customer is when in reality there is a chain of "customers" who are directly or indirectly involved in the buying decision. The *purchasers* who pay for the product or service may differ from the actual *users*, and in some cases there are important *influencers*, as well. While these three groups may overlap, they often differ.

When they do, they frequently hold different definitions of value. A corporate purchasing agent, for example, may be more concerned with costs than the corporate user, who is likely to be far more concerned with ease of use. Likewise, a retailer may value a manufacturer's just-in-time stock-replenishment and innovative financing. But consumer purchasers, although strongly influenced by the channel, do not value these things.

Individual companies in an industry often target different customer segments – large versus small customers, for example. But an industry typically converges on a single buyer group. The pharmaceutical industry, for example, focuses overridingly on influencers – the doctors. The office equipment industry focuses heavily on purchasers – corporate purchasing departments. And the clothing industry sells predominantly to users. Sometimes there is a

strong economic rationale for this focus. But often it is the result of industry practices that have never been questioned.

Challenging an industry's conventional wisdom about which buyer group to target can lead to the discovery of new market space. By looking across buyer groups, companies can gain new insights into how to redesign their value curves to focus on a previously overlooked set of customers.

Consider Bloomberg. In little over a decade, Bloomberg has become one of the largest and most profitable business-information providers in the world. Until Bloomberg's debut in the early 1980s, Reuters and Telerate dominated the on-line financial-information industry, providing news and prices in real time to the brokerage and investment community. The industry focused on purchasers – the IT managers – who valued standardized systems, which made their lives easier.

This made no sense to Bloomberg. Traders and analysts, not IT managers, make or lose millions of dollars for their employers each day. Profit opportunities come from disparities in information. When markets are active, traders and analysts must make rapid decisions. Every second counts.

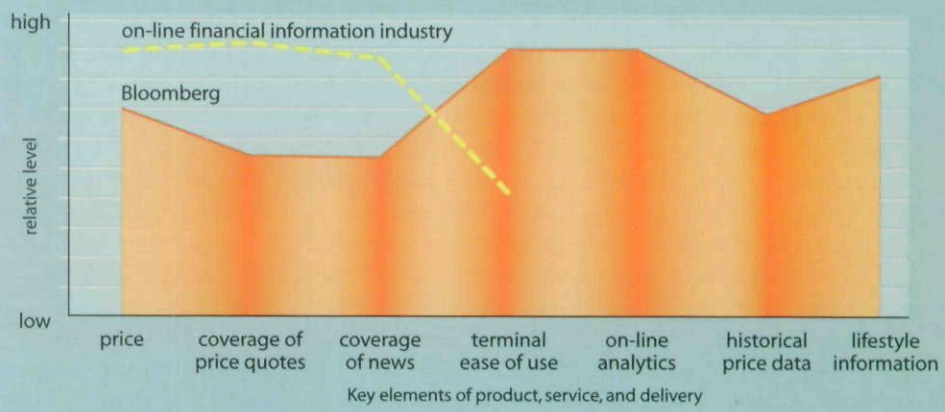
So Bloomberg designed a system specifically to offer traders better value, one with easy-to-use terminals and keyboards labeled with familiar financial terms. The systems also have two flat-panel monitors, so traders can see all the information they need at once without having to open and close numerous windows. Since traders have to analyze information before they act, Bloomberg added a built-in analytic capability that works with the press of a button. Before, traders and analysts had to download data and use a pencil and calculator to perform important financial calculations. Now users can quickly run "what if" scenarios to compute returns on alternative investments, and they can perform longitudinal analyses of historical data.

By focusing on users, Bloomberg was also able to see the paradox of traders' and analysts' personal lives. They have tremendous income but work such long hours that they have little time to spend it. Realizing that markets have slow times during the day when little trading takes place, Bloomberg decided to add information and purchasing services aimed at enhancing traders' personal lives. Traders can buy items like flowers, clothing, and jewelry; make travel arrangements; get information about wines; or search through real estate listings.

By shifting its focus upstream from purchasers to users, Bloomberg created a value curve that was radically different from anything the industry had ever seen. The traders and analysts wielded their power within their firms to force IT managers to purchase Bloomberg terminals. Bloomberg did not simply win customers away from competitors – it grew the market. "We are in a business that need not be either-or," explains founder Mike Bloomberg. "Our customers can afford to have two products. Many of them take other financial news services and us because we offer uncommon value." (See the graph "Bloomberg's Value Curve at Its Debut.")

Philips Lighting Company, the North American division of the Dutch company Philips Electronics, re-created its industrial lighting business by shifting downstream from purchasers to influencers. Traditionally, the industry focused on corporate purchasing managers who bought on the basis of how much the lightbulbs cost and how long they lasted. Everyone in the industry competed head-to-head along those two dimensions.

Bloomberg's Value Curve at Its Debut



To establish its value curve, Bloomberg looked across the chain of buyers from the IT managers that had traditionally purchased financial information systems to the traders who used them. Its value innovation stemmed from a combination of creating new features – such as on-line analytic capabilities – that traders rather than IT managers value and raising ease of use by an order of magnitude.

By focusing on influencers, including CFOs and public relations people, Philips came to understand that the price and life of bulbs did not account for the full cost of lighting. Because lamps contained environmentally toxic mercury, companies faced high disposal costs at the end of a lamp's life. The purchasing department never saw those costs, but CFOs did. So in 1995, Philips introduced the Alto, an environmentally friendly bulb that it promotes to CFOs and to public relations people, using those influencers to drive sales. The Alto reduced customers' overall costs and garnered companies positive press for promoting environmental concerns. The new market Alto created has superior margins and is growing rapidly; the product has already replaced more than 25% of traditional T-12 fluorescent lamps used in stores, schools, and office buildings in the United States.

Many industries afford similar opportunities to create new market space. By questioning conventional definitions of who can and should be the target customer, companies can often see fundamentally new ways to create value.

Looking Across Complementary Product and Service Offerings

Few products and services are used in a vacuum; in most cases, other products and services affect their value. But in most industries, rivals converge within the bounds of their industry's product and service offerings. Take movie theaters as an example. The ease and cost of getting a babysitter and parking the car affect the perceived value of going to the movies, although these complementary services are beyond the bounds of the movie theater industry as it has been traditionally defined. Few cinema operators worry about how hard or costly it is for people to get babysitters. But they should, because it affects demand for their business.

Untapped value is often hidden in complementary products and services. The key is to define the total solution buyers seek when they choose a product or service. A simple way to do so is to think about what happens before, during, and after your product is used. Babysitting and parking the car are needed before going to the movies. Operating and application software are used along with computer hardware. In the airline industry, ground transportation is used after the flight but is clearly part of what the customer needs to travel from one place to another.

Companies can create new market space by zeroing in on the complements that detract from the value of their own product or service. Look at Borders Books & Music and Barnes & Noble in the United States. By the late 1980s, the U.S. retail-book industry appeared to be in decline. Americans were reading less and less. The large chains of mall bookstores were engaged in intense competition, and the small, independent bookstore appeared to be an endangered species.

Against this backdrop, Borders and B&N created a new format – book superstores – and woke up an entire industry. When either company enters a market, the overall consumption of books often increases by more than 50%.

The traditional business of a bookstore had been narrowly defined as selling books. People came, they bought, they left. Borders and B&N, however, thought more broadly about the total experience people seek when they buy books – and what they focused on was the joy of lifelong learning and discovery. Yes, that involves the physical purchase of books. But it also includes related activities: searching and hunting, evaluating potential purchases, and actually sampling books.

Traditional retail-book chains imposed tremendous inefficiencies and inconveniences on consumers. Their staffs were generally trained as cashiers and stock clerks; few could help customers find the right book. In small stores, selection was limited, frustrating the search for an exciting title. People who hadn't read a good book review recently or picked up a recommendation from a friend would be unlikely to patronize these bookstores. As a rule, the stores discouraged browsing, forcing customers to assume a large part of the risk in buying a book, since people would not know until after they bought it whether they would like it. As for consumption, that activity was supposed to occur at home. But as people's lives have become increasingly harried, home has become less likely to be a peaceful oasis where a person can enjoy a wonderful book.

Borders and B&N saw value trapped in these complementary activities. They hired staff with extensive knowledge of books to help customers make selections. Many staff members have college or even advanced degrees, and all are passionate book lovers. Furthermore, they're given a monthly book allowance, and they're actually encouraged to read whenever business is slow.

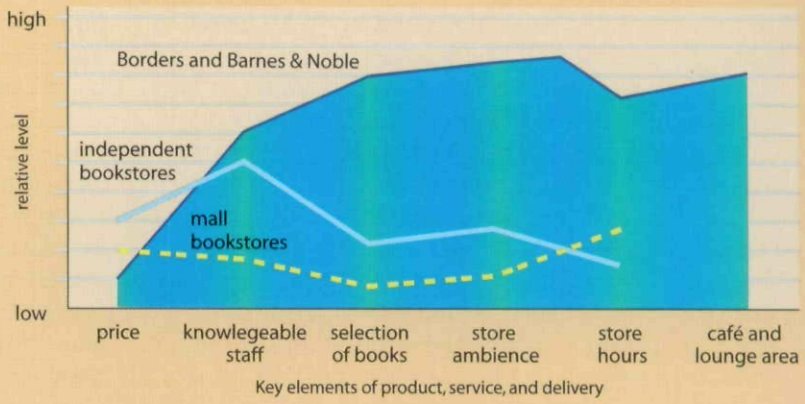
The superstores stock more than 150,000 titles, whereas the average bookstore contains around 20,000. The superstores are furnished with armchairs, reading tables, and sofas to encourage people not just to dip into a book or two but to read them through. Their coffee bars, classical music, and wide aisles invite people to linger comfortably. They stay open until 11 at night, offering a relaxing

destination for an evening of quiet reading, not a quick shopping stop. (See the graph "Value Innovation in Book Retailing.")

Book superstores redefined the scope of the service they offer. They transformed the product from the book itself into the pleasure of reading and intellectual exploration. In less than six years, Borders and B&N have emerged as the two largest bookstore chains in the United States, with a total of more than 650 superstores between them.

We could cite many other examples of companies that have followed this path to creating new market space. Virgin Entertainment's stores combine CDs, videos, computer games, and stereo and audio equipment to satisfy buyers' complete entertainment needs. Dyson designs its vacuum cleaners to obliterate the costly and annoying activities of buying and changing vacuum cleaner bags. Zeneca's Salick cancer centers combine all the cancer treatments their patients might need under one roof so they don't have to go from one specialized center to another, making separate appointments for each service they require.

Value Innovation in Book Retailing



Borders and Barnes & Noble looked across complementary products and services to establish a new value curve in book retailing. Their book superstores raised the selection of books, the level of staff knowledge, and the range of store hours well above the industry standards while lowering price and creating a wholly new reading environment.

Looking Across Functional or Emotional Appeal to Buyers

Competition in an industry tends to converge not only around an accepted notion of the scope of its products and services but also around one of two possible bases of appeal. Some industries compete principally on price and function based largely on calculations of utility; their appeal is rational. Other industries compete largely on feelings; their appeal is emotional.

Yet the appeal of most products or services is rarely intrinsically one or the other. The phenomenon is a result of the way companies have competed in the past, which has unconsciously educated consumers on what to expect. Companies' behavior affects customers' expectations in a reinforcing cycle. Over time, functionally oriented industries become more functionally oriented; emotionally oriented industries become more emotionally oriented. No wonder market research rarely reveals new insights into what customers really want. Industries have trained customers in what to expect. When surveyed, they echo back: more of the same for less.

Companies often find new market space when they are willing to challenge the functional-emotional orientation of their industry. We have observed two common patterns. Emotionally oriented industries offer many extras that add price without enhancing functionality. Stripping those extras away may create a fundamentally simpler, lower-priced, lower-cost business model that customers would welcome. Conversely, functionally oriented industries can often infuse commodity products with new life by adding a dose of emotion – and in so doing, can stimulate new demand.

Look at how Starbucks transformed a functional product into an emotional one. In the late 1980s, General Foods, Nestlé, and Procter & Gamble dominated the U.S. coffee market. Consumers drank coffee as part of a daily routine. Coffee was considered a commodity industry, marked by heavy price-cutting and an ongoing battle for market share. The industry had taught customers to shop based on price, discount coupons, and brand names that are expensive for companies to build. The result was paper-thin profit margins and low growth.

Instead of viewing coffee as a functional product, Starbucks set out to make coffee an emotional experience, what customers often refer to as a "caffeine-induced oasis." The big three sold a commodity – coffee by the can; Starbucks sold a retailing concept – the coffee bar. The coffee bars offered a chic gathering place, status, relaxation, conversation, and creative coffee drinks. Starbucks turned

coffee into an emotional experience and ordinary people into coffee connoisseurs for whom the steep $3-per-cup price seemed reasonable. With almost no advertising, Starbucks became a national brand with margins roughly five times the industry average.

What Starbucks did for coffee, Swatch did for budget watches. Long considered a functional item, budget watches were bought merely to keep track of time. Citizen and Seiko, the leaders in the industry, competed through advances in functionality by using quartz technology to improve accuracy, for example, or by making digital displays that were easier to read. Swatch turned budget watches into fashion accessories.

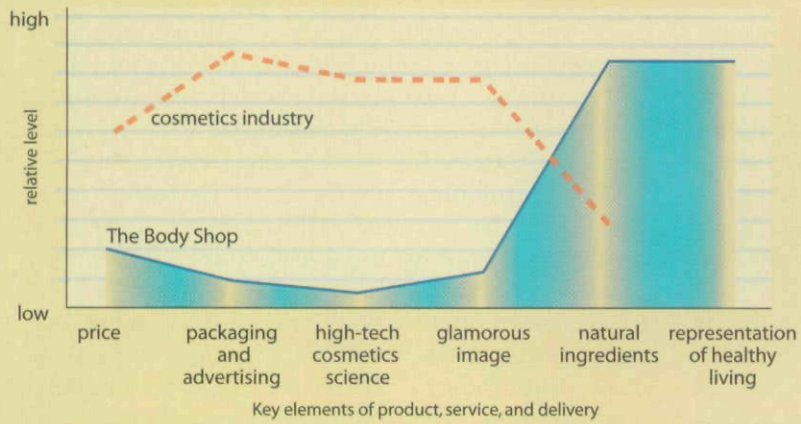
SMH, the Swiss parent company, created a design lab in Italy to turn its watches into a fashion statement, combining powerful technology with fantasy. "You wear a watch on your wrist, right against your skin," explains chairman Nicholas Hayek. "It can be an important part of your image. I believed that if we could add genuine emotion to the product and a strong message, we could succeed in dominating the industry and creating a powerful market." Before Swatch, people usually purchased only one watch. Swatch made repeat purchases the standard. In Italy, the average person owns six Swatches to fit their different moods and looks.

The Body Shop created new market space by shifting in the opposite direction, from an emotional appeal to a functional one. Few industries are more emotionally oriented than cosmetics. The industry sells glamour and beauty, hopes and dreams as much as it sells products. On average, packaging and advertising constitute 85% of cosmetics companies' costs.

By stripping away the emotional appeal, the Body Shop realized tremendous cost savings. Since customers get no practical value from the money the industry spends on packaging, the Body Shop uses simple refillable plastic bottles. The Body Shop spends little on advertising, again because its customers get no functional value from it. In short, the Body Shop hardly looks like a cosmetics company at all. The company's approach – and its emphasis on natural ingredients and healthy living – was so refreshingly simple that it won consumers over through common sense and created new market space in an industry accustomed to competing on a tried-and-true formula. (See the graph "Is the Body Shop a Cosmetics Company?")

A burst of new market creation is under way in a number of service industries that are following this pattern. Relationship businesses like insurance, banking, and investing have relied heavily on the emotional bond between broker and client. They are ripe for change. Direct Line Insurance in Britain, for example, has done away with traditional brokers. It reasoned that customers would not need the hand-holding and emotional comfort that brokers traditionally provide if the company did a better job of, for example, paying claims rapidly and eliminating complicated paperwork. So instead of using brokers and regional branch offices, Direct Line substitutes information technology to improve claims handling, and it passes on some of the cost savings to customers in the form of lower insurance premiums. In the United States, Vanguard Group in index funds and Charles Schwab in brokerage services are doing the same in the investment industry, creating new market space by transforming emotionally oriented businesses based on personal relationships into high-performance, low-cost functional businesses.

Is the Body Shop a Cosmetics Company?



By reconsidering the traditional basis of appeal of its industry, the Body Shop created a value curve so divergent that it hardly looks like a cosmetics company at all. In appealing to function rather than emotion, the Body Shop reduced price, glamour, and packaging costs while creating a new emphasis on natural ingredients and healthy living.

Looking Across Time

All industries are subject to external trends that affect their businesses over time. Think of the rapid rise of the Internet or the global movement toward protecting the environment. Looking at these trends with the right perspective can unlock innovation that creates new market space.

Shifting the Focus of Strategy

From Head-to-Head Competition to Creating New Market Space

The Conventional Boundaries of Competition	HEAD-TO-HEAD COMPETITION	CREATING NEW MARKET SPACE
Industry	focuses on rivals within its industry	→ ***looks across substitute industries***
Strategic group	focuses on competitive position within strategic group	→ ***looks across strategic groups within its industry***
Buyer group	focuses on better serving the buyer group	→ ***redefines the buyer group of the industry***
Scope of product and service offerings	focuses on maximizing the value of product and service offerings within the bounds of its industry	→ ***looks across to complementary product and service offerings that go beyond the bounds of its industry***
Functional-emotional orientation of an industry	focuses on improving price-performance in line with the functional-emotional orientation of its industry	→ ***rethinks the functional-emotional orientation of its industry***
Time	focuses on adapting to external trends as they occur	→ ***participates in shaping external trends over time***

Most companies adapt incrementally and somewhat passively as events unfold. Whether it's the emergence of new technologies or major regulatory changes, managers tend to focus on projecting the trend itself. That is, they ask in which direction a technology will evolve, how it will be adopted, whether it will become scalable. They pace their own actions to keep up with the development of the trends they're tracking.

But key insights into new market spaces rarely come from projecting the trend itself. Instead they arise from business insights into how the trend will change value to customers. By looking across time – from the value a market delivers today to the value it might deliver tomorrow – managers can actively shape their future and lay claim to new market space. Looking across time is perhaps more difficult than the previous approaches we've discussed, but it can be made subject to the same disciplined approach. We're not talking about predicting the future, which is inherently impossible. We're talking about finding insight in trends that are observable today. (See the diagram "Shifting the Focus of Strategy.")

Three principles are critical to assessing trends across time. To form the basis of a new value curve, these trends must be decisive to your business, they must be irreversible, and they must have a clear trajectory. Many trends can be observed at any one time – a discontinuity in technology, the rise of a new lifestyle, or a change in regulatory or social environments, for example. But usually only one or two will have a decisive impact on any particular business. And it may be possible to see a trend or major event without being able to predict its direction. In 1998, for example, the mounting Asian crisis was an important trend certain to have a big impact on financial services. But the direction

that trend would take was impossible to predict – and therefore envisioning a new value curve that might result from it would have been a risky enterprise. In contrast, the euro is evolving along a constant trajectory as it replaces Europe's multiple currencies. This is a decisive, irreversible, and clearly developing trend upon which new market space might be created in financial services.

Having identified a trend of this nature, managers can then look across time and ask themselves what the market would look like if the trend were taken to its logical conclusion. Working back from that vision of a new value curve, they can then identify what must be changed today to unlock superior value for buyers.

Consider Enron, an energy company based in Houston, Texas. In the 1980s, Enron's business centered on gas pipelines. Deregulation of the gas industry was on the horizon. Such an event would certainly be decisive for Enron. The U.S. government had just deregulated the telecom and transportation industries, so a reversal in its intent to deregulate the gas industry was highly unlikely. Not only was the trend irreversible, its logical conclusion was also predictable – the end of price controls and the breakup of local gas monopolies. By assessing the gap between the market as it stood and the market as it was to be, Enron gained insight into how to create new market space.

When local gas monopolies were broken up, gas could be purchased from anywhere in the nation. At the time, the cost of gas varied dramatically from region to region. Gas was much more expensive, for example, in New York and Chicago than it was in Oregon and Idaho. Enron saw that deregulation would make possible a national market in which gas could be bought where it was cheap and sold where it was expensive. By examining how the gas market could operate with deregulation, Enron saw a way to unlock tremendous trapped value on a national scale.

Accordingly, Enron worked with government agencies to push for deregulation. It purchased regional gas-pipeline companies across the nation, tied them together, and created a national market for gas. That allowed Enron to buy the lowest cost gas from numerous sources across North America and to operate with the best spreads in the industry. Enron became the largest transporter of natural gas in North America, and its customers benefited from more reliable delivery and a drop in costs of as much as 40%.

Cisco Systems created a new market space in a similar way. It started with a decisive and irreversible trend that had a clear trajectory: the growing demand for high-speed data exchange. Cisco looked at the world as it was – and that world was hampered by slow data rates and incompatible computer networks. Demand was exploding as, among other factors, the number of Internet users doubled roughly every 100 days. So Cisco could clearly see that the problem would inevitably worsen. Cisco's routers, switches, and other networking devices were designed to create breakthrough value for customers, offering fast data exchanges in a seamless networking environment. Thus Cisco's insight is as much about value innovation as it is about technology. Today more than 80% of all traffic on the Internet flows through Cisco's products, and its margins in this new market space are in the 60% range.

Regenerating Large Companies

Creating new market space is critical not just for start-ups but also for the prosperity and survival of even the world's largest companies. Take Toyota as an example. Within three years of its launch in 1989, the Lexus accounted for nearly one-third of Toyota's operating profit while representing only 2% of its unit volume. Moreover, the Lexus boosted Toyota's brand image across its entire range of cars. Or think of Sony. The greatest contribution to Sony's profitable growth and its reputation in the last 20 years was the Walkman. Since its introduction in 1979, the Walkman has dominated the personal portable-stereo market, generating a huge positive spillover effect on Sony's other lines of business throughout the world.

Likewise, think of SMH. Its collection of watch companies ranges from Blancpain, whose watches retail for over $200,000, to Omega, the watch of astronauts, to midrange classics like Hamilton and Tissot to the sporty, chic watches of Longines and Rado. Yet it was the creation of the Swatch and the market of fun, fashionable watches that revitalized the entire Swiss watch industry and made SMH the darling of investors and customers the world over.

It is no wonder that corporate leaders throughout the world see market creation as a central strategic challenge to their organizations in the upcoming decade. They understand that in an overcrowded and demand-starved economy, profitable growth is not sustainable without creating, and re-creating, markets. That is what allows small companies to become big and what allows big companies to regenerate themselves. ▽

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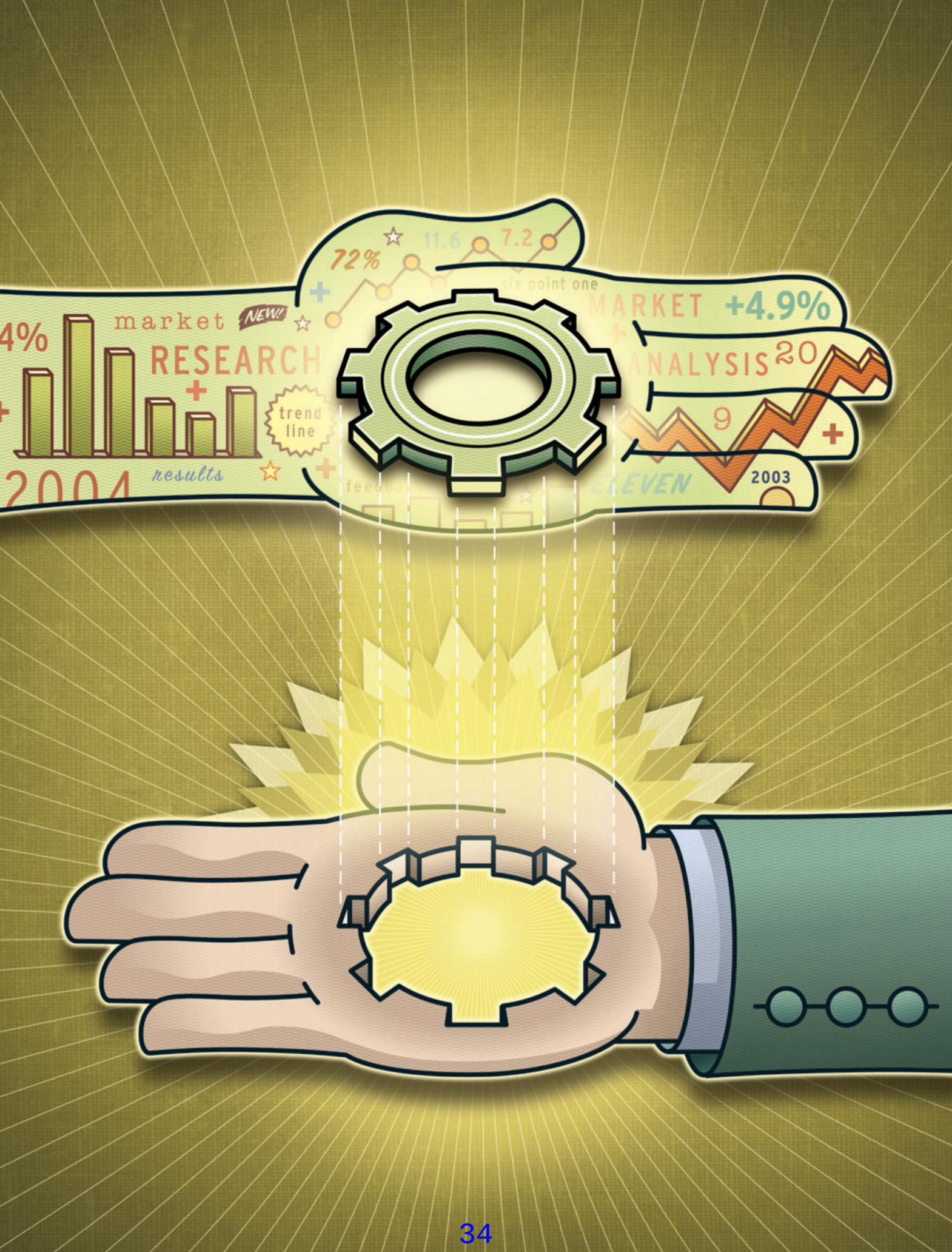
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Customer Value Propositions in Business Markets

by JAMES C. ANDERSON, JAMES A. NARUS, AND WOUTER VAN ROSSUM

Under pressure to keep costs down, customers may only look at price and not listen to your sales pitch. Help them understand – and believe in – the superior value of your offerings.

"CUSTOMER VALUE PROPOSITION" has become one of the most widely used terms in business markets in recent years. Yet our management-practice research reveals that there is no agreement as to what constitutes a customer value proposition – or what makes one persuasive. Moreover, we find that most value propositions make claims of savings and benefits to the customer without backing them up. An offering may actually provide superior value – but if the supplier doesn't demonstrate and document that claim, a customer manager will likely dismiss it as marketing puffery. Customer managers, increasingly held accountable for reducing costs, don't have the luxury of simply believing suppliers' assertions.

PETER HOEY

Take the case of a company that makes integrated circuits (ICs). It hoped to supply 5 million units to an electronic device manufacturer for its next-generation product. In the course of negotiations, the supplier's salesperson learned that he was competing against a company whose price was 10 cents lower per unit. The customer asked each salesperson why his company's offering was superior. This salesperson based his value proposition on the service that he, personally, would provide.

Unbeknownst to the salesperson, the customer had built a customer value model, which found that the company's offering, though 10 cents higher in price per IC, was actually worth 15.9 cents more. The electronics engineer who was leading the development project had recommended that the purchasing manager buy those ICs, even at the higher price. The service was, indeed, worth something in the model–but just 0.2 cents! Unfortunately, the salesperson had overlooked the two elements of his company's IC offering that were most valuable to the customer, evidently unaware how much they were worth to that customer and, objectively, how superior they made his company's offering to that of the competitor. Not surprisingly, when push came to shove, perhaps suspecting that his service was not worth the difference in price, the salesperson offered a 10-cent price concession to win the business–consequently leaving at least a half million dollars on the table.

Some managers view the customer value proposition as a form of spin their marketing departments develop for advertising and promotional copy. This shortsighted view neglects the very real contribution of value propositions to superior business performance. Properly constructed, they force companies to rigorously focus on what their offerings are really worth to their customers. Once companies become disciplined about understanding customers, they can make smarter choices about where to allocate scarce company resources in developing new offerings.

We conducted management-practice research over the past two years in Europe and the United States to understand what constitutes a customer value proposition and what makes one persuasive to customers. One striking discovery is that it is exceptionally difficult to find examples of value propositions that resonate with customers. Here, drawing on the best practices of a handful of suppliers in business markets, we present a systematic approach for developing value propositions that are meaningful to target customers and that focus suppliers' efforts on creating superior value.

Three Kinds of Value Propositions

We have classified the ways that suppliers use the term "value proposition" into three types: all benefits, favorable points of difference, and resonating focus. (See the exhibit "Which Alternative Conveys Value to Customers?")

All benefits. Our research indicates that most managers, when asked to construct a customer value proposition, simply list all the benefits they believe that their offering might deliver to target customers. The more they can think of, the better. This approach requires the least knowledge about customers and competitors and, thus, the least amount of work to construct. However, its relative simplicity has a major potential drawback: *benefit assertion.* Managers may claim advantages for features that actually provide no benefit to target customers.

Such was the case with a company that sold high-performance gas chromatographs to R&D laboratories in large companies, universities, and government agencies in the Benelux countries. One feature of a particular chromatograph allowed R&D lab customers to maintain a high degree of sample integrity. Seeking growth, the company began to market the most basic model of this chromatograph to a new segment: commercial laboratories. In initial meetings with prospective customers, the firm's

Customer managers, increasingly held accountable for reducing costs, don't have the luxury of simply believing suppliers' assertions.

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Which Alternative Conveys Value to Customers?

Suppliers use the term "value proposition" three different ways. Most managers simply list all the benefits they believe that their offering might deliver to target customers. The more they can think of, the better. Some managers do recognize that the customer has an alternative, but they often make the mistake of assuming that favorable points of difference must be valuable for the customer. Best-practice suppliers base their value proposition on the few elements that matter most to target customers, demonstrate the value of this superior performance, and communicate it in a way that conveys a sophisticated understanding of the customer's business priorities.

VALUE PROPOSITION:	ALL BENEFITS	FAVORABLE POINTS OF DIFFERENCE	RESONATING FOCUS
Consists of:	All benefits customers receive from a market offering	All favorable points of difference a market offering has relative to the next best alternative	The one or two points of difference (and, perhaps, a point of parity) whose improvement will deliver the greatest value to the customer for the foreseeable future
Answers the customer question:	"Why should our firm purchase your offering?"	"Why should our firm purchase your offering instead of your competitor's?"	"What is *most* worthwhile for our firm to keep in mind about your offering?"
Requires:	Knowledge of own market offering	Knowledge of own market offering and next best alternative	Knowledge of how own market offering delivers superior value to customers, compared with next best alternative
Has the potential pitfall:	Benefit assertion	Value presumption	Requires customer value research

salespeople touted the benefits of maintaining sample integrity. Their prospects scoffed at this benefit assertion, stating that they routinely tested soil and water samples, for which maintaining sample integrity was not a concern. The supplier was taken aback and forced to rethink its value proposition.

Another pitfall of the all benefits value proposition is that many, even most, of the benefits may be points of parity with those of the next best alternative, diluting the effect of the few genuine points of difference. Managers need to clearly identify in their customer value propositions which elements are points of parity and which are points of difference. (See the exhibit "The Building Blocks of a Successful Customer Value Proposition.") For example, an international engineering consultancy was bidding for a light-rail project. The last chart of the company's presentation listed ten reasons why the municipality should award the project to the firm. But the chart had little persuasive power because the other two finalists could make most of the same claims.

Put yourself, for a moment, in the place of the prospective client. Suppose each firm, at the end of its presentation, gives ten reasons why you ought to award it the project, and the lists from all the firms are almost the same. If each firm is saying essentially the same thing, how do you make a choice? You ask each of the firms to give a final, best price, and then you award the project to the firm that gives the largest price concession. Any distinctions that do exist have been overshadowed by the firms' greater sameness.

Favorable points of difference. The second type of value proposition explicitly recognizes that the customer has an alternative. The recent experience of a leading industrial gas supplier illustrates this perspective. A customer sent the company a request for proposal stating that the two or three suppliers that could demonstrate the most persuasive value propositions would be invited to visit the customer to discuss and refine their proposals. After this meeting, the customer would select a sole supplier for this business. As this example shows, "Why should our firm purchase your offering instead of your competitor's?" is a more pertinent question than "Why should our firm purchase your offering?" The first question focuses suppliers on differentiating their offerings from the next best alternative, a process that requires detailed knowledge of that alternative, whether it be buying a competitor's offering or solving the customer's problem in a different way.

Knowing that an element of an offering is a point of difference relative to the next best alternative does not, however, convey the value of this difference to target customers. Furthermore, a product or service may have several points of difference, complicating the supplier's understanding of which ones deliver the greatest value. Without a detailed understanding of the customer's requirements and preferences, and what it is worth to fulfill them, suppliers may stress points of difference that deliver relatively little value to the target customer. Each of these can lead to the pitfall of *value presumption:* assuming that favorable points of difference must be valuable for the customer. Our opening anecdote about the IC supplier that unnecessarily discounted its price exemplifies this pitfall.

Resonating focus. Although the favorable points of difference value proposition is preferable to an all benefits proposition for companies crafting a consumer value proposition, the resonating focus value proposition should be the gold standard. This approach acknowledges that the managers who make purchase decisions have major, ever-increasing levels of responsibility and often are pressed for time. They want to do business with suppliers that fully grasp critical issues in their business and deliver a customer value proposition that's simple yet powerfully captivating. Suppliers can provide such a customer value proposition by making their offerings superior on the few elements that matter most to target customers, demonstrating and documenting the value of this superior performance, and communicating it in a way that conveys a sophisticated understanding of the customer's business priorities.

This type of proposition differs from favorable points of difference in two significant respects. First, more is not better. Although a supplier's offering may possess several favorable points of difference, the resonating focus proposition steadfastly concentrates on the one or two points of difference that deliver, and whose improvement will continue to deliver, the greatest value to target customers. To better leverage limited resources, a supplier might even cede to the next best alternative the favorable points of difference that customers value least, so that the supplier can concentrate its resources on improving the one or two points of difference customers value most. Second, the resonating focus proposition may contain a point of parity. This occurs either when the point of parity is required for target customers even to consider the supplier's offering or when a supplier wants to counter customers' mistaken perceptions that a particular value element is a point of difference in favor of a competitor's offering. This latter case arises when customers believe that the competitor's offering is superior but the supplier believes its offerings are comparable–customer value research provides empirical support for the supplier's assertion.

To give practical meaning to resonating focus, consider the following example. Sonoco, a global packaging supplier headquartered in Hartsville, South Carolina, approached a large European customer, a maker of consumer packaged goods, about redesigning the packaging

The Building Blocks of a Successful Customer Value Proposition

A supplier's offering may have many technical, economic, service, or social benefits that deliver value to customers – but in all probability, so do competitors' offerings. Thus, the essential question is, "How do these value elements compare with those of the next best alternative?" We've found that it's useful to sort value elements into three types.

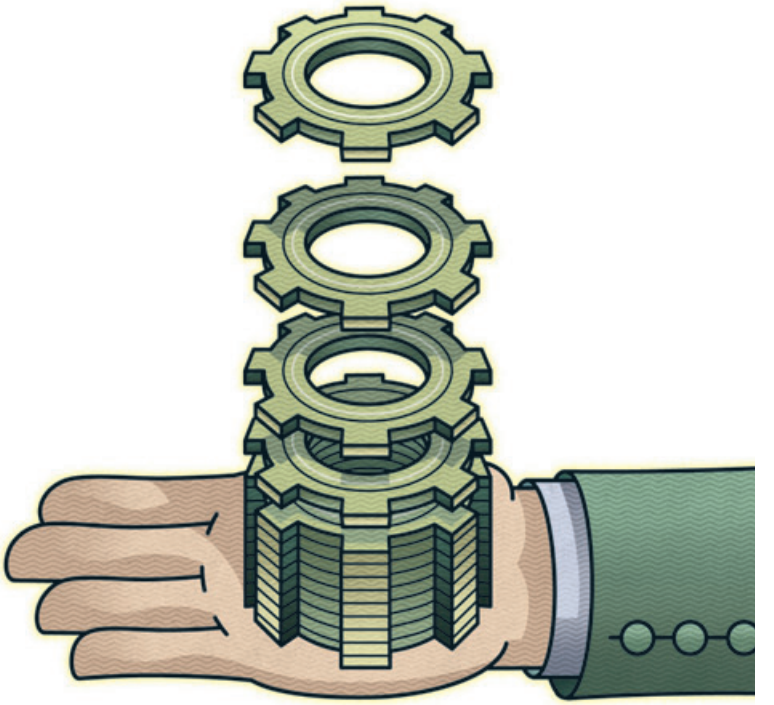
Points of parity are elements with essentially the same performance or functionality as those of the next best alternative.

Points of difference are elements that make the supplier's offering either superior or inferior to the next best alternative.

Points of contention are elements about which the supplier and its customers disagree regarding how their performance or functionality compares with those of the next best alternative. Either the supplier regards a value element as a point of difference in its favor, while the customer regards that element as a point of parity with the next best alternative, or the supplier regards a value element as a point of parity, while the customer regards it as a point of difference in favor of the next best alternative.

for one of its product lines. Sonoco believed that the customer would profit from updated packaging, and, by proposing the initiative itself, Sonoco reinforced its reputation as an innovator. Although the redesigned packaging provided six favorable points of difference relative to the next best alternative, Sonoco chose to emphasize one point of parity and two points of difference in what it called its distinctive value proposition (DVP). The value proposition was that the redesigned packaging would deliver significantly greater manufacturing efficiency in the customer's fill lines, through higher-speed closing, and provide a distinctive look that consumers would find more appealing – all for the same price as the present packaging.

Sonoco chose to include a point of parity in its value proposition because, in this case, the customer would not even consider a packaging redesign if the price went up. The first point of difference in the value proposition (increased efficiency) delivered cost savings to the customer, allowing it to move from a seven-day, three-shift production schedule during peak times to a five-day, two-shift operation. The second point of difference delivered an advantage at the consumer level, helping the customer to grow its revenues and profits incrementally. In persuading the customer to change to the redesigned packaging, Sonoco did not neglect to mention the other favorable points of difference. Rather, it chose to place much greater emphasis on the two points of difference and the one point of parity that mattered most to the customer, thereby delivering a value proposition with resonating focus.



Stressing as a point of parity what customers may mistakenly presume to be a point of difference favoring a competitor's offering can be one of the most important parts of constructing an effective value proposition. Take the case of Intergraph, an Alabama-based provider of engineering software to engineering, procurement, and construction firms. One software product that Intergraph offers, SmartPlant P&ID, enables customers to define flow processes for valves, pumps, and piping within plants they are designing and generate piping and instrumentation diagrams (P&ID). Some prospective customers wrongly presume that SmartPlant's drafting performance would not be as good as that of the next best alternative, because the alternative is built on computer-aided design (CAD), a better-known drafting tool than the relational database platform on which SmartPlant is built. So Intergraph tackled the perception head on, gathering data from reference customers to substantiate that this point of contention was actually a point of parity.

Here's how the company played it. Intergraph's resonating focus value proposition for this software consisted of one point of parity (which the customer initially thought was a point of contention), followed by three points of difference:

Point of parity: Using this software, customers can create P&ID graphics (either drawings or reports) as fast, if not faster, as they can using CAD, the next best alternative.

Point of difference: This software checks all of the customer's upstream and downstream data related to plant assets and procedures, using universally accepted engineering practices, company-specific rules, and project- or process-specific rules at each stage of the design process, so that the customer avoids costly mistakes such as missing design change interdependencies or, worse, ordering the wrong equipment.

Point of difference: This software is integrated with upstream and downstream tasks, such as process simulation and instrumentation design, thus requiring no reentry of data (and reducing the margin for error).

Point of difference: With this software, the customer is able to link remote offices to execute the project and then merge the pieces into a single deliverable database to hand to its customer, the facility owner.

Resonating focus value propositions are very effective, but they're not easy to craft: Suppliers must undertake

customer value research to gain the insights to construct them. Despite all of the talk about customer value, few suppliers have actually done customer value research, which requires time, effort, persistence, and some creativity. But as the best practices we studied highlight, thinking through a resonating focus value proposition disciplines a company to research its customers' businesses enough to help solve their problems. As the experience of a leading resins supplier amply illustrates, doing customer value research pays off. (See the sidebar "Case in Point: Transforming a Weak Value Proposition.")

Substantiate Customer Value Propositions

In a series of business roundtable discussions we conducted in Europe and the United States, customer managers reported that "We can save you money!" has become almost a generic value proposition from prospective suppliers. But, as one participant in Rotterdam wryly observed, most of the suppliers were telling "fairy tales." After he heard a pitch from a prospective supplier, he would follow up with a series of questions to determine whether the supplier had the people, processes, tools, and experience to actually save his firm money. As often as not, they could not really back up the claims. Simply put, to make customer value propositions persuasive, suppliers must be able to demonstrate and document them.

Value word equations enable a supplier to show points of difference and points of contention relative to the next best alternative, so that customer managers can easily grasp them and find them persuasive. A value word equation expresses in words and simple mathematical operators (for example, + and ÷) how to assess the differences in functionality or performance between a supplier's offering and the next best alternative and how to convert those differences into dollars.

Best-practice firms like Intergraph and, in Milwaukee, Rockwell Automation use value word equations to make it clear to customers how their offerings will lower costs or add value relative to the next best alternatives. The data needed to provide the value estimates are most often collected from the customer's business operations by supplier and customer managers working together, but, at times, data may come from outside sources, such as industry association studies. Consider a value word equation that Rockwell Automation used to calculate the cost savings from reduced power usage that a customer would gain by using a Rockwell Automation motor solution instead of a competitor's comparable offering:

$$\begin{aligned}\text{Power Reduction Cost Savings} = {} & [\text{kW spent} \times \text{number of operating hours per year} \times \$ \text{ per kW hour} \times \text{number of years system solution in operation}]_{\text{Competitor Solution}} \\ & - [\text{kW spent} \times \text{number of operating hours per year} \times \$ \text{ per kW hour} \times \text{number of years system solution in operation}]_{\text{Rockwell Automation Solution}}\end{aligned}$$

This value word equation uses industry-specific terminology that suppliers and customers in business markets rely on to communicate precisely and efficiently about functionality and performance.

Demonstrate Customer Value in Advance

Prospective customers must see convincingly the cost savings or added value they can expect from using the supplier's offering instead of the next best alternative. Best-practice suppliers, such as Rockwell Automation and precision-engineering and manufacturing firm Nijdra Groep in the Netherlands, use *value case histories* to demonstrate this. Value case histories document the cost savings or added value that reference customers have actually received from their use of the supplier's market offering. Another way that best-practice firms, such as Pennsylvania-based GE Infrastructure Water & Process Technologies (GEIW&PT) and SKF USA, show the value of their offerings to prospective customers in advance is through *value calculators.* These customer value assessment tools typically are spreadsheet software applications that salespeople or value specialists use on laptops as part of a consultative selling approach to demonstrate the value that customers likely would receive from the suppliers' offerings.

Some best-practice suppliers are even willing to guarantee a certain amount of savings before a customer signs on.

When necessary, best-practice suppliers go to extraordinary lengths to demonstrate the value of their offerings relative to the next best alternatives. The polymer chemicals unit of Akzo Nobel in Chicago recently conducted an on-site two-week pilot on a production reactor at a prospective customer's facility to gather data firsthand on the performance of its high-purity metal organics offering relative to the next best alternative in producing compound semiconductor wafers. Akzo Nobel paid this

prospective customer for these two weeks, in which each day was a trial because of daily considerations such as output and maintenance. Akzo Nobel now has data from an actual production machine to substantiate assertions about its product and anticipated cost savings, and evidence that the compound semiconductor wafers produced are as good as or better than those the customer currently grows using the next best alternative. To let its prospective clients' customers verify this for themselves, Akzo Nobel brought them sample wafers it had produced for testing. Akzo Nobel combines this point of parity with two points of difference: significantly lower energy costs for conversion and significantly lower maintenance costs.

Document Customer Value

Demonstrating superior value is necessary, but this is no longer enough for a firm to be considered a best-practice company. Suppliers also must document the cost savings and incremental profits (from additional revenue generated) their offerings deliver to the companies that have purchased them. Thus, suppliers work with their customers to define how cost savings or incremental profits will be tracked and then, after a suitable period of time, work with customer managers to document the results. They use value documenters to further refine their customer value models, create value case histories, enable customer managers to get credit for the cost savings and incremental profits produced, and (because customer managers know that the supplier is willing to return later to document the value received) enhance the credibility of the offering's value.

A pioneer in substantiating value propositions over the past decade, GEIW&PT documents the results provided to customers through its value generation planning (VGP) process and tools, which enable its field personnel to understand customers' businesses and to plan, execute, and document projects that have the highest value impact for its customers. An online tracking tool allows GEIW&PT and customer managers to easily monitor the

Case in Point: Transforming a Weak Value Proposition

A leading supplier of specialty resins used in architectural coatings – such as paint for buildings – recognized that its customers were coming under pressure to comply with increasingly strict environmental regulations. At the same time, the supplier reasoned, no coating manufacturer would want to sacrifice performance. So the resins supplier developed a new type of high-performance resins that would enable its customers to comply with stricter environmental standards – albeit at a higher price but with no reduction in performance.

In its initial discussions with customers who were using the product on a trial basis, the resins supplier was surprised by the tepid reaction it received, particularly from commercial managers. They were not enthusiastic about the sales prospects for higher-priced coatings with commercial painting contractors, the primary target market. They would not, they said, move to the new resin until regulation mandated it.

Taken aback, the resins supplier decided to conduct customer value research to better understand the requirements and preferences of its customers' customers and how the performance of the new resin would affect their total cost of doing business. The resins supplier went so far as to study the requirements and preferences of the commercial painting contractors' customers – building owners. The supplier conducted a series of focus groups and field tests with painting contractors to gather data. The performance on primary customer requirements – such as coverage, dry time, and durability – was studied, and customers were asked to make performance trade-offs and indicate their willingness to pay for coatings that delivered enhanced performance. The resins supplier also joined a commercial painting contractor industry association, enrolled managers in courses on how contractors are taught to estimate jobs, and trained the staff to work with the job-estimation software used by painting contractors.

Several insights emerged from this customer value research. Most notable was the realization that only 15% of a painting contractor's costs are the coatings; labor is by far the largest cost component. If a coating could provide greater productivity – for example, a faster drying time that allowed two coats to be applied during a single eight-hour shift – contractors would likely accept a higher price.

The resins supplier retooled its value proposition from a single dimension, environmental regulation compliance, to a resonating focus value proposition where environmental compliance played a significant but minor part. The new value proposition was "The new resin enables coatings producers to make architectural coatings with higher film build and gives the painting contractors the ability to put on two coats within a single shift, thus increasing painter productivity while also being environmentally compliant." Coatings customers enthusiastically accepted this value proposition, and the resins supplier was able to get a 40% price premium for its new offering over the traditional resin product.

execution and documented results of each project the company undertakes. Since it began using VGP in 1992, GEIW&PT has documented more than 1,000 case histories, accounting for $1.3 billion in customer cost savings, 24 billion gallons of water conserved, 5.5 million tons of waste eliminated, and 4.8 million tons of air emissions removed.

As suppliers gain experience documenting the value provided to customers, they become knowledgeable about how their offerings deliver superior value to customers and even how the value delivered varies across kinds of customers. Because of this extensive and detailed knowledge, they become confident in predicting the cost savings and added value that prospective customers likely will receive. Some best-practice suppliers are even willing to guarantee a certain amount of savings before a customer signs on.

A global automotive engine manufacturer turned to Quaker Chemical, a Pennsylvania-based specialty chemical and management services firm, for help in significantly reducing its operating costs. Quaker's team of chemical, mechanical, and environmental engineers, which has been meticulously documenting cost savings to customers for years, identified potential savings for this customer through process and productivity improvements. Then Quaker implemented its proposed solution – with a guarantee that savings would be five times more than what the engine manufacturer spent annually just to purchase coolant. In real numbers, that meant savings of $1.4 million a year. What customer wouldn't find such a guarantee persuasive?

Superior Business Performance

We contend that customer value propositions, properly constructed and delivered, make a significant contribution to business strategy and performance. GE Infrastructure Water & Process Technologies' recent development of a new service offering to refinery customers illustrates how general manager John Panichella allocates limited resources to initiatives that will generate the greatest incremental value for his company and its customers. For example, a few years ago, a field rep had a creative idea for a new product, based on his comprehensive understanding of refinery processes and how refineries make money. The field rep submitted a new product introduction (NPI) request to the hydrocarbon industry marketing manager for further study. Field reps or anyone else in the organization can submit NPI requests whenever they have an inventive idea for a customer solution that they believe would have a large value impact but that GEIW&PT presently does not offer. Industry marketing managers, who have extensive industry expertise, then perform scoping studies to understand the potential of the proposed products to deliver significant value to segment customers. They create business cases for the proposed product, which are "racked and stacked" for review. The senior management team of GEIW&PT sort through a large number of potential initiatives competing for limited resources. The team approved Panichella's initiative, which led to the development of a new offering that provided refinery customers with documented cost savings amounting to five to ten times the price they paid for the offering, thus realizing a compelling value proposition.

Best-practice suppliers make sure their people know how to identify what the next value propositions ought to be.

Sonoco, at the corporate level, has made customer value propositions fundamental to its business strategy. Since 2003, its CEO, Harris DeLoach, Jr., and the executive committee have set an ambitious growth goal for the firm: sustainable, double-digit, profitable growth every year. They believe that distinctive value propositions are crucial to support the growth initiative. At Sonoco, each value proposition must be:

- *Distinctive.* It must be superior to those of Sonoco's competition.
- *Measurable.* All value propositions should be based on tangible points of difference that can be quantified in monetary terms.
- *Sustainable.* Sonoco must be able to execute this value proposition for a significant period of time.

Unit managers know how critical DVPs are to business unit performance because they are one of the ten key metrics on the managers' performance scorecard. In senior management reviews, each unit manager presents proposed value propositions for each target market segment or key customer, or both. The managers then receive summary feedback on the value proposition metric (as well as on each of the nine other performance metrics) in terms of whether their proposals can lead to profitable growth.

In addition, Sonoco senior management tracks the relationship between business unit value propositions and business unit performance – and, year after year, has concluded that the emphasis on DVPs has made a significant contribution toward sustainable, double-digit, profitable growth.

Best-practice suppliers recognize that constructing and substantiating resonating focus value propositions is not a onetime undertaking, so they make sure their people know how to identify what the next value propositions ought to be. Quaker Chemical, for example, conducts a value-proposition training program each year for its chemical program managers, who work on-site with customers and have responsibility for formulating and executing customer value propositions. These managers first review case studies from a variety of industries Quaker serves, where their peers have executed savings projects and quantified the monetary savings produced. Competing in teams, the managers then participate in a simulation where they interview "customer managers" to gather information needed to devise a proposal for a customer value proposition. The team that is judged to have the best proposal earns "bragging rights," which are highly valued in Quaker's competitive culture. The training program, Quaker believes, helps sharpen the skills of chemical program managers to identify savings projects when they return to the customers they are serving.

As the final part of the training program, Quaker stages an annual real-world contest where the chemical program managers have 90 days to submit a proposal for a savings project that they plan to present to their customers. The director of chemical management judges these proposals and provides feedback. If he deems a proposed project to be viable, he awards the manager with a gift certificate. Implementing these projects goes toward fulfilling Quaker's guaranteed annual savings commitments of, on average, $5 million to $6 million a year per customer.

Each of these businesses has made customer value propositions a fundamental part of its business strategy. Drawing on best practices, we have presented an approach to customer value propositions that businesses can implement to communicate, with resonating focus, the superior value their offerings provide to target market segments and customers. Customer value propositions can be a guiding beacon as well as the cornerstone for superior business performance. Thus, it is the responsibility of senior management and general management, not just marketing management, to ensure that their customer value propositions are just that.

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P.C. VEY

"What we need are some fresh new ideas. You know, like we had last year."

Harvard Business School

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Matching the Process of Product Development to Its Context

Introduction

The value of an integrated new product development process, i.e., one in which marketing, research and development, and production work together rather than through sequential hand-offs of ideas and blueprints is well-documented.[1] Each team member brings crucial skills and knowledge to the party; marketing's major job is to bring in the "voice of the market."

While marketing's job is clear, its performance overall has led some observers to despair such as in the article "The Decline and Fall of Market Research in Corporate America," viz. "We have lost our energy when it comes to listening to the customer. We are in a state of decompression in that area, and it is killing us in the marketplace." (Hodock [1991])

A major contributor to this lack of vitality in market research is the standardization of research methods across all the company's new product development projects. Rather than a "one-size-fits-all" situation, the market research process must be tailored to context set by three key factors:

1. The impetus to the development activity;
2. The extent of market and company "newness" of the proposed product;
3. The opportunity cost and development risk associated with the project.

This note sets out these three context factors and provides a framework for assessing the specific words to be heard from the voice of the market and the most appropriate means of listening.

Context Description

The first context descriptor is the impetus to the development activity, i.e., the product's "reason why." Marketing must understand the strategic positioning of the product within the firm to

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[1]See, for example, J.L. Bower and T.M. Hout's "Fast-Cycle Capability for Competitive Power," H. Takeuchi and I. Nonaka "The New New Product Development Game," G. Stalk and T. Hout, *Competing Against Time*, and K. Clark and T. Fujimoto, *Product Development Performance*.

Professor Robert J. Dolan prepared this note as the basis for class discussion.

bring the right data to the table. For example, assessing a product's ability to open up new market segments requires different data than assessing it up to induce current customers to "trade up."

The second key context factor is the product's extent of "newness." **Figure A** shows the results of the 1982 Booz, Allen and Hamilton survey which classified 700 firms' product introductions according to:

1. Newness to the Market.
2. Newness to the Company.

Figure A Booz, Allen and Hamilton Newness Map

Newness to company			
HI	20% New Product Lines		10% New to the World
	26% Improve Existing	26% Additions to Line	
LO	11% Cost Reductions		7% Repositions
	LO		HI

Newness to Market

Only 17% had "high" newness to the market comprised of 10% with high company newness and 7% with low company newness. For the vast majority of products, relative comparisons to both currently existing products of the firm and "in-kind" competitors must be considered.

The third key context factor is the product's position on the opportunity cost/development risk map. In his article describing this McKinsey concept, Krubasik [1988] defines opportunity cost as the risk of missing a fast moving market window. Developmental risk is the risk of introducing the wrong product to the market. **Figure B** shows a map of these variables to the recommended product development process.

Figure B Opportunity Cost/Development Risk Map

Opportunity Cost			
HI	Crash Program		
		Step-by-Step Product Line	
LO			100% Right
	LO		HI

Developmental Risk

In situations of low development risk and high opportunity cost, getting to the market quickly is the paramount concern and a "crash program" is required. On the other hand, low opportunity cost coupled with high developmental risk makes the time-to-market less important and places emphasis on making sure the product is right once it gets there.

These contextual factors lead to very different optimal product development processes. Rather than relying on a standard set of procedures—in market research, research and development, and engineering, the firm must ask a different set of questions depending upon the context and also utilize a different set of research methods to obtain the necessary market data.

Linking Context to Process

The newness map has the central position in linking context to process. Consider the four examples shown in **Figure C**: the Honda Accord Station Wagon, Kodak Filmless Camera, Intecom PBX, and Light Signatures Document Processor. What issues did each face?

Figure C Four Product Introdctions on Newness Map

Newness to Firm			
HI		Intercom: PBX Systems	Light Signatures: Document Processor
	Honda: Accord Station Wagon	Kodak: Filmless Camera	
LO			
	LO		HI

Newness to Market

The Accord Station Wagon's position is "firm moderate/market low." The executive vice president of Honda's U.S. sales and marketing division explained Honda's choice of a station wagon as opposed to a minivan as "simply a cost efficient way to add a new model. It's an easy way for us to get a vehicle with a certain amount of sales potential, without getting into an area where we have no experience." (Stertz [1990]) Whereas the station wagon was simply a reengineering of the sedan, a minivan would have stretched Honda's capability—in terms of producing the vehicle and entering into intense competition in a segment with well-established competitors. The station wagon was a conservative move presenting little question about the Honda's ability to manufacture effectively. The major issues were: the demand for the station wagon segment overall, (registrations had fallen from over 800,000 in 1986 to 450,000 in 1989); to a lesser degree, the extent to which the Accord wagon would take away from sales of the Accord sedan; the fit to the Honda image to the station wagon segment; and the appeal of the Honda wagon relative to currently existing wagons.

Kodak Photo CD in the "firm moderate/market moderate" position is a filmless camera system due out in March 1992 (Rigdon [1991]). The "market moderate" position stems from Sony and Canon filmless systems now available which operate somewhat differently from Kodak's system. These products have had limited success. Sony's MAVICA system captures pictures on a floppy disc

which can be instantly shown on a television set but these images are fuzzier than actual film-based photos. Kodak's system will store the photos on a compact disc, shown on either a television or a computer terminal. It is believed the quality of the Kodak system image will be comparable to prints from conventional film systems.

Kodak's situation brings the following to the forefront:

1. What features would be most desired by consumers?

2. Would Kodak's improvement in picture image quality be sufficient to overcome potential consumers' reservations about the available Sony and Canon systems?

3. How should the product be brought to market? i.e., should it be sold through the current camera salesforce or should a new salesforce be set up?

4. How can the cannibalization of its current market-dominating film based system be controlled?

Intecom's voice-and-data PBX is an example of "firm high/market moderate" (see Ghemawat [1991] for details). Intecom was a start-up company which became a successful innovator over industry incumbents AT&T, Rolm and Northern Telecom. The primary product development issues at InteCom were:

1. How likely was it that they would be able to make a commercially viable product?

2. How soon would the incumbents or others match or leapfrog the InteCom technology?

3. How great were switching costs among present users?

An important contrast between Intecom and Kodak is the suppression of cannibalization concerns as one moves from moderate to high on the firm newness dimension. Ghemawat identifies InteCom's freedom from concern about cannibalization as the key driver of the fact that it developed the new technology rather than the industry incumbents.

Finally, Light Signatures Inc.'s Sigma Three Secure Document Processing System (Crane [1988]) is "firm high/market high." This system, designed to reduce stock certificate fraud, operates by passing a light beam through a stock certificate to capture the unique fiber pattern in memory. Issues in product development included:

1. Would the system work?

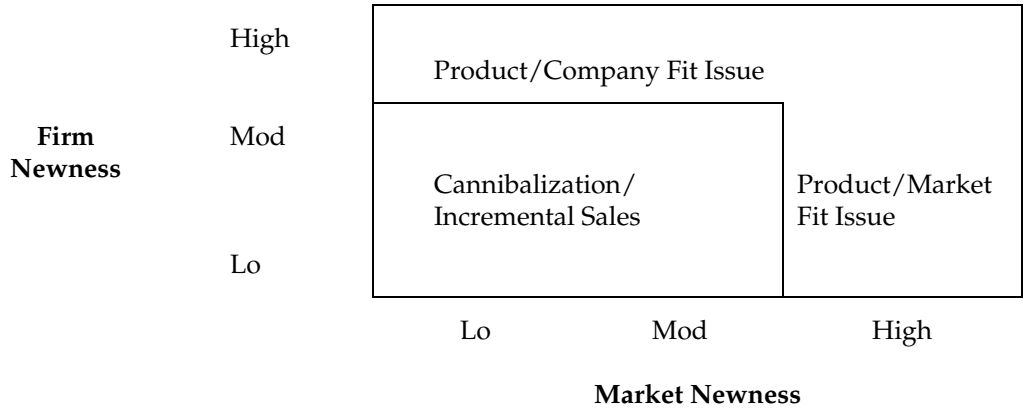
2. Could potential buyers in the securities and banking industry be convinced to trust it?

3. Could industry standards be set up ensuring compatibility of the system with other necessary in-place parts of a network?

To deal with these risks, Light Signatures entered into Beta Tests with Manufacturers Hanover and Morgan Guaranty. The results of these tests led the Securities Transfer Association and Securities Industry Committee for the American Society of Corporate Secretaries to endorse the Light Signature system.

Figure D summarizes the key marketing issues as a function of position on the newness map. In each case, the firm must assess consumer likely response to a new offering but the associated key issues differ. Products in the southeast portion of the map raise cannibalization concerns as the low level of market newness limits the potential for expanding the market and low firm newness means competition between the entry and the firm's own existing products.

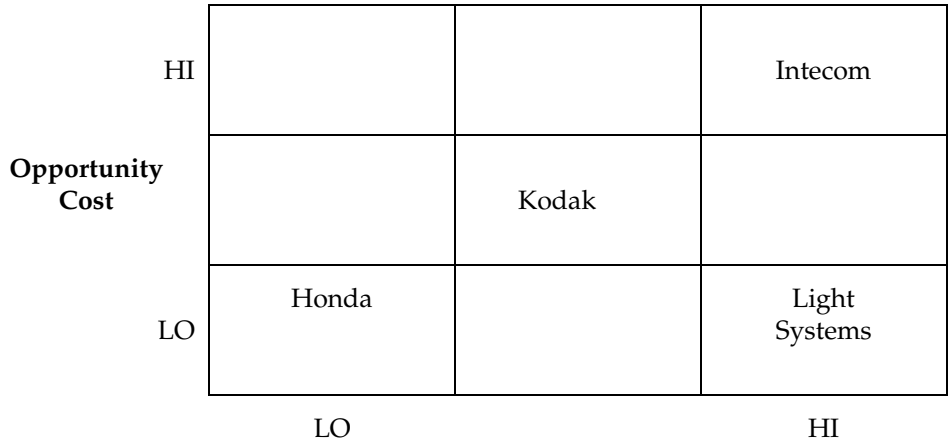
Figure D Position on Newness Map and Resulting Paramount Marketing Issues



There are two ways to reduce cannibalization concerns. First, move to the right in **Figure D**, retaining low to moderate firm newness but moving to new market segments. New segments ensure sales would be incremental; but, the cost is an issue of product/market fit. The second alternative is moving directly up in **Figure C**, to high firm newness. The cost here is the question of product/company fit, i.e., how well the firm can deal with development and new manufacturing and marketing requirements. Since the newness to the market is at most moderate, there are established competitors and this potential barrier must be overcome.

After consideration of the position on the newness map indicates key area of concern, added insight comes from considering the opportunity cost/development risk position. While these two maps are obviously related, there is not a one-to-one correspondence between them. **Figure E** shows the four firms on the risk map.

Figure E Firm Positions on Risk Map



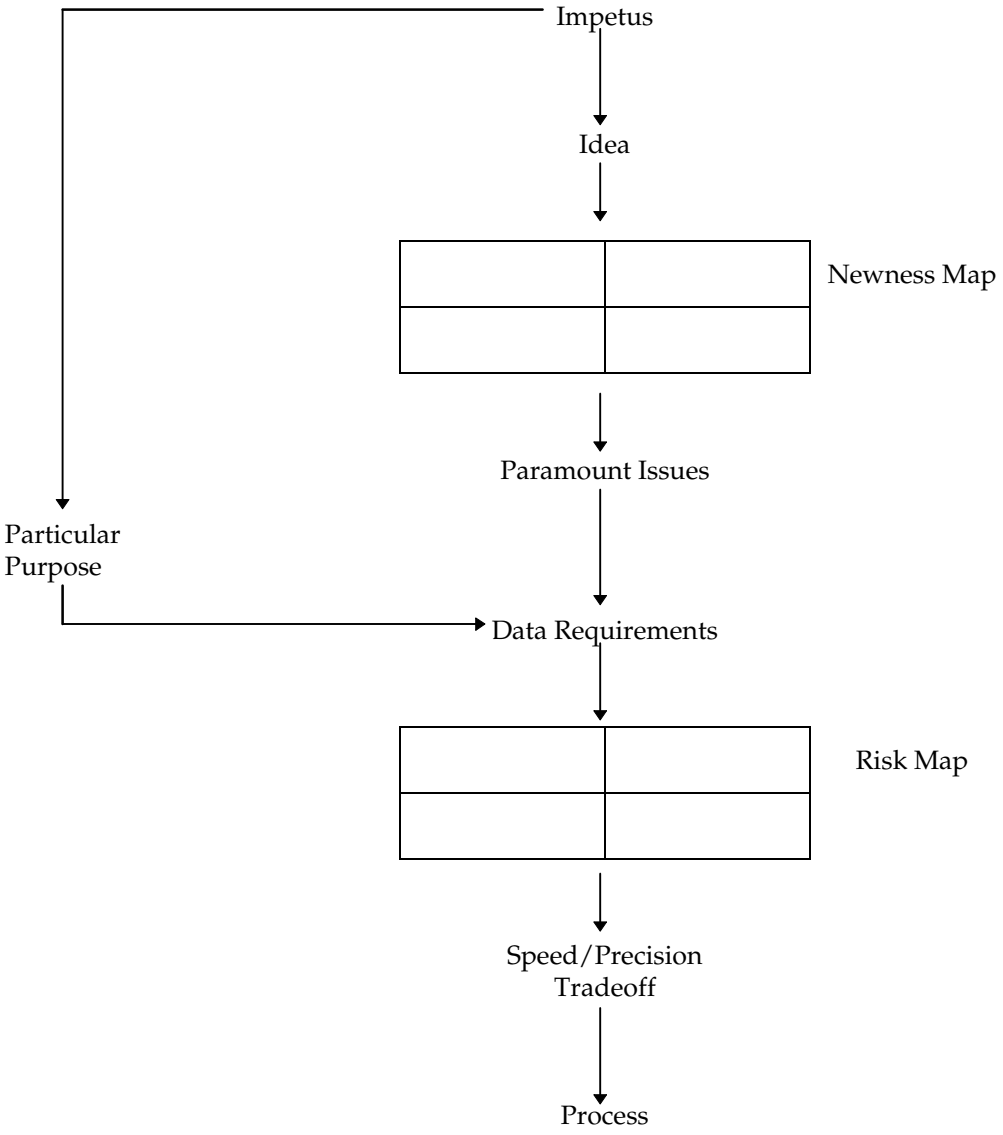
Honda, facing low risk on both dimensions, can proceed with much more latitude than the other firms. Intecom and Light System both face high developmental risk, suggesting a need to "get it

right." However, due to the lack of competitors with the same technological aims, Light System has low opportunity cost, permitting lengthy market testing through beta sites. If Intecom utilized a similar market research program, it would probably be beaten to market by a competitor. Kodak represents a lower degree of developmental risk but intermediate position on opportunity cost. This suggests a process to get to market by maintaining flexibility via development of a modular system.

Summary

Figure F presents an overall schematic of how context impacts the proper new product development process. The impetus for a new product program generates a particular purpose for the introduction. This establishes certain evaluation criteria. The position of the idea on the newness map surfaces the key marketing questions and establishes the data requirements. The position on the risk map then helps determine the optimal trade-off of speed vs. accuracy in the research process.

Figure F Context to Process Model



The classic symptoms of poor performance by marketing in the new product development task are:

1. Market research data arriving too late to have an impact on the decision.

2. Market research data not being informative on the key decision issues facing management due to lack of understanding the strategic role of the new product.

3. Market research data documenting the obvious.

4. Market research being designed to confirm an already held view rather than to present possibly disconfirming data.

Understanding of the context and custom tailoring research process to it is key to revitalizing market research and increasing marketing's contribution to the integrated development process.

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Concept Testing

1. Concept Testing: Definition and Purpose

Managers often screen new product ideas first with respect to internal considerations, e.g., can we efficiently manufacture the product, does it fit our existing channels of distribution, does it fit with the general corporate image, etc. If the internal checks are met, attention turns to assessing the market viability of the *idea* prior to incurring the development expense of actually fabricating a product. Research on the concept may begin with qualitative research procedures such as a focus group in which consumers react to the idea in a moderated, but free-form discussion. A *quantitative* research phase follows measuring consumers' reaction to a proposed product on multiple dimensions, e.g., likelihood of purchase, perceived importance of product, and perceived quality of product. This phase produces both a sales volume forecast and diagnostic information to guide the positioning in the marketplace. We refer to this phase as a concept testing.

Most firms follow a similar procedure for all of their concept tests—utilizing many of the same measurements—in order to build a data base of benchmarks useful in interpreting test results.

2. Executing A Concept Test

In addition to the usual sample selection issue,[1] the major executional considerations in a concept test are the concept communication method and the consumer response measured.

Communication can be in a factual, nonemotional way or in the context of persuasive communications as would surround the product in a typical market situation. Crawford (1987) offers a good illustration of the alternatives. In General Mills' consideration of a new low-calorie peanut butter consumer reaction to which concept would be more useful:

Professor Robert J. Dolan prepared this note as the basis for class discussion.

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1. The issue of sample selection is not discussed here since it is the same as for any market research survey. This issue is covered in most market research texts and in the Note on Survey Research Methods, HBS Case Services No. 582-055.

Concept A: "A low-calorie form of peanut butter that can be used in most diets."

OR

Concept B: "A marvelous new way to chase the blahs from your diet has been discovered by General Mills scientists—a low-calorie version of ever-popular peanut butter. As tasty as ever and produced by a natural process, our new Light Peanut Butter will fit every weight-control diet in use today virtually without restriction."

Concept statement A has the advantage of eliciting evaluation of the concept rather than the concept plus communication strategy. The disadvantage is that the consumer is reacting to something quite unlike that which he/she will "see" in the marketplace. Generally, concept statements such as B (referred to as a "positioning concept" as opposed to the "core idea" concept of A) yield better behavioral predictions from consumers since there is a greater similarity to the actual purchase situation.

The second communication issue is whether to use words only or add illustration, e.g., a rough sketch, photograph, or film. There is no general rule as to which is better. For example, testing alternative new course electives among MBA students is better done with words only; whereas a designer clothing item would be difficult to communicate in words.

Figure A Six Types of Concepts

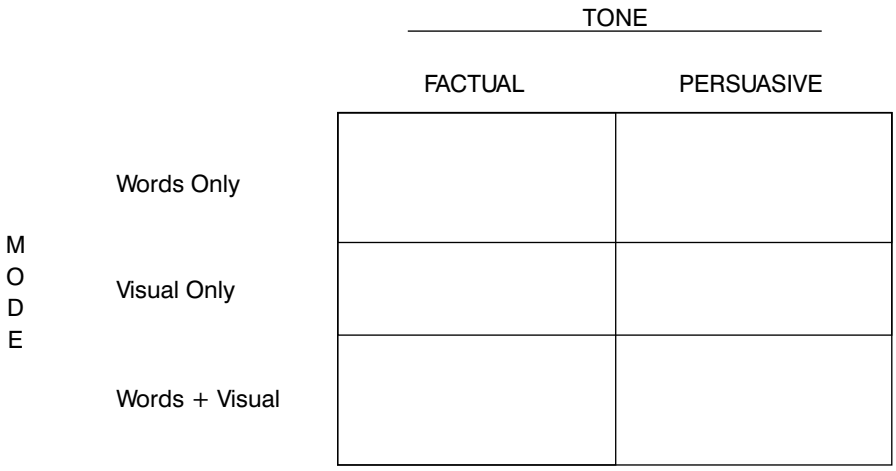


Figure A shows the six possible combinations of concept communication mode and tone. No one cell of **Figure A** inherently dominates the others. However, it is important to recognize the impact of concept type on respondents' reactions—in particular, the purchase intent scores. Generally, a move from factual to persuasive tone increases purchase intent scores. Similarly, words plus visual generally produces scores greater than either alone. Comparing concepts with executions from different cells of **Figure A** is invalid. In "Do Concept Scores Measure The Message or The Method?", Lewis (1984) documents the impact of context in consumer products research, via data

from three situations, two at Pfizer and one at Clairol. Identical concepts were tested first in a words-only form and then in a words-plus visual form. In particular, the visual was a mock-up of the product for consumers to see and hold. **Table A** shows the percentage of respondents who declared "positive interest" in the concept. On average, the addition of the visual drove up the positive interest score by 20 percentage points. **Table A** illustrates the danger of naively comparing concept scores across types. Suppose Pfizer A concept had been tested only in the Words Plus Visual form while Pfizer B had been tested only in the Words Only form. Without recognition of the mode effect, one would say that A "outscored" B by 46% to 35% when, in fact, B dominates A in both modes.

Table A Purchase Interest Percentage for Concepts with Different Executions

	Pfizer A	Pfizer B	Clairol
1. Words only	20%	35%	33%
2. Words plus visual	46	52	50
3. Difference (Row 2 minus Row 1)	26	17	17

The second major execution issue is determining the data to collect. Typically, the data fall into four classes:

1. Intended Purchase Measures
2. Overall Product Diagnostics
3. Special Attribute Diagnostics
4. Respondent Profiling Variables

Data type #1: Purchase Measures Purchase measures cover purchase intention and expected frequency. Purchase intention is included in virtually all concept tests. The form is typically: "Based on this product description, how likely would you be to buy this product if it were available at a store in your area?"; check one:

- Definitely would buy
- Probably would buy
- Might or might not buy
- Probably would not buy
- Definitely would not buy

While this five-point scale is most common, six-, seven-, and eleven-point scales are also regularly used.

For nondurable goods, the frequency of purchase is also key. Purchase intent is a good indicator of trial, but forecasting volume requires knowing whether the product is part of someone's everyday consumption habit or a special occasion item. The expected purchase incidence question adds this dimension. Again, there is a variety of ways to specify this question but generally it takes a form such as: "Which statement best describes how often you think you would buy this product if it were available to you?"

- Once a week or more often
- Once every two or three weeks
- Once a month
- Once every two to three months
- Once every four to six months
- Once or twice a year
- Less often
- Never

In cases where the product may come in different sizes or is such that multiple units might be purchased at one time, these issues are also addressed.

In summary, given:

Sales volume per household in time period = % households in market who try

- expected # purchases in the period for triers
- expected # units per purchase

the purchase measures from a concept test typically are designed to measure the three variables on the right-hand side.

Data type #2: Overall Product Diagnostics Managers want to obtain data to understand why the purchase measures turn out the way they do. Concept diagnostics are of two types: (i) a set devoted to the overall idea and (ii) a set on specific attributes. With respect to overall product judgments, there is a standard battery of questions addressing the concept's:

1. uniqueness or differentiation from other products
2. believability
3. importance in solving a consumer's problem
4. inherent interest
5. value for the money

Uniqueness and believability are the two most widely used diagnostic measures. Since it is possible that a high uniqueness, high believability concept could still generate low purchase interest, firms usually assess how salient the product is to solving a consumer's problem and its overall interest. For example, while a respondent may rate a television permitting the viewing of two channels at once as both unique and believable, purchase interest may be low because the respondent does not view the current constraint of one channel at a time as a problem.

Finally, if the concept statement includes the price at which the product will be offered, a measure is usually taken on the relative size of the benefits (which all the above has been related to) versus the cost. This is usually done in a "value-for-the-money" question measured on a five-point scale.

Data type #3: Specific Attribute Diagnostics When a concept has a number of attributes or benefits offered, it is useful to probe which attributes/benefits contribute to the purchase intention.

In some cases, this probing is achieved through the use of open-ended questions such as "you said that you [state respondent's answer to purchase intention question]. What is it specifically about the product which makes you feel this way?"

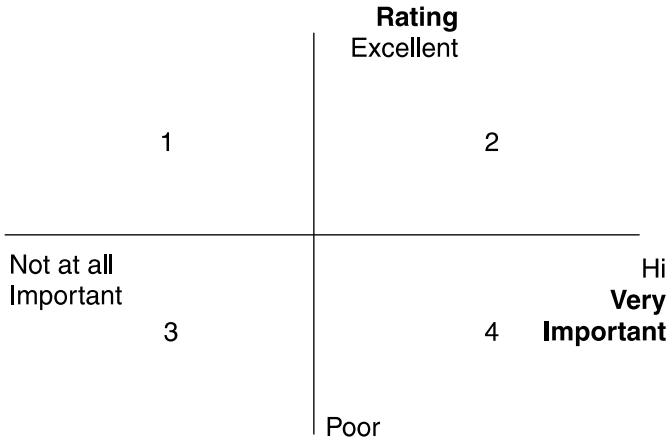
Second, it is often useful to collect data on perceptions of specific attributes and their importance to the consumer. For example, a new food item might be rated on the perception and important scales as follows:

	Perception				
	Excellent				Poor
Ease of preparation	☐	☐	☐	☐	☐
For serving guests	☐	☐	☐	☐	☐
Calorie level	☐	☐	☐	☐	☐

	Attribute Importance				
	Very Important				Not At All Important
Ease of preparation	☐	☐	☐	☐	☐
For serving guests	☐	☐	☐	☐	☐
Calorie level	☐	☐	☐	☐	☐

Schwartz (1989) suggests using these data in "quadrant analysis" which shows each attribute as falling in one of the quadrants as shown in **Figure B**.

Figure B Quadrant Analysis



Quadrants 1 and 3 contain attributes which the consumer does not care about. In one sense, they are "no problem" areas but if many of the attribute scores are in Quadrant 1, it suggests the concept is good on the wrong things. Quadrant 2 is the set of key communication attributes—both important and the product does well on them. Quadrant 4 is the problem quadrant where one should focus product improvement efforts as they are salient to the consumer and the concept currently is viewed poorly on them.

Data type #4: Respondent Profiling Variables The final set of variables useful in analyzing concepts is the type of consumers who respond in different ways. The most obvious of these is demographics which help in targeting efforts but other more innovative data collection can be useful as well, e.g., data on:

- current purchase behavior
- perception of the category
- barriers to changing brands
- influence in actual purchase decision

For example, it might be important to understand how satisfied those with high purchase intent scores are with their current brand. High satisfaction with the current brand makes a switch to a new brand less likely.

3. Interpreting The Purchase Intent Data

Of all the data, the PI score is at the heart of a concept test. How best does one interpret these data? Suppose the concept test on low-calorie peanut butter yields PI data:

Definitely will buy	15%
Probably will buy	45
Might/might not buy	20
Probably not buy	10
Definitely not buy	9

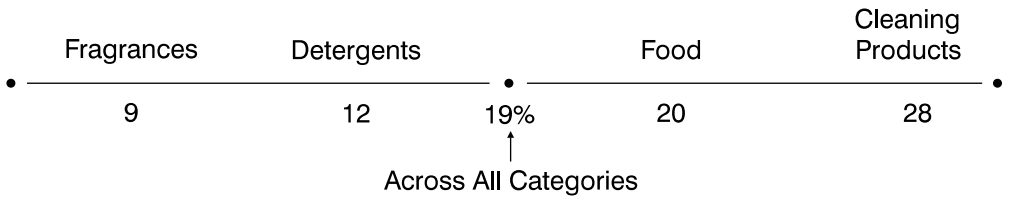
Is this a good or bad set of scores? If the product was introduced, what sales volume would you expect? These are two important, logical questions which cannot be answered just by looking at the five numbers.

General rules of thumb on "good" PI scores exist. For example, Taylor, Houlahan, and Gabriel (1975) claim that based on their experience with over 100 brands in many product categories ". . .a concept statement should receive 80% to 90% favorable answers ["definitely will buy" or "probably will buy"] to encourage subsequent development work." Thus with its 60% favorable answer score, our low-cal peanut butter falls short of this published norm. Schwartz (1987) states the following average scores across all product categories:

Definitely will buy	19%
Probably will buy	64%

for an average 83% favorable rating score—a number not inconsistent with the rule-of-thumb of Taylor, Houlahan, and Gabriel. However, Schwartz also makes the important point that average scores vary appreciably across product categories. For example, he presents data on four category's average "definitely will buy" scores as shown in **Figure C**.

Figure C Average "Definitely Will Buy" Percent—Across all Categories and in Four Specific Categories



Thus, while Taylor et. al's "rule-of-thumb" may be a useful first cut in assessing the "goodness" of the PI scores, it is only that. The variation in scores across categories shows the need to have category specific norms. These can come from three places: (i) published sources (such as Schwartz), (ii) the company's own files, or (iii) the files of the research company hired to do the concept test. Helpful information from published sources is very limited. The second source may suffice for an active company regularly introducing products into the same categories. Generally, however, there is important value in the benchmarks established by research firms with a broad array of clients participating in many product categories. In fact, one of the major concept testing research firms uses its extensive data base built up from its past tests as its primary competitive advantage.

Relationship Between Intent and Actual Purchase

With respect to sales volume estimation, research shows that there is a strong correlation between PI and trial, i.e., concepts with higher PI scores than benchmarks tend to have higher trial rates. For consumer packaged goods, the rule-of-thumb is that the "top-box" (i.e., "definitely intend to buy") is a good indicator of the likely trial rate. Anecdotal evidence for this is in Taylor, Houlahan, and Gabriel (1975). Their test involves a finished product in a finished package rather than a concept statement. But the PI scores were collected in the same way. Consumers in certain neighborhoods of a city were given three samples of a product. Ten days later they were called to obtain purchase intention ratings. At the end of the interview, they were told that the product would be available in a specific store in their neighborhood. The PI scores were:

Definitely would buy	18%
Probably would buy	29
Might/Might not buy	28
Probably would not buy	17
Definitely would not buy	15

Using the "Top-Box" rule, 18% trial would be expected. After six weeks, people were called back and it was found that 19% of those exposed to the product in supermarkets had bought it at least once. Nobody in the "bottom-three" boxes had tried the product. Trial among those in the "Top-2" boxes were 35% of those exposed to the product. The advertising agency, BBDO uses the Top Box score from a standard concept test as an estimate of the trial rate in its New Product Early Warning System forecasting model (Pringle, Wilson, and Brody [1982]) and apparently has had good success with it.

Note that PI is a predictor only of trial and not repeat purchase. Tauber (1981) provides compelling data on this. For six new food products which went to test market or national introduction, he tracked awareness, trial rate and repeat purchase rates by stated purchase intention in a standard concept test. The results were as follows:

Stated Intention	Became Aware of Product	Tried Given Aware	Repeat Given Trial
Definitely buy	71	31	52
Probably	60	16	43
Might/might not	54	17	56
Probably not	52	8	50
Definitely not	38	10	40

The last column shows that while intenders are more likely to become aware and try, purchase intention at the concept stage does not differentiate those who are repeaters. This is because product satisfaction drives repeat and satisfaction is not a factor in a concept test.

The centrality of PI scores in new product development and the lack of apparent grounding for the different rules of thumb have prompted academic investigation of the PI/purchase behavior relationship by Morrison (1979) and Kalwani and Silk (1982). Kalwani and Silk show PI scores do correlate with actual purchase behavior for a broad array of products. However, the relationship between PI scores and purchase behavior does vary by product category. For consumer packaged goods, their data support the current emphasis on the "top-box." On the other hand, for durables, they show that a weighted average of all box scores leads to better estimates of purchase.

4. Summary

Concept testing is a staple of the research process for new products. It is a key tool for setting development priorities, prior to major investments to create the product or service. Key guidelines to the execution and interpretation of concept tests are:

a. select the tone/mode appropriate to the situation

b. interpret PI scores in light of the tone/mode selection and appropriate benchmarks.

c. design the test to afford diagnostic as well as predictive information.

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Techsonic Industries, Inc.: Humminbird—New Products

In July of 1989, the top management of Techsonic Industries, Inc. of Eufaula, Alabama, met to make plans for an important industry trade show coming up in October. Techsonic, a privately held company, was the leading manufacturer of depth sounders, devices that used sonar to help sports fishers measure the depth of the water beneath their boats and locate fish. Techsonic sold its products under its well-known "Humminbird" brand name. The upcoming annual trade show was often used to introduce new products to the market and it was a company tradition to have something at the show each year to excite its customers and the industry.

The company had three new products in various stages of development: a new depth sounder—the "901", a VHF (very high frequency) marine radio, and a navigation device based on newly available satellite technology. Whereas the 901 would be an extension of Techsonic's existing line of depth sounders, the radio and the navigation device would be the start of two new product lines. The company had completed substantial market research on all three of these products and had to decide which ones it would proceed with and the priorities it would attach to each. In addition, Techsonic's Chairman Jim Balkcom and President Tom Dyer wanted to see marketing plans for the new products before the trade show.

Company Background[1]

In 1989, Eufaula, Alabama, was a small southern town with stately old homes, beautiful dogwood trees, and numerous bass boats on trailers headed toward the town's lake. Techsonic Industries, located on the shores of Lake Eufaula, was founded in 1971 by Yank Dean IV, an inventor, Eufaula native, and bass fisher. During the early 1970s, bass anglers began using sonar depth sounders to measure the depth of the lake bottom beneath their boats. The depth sounder would also display the depth of objects such as logs, sea grass, and, anglers hoped, fish. The type of depth sounder most commonly used was called a "flasher" because it indicated the depth of objects with flashing lights on a circular display. Dean's and his fishing friends' dissatisfaction with existing

[1] In addition to field interviews, the first two sections draw on material from Joshua Hyatt, "Ask and You Shall Receive," *Inc.*, September 1989, pp. 90-97

This case was prepared by Eric D. Beinhocker, research associate, under the supervision of Professor Melvyn A.J. Menezes as the basis for class discussion rather than to illustrate either effective or ineffective handling of an administrative situation. Certain data have been disguised.

flashers spurred Dean to develop one that they themselves would like to use. The "Humminbird Super 60" was introduced with a waterproof case, an easy to read display, sturdy components, and a three-day repair guarantee (see **Exhibit 1** for product photos). Although incremental, these improvements struck a chord with anglers, and the Super 60 became a legendary product in the bass fishing community.

Though pleased with the Super 60's success, the company's very profitable $2 million a year in revenues, and the regional customer base, Dean knew that the company had greater potential. In 1976, he recruited Jim Balkcom, an Atlanta banker, West Point graduate, and Harvard Business School MBA, to join Techsonic as a vice president. Although Balkcom was an Atlanta native and a non-fisher, Dean convinced him of the opportunity to build a business in Eufaula. Eleven months after Balkcom joined, Dean died of a heart attack while jogging. In 1977, Balkcom found himself president of a company that needed new products but had just lost its only inventor, engineer, and source of market knowledge.

Despite these difficulties, Balkcom had ambitious plans for Techsonic. His long-range vision focused on growth through new products and customer loyalty through outstanding service. He poured money into efforts to enhance the existing product line and enter the market for a different type of depth sounder known as a chart recorder.[2] During the six-year period 1977 to 1982, Techsonic introduced nine new products, all of which turned out to be, as one executive put it, "half-dead dogs." The new flashers did not offer any new features that were truly useful, and the chart recorders were too expensive, complicated, and unreliable for Humminbird's customer base.

Fortunately for Techsonic, the Super 60's reputation for quality and the company's high standards of service kept customers loyal. When Yank Dean was alive, customer service often consisted of his crawling under customers' boats on a Saturday morning to get their Super 60s working. Techsonic developed a reputation for standing behind its products. After Dean's death Balkcom worked to develop an organization and culture that could build on that image in the market as the company grew.

In 1978, while Techsonic was still struggling to develop new products, Balkcom hired his West Point classmate, Tom Dyer, to head sales and marketing. Over the next several years, Balkcom and Dyer greatly expanded distribution from local sporting goods and fishing shops to mass market retailers such as Wal-Mart and K mart, catalogers such as Bass Pro, and marine and sporting goods stores nationwide. Although revenues increased to $19.6 million in the fiscal year ended June 30, 1983, the Super 60 still accounted for 97% of the company's sales (a summary of Techsonic's financial history from 1985 appears in **Exhibit 2**).

New Product Development

In early 1984, Techsonic's management took a step that was unprecedented in their $55-million-a-year industry. They began a deliberate effort to research their customer base—both existing and potential. Although concerned about spending $20,000 for "a folder with some stuff in it," they commissioned a market research firm (MRF) to perform market research using focus groups[3] and telephone interviews. MRF ran focus groups in nine cities across the country and oversaw 2,500 phone interviews. They found that Techsonic's customers wanted a product that was easier to read in sunlight and that had a graphic representation like that of a chart recorder, but was as reliable and

[2] Instead of flashing lights on a depth scale, chart recorders trace an image showing the location of fish with a pen on paper moving between two rollers.

[3] In a focus group, an interviewer spends time with a group of customers to guage reactions to new product or advertising concepts.

inexpensive as a flasher. Techsonic's management was surprised to learn that most of their customers really did not know how to use their flashers and wanted a simpler product. They had always assumed that their customers liked lots of buttons and features.

Techsonic's management soon realized that the solution to these customer needs lay in a new technology, liquid crystal displays (LCDs). LCDs, which in 1983 were found mostly in digital watch and calculator displays, would allow a graphic representation of the bottom, fish, and other objects. But, unlike a chart recorder, there would be no moving parts to break down or paper that could get wet. The unit could be waterproof, sturdy, and, with its large display, easy to read in sunlight. In addition, the product could be easy to use with an "automatic mode," allowing anglers simply to turn the unit on and use it, but still have the option of changing settings if they wanted to.

By the fall of 1984, Techsonic began to build prototypes and, consistent with its new philosophy of listening to its customers, returned to focus groups to test reactions to the product. The reactions were positive, though not exactly what management expected. The majority of the participants said they would not remove their old flashers and replace them with this new product. Instead they would mount the two side by side on their boats.

In June 1984, a month before the new product's introduction, the company began to build interest and demand in the distribution channel through heavy advertising in the top fishing magazines. Rather than positioning the product as competing with flashers, the advertising copy, with the slogan "Bridging the Gap—between flashers and charts," was based on data from the focus groups. Each point that had emerged as important in the focus groups—for example, ability to view in sunlight—was addressed in the ads. Techsonic introduced the product in July 1984 as the "Humminbird LCR" (liquid crystal recorder) (photo in **Exhibit 1**) at the American Fishing and Tackle Manufacturers Association trade show, with the largest booth it had ever had.

By the end of fiscal year 1985, eleven months after the introduction, the company had sold 238,000 LCR units. The most Super 60s it had ever sold in a year was 163,780. Revenues increased more than two and a half times, to $52.7 million, with the Super 60 accounting for only 25% of unit sales. Management was surprised to learn that almost half of the LCR's sales were to first-time buyers. The LCR product had not only increased Humminbird's market share, but had also brought new buyers into the market, increasing the total market size.

The LCR's success helped make listening to the customer the foundation of the company's culture. Balkcom and a group of employees developed a "corporate values" card for every employee to carry which featured the company motto, "The Quality of any Product or Service is what the Customer says it is." "The Customer" was placed at the top of the organizational chart in Techsonic's lobby, and management began to believe that its lack of fishing experience was actually an advantage in an industry in which most executives were avid anglers. As Al Nunley, vice president of marketing, described it, "We don't have any preconceived ideas, and our emotions about our own likes and dislikes in fishing don't get in the way. Others in this industry think they know what the customer wants. We're about the only ones who actually ask and listen."

According to Dyer, "Now we had a secret weapon. We were stupid enough to think that if it worked for us once, it could work for us again." In the spring of 1985, MRF returned to focus groups to start the product development cycle again, this time using warranty cards from LCR purchasers to select the groups. With these groups, a single theme repeatedly appeared. Claiming that it was too difficult to distinguish fish from rocks and other objects, participants suggested displaying the "fish in red." The LCD supplier developed a new black and red LCD, and Techsonic quickly built a series of prototypes.

Focus groups were held for the new products, trying different symbols and mixes of red and black to depict different sizes of fish and varying bottom hardness. Their message was "Keep it simple. Show fish in red and the bottom in black."

Techsonic introduced its new "4-ID" product in July 1986 with the slogan, "If it's red, it's fish. It's that simple." Data from focus groups and telephone interviews showed a very positive response to the new product. However, the company could not believe that it would repeat the LCR's success. For one, at $350 the new 4-ID was significantly more expensive than the LCR, which in 1986 sold for $200. Techsonic shipped 163,000 4-ID units from January to June. By December end it had shipped 230,000 4-ID units, with total company sales growing to $95 million. Once again, the company had both increased its market share and brought new buyers into the market by introducing an easier-to-use, more functional product.

As new Humminbird products expanded the market, competitors began to enter, mimicking Humminbird features. Prices began to erode and product life cycles shortened.

During 1987, the product development cycle at Techsonic was repeated. But this time the focus groups and interviews with Humminbird users revealed fewer and less substantial problems to be solved. Customers were pretty satisfied with their LCRs, 4-IDs or their imitators.

Thus, the next product in the Humminbird line, the TCR, was much the same as the 4-ID, but with some incremental improvements to the resolution of the sonar, the mounting system, and the products' ease of use. Although the improvements were useful, none had the impact of the first LCR or "fish in red." The positioning statement for the TCR was "The Next Generation," and the product line was introduced in August 1988.

In addition to its middle- and low-end TCR products, Techsonic introduced a high-end product, the TCR Color-1, which used a new eight-color LCD technology. However, anglers were not sufficiently interested in color to justify the product's higher price and it failed to become a mainstream hit.

The TCR line sold at a rate just under its target until April of 1989, when the entire marine market went into a nosedive. As Balkcom described it, "everything stopped." A large portion of Techsonic's sales were to new-boat buyers, so that when new-boat sales diminished, its sales were strongly affected, causing a build-up of inventory in the company's sales channels. Because most of Techsonic's competitors were similarly affected, significant price reductions occurred as manufacturers and dealers attempted to clear the excess inventory from the channel.

Depth Sounder Market

The total depth sounder market in 1989 was approximately $286 million, up from $20 million in 1976 and $55 million in 1983. The productwise breakup was: LCDs-$264 million, 1,050,000 units; flashers-$17 million, 110,000 units; chart recorders-$5 million, 10,000 units. In 1989, the depth sounder market and the entire U.S. fishing electronics industry experienced a sharp downturn, with sales and profits dropping an average of 15%. A slowdown in the new-boat market and increased competition led to a significant erosion in depth sounder prices.

Competition

Competition in the depth sounder market increased from a handful of companies to more than 30 in 1989, with Humminbird and MorPal the dominant ones. There were seven others that competed directly with Humminbird (see **Exhibit 3**).

In the low-end of the market (below $135 retail price), a number of smaller companies had come out with products copying Humminbird features. As Balkcom described it, depth sounders in the low-end were about as differentiated as "jellybeans." Meanwhile, the high-end of the market was

involved in a "feature war," with new technologies and features being added to products at a rapid pace and vendors unable to increase their prices to reflect the additional functionality. Some of the features Techsonic's competitors were adding in 1989 included split screens that showed both an LCR-like graph and a flasher-like display, touch screens replacing buttons for function selection, and digital water temperature, speed, and depth indicators.

End-Users

In early 1987, Techsonic commissioned a market research firm (MRF) to gather information on the end-users of depth sounders. It conducted telephone interviews of 605 noncommercial power boat owners. A summary of that survey's findings is presented in **Exhibit 4**.

Marketing

Distribution

Techsonic sold its products through multiple sales channels. To reach these channels, it used a sales force of 29 people in the United States, including three regional managers. Most of Techsonic sales were through mass merchants and catalogers. Other channels used by Techsonic included marine distributors, marine dealers, sporting goods distributors and dealers and OEM.

Mass merchants and catalogers operated with lower gross margins (1%-15%) than did the other channels (20%-40%). Consequently, the volume of Humminbird product sold through mass merchants and catalogers resulted in heavy discounting of the products in the marketplace. As a result, many marine dealers and distributors were unable to make an adequate return on Humminbird. Although a few marine dealers made 20% margins on Humminbird, most of them broke even or lost money. They wanted to make 30%-40% margin on the products they stocked, but believed that a margin of at least 20% was necessary for survival. In 1989, many marine dealers were dropping the Humminbird line and stocking competing brands that were not sold by mass merchants, even though they often had to put in greater efforts to sell them.

Most distribution channel members viewed Humminbird as a mid-level product, both in technology and price. Although Techsonic had pioneered many of the innovations in the industry, many of its dealers perceived MorPal as the technological leader, and some considered Humminbird's "fish in red" a sales gimmick that seemed to work well with customers. They considered the Humminbird brand to be a good value with high customer acceptance, believing it most appropriate for first-time buyers and weekend fishers.

Communications

Techsonic spent approximately $1.7 million on print advertising in 1989, the highest in the industry. Humminbird products were advertised regularly in fishing and outdoor magazines such as *Bass Masters, Field & Stream, Fins and Feathers,* and *Bassin'* and occasionally in publications such as *USA Today* and *Sports Illustrated.* Favorable product reviews in trade magazines were important, and Techsonic had a public relations firm assist it in communicating with the press.

Boat shows and industry trade shows also played an important role in promoting Humminbird products. Techsonic used them to demonstrate its products to dealers and customers, as well as to introduce new products, assess the competition, and get feedback from the market.

Techsonic also sponsored the "Humminbird Sports Team," a group of well-known professional bass fishers and other athletes. In addition, it sponsored a number of sporting events carried on cable television, including: "Humminbird Bass & Golf" (fishing and golf competition), "Humminbird Bass & Race" (fishing and car racing), and an annual celebrity bass-fishing tournament.

New Product Options
Project 901

In 1989, to reassert its position as the market and technological leader, Techsonic's R&D team developed a revolutionary new fish-finding system. The product, referred to internally as Project 901, had taken years to develop and was aimed at satisfying two important benefits that Techsonic believed anglers sought in a depth sounder: to find fish faster and to see fish better. The product provided the first truly three-dimensional view of the water ever available in a depth sounder, allowing anglers to distinguish more easily between fish and other objects, as well as to more precisely locate the fish.

Market Study

Techsonic commissioned a market research firm at a cost of $50,000 to conduct a market study on the 901. The objectives were to determine the customer's intention to buy and the perceived uniqueness of the product, the market and sales potential for the first three years, and a profile of the potential customer, and to provide guidelines for product positioning, features to be included in the standard and deluxe models, and the best price for each model.

Methodology

MRF conducted 375 interviews in three key markets: freshwater, saltwater, and Great Lakes. The respondents were boat owners who planned to buy a depth sounder during the next three years. The interviews, lasting 15 minutes, were conducted at the boat owners' homes by experienced interviewers. Respondents were paid $15 for their participation and were not informed that the research was being conducted for Humminbird.

After a few questions obtaining demographic information and the brand of depth sounder they would consider buying, participants were shown a short video of the 901. They were then asked about (a) their likelihood of buying the 901 if it were available at a reasonable price (no price was stated); (b) the perceived uniqueness of the 901; (c) pricing; and (d) their likelihood of buying the 901 within the next year if it were available at $449.

Next, participants were shown another short video explaining some additional or optional features of the 901. For each feature, participants were asked whether they believed that (a) it was essential to the product and had to be included for them to purchase the product; (b) it increased the value of the product, for which they would pay more if it were included; or (c) it had no effect on whether or not they would buy the product. They were then asked questions about pricing the deluxe model (which had all the features they wanted), and how likely they were to buy it within the next year if it were available at $629.

Analysis and Recommendations

Customer Interest: The market research firm concluded that the 901 was a clear winner because it scored high on the dimensions of uniqueness and purchase likelihood (see **Exhibit 5**). In addition, the 901 results compared very favorably with those of past new products from Techsonic. It earned the highest uniqueness score of any Techsonic product and the highest intention-to-buy score since the original LCR in 1984.

Freshwater fishers and mid-sized boat owners were the most likely to buy the product. Those who did not own a depth sounder and those who currently owned an LCD or chart recorder indicated they were most likely to buy the 901.

Market and Sales Potential: MRF estimated the total market potential for the first three years to be 320,000 units and Humminbird's sales potential at 139,871 units (including 93,030 standard units and 46,841 deluxe units) during that period (see **Exhibit 6**). Based on Techsonic's retail pricing plans of $449 for the standard unit and $629 for the deluxe unit, the 901 would represent retail sales of $71.2 million over three years.

Important assumptions in the calculation of the market and sales potential given in **Exhibit 6** were:

1. All respondents who said that they were "very likely to buy" the 901 at a reasonable price were considered potential customers for year one. Respondents who indicated they were "somewhat likely" to buy the 901 at a reasonable price were considered potential customers for years two to three.

2. For participants for whom Humminbird was not the first-choice vendor for the next depth sounder purchased, for each manufacturer the proportion of respondents who said they would consider Humminbird was applied to that manufacturer's potential market share to estimate Humminbird's potential sales.

Product Positioning: Based on the resposes to the product description, MRF concluded that despite the 901's technological wizardry, its most important perceived benefit was that it helped customers find fish faster and see them better. Respondents' comments indicated that although technology played an important role in the 901's perceived uniqueness, they had come to expect technology and were no longer amazed by it. MRF felt that although people responded to the 901's novelty and many considered it their next great toy, these considerations were secondary to the ease factor (see **Exhibit 7**). They recommended emphasizing that the 901 made fishing easier, and thus more fun.

Product Features: Customer evaluations of the various 901 features are shown in **Exhibit 8**. Based on these responses, MRF recommended that the standard 901 model should include: 3-D view to 240 feet, a video operator's manual, a temperature gauge, and ability to match display speed and boat speed. They recommended that the following additional features be included in the deluxe model: bottom hardness indicator, ability to program the display to show different fish sizes, three simultaneous views of the bottom from different angles, marine plotter connection, and a speedometer.

Pricing: Before seeing or hearing about the 901, the amount of money people said they planned to spend on their next depth sounder ranged from $219 to $560. The suggested "best prices" for the 901 indicated that Techsonic was on target with the $629 price for the deluxe model, but that they could charge substantially more than the previously considered $449 for the standard model. Considering all this, MRF suggested retail prices of $529 and $629 for the standard and deluxe models, respectively.

Margins: Techsonic management expected dealer margins to be anywhere from 15% to 40%, depending on the channel. In planning for the product, they decided to use a net price to dealers of $390 for the standard model and $440 for the deluxe model, and unit sales levels of 120,000 and 36,000, respectively over the next three years (see **Exhibit 9**).

At a similar stage, the company's last two products to be introduced, the TCR ID-1 and TCR ID-10, had been projected to sell approximately 21,600 units each over three years. The average price over the same period for both products was forecast at about $260, with gross margins of 42% and 46%, respectively. The total capital expenditures for both products was $151,643, and the total projected earnings before interest and taxes was $2.08 million.

The VHF Marine Radio

In 1988, Techsonic's board of directors decided that it would be in the company's interest to move beyond its dependence on depth sounders and to make additional use of its powerful brand name and distribution network. The board believed that marine communications, in particular VHF radios, presented an opportunity because of the relatively small degree of penetration in Humminbird's customer base. The VHF radio market was fragmented, with no dominant competitor, and weakly represented in Humminbird's distribution channels. Finally, Techsonic felt it could build a differentiated product using its brand name and reputation for waterproofing, durability, and service.

Market Study and Methodology

Techsonic commissioned MRF at a cost of $26,000 to do a market study to determine the market potential for a Humminbird radio and to define an appropriate product. MRF interviewed three groups of potential buyers: recreational boaters, sports fishers, and Humminbird customers.

VHF Market

VHF radios were used primarily for safety: to communicate for help in an emergency and to find out the weather. However, in addition to providing a "lifeline for survival," VHFs provided a "social pipeline." A popular method of communication among boaters, they were used to talk to friends on the shore, to contact other boaters, and to find out where fish were, what bait was working, and who was catching what. Although fishing was often characterized as a solitary sport, most fishers appreciated the opportunity to interact with others (see **Exhibit 10**).

The study confirmed the fragmented nature of the market. FindFish Electronics was owned by 17% of the respondents, STEBOB Radio by 7%, IGM Communications by 5%, and various other brands (none of which had more than 3% market share) by 45%. The remaining 26% did not know the brand of their VHF radio.

End-Users

More than two-thirds of the respondents had a VHF and about one third had a CB (Citizens Band) radio. MRF concluded that most boaters would therefore be purchasing a VHF radio as a replacement for an older unit. Although the demographic profile of VHF owners was very similar to that of depth sounders, only 7% of Humminbird's customers owned a VHF, and 42% owned a CB radio.

A majority (56%) of the respondents purchased their VHF radios from marine dealers. The other major channels of distribution included mail order catalogs (14%), department stores (6%), sporting goods stores (6%), and catalog showrooms (5%). About two-thirds of the respondents installed the radios themselves.

Nearly two-thirds of the respondents attended a boat show within the previous year. About 25% participated or watched fishing tournaments, and about as many belonged to a fishing or boating club that held regular meetings.

Product Features

A vast majority (88%) of the respondents purchased fixed-mount radios, as opposed to hand-held radios, and bought an antenna at the same time (90%), though in most cases (57%) not as a package.

The major problems VHF owners faced concerned the radio's durability, the battery's dying, and the absence of waterproofing. However, it was not clear exactly what impact solving these problems would have on brand choice.

Concerns

Techsonic management was concerned about a few problems regarding the distribution channels. First, radios were typically purchased through marine dealers, a channel in which Techsonic was quite weak, accounting for only 11% of Humminbird depth sounder sales. The trend for depth sounders was moving away from marine dealers as price competition from the mass merchants and catalogers was driving dealers away from the Humminbird line. Techsonic's management had in the past encouraged this trend because research had indicated that product availability was a major sales bottleneck, a problem that the mass merchants could solve.

Techsonic management believed that there was an opportunity to increase the number of radios sold in the mass merchant channels and that it had the right product to do so. At the same time, the MRF research indicated that a strong presence in marine dealers would be critical for success. However, there was some expectation that marine dealers would be quite wary about being "burned" by Humminbird again, especially if they saw Techsonic pushing the radios through the mass merchants.

The second problem centered around the mass merchants. A small number of mass merchants that moved significant amounts of Humminbird product traditionally allocated three SKUs (stock keeping units) to Humminbird. They had communicated strong resistance to increasing this number of SKUs, leading MRF to believe that a Humminbird radio would potentially force the removal of another Humminbird product from these retailers' shelves.

The third problem centered around pricing through the mass merchant channel. Pricing was not addressed in the MRF survey, but Techsonic had decided to set $269 as the expected retail price, based on a competitive analysis of similarly featured radios (though some Humminbird features such as waterproofing were unique) and Techsonic's internal profit targets. Management expected dealers to make 15% to 35% on the product and used a net dealer price of $195 in their internal profit forecast (see **Exhibit 11**).

Early discussions with Humminbird dealers revealed a potential problem with these prices. Mass merchants traditionally viewed Humminbird as the mid-point in their lines, and wanted to sell the radio at $199. At $269, a Humminbird radio would be at the high-end of the radios they were selling. Although they felt that the Humminbird VHF was an attractive product with some

differentiating features, they were skeptical as to the value of its brand name at the high-end of the radio market.

Finally, there was some concern among Techsonic managers that the radio would be the first Humminbird product manufactured outside the company. At least initially, the radio's electronics would be manufactured in the Philippines by an experienced, low-cost producer. Final assembly, testing, and packaging would be done in Eufaula.

Navigation Products

In addition to radios, Balkcom and Dyer were considering expanding into marine navigation electronics, in which they believed there was significant opportunity because of a new technology that would be introduced to the market in late 1990.

Navigation Market

In 1989, the most commonly used navigation system for recreational boating and sports fishing was LOCATOR. Boats equipped for LOCATOR had a device that received LOCATOR signals and displayed an estimate of the boat's position. By timing the differences in the reception of signals transmitted from three or more of the LOCATOR network's ground-based stations, the receiving unit on the boat could estimate the boat's position.

The LOCATOR market was small (estimated 1989 sales of 80,000 units) and very fragmented. Only two brands (PAR Digital and Onkar Marine) held more than a 10% market share. LOCATOR products had a retail price beginning at about $300 and required a considerable amount of skill to operate. Most LOCATOR receivers were not user friendly, and owners complained of having to refer to the manual constantly. Some of the problems LOCATOR users faced were performance-related: accuracy tended to degrade in bad weather, signals were subject to interference, it was often unusable because a transmitter was not operating, and the transmitters were concentrated along the coasts, leaving most inland lakes and waterways with poor or no coverage.

GPS (Global Positioning System) was a new satellite-based navigation system sold in the commercial market and priced between $3,000 and $5,000. A GPS receiver in a boat used time differences in its reception of signals from a group of satellites to determine the boat's location. The major advantages of GPS over LOCATOR were that its readings were more accurate, its signals were much less susceptible to interference or weather problems, and it would cover the entire world. Although limited in 1989 to approximately 10 hours per day, GPS was expected to become 24-hour effective by late 1990, with worldwide coverage expected to be completed in late 1991.

Balkcom and Dyer believed that the shift in navigation technology from LOCATOR to GPS presented Techsonic with two opportunities. The first was to enter the navigation market by introducing a product based on GPS technology. Techsonic hoped to introduce GPS to therecreational boating and sports fishing market by developing a user-friendly version priced to consumers at about $1000.

The second opportunity was to attempt to expand the LOCATOR market significantly by introducing a more user-friendly version of LOCATOR and selling it at $50 less than competitively priced products. They believed that the LOCATOR market had been limited by operational complexity and price. They felt they could take advantage of Humminbird's reputation among freshwater fishers and smaller-boat owners, where LOCATOR had a low level of penetration.

Market Study

Balkcom and Dyer commissioned a market research firm (MRF) at a cost of $33,000 to study the market for navigation devices and help identify appropriate market opportunities. Specifically, the study sought (a) to examine whether the LOCATOR and/or GPS markets were worth pursuing, and (b) to determine for the LOCATOR and GPS systems appropriate product positioning, desired features and configurations, comparative ratings and purchase intentions, and price expectations and sensitivities.

Methodology

The study was conducted using 308 mailed questionnnaires to noncommercial powerboat owners, of whom 205 owned LOCATORs and 103 owned no navigation system. Both groups contained saltwater and freshwater boat owners.

Analysis and Recommendations

Navigational Problems: LOCATORs were purchased primarily for navigational purposes, especially for navigating in bad weather, for determining the boat's exact position, and for returning to favorite fishing or diving spots. The problems frequently mentioned by LOCATOR owners were "having to refer to the manual all the time" (62%), "not being able to use the LOCATOR because a transmitter was not operating" (43%), "forgetting which waypoint number identifies a particular position" (39%), "taking a long time to warm up and lock on to a signal" (38%), "not being able to use it because of interference or bad weather" (37%), and "getting incorrect readings" (37%).

The predominant reasons for not purchasing a LOCATOR were price (50%) and the lack of a need (32%). The problems faced by LOCATOR nonowners are summarized in **Exhibit 12**.

Brand Preferences and Product Design: There was considerable lack of involvement with the product category. Half the respondents were unable to give a specific answer when asked which brand of LOCATOR they would purchase. Among LOCATOR owners, PAR Digital (14%) and Onkar Marine (12%) had the highest market shares. Other popular brands were Global Navigation (9%), Navsonic (8%) and Marmen (7%). LOCATOR units were purchased either as stand-alone units (79%), or as combinations: LOCATOR/depth sounder (13%) or LOCATOR/plotter (8%). However, regarding what they would like to buy, respondents' preferences were: stand-alone units (40%), LOCATOR/depth sounder (26%), LOCATOR/marine plotter (23%), and LOCATOR/GPS (8%). Nonowners were significantly more interested in a depth sounder combination, whereas LOCATOR owners significantly preferred a marine plotter combination.

Respondents were asked to evaluate various attribute and benefit statements in terms of both desirability and impact on the selection of a system. MRF then combined impact and desirability ratings to come up with a "Motivating Power" score for each product feature or benefit. Comparing the motivating power score with desirability (see **Exhibit 13**), MRF concluded that although performance characteristics emerged as the most critical, respondents sometimes tended to understate the importance of not being affected by interference, being able to lock on to weak signals, and being the most technologically advanced system. They also concluded that respondents overestimated the importance of price dimensions such as best value and being priced appropriately for navigation needs.

LOCATOR vs. GPS: The awareness of LOCATOR (90% unaided, 98% aided) was substantially higher than that of other navigation systems: SATNAV (27% and 65%), Compass (20% and 88%), and GPS (12% and 76%). Nearly half the respondents who were aware of GPS did not know how it worked. Respondents rated LOCATOR and GPS systems on various attributes and benefits. The two

systems were then compared along the continuum of motivating power. On many of the most motivating performance characteristics, GPS was judged superior to LOCATOR. LOCATOR had a big advantage over GPS on price, which, according to MRF's analysis, played only a relatively modest role in selecting a navigation system.

The purchase intentions of respondents in terms of the percentage who said that they would definitely or probably purchase during the next three years is given in **Table A**.

Table A Purchase Intention for LOCATOR and GPS

Time Period	LOCATOR Owners	LOCATOR Nonowners	Total
Next Year:			
LOCATOR	11%	34%	19%
GPS	7%	14%	9%
Years 2-3:			
LOCATOR	19%	37%	25%
GPS	24%	30%	26%

Respondents who indicated a greater purchase interest in GPS tended to have higher incomes.

Pricing: To provide guidelines on the optimal price for a LOCATOR or GPS system, respondents were asked a series of questions such as: At what price does a LOCATOR/GPS begin to be expensive? To be cheap? To be so expensive that you would never consider using it? To be so cheap that you would question its quality? Responses to these questions indicated that for LOCATOR owners, the optimal price for a LOCATOR ranged from $780 to $915, and for a GPS system, it ranged from $910 to $1,399. For nonowners the corresponding optimal price ranges were $480 to $580 and $580 to $960.

Recommendations

Based on the results of this study, MRF recommended that Techsonic immediately pursue the development of a GPS system rather than a LOCATOR system. According to them, the GPS system represented the best solution to many of the problems experienced by boat owners regarding navigation and positioning. MRF also noted that both LOCATOR owners and nonowners were concerned with LOCATOR obsolescence.

MRF concluded that they expected interest to build in GPS as it became fully operational and as costs declined. The Humminbird GPS system should be positioned as the most state-of-the-art and user-friendly system available, and, MRF believed, it could be priced at $1,000 or more.

Margins: Management expected dealers to realize margins of anywhere from 15% to 40% on GPS products and estimated its net sales price to dealers at $800 during the first year of sales. The expected retail price for a LOCATOR product was $630 with a net dealer price of $450. An analysis of Techsonic's expected margins on the GPS and LOCATOR products appear in **Exhibit 14**.

Joint Venture: To facilitate entry into the GPS market, Balkcom and Dyer had discussed the possibility of a joint venture with Standard Telecommunications, Inc. (STel) of Palo Alto, California. STel, which had worked on GPS-based navigation systems as a U.S. Department of Defense contractor, was interested in diversifying into civilian applications of GPS and agreed to develop low cost GPS products for Techsonic for a $1,000,000 "development fee." If the joint venture went through, STel would be responsible for the GPS electronics and Techsonic would specify features and

develop the user interfaces, displays, and casings for the products. Techsonic would have exclusive rights to manufacture and market all STel GPS products for the consumer market. Such exclusivity would not extend to commercial or military markets.

Balkcom and Dyer believed that this joint venture would put Techsonic in a unique position for entering the GPS market. None of STel's competitors that were experienced in working with GPS, such as Trimble, Magellan, or Sony, had any presence in the consumer market for marine electronics. Similarly, none of Humminbird's competitors that were considering GPS, such as MorPal, Onkar Marine, ESTAP-Sonic, or PAR Digital, had any expertise with the technology.

The Decision

On July 30, Techsonic's senior management met to decide the fates of the three new products. Al Nunley, vice president of marketing, was scheduled to make a presentation of his recommendations and marketing plans. He had asked his marketing manager, Mike Centers, to assist him in the preparation as well as in the presentation at the meeting.

Centers, a 1989 graduate of Harvard Business School had joined Techsonic in June after spending the previous summer there. Although Centers was a relative newcomer to Techsonic, he had become steeped in its culture of listening to and serving the customer. He was very impressed with how well that strategy had served the company.

Centers thought about how these new products fit into that tradition of listening. He also wondered whether an almost single-minded devotion to listening to the customer could lead to problems, and whether listening to the customer was really the major reason behind Techsonic's success.

As they prepared for the presentation Nunley and Centers wondered which of the products Techsonic ought to introduce and the priorities they ought to recommend.

Exhibit 1 Product Photographs

Super 60 Flasher:
(1989 net dealer price: $159)

LCR:
(two LCR models: $163 and $426)

TCR:
(four TCR models: $214, $349, $369, and $979)

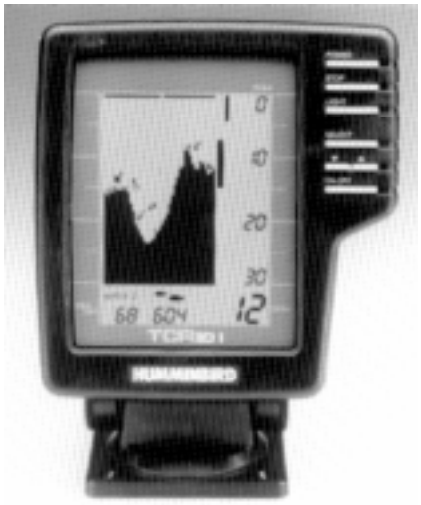


Exhibit 2 Summary Financial Statements

Income (Year Ended June 30) ($000)	1985	1986	1987	1988	1989
Net Sales	52,063	94,792	106,155	122,534	107,089
Gross Profit	23,975	45,546	47,602	46,968	32,001
Sales & Marketing	8,146	12,949	14,125	17,272	19,239
Engineering	1,345	1,949	2,289	3,590	3,851
General & Administration	4,452	5,953	5,678	5,742	5,076
Other Expenses	3,652	6,217	6,742	0	0
Interest Expense	0	0	0	9,591	16,240
Refinance Expense	0	0	0	12,415	0
Pretax Profit	6,380	18,478	18,768	(1,642)	(12,405)
Income Tax	2,210	8,016	8,371	850	(5,253)
ESOP Contribution	340	510	510	0	0
Discontinued Operations	1,387	184	(26)	0	0
Net Income	2,443	9,768	9,913	(2,492)	(7,152)

The company's balance sheet as of June 30, 1990, showed $798,000 in cash, current assets of $33.3 million, current liabilities of $16.8 million, long-term debt of $29.7 million, subordinated debt of $33.1 million, and stockholders' equity of $3.7 million.

Exhibit 3 U.S. Market Share and Industry Advertising Expenditures, 1989

	Total (% $)	LCDs (% Units)		Flashers (% Units)		Chart (% Units)		Advertising Expenditure ($)
Company		F	S	F	S	F	S	
Techsonic Industries	38	31	16	22	12	6	4	$1,700
MorPal	26	12	10	29	18	35	25	674
Hammertech Electronics	9	na	na	na	na	na	na	721
PAR Digital	6	4	5	5	5	—	14	383
Marmen	6	na	na	na	na	na	na	374
Lisotech	4	10	22	1	2	—	—	199
Navsonic	4	na	na	na	na	na	na	753
FindFish Electronics	na	8	1	7	9	—	8	346
Jules Marine Technology	na	1	0	3	0	1	0	1,020
All Others	7	34	46	33	54	58	49	3,256
	100	100	100	100	100	100	100	$9,426

Source: Techsonic Industries, Inc.

F freshwater market S saltwater market

na not available — Company does not manufacture a product in this category.

Exhibit 4 End-User Telephone Survey, 1987: Summary Results

- Noncommercial power boat owners were predominantly male (94%), average age 45, and average annual income $40,000. Their occupations were professional or managerial (50%), blue collar (24%), or retired (18%).

- Noncommercial power boat owners used their boats primarily for sports fishing (89%). They fished primarily in freshwater (95%), and to a much lesser extent in saltwater (14%) or in the Great Lakes (14%). On average, they spent $900 a year on boating and fishing equipment, not including major purchases such as boats and trailers.

- Most of the respondents watched boating- and fishing-related TV programs (72%) and attended boat shows (59%).

- Unaided brand awareness and brand preference for depth sounders were as follows:

	Unaided Awareness	Most Preferred	Also Considered
Humminbird	70%	28%	37%
MorPal	73	40	28
Jules Marine Tech.	32	5	34
PAR Digital	20	2	15
FindFish Electronics	17%	1%	12%

- Seventy-seven percent of the respondents owned depth sounders, and the average number of depth sounders owned was two. Of those who owned a depth sounder, 75% owned a flasher, 28% an LCD, and 26% a chart.

- Among depth sounder owners, Humminbird was owned by 47%, MorPal by 41%, and Jules Marine Tech. by 12%. Humminbird was popular in LCDs (57% share) and flashers (41%), but was weak in charts (15%). On the other hand, MorPal was strong in charts (54%) and flashers (42%), but not so strong in LCDs (25%).

- Respondents purchased their depth sounders from a variety of outlets: marine stores (28%), sporting goods stores (16%), mass merchants (15%), catalogs (15%), OEM as part of the boat (13%), and another fisher (5%).

Source: Company records

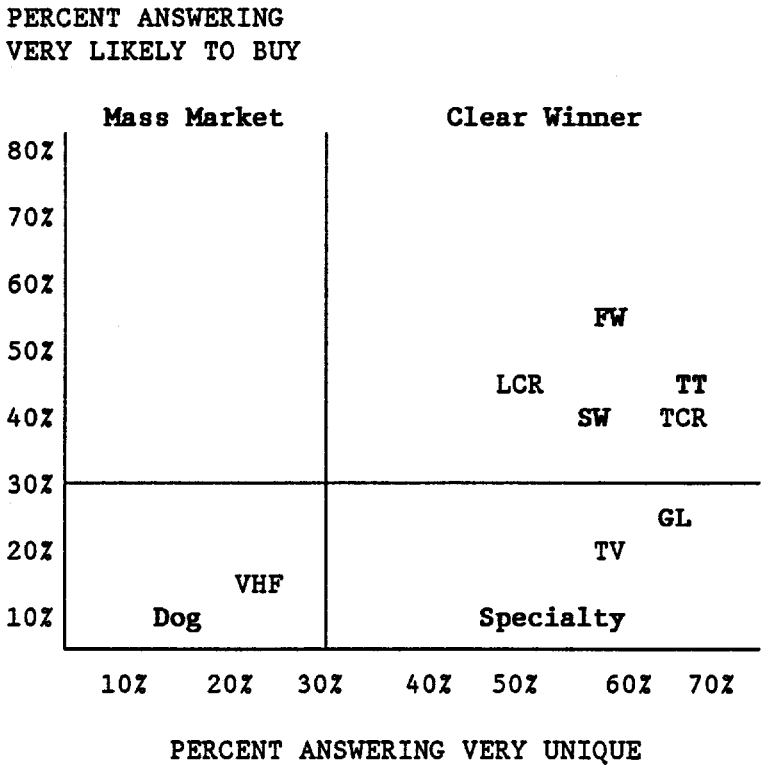
Exhibit 5 Project 901 Product Test: Customer Interest

The average respondent was 45 years old, most likely a professional, executive or manager and had an average annual income of $50,000, a profile which was similar to the general population of boat owners.

Participants were asked the following two questions:

"You said you were considering buying a depth sounder. If this new product were available to you at a reasonable price, how likely would you be to buy it during the next year? Would you be: very likely to buy; somewhat likely to buy; not very likely to buy; or not at all likely to buy it during the next year?"

"How different or unique would you say this product is compared to what is now available to you to buy? Would you say it is: Very unique; somewhat unique; not very unique; or not at all unique or different from what is available now?"



901 Test Results:
TT = Total market
FW = Freshwater
GL = Great Lakes
SW = Saltwater

Past Results:
LCR = Where LCR scored when tested
TCR = Where TCR scored when tested

Test Controls (other products used to guage reaction):
TV = A random LCD television
VHF = A random saltwater VHF marine radio

Source: Company records

Exhibit 6 Project 901 Test: U.S. Market Potential

Total Market Potential for Humminbird 901:

	Number of Boats	%	Basis
A. Boats whose use makes them eligible to own depth sounders	4,000,000		Past experience
B. Boats likely to purchase depth sounders in next 1-3 years	320,000	8% of A	Past experience
Total Market Potential	**320,000 units**		

First-Year Sales Potential for Humminbird 901:

Stated First Choice			"Very Likely" First Year	"Would Buy" Humminbird	Total Units
(31%) Humminbird	=	99,200	X 49%	X 100%	48,608 (Humminbird share)
(20%) MorPal	=	64,000	X 27%	X 38%	6,566 (MorPal, but would buy Humminbird)
(14%) Jules Marine	=	44,800	X 48%	X 71%	15,268 (Jules Marine, but would buy Humminbird)

Humminbird Sales Potential in First Year: 70,442

Based on responses, sales of standard units at $449 each were estimated to be 47,530 units and sales of deluxe units at $629 each were estimated to be 22,912 units.

Second- and Third-Year Sales Potential for Humminbird 901:

			"Somewhat Likely"	"Would Buy" Humminbird	Total Units
(31%) Humminbird	=	99,200	X 45%	X 100%	44,640 (Humminbird share)
(20%) MorPal	=	64,000	X 47%	X 38%	11,430 (MorPal, but would buy Humminbird)
(14%) Jules Marine	=	44,800	X 42%	X 71%	13,359 (Jules Marine, but would buy Humminbird)

Humminbird Sales Potential in Second and Third Years: 69,429

Based on responses, sales of standard units at $449 each were estimated to be 45,500 units and sales of deluxe units at $629 were estimated to be 23,929.

Source: Company records

Exhibit 7 Project 901 Study: Product Positioning

The interviewer read the following: "I now will read you four different ways this new product could be described. Please listen carefully and choose the one description which best matches your perception of this new product." Questions were read in order. Cards with questions written on them were placed on the table for the respondents to study.

Question	Response
a. It's the next hot item for fishermen. Anyone who values having the very latest equipment would just have to have it.	**15%**
b. It's much easier to understand what's on the screen. It looks as though it would be easy to use, and it would make catching fish easier.	**48%**
c. It's fascinating to watch the bottom and fish move across the screen. It would be fun to have this product on a boat.	**12%**
d. It's the next generation of fish-finding technology. It's obviously light years ahead of anything else on the market.	**25%**

Source: Company records

Exhibit 8 Project 901 Study: Product Features

Feature	Available With Competitive Products	Essential For Purchase (%)	Would Pay More For (%)	No Effect On Purchase (%)
1. View three different angles	No	39	22	39
2. Instructions on videotape	No	38	23	39
3. Temperature gauge	On some	36	46	18
4. Display speed matches boat speed	No	28	39	39
5. Show fish size	On some	29	50	21
6. Bottom hardness indicator	No	29	39	32
7. Distance display from back to front	On some	28	31	41
8. 3-D View to 240 feet	No	28	47	25
9. Speedometer	On some	22	26	52
10. 6" × 4" screen	On some	18	37	45
11. Regular view 240-600 ft.	On some	18	19	63
12. Bottom alarm	Yes	13	28	59
13. Marine plotter connection	On some	11	40	49

Source: Company records

Exhibit 9 Project 901: Profit and Loss Forecast

(Year Ending June 30)	1991	1992	1993	Total	
Standard Model					
Unit Sales	28,000	32,000	60,000	120,000	
Net Price per Unit	390.00	$330.00	$280.00	$319.00	avg.
Net Sales	10,920,000	10,560,000	16,800,000	38,280,000	
Gross Profit	4,914,000	4,224,000	5,880,000	15,018,000	
%	45.00%	40.00%	35.00%	39.23%	
SG&A (25%)	2,730,000	2,640,000	4,200,000	9,570,000	
Other	933,000	426,000	271,000	1,630,000	
EBI&T	$1,251,000	$1,158,000	$1,409,000	$3,818,000	
Deluxe Model					
Unit Sales	4,000	12,000	20,000	36,000	
Net Price per Unit	$440.00	$375.00	$320.00	$351.67	avg.
Net Sales	1,760,000	4,500,000	6,400,000	12,660,000	
Gross Profit	792,000	1,800,000	2,240,000	4,832,000	
%	45.00%	40.00%	35.00%	38.17%	
SG&A (25%)	440,000	1,125,000	1,600,000	3,165,000	
Other	217,000	146,000	101,000	464,000	
EBI&T	$135,000	$529,000	$539,000	$1,203,000	
Capital Expenditures for Both Products Combined:					
Packaging	$36,000				
Tooling	136,000				
Equipment	38,000				
R&D	400,000				
Total	$610,000				

Source: Company records

Exhibit 10 VHF/Marine Radio Market Study: What would you like to do?/What would you use a radio for?

	Recreational Boaters		Fishermen		Humminbird Customers	
	A. %	B. %	A. %	B. %	A. %	B. %
Get the weather	62	56	67	66	42	33
Radio for help in emergency	56	56	56	57	33	39
Find out where the fish are biting	27	23	38	34	26	23
Know what bait is working	25	21	36	33	27	23
Talk to friends on shore	19	21	36	29	20	13
Know who's catching what	18	14	34	26	23	14
Talk with other boaters	24	11	24	15	18	8
Touch base with home	19	24	26	27	11	15
Schedule meeting with other boaters	21	17	13	13	11	8
Order supplies from offshore	8	8	13	8	4	4

Source: Company records

A. = Would like to be able to do often

B. = Would use a marine/VHF radio to do

Exhibit 11 VHF/Marine Radio: Profit and Loss Forecast

(Year Ending June 30)	1991	1992	1993	Total	
Unit Sales	5,600	20,000	24,000	49,600	
Net Price per Unit	$195.00	$175.00	$157.00	$168.55	avg.
Net Sales	1,092,000	3,500,000	3,768,000	8,360,000	
Gross Profit	218,400	1,225,000	1,507,200	2,950,600	
%	20.00%	35.00%	40.00%	35.29%	
SG&A (25%)	273,000	875,000	942,000	2,090,000	
Other	240,000	48,000	0	288,000	
EBI&T	($294,600)	$302,000	$565,200	$572,600	
Capital Expenditures:					
Packaging	$18,000				
Tooling	318,000				
Equipment	60,000				
R&D	180,000				
Total	$576,000				

Source: Company records

Exhibit 12 Global Positioning System: Problems Faced by LOCATOR Non-Owners

	Frequent Problem	If Occurs, Major Problem
Not being able to determine your exact position	67%	30%
Not being able to navigate in the fog	67	72
Not being able to tell how much time it will take to get to a particular destination	62	16
Not being able to tell someone your position, or find someone according to their position	60	39
Not being able to return to favorite fishing/diving spot	58	33
Not being able to find your way in strange/new waters	49	48
Not being able to navigate through difficult channels	40	54
Not being able to determine your course heading	40	39
Not being able to find your way back to harbor in bad weather	34	54
Not being able to find your way back to harbor at night	32%	67%

Source: Company records

Exhibit 13 Global Positioning System: Purchase Motivators and Feature Desirability

Features	RANKINGS					
	Total Sample		LOCATOR Owners		Non-Owners	
	MP	D	MP	D	MP	D
Works in all weather	1	1	1	1	1	1
Provides the highest level of accuracy	2	4	2	3	3	9
Not affected by interference	3	7	3	6	5	6
Won't become obsolete	4	6	6	7	2	3
Provides total coverage	5	3	4	2	6	11
Locks on to weak signals	6	12	5	9	11	15
Best value	7	2	11	4	4	2
Most technologically advanced	8	13	8	13	10	14
Clearly displaying all information at the same time	9	11	9	11	9	12
Being the easiest to learn how to operate	10	8	7	8	14	5
Being serviced and returned within three days	11	9	12	10	8	7
Quickly installed by you, yourself	12	10	14	12	7	4
Being priced appropriately for needs	13	5	10	5	15	8
Saltwater proof, submersible	14	14	13	14	16	13
Showing the shoreline, position, and course	15	16	15	16	12	10
Allowing for software update	16	15	16	15	13	16

Source: Company records

MP = Motivating power of feature in purchase decision

D = Desirability of feature

Exhibit 14 Navigation Systems: Profit and Loss Forecast

Global Positioning System

(Year Ending June 30)	1991	1992	1993	Total	
Unit Sales	400	6,000	16,800	23,200	
Net Price per Unit	$800.00	$704.00	$620.00	$644.83	avg.
Net Sales	320,000	4,224,000	10,416,000	14,960,000	
Gross Profit	114,688	2,407,680	4,999,680	7,522,048	
%	35.84%	57.00%	48.00%	50.28%	
SG&A (25%)	80,000	1,056,000	1,249,920	2,385,920	
EBI&T	$34,688	$1,351,680	$3,749,760	$5,136,128	
Capital Expenditures:					
Packaging	$ 28,000				
Tooling	80,000				
Equipment	36,000				
R & D	220,000				
Joint Venture Investment	400,000				
Total	$764,000				

LOCATOR

(Year Ending June 30)	1991	1992	1993	Total	
Unit Sales	4,000	12,000	5,600	21,600	
Net Price per Unit	$450.00	$375.00	$300.00	$369.44	avg.
Net Sales	1,800,000	4,500,000	1,680,000	7,980,000	
Gross Profit	630,000	1,440,000	470,400	2,540,400	
%	35.00%	32.00%	28.00%	31.83%	
SG&A (25%)	450,000	1,125,000	420,000	1,995,000	
EBI&T	180,000	315,000	50,400	545,400	
Capital Expenditures:					
Packaging	$ 21,600				
Tooling	88,000				
Equipment	72,000				
R & D	120,000				
Total	$301,600				

Source: Company records

Harvard Business School

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Perceptual Mapping: A Manager's Guide

I. Introduction

Pictures are often more effective than words, e.g., basketball coaches map out plays on mini-blackboards during time-outs; a company's annual reports set out sales figures in a bar graph; and executives study maps of sales regions to identify account concentration and territory development. Similar pictures often play a role in new product development as evidenced by the common usage of terms like "product positioning" and "market structure." These terms seem to indicate that the manager is visualizing a map of the marketplace in which brands are positioned against one another vying for the spot which consumers most desire. In strategic planning sessions, it is not unusual for a participant to pick up a marker and make his vision explicit on a flip chart. For example, a V.P. of marketing for a men's tailored clothing company might think of the dimensions of competition as mainly two: price and youthfulness of appeal and thus sketch out the "map" in **Figure A**.

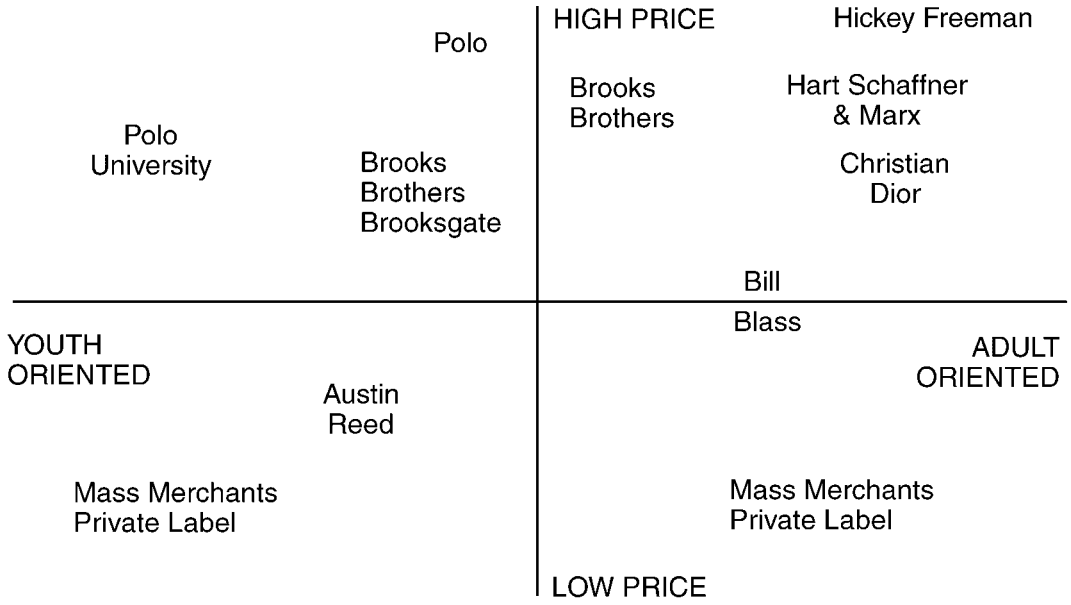
Products range from the very expensive Hickey Freeman for the mature person to Austin Reed as branded low-price alternative for the younger set, to private label clothing. The strategic planners use this map as the focal point of a discussion on where the firm's new suit line should be placed.

Implicitly, the group makes two assumptions in using the map in this way: (i) potential customers use these same two dimensions in differentiating brands, i.e., price and youthfulness of appeal are key to customers and (ii) the placement of a brand on the two dimensions reflects the beliefs of customers. If it is a reliable representation of the views of customers in the marketplace, this type of map can illuminate discussions on target market selection, product design and product communications strategy.

Since the perceptions of customers are key, a set of market research tools has been developed to produce maps based on hard consumer perception data. These data replace perhaps informed, but somewhat subjective, judgment of managers. This note discusses these "Perceptual Mapping" tools. Having given some rationale for the construction of maps, Section II discusses construction procedures and Section III presents some illustrative applications and details the uses of the maps.

Professor Robert J. Dolan prepared this note as the basis for class discussion.

Figure A Map of Competitors in Suit Business



II. Developing the Map

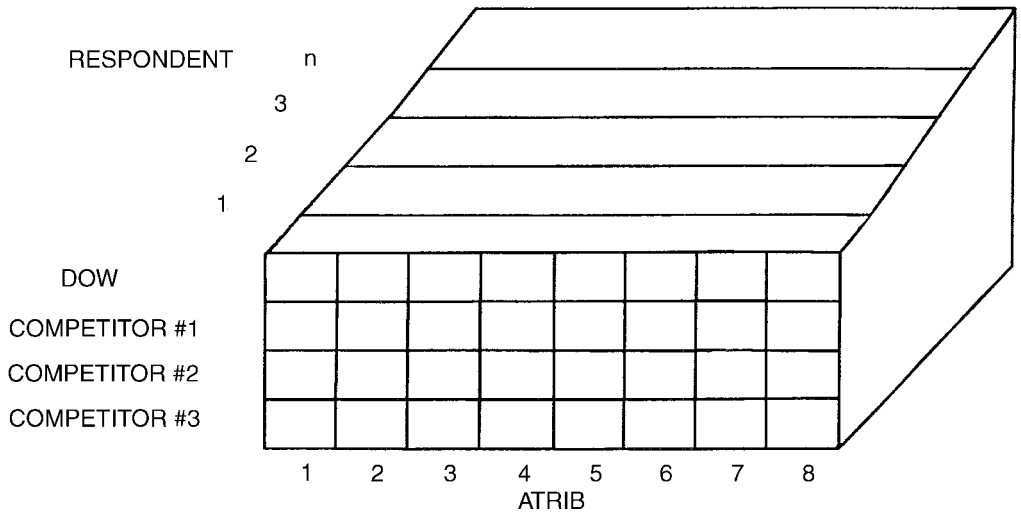
One obvious way to develop the map of a product category is to ask a consumer to name the two most important differentiating characteristics and then rate each product on these characteristics. This might work reasonably well in some situations. However, in general, it places too great a burden on respondents to result in reliable maps.

There are two major alternatives for constructing maps, differing in what is asked of consumers: (i) attribute rating method (AR) and (ii) overall similarity method (OS). The AR method is similar to one proposed above except consumers are presented a full list of possible relevant attributes and rate each item on each attribute. For example, Siemer (1989) uses the AR method to map the competition among vendors of specialty plastics. Potential customers rated Dow Chemical and three competitors on the eight attributes which Dow believed important:

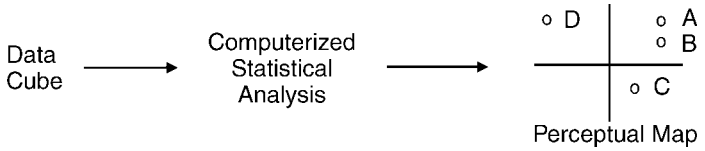
1. meets scheduled delivery dates
2. practices innovation and development
3. has fair pricing
4. has consistent product
5. provides support in solving processing problems
6. has custom color capability
7. provides adequate technical literature
8. withstands high heat distortion temperatures

The data collection phase of the AR approach results in a "data cube" as shown in **Figure B**.

Figure B The "Data Cube" of the AR Method



Each respondent provides 32 numbers, i.e., the ratings of each vendor on each of eight attributes. As shown in **Figure B**, for N respondents, one can think of the data from each being stacked up together in the data cube of 32 x N numbers. Now the question is how to extract some information from these data. This is the role of statistical analysis. The process is:

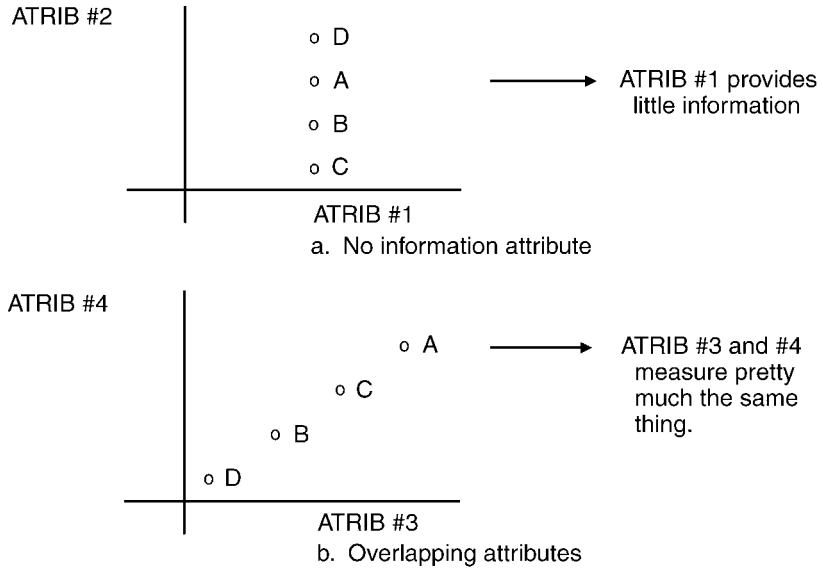


The statistical analysis (either "factor analysis" or "multiple discriminant analysis") essentially works on one set of vendor attribute ratings. This one set can be obtained by averaging the ratings across all respondents to obtain an aggregate market view or the analysis can be done sequentially for smaller groups of respondents to examine whether segments exist which vary in their perceptions of products. The philosophy behind the analysis is to find the two axes for the perceptual map which will convey the most information in the data cube.

The statistical analysis defines the axes by including the original attributes with different weights.[1] Intuitively, what the procedures do is "look" at situations such as shown in **Figure C**. In **Figure Ca**, we see all vendors are rated identically for attribute #1, so that is not a very interesting product feature. Once the statistical analysis reveals this, it does not give attribute #1 much importance in portraying the situation. Attribute #2 on the other hand varies across products and would have a place in the final map. **Figure Cb** is a situation in what attributes #3 and #4 are highly correlated, i.e., the vendors rated high on #3 are also rated high on #4. The statistical analysis would thus treat #3 and #4 as measurements of the same underlying construct.

[1]For details and a comparison of the statistical methods, see Hauser and Koppelman (1979).

Figure C Attribute Analysis



The analysis collapses down from the original set of attributes to a two-dimensional map with the four vendors positioned on the axes. Since the original data are in eight dimensions (attributes) and the perceptual map is reduced down to two, the map cannot capture all the variation among the vendors given in the data matrix. However, essentially it does the best it can, i.e., retains the most important information from the full data matrix and reports it in two dimensions to provide visual impact. For some representative maps using the AR method, see:

Siemer (1989) - p. 112 - Vendors of Specialty Plastics
Johnson (1987) - p. 144 - Presidential Candidates
Block (1989) - p. 122 - Channels of Distribution Alternatives
Stannard (1989) - p. 133 - Automobiles

The AR method has a key limitation for some product types, i.e., it requires the researcher to articulate and the respondent to think in terms of attributes. Apparently, this was not a problem for specialty plastics at Dow. However, imagine executing the AR approach in the soft drink or perfume market. In categories with competition driven by tastes, odors, or aesthetics—i.e., things we do not verbalize very well—the AR method breaks down. In such situations, the overall similarity (OS) method is preferred.

The OS method produces a map similar to that of AR. However, the input data are quite different. In OS, we do not specify any attributes of the products. We simply ask the respondent to make judgments about the overall similarity of pairs of items. Specifically, for n items, we require the respondent to rank the [(n)(n-1)]÷2 possible pairs of items from most similar to least similar. For example, mapping the movie market we might consider 6 items: *Henry V, Fish Called Wanda, Nuns on the Run, Little Mermaid, Field of Dreams,* and *Teenage Mutant Ninja Turtles*. (Note: we limit this to six for simplicity in showing how the procedure works. Ordinarily, one would want to consider all relevant competition.) With 6 items, there are 15 pairs. A convenient way to represent the required input is in matrix form with a 1 = most similar pair and a 15 = least similar pair. Suppose one respondent gave the judgments as shown in **Table A**:

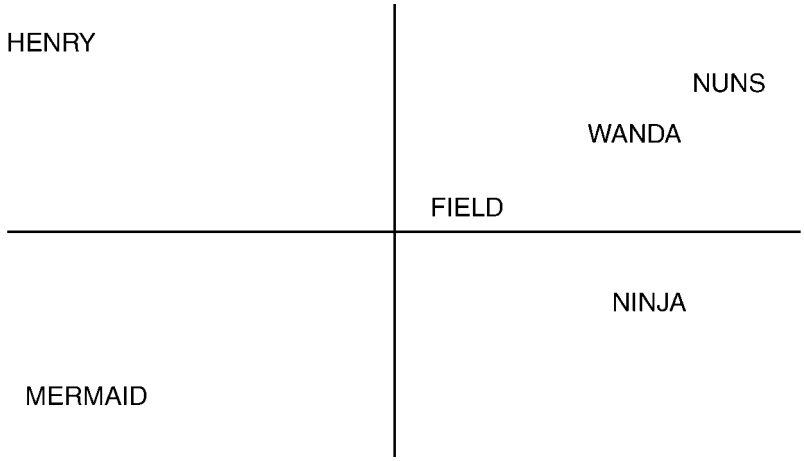
Exhibit Table A Respondent Ranking of Similarity of Six Movies

	WANDA	NUNS	MERMAID	FIELD	NINJA
HENRY	11	12	10	6	13
WANDA	-	1	14	2	5
NUNS		-	15	3	6
MERMAID			-	8	9
FIELD				-	4
NINJA					-

"Eyeballing" the data, we might notice a couple of things. First, Field of Dreams is seen as pretty similar to all the movies (obviously this hypothetical respondent never threw a baseball with his hypothetical father). Also, the Mermaid-Ninja pair is rated ninth—less similar than the average pair. This might seem odd as they are two children's movies in the set. In order to sort these things out, we submit the data to a statistical procedure (Multidimensional Scaling), to develop a map to permit us to "see" the data and get the information from it.

The statistical analysis attempts to find a map such that the distance between the movies as shown on the map match up (i.e., be in the same order) as the rank numbers in the input data matrix of **Table A**. The map in **Figure D** fits this bill. The output of multidimensional scaling is a plot like **Figure D** and a statistic which tells how closely the distances on the map match up with the original input data. Note that we do not know what the axes are—but our knowledge of the category can help us to name them. On the vertical axis, it's *Henry V, Fish Called Wanda,* and *Nuns on the Run* on one end versus *Teenage Mutant Ninja Turtles* and *Little Mermaid* on the other. This strongly suggests an adult versus kids audience vertical dimension. Second, the horizontal axis has *Henry V* and *Little Mermaid* versus *Nuns on the Run, Fish Called Wanda* and *Teenage Mutant Ninja Turtles*—strongly suggesting a humor dimension. *Field of Dreams* is the middle position—with broad audience appeal and a mix of serious and humorous. The map helps explain what might seem odd to us from "eyeballing" the data. While *Little Mermaid* and *Teenage Mutant Turtles* are seen as similar in their target audience, this respondent differentiates them on the basis of their relative use of humor.

Figure D Perceptual Map of Movie Market



The OS method thus allows us not only to map products but also infer the attributes used by the respondent in making distinctions. Note, however, that these inferences were somewhat subjective (e.g., one might say the horizontal axis is quality of the musical score) and required knowledge of the objects by the analyst. The OS procedure has been used in the mapping of:

- Retail stores by Arora (1982), Singson (1975)
- Desserts by Jain (1978)
- Food Products by Lautman, Percy and Kordish (1978)
- Ethical Drugs by Neidell (1969)
- Cigarette Brands by Smith and Lusch (1976)

Table B summarizes the major differences between the AR and OS methods.

Table B Comparison of AR and OS Methods

AR	OS
Input Data	
• brand ratings on attributes • attributes prespecified by analyst	• overall similarity ranking • definition of similarity left to respondent
Statistical Technique	
• factor analysis or multiple discriminant analysis (software generally available)	• multidimensional scaling (special-purpose software required; however, efficient packages available at low cost)
Output	
• product positions on axes defined as combination of original variables	• relative product positions; axes must be interpreted by analyst
Best Suited For	
• applications with hard attributes which can be verbalized	• categories dominated by not easily articulated attributes

The major difference is in the input data required. While OS does require specialized software, a number of packages are available at no great cost. However, because of issues relating to statistical power, OS is inappropriate for applications with less than 8 brands to be mapped. Because the nature of the different product category determines which method is more appropriate, AR and OS should be viewed as complements to one another, rather than substitutes.

III. Applying the Maps in New Product Development

There are three major ways in which perceptual maps are used in the new product development process:

(i) to obtain a better understanding of market structure
(ii) to test where a new product being considered for introduction would be perceived
(iii) to provide direction to R&D efforts to satisfy the wants of consumers better.

In many studies, perceptual maps are used for all three of these purposes simultaneously. The third is somewhat different from the others in that it requires representation of consumers'

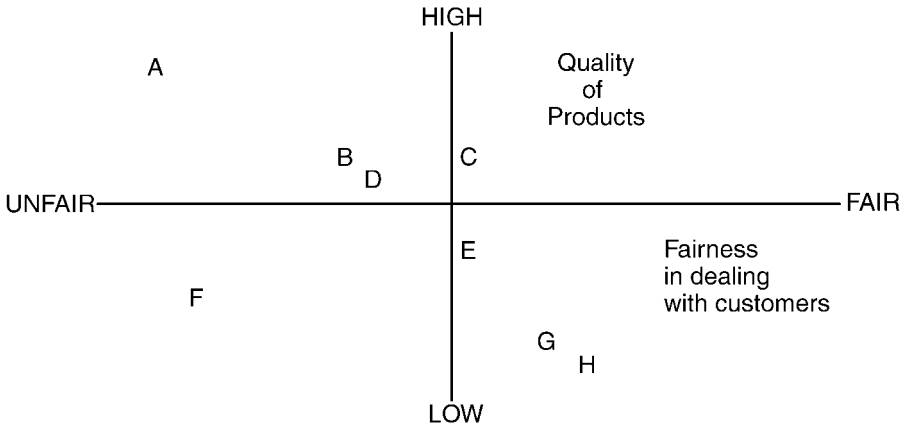
preferred positions (their "ideal points") as well as competitors' positions on the map. The procedure for achieving this will be discussed below. We will now cover each of the three purposes in turn.

Purpose #1: Understanding Market Structure

At the idea generation stage of the new product development process, perceptual maps can be a useful stimulus to opportunity identification. Our vice president of marketing for the suit manufacturer was putting maps to this use in the example above. Specifically, the map of **Figure A** can indicate "holes" in the product space which might be exploited. These "holes" may represent niches of the market which current competitors have overlooked and could be developed. Second, the maps indicate the vulnerability of competitors by showing how consumers perceive them. For example, there are cases where a dominant share brand seems impossible to attack. However, a deeper understanding of customers' attitudes and perceptions can show the means of attacking this seemingly impregnable incumbent. Consider **Figure E**, a hypothetical map of eight vendors. Suppose using the AR or OS method generated the map with the axes interpreted as shown in the figure. Market shares in the category are:

A.	58%	E.	8%
B.	8%	F.	1%
C.	9%	G.	5%
D.	7%	H.	4%

Figure E Map of Competitive Positions of Eight Firms



These market shares are compatible with the map positions and the notion that a large proportion of the customers in the category are quite quality sensitive and hence buy from firm A even though it is perceived as "unfair."

The market share numbers suggest a difficult job in attacking A. However, the map indicates A's vulnerability. A's differentiation on quality, i.e., even firms B, C, D, and E are significantly lower in quality, grants it some power which it has exercised to the point of being negatively perceived by customers. If A were positioned in the map in the upper right hand quadrant, (say at A's quality and H's fairness), there would be no basis for attacking A. However, its poor position on fairness indicates A's market share can be taken away if a firm is able to produce product near A's quality level and treat customers well simultaneously.

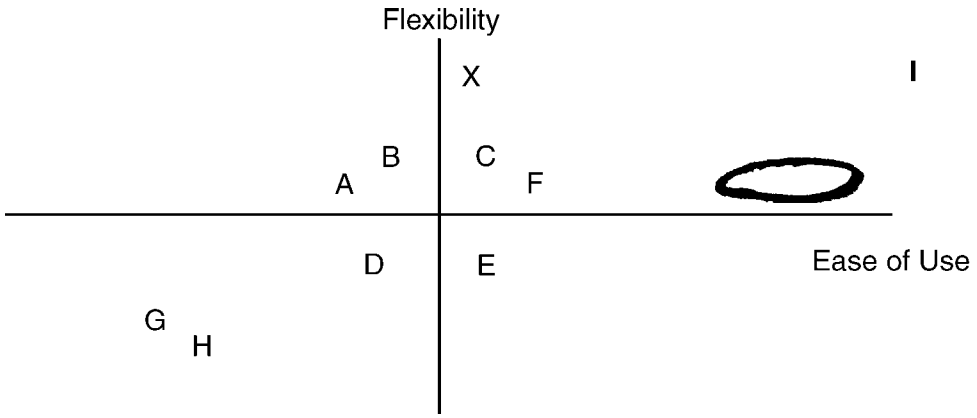
Purpose #2: Perceptions of a Product Concept

Once a general opportunity has been identified, (either with or without perceptual maps) the process usually moves forward to concept development and testing and, in consumer packaged goods, some form of product use test or laboratory test market. In either of these phases, perceptual maps can be used to test if the concept or product would be perceived as the firm intended by consumers. The ASSESSOR pretest market system (see Silk and Urban (1978) for details) regularly uses perceptual mapping (an AR version) to provide diagnostic information to complement its prediction of the market share a proposed new product would attain.

For this use, respondents must be informed about the new concept or product, either through a concept statement or, if possible, product use. Once they are able to form their own image and judgments about the brand, the method proceeds as usual.

For example, suppose a firm in the computer business already participates in the market and the key attributes are ease of use, flexibility, and price. A Perceptual Map of the market is shown in **Figure F**.

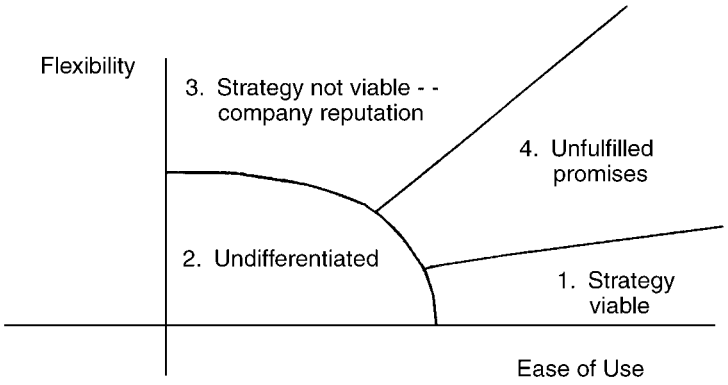
Figure F Perceptual Map of Personal Computer Market



The map shows a group of competitors in the middle of the map; firms G and H offer less flexibility and convenience (presumably at lower prices). Our Firm X has been able to differentiate itself from the group via innovation on flexibility, taking point X on the map. Although not depicted on the map, this is at a slight price premium over the offerings of A, B, C, D, E, and F. Firm I has been able to differentiate itself by offering both greater flexibility and greater ease of use, but its offering is at a significant price premium.

Our firm is considering expanding its product line to bring out a machine which is very easy to use, but with average flexibility, i.e., a product in the area of the circle drawn on the map. Such a product would sell at the same price level as X, but would (it was hoped) not cannibalize X but rather appeal to a market segment now buying F or I. The question is whether the product could take on this position in customers' eyes even if, in a technical performance sense, it provided average flexibility but was quite easy to use. Perceptual mapping can provide an answer to the advisability of the strategy. Once consumers understand the proposed product, a mapping study could be done to see where the new product falls. **Figure G** shows the four zones.

Figure G



If the new product takes on a position in consumer's eyes in Zone 1, the basic positioning is viable. The product is positioned strongly on the ease-of-use dimension and the trade-off for ease-of-use for flexibility is communicated. All other zones are problematic. Zone 2 puts the firm "in the bunch" with firms A, B, C, D, E, and F—not differentiated enough to make a product line extension worthwhile. Zone 3 is a basic failure to capture the desired position. The firm's reputation for flexibility overwhelms the new product features and the new product is seen to have the same basic strengths and weaknesses as the firm's current offering. Finally, Zone 4 may initially look like a good place to be—offering both improved ease-of-use and flexibility over the "bunch," but the product cannot deliver against those expectations and hence in the long term this would be a disaster.

Similarly, a map can be used after a product introduction to track the positioning. For example, suppose the study at this stage showed the new product to be on the border between Zones 1 and 4. One might then argue that the respondents had limited communication about the new product and that an actual introduction would be accompanied by extensive company-managed communication and trade press reviews which would be sufficient to place the product squarely in Zone 1, the "strategy viable" zone. Perceptual maps could be constructed after the introduction to test this hypothesis and aid in the determination of whether remedial action was necessary. Smith and Lusch (1976) used this approach to examine the effectiveness of a Liggett and Myers repositioning effort.

Purpose #3: Direction to R&D Efforts to Satisfy Customers Better

This purpose is similar to #2, except here we require formal representation of the "ideal point" of a customer, i.e., what point on the map represents the ideal combination of attributes for different customer groups. Our example in #2 was chosen to sidestep this issue by choosing two attributes which almost everybody would like as much of as he could get for a given price. Consequently, we could think of the "ideal" being as far to the northeast as possible.

When we have attributes for which more is not necessarily better, we will want to represent explicitly these ideals. There are two methods for doing this, both of which are applicable in either the AR or OS procedure. The first method is to alter the input data collection phase to include the respondents "ideal" in the set of things to be rated on each attribute (AR method) or to be considered in forming all possible pairs for similarity ranking (OS method). The second method is to augment the data collection on perceptions with a preference phase. Statistical analysis, called preference mapping or "unfolding," is then used to position a respondent "ideal point" un the map following the principle that the ideal should be "close to" the brands at the top of the preference ranking and "far from" those at the bottom of the preference ranking (see Jain (1971) for example).

The examples in the literature point out the value of doing this because the ideal points of individuals while usually clustered, are spread out across the map of brands. For example, Johnson's work (1987) on presidential candidates identified eight clusters with significantly varied ideals on the two key dimensions of candidate differentiation:

- liberal versus conservative
- reduce government involvement versus increase government involvement.

Summary

Often the intent is to use perceptual maps to serve each of these three purposes. The potential for managerial utility is hopefully clear from the description of the technique; however, added testimony comes from the number of firms regularly using the method and the reaction of some of those users. For example, in discussing Dow Chemical's application in the specialty plastics market, Siemer (1989) notes the following contributions of the perceptual mapping study:

> Some of the facts we learned from this study shocked us. . . . We had focused on physical product benefits as a basis for competitive advantage. Instead, we found a market more interested in service issues. [The study provided] greater understanding of the market structure . . . an understanding of the unique needs of industry segments [and] . . . competitors' vulnerabilities from the point of view of our customers.

The impact of this improved understanding was a change in Dow's basic approach to the market and spending plans, viz. "We were able to develop a strategic positioning for Dow that focused and prioritized our resources where they would have the greatest competitive advantage, and then were able to abandon issues and priorities that had low potential return because of customer indifference."

IV. Summary

Perceptual mapping has proven a useful tool. It does have a number of limitations, however, which should be noted. First, it presents a static view, i.e., it is a snapshot of consumers' current perceptions. If a series of studies of the same market is done over time, some trends can be monitored. Second, while it may help a firm determine what it would like to do vis-à-vis the market, it provides no indication of the cost or likelihood of being able to achieve the desired positioning.

In short, it in no way substitutes for management judgment but often provides valuable input and serves as a very useful focal point in strategic planning discussions.

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YOUNGME MOON

KERRY HERMAN

Marketing Antidepressants: Prozac and Paxil

For the first time I am living in an acceptable range of emotions. . . . It's not that I am constantly happy now. I have doubts and fears like anyone else, but I don't have the obsessions and phobias I used to have, and I don't have those periods where I was weighed down by feelings that made getting out of bed impossible.[1]

—David Lessoff, Prozac user

Prozac, a treatment for depression approved by the Food and Drug Administration (FDA) in 1987, began entering the national consciousness in the late-80s. By 2000, over 24 million prescriptions of Prozac were being filled each year, and Prozac had become the best-selling mental-health drug in history. By 2001, however, the market landscape for Prozac had shifted. The patent on the landmark drug was about to expire, and Eli Lilly and Company (Lilly), which manufactured the drug, was holding its breath in anticipation. In addition, the makers of competitive antidepressants—including Zoloft, Paxil, and Celexa—were scrambling to reevaluate their marketing, positioning, and pricing strategies given that lower-priced, generic versions of Prozac would soon be on the market.

The Treatment of Depression

"People confuse [depression] with the everyday sensation of feeling despondent and dismiss it," says NIMH neuroscientist Philip Gold. "In fact, it takes an incredibly strong person to bear the burden of the disease, which ought to be given a more appropriate name."

UCLA neuropsychiatrist Peter Whybrow suggests that people who want to know what severe depression feels like can get a glimpse of it by combining the anguish of profound grief with the bodily sensations of severe jet lag. Boston native and longtime depression sufferer Evie Barkin describes it this way: "It's like the worst migraine of your life, and it seems like it will never go away."[2]

— U.S. News & World Report

Clinical (or "major") depression is a complicated and poorly understood disorder that is not easily diagnosed. Estimates vary, but it is believed that at any given time, about 10 million American adults

[1] Michael T. Kaufman, "Mother's love and science dispel a black cloud," *The New York Times*, December 31, 1994, p. 29.

[2] Joannie M. Schrof, Stacey Schultz, "Melancholy nation," *U.S. News & World Report*, March 8, 1999, p. 56.

Professor Youngme Moon and Research Associate Kerry Herman prepared this case. This case was developed from published sources. HBS cases are developed solely as the basis for class discussion. Cases are not intended to serve as endorsements, sources of primary data, or illustrations of effective or ineffective management.

(as much as 5% of the adult population) suffer from major depression, although just a fraction (one-third to one-half) ever seek treatment.[3]

Symptoms differ depending on the individual sufferer. Some sufferers have difficulty sleeping and eating; others spend most of the day oversleeping and overeating. Some suffer from delusional highs; others from suicidal lows. Symptoms can also include severe headaches, muscle pains, and upset stomachs, and sufferers are often overcome by feelings of apathy, doom, fear, panic, anxiety, and/or self-destruction. In many cases, even the most basic daily tasks become impossible, as cognitive abilities such as concentration and memory become less reliable. It is estimated that depressed people are 35 times more likely to commit suicide than others. (See **Exhibit 1** for a more complete definition of clinical depression and other depressive disorders.)

Before the introduction of Prozac, two classes of antidepressants were used to treat clinical depression: tricyclics (e.g., Imipramine, Elavil, and Tofranil), and monoamine oxidase inhibitors, or MAOIs (e.g., Nardil, Parnate). Both types of antidepressants work by increasing the levels of two related chemicals in the brain, serotonin and norepinephrine, which carry nerve signals through the nervous system and are believed to be associated with mood.

Although they have been shown to be quite effective in clinical trials (tricyclics and MAOIs are believed to alleviate the symptoms of depression 60% to 80% of the time), both of the drugs are tricky to administer. Tricyclics, for example, do not work if taken in quantities that are too small, but can be toxic if taken in quantities that are too large. Because the same dosage can yield different concentrations in different patients, a patient who is prescribed tricyclics must begin with a very low dosage that the doctor gradually increases over time, until the optimal dose can be found using blood monitoring. Even after the proper dosage has been achieved, tricyclics tend to bring on side effects such weight gain, extreme sluggishness, constipation, urinary retention, and disturbances in heart rhythm and blood pressure.

The MAOIs also carry the risk of severe side effects. They can be associated with headaches and high blood pressure, and on rare occasions, have been known to cause death from brain hemorrhage. The MAOIs can also be deadly if mixed with common foods (including cheese and other dairy products, red wine, beer, pickles, fava beans, ripe figs, and allergy medication). Because of this, both the tricyclics and the MAOIs are generally only prescribed to people suffering from the severest forms of depression.

The Development of Prozac

The development of Prozac began in the 1960s, when a pharmacologist named Ray Fuller joined forces with several Eli Lilly scientists to develop a new antidepressant. The team's goal was to develop a "clean" drug that worked exclusively to increase serotonin levels in the brain, without affecting anything else. After testing over 250 compounds, the team discovered a compound—fluoxetine hydrochloride—that seemed to selectively target serotonin. In 1974, the Lilly researchers published their findings on fluoxetine hydrochloride (the chemical name for Prozac) and began the drug development process.[4]

[3] All information about major depression in this section is based on data from the National Institute of Mental Health, January 2001.

[4] Peter Kramer, *Listening to Prozac* (New York: Penguin USA, 1997), p. 60.

To produce a new drug in the United States, a pharmaceutical company must manufacture the compound into a drug, complete preclinical testing of the drug, and complete three phases of clinical trials. The company can then submit a new drug application (NDA) to the FDA. A company generally applies for a patent on the drug early on in the development process; patents have a term of 20 years from the date of application.[5] The drug development process (including preclinical and clinical testing) can cost as much as $800 million and take eight to ten years. The actual FDA approval process can often take an additional 36 months.[6] (**Exhibit 2** describes the FDA approval process more completely.)

In Lilly's case, the clinical trials for fluoxetine hydrochloride took about a decade. The results of these trials were less than spectacular, however: In the end, fluoxetine hydrochloride did not appear to be significantly more effective than tricyclics and MAOIs in alleviating the symptoms of severely depressed patients.[7] Given these tepid clinical trial results, expectations for Prozac (the brand name for fluoxetine hydrochloride) were muted when Lilly released the drug in early 1988. For a $600 million company—which Eli Lilly was in the late 1980s—Prozac was expected to earn no more than $70 million in annual sales.

The Marketing and Adoption of Prozac

Needless to say, the success of Prozac far exceeded Lilly's expectations. In 1988 (Prozac's first full year on the market) about 2.5 million prescriptions of Prozac were filled, more than for any other brand of antidepressant, and global sales of Prozac reached $125 million. The following year, global sales jumped to $350 million, which was more than the combined total spent on *all* antidepressants on the market just two years earlier. By 1992, the number of Prozac prescriptions being filled was closing in on 10 million a year, and by the end of the decade, Prozac accounted for almost a quarter ($2.6 billion) of Lilly's global sales and more than a third of its global profit. In the United States alone, Prozac accounted for $2.2 billion in sales.[8] (See **Exhibit 3** for Prozac sales versus the competition over time.) Moreover, the antidepressant market in the United States had become an $8.3 billion market, and the total number of prescriptions for all antidepressants in the U.S. had risen from 40 million in 1988, to 120 million 10 years later.[9]

It was difficult to pinpoint a single reason for Prozac's success; rather, several factors converged to create the "Prozac phenomenon." One factor was Lilly's savvy detailing tactics.[10] In planning for the launch, Lilly's sales force educated itself about modern psychiatric practices, in particular the global

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[5] In some cases, companies qualified for restoration of some of the patent life lost during preclinical and clinical trials, adding as much as an additional five years to the overall patent term.

[6] Pharmaceutical Research and Manufacturers of America, based on data from the Tufts Center for the Study of Drug Development.

[7] In clinical trials, Prozac alleviated the symptoms of depression about 60% of the time, whereas tricylics allieviated the symptoms of depression 80% provided that the dose was fine-tuned and patients stuck to their doses. See G. Cowley, "The Promise of Prozac," *Newsweek*, March 26, 1990.

[8] Company reports.

[9] "Eli Lilly & Co.," Prudential Financial analyst report, July 2001; Marianne Szegedy-Maszak, "The career of a celebrity pill," *U.S. News & World Report*, August 6, 2001, p. 38.

[10] One of the primary methods by which pharmaceutical companies marketed their products was via "detailing." Detailing refered to the practice by which pharmaceutical sales representatives (and in some cases, supporting medical staff) made face-to-face sales visits to doctors and other healthcare providers to market new and existing products.

trend toward psychopharmacology.[11] Lilly then directed its sales efforts toward psychiatrists, particularly those who were major prescribers and "opinion leaders" in this area.

Most of the older antidepressant drugs—the tricyclics and MAOIs—were already off-patent; as a result, they were not being promoted or detailed energetically. In fact, as Peter Kramer, psychiatrist and author of *Listening to Prozac*, explained, the side effects associated with these drugs created a dilemma for many psychiatrists: "[One psychiatrist told me that] merely listing the side effects of the tricyclics interfered too much with the analysis. Patients would accuse him of hostility, of unconsciously wanting to poison them. If they did take medicine, patients would spend long sessions on the couch complaining about how the analyst had made them constipated."[12]

Thus, although Prozac was not necessarily more effective in treating severe depression, Lilly's sales reps were able to emphasize several advantages Prozac had over existing alternatives. First, because it was difficult to overdose on the drug, Prozac was safer in the hands of potentially suicidal patients. Second, Prozac was easier to administer: Though it typically took Prozac between three and six weeks to become effective, a single daily dose of one or two 20-milligram capsules was generally sufficient for most patients. Third, Prozac's side effects, which included jitteriness, insomnia, nausea, loss of libido, and weight loss, were not considered serious.

After Prozac had been on the market for several months, Lilly began diverting more of its detailing efforts toward general practitioners rather than limiting its efforts to psychiatrists.[13] These marketing activities coincided with a nationwide effort by managed care providers to cut costs; in this context, Lilly was able to position Prozac—which did not need to be accompanied by constant medical supervision—as an appealing alternative for general practitioners who were reluctant to send patients to expensive specialists.[14] By 1989, it was estimated that over 60% of prescriptions resulted from a visit to a primary-care physician or non-mental health specialist.[15]

Lilly also sponsored massive educational efforts directed toward general practitioners. After the American Medical Association found (in 1990) that nearly 46% of family doctors were unable to diagnose depression correctly in their patients, Lilly—along with several professional organizations—set out to stimulate appropriate diagnoses and help remove the social stigma of psychiatric disorders. By all accounts, the strategy worked; by 1990—just two years after its introduction—the positive word-of-mouth about the drug had taken on a life of its own:

> Nearly everyone has something nice to say about the new treatment. It looks like a "wonder drug" to *New York* magazine, a miracle diet pill to the *National Enquirer*. The drug has had such good press than even healthy people have started asking for it. "Our phone rings off the hook every time someone does a story about Prozac," says Dr. David Hellerstein, head of psychiatric outpatient services at Manhattan's Beth Israel Medical Center. "People want to try it. If you tell them they're not depressed they say, 'Sure I am!'"[16]

The marketing of Prozac got a further boost in 1993 when Kramer first published *Listening to Prozac*, which described his personal experiences in prescribing the drug. Kramer concluded that

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[11] Eli Lilly and Company presentation to The New York Society of Security Analysts, Inc., *Investext Report*, May 15, 1988.

[12] Kramer (1997), pp. 65–66.

[13] Eli Lilly and Company presentation to The New York Society of Security Analysts, Inc., *Investext Report*, May 15, 1988.

[14] Joseph Glenmullen, *Prozac Backlash* (New York: Touchstone Books, 2000), pp. 14–15.

[15] Susan Brink, "Singing the Prozac blues," *U.S. News & World Report*, November 8, 1993, p. 76.

[16] Geoffrey Cowley et al., "The Promise of Prozac," *Newsweek*, March 26, 1990, p. 38.

Prozac was not only effective at treating depression, but was also effective at transforming the personalities of its users for the better, giving them more confidence and greater feelings of self-worth. Eventually, the controversial book, which topped best-seller lists for over six months, spawned a number of other books about the benefits (and dangers) of Prozac, and stimulated a nationwide discussion about the nature of depression.

As a result of these factors, Prozac became not only a popular drug but a socially acceptable one as well. Prior to the introduction of Prozac, most mildly depressed people tended to be suspicious of medication, but now, as a 1994 article in *Newsweek* put it:

> Compared with the antidepressants of the past—obscure compounds that only psychiatrists and their patients could name—Prozac has attained the familiarity of Kleenex and the social status of spring water. The drug has shattered old stigmas. Americans swap stories about it at dinner parties, joke about it in cartoons and essays and recommend it to stressed-out friends and relatives. . . .[17]

As for severely depressed people, it was difficult to overstate the impact of Prozac on their lives. For the first time, these patients had an alternative to high-risk drugs, psychotherapy, or electroconvulsive theory. Of course, Prozac didn't work for everyone; rather, it tended to be effective in about 60% of cases. Even some who responded positively found that the benefits wore off over time. Others had difficulty tolerating the side effects, which were often more serious than patients had anticipated. Nonetheless, Mary Guardino, founder of "Freedom from Fear" (a nonprofit advocacy group for depression), spoke for thousands of sufferers of depression when she said:

> To me, Prozac will forever be a legend and what this drug helped to create is legendary. The millions who found miracles of relief from their pain and suffering are only part of the story. . . . People learned that [depression is] not "just the blues," but could be a serious illness with major consequences. . . . To me, Prozac will be forever remembered as the beginning of a new and better era in the treatment of mental illnesses. Eli Lilly and Company and Prozac made it all happen, and all of us who care about those suffering from mental illnesses owe them a big "Thank You!"[18]

Furthermore, as the decade wore on, Prozac began developing a reputation for being effective at treating other disorders, such as obsessive-compulsive disorder (OCD) and panic disorder. (See **Exhibit 4** for definitions and **Exhibit 5** for estimated population sizes of these disorders.) As a result, the "off-label" prescribing of Prozac became a frequent practice.[19] Indeed, because Prozac was already on the market and physicians felt comfortable with the side effects associated with the drug, the familiar green pill soon became a treatment for problems such as smoking, alcoholism, bulimia, and even kleptomania.[20] The 1994 article in *Newsweek* concluded:

> One reason the drug has become cultural currency is that folks are using it for just about everything but hangnails. Though depression is still the only condition for which it's currently

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[17] Geoffrey Cowley, "The Culture of Prozac," *Newsweek,* February 1994, pp. 41–42.

[18] Mary Guardino, "Prozac: The End of an Era," http://www.freedomfromfear.com/public.asp#42, February 22, 2002.

[19] Once approved by the FDA a drug can be prescribed in any way doctors see fit; this kind of "off-label prescribing" is legal in the U.S.

[20] "U.S. Antidepressant Medications Market," *Frost & Sullivan,* Report #7458-52 (2001) I-4. Also see Kramer (1997); Glenmullen (2000); Geoffrey Cowley et al., "The Promise of Prozac," *Newsweek,* March 26, 1990, p. 38; A. M. Sebulsky, "*Eli Lilly—Company Report*," March 1, 1989, p. 2, particularly Table 1, p. 2.

licensed in the United States, doctors are directing it at such socially topical concerns as gambling, obesity, premenstrual syndrome (PMS) and fear of public speaking.[21]

Competitors Enter the Market

By the mid-1990s, Prozac had been joined by several similar drugs; all of the drugs in this new class of antidepressants were called "SSRIs" (selective serotonin reuptake inhibitors) because they selectively increased serotonin levels in the brain. For example, Pfizer's SSRI, branded "Zoloft" (sertaline), was released in 1992, SmithKline Beecham's "Paxil" (paroxetine) was released in 1993, and Forest Laboratories's "Celexa" (citalopram) was released in 1999.[22] (See **Exhibit 6** for additional information about these SSRIs.)

Like Prozac, all of these SSRIs were FDA-approved for the treatment of clinical depression, but were also believed to be effective for a wide range of disorders, including general anxiety disorder, obsessive-compulsive disorder, and eating disorders. They were similar to Prozac in other respects as well: They could be taken once a day, they had comparable side effects, they took several weeks before they began to work, and an overdose was considered relatively safe.[23]

As these new competitors began to chip away at Prozac's dominant marketshare, Lilly fought back with a direct-to-consumer advertising campaign. Launched in 1997, the $22 million campaign,[24] handled by ad agency Leo Burnett, featured splashy two-page advertisements placed in dozens of national publications, including *Time*, *Newsweek*, *Parade*, *Men's Health*, and *Cosmopolitan*. On one page, the slogan, "Depression Hurts" appeared under a rain cloud. On the second page, an image of a bright sun shone down on the words, "Prozac can help." (See **Exhibit 7** for a Prozac advertisement.)

Direct-to-consumer (DTC) advertising was a new tool in Lilly's marketing arsenal. Before 1997, DTC advertising for prescription drugs had been rare in the United States; instead, pharmaceuticals had been marketed to doctors and healthcare providers through office visits, seminars and conferences, free samples, promotional items, direct mail, advertising in medical journals, and informational packets. But in 1997, the FDA had issued new guidelines that allowed drug companies to air broadcast advertisements that did not contain reams of information about a drug's possible side effects. This relaxation of strictures on information and disclosure had paved the way for more high-profile branded DTC advertising by pharmaceutical companies; Lilly was one of the first to take full advantage of the less stringent guidelines.

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[21] Cowley (1994), p. 41.

[22] Solvay and Upjohn released its own SSRI, "Luvox" (fluvoxamine), in 1995, but it was only approved for obsessive-compulsive disorder (OCD) in the U.S. (although it had been prescribed for depression in Europe since 1983).

[23] According to a study by the Indiana University School of Medicine and the Regenstreif Institute for Healthcare, published in the *Journal of the American Medical Association*. See "Few differences between three top antidepressants," *Chicago-Sun Times*, December 19, 2001, p. 35.

[24] Lilly spent over $37 million on DTC advertising the following year, 1998. Competitive Media Reporting, *Strategy Report*, March 2001.

The Marketing of Paxil

Shyness can't be marketed because most people recognize it as a normal variation on personality. But "social phobia" sounds like a disease. [25]

—Eliot Valenstein, Professor of Psychology and Neuroscience

Coming to market third, Paxil was originally positioned as an alternative to Prozac, particularly for those individuals who had trouble tolerating Prozac or were concerned about Prozac's long-term side effects. Paxil, for example, didn't remain in the body as long as Prozac; its half-life was 21 hours, compared with Prozac's which could last up to 384 hours. Nonetheless, Paxil remained overshadowed by Prozac during much of the 1990s.

This began to change in May 1999, when Paxil received approval from the FDA for a new "indication" (a new disorder): the treatment of social anxiety disorder. Social anxiety disorder (SAD, also called social phobia) had officially entered the psychiatric lexicon in 1980, when it had been defined as a condition in which sufferers "avoided" situations that made them anxious.[26] By 1987, the diagnostic definition had been expanded to include people who "struggled through situations that made them anxious." Some five million American adults (3.7% of the adult population) were thought to suffer from SAD.[27]

Specifically, SAD was characterized by an intense fear of situations, usually social or performance situations. This fear resulted in extreme anxiety in anticipation of an activity, a panic attack when faced with an activity, or avoidance of an activity altogether. Symptoms included blushing, sweating, dry mouth, and heart palpitations. (See **Exhibit 8** for a more thorough description of SAD.)

Paxil's product director noted, "Every marketer's dream is to find an unidentified or unknown market and develop it."[28] Social anxiety disorder presented just such an opportunity—it was estimated that only 5% of those affected by SAD ever sought treatment. Paxil being the "first and only" medication to win U.S. approval for SAD, SmithKline Beecham hired a public relations agency, Cohn & Wolfe, to reinvigorate sales of Paxil. Cohn & Wolfe decided the best way to do this was by heightening public awareness of SAD, a disorder that most people viewed not as a serious medical condition but as a form of "shyness."

The marketing plan involved educating reporters, consumers, and physicians about SAD in order to encourage diagnosis and treatment. To this end, SmithKline Beecham partnered with the Social Anxiety Disorder Coalition to recruit SAD patients who were willing to share their experiences with the media. "Finding patients really helped put a face on the disorder and made people understand that it's much more than normal shyness," noted one Cohn & Wolfe executive. The agency also launched an aggressive media campaign featuring video news releases and press kits.[29]

By all accounts, the public awareness campaign for SAD was hugely successful. In May 1999 alone (the month Paxil was granted FDA approval for SAD), the campaign resulted in over 400

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[25] Eliot Valenstein, professor of psychology and neuroscience, as cited in Brendan Koerner, "Coming to you direct," *U.S. News and World Report,* June 21, 1999.

[26] Social phobia was first included in the third edition of the Diagnostic and Statistical Manual of Mental Disorders—DSM-III—considered to be the official reference for psychiatric disorders. Conditions not defined in the DSM were generally not covered by health insurers.

[27] National Institute of Mental Health, January 2001.

[28] Barry Brand, as cited in David Goetzl, "Paxil: Barry Brand," *Advertising Age,* June 26, 2000, S16.

[29] "Patient Testimonials Reintroduce An Old Drug in a New Market," *PR News,* vol. 56, no. 20, May 15, 2000, p. 1.

million mentions of social anxiety disorder in the national and local media. Social anxiety disorder was also featured prominently in prestigious news publications such as *U.S. News & World Report* and *The New York Times*, as well as broadcast news programs such as *Good Morning America*.[30] (See **Exhibit 9** for sample headlines.)

SmithKline Beecham supplemented the public relations campaigns with a direct-to-consumer advertising campaign. From May through December 1999, SmithKline spending on DTC advertising went from zero to $31.5 million; 70% of this was directed at television (e.g., shows such as "Ally McBeal") while most of the remainder was spent on magazine advertising (e.g., *Rolling Stone*). (In contrast, just a million dollars was spent on advertising in medical journals.[31])

The message in the DTC advertisements focused almost exclusively on social anxiety disorder, rather than the drug (Paxil) itself. The tag line in the ads was "Your life is waiting." Some of the advertisements referred consumers to websites (either www.paxil.com or websites hosted by SAD advocacy groups), where they could complete a diagnostic "self-test" to determine whether they might be suffering from social anxiety disorder. (See **Exhibit 10** for a diagnostic SAD self-test from the Paxil website.)

In 2000, SmithKline Beecham merged with Glaxo Wellcome to become GlaxoSmithKline (GSK), one of the world's largest pharmaceutical companies. That year, GSK increased the DTC advertising budget for Paxil to over $90 million, and global sales of Paxil, which had lagged behind Prozac and Zoloft, picked up considerably. By 2000, prescriptions for Paxil were generating almost $1.6 billion in revenue for GSK in the United States alone, and Paxil had become the number-one SSRI for new retail prescriptions.[32]

As Prozac's market share began to decline, Lilly once again fought back, this time by increasing sales calls on doctors by 25% in 1999. That same year, Lilly also produced a 30-minute infomercial to air on local and cable television stations in the middle of the night and on weekends (when more depressed people were presumably watching). The infomercial, aimed primarily at women, included testimonials from people who had benefited from Prozac.[33]

The SSRI Backlash

By the end of the decade, the SSRIs—including Prozac, Zoloft, Paxil, and Celexa—accounted for more than 80% of all antidepressants prescribed in the U.S.[34] In addition, all four were among the best-selling drugs in the entire prescription market. (Prozac was the fifth most popular drug; Zoloft was the eighth; Paxil was the eleventh; and Celexa was the 39th.)[35] Also, it was not uncommon for a

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[30] *PR News* (2000), p. 1.

[31] Milton Liebman, "Head-to-Head Marketing…may the best-promoted drug win," *Medical Marketing and Media,* November 2000, pp. 92–100.

[32] David Pilling, "SmithKline Beecham to lift Japanese spirits with Paxil," *The Financial Times,* November 22, 2000, p. 31. See also "Joint Statement by the Chairman and the Chief Executive Officer," GlaxoSmithKline Annual Report, 2000.

[33] "Big issue, bad taste: Experts saddened by medication infomercial," *Marketing News TM*, June 7, 1999, p. H33.

[34] "GlaxoSmithKline: Size Matters," *ABN AMRO Analyst Report*, February 1, 2001, p. 17.

[35] The top 10 best-selling drugs (by dollar sales) in the United States in 2000 were: (1) Prilosec, (2) Lipitor, (3) Prevacid, (4) Zocor, (5) Prozac, (6) Celebrex, (7) Epogen, (8) Zoloft, (9) Zyprexa, and (10) Procrit. Ranked eleventh was Paxil; ranked 39th was Celexa. Sales data from *Pharmacy Times*, April 2001, based on IMS Health data.

patient to have sampled three or four different SSRI brands. Yet despite their popularity, a backlash against SSRIs was also brewing. This backlash was based on a number of issues.

First, because SSRIs were being prescribed for so many conditions (ranging from severe depression to weight loss to nail biting), there was growing concern that Americans were overusing SSRIs, and in the process, overmedicating themselves. According to some doctors, part of the blame lay with general practitioners. Most SSRI users received their prescriptions from primary care physicians, and as one doctor worried, "unfortunately, too many of these doctors don't have either the skills or the time to detect the presence of depression in their patients."[36] As evidence, critics pointed to research that showed that although some 28 million Americans took antidepressants in 1996,[37] there were only about 10 million Americans estimated to actually be suffering from clinical depression.

Second, there was concern that patients were not using the drugs properly. Antidepressants normally required several weeks to take effect, but some doctors reported that more than half of their patients dropped their antidepressant prescriptions after the first 30 days.[38]

Third, many of those being prescribed SSRIs were under the age of 18. Children between the ages of six and eighteen received 735,000 SSRI prescriptions in 1996, an increase of 80% over the previous two years. Depression was a rising concern among youngsters, affecting an estimated 5% of children five to twelve years old, and 10% of adolescents.[39] Teen suicide rates had tripled since the 1950s, and depression was believed to be a major factor in school failure. A 1997 article in *Newsweek* described one child whose life was apparently saved by medication:

> Buddy was a cheerful, popular imp when he started first grade. But as the year progressed he developed frequent headaches and became hypersensitive to criticism. By summertime, he had lost interest in his friends and dropped his hobby of tinkering with old electronic gizmos. Second grade bored him so deeply that his parents tried moving him into a third-grade class, but his mood only worsened. A psychiatrist placed him on Paxil after [a] suicide attempt, and the family says it saved his life. Though Buddy now splits his time between a class for gifted kids and one for the emotionally disturbed, he has reclaimed his curiosity and humor. [40]

Some adults, however, were ambivalent about prescribing SSRIs to youngsters, particularly since the drugs had not been tested on children during clinical trials:

> My niece is very shy. Although she is a smart girl, she never raises her hand in class. She has a hard time making new friends and was reluctant to go to camp this summer, even though she had a good time once she got there. This is a pattern, so my sister has asked the pediatrician about Paxil. She heard that it is good for shyness, and he is willing to prescribe it. I am appalled that they would medicate an eight-year-old like this. I was a shy kid myself, and I grew out of it. This issue is creating tension in the family. Is Paxil safe for a child?[41]

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[36] Craig Gunsauley, "Prozac Nation," *Employee Benefit News*, March 1, 2002.

[37] Michael Rust, "The power of Prozac," *Insight on the News*, September 14, 1998.

[38] Craig Gunsauley (2002).

[39] Mary Crowley, "Do kids need Prozac?" *Newsweek*, October 20, 1997, p. 73.

[40] Crowley (1997), p. 73.

[41] Joe Graedon and Teresa Graedon, "Does Shy Child Need Medicine?" *The Plain Dealer,* August 14, 2000, p. 10E.

One physician was outraged by a press release he received from the Anxiety Disorders Association of America:

> It said if your child is afraid of going back to school, maybe it's not normal, maybe your child needs drugs. It defined childhood anxiety as an "inability to separate from home" and "excessive worry about social situations." As a new school year begins, what child doesn't have those problems? The release says three children in every class have an anxiety disorder. The solution? Enclosed [were] . . . details of the wonders of Paxil. . . .[42]

Adding to the backlash was growing criticism about the boom in direct-to-consumer advertising for antidepressants.[43] A National Center for Health Statistics report suggested that television and print ads directed toward patients were hyping demand for prescriptions drugs such as Paxil.[44] (See **Exhibit 11** for the growth in DTC advertising since 1997. See **Exhibit 12** for a list of the Top 10 most advertised drugs in the United States). As one doctor argued:

> The United States is the only industrialized nation that allows drugs to be advertised to the public. Other nations find the practice to be unethical. I have had patients come into my office who have seen these ads, and . . . they become convinced that they need that particular drug, which is often the most expensive one for their particular condition. These branding ads paint a rosy picture that may create unrealistic expectations for patients.[45]

Finally, critics complained that the information communicated through DTC marketing was misleading. For example, the list of side effects associated with SSRIs appeared to be growing as the long-term effects of the drugs were beginning to come to light. Most DTC advertisements either neglected to mention, or tended to gloss over, these side effects.

Side effects included facial and body tics, agitation, nausea, insomnia, diarrhea, sexual dysfunction, and an increased risk of gastrointestinal bleeding among people aged 65 or over. There appeared to be a slight risk of seizures associated with SSRIs, and in some rare cases, reports of manic, violent, or suicidal behavior. There was also increasing evidence that withdrawal from SSRIs could be severe and debilitating. One psychiatrist recounted a typical story:

> Tanya was prescribed Paxil after two severe panic attacks landed her in the emergency room. . . . After five months, in consultation with her own doctor, she decided to stop taking the drug. . . . [Two days later,] while swimming in the university pool, she was struck by what felt like electrical currents coursing through her body. . . . Terrified, she thought the water had been accidentally electrified. . . . [Once out of the water] the "zapping" sensations in her brain continued, jolting down her body. She felt nauseous and dizzy, with a strange "buzzing" in

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[42] Michael Breen, "Shyness Becomes a Disease," *Chicago Sun-Times,* September 3, 2000, p. 11; and Scott Gottlieb, "Pills For What Ails You Socially," *The Los Angeles Times,* July 23, 2000, p. M2.

[43] Critics also expressed concern that DTC advertising was driving up the costs of prescription drugs. Pharmaceutical firms typically enjoyed a 16% to 20% return on gross revenues, which they justified by pointing out that, for every $5 in revenues, they had to put back $1 in Research and Development (R&D); see "Pharmaceutical Marketplace Dynamics," *National Health Policy Forum*, May 31, 2000. But as one professor and pharmacoeconomist countered, "The drug companies give the impression that they need those profits to fund R&D. But no, that's not true. . . . On average, for every $100 spent on a drug at the manufacturer's level, the actual cost of making it is about $10 to $15. A further $20 goes to R&D. About $15 goes to taxes and administrative costs. About $30 goes to advertising and marketing. And about $20 goes to profit." See Patricia Barry, "What's behind high drug prices in the U.S.?" *AARP Bulletin*, 41, no. 4 (April 2000), pp. 6–7.

[44] Six of the Top 10 DTC spending products (see **Exhibit 13**) were also among the Top 20 best-selling drugs in the U.S. See "Medication Nation," *St. Louis Post-Dispatch,* July 23, 2001, p. C18.

[45] As cited in Gale Scott, "Prescription Pitches Are Direct-to-Consumer," *The New York Times,* August 21, 2001.

> her ears. . . . [Her doctor] confirmed that these were not symptoms of another panic attack—she was experiencing withdrawal from Paxil. . . . Tanya said, "I feel hostage to this drug. I'm petrified of not taking a dose because of the withdrawal symptoms. . . . I probably never needed this medication and now I'm on it because I can't get off it."[46]

Other physicians, however, argued that DTC advertising was actually beneficial in educating the public about hard-to-understand diseases and their treatment. A professor of psychiatry at the University of California in San Diego noted:

> When I talk to family physicians, I don't hear them saying "I have all these people who are asking for medicines they don't need." They say, "This patient said she had social anxiety, and I've been treating her for years and I never thought to ask about it." What could be negative about that? . . . Would somebody who is not having a problem take a medicine that is costly and has side effects? I don't think too many people would do that. The idea that this is cosmetic psychopharmacology I find offensive.[47]

Jenna Wallace, a spokeswoman for the National Foundation for Depressive Illness, a New York-based clearinghouse for information about depression, added, "It's odd. . . . We ask people who are suffering from depression to live without their medication, but we don't ask the same of diabetics. . . . There's a deep-seated stigma surrounding mental illness—that it's not a medical condition, it's a moral issue."[48]

The Introduction of Generic SSRIs into the Market

By 2001, the market landscape had changed considerably from the time Prozac had first been introduced. For one thing, Prozac's patent was set to expire in August 2001, and it was unclear how Lilly and its competitors should adjust their marketing strategies. Typically, in the first six months after a patent expired, only one generic was allowed on the market (in this case, a generic produced by Barr Laboratories). The price for this generic was usually set at about 25% below that of the branded drug. After that, a number of generics tended to enter the market, and the price for generics tended to settle at about 20% of what the branded drug had cost on patent.[49]

In the case of Prozac, most patients paid anywhere from $50 to $100 for a 30-day prescription. For patients with health insurance, this payment was generally covered—aside from a co-payment that typically ranged from $5 to $25—provided that the condition being treated was covered by their insurance company. However, after August 2001, patients who were unwilling to switch to a generic version would, in many cases, have to pay a premium in the form of higher co-payment to keep their Prozac prescriptions.[50] In response to this anticipated price competition, Lilly had adopted a multi-pronged strategy that involved the following elements:

(1) ***The development of new delivery methods for Prozac***. In early 2001, Lilly had received FDA approval for a 90 mg. version of Prozac that could be taken just once a week. The marketing

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[46] Excerpted from patient history cited in Glenmullen (2000), pp. 64–71.

[47] Murray Stein, psychiatry professor at the University of California San Diego, cited in Shankar Vedantam, " Drug Ads Hyping Anxiety Make Some Uneasy," *The Washington Post,* July 16, 2001, p. A1.

[48] Rust (1998).

[49] "When patents expire," *Brandweek*, July 16, 2001.

[50] This was not true in every case; policies varied depending on the form of insurance.

campaign for Prozac Weekly had begun in May; it not only emphasized patient convenience, but also offered free samples to users interested in switching from Prozac or other SSRIs.

(2) ***The repositioning of Prozac for new indications***. Throughout the 1990s, Lilly had sought FDA approval for the use of fluoxetine hydrochloride in the treatment of several other disorders. It had already received approvals from the FDA for obsessive-compulsive disorder and bulimia, and had recently become the first antidepressant approved for the treatment of geriatric depression (depression among the elderly) in the United States.[51]

In 2000, Lilly had also received FDA approval for the use of fluoxetine hydrochloride to treat premenstrual dysphoric disorder (PMDD), a severe form of premenstrual syndrome (PMS) that was characterized by severe monthly mood swings and physical symptoms that interfered with daily life. PMDD was a "nonofficial" indication,[52] but Lilly had been able to gain patent protection for the indication until 2007,[53] and the company was optimistic about its ability to create a new market around PMDD. The color of the pill had been changed from Prozac green to a more feminine pink and lavender, and the drug had been rebranded as "Sarafem." Launched in the summer of 2000, television and print advertisements had touted the fact that Sarafem was "the first and only prescription medication for PMDD," along with the slogan, "Sarafem—More like the woman you are."

Lilly was currently awaiting FDA approval for several other indications, including panic disorder (Zoloft and Paxil had already received FDA approval for this indication) and post-traumatic stress disorder (PTSD). Lilly was also preparing to file for FDA approval of a pediatric version of Prozac, which would make it the only SSRI on the market with this claim. (See **Exhibit 13** for a list of SSRIs and the indications for which they are FDA-approved.)

(3) ***The development of new antidepressants.*** Since 1998, Lilly had increased its R&D budget 30% (to more than $2 billion) and hired hundreds of scientists in search of its next blockbuster. There were even reports that Lilly's CEO and chairmen, Sidney Taurel, had ordered Lilly's researchers not to bother with any drugs unlikely to top $500 million in annual sales.[54] With respect to the antidepressant market, Lilly was developing several non-SSRI drugs, but there was no certainty that they would make it through the FDA process. (See **Exhibit 14** for Lilly's antidepressant pipeline, **Exhibit 16** for Lilly's income statement, and **Exhibit 17** for Lilly's sales by therapeutic area.)

For its part, GSK was refining its own marketing strategy for Paxil in response to the impending patent expiry of Prozac. Although Paxil's patent extended until 2006, the availability of generic versions of Prozac was expected to have an impact on all of the SSRIs on the market. GSK's strategy for maintaining and growing market share in the antidepressant market was similar to Lilly's.

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[51] *Frost & Sullivan* (2001), pp. 6–17.

[52] PMDD was considered "nonofficial" because it was not listed in the Diagnostic and Statistical Manual (DSM), the official reference for psychiatric disorders. However, it was "under evaluation" for possible inclusion in future editions of the DSM.

[53] There are a number of ways for a pharmaceutical company to file a new patent application for a drug whose active ingredient is already on the market. It can file for a patent on a new indication of an existing drug, a new formulation of the drug (e.g., a new dosage), a new method of absorption, a new manufacturing process, etc. According to the National Institute of Health Care Management, only 36% of new drug applications approved by the FDA in the 1990s were for new chemical entities; the remaining 64% were for drugs whose active ingredients were already on the market. See James Frederick, "Patent expirations, healthcare trends bode well for increased generic sales," *Drug Store News*, March 5, 2001, p. 45

[54] Michael Arndt, "Eli Lilly: Life after Prozac," *BusinessWeek*, July 23, 2001, p. 80.

(1) ***The development of new delivery methods for Paxil.*** In 1999, GSK had received FDA approval for a controlled-release version of Paxil (Paxil CR), although this new version had not yet been launched. The FDA approval had been for the treatment of depression, and the company was now awaiting approval for the use of Paxil CR in treating panic disorder as well. There were reports that Paxil CR produced fewer side effects (in particular, less nausea) than current versions of Paxil.

(2) ***The repositioning of Paxil for new indications***. Paxil was already FDA-approved for a number of indications, including depression, OCD, panic, and social anxiety disorder. Paxil had also recently received FDA approval for the treatment of generalized anxiety disorder (GAD). It was currently awaiting approval for PTSD, and was in the midst of Phase III trials for the treatment of PMDD (using a controlled-release formulation).

(3) ***The development of new antidepressants.*** In 2000, GSK had invested over $3.5 billion in research and development.[55] In the non-SSRI antidepressant market, GSK already had a successful product in Wellbutrin (Wellbutrin was also marketed for smoking cessation under the brand name "Zyban") and was working to develop other selective norepinephrine reuptake inhibitors. (See **Exhibit 15** for other GSK antidepressants in the pipeline, **Exhibit 16** for GSK's income statement, and **Exhibit 18** for GSK sales by therapeutic area.)

Although the entry of generics was expected to eat into the market shares of Prozac and other branded SSRIs, it was not clear by how much. Many industry observers believed that Prozac's enormous brand recognition would enable it to withstand price competition from generics. More generally, it was believed that the ability to directly speak to consumers (through DTC advertising) gave all pharmaceutical companies added flexibility in dealing with the expiration of patents. Given that it was now possible to create consumer brand loyalty toward particular drugs, the erosion of margins and market share as a result of the availability of generics no longer seemed inevitable. As one healthcare marketing expert put it:

> Companies need to work on strengthening brand from the start, so that when patents expire they have developed brand loyalty and can feel the benefits. Having a strong brand name makes it easier to work directly with patients after a brand goes off patent. If you have high patient involvement then you can use tactics like patient advocacy groups, where you can highlight the values and unique properties of a brand.[56]

[55] GlaxoSmithKline, Annual Report, 2001.

[56] Cited in Nick Purdom, "Top drug brands face a bitter pill: What happens to popular brand name drugs, such as Prozac, when their patents run out and the generic competitors move in?" *PR Week*, September 3, 1999.

Exhibit 1 Depressive Disorders

In the U.S., mental disorders are diagnosed based on the *Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV,* published 1994*).* Conditions not defined in the DSM are generally not covered by U.S. health insurers.

In any given one-year period, 9.5% of the U.S. adult population (about 18.8 million adults) suffer from a depressive disorder. Depressive disorders include major/clinical depression, dysthymic disorder, and bipolar disorder. Symptoms of depression include:

- Persistent sad, anxious, or "empty" mood
- Feelings of hopelessness, pessimism
- Feelings of guilt, worthlessness, helplessness
- Loss of interest or pleasure in hobbies and activities that were once enjoyed, including sex
- Decreased energy, fatigue, being "slowed down"
- Difficulty concentrating, remembering, making decisions
- Insomnia, early-morning awakening, or oversleeping
- Appetite and/or weight loss, or overeating and weight gain
- Thoughts of death and suicide; suicide attempts
- Restlessness, irritability
- Persistent physical symptoms that do not respond to treatment, such as headaches, digestive disorders, and chronic pain

Major (Clinical) Depression: A person is diagnosed to be suffering from major depression if several of the symptoms listed above persist nearly every day for at least two weeks. About 10 million people in the U.S. are believed to be suffering from major depression.

Dysthymic Depression: Dysthymia[a] is a milder form of depression that is more chronic. Symptoms last at least two years, but are not as disabling as in major depression.

Manic-Depressive (Bipolar) Disorder: A person who has this form of depression will swing between extreme poles of emotion. During a depressive phase, the person has symptoms of major depression; during a manic phase, the person may exhibit inappropriate displays of happiness or excitement, an extremely high energy level, the need to talk constantly, the need to take dangerous risks, etc.

Some additional facts about depression:

- Women are about two times more likely to suffer from depression than men.
- Depression often starts during the late 20s (although it can strike at any age).
- The children, siblings, and parents of a person with depression are up to three times more likely to suffer from major depression than those with no family history.
- People with other medical illnesses or substance-abuse problems are at higher-than-average risk for depression.

Source: Adapted from Institute of Mental Health information.

[a] Pronounced dis-THIME-ee-uh.

Exhibit 2 The FDA Approval Process

		Clinical Trials			
	Discovery and Preclinical Testing	**Phase I**	**Phase II**	**Phase III**	**FDA Review**
Years	4.5	1	2.5	2	3
R&D Budget	15%–20%	20%–25%	20%–25%	30%–35%	
Purpose	Assess safety and biological activity	Determine safety and dosage	Evaluate effectiveness, look for side effects	Verify effectiveness, monitor adverse reactions	1. Submit NDA (new drug application) 2. FDA reviews the NDA 3. Approval
Success rate	5,000–10,000 compounds evaluated; 250 enter preclinical testing	5 compounds enter clinical trials			1 approved

Preclinical Testing: A pharmaceutical company conducts laboratory and animal studies to show biological activity of the compound against the targeted disease, and the compound is evaluated for safety. After completing preclinical testing, the company files an "investigational new drug application" (IND) with the FDA to begin to test the drug in people.

Phase I: Phase I consists of tests to study a drug's safety profile, including the safe dosage range. The studies also determine how a drug is absorbed, distributed, metabolized and excreted, and the duration of its action.

Phase II: Phase II consists of controlled tests on patients with the disease to assess the drug's effectiveness.

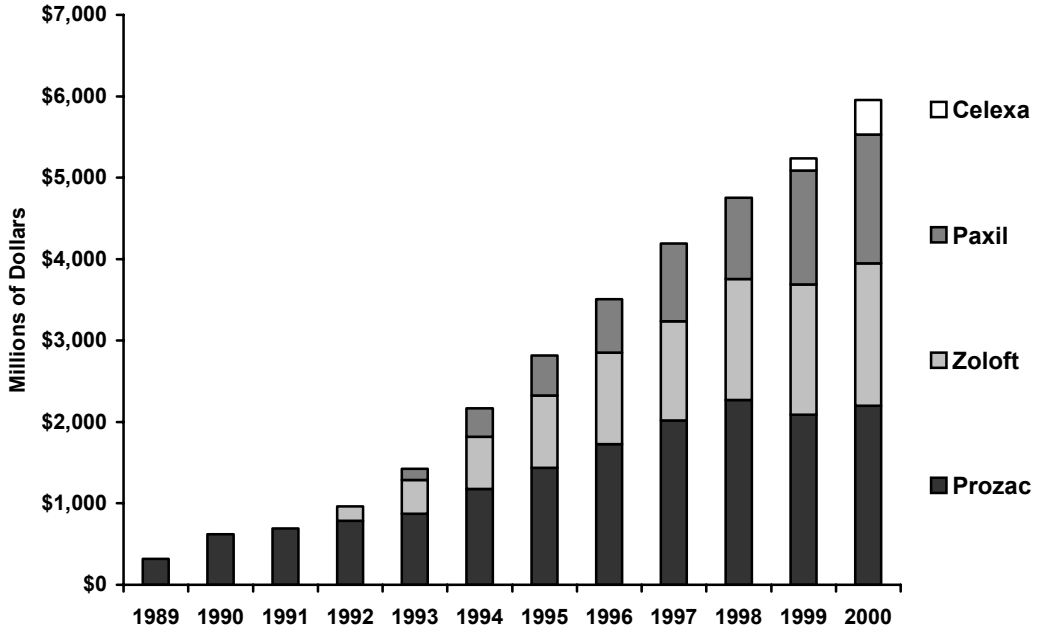
Phase III: Phase III consists of controlled tests on patients with the disease to verify the drug's effectiveness. Physicians monitor patients carefully to confirm efficacy and identify adverse events.

NDA Submission: Following completion of all three phases of clinical trials, a company analyzes the data and files an NDA (new drug application) with the FDA. NDAs are often 100,000 pages long.

Approval: Once the FDA approves an NDA, the new medicine becomes available for physicians to prescribe. A company must continue to submit periodic reports to the FDA, including any cases of adverse reactions and appropriate quality-control records. For some medicines, the FDA requires additional trials (Phase IV) to evaluate long-term effects.

Source: Adapted from Pharmaceutical Research and Manufacturers of America, based on data from the Tufts Center for the Study of Drug Development. Data on allocation of money in the average R&D process from Deutsch Banc Alex Brown.

Exhibit 3 Sales of SSRIs over Time, United States Only



Source: Casewriter researcher.

Note: Prozac sales include Sarafem sales in 2000. The chart excludes sales of Luvox, an SSRI that was approved for the treatment of obsessive-compulsive disorder in the U.S. in 1995.

Exhibit 4 Various Anxiety Disorders

Anxiety disorders are believed to be the most common of emotional disorders, affecting about 19 million Americans every year. Each anxiety disorder has its own distinct features, but all are characterized by excessive, irrational fear and dread. The anxiety disorders include:

Panic Disorder: People with panic disorder have feelings of terror that strike suddenly and repeatedly without warning (they can even occur during sleep). During these panic attacks, individuals experience a pounding heart or chest pain, sweating, dizziness, trembling, shortness of breath, numbness, chills, and hot flashes. Because these attacks occur unexpectedly and seemingly without reason, many people with panic disorder initially believe they are having a heart attack.

Obsessive-Compulsive Disorder (OCD): People with OCD are plagued by persistent, unwelcome thoughts or images, or the urgent need to engage in certain rituals (e.g., hand washing). If OCD becomes severe, it can prevent the sufferer from holding down a job or carrying out normal responsibilities.

Post-Traumatic Stress Disorder (PTSD): PTSD is a debilitating condition that can develop following a terrifying event. People with PTSD often have persistent frightening thoughts and memories of their ordeal and feel emotionally numb. Some repeatedly relive the trauma in the form of nightmares and disturbing recollections during the day.

Social Anxiety Disorder (SAD): People with social anxiety disorder (also known as "social phobia") experience overwhelming anxiety and excessive self-consciousness in typical social situations. They have a persistent, intense, and chronic fear of being watched and judged by others and being embarrassed or humiliated by their own actions. This fear may be so severe that it interferes with everyday responsibilities.

Specific Phobias: A specific phobia is an intense fear of something that poses little or no actual danger. Some of the more common specific phobias are centered around closed-in places, heights, escalators, tunnels, highway driving, water, flying, dogs, and injuries involving blood.

Generalized Anxiety Disorder (GAD): People with GAD experience ongoing, exaggerated tension that interferes with daily functioning. Individuals with GAD worry constantly, even when there is no apparent reason to do so.

Source: Adapted from National Institute of Mental Health, January 2001.

Exhibit 5 Estimated U.S. Population Size of Various Disorders (2000)

Disorder	Total Population (millions)	Percentage of Adult Population
Depressive Disorders		
Major (Clinical) Depression	9.9	5.0%
Dysthymic Disorder	10.9	5.4%
Bipolar Disorder	2.3	1.2%
Anxiety Disorders		
Panic Disorder	2.4	1.7%
Obsessive-Compulsive Disorder (OCD)	3.3	2.3%
Social Anxiety Disorder (SAD)	5.3	3.7%
Post-Traumatic Stress Disorder (PTSD)	5.2	3.6%
Generalized Anxiety Disorder (GAD)	4.0	2.8%
Specific Phobia	6.3	4.4%

Source: Adapted from National Institute of Mental Health data, January 2001.

Exhibit 6 Additional Information about SSRIs

	Prozac	Zoloft	Paxil	Celexa
Company	Eli Lilly	Pfizer	SKB/GSK	Forest Labs
Active ingredient	Fluoxetine	Sertaline	Paroxetine	Citalopram
Market Entry Date	January 1988	February 1992	January 1993	July 1998
Initial Indication	Depression	Depression	Depression	Depression
Expected Patent Loss	2001	2005	2006	2009
Cost/30 days (in 2000)	$79.20	$70.20	$65.70	$57.90

Source: Adapted from "U.S. Antidepressant Medications Market," *Frost & Sullivan*, Report #7458-52, 2001.

Exhibit 7 Advertisement for Prozac

Depression hurts.

Depression isn't just feeling down. It's a real illness with real causes. Depression can be triggered by stressful life events, like divorce or a death in the family. Or it can appear suddenly, for no apparent reason.

Some people think you can just will yourself out of a depression. That's not true. When you're clinically depressed, one thing that can happen is the level of serotonin (a chemical in your body) may drop. So you may have trouble sleeping. Feel unusually sad or irritable. Find it hard to concentrate. Lose your appetite. Lack energy. Or have trouble feeling pleasure. These are some of the symptoms that can point to depression – especially if they last for more than a couple of weeks and if normal, everyday life feels like too much to handle.

To help bring serotonin levels closer to normal, the medicine doctors now prescribe most often is Prozac.® Prozac isn't a "happy pill." It's not a tranquilizer. It won't take away your personality. Depression can do that, but Prozac can't.

Prozac has been carefully studied for nearly 10 years. Like other antidepressants, it isn't habit-forming. But some people do experience mild side effects, like upset stomach, headaches, difficulty sleeping, drowsiness, anxiety and nervousness. These tend to go away within a few weeks of starting treatment, and usually aren't serious enough to make most people stop taking it. However, if you are concerned about a side effect, or if you develop a rash, tell your doctor right away. And don't forget to tell your doctor about any other medicines you are taking. Some people should not take Prozac, especially people on MAO inhibitors.

As you start feeling better, your doctor can suggest therapy or other means to help you work through your depression. Remember, Prozac is a prescription medicine, and it isn't right for everyone. Only your doctor can decide if Prozac is right for you – or for someone you love. Prozac has been prescribed for more than 17 million Americans. Chances are someone you know is feeling sunny again because of it.

Prozac can help.

prozac®
fluoxetine hydrochloride

Welcome back.

Please see important information on following page. Lilly

Source: Eli Lilly and Company.

Exhibit 8 Definition of Social Anxiety Disorder (SAD)

People with social anxiety disorder (or social phobia) experience overwhelming anxiety and excessive self-consciousness in social situations. They have a persistent and intense fear of being watched by others. People with SAD often worry for days or weeks in advance of a dreaded situation.

Social phobia can be limited to only one type of situation—e.g., formal or informal speaking situations—or, in its most severe form, can occur anytime the sufferer is around other people. Physical symptoms can include blushing, profuse sweating, trembling, difficulty talking, and nausea or other stomach discomfort. Fear of symptoms can create a vicious cycle: as the sufferer worries about experiencing the symptoms, the greater his/her chances of developing the symptoms.

Social phobia often runs in families and may be accompanied by depression or alcohol dependence. It occurs in women twice as often as in men, although a higher proportion of men seek help for this disorder. The disorder typically begins in childhood or early adolescence and rarely develops after age 25.

Source: Adapted from National Institute of Mental Health.

Exhibit 9 Sample Headlines about Social Anxiety Disorder

"Socially Phobic? Now There's Hope," ***BusinessWeek***, May 10, 1999

"Social Anxiety," ***U.S. News & World Report***, June 21, 1999 (cover story)

"Selling Shyness," ***The New Republic***, August 2, 1999

"Drug Firm touts 'Cure' for Shyness—But Is It An Illness?" ***Chicago Sun-Times***, January 23, 2000

"Pills for What Ails You Socially," ***Los Angeles Times***, July 23, 2000

Source: Casewriter research.

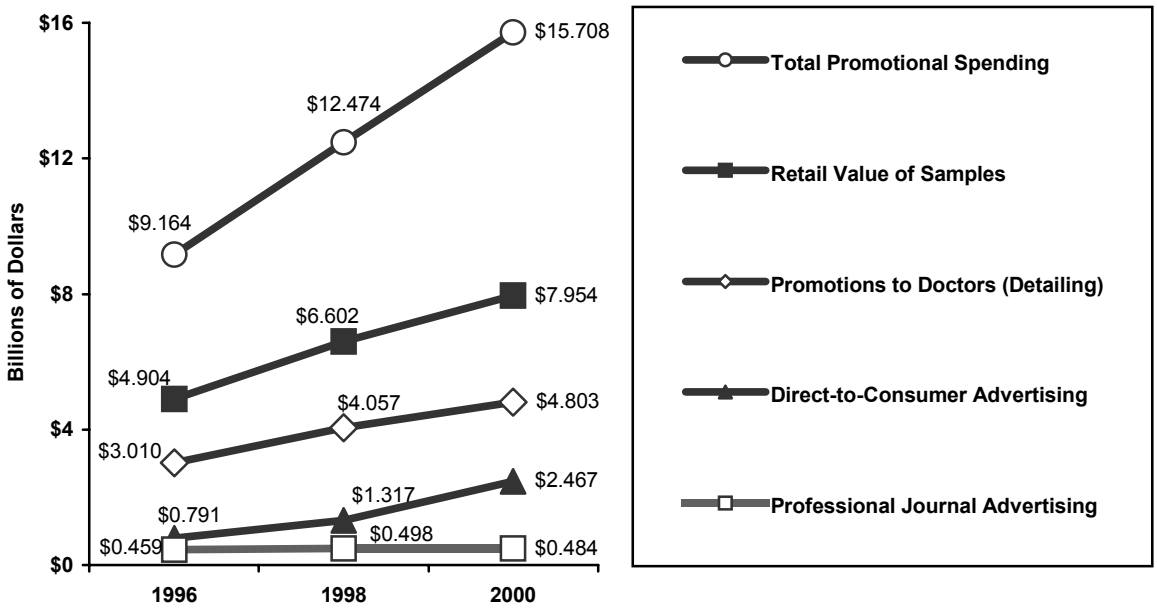
Exhibit 10 Self-Test for Social Anxiety Disorder, from the Paxil Website

Instructions: Please choose the answer that best describes how much the following problems have bothered you during the past week.

		not at all 0	a little bit 1	somewhat 2	very much 3	extremely 4
1.	I am afraid of people in authority.	O	O	O	O	O
2.	I am bothered by blushing in front of people.	O	O	O	O	O
3.	Parties and social events scare me.	O	O	O	O	O
4.	I avoid talking to people I don't know.	O	O	O	O	O
5.	Being criticized scares me a lot.	O	O	O	O	O
6.	Fear of embarrassment causes me to avoid doing things or speaking to people.	O	O	O	O	O
7.	Sweating in front of people causes me distress.	O	O	O	O	O
8.	I avoid going to parties.	O	O	O	O	O
9.	I avoid activities in which I am the center of attention.	O	O	O	O	O
10.	Talking to strangers scares me.	O	O	O	O	O
11.	I avoid having to give speeches.	O	O	O	O	O
12.	I would do anything to avoid being criticized.	O	O	O	O	O
13.	Heart palpitations bother me when I'm around people.	O	O	O	O	O
14.	I am afraid of doing things when people might be watching me.	O	O	O	O	O
15.	Being embarrassed or looking foolish are among my worse fears.	O	O	O	O	O
16.	I avoid speaking to anyone in authority.	O	O	O	O	O
17.	Trembling or shaking in front of others is distressing to me.	O	O	O	O	O

Source: Adapted from http://www.paxil.com/test/st_sai.html.

Exhibit 11 Growth in Pharmaceutical Promotional Spending over Time



Source: Adapted from IMS Health, Inc., *Integrated Promotion Service*, and Competitive Media Reporting, 1996–2001.

Exhibit 12 U.S. Top 10 Most Advertised Prescription Drugs (2000, in $ millions)

Drug	Company	Indication	2000 Sales	2000 DTC Spending
Vioxx	Merck & Co.	Anti-inflammatory	1,518.0	160.8
Prilosec	AstraZeneca	Anti-ulcerant (PPI)	4,102.2	107.9
Claritin	Schering-Plough	Antihistamine	2,035.4	100.3
Paxil	GlaxoSmithKline	Antidepressant	1,808.0	92.1
Zocor	Merck & Co.	Cholesterol-lowering	2,207.0	91.2
Viagra	Pfizer	Erectile Dysfunction	809.4	89.5
Celebrex	Pharmacia/Pfizer	Anti-inflammatory	2,015.0	78.8
Flonase	GlaxoSmithKline	Asthma	618.7	78.1
Allegra	Aventis	Antihistamine	1,120.4	67.0
Meridia	Knoll	Weight-loss	113.2	65.0

Source: Adapted from Competitive Media Reporting, *Strategy Report*, March 2001.

Exhibit 13 The SSRIs: FDA Approval Status for Various Indications as of 2002

	Prozac	Zoloft	Paxil	Celexa	Luvox
Major Depression	Approved 1987	Approved 1992	Approved 1993	Approved 1998	
Dysthymia	Approved 1990				
Geriatric Depression	Approved 1991				
Pediatric Depression	Preparing to file NDA				
Panic Disorder	Awaiting FDA approval	Approved 1995	Approved 1995		
Obsessive-Compulsive Disorder (OCD)	Approved 1994	Approved 1997	Approved 1996		Approved 1995
Social Anxiety Disorder (SAD)		Clinical trials	Approved 1999		
Post-Traumatic Stress Disorder (PTSD)	Preparing to file NDA	Approved 2001	Awaiting FDA approval		
Generalized Anxiety Disorder (GAD)			Approved 2001		
Bulimia	Approved 1996				
Premenstrual Dysphoric Disorder (PMDD)	Approved 2000 (Sarafem)	Awaiting FDA approval	Phase III Clinical Trials		

Source: Casewriter research.

Exhibit 14 Eli Lilly's Pipeline for Drugs in the Psychiatric Market (Partial List)

Product	Class	Indication	Status
Atomoxetine	Atypical[a]	Attention Deficit Hyperactivity Disorder; adults and children	FDA approval est. 2002
Duloxetine	Atypical[a]	Depression	FDA approval est. 2002/2003
Zyprexa	Atypical[a] anti-psychotic	Schizophrenia (Short-acting intramuscular formulation)	Phase III
Prozac	SSRI	Depression—Japan	Phase III
MGluR2	Atypical[a]	Anxiety	Phase II
OFC	Prozac/Zyprexa combination	Refractory and Psychotic Depression	Phase II
Zyprexa	Atypical[a] anti-psychotic	Bipolar Depression	Phase II
Zyprexa	Atypical[a] anti-psychotic	Schizophrenia (Long-acting depot)	Phase II

Source: Adapted from company reports for 2001.

[a]As used above, the term "atypical" refers to an antidepressant that does not fall into the SSRI, tricyclic, and MAOI classes of antidepressants.

Exhibit 15 GlaxoSmithKline's Pipeline for Drugs in the Psychiatric Market (Partial List)

Product	Class	Indication	Status
Paxil	SSRI	Post-Traumatic Stress Disorder	FDA approval est. 2001 (Dec.)
Paxil CR	SSRI	Panic Disorder (controlled release formulation)	FDA approval est. 2002
Paxil CR	SSRI	Premenstrual Dysphoric Disorder (controlled release formulation)	Phase III
Wellbutrin XL	Atypical[a]	Depression (controlled release formulation)	Phase III
Lamictal	Atypical[a]	Bipolar Disorder (long-term prophylaxis)	Phase III
Lamictal	Atypical[a]	Bipolar Disorder (acute treatment)	Phase III
Vilazodone SB659746A (EMD68843)	SSRI and 5HT1a partial agonist	Depression	Phase II
SB271046	Atypical[a]	Schizophrenia & Alzheimer's Disease	Phase II
GW597599	Atypical[a]	Depression & Anxiety	Phase I
GW468816	Atypical[a]	Smoking cessation	Phase I
SB723620	Atypical[a]	Anxiety & Depression	Phase I
Talnetant (SB223412)	Atypical[a]	Schizophrenia	Phase I
GW353162	Atypical[a]	Depression & Bipolar Disorder	Phase I

Source: Adapted from company reports for 2001.

[a]As used above, the term "atypical" refers to an antidepressant that does not fall into the SSRI, tricyclic, and MAOI classes of antidepressants.

Exhibit 16 Eli Lilly & Company and GlaxoSmithKline Income Statements, 2000

	Eli Lilly $ (in millions)	GlaxoSmithKline $ (in millions)
Human Pharmaceuticals sales	10,271	23,452
Consumer Healthcare sales	--	4,028
Animal Health sales	668	--
Total Sales	**10,953**	**27,480**
Cost of sales	(2,068)	(6,023)
Marketing and administrative (SG&A)	(3,228)	(10,846)
Research and development	(2,019)	(3,839)
Other Operating Income	---	416
Total Operating Expenses	**(7,315)**	**(20,292)**
Operating Income	**3,638**	**7,188**
Net Income	**2,905**	**6,314**

Source: Adapted from Annual Reports, 2000.

Exhibit 17 Eli Lilly and Company Pharmaceutical Sales by Therapeutic Area (2000)

Therapeutic Area	% of Total
Central Nervous System (includes Prozac, Zyprexa, and others)	50%
Endocrine	25%
Anti-Infectives	7%
Oncology	6%
Cardiovascular	5%
Gastrointestinal	3%
Other	4%
Total	100%

Source: Adapted from Eli Lilly Annual Report, 2000.

Exhibit 18 GlaxoSmithKline Pharmaceutical Sales by Therapeutic Area (2000)

Therapeutic Area	% of Total
Central Nervous System (includes Paxil, Wellbutrin, and others)	21%
Respiratory	18%
Anti-Bacterials	16%
Anti-Virals	12%
Metabolic and Gastrointestinal	8%
Vaccines	6%
Oncology and Emesis	5%
Cardiovascular	3%
Dermatologicals	2%
Arthritis	1%
Other	8%
Total	100%

Source: Adapted from GlaxoSmithKline Annual Report, 2000.

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ROBERT J. DOLAN

Analyzing Consumer Preferences

Introduction

Consumer preferences are at the heart of marketing. When we analyze consumer behavior, we are typically assessing how consumers make purchase decisions (i.e., the process via which they come to value one purchase alternative over another). Understanding of consumer preferences is particularly important for product policy (e.g., what features to have, whether or not to offer a new product) and pricing decisions.

Two procedures with proven utility for the actionable analysis of consumer preferences are

1. Concept testing,
2. Conjoint analysis.

A concept test is very straightforward: consumers are presented with a product idea and directly asked for their reaction (e.g., how likely would you be to buy this product?). We describe this type of testing and provide examples in Section I. While useful in many situations, the standard concept test has some important limitations. To a large extent, these limitations relate to the diagnostic information provided. If consumers collectively rate a product concept poorly, we know we should not launch the product—but the real question we want input to is how to fix it so that we do have a product that is acceptable to the marketplace. The consumer's reaction to a product (e.g., I am likely to buy it or I'm not) is a reflection of the consumer's underlying preferences.

Conjoint analysis, described in Section II, is a set of procedures developed to overcome a fundamental limitation of concept tests. In conjoint, we reorient our efforts not to look at reactions to a product idea per se but to get insight into the underlying preferences. The development of software to facilitate the consumer questioning and data analysis to achieve this result has been an active area of research—both by market research practitioners and academics. Conjoint is a staple of market research firms' offerings, and several firms specialize in conjoint applications. Thousands of conjoint studies are done each year in product categories ranging from hotels, rural health care systems, and cellular telephones to blue jeans. Section II describes this method and includes example applications. While not focusing on statistical details, we provide some intuition for the data analysis procedures.

Professor Robert J. Dolan prepared this note as the basis for class discussion.

Section I: Concept Testing

Standard Concept Tests are widely used. For example, Colgate-Palmolive[1] faced the issue of whether or not to introduce a new toothbrush and how to position it. Research was conducted presenting mock advertisements conveying various positioning alternatives to consumers. Consumers reacted to the offerings on a five-point "purchase intention" scale, marking one box:

Definitely would buy	☐
Probably would buy	☐
Might/Might not buy	☐
Probably would not buy	☐
Definitely would not buy	☐

The best of the Colgate options found 87% of consumers rating the concept in one of the "top two boxes." This information helped to indicate the potential for the product.

In a similar vein, when BIOPURE[2] received FDA approval for a blood substitute for dogs, it conducted a survey in which the product was described to veterinarians who were then asked if they "would try" the product in critical and noncritical cases. At a price of $100, 95% reported being willing to try for critical cases and 70% for noncritical.

Executing a Concept Test

Designing a concept test presents the usual survey design issues of what sample size to have and how to select respondents. In addition to this, the two key executional decisions in a concept test are

1. How to communicate the concept,
2. The data to collect from respondents.

On the first issue, Colgate chose to present a "positioning concept" (i.e., the product concept was presented in persuasive form by showing consumers mock advertisements for the Precision toothbrush). An alternative is to state the core idea only without an accompanying marketing message (e.g., "Precision is a new toothbrush with bristles of varying lengths resulting in 35% more plaque removal."). There is no general rule on "core idea" vs. "positioning concept" being the better choice for concept testing. Generally, using a "positioning concept" approach gives better prediction of actual marketplace reaction because there is a closer match of what the respondent sees to what will be seen in the actual purchase situation. The caveat on "positioning concepts" is that the response obtained is a reaction both to the product and the quality of the accompanying presentation

[1] "Colgate-Palmolive Company: The Precision Toothbrush," HBS Nos. 593-064 or 499-082 (condensed version).

[2] "BIOPURE Corporation," HBS No. 598-150.

of the positioning. So, two things are being mixed together. Another important point is not to be comparing scores from a "positioning concept" test and a "core idea" test.

The second issue is the data to collect. Colgate and BIOPURE typify concept testing in that some form of purchase intention data were collected. This is often augmented by three other forms yielding the set:

1. Intended Purchase Measures
2. Overall Product Diagnostics
3. Special Attribute Diagnostics
4. Respondents Profiling Variables

Data Type #1: Purchase Measures Purchase measures include likelihood of purchase and expected amount. Purchase intention is captured through questions like "Based on this product description, how likely would you be to buy this product if it were conveniently available?"; check one:

- ❑ Definitely would buy
- ❑ Probably would buy
- ❑ Might or might not buy
- ❑ Probably would not buy
- ❑ Definitely would not buy

While this five-point scale is most common, six-, seven-, and eleven- point scales are also used.

For nondurable goods, the frequency of purchase is also key. Purchase intent is a good indicator of trial, but forecasting volume sold requires knowing whether the product will be part of someone's everyday consumption habit or a special-occasion item. The expected purchase incidence question adds this dimension. Again, there is a variety of ways to specify this question but generally it takes a form such as "Which statement best describes how often you think you would buy this product if it were conveniently available to you?"

- Once a week or more often
- Once every two or three weeks
- Once a month
- Once every two to three months
- Once every four to six months
- Less often
- Never

In cases where the product may come in different sizes or is such that multiple units might be purchased at one time, respondents are probed on these issues as well.

In summary, given

Sales volume per potential user in time period = % of potential users in market

who try product

* Expected number of purchases in the period for triers

* Expected number of units per purchase

the purchase measures from a concept test typically are designed to measure the three variables on the right-hand side.

Data Type #2: Overall Product Diagnostics Diagnostic data give insight into why the purchase data turned out the way it did. With respect to the overall concept, tests usually assess the product's perceived uniqueness (e.g., On a 1-5 scale where 1 = very similar and 5 = quite distinct, how would you rate the product relative to ones currently on the market?) and believability (i.e., Does the respondent believe the product can do what it claims?). For example, can the Colgate Precision toothbrush remove 35% more plaque?

Since a high-uniqueness, high-believability concept could still generate low purchase interest, firms usually assess how salient the product is to solving a consumer's problem and its overall interest to the consumer. For example, while a respondent may rate a television permitting the viewing of three channels at once as both unique and believable, purchase interest may be low because the respondent does not view the current channel constraint as a problem.

Data Type #3: Specific Attribute Diagnostics When a concept has a number of attributes or benefits offered, it is useful to probe which attributes/benefits significantly contribute to or distract from the purchase intention. One method is the use of open-ended questions such as "you said that you [state respondent's answer to purchase intention question]. What is it specifically about the product that makes you feel this way?"

A second approach is to collect data on perceptions of specific attributes and their importance to the consumer. For example, we might ask respondents exposed to a new Internet Service concept for data on perception and importance scales as follows:

Perception: How do you perceive the service on each of the following dimensions?					
	Excellent				**Poor**
Entertainment Value	☐	☐	☐	☐	☐
Educational Value	☐	☐	☐	☐	☐
Ease of Site Navigation	☐	☐	☐	☐	☐

Attribute Importance: How important is the attribute to you?					
	Very Important				**Not at all important**
Entertainment Value	☐	☐	☐	☐	☐
Educational Value	☐	☐	☐	☐	☐
Ease of Site Navigation	☐	☐	☐	☐	☐

Data Type #4: Respondents Profiling Variables The final set of variables useful in analyzing concepts is the type of consumers who respond in different ways. The most obvious of these is demographics, which help in targeting efforts, but other more innovative data collection can be useful as well, for example, data on

- Current purchase behavior,
- Perception of the category,
- Satisfaction with current brands used,
- Influence in actual purchase decision.

For example, it might be important to understand how satisfied those with high purchase-intent scores are with their current brand. High satisfaction with the current brand makes a switch to a new brand less likely.

Interpreting the Purchase Intent Data

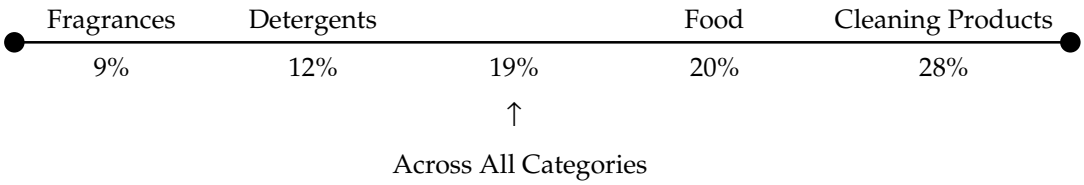
The Purchase Intent score is at the heart of a concept test. How does one best interpret these data? Colgate Precision got an 87% "top-two box" score; is this good or bad? If the brush was introduced, what sales volume could Colgate expect? These are two important, logical questions.

General rules of thumb on "good" purchase-intent scores exist. For example, Taylor, Houlahan, and Gabriel[3] claim that, based on their experience with over 100 brands in many product categories, ". . . a concept statement should receive 80% to 90% favorable answers ["I definitely will buy" or "probably will buy"] to encourage subsequent development work." Schwartz[4] states the following average scores for concept tests across all product categories:

Definitely will buy	19%
Probably will buy	64%

Adding these two gives an 83% favorable rating score—a number not inconsistent with the rule-of-thumb of Taylor, Houlahan, and Gabriel. However, Schwartz also makes the important point that average scores vary appreciably across product categories. For example, he presents data on four categories' average "definitely will buy" scores as shown in **Figure A**.

Figure A Average "definitely will buy" percent—Across all categories and in four specific categories



[3] J. Taylor, J. Houlahan, and A. Gabriel, "The Purchase Intention Question in New Product Development: A Field Test," *Journal of Marketing*, January 1975, pp. 90-92.

[4] D. Schwartz, *Concept Testing*, AMACOM, 1987.

Thus, while Taylor et al.'s "rule-of-thumb" may be a useful first cut in assessing the "goodness" of the purchase intent scores, it is only that. The variation in scores across categories shows the need to have category specific norms or benchmarks. These norms can come from (i) published sources (such as Schwartz), (ii) the company's own files, or (iii) the files of the research company hired to do the concept test. Helpful information from published sources is very limited. The second source may suffice for an active company regularly introducing products into the same categories. Generally, however, there is important value in the benchmarks established by research firms with a broad array of clients participating in many product categories. BASES Worldwide, the largest concept testing firm, has done over 10,000 concept testings and hence has a valuable database to assist in interpreting results.[5]

Section II: Conjoint Analysis

Concept tests have had a long history of use in marketing and continue to be a viable research option in many situations. Testing is relatively inexpensive, the results and methods are easily understood, and the benchmarks developed over time help in interpreting results.

However, in many situations today, the product design question is of a level of complexity that overruns the capabilities of the standard concept test. The issue is not how many people will intend to buy my 233 MHz personal computer, but how many more would be willing if I made it with 300 MHz? Suppose I had to charge $200 more for it? Suppose to offset the cost of speed, I downgrade the screen size? Made the product heavier? Reduce the warranty length? Conjoint analysis gives us a way to answer these critical questions. It has been used in a wide variety of product categories to deal with these issues of the augmented product design (i.e., product features and other value-adds like brand name and warranty coverage) and pricing. **Table A** presents a representative list.[6]

Of course, we can't get the insights conjoint provides for free. It is more difficult to develop an in-depth-enough understanding of the technique to be a responsible, productive user of it. It is more expensive and time consuming to do a conjoint study than a concept test. But, its record of successful use and its taking a place in the repertoire of first-rate marketers make exploration of it more than worthwhile.

The idea behind conjoint is simple. Think about a product category in which the hierarchy of effects is of the Learn→ Feel→ Do type (e.g., buying a new PC, enrolling in a health club, subscribing to an information service). In product categories with a high-cognitive front end, we often look at a product as a bundle of attributes. An individual's "value system" is simply how much value the person would put on each level of the attributes. That's what we need to know to dig into the kind of questions noted above on how to trade features off against each other.

The problem is that if we walked up to a consumer and said, "Please tell me your value system," he or she probably could not do it even if they wanted to. In conjoint, we get around this by asking the consumer a series of questions he or she can more easily answer (e.g., which would you prefer: a Dell running at 233 MHz for $2,000 or a Packard-Bell, running at 300 MHz for $1,700?) and we let statistic procedures do the hard stuff (i.e., go from these answers to an estimate of the underlying "value system").

Table A

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[5] P. Green, A. Krieger, T. Vavra, "Evaluating New Products," *Marketing Research*, Winter 1997.

[6] Drawn from R.J. Dolan, "Managing the New Product Development Process," HBS No. 592-011, and P. Green, *et al.*, "Evaluating New Products."

Consumer Durables

- Automobiles
- Cameras
- Cellular telephones
- Computers
- Condominium design and pricing
- Food processors
- Snowmobiles

Consumer Nondurables

- Blue jeans
- Rug cleaners
- Shampoos

Consumer Services

- Credit cards
- Rural health care systems
- Hotels
- Railway pricing

Industrial Goods

- Lift trucks
- Material requirements planning systems
- Copiers

The trick in conjoint is that, via construction of the value system, we bootstrap ourselves up from asking about preferences on a small subset of products to being able to make predictions about relative preference for *any* products with these attributes. This point will become clearer as we go along. First, we consider how one can calculate a "value system" from some overall judgments.

To get a sense of how it works, let's take an example. Consider a fitness facility interested in optimal design of its locker rooms. To keep things simple, let's say there are only two attributes potentially important to users: (i) whether or not there is a sauna and (ii) the size of available lockers. There are two alternative "levels" for the sauna ("yes" and "no") and three levels for lockers:

a. Small (20″ x 20″ x 20″) storage lockers permanently assigned plus large hanging ones (72″ x 20″ x 20″) for daily use.

b. Mid-size only (36″ x 20″ x 20″) permanently assigned.

c. No permanently assigned locker; hanging locker (72″ x 20″ x 20″) available on daily basis with mirror inside door.

There are thus 2 x 3 = 6 different sauna/locker combinations or products. One might in practice ask individuals how important these alternative attributes are. Alternatively, one can simply ask the respondent to rank order the 6 possible combinations from *most* to *least preferred*. The individual might respond as follows:

		Sauna	
		Yes	No
Locker	(SM) Small storage, large daily	Rank 2	Rank 4
	(MED) Medium storage only	Rank 1	Rank 3
	(DAY) Large daily with mirror only	Rank 5	Rank 6

With these ranks, we can ask the respondent to rate the desirability of the products, ranging from *least desirable* (a score of 0) to *most* (a score of 100). Suppose we are given the following ratings:

	Sauna	
	Yes	No

	SM	80	40	Average = 60
Locker	MED	100	60	Average = 80
	DAY	20	0	Average = 10
		Average = 66.7	Average = 33.3	

Since each locker size is rated with both levels of the sauna attribute, we can calculate the utility of an attribute level as the average of the score across all choices where it appears. Following this, we would have:

Sauna:
Yes = 66.7
No = 33.3

Locker:
SM = 60
MED = 80
DAY = 10

This is the individual's "value system." Note that it recaptures the stated original ranking data:

Product	Value System Score	Value System Score Rank	Stated Original Rank
MED + Sauna	80 + 66.7 = 146.7	1	1
SM + Sauna	60 + 66.7 = 126.7	2	2
MED + No Sauna	80 + 33.3 = 113.1	3	3
SM + No Sauna	60 + 33.3 = 93.3	4	4
DAY + Sauna	10 + 66.7 = 76.7	5	5
DAY + No Sauna	10 + 33.3 = 43.3	6	6

With this value system, we can get an idea of how important the two attributes are to the consumer: the highest-rated locker option has 80 points and the lowest has 10 for a difference of 70. The sauna differential is only 33.3, suggesting the sauna attribute is less important than the locker attribute.

In practice, obviously, things are more complicated. We have lots more attributes and we use a multiple regression-type procedure to go from overall judgments to estimated value system. Conjoint is built on the idea of something called a part-worth model. It says, if a product in a category has n attributes, then the utility of an object i in the category is:

$$U_i = U_{i1} + U_{i2} + U_{i3} + \ldots\ldots\ldots U_{in}$$

- U_i: Utility of an object i to consumer
- U_{i1}: Utility of object i's level of attribute #1 to consumer
- U_{in}: Utility of object i's level of attribute n to consumer

That is, to get the utility of an item, we just sum up over all its attributes. The idea of conjoint is that consumers have a pretty good idea of the things on the left-hand side of the equation (i.e., we can ask them about that and use that pretty reliable information to estimate the stuff on the right-hand side).

Now we will go through a real application to see how it works in practice. This is an actual study[7] for a German automobile company to design and price its new model, code-named LION. LION would be positioned in the marketplace against models from two competitors—another German-based company and a Japanese company.

Step 1 Choose Attributes

The first step in a conjoint study is to specify the possibly relevant attributes. Based on past research and its wealth of experience in the category, management specified five key attributes:

1. Brand name
2. Engine power
3. Fuel consumption
4. Environmental performance
5. Price

(A preliminary research stage is sometimes necessary to elicit possible relevant attributes from consumers, e.g., if this is a new product category for the firm.) Note the important capability that conjoint can handle a mix of hard, tangible features like engine power and fuel consumption, and intangibles like brand.

Step 2 Choose Relevant Levels of Attributes

Determine the relevant levels of the attributes that consumers should be asked to evaluate. In this case, we specified the same number of levels (three) for each of the attributes. This need not be the case, however. Conjoint can accommodate any practical number of attribute levels for an attribute. The following attribute levels were used:

- Brand
  - LION, "German" and "Japanese" (in the study, the actual names of the "German" and "Japanese" brands were used; but, for confidentiality reasons, we use those terms here)
- Engine Horsepower
  - 150 HP, 200 HP, and 250 HP
- Fuel Consumption
  - 12, 14, and 16 liters per 100 Km
- Environmental Performance
  - (i) fulfills minimum requirements, (ii) exceeds minimum requirements, and (iii) sets new standards in environmental performance
- Price (Deutschmarks/DM)
  - 50,000, 60,000, and 70,000

[7] This study was reported on in R.J. Dolan and H. Simon, *Power Pricing* (New York: Free Press, 1996).

Respondents were given a detailed description of the Environmental Performance variable and the above listing is a shorthand representation.

Step 3 Choose a Sample Size and Respondent Type

Respondents were prescreened for interest in buying an automobile in the 50,000 to 70,000 DM range within a specified time horizon.

Step 4 Choose Response Task and Survey Administration Mode

In this case, a pairwise comparison approach was used. This method describes two alternatives on all five dimensions and asks the consumer for a preference judgment between the pair. The survey was administered on a laptop computer. An example screen is as follows:

A		B
LION Brand		*Japanese Brand*
Fulfills minimum environmental requirements Fuel consumption: 16 liters Horsepower: 250 Price: DM 60,000	OR	Exceeds environmental requirements Fuel consumption: 12 liters Horsepower: 150 Price: DM 50,000

If you prefer A, press A; if you prefer B, press B.

The alternatives are set up so the consumer has to trade off one thing to get another. On this screen, LION is markedly better than "Japanese" on Engine Power but performs in an inferior fashion on environmental standards, fuel consumption, and price. Depending on his or her preferences, the respondent makes a choice. The computer software then produces another choice to be made. Because the interview was done on a laptop, the program "learns" the consumer's preferences as it goes and so can adapt the questions to zero in on areas of uncertainty. Usually between 15 and 20 choice comparisons were needed to calibrate the underlying value system. Interview times varied between 30 and 60 minutes.

Step 5 Compute Individual Customer Value Systems

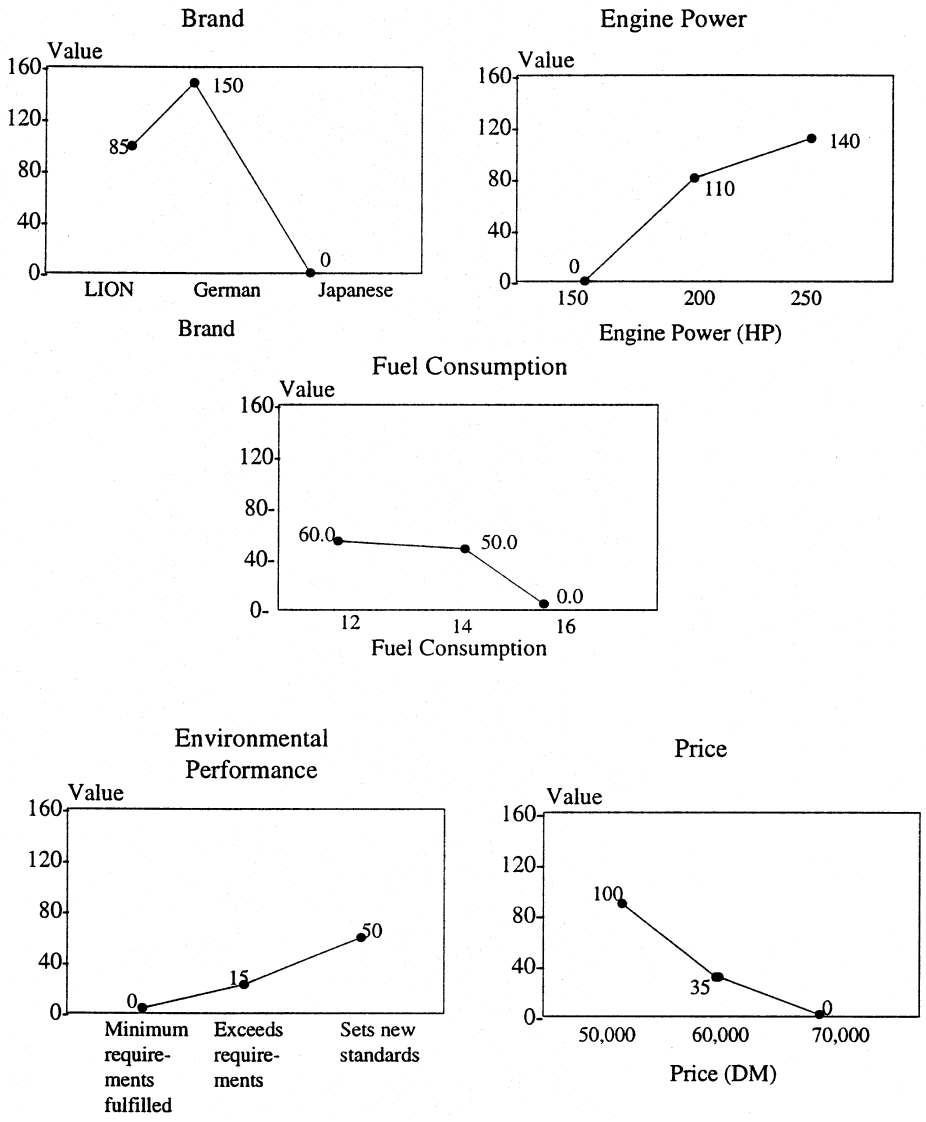
A strong point of conjoint is that value systems are estimated at the level of the individual respondent. There is no presumption that respondents have the same value system. As such, conjoint can be a useful method for defining market segments based on differing attributes of importance.

Step 6 Analyze the Data

(a) Attribute Level Values Often it is useful to look at average values of attributes across the full respondent set to get a general sense of the market.

Table B gives the results for this study. The five panels give the results for each attribute individually. For each attribute, the lowest scale value is 0. Vertical value scales are comparable across attributes.

Table B Values of Attribute Levels for LION Case



We can get a rough indicator of the relative importance of attributes by looking at the spread of the high-to-low values of the attribute. One has to be careful in interpreting this because the value obviously depends on the attribute levels we have chosen for the study. For example, if the Environmental Performance variable included an attribute level "Fails to Meet Requirements After First Year," that would drive up the value difference between lowest and highest attribute levels.

From the values in **Table B** we can derive a rough measure of attributes' importance.

	(1) Highest Score for any level of this Attribute	% of Importance = Col. (1) entry divided by Total of Col. (1)
Brand	150	150/500 = 30%
Engine Power	140	140/500 = 28%
Price	100	100/500 = 20%
Fuel Consumption	60	60/500 = 12%
Environmental Performance	50	50/500 = 10%
Total	500	

One surprise from this study was the low importance of Environmental Performance, estimated at only 10% of the purchase decision. Previous studies done by the company featured surveys in which people were directly asked the importance of environmental performance. As one might expect, the offered response was typically that it was critical. Here, however, to "get" environmental performance, a respondent had to give up something else, like power or price, and was generally not inclined to do so.

Because price was one of the variables, one can get a rough sense of the dollar value (or actually DM value here) of different performance levels. For example, the "brand value" of LION over "Japanese" was 85 points. The price panel shows a 100-point difference equating to 20,000 DM. Thus, the brand value of LION relative to "Japanese" is roughly:

$$\frac{85}{100} * 20{,}000\ \text{DM} = 17{,}000\ \text{DM}$$

Similarly, reducing fuel consumption by 25%, from 16 to 12 liters per km, was worth 60 points, or in DM terms:

$$\frac{60}{100} * 20{,}000\ \text{DM} = 12{,}000\ \text{DM}$$

(b) Market Simulations Once we have respondents' value systems, we can predict what automobile they would choose from a given set. For example, suppose a customer had a choice of three automobiles, as follows:

Attribute	Model A	Model B	Model C
• Brand	LION	German	Japanese
• Engine Power	150	200	250
• Fuel Consumption (liters/100km)	12	16	14
• Environmental Performance	new standards	meets requirements	meets requirements
• Price (DM)	DM 60,000	DM 70,000	DM 50,000

Let's assume this person's value system matched the average market system in **Table B.** Then, we can compute the value he or she would place on each option:

Model A: 230 value points (LION = 85 + Power = 0 + Fuel = 60 + Environmental = 50 + Price = 35)

Model B: 260 value points (by same method)

Model C: 290 value points (by same method)

Two rules are commonly used to translate value points into predictions of share. First is the simple "the consumer buys whatever is the highest point total." This is called the "Maximum Utility Rule." Using that rule, we would predict this person would buy Model C. We can look at part-worths to say this is due to its Engine Power. An alternative rule is the "Share of Utility" rule in which the probability of buying a given model is proportional to its value points, i.e.,

$$\textit{Probability Buy Model A} = 230/(230 + 260 + 290) = 29\%$$

Similarly, the probabilities for B and C would be 33% and 37% respectively.

Note that once we have the value system estimates for a representative set of individuals, we can simulate any scenarios we like, e.g.,

- What happens at various price points?
- What happens if LION is offered in two models?
    a. LION, 150 HP, 12 liters, New Standards, DM 60,000, and
    b. LION, 200 HP, 14 liters, Meets Requirements, DM 70,000

The first scenario of price changes was fully investigated in this study and the optimal price found to be DM 54,000 vs. DM 60,000 as originally intended, when the thinking was consumers were willing to pay for environmental performance.

General Conjoint Decision Issues

There are a number of different approaches to conjoint, varying mostly in the task which is placed upon respondents. We saw one particular form in the LION study. Respondents were asked *pairwise preferences*. An offshoot of this is to ask the respondent "by how much" is one option preferred, e.g., "Press a number from 1 to 9 to indicate your preference where 1 represents you prefer option A a

great deal, 5 if you are indifferent between the two options, and 9 means you prefer option B a great deal."

Another common approach is to take "full profiles" (i.e., ratings of objects on all the attributes in the study) and simply ask for an absolute rating of desirability rather than pairwise comparisons. Essentially this produces data similar to the pairwise preference methods; the key question is, what response task can a respondent do more reliably?

Finally, there is a hybrid method which uses one of the two methods above in conjunction with the respondents' own estimates—or "self-explicated" ratings. Lilien and Rangaswamy's software from *New Product and Brand Management*,[8] Chapter 4, follows this approach.

Guidelines for Use

Conjoint is a powerful tool with broad applicability. Necessary assumptions underlying conjoint have been mentioned throughout this discussion. We collect them here to summarize situations wherein conjoint would be most applicable.

1. *Product as a Bundle of Attributes*

   The product must be able to be specified as a collection of attributes. There are some largely image products (e.g., a perfume) for which this is just not possible.

2. *Must Know Important Attributes*

   Conjoint requires that we either know or find out by another method what attributes are salient in the product category.

3. *Respondents Can Reasonably Rate Products*

   The input data we require from respondents are overall preference or purchase-likelihood judgments. This requires a level of respondent familiarity with the product category.

4. *Attributes Should be Actionable*

   The firm should, in most cases, be able to act upon the output of the conjoint by constructing products that deliver the attribute levels used in the analysis.

This note has tried only to communicate the basic principles of conjoint analysis. Many researchers are currently at work expanding the domain of applicability and accuracy of conjoint. Specialist market research firms exist to deal with complicated applications while straightforward ones can be addressed internally. State-of-the-art software is available inexpensively. Complicated or straightforward, effective use of conjoint requires that the manager understand the technique, its vast potential, and its limitations.

[8] G. Lilien and A. Rangaswamy, *New Product and Brand Management: Marketing Engineering Applications* (Reading, Mass.: Addison Wesley, 1999).

Harvard Business School

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Strategic Industry Model: Emergent Technologies

In Spring 1990, Emergent Technologies was considering entry into the Desktop Computer Market. At issue for Emergent was the question of whether it would gain sufficient market share to warrant entry and what an optimal entry strategy would be. The primary focus was the Reseller Market, i.e., firms who would buy Emergent's product and integrate it with other hardware or software to serve a specific user need.

Competition in this market was conducted on a worldwide basis. Of the nine major firms (representing 95% of unit sales in the market), four were from the United States, three from Europe, and two from Asia. Their approximate market shares were:

United States	European	Asian
Alliance—15%	Attwood Associates—10%	Cheong—6%
Beta Technologies—12%	Penucchini Processors—9%	Kojima—7%
Computer Process Systems—14%	Stobart Systems—11%	
Developmental Integration Systems—11%		

John Morton Company of Chicago performed market research resulting in a "Strategic Industry Model" to let Emergent examine strategic alternatives.

The Research

The "Strategic Industry Model" was the result of a three stage research process. In Stage 1, qualitative interviews were done with 30 firms to locate the decision making authority in the firm and to elicit the product attributes used in making purchase decisions. These interviews and Emergent input led to specification of 14 potentially important attributes of four types:

I. Vendor Descriptions
   1. Brand Name/Reputation
   2. Breadth of Vendor's Product Line
   3. Time to Market Reputation

Robert J. Dolan prepared this case as the basis for class discussion rather than to illustrate either effective or ineffective handling of an administrative situation.

II. Product Price and Terms
   4. Price
   5. Payment Terms
   6. Financing Available
   7. Warranty Length

III. Support
   8. Response Time for Support
   9. Installation and Maintenance
   10. Response Time for Hardware Service
   11. Training
   12. Marketing Support

IV. Product Features
   13. Software Compatibility
   14. Processor Speed

See **Exhibit 1** for formal definition of the attributes and specification of how they were measured in the study. **Exhibit 2** shows each vendor's score on the 14 attributes. Some of these are "average perceptions" of the market—perceptions were not found to vary much across customers. Others, such as price, are simply facts. In addition to ratings for all ten major players, **Exhibit 2** shows ratings for a group of clones and a possible set of attributes for Emergent's entry.

In Stage 2, approximately 225 individual decision makers in prospect firms performed a computerized interviewing session to provide data for a conjoint analysis. Respondents were asked a series of questions such as: Which of the following would you prefer, A or B?

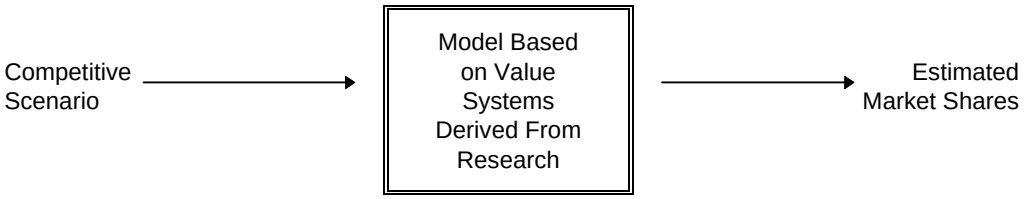
A: Alliance Brand, priced at $4,000, with a 12-month warranty

or

B: Penucchini Brand, priced at $3,700, with a 6-month warranty

Based on many questions like this, i.e., overall preference judgements, conjoint analysis teases out the "value system" underlying the choices. (See "Conjoint Analysis: A Manager's Guide" note for details.)

In Stage 3, John Morton validated the model finding it to be an adequate representation of the marketplace. In the end, the "Strategic Model" allowed Emergent to specify any competitive scenario, i.e., description of suppliers on the 14 attributes, and assess the expected market shares. The process is:



Developing A Strategy Recommendation for Emergent

The Strategic Industry Model provides two kinds of data which can be useful in developing a strategy recommendation: (i) perceptual maps; and (ii) outputs from competitive scenario simulations.

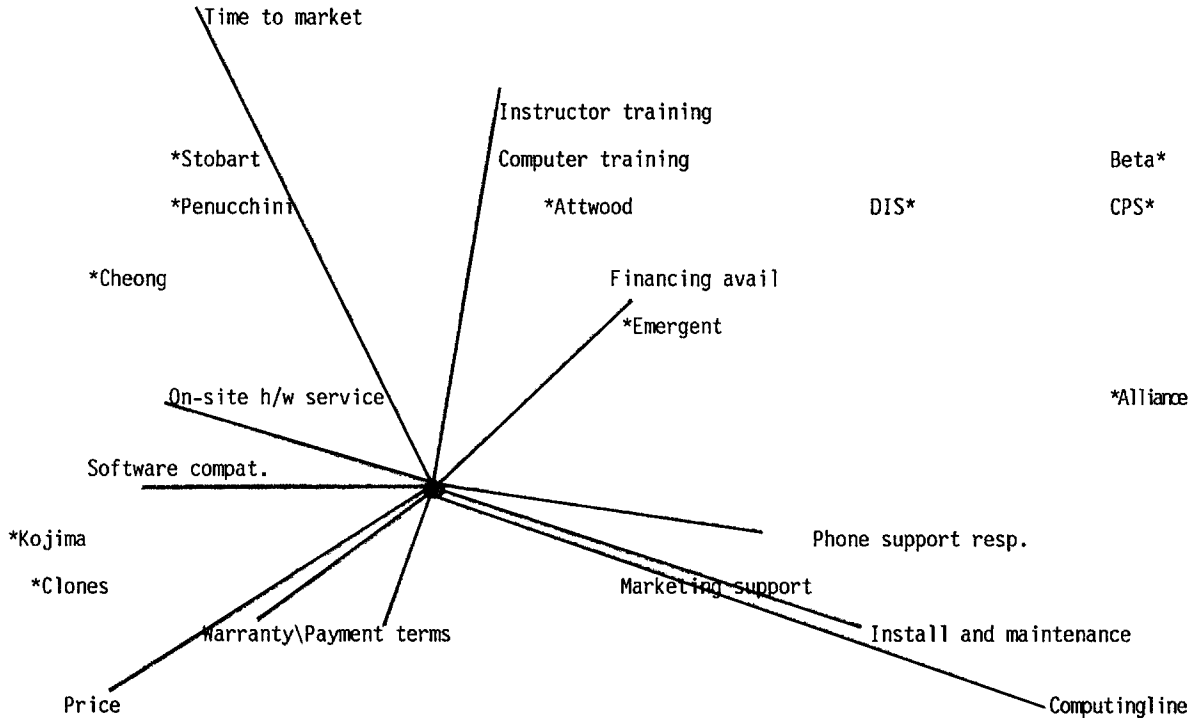
First, consider the perceptual data. How do potential customers see the competition among suppliers? A perceptual mapping algorithm applied to the data of **Exhibit 2** produced the map in **Figure 1**. The length of the vectors in **Figure 1** represent the extent of variation among competitors on that dimension.

Question 1. Based on the perceptual map, define the bases for competition in the market. Are there any "strategic groups?"

Question 2. How "well-positioned" is Emergent with its proposed attribute levels?

Question 3. In general, assess the utility of perceptual mapping by comparing the insights available from examining **Figure 1** to those obtainable from examining the raw data of **Exhibit 2**.

Figure 1 Strategic Industry Model, Plot Map Example



The second major part of the Strategic Industry Model is competitive scenario simulations. **Exhibit 3** contains the results of the "Base Case" simulation, i.e., the result of simulating the scenario of the competitive data given in **Exhibit 2**. This shows a 7.5% market share for Emergent. This share prediction is based on Emergent achieving comparable levels of awareness and distribution to that of incumbent firms.

Exhibit 4 is the output of the Factor Sensitivity feature of the Strategic Industry Model. Starting from the base case with the 7.5% share achieved by Emergent based on the attribute values of **Exhibit 2**, the Factor Sensitivity Model examines the impact of Emergent changing its positioning. Specifically, it takes each of the 14 attributes; changes Emergent's level to the ones shown and simulates this new competitive environment. For example, consider "Computer Breadth," the second attribute which is "a measure of the breadth of supplier's computer line." It is measured on a continuous scale from 1 to 3 (see **Exhibit 1**) with 1 = single product, 2 = limited product, and 3 = broad range. Emergent's proposed strategy has a 1.4 level—which represents a level of more than

one product but still fewer than necessary to reach "limited." In contrast, Alliance, Beta, and CPS all have pretty broad product lines at levels 2.8, 2.9, and 2.8 respectively (see **Exhibit 2**). The output of the Factor Level Sensitivity says that if Emergent changed from 1.4 to:

- A 1 rating, i.e., dropping to single product, its share would decrease by .2 share points to 7.3% share representing a 3.3% drop in Emergent volume, i.e., (7.5-7.3) ÷ 7.5 = 3.3%
- A 2 rating, i.e., expanding to reach "limited," yields an improvement from 7.5% to 7.9% share, up 5.2%.
- A 3 rating, i.e., expand to reach "broad," yields an improvement to 8.6% share, up 13.6%.

Other variables are interpreted in the same way. The Factor Sensitivity Report considers change in only one attribute at a time, i.e., takes all other attribute levels to be that specified in the "base case" scenario, i.e., that described in **Exhibit 2**.

Question 4. Based on the Factor Level Sensitivity, what attributes are most important to consumers? Does the factor level sensitivity report give any insight into the segmentation of the marketplace?

Question 5. What are the key leverage points for Emergent?

Question 6. Emergent does not have the resources required to improve its product line breadth in the short term. Second, it believes its margins are just barely adequate now so it would not look too favorably on anything like a price cut unless it gave big return. Nevertheless, it would like to improve its market share position. Without any cost data, you can't get too precise on this but what general directions would you suggest Emergent pursue? What market share gain could they expect?

Question 7. If Emergent follows your strategy and gains share, who would they hurt? Can you tell anything about this from either the perceptual map or the factor level sensitivity?

John Morton provided Emergent with the Strategic Industry Model to allow it to simulate any environment it wished. This allowed Emergent to examine the impact of simultaneously changing many variables. Results of Emergent's first run are in **Exhibit 5**.

Question 8. How does this "hands-on" capability help Emergent? What insights do you get from **Exhibit 5**?

Question 9. What other scenarios would you like to simulate?

Question 10. For what types of products and situations do you see this type of analysis exemplified by the Strategic Industry Model most useful?

Exhibit 1 Attribute Definitions

1. Brand self-explanatory; this attribute cannot be changed.

2. Computer Breadth a measure of the breadth of supplier's computer line. Continuous variable; scored on a scale of 1-3 with:

1. Single product only
2. Limited product only
3. Broad range of products

3. Time to Market measures whether the manufacturer tends to offer new products before, at the same time, or after competitor's similarly advanced technology. Measured in months on a scale ranging from -12 to +6 where:

-12: usually 12 months late
+6: usually 6 months ahead

4. Price self-explanatory continuous variable: ranges from $2,000 to $5,000.

5. Payment Terms the number of days after invoice date in which full payment is due; measured in days on a continuous scale ranging from 30 days to 120 days.

6. Financing Available designates the financing available; measured on a discrete scale where:

1. No financing
2. Only end user financing
3. Only reseller inventory financing
4. Both end user and reseller inventory

7. Warranty designates length of warranty period; measured on a continuous scale in months ranges from 6 to 36.

8. Support Response designates manufacturer's speed of response to queries; measured on a continuous scale from 1 to 3, where:

1. immediately
2. same day
3. next day

9. Installation and Maintenance designates support of manufacturer on installation and maintenance; measured on a discrete scale with:

1. not available
2. installation only
3. maintenance only
4. both installation and maintenance

10. Hardware Service designates the speed on manufacturer's response to hardware problems; measured on a continuous scale from 1 to 4 where:

1. within four days
2. same day

3. next day
4. within a week

11. Training describes the type of training offered by the manufacturer; measured on a discrete scale with:

1. none
2. instructor-based training
3. computer-based training

12. Marketing Support describes support provided by manufacturer to resellers in their marketing efforts; measured on a discrete scale with:

1. none
2. lead generation only
3. cooperative advertising only
4. both lead generation and cooperative advertising

13. Software Compatibility describes the range of compatibility of firm's software; measured on a continuous scale ranging from 1 to 3 where:

1. only the reseller's software
2. some software
3. a wide range of software

14. Processor Speed describes the speed of the vendor's offering relative to the average speed of competitors; measured on a continuous scale from 1 to 5 where:

1. 50% slower
2. 25% slower
3. as fast
4. 25% faster
5. 50% faster

Exhibit 2 Attribute/Supplier Offering Matrix[a]

	UNITED STATES					EUROPEAN			ASIAN		
Attributes	**Alliance**	**Beta**	**CPS**	**DIFS**	**Proposed Emergent**	**Attwood**	**Penucchini**	**Stobart**	**Cheong**	**Kojima**	**Clones**
Brand	6	4	5	9	7	8	1	3	10	2	11
Computer Line Breadth	2.8	2.9	2.8	2.1	1.4	1.8	1.9	1.7	1.8	1.5	1.8
Time to Market	-7	-3	-2	+4	-1	5	2	2	-5	-3	-5
Price	3,700	3,800	3,500	3,300	3,800	3,500	3,900	3,600	3,800	2,400	2,300
Payment Terms	38	42	41	33	36	45	43	33	42	37	38
Financing Available	4	4	4	1	2	1	4	1	1	1	1
Warranty	12	9	9	9	9	12	12	12	12	6	12
Support Response	2	2.4	1.9	1.9	1.6	2	1.9	1.5	2.2	2.1	2.0
Installation and Maintenance	4	4	4	4	4	4	1	1	1	1	1
Hardware Service	1.7	1.9	2.0	2.3	3.2	2.6	3.4	2.2	3.4	2.9	3.3
Training	2	2	2	2	3	2	3	2	1	1	1
Marketing Support	4	4	4	2	2	3	4	4	1	1	2
Software Compatibility	2.3	2.2	2.1	2.3	2.0	2.6	2.6	3.0	2.4	2.9	2.8
Processor Speed	3.3	2.9	3.2	3.2	3.2	3.8	3.1	3.6	3.2	2.9	2.9

[a]See **Exhibit 1** for detailed explanation of the attributes and the scale on which they are measured.

Exhibit 3 Base Case Results

Report: Demand Share **Sorted by:** Order of Base Case

Title: base case

Date: Friday 10/25/91 - 15:07:35

Run Description

Customer Selected

All segments included
Resulting number of customers: 225

Product Market Changes

Added products:
Deleted products:
Changed products:

Key

CUR RUN Calculated Demand Share, Current Run
BASE Base Case Demand Share, Market Unchanged
DIF Difference between RUN and BASE

NAME	CUR RUN	BASE	DIF
Alliance	12.9	12.9	0.0
Beta	11.1	11.1	0.0
CPS	12.5	12.5	0.0
DIS	10.4	10.4	0.0
Emergent	7.5	7.5	0.0
Attwood	8.9	8.9	0.0
Penucchini	8.0	8.0	0.0
Stobart	9.6	9.6	0.0
Cheong	4.7	4.7	0.0
Kojima	7.1	7.1	0.0
Clones	7.2	7.2	0.0

Exhibit 4 Factor Level Sensitivity

Report: Factor Level Sensitivity

Title: Factor Snsitivity

Date: Friday 10/25/91 - 15:40:00

Run Description

Customer Selected

All segments included
Resulting number of customers: 225

Product Market Changes

Added products:
Deleted products:
Changed products:

Key

Run Share Calculated Demand Share, Current Market
SHARE Calculated Demand Share, Current Market, New Level
DIF, %DIF Absolute, Percent change between Run Share and SHARE
Current Level Current Factor Specification

Product: Emergent		**Run Share: 7.5**	
NAME	**SHARE**	**DIF**	**%DIF**
Manufacturer			
Current Level: 7.00			
Penucchini	7.9	0.4	4.7
Kojima	8.1	0.6	7.5
Stobart	8.7	1.2	15.7
Beta	8.5	0.9	12.3
CPS	8.6	1.0	13.3
Alliance	9.1	1.5	20.3
Emergent	7.5	-0.0	-0.0
Attwood	7.4	-0.1	-1.5
DIS	8.6	1.1	14.4
Cheong	7.9	0.3	4.6
Clones	7.8	0.3	3.9

Exhibit 4 (continued)

Product: US mfr 4		Run Share: 7.5	
NAME	**SHARE**	**DIF**	**%DIF**
Compute breadth			
Current Level: 1.40			
1. Single prod only	7.3	-0.2	-3.3
2. Limited prods	7.9	0.4	5.2
3. Broad range prod	8.6	1.0	13.6
Time to Market			
Current Level: -1.00			
-12.(-) 12 months late	6.7	-0.8	-11.0
(-) 6 months late	7.2	-0.4	-4.9
On time	7.6	0.1	1.0
6. (+) 6 months ahead	8.1	0.6	7.3
Price			
Current Level: 3800.00			
2000. $2,000	10.7	3.2	42.0
$2,500	9.4	1.8	24.0
$3,000	8.4	0.9	11.4
$4,000	7.4	-0.2	-2.5
5000. $5,000	6.4	-1.1	-14.8
Paymt term (days)			
Current Level 36.00			
1. within 30 days	7.4	-0.1	-1.4
within 60 days	8.0	0.5	6.2
120. within 120 days	8.5	0.9	12.2
Financing avail			
Current Level 2.00			
1. None	6.9	-0.6	-8.4
2. End user	7.5	-0.0	-0.0
3. Inventory	7.5	-0.1	-0.8
4. Both	7.9	0.3	4.2
Warranty (months)			
Current Level: 9.00			
6.6 months	7.4	-0.1	-1.7
12 months	8.1	0.6	7.4
36.36 months	8.7	1.1	14.9
Support response			
Current Level: 1.60			
1. Immediately	7.9	0.4	4.8
2. Same day	7.3	-0.2	-3.0
3. Next day	6.6	-0.9	-12.1
Install and maint			
Current Level: 4.00			
1. Not available	6.2	-1.3	-17.5
2. Installation	6.7	-0.8	-11.0
3. Maintenance	7.2	-0.3	-4.4
4. Both	7.5	-0.0	-0.0
Hardware service			
Current Level: 3.20			
1. Within 4 hours	8.9	1.4	18.2
2. Same day	8.4	0.8	11.2
3. Next day	7.7	0.2	2.2
4. Within a week	6.9	-0.6	-8.3

Exhibit 4 (continued)

Product: US mfr 4		Run Share: 7.5	
NAME	**SHARE**	**DIF**	**%DIF**
Training			
Current Level: 3.00			
1. None	6.8	-0.7	-9.9
2. Instructor-base	7.5	-0.0	-0.4
3. Computer-based	7.5	-0.0	-0.0
Marketing support			
Current Level: 2.00			
1. None	6.7	-0.8	-10.8
2. Lead generation	7.5	-0.0	-0.0
3. Co-op advertising	7.3	-0.3	-3.4
4. Lead gen/coop adv	8.0	0.5	6.0
Software compatability			
Current Level: 2.00			
1. Only your sftwr	6.8	-0.7	-9.3
2. Some software	7.5	-0.0	-0.0
3. Wide range sftwr	8.2	0.7	9.2
Processor speed			
Current Level: 3.20			
1. 50% slower	6.3	-1.2	-16.0
2. 25% slower	6.8	-0.7	-9.2
3. As fast	7.4	-0.1	-1.3
4. 25% faster	8.0	0.4	5.4
5. 50% faster	8.5	0.9	12.2

Exhibit 5 Example of Results of Emergent Attribute Level Changes

Report: **Demand Share** **Sorted by:** Order of Base Case

Title: Emergent changes; moves into the strategic group

Date: Friday 10/25/91 - 16:25:29

Run Description

Customer Selected

All segments included
Resulting number of customers: 225

Product Market Changes

Added products:
Deleted products:
Changed products:

Emergent

Hardware service	From	3.20	To	2.00
Support response	From	1.60	To	1.20
Warranty (months)	From	9.00	To	24.00
Financing avail	From	2.00	To	4.00
Time to market	From	-1.00	To	4.00

Key

CUR RUN Calculated Demand Share, Current Run
BASE Base Case Demand Share Market Unchanged
DIF Difference between RUN and BASE

NAME	CUR RUN	BASE	DIF
Alliance	12.5	12.9	-0.4
Beta	10.8	11.1	-0.3
CPS	12.1	12.5	-0.4
DIS	10.1	10.4	-0.3
Emergent	10.3	7.5	2.8
Attwood	8.6	8.9	-0.3
Penucchini	7.8	8.0	-0.2
Stobart	9.3	9.6	-0.3
Cheong	4.6	4.7	-0.1
Kojima	6.9	7.1	-0.2
Clones	7.0	7.2	-0.2

Harvard Business School

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Designing Channels of Distribution

For many businesses, the successful launch of new products is critical to maintaining market leadership. Unfortunately, empirical data indicate that one-third to one-half of all new products fail to meet a firm's financial and marketing goals.[1] A survey of 183 *Fortune* 1000 firms indicated that nearly half of them had new product failures exceeding 40%.[2] This result is indeed surprising because these failed products had been screened for technical soundness and commercial feasibility. Various explanations have been offered for these failures: insufficient attention to the commercialization process, lack of management support, and poor marketing planning and execution. In this article, we focus on one aspect of the launch decision: the choice of distribution channels. We offer a method to systematically evaluate, plan, and execute the channel choice decision for new industrial products.

The primary question is about channel structure; that is, which intermediary, or intermediary combination, is best suited to take the new product to market? There is an equally important corollary question: How should the intermediary network be managed once it is up and running? This and related management issues are dealt with in greater detail in a later article, "Reorienting Channels of Distribution."

Fundamentally, the approach that we offer is similar to that suggested by Stern and Sturdivant[3] and Rangan, Menezes, and Maier.[4] The starting point is the customer and the building block is the channel function. In our experience the method has worked best when implemented by a cross-functional task force headed by a senior executive reporting directly to the CEO. The new product development team in many cases could double up as the channels task force. It is important for the task force, however, to commission appropriate teams to participate in the various steps, rather than assume all the expertise themselves. We first present a schematic overview of the design method, highlighting its six important steps, followed by an illustrative application.

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[1]Booz Allen & Hamilton, Inc. (1982), *New Product Management for the 1980s* (New York: Booz Allen & Hamilton).

[2]G. Dean Kortge (1989), "Simultaneous New Product Development: Reducing the New Product Failure Rate," *Industrial Marketing Management*, 18(4), 301-306.

[3]Louis W. Stern and Frederick D. Sturdivant (1987), "Customer-Driven Distribution Systems," *Harvard Business Review* (July-August).

[4]V. Kasturi Rangan, A.J. Menezes, and Ernie Maier (1992), "Channel Selection for New Industrial Products: A Framework, Method, and Application," *Journal of Marketing*, Vol. 56, July, 69-82.

Professor V. Kasturi Rangan prepared this note as the basis for class discussion.

The Channel Design Framework

Step 1 consists of identifying homogeneous customer segments. Obviously, customers with similar requirements will need similar channel sources. It is important to keep in mind, however, that a customer is usually an end-user and rarely a channel intermediary. For example, producers of agricultural chemicals should target the farmer and not the dealer. But producers of plastic pellets for making milk bottles should probably focus on the "dairy," not the "consumer," because that is where the product has value in the eyes of the end-user. A dairy, especially a large one, will certainly need to worry about the cost and quality of the milk bottles. In some cases (e.g., a small dairy) the molder who manufactures the bottle might be the more appropriate end-user. In any case, there should be a thoughtful end-user, rather than an intermediary, focus.

While advocating an emphasis on the end-user may appear rather obvious, in our experience this has been a hotly debated issue in several business applications of this approach. Many industrial marketers have long looked upon their distribution channels as "customers" and rarely bothered to look beyond. Yet the primary purpose of the distribution channel is to satisfy customer/end-user needs, and intermediaries are conduits to effect this goal. The recommended method here is not intended to undermine the role of the intermediary, only to view them as a means to an end and not an end in itself.

Step 2 consists of identifying and prioritizing the customer's channel function requirements. A generic list appears in **Table 1**, but it should be treated only as a starting point. Each product-market context is unique, and channel function requirements that best represent customers' reality are most likely to lead to effective channel solutions. This information should be elicited from customers in as fine-grained a detail as possible. For instance, it would be useful to know how keen customers are for a three-year instead of a one-year warranty, and how much they would be willing to pay for it; how sensitive they are for a two-hour instead of a six-hour service response time. **Table 2** provides an example.

In our experience, the data for this step are most effectively gathered simultaneously with **Step 1** (segmentation data). This way, segmentation and channeling strategies are consistent with each other and reflective of customers' needs.

Data gathering in Step 2 has to be based on customer input. For new products, this equates to potential customers, but, depending on the nature of the innovation, these potential users may or may not be able to provide reliable feedback. In these cases, we suggest using a team of experts who have special knowledge of the products and how customers are likely to buy and use them. There are two such groups of experts. First are customer lead users. Eric von Hippel[5] identifies them as "users whose present strong needs will become general in a marketplace months or years in the future. Since lead users are familiar with conditions that lie in the future for most others, they can serve as a need-forecasting laboratory for marketing research." A second group of experts is often found in-house.[6] In the new-product channel context, judgmental projections of experienced salespeople, product managers, sales managers, and product development engineers can compensate for the absence of extensive customer data on purchases and usage behaviors.

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[5]E. Von Hippel, (1986), "Lead Users: A Source of Novel Product Concepts," *Management Science*, Vol. 32, No. 7, 791-805.

[6]Jean-Claude Larreche and Reza Moinpour (1983), "Managerial Judgement in Marketing: The Concept of Expertise," *Journal of Marketing Research*, 20 (May), 110-21.

Table 1 Eight Generic Channel Functions

1. **Product Information**. Customers seek more information on certain kinds of products, particularly products that are new and/or technically complex, and those that have a rapidly changing technological component.

2. **Product Customization**. Some products inherently need technical modification; they require customization to fit the customer's production requirements (e.g., special steel for a maker of surgical instruments). Many times, however, even a standard product may need to fulfill specific customer requirements or factors such as size or grade.

3. **Product Quality Assurance**. A customer emphasizes product integrity and reliability because of product consequences for the customer's own operations; e.g., a standard chemical may be of utmost importance to pharmaceutical manufacturers given the liability associated with a defective final product. This is a measure of the application's importance to the customer.

4. **Lot Size**. This function reflects the customer's dollar outlay for the product. If it has a high unit value or is used extensively, it is likely to represent a significant financial decision for the customer and is likely to lead to a concentrated purchasing effort.

5. **Assortment**. A customer may need a broad range of products and may require one-stop shopping. For example, an electrical contractor may need products that satisfy different electrical codes, depending on the nature of the project. At other times, assortment needs may simply be related to the breadth of the product line (e.g., size) and availability of complementary products (e.g., wires with electrical switches).

6. **Availability**. Some customer environments require the channel to support a high degree of product availability. These are usually customers whose product-usage rate is difficult to predict (e.g., spare parts, because they are required only when a machine breaks down), or customers who will switch to competition rather than wait when the product is unavailable. Notions of demand uncertainty and requirements of buffer inventory are related to this function.

7. **After Sales Service**. Customers need services such as installation, repair, maintenance, and warranty. Often the quality and availability of such post-sales services will influence the initial sale. The nature of this service will obviously differ by industry. For example, in the computer industry the compatibility and availability of hardware and software upgrades may serve as a key purchasing influence.

8. **Logistics**. Transporting, storing, and supplying products to the end user involve levels of complexity. For example, transshipping and transporting hazardous chemicals may require special investments likely to increase handling costs. Moreover, once such investments are in place, governing their effective use will involve additional transaction costs.

Table 2 Example: Channel Function Priorities and Operational Detail

Most Important:

1. **Product Information**. Customers would like complete technical knowledge of product construction. They would prefer the availability of an expert to supervise installation as well as initial use. After the initialization, customers would be satisfied to exchange performance characteristics via computer, seeking assistance only when necessary.

2. **Product Warranty**. Customers would prefer a 3-year warranty and are not willing to pay more than a 5% price premium to receive the same. In case of a product breakdown, they would like it repaired within 4 hours, and in any case not beyond 24 hours. Customers are willing to pay for the labor charges if repaired within 4 hours.

Somewhat Important (but not critical):

3. **Application Engineering**. Customers would like application engineers to visit installations every month to assist in optimizing the system in operation.

4. **Availability of Complementary Products**. Customers would like to source complementary products simultaneously from the same channel source, if possible.

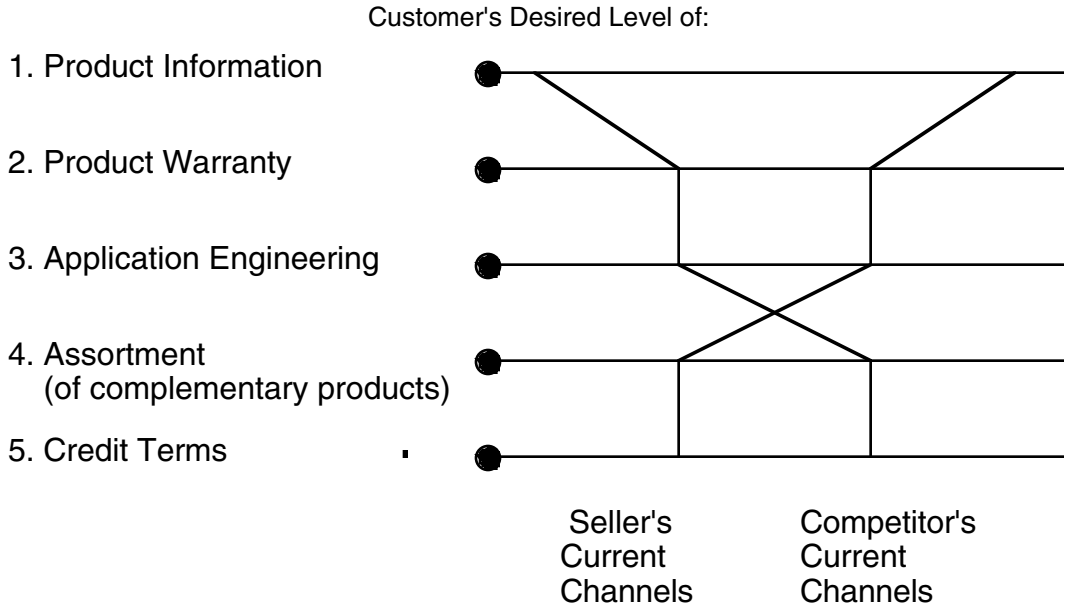
5. **Credit Terms**. Customers would like a 90-day credit term, if possible, but they can live with 30-day credit terms.

Step 3 consists of benchmarking the seller's existing channel capabilities as well as competitors' channels with respect to customers' channel function requirements. Data from Step 2 will serve to prioritize and anchor customers' desired (or ideal) level of channel functions. A supplier executing at that level can therefore be assured of the lion's share of the business. But the supplier's channel capabilities may not match this functional profile. The larger the deviation on the important functions, the lesser the chances of attracting customers. It is a good idea at this stage to also benchmark the channel capabilities of leading competitors. This will provide a comprehensive map of the company's relative channel strengths and weaknesses.

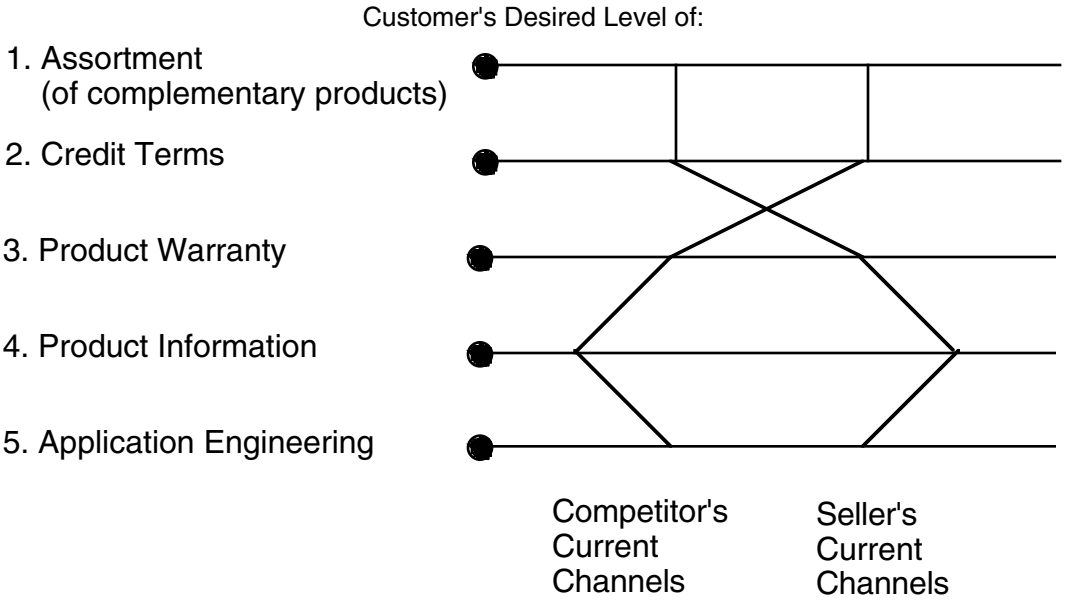
In the example in **Table 3**, the leading competitor uses a direct sales force channel and is therefore able to provide a relatively high level of customer intimacy with respect to product information, product warranty, and application engineering functions; whereas the target firm uses a distributor channel and is therefore able to provide a better level of service with respect to availability of complementary products and credit terms. The firm's relative channel profile for two customer segments is shown. But because the large customers and small customers prioritize channel functions differently, the target company is likely to do poorly with the large customers if it were to sell the new product through its existing channels. On the other hand, it has a stronger profile with small customers because its distributors provide superior "assortment" and "credit terms."

Table 3 Channel Benchmarking

Large Customer Segment



Small Customer Segment



When the various product options in the market are comparable in product functions, features, and price, Step 3 serves as a direct calibration of channel effectiveness. If there are product differences, however, the relative deviations from the customers' channel function requirements will not neatly map onto projected sales/market share. This is why some companies prefer to have product development people on the channels task force. Having the benchmarking and calibration

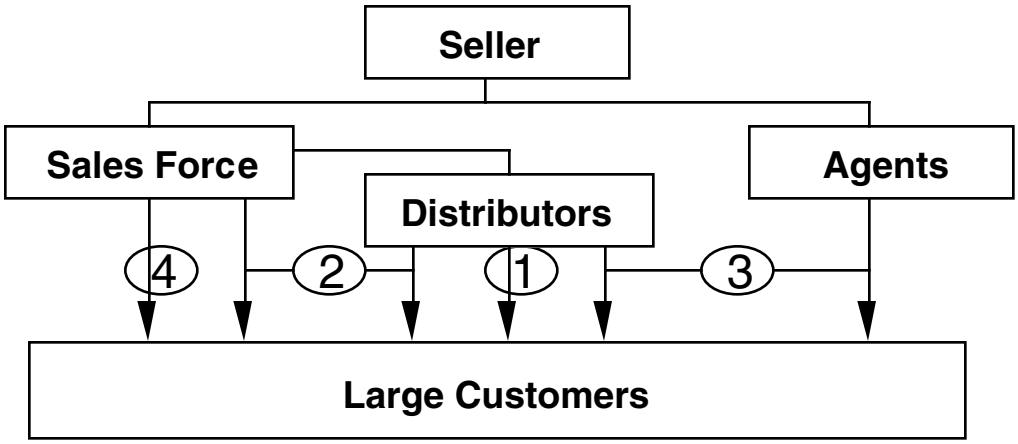
step executed by the same team that identified, clarified, and prioritized customers' channel function requirements ensures measurement consistency and reliability.

Step 4 consists of creatively interpreting the output from Steps 2 and 3 to arrive at the feasible channel options that would satisfy customers' requirements. For example, large customers' needs from **Table 3** could be potentially served by a direct sales force, and small customers by a distributor channel. But it is also possible to serve large customers with a combination of direct sales force and distributors, whereby the direct sales force would handle the product information, product warranty, and application engineering functions, and the distributors would handle the product assortment and credit terms. Usually, various channel alternatives will be available to take a product to market (e.g., agents, brokers, manufacturers' reps, value-added resellers). The role of the channels task force here is to creatively identify channel alternatives with the potential of getting closer to customers' ideal requirements. For the example, in **Table 4,** Option 1 (seller - salesforce - distributor - customer) is the current capability. Options 2 and 3 are hybrid combinations whereby the salesforce / agents perform a set of channel functions, and the distributors supplement the rest. It would be ideal for the salesforce / agents to deliver the product information, product warranty, and application engineering functions, and the distributors to deliver the product assortment and credit function. This way both the large and small customers would be happy. Finally Option 4 is a pure direct salesforce alternative, which would please the large customers.

It is important at this stage not to be restricted by real or imagined constraints. Issues of channel cost or conflict should be strictly deferred to Step 5. For example, one may conclude that under Option 1 the seller's existing distributors would not be able to adequately satisfy customers' product information, product warranty, and application engineering needs. But that should be no reason to rule out the option. If feasible, one should assume that with appropriate investments and training, distributors could rise to the desired level. Such an option should then be considered in the choice set at this stage.

Step 5 consists of systematically evaluating the benefits and costs associated with each option. Revenues, marketshare, marketpenetration, transaction costs, start-up costs, and opportunity costs must all be considered. Channel costs are not only influenced by the depth and extent of channel functions to be performed, but also by competitive behavior that influences the availability of channels. Varying investment strategies for each option from Step 4 will lead to differing customer satisfaction levels and consequently varying levels of outputs (revenue, profits, share, etc.). Investment options that push the profile in **Table 3** closest to the customer's ideal will lead to the best outcomes, but that may come at a huge cost. Thus the options being considered here will have to be a multiple of those from Step 4--varying investment levels for each option. This analysis should be as quantitative and as specific as possible. An estimate of intensity (and number) of distributors, for example, is useful information. Qualitative factors such as channel motivation and level of conflict / cooperation may be considered as well. The appropriate channel, of course, is a sensible tradeoff between output (e.g., revenues) and input (e.g., transaction costs). Companies with multiple product-market segments may draw up a short list of appropriate strategies for each segment rather than prematurely locking in on one. The reason for this becomes clear in Step 6.

Table 4 Generating Alternatives



Option 1 Current method of going to market

Option 2 Salesforce and distributors sharing channel functions among them

Option 3 Agents and distributors sharing channel functions among them

Option 4 Salesforce performing all channel functions

Step 6 consists of elaborating the channel overlaps for multiproduct, multi-market businesses by aggregating the output from Step 5. Channel synergies and dysfunctionalities across product-market segments should be discussed, and trade-offs made within the pool of appropriate strategies. This discussion is likely to be productive and objective if Step 5 data are largely quantitative. Channel designers then have an estimate of the system-wide cost for trading each best option from Step 5. Benefit-cost analysis then becomes more meaningful, and if necessary the company might be better off investing in conflict-resolution mechanisms rather than skipping customer-oriented optimal channels. Strategic long run factors become very important at this stage of the evaluation. The key question is, "Do the channels provide a market advantage? Does it reflect strategy?"

Table 5 shows three different optimal channels for the three different target segments of a company. There are likely to be practical difficulties in the co-existence of these three channels. First, Segments 1 and 2 may be somewhat hard to demarcate, especially with respect to the medium-sized accounts. Second, "dealers" for the industrial and consumer markets may overlap in some cases. But if the company's strategic focus was on the industrial market, and say this accounted for 80% of the market potential, it may make a lot of sense to serve Segment 3 through industrial dealers (channel 2) as well. Again, knowing the potential conflicts between the direct salesforce and dealers for the medium-sized accounts, it may be wise to negotiate "dealer" agreements carefully up front. Alternatively, as shown in **Table 6**, if a hybrid approach was second best for both of the industrial segments, and if the projected decrease in revenues and profits is less than the anticipated conflict costs of the "ideal channel," it may simply make sense to go with the second best solution.

The key to effectively implementing this step is totally dependent on the care used and detail undertaken in the previous steps. In the absence of well-calibrated channel maps and

concrete financial data, this crucial final step could deteriorate into a slugfest of personal hunches, which is exactly what this systematic procedure tries to overcome.

Table 5 Optimal Channels for Three Segments

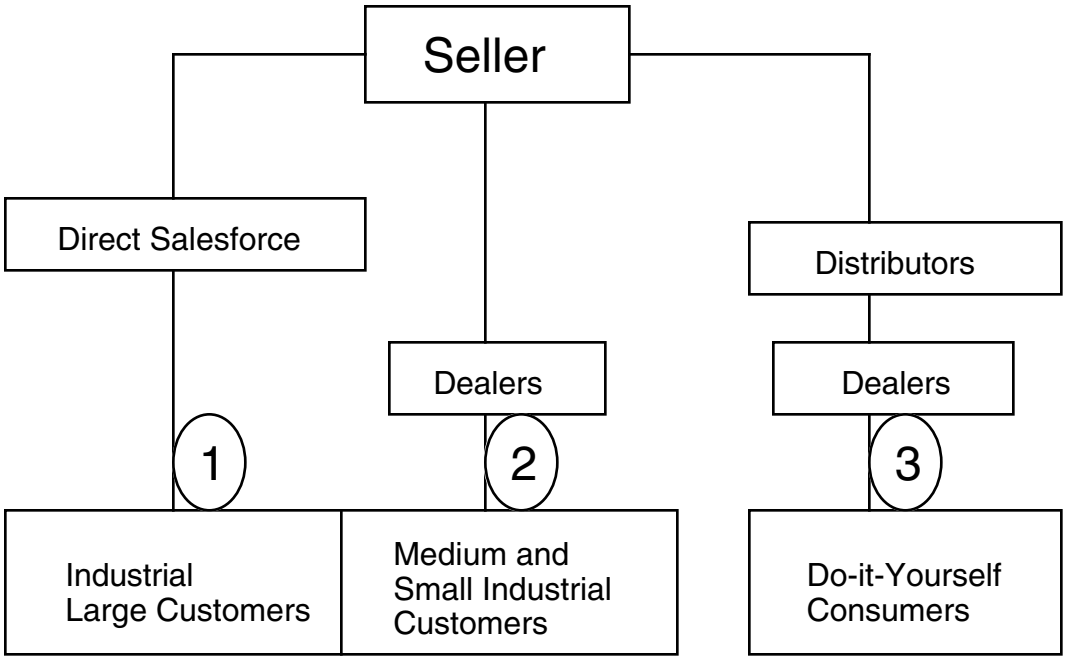
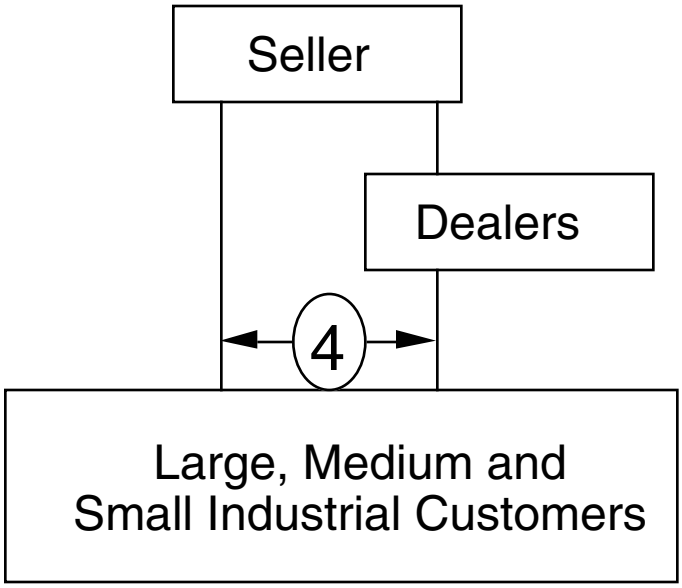


Table 6 The Second Best Option: Hybrid Channel for Industrial Customers



Application: A Description of the Process[7]

What follows is a brief description of how the channel design method was implemented in a division of a large industrial company.

Manufacturing process changes had enabled this company to develop a new product, Scotchfiber (disguised name). Customers used Scotchfiber-type products for a variety of applications such as deburring metal parts; deflashing plastic and paper utensils; cleaning golf balls, tiles, and rubber articles; gripping fabric in textile mills; and containing components for assembly. Management was convinced of Scotchfiber's superiority, especially in the $100 million industrial cleaning and finishing market which consisted of many specialty applications. The new product was to be directed originally only at large industrial users in various industries. Independent market research confirmed that these customers uniformly sought a high level of technical benefits. The product launch team headed by the director for Marketing Operations served as the channels task force.

Scotchfiber was a new product line for this company. Potential customers currently used alternative solutions to address their needs, and Scotchfiber applications had little overlap with the company's existing product lines. About 95% of the company's current products were sold to end users through a network of more than 500 independent distributors with the help of the company's 100 salespeople. Because of the new product's numerous potential applications and the strength of its distribution channels, management was inclined to route Scotchfiber through existing channels, which consisted of general-line finishing distributors.

With the help of the marketing manager, product manager, and two sales representatives, we worked out operational definitions for each of the eight channel functions identified in **Table 1** to reflect the Scotchfiber marketing context. The function "product information," for example, was characterized by the degree of information a customer sought on (1) roll fiber length, fiber property, and construction density, and (2) usage properties, such as the ability to finish irregularly shaped pieces and interiors. The operational definitions for each function were typed on separate cards to be used as the basic interview guide.

We chose 10 potential "customer experts" who were at the leading edge of adopting and using the new product to be key respondents. These lead users were considered the trendsetters in their industry and either had already started to use Scotchfiber in production trials or were in the process of placing the trial order. In addition, we selected 11 individuals from the company who had special knowledge about the product and/or its customer applications. Some of these "producer experts" were intensely involved in Scotchfiber product and application development, and the rest were involved in marketing the product to lead users.

Experts were interviewed individually to obtain their evaluations of customers' anticipated channel function requirements and priorities as they saw them. We chose three years as the time horizon for the new product channel study because the company's top management estimated this to be the time frame in which Scotchfiber could establish itself in the market, if successful.

Combining the experts' evaluations is essential to making a good channel decision because knowledge is generally dispersed in the early stages of the product life cycle. Two broad approaches are used for combining experts' opinions: group-oriented, where experts interact,

[7]A large part of this section is extracted from V. Kasturi Rangan, A.J. Menezes, and Ernie Maier (1992), "Channel Selection for New Industrial Products: A Framework, Method, and Application," *Journal of Marketing*, Vol. 56, July 1982.

inform, and build consensus, such as the Delphi method,[8] and analytical (statistical), when interaction among the experts is impossible because of physical separation or confidentiality. Because some of the lead-use customers were considering proprietary applications of the Scotchfiber technology, we did not use the interactive Delphi method, but instead chose a mathematical "consensus" method developed by Robert Winkler.[9]

The new product channel profiles were presented to the New Product Launch team which was made up of six members of the division's marketing and sales staff who were responsible for drafting an initial Scotchfiber marketing plan. None had participated as experts in the earlier evaluations. The launch team also benchmarked the capabilities of its existing channels as well as Scotchfiber's indirect competitors. This was done by a subcommittee of the task force aided by a market research firm. Armed with these data, the launch team met several times to reach the following conclusions:

- The anticipated customer requirements on product information, product customization, and product quality assurance for the new product considerably exceeded the current capabilities of the division's general-line finishing distributors.

- The anticipated channel function profile after the product was established (i.e., 3 years) matched that of the division's other products currently being routed through general-line finishing distributors.

- A new class of distributors, fiber specialists, which the company did not currently use, would also be able to satisfy the functional requirement for the established product. However, they would have difficulties fulfilling the first three functional requirements for the new product, but to a lesser degree than the current distributors.

Six channel paths were initially identified as feasible options for taking the product to market (see **Table 7**): two of these were pure options, while the other four were hybrid combinations of salesforce and distributors sharing channel tasks for the new product. Options 5 and 6, however, were eliminated as the group thought both these options would entail very high switching costs and channel conflicts given the required change from one class of distributor to the other. It just didn't make sense to start with fiber specialists and switch to general-line distributors and vice versa. The costs of taking back inventory and any legal fees for rewriting and defending new contracts would far surpass the benefits. Thus the choices for the optimal channel were reduced to four.

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[8]H.A. Linstone and M.A. Turoff (1975), *The Delphi Method: Techniques and Applications* (Boston: Addison-Wesley).

[9]Robert L. Winkler (1981), "Combining Probability Distributions from Dependent Information Sources," *Management Science*, 27 (April), 479-488.

Table 7 Feasible Channel Options

Now (when product is new)		3 Years Later (when product is established)
Option 1	Sales Force	• **General-line Finishing Distributors**
Option 2	Sales Force	• **Fiber Specialist**
Option 3	**Sales Force and General-line Finishing Distributors**	• **General-line Finishing Distributors**
Option 4	Sales Force and Fiber Specialists	• **Fiber Specialists**
Option 5	**Sales Force and General-line Finishing Distributors**	¨ **Fiber Specialists**
Option 6	Sales Force and Fiber Specialists	• **General-line Finishing Distributors**

At this company, new products were assigned sales and profit targets: Line managers were expected to achieve or surpass both. The division's area sales managers and their key sales representatives were contacted for revenue and cost estimates of going to market using each of the four channel options. Instead of estimating variations in sales revenues through each option, area sales managers felt more confident in estimating the intensity of channel coverage each option required for achieving the fixed sales target. Knowing this, the cost of each channel option can be estimated. Distribution costs were disaggregated into seven elements: demand generation (salesforce time, marketing, and advertising); distributor technical training; distributor administrative training; sales support (inventory carrying and customer credit); logistics (order processing, transportation, and warehousing); distribution margin; and opportunity costs (of sales-force time taken away from selling existing products).

Many cost elements, such as logistics, sales support, and distribution margin, can be computed once the channel options and the details of its implementation are known. But others, such as distributor training costs and opportunity costs, are essentially judgments for new products and channels that were obtained from area sales managers and subsequently refined by headquarters' accounting staff. We aggregated the costs for each channel option. Because the sales target was identical for all four options, the optimal channel in this case was the cost-minimizing option. The relative cost numbers are shown in Table 8. Option 3 was the optimal choice.

Table 8 Relative Costs of Feasible Channel Options

		Distributor Training and Maintenance Costs						
	Demand Generation Costs	**Technical**	**Administrative**	**Sales Support Costs**	**Logistics Costs**	**Distribution Margin**	**Opportunity Costs**	**Total Cost Index**
Option 1	High	Low	Low	High	Medium	Low	Medium	102
Option 2	High	Medium	High	Medium	Medium	Medium	High	110
Option 3	Medium	Medium	Low	Medium	Low	High	Low	100
Option 4	Medium	Medium	High	Medium	Medium	High	High	111

In Option 3, the sales force and the general-line finishing distributors together called on end users to establish the product and effect sales. In three years these same distributors would be expected to take on full responsibility for the product line; by then, it was assumed that the

distributors would be sufficiently trained to service and maintain the several applications for the product.

Conclusion

To evaluate the usefulness of the proposed method, we went back to the company a year after the new product launch to obtain information on how Scotchfiber was performing. We interviewed several members of the original launch team and a cross-section of the field sales management and sales reps directly involved in the Scotchfiber marketing effort. A full year after launch, Scotchfiber sales were running 25% ahead of sales targets and profits were running 34% above expected levels.

Although these results pertain to evaluations at the end of the first year of a three-year planning horizon model, management believed the suggested method helped them make a good decision. Without the aid of this method, the company would have distributed the product through its 500 distributors, which, managers thought on hindsight, would have been a mistake. The company's decision makers initially underestimated the channel support required for the new product's launch. Formally incorporating customer judgments, an essential part of the method, helped remedy management misperception.

Our interviews also identified factors such as effective communication between headquarters and field sales as key reasons for Scotchfiber's success. But two of the top three reasons were "involvement of the direct sales force" and "the channel selection process." A key contribution of this research was the process itself. Other than bringing a conceptual framework to the new product channel decision, the research process integrated judgments from three important constituencies:

- lead-use customers (the potential early adapters of the product)
- in-house experts (such as the product manager and distribution development manager)
- line managers (sales reps and sales managers)

The process combined channel concepts with experts' judgments and managers' inputs to arrive at an appropriate channel for the new product. The managers' active participation generated substantial commitment to the method and facilitated its implementation. The very process of systematically focusing on the new product channel problem led to the discovery and improvement of several related (but not central to the method) tasks, all of which magnified the impact. There is a valuable lesson in this: the process of method development and implementation is perhaps as important as the underlying conceptual framework. While the method outlined here may be immediately more applicable to new product markets, the same principles have been used in several channel audits of mature product markets as well. Steps 1 to 3 are particularly useful. Knowing the capability of existing channels with respect to customer's channel function requirements and benchmarking them with competitors' channels provide useful diagnostics. While a structural change may not be feasible in some cases given long-established channel relationships, distribution managers can at least infer specific guidelines on how to manage existing channel networks to enhance their profile to be more in tune with customer needs.

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Rohm and Haas (A)
New Product Marketing Strategy

On May 15, 1984, Joan Macey, Rohm and Haas market manager for Metalworking Fluid Biocides, was reviewing distributor purchases of Kathon MWX, a new biocide that killed microorganisms in metalworking fluids. She found that total sales to distributors for the first five months were 74 boxes against a first-year target of 1,350 boxes. "I have a super product but I can't sell it," she said. "I am in the process of reviewing our approach of taking this product to market, but at this point I am not convinced we have a better alternative."

Macey was also responsible for the marketing of Kathon 886 MW, a liquid biocide used in large metalworking fluid tanks (above 1,000-gallon capacity). Kathon 886 MW was a powerful biocide, and very small quantities were sufficient to treat large tanks. Because of its low-use level, Kathon 886 MW was not suitable for smaller-capacity tanks, and Kathon MWX was developed specifically for use in tanks with less than 1,000-gallon capacity.

Kathon 886 MW had a sales volume of $5.4 million in 1983; sales for the first five months of 1984 were at the budgeted level of $2.1 million. Kathon MWX had been launched in December 1983, with a targeted sales volume of $0.2 million in 1984; sales in the first five months were about $12,000. Macey estimated the market potential for Kathon 886 MW to be $18 million and Kathon MWX to be $20 million. Explaining the poor sales of Kathon MWX, she said:

> The total usage of Kathon MWX and its substitutes is nowhere near the $20 million potential for this market. Many small users are either unaware or don't see the need for biocides in their metalworking fluid treatment. We do poorly because we do not have enough competition to build primary demand.

Company Background

In 1906, Otto Rohm and Otto Haas founded the company in Germany to sell chemicals to that country's leather tanning industry. The U.S. branch opened in Philadelphia in 1909. At the end of World War I, Otto Haas incorporated the American branch as an independent company. Over the years it became a leader in chemical technology, especially in acrylic emulsion polymers.[1] In 1983, the American company reported worldwide sales of $2 billion derived from four business segments:

[1]The technology involves dispersing, or emulsifying, certain monomers in a fluid such as water. Then the monomers are "polymerized"—linked together through a chemical reaction. The resulting emulsion polymer retains the viscosity of water. When exposed to air, the water evaporates and a continuous, tough film remains.

Professor V. Kasturi Rangan and Susan Lasley, MBA '85, prepared this case as the basis for class discussion rather than to illustrate either effective or ineffective handling of an administrative situation. All quantitative data not publicly available have been disguised.

1. Polymers, resins, and monomers—for applications in paints, industrial finishes, decorative coatings, and construction products
2. Plastics—for applications in signs, skylights, containers, and automotive products
3. Agricultural chemicals—herbicides and fungicides for crop diseases
4. Industrial chemicals—for lubricants and fuels, water treatment, and the formulation of a wide variety of industrial and consumer products

The company's product lines consisted of over 500 different products. **Exhibit 1** gives the trend of sales and profits by business segments.

The Industrial Chemicals business segment consisted of three product groups: Fluid Process Chemicals, Petroleum Chemicals, and Specialty Chemicals. The Kathon microbiocide products with 1983 sales of $25 million were part of the Specialty Chemicals Group. Surface active chemicals (called surfactants) and water-soluble polymers were the other products marketed by the Specialty Chemicals Group (see **Exhibit 2** for an organization chart). Joan Macey was market manager for microbiocide applications in the metalworking fluid and latex/adhesives markets. Latex/adhesives biocides (1983 sales of $2 million) were sold directly by the Specialty Chemicals sales force to about 50 compounders for use in emulsions, paints, sealants, and adhesives. The metalworking fluid biocides—Kathon 886 MW and Kathon MWX—were sold through a network of formulator/distributors. All of them manufactured and sold metalworking fluids as well as any auxiliary products such as biocides and corrosion inhibitors. As market manager, Macey was responsible for formulating the marketing strategies for the three products under her charge, all of which were sold by the Specialty Chemicals sales force.

Fourteen of the 40 salespeople employed by the Industrial Chemicals business unit worked for the Specialty Chemicals Group and were responsible for selling all the products of the group (surfactants, biocides, and polymers) to various markets. Salespeople were assigned to exclusive territories and were supervised by three district managers who reported to a national field sales manager based at the Philadelphia headquarters.

All members of the sales force had college degrees in chemistry, chemical engineering, or related fields. The salesperson's role was to offer help and advice to the user in formulation or process design, for example, recommending appropriate chemical levels for cooling tower treatment or detergent formulations. Starting salaries for trainees ranged from $20,000 to $27,000 annually, and the experienced salesperson could earn $50,000 to $70,000. Salespeople were evaluated on several objectives, including new account activity, market penetration, and quantity sold in pounds. Six of the fourteen salespeople had most of the biocide customers in their respective territories. On average, they spent about 20% to 30% of their time on all biocide customers; approximately one-third of this time was spent on metalworking fluid formulators (the primary customers for Kathon 886 MW and Kathon MWX). The rest of the time was spent visiting users. Many of these calls were made jointly with the formulators' salespeople.

Metalworking Fluid Biocides

Metalworking fluid, as the name implies, is used in operations such as turning, milling, grinding, honing, and drilling. The fluid is directed onto the surface of the metal being machined to lubricate and cool the work piece and the machine tool and to remove chips and debris from the work area.

In 1983 about 60 million gallons of metalworking fluid concentrate were produced in the United States. Nearly all of it had to be diluted with water by the user. Water was typically 90% to 95% of the mixture after dilution. The diluted fluid was then placed in a reservoir and pumped to a nozzle that directed the fluid to the machined piece (see **Exhibit 3**). A tray built into the workstation caught chips, and the used fluid was filtered and returned to the reservoir for reuse.

Microorganisms such as bacteria, fungi, and yeast flourish in the warm aqueous environment of metal machining, and their growth increases with poor shop maintenance. They break down the metalworking fluids, and as the microorganisms develop, they multiply in long chains to clog filters, flow lines, and drains. Their foul-smelling, metabolic by-products stain and corrode work pieces and pollute the work environment.

Biocides are chemicals that kill the microorganisms in water-based metalworking fluids without affecting fluid performance. They have many applications in manufacturing products such as cosmetics, paper detergents, and latex paints. They are used, as well, in water treatment and oil-field drilling.

Chemical companies formulate metalworking-fluid concentrates by mixing emulsified oils and special additives. Formulators often add biocides to the metalworking fluid concentrate to provide some initial protection against contamination. The concentrate is then sent to users who dilute it for their machining operations. Metalworking fluids are depleted by water evaporation and fluid loss and must be replenished each day. As the fluid ages, the concentrate biocide no longer adequately protects it, and a maintenance biocide must be added to extend fluid life. A metalworking system kept free of bacteria, yeast, or fungi uses fluid for a much longer period of time—one or two weeks longer than the three to four weeks for a less well-maintained system. Regular treatment with maintenance biocides and make-up metalworking fluid (every one or two weeks) extends fluid life almost indefinitely and does not require a complete flushing of the fluid tank.

The *concentrate biocide* market was estimated to be $30 million in 1983. Industry sources predicted a downward sales trend, however, because of the growing use of maintenance biocides. The *maintenance biocide* market was estimated to be about $38 million in 1983, but if industry predictions were right, it would replace nearly all of the concentrate biocide market in 10 years.

Kathon Metalworking Fluid Biocides

Kathon 886 MW, a liquid, was the primary maintenance biocide on the market. Too reactive to be used in the metalworking fluid concentrate, it extended the life of diluted fluids in central system reservoirs. Kathon 886 MW was a broad-spectrum biocide generally 10 times more effective than competitive biocides. One gallon of Kathon 886 MW protected 8,000 to 10,000 gallons of metalworking fluid in a central reservoir initially for three weeks. About 10-15 gallons of a competitive product would be required to do the same job. In 1983, Kathon 886 MW had a 30% share of the $18 million maintenance biocide market for large systems. It was distributed by 12 major metalworking fluid formulators, who sold it as part of a fluid maintenance package to their customers. From a practical standpoint, because of its low use level and toxic properties, it could not be used in metalworking fluid reservoirs smaller than 1,000 gallons without creating misuse problems and safety risks.

Customers who were satisfied with the performance of Kathon 886 MW had asked for a convenient, safe-to-use version for their smaller (50- to 100-gallon) reservoirs. A market survey revealed that this was the most common reservoir size for small machines. Rohm and Haas technicians responded with an intense product development effort that led to the development of Kathon MWX.

After attempts to formulate a water-soluble solid product had failed, a unique packaging design to deliver liquid biocide was developed (**Exhibit 4**). It was a 5.5 x 7.5-inch water-permeable plastic packet containing two ounces of diatomaceous earth[2] soaked with Kathon 886 MW. The packet was designed to hang into the metalworking fluid reservoir by a strap suspended on a plastic hook and could treat 25-75 gallons of metalworking fluid for 2-4 weeks. The customer simply placed the packet in the metalworking fluid; water then flowed through the packet and gradually

[2]An inert solid that when mixed with Kathon had the consistency of moist sand.

transferred the biocide from the diatomaceous earth to the fluid. The used packet could be removed from the reservoir for disposal at the first sign of failure (odor) or in one month. No maintenance was required, and the packet was safe to handle and dispense. In expanding the fluid maintenance market to include small machine applications, it was estimated that the potential existed for $20 million in added sales volume.

Although Kathon 886 MW and MWX were maintenance biocides, they could be used in only 70% of the metalworking fluids. Incompatibility with the concentrate biocide in the original formulation rendered them ineffective with the other 30%. By comparison, however, competitive maintenance biocides were compatible in only about 45% of commercial metalworking fluids.

Customers

In 1983, there were about 325 potential customers for Kathon 886 MW or equivalent products, and an estimated 150,000 potential customers for Kathon MWX. **Table A** breaks down the metalworking industry by machine size. Biocide users worked with either *nonferrous metals* such as aluminum, copper, tungsten, and titanium or *ferrous metals* such as iron and steel.

Nonferrous metals In the domestic market, nonferrous metals were used primarily to make aluminum sheet, foil, and cans in large-scale, fully automated, high-speed manufacturing facilities. Central systems used metalworking fluid in reservoirs as large as 150,000 gallons. Nonferrous operations required the metalworking fluid to be kept completely free of bacteria because of the sensitivity of the metal to staining, and microbiologists and chemists were often employed to develop biocide treatments and monitor systems closely. Kathon 886 MW was the favored biocide of many of these companies and held about 70%-80% of a $3 million-$5 million market.

Ferrous metals The ferrous metal industries ranged broadly from the large-scale automated manufacture of products such as automotive and farm equipment to the smaller-scale production of pumps, instruments, aircraft parts, and nuts and bolts. Customers with large scale manufacturing facilities had central systems similar to those in the nonferrous industries, but bacteria levels in the metalworking fluid were not as critical to ferrous metals as they were to nonferrous metals.[3] Though Kathon 886 MW was adopted by many for its cost effectiveness, its overall share of the $12 million-$16 million ferrous market (only central systems) was only 15%-20%.

[3]The ferrous industry generally accepted up to 50,000 cfu/ml of bacteria (50,000 colony-forming units of bacteria per milliliter of metalworking fluid).

Table A Metalworking Industry Fluid Systems

Metalworking Fluid System	Reservoir Capacity (gallons)	Number of Metalworking Machines	Number of Plants
Central system	50,000 to 250,000	170	25
Central system	8,000 to 30,000	1,530	300
Individual system	50 to 1,000	1,701,000	150,000

Competition

Table B lists the major competitors in the biocide market. In 1983 Rohm and Haas, Lehn and Fink, Dow Chemical, and Angus Chemical each had approximately a 15%-20% share of the maintenance biocide market.

It was assumed that Lehn and Fink and Angus Chemical each employed three salespersons for metalworking biocides. Lehn and Fink sold directly to distributors and end-users, and distributors were supplied at 10% off list price. Angus Chemical sold to distributors and end-users at the same price.

Olin Corporation's Triadine-10, introduced in 1983, was well-received by the market. Two other major chemical companies were planning entries into the maintenance biocide market: Union Carbide with Gluteraldehyde and ICI with Proxel, both for central systems. Rohm and Haas chemists conducted comparative tests (see **Exhibit 5**) to demonstrate that Kathon 886 MW was still the most cost-effective biocide for central systems.

The most widely known product for individual systems was Tris Nitro "Sump Saver" tablets, an Angus product. One two-ounce tablet treated 25 gallons of metalworking fluid. Macey estimated that distributors paid $4.00/pound (eight tablets) and sold them to customers for $7.75/pound. Unlike Kathon MWX, these tablets dissolved in the metalworking fluid. They were generally considered less effective against bacteria and ineffective against fungi, and they worked for only about three days.

Another product, Dowicil 75, came in water-soluble packages that were dropped into the reservoir. Each 2.5-pound package treated 500 gallons of fluid. Macey estimated the cost to distributors at $2.34/pound and a resale price of $10/pound. While Dowicil 75 performed well against both bacteria and fungi, it had a heavy ammonia odor, released formaldehyde, and could not be safely used in reservoirs with capacities less than 500 gallons.

Some metalworking operators in small shops, in a makeshift effort to control the odor released by bacteria, poured household bleaches, disinfectants, deodorants, and similar materials into their smaller reservoirs. The odors of these materials usually combined with the bacterial odor to make the working environment even worse for the workers. These substitute materials also interfered with the cooling and lubricating performance of the metalworking fluid.

Table B Competitors' Products

Company	Concentrate Biocide	Maintenance Biocide: Central Systems	Maintenance Biocide: Stand-Alone Systems
1. Lehn and Fink	Grotan	Grotan	-
2. Dow Chemical	-	Dowicil 75 DBNPA	Dowicil 75
3. Angus Chemical	Bioban P-1487	Tris Nitro	Tris Nitro
4. Olin Corporation	Triadine-10	Triadine-10	
-			
5. Millmaster Onyx	-	Onyxide 200	-
6. RT Vanderbilt	-	Vancide TH	-
7. Merck	-	Tektamer 38 A.D.	-

Distribution Channels

The first level of distributors in this industry were the metalworking fluid formulators. They purchased biocides, both concentrate and maintenance, directly from the manufacturers. The concentrate biocide was incorporated into the metalworking fluid at the time of its formulation. The formulators then sold the metalworking fluid directly to large companies and to other dealers who resold it to smaller accounts. Metalworking fluid generally accounted for more than 90% of a formulator's business. As a service to customers with large central reservoir systems, distributors provided a maintenance package that usually included delivery, fluid preparation, weekly monitoring for microorganisms, and maintenance biocide treatments. Other special-purpose chemicals such as pH adjusters and corrosion inhibitors were provided as needed. Many of these products were sold under the formulators' private brand names. Most formulators engaged in R&D, acceptance testing of manufacturers' additives, and systems monitoring.

In 1983 the total sales of 10 large national formulators were roughly $200 million. Another 20-30 formulators had a combined sales volume of some $100 million. Several hundred small formulators had sales of $0.5 to $1 million each. Because of the number and fragmentation of the ferrous metalworking industries, large formulators distributed their products through a secondary distribution network, consisting primarily of industrial supply houses and machine tool shops.

Industrial supply houses ranged from small, family-managed companies in rural areas to large, professionally managed companies in urban areas. Some specialized in serving particular industry sectors. They were "supermarkets" for their customers. A supply house servicing a ferrous metalworking industry, for example, might carry several brands of biocides, safety accessories, uniforms, small general-purpose tools, shop cleaning and maintenance supplies, worktables, hand trucks, concrete blocks, spill absorbents, and hand soaps.

The 1982 Census of Wholesale Trade listed 14,327 industrial supply houses in the United States. A major metropolitan area might have over 100 supply houses serving a variety of industries. Industrial supply house sales in 1982 amounted to approximately $40 billion. Inside salespeople took telephone orders from regular customers and over-the-counter orders from walk-in customers. Outside salespeople generated new accounts and called on regular customers.

Machine tool shops specialized in distributing and servicing machine tools and items used with them like spare parts, tool bits, metalworking fluids, and biocides. Some also served as sources of metals. There were 3,654 such companies in the United States, and in 1982 their sales were $8.7 billion.

Typically, large industrial companies (e.g., General Motors, Caterpillar Tractor) purchased biocides directly from manufacturers or from their distributors (formulators). They used the secondary network of industrial supply houses and machine tool shops for miscellaneous items (such as safety equipment or paper towels) that were not critical to their line of business. Small companies, however, often relied exclusively on industrial supply houses and machine tool shops for all their needs.

Marketing Strategy for Kathon MWX

Ten of Rohm and Haas's 12 distributors (formulators of metalworking fluid) agreed to distribute Kathon MWX in addition to Kathon 886 MW. The company offered private branding on Kathon 886 MW, but not on Kathon MWX. Though many formulators asked for private branding, only one distributor declined to carry Kathon MWX when turned down on a request for its own-brand product. Explaining the rationale for this policy, a company manager said:

> Kathon MWX is the industrial equivalent of a consumer packaged good; it is a "baggie" product packaged at the factory. We need some uniformity in package design. Moreover, we want the end-user to know it's a Rohm and Haas product. Our end-users hardly see the Kathon 886 MW drum because our formulators include the product as a part of their maintenance service. But Kathon MWX is different; we expect the end-users to do the maintenance themselves.

Kathon MWX was packed in boxes containing 144 packets, each packet weighing two ounces. Quantity prices to distributors per box of 144 packets were as follows:

1-2 boxes	$180.00
3-4 boxes	165.00
5+ boxes	145.00

Joan Macey estimated the manufacturing cost per packet to be about 50 cents. The company did not specify a price to end-users, but most formulators charged end-users and other dealers $2/packet. Some formulators had a strong secondary distribution network consisting of 200-300 industrial supply houses, and in such instances, the secondary level of distribution was known to add a 10% margin. One of the company's distributors with a sales force of 700 commissioned reps claimed that he could sell each packet for $6 to the end-users.

The product launch (December 1983) was accompanied by a press release in 40 metalworking industry journals announcing the availability of Kathon MWX. The announcement included information about characteristics of Kathon MWX and its benefits. Full-page advertisements costing $3,800 each were placed in five issues of *American Machinist* between February and June 1984. Interested readers could get further information and a two-packet sample by filling out a reader service coupon. Over 200 such inquiries were received from the February, March, and April advertisements. All inquiries were forwarded to distributors. Rohm and Haas responded directly with a copy of the very colorful ad, a material safety data sheet, a set of technical notes, and a "how-to-use" booklet (see **Exhibit 4**). Distributors were expected to follow up on the leads and generate orders.

In spite of all these efforts, the sales in the first five months of the launch period barely touched $12,000.

Joan Macey's Dilemma

Disappointed with Kathon MWX's sales performance, Macey began a review of her marketing plan to take any necessary corrective steps. She also sought opinions from two of her colleagues in the Specialty Chemicals division who had successfully launched and established new products. Her first colleague advised:

> You are too hard on yourself, Joan. New products don't succeed overnight. It takes years for the product to get market acceptance and longer still to get dealer support. If you feel comfortable about your original marketing plan, it's worthwhile giving it a chance. We are in the business of specialty chemicals, we offer solutions to customers' problems. We are not in the fashion business!

Her second colleague felt differently; he agreed that Kathon MWX's initial marketing approach was probably not best suited for the product. He encouraged Macey to review the marketing plan, saying, "The only good news on Kathon MWX is that you know there is a problem; therefore you can fix it."

Regardless of what she might ultimately do about her strategy for marketing the product, Macey thought it would be a good idea to contact the 200 prospects who had responded to the reader service coupons. Macey employed a summer trainee who was working toward an MBA to conduct a telephone survey. Explaining her rationale for the survey, she said:

> I wish I could thoroughly research the market, but that's not possible. Frankly, what else can I do with the limited budget I have for support activities? Kathon MWX has to show some initial movement before further resources are justified. It is imperative that I make a quick decision. After all, I have other products to manage and my boss has the entire biocide business to manage. One has to place Kathon MWX in its proper perspective. A quick survey should do that.

The survey revealed several major facts:

1. On average, customers discarded used metalworking fluid after three weeks. Rancidity and dermatitis[4] were the primary reasons for this, and most customers believed that bacteria, not metal particles or harsh chemicals, caused the dermatitis.
2. Although most survey participants had their used fluids hauled away, few knew how much this service cost. Those who did know gave figures of $0.29, $0.55, $1.80, and $2.00 per gallon of used fluid.
3. Only about 20% of the participants remembered receiving the Kathon MWX information packet. When asked about the image of the product conveyed by the promotional literature, many said that the product was worth trying. Despite their inclination to use Kathon MWX, they expressed some apprehension about its safety. An explanation of the proper handling technique usually overcame these fears.
4. Users obtained metalworking fluids from tool shops, oil companies, formulators, and industrial supply shops. The majority sourced from two or more small, local tool or supply shops within 30 miles of their businesses, as well as one of the large national formulators. Users occasionally found it necessary to write to a large national distributor for supplies that were not locally available.
5. About 50% of the users used products ranging from household disinfectants to metalworking fluid biocides to kill odor-causing bacteria in their machine sumps. The majority of these products did not seem to work, yet the end-user typically continued to use the product. Only half of the participants who had tried a biocide could remember its name. None had tried Kathon MWX.

[4]Dermatitis symptoms are skin eruptions and rashes that last anywhere from a few hours to a few weeks.

From the summer trainee's survey report, Macey extracted the cost information that she thought would be useful in a review of Kathon MWX's marketing strategy (see **Exhibit 6**). She wondered if raising the price would increase end-user perception of the product's value. She wondered what short-term and long-term sales and market share targets were appropriate for Kathon MWX. Concerned about the appropriateness of the current channels of distribution for Kathon MWX, she considered other options. Finally, of course, she wondered if Kathon 886 MW was a help or hindrance in developing a market for Kathon MWX, especially since marketing plans for Kathon 886 MW projected a healthy growth in distribution and market share.

Exhibit 1 Sales and Profits by Business Segments, 1979-1983 (millions of dollars)

	1983	1982	1981	1980	1979
Net Sales					
Polymers, resins, and monomers	$745	$707	$753	$665	$626
Plastics	390	353	376	345	345
Industrial chemicals	336	331	324	303	265
Agricultural chemicals	337	336	308	295	243
Other industries	68	101	124	117	111
Total	**$1,876**	**$1,828**	**$1,885**	**$1,725**	**$1,590**
Net Earnings					
Polymers, resins, and monomers	$79	$47	$45	$53	$50
Plastics	33	9	14	16	27
Industrial chemicals	22	12	23	23	20
Agricultural chemicals	18	24	21	20	16
Other industries	(11)	2	(6)	(9)	(1)
Corporate	(3)	(8)	(4)	(9)	(16)
Total	**$138**	**$86**	**$93**	**$94**	**$96**
RONA[a]					
Polymers, resins, and monomers	19.7%	12.9%	11.5%	12.8%	12.1%
Plastics	13.9	3.7	5.2	7.3	13.2
Industrial chemicals	12.6	7.4	13.1	13.8	12.0
Agricultural chemicals	7.2	9.1	7.2	9.8	9.7
Other industries	(6.3)	1.2	(4.2)	(6.1)	(1.0)
Total	**10.5%**	**7.6%**	**7.9%**	**8.9%**	**9.6%**

Source: Company records

Note: Net earnings are from continuing operations (before extraordinary credit in 1979) and are after the allocation of corporate expenses and income taxes. Income taxes are allocated based on the tax effect of transactions included in pretax income. Corporate consists mainly of after-tax interest income and expense.

[a]Return on net assets (RONA) equals net earnings from continuing operations plus after-tax interest expense, divided by year-end total assets.

Exhibit 2 Organization Chart: Specialty Chemicals Group

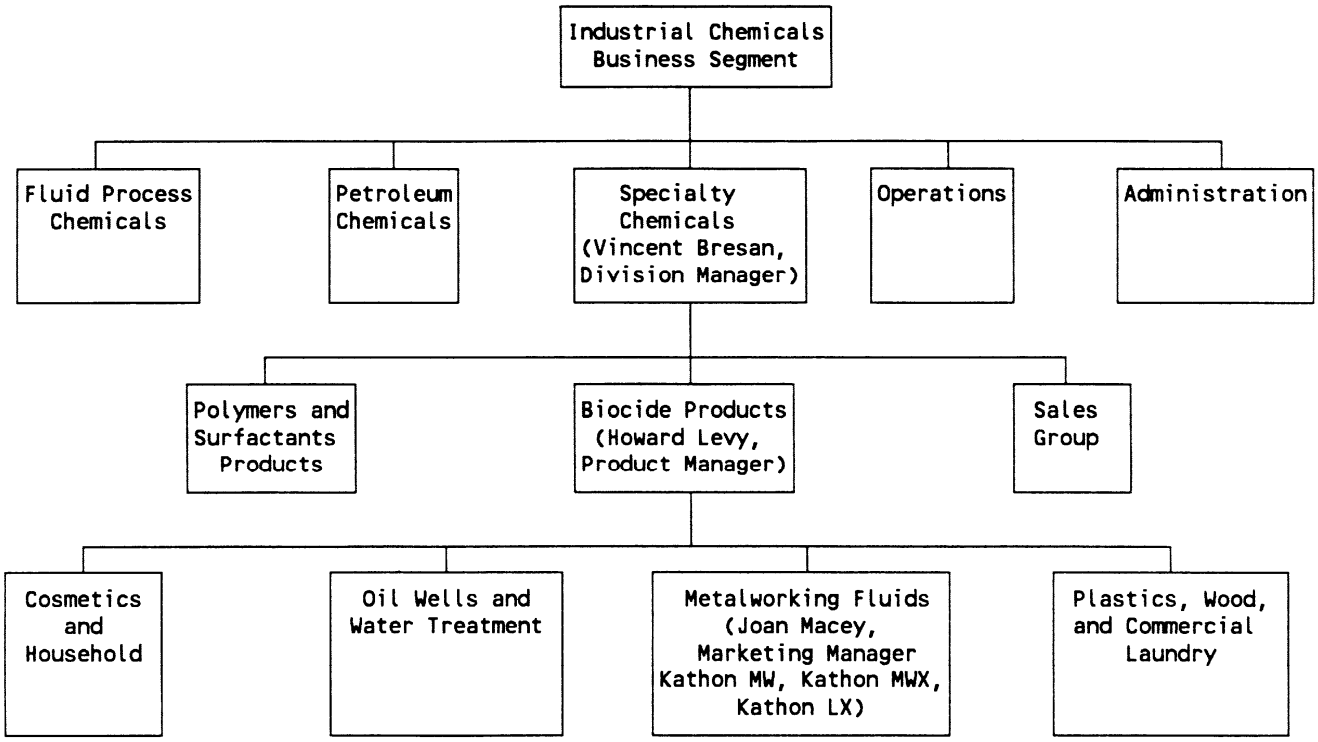


Exhibit 3 Metalworking Fluid

Source: Company material

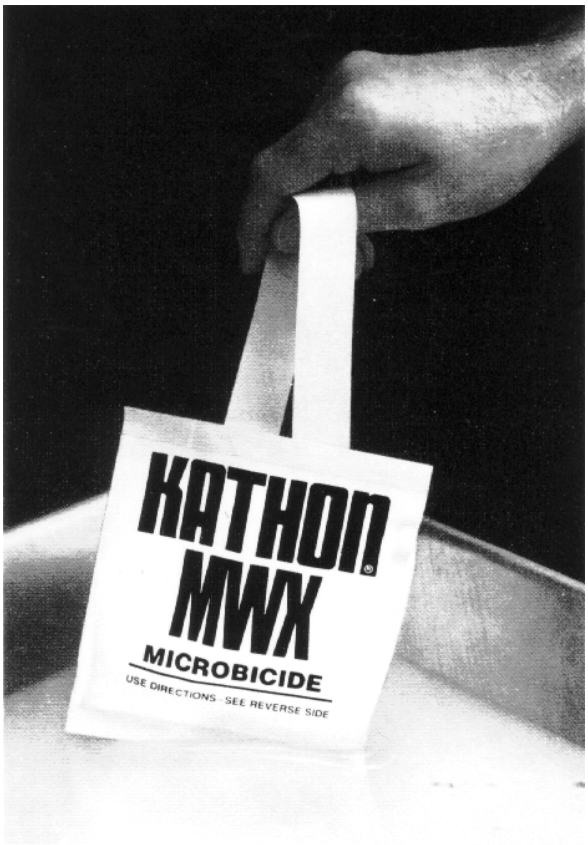
Exhibit 4 Kathon MWX User Information

Kathon® MWX Biocide Packets

for small machine maintenance

Extends fluid life
Extends fluid life
Extends fluid life
Extends fluid life
Extends fluid life
Extends fluid life
Extends fluid life

- Extends fluid life
- Controls bacteria and fungi
- Eliminates odor
- Minimizes machine downtime
- Effective over a wide pH range
- Easy to use, safer to handle
- Does not release formaldehyde
- Readily disposable
- EPA registered for metal-working fluids



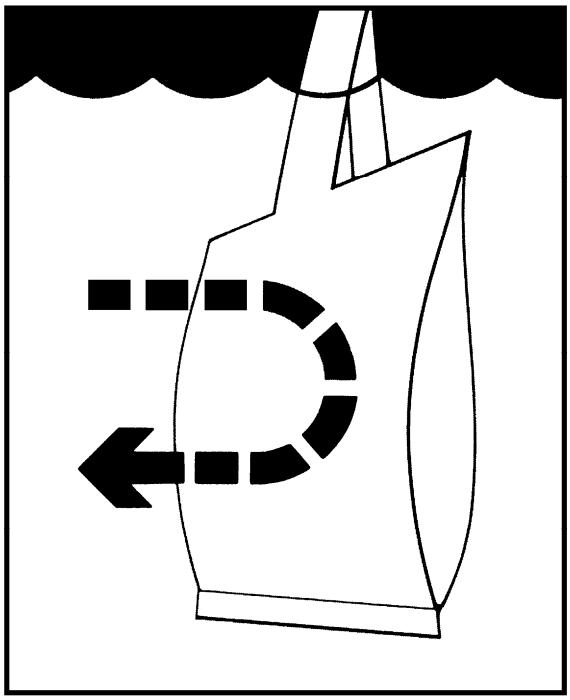


Exhibit 4 (continued)

What is Kathon MWX?

It is a safer-to-handle plastic packet containing a highly water soluble biocide which controls bacteria and fungi, including the odors they produce.

How should you use Kathon MWX?

Simply attach the packet to the hook provided and suspend it from the edge of the sump into a 50 gallon reservoir of dilute soluble, semi-synthetic or synthetic metalworking fluid.

How many Kathon MWX packets should be used?

For noticeably rancid fluids, use 1-2 unopened 2 ounce packets for every 50 gallons of fluid every 1-2 weeks. Follow this with a maintenance dose of one packet for every 50 gallons every 2-4 weeks.

How does Kathon MWX work?

When the packet is submerged in the fluid, the aqueous fluid enters the packet through the small pores and carries the active ingredient back out into the fluid where it destroys bacteria and fungi, including the odors they produce. This flow action will continue to release active ingredient from the packet to the reservoir until it reaches equilibrium (about 3 days). After this, the active ingredient will gradually be depleted as it continues to prevent the development of rancidity.

How will you know that Kathon MWX is doing the job?

Since the active ingredient in Kathon MWX begins to act immediately, any odor produced by the rancid fluid will be significantly reduced within several hours. Slime and other biological debris will pull away from the sides and bottom of the reservoir and disperse in approximately 3 days.

When should the Kathon MWX packet be removed from the reservoir?

The packet should be left in for a minimum of 3 days to reach equilibrium. At this time, the level of active ingredient in the packet is the same as the level in the fluid. This level – 20 ppm – is non-hazardous and similar to the level used in many consumer products. The packet may be left in place for an additional 2 to 4 weeks since it will continue to provide rancidity control until the active ingredient is essentially gone.

How should you dispose of Kathon MWX?

If the packet is removed in fewer than three days, it should be treated with a deactivating solution (see product literature) before disposal. If the packet is removed after three days, it will consist of the plastic packet, diatomaceous earth and a non-hazardous level of active ingredient. It may be disposed of as trash, unless prohibited by state or local authorities.

Source: Company records

Exhibit 5 Kathon 886 MW Cost Effectiveness

Comparative Cost of Treating a 10,000 Gallon System with Biocide (for one cycle)

I. *With Dowicil 75*
10,000 gals.[a] x 8.4 lbs.[b]/gal. x 0.15%[c] x $2.14[d]/lb. = $269.64

II. *With Grotan*
10,000 gals. x 8.4 lbs./gal. x 0.15% x $1.20/lb. = $151.20

III. *With Kathon*
886 MW 10,000 gals. x 8.4 lbs./gal. x 0.01% x $8.50/lb. = $71.40

Source: Company records

[a]This corresponds to approximately 400 gallons of metalworking fluid concentrate.

[b]Weight of metalworking fluid per gallon

[c]Biocide concentration required for treatment

[d]Biocide price to end-user

Exhibit 6 Cost Information Gathered from Survey Data

	Average Cost
Metalworking fluid concentrate	$5.68/gallon[a]
Waste disposal	$1.36/gallon[b]
Kathon MWX	$2/packet

- 1 packet of Kathon MWX treats 25-50 gallons of diluted metalworking fluid.
- A typical small machine shop had 22 machines, each with a reservoir capacity of 50 gallons. It discarded fluid every four weeks. By using Kathon MWX they could keep the fluid 2-5 weeks longer.
- Machine downtime, labor, and water costs were negligible for small machines. Costs of other additives (buffers, corrosion inhibitors) were not considered in a differential analysis.

[a]Per gallon of undiluted fluid. A dilution ratio of 1:24 is assumed.

[b]Per gallon of diluted fluid.

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9-502-030

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YOUNGME MOON

Aqualisa Quartz: Simply a Better Shower

Plumbing hasn't changed since Roman times.

—Tim Pestell, Aqualisa national sales manager

Harry Rawlinson (HBS '90) shrugged out of his overcoat and headed to the reception desk of the South Kent County Marriott. "Can you direct me to the breakfast room?" he asked, "I'm meeting some guests from America." The receptionist pointed toward a hallway lined with photographs of the region's golf fairways and putting greens. "It's just to the left down there," she said. As he strode down the narrow corridor, Rawlinson, managing director of Aqualisa (see **Exhibit 1**), a U.K. shower manufacturer, felt a surge of energy. He had been looking forward to this opportunity to discuss an HBS case possibility.

In May 2001 Aqualisa had launched the Quartz shower, the first significant product innovation in the U.K. shower market since—well, to Rawlinson's mind—since *forever*. But here it was early September 2001, and the euphoria surrounding the product's initial launch had long since faded. Rawlinson knew the Quartz was technologically leaps and bounds above other U.K. showers in terms of water pressure, ease of installation, use, and design. But for some reason, it simply wasn't selling.

The U.K. Shower Market

Rawlinson leaned forward as he began to explain his situation. Showers in the U.K. were plagued with problems. While everyone had a bathtub, only about 60% of U.K. homes had showers. Archaic plumbing, some of it dating to the Victorian era, was still common in many homes. For the most part this plumbing was gravity fed; a cold-water tank or cistern sat somewhere in the roof, while a separate boiler and cylinder were needed to store hot water in a nearby airing cupboard.

Gravity-fed plumbing meant poor-to-low water pressure, about 3 to 4 liters per minute.[1] Gravity-fed plumbing also created frequent fluctuations in pressure, which caused the temperature to noticeably vary from minute to minute. If the pressure from the cold-water pipe decreased momentarily, the flow from the hot water pipe would increase, immediately raising the temperature.

[1] Water pressure in the United States, in contrast, is generally at least 18 liters per minute.

Professor Youngme Moon and Research Associate Kerry Herman prepared this case. HBS cases are developed solely as the basis for class discussion. Cases are not intended to serve as endorsements, sources of primary data, or illustrations of effective or ineffective management. Some data have been modified or disguised.

These two problems—low pressure and fluctuations in temperature—were typically addressed through the use of either electric showers or special U.K. shower valves.

1. **Electric showers** used water from the cold water supply. Electrical heating elements in the shower instantaneously heated the water to the required temperature, eliminating the need for a boiler to store hot water. While this made electric showers convenient for small bathrooms, the electrical components were usually mounted in a bulky white box that was visible in the shower stall. In addition, electric showers did nothing to address the poor water flow of many showers in U.K. homes, since the flow was limited by the amount of energy that could be applied to heat the water instantaneously. Aqualisa sold electric showers mostly under a separate brand name, the "Gainsborough" brand. (See **Exhibit 2** for shower sales by type and brand.)

2. **Mixer shower valves** came in two types: manual and thermostatic. Both types blended hot and cold water to create a comfortable temperature, but while thermostatic valves controlled the temperature automatically, manual valves required the user to manually find the right temperature mix. Installing a mixer valve meant excavating the bathroom wall, which was often a two-day job. If a user wanted to boost water pressure, an additional booster pump (typically costing from €350 to €600) could be installed to enhance the flow rate.

   The Aquavalve 609 was the company's core product in the mixer-shower-valve category. At about 60,000 units per year, it was by far Aqualisa's top-selling shower. It was regarded by plumbers as being a high-quality, reliable mixer shower with state-of-the-art technology. It cost about €155 to manufacture and sold (at retail) for €675 to €750. The Aquavalve 609 was thermostatic and could be supplemented by an Aquaforce booster pump to create stronger pressure.

3. **Integral power showers** consisted of a single compact unit that combined a thermostatic mixer valve and a booster pump. Although they provided up to 18 liters of blended water per minute, they had to be mounted in the shower, resulting in the presence of a bulky box on the wall. In addition, these units were generally regarded as being less reliable than a mixer-shower and booster-pump combination. The Aquastream Thermostatic was Aqualisa's primary product in this category. It cost about €175 to produce and sold (at retail) for about €670. At about 20,000 units per year, it was Aqualisa's strongest-selling shower in the power shower category.

Most consumers could readily identify what they disliked about their showers—poor pressure and varying temperature being at the top of the list. But there were other complaints as well. Showers often broke down, or "went wrong," as Rawlinson described. "They break after awhile. The mechanisms get gummed up with lime scale, making the valves stiff and hard to turn; the seals start to leak, or they go out of date." As a result, consumers complained about hard-to-turn valves, leaky seals, and worn-out showers. (Almost half the U.K. shower market consisted of sales of replacement showers—see **Exhibit 3**.) On the other hand, consumers were generally uninformed about showers, and there was little understanding of product options (see **Exhibit 4**). Brand awareness was low; only one company in the market (Triton) had managed to build brand awareness at the consumer level.

Shower buyers in the U.K. tended to fall into one of three pricing segments: premium, standard, and value. Consumers in the premium segment typically shopped in showrooms; they took for granted high performance and service, and for them style determined their selection. Consumers in the standard price range tended to emphasize performance and service; they usually relied on an independent plumber to recommend or select a product for them. Consumers in the value segment

were primarily concerned with convenience and price; they liked to avoid solutions that required any excavation and tended to rely on an independent plumber to select a product. (See **Figure A** for Aqualisa's core product offerings in the various shower categories.)

Figure A Aqualisa's Core Product Offerings in the Various Shower Categories[2]

		Aqualisa's Core Product Offerings		
Type of Shower		**Value**	**Standard**	**Premium**
Electric Shower	• Does not require hot water supply • Results in bulky box on the wall • Low flow rate	Gainsborough Retail: €95	Gainsborough Retail: €155	Aquastyle Retail: €230
Mixer Shower	• Requires both hot and cold water supply • Requires additional pump to address pressure problems • Installation typically requires excavation of bathroom	Aquavalve Retail: €390	Aquavalve 609 Retail: €715	
Power Shower	• Requires both hot and cold water supply • Results in bulky box on the wall • Regarded as less reliable than a mixer-shower and pump combination	Aquastream Manual Retail: €480	Aquastream Thermostatic Retail: €670	

Source: Aqualisa.

In addition, there was a sizeable do-it-yourself (DIY) market in the U.K. Do-it-yourselfers generally shopped at large retail outlets that catered to them (for example, the popular B&Q, which modeled itself after Home Depot in the United States). These customers were primarily interested in inexpensive models that were easy to install, even though the DIY products were bulky and unattractive. Electric showers were the overwhelming choice in this segment. They could be adapted to all water systems and could be installed in a day; they were particularly popular among landlords and apartment dwellers.

Finally, there was a significant property developer market in the U.K. Most developers did not need to worry about pressure problems because new homes were almost exclusively built with high-pressure systems. Developers faced a different set of issues, preferring reliable, nice-looking products that could work in multiple settings. Developers were also price-sensitive; with the exception of luxury builders, most developers did not feel the need to invest in premium valves. Developers usually had relationships with independent plumbers who installed whatever product they selected.

Aqualisa sold to developers under its ShowerMax brand, which was available only through specialist contract outlets. Elements of the Aquavalve technology had been redesigned and re-branded for the ShowerMax product line and optimized for developers' specific needs. Because new homes did not use gravity systems, ShowerMax could deliver a high-pressure shower—with

[2] Aqualisa offered a variety of other specialty shower models in each of these categories. The differences between these showers were primarily stylistic (e.g., contemporary, antique, brass, etc.).

Aquavalve technology—at a significantly lower cost. Rawlinson commented, "Aqualisa's core products are too expensive for them because of extra features aimed at the retail market. Even at a discounted price, they consider Aqualisa too high-end. But a cut-down product branded "ShowerMax" just for them, at the right price—they love it."

Rawlinson continued:

> Real breakthroughs are pretty rare in the shower market. Innovations are primarily cosmetic. Most of the major manufacturers recycle their product line and relaunch their main products about every four or five years. It refreshes your brand, but market share doesn't really change. At Aqualisa, we've tended to do a relaunch every three to four years. Aesthetically we've changed the look, and we've made incremental technological improvements to boost the performance and quality, but it's basically been the same mechanisms inside. These aren't breakthrough innovations we're talking about.

Channels of Distribution

Showers in the U.K. were sold through a variety of channels (see **Exhibits 5** and **6**), including trade shops, distributors, showrooms, and DIY outlets.

Trade shops. Trade shops (or plumbers' merchants) carried products across all available brands. Their primary customer was the plumber, who worked for developers, showrooms, contractors, or directly for consumers. Trade merchants tended to stock whatever there was demand for. The Aqualisa brand was available in 40% of trade shops. As Rawlinson put it: "The staff in these outlets don't have the time to learn all the features and benefits of the 45,000 items they offer. They focus on making sure they have the right stock of products that are in demand. Their customers are looking for reliable product availability more than technical advice."

Showrooms. Distributors supplied showrooms, which tended to be more high-end. Showroom "consultants" typically led consumers through the process of selecting and designing a bathroom "solution." A shower might be one small part of an overall renovation project. Various shower and bath options were displayed in the showroom, and although no inventory was held on location, these ensembles allowed the consumer a chance to view the product in a pleasant environment. Showrooms preferred to carry high-end product lines and brands (for example, Hansgrohe, a high-end German brand) unavailable in other channels. Showrooms also offered installation services by subcontracting with contractors and independent plumbers. There were about 2,000 showrooms in the U.K.; the Aqualisa brand was sold in about 25% of them.

DIY Sheds. Do-it-yourself retail outlets like B&Q offered discount, mass-market, do-it-yourself products. Electric showers, because they were cheaper and easier to retrofit, led sales in this channel. The Aqualisa brand was unavailable through this channel, but its Gainsborough brand was available in 70% of the approximately 3,000 DIY outlets in the U.K.

Plumbers (Installers)

There were about 10,000 master plumbers in the U.K. Plumbers had to undergo several years of training and three years of apprenticeship to become master plumbers. There was a significant shortage of master plumbers in the U.K., and as a result, consumers often had to wait six months before a plumber could take on a new job.

A standard shower installation was usually a two-day job and required significant bathroom excavation.[3] Plumbers—who installed 40 to 50 showers a year—charged about €40 to €80 per hour, plus the cost of excavation and materials (plumbers usually passed the cost of the shower and other materials on to the consumer with a small markup). Because prices to consumers were usually quotes as lump sums, consumers were often unaware of how the costs broke down (labor, materials, excavation, and so on).

For plumbers, unfamiliar products could present unknown performance problems, and a bungled installation often required a second visit, paid for out of the plumber's pocket. For this reason, plumbers generally preferred to install a single shower brand and were extremely reluctant to switch brands. Loyalty to a single brand created expertise in a given brand's installation idiosyncrasies and failure problems. Over time, plumbers also liked to familiarize themselves with the service they could expect from a manufacturer.

As a general rule, plumbers distrusted innovation. For example, in the 1980s some manufacturers had introduced electronic "push-button" controls for temperature settings. Rawlinson recalled: "The mechanisms were poorly designed and didn't work well at all. Ever since that, there's been a great deal of skepticism toward anything that seems technologically newfangled—especially if it involves electronics."

The Development of the Quartz Shower Valve

Historically, Aqualisa's reputation had always been strong in the U.K. shower market; the company was generally recognized as having top quality showers, a premium brand, and great service. Aqualisa's market share ranked it number two in mixing valves and number three in the overall U.K. shower market. (See **Exhibit 7** for additional information on Aqualisa's financials.)

However, when Rawlinson joined the company in 1998, he believed it was vulnerable, for several reasons. First, Rawlinson believed that other companies were catching up to Aqualisa in terms of product quality. Second, Rawlinson feared that the market was beginning to perceive Aqualisa products as being overpriced (see **Exhibit 8**). Third, while Aqualisa's service was still regarded as being "great," actual service had slipped over the past few years. And finally, about 10% of Aqualisa showers still "went wrong," a percentage that hadn't improved in many years. Rawlinson remembered:

> When I first joined Aqualisa in May of 1998, what I found was a highly profitable company that was quite comfortable with its niche in the market. It had 25% net return on sales and was enjoying 5% to 10% growth in a mature market. Everyone was happy. But I was worried. I knew the current points of difference were eroding and that eventually the market might implode on us. From the start, I firmly believed that the future was to focus on innovation.

Rawlinson's first priority was to build a research and development (R&D) team:

> We brought together a top-notch team of outsiders and insiders to look at the future of showers. We had engineers, R&D, our sales and marketing director, and a market research guy. We did research studies to understand peoples' problems and attitudes to showering. We had a top industrial designer and a bunch of Cambridge scientists who apply technology to industrial applications. We put all these people into a huddle—held brainstorming sessions,

[3] Typically, the plumber would either excavate himself, or he would subcontract the work to a plasterer. The price plumbers charged for excavation varied significantly.

with flip charts and felt-tip pens. And we came up with all kinds of things to improve in a shower.

As a result of their market research, Rawlinson realized that the consumer wanted a shower that looked great, delivered good pressure at stable temperatures, was easy to use, and didn't break down. Plumbers wanted a shower that was easy to install, with a guarantee to not break down or require servicing. The team's brainstorming led to some real breakthroughs. Rawlinson noted:

> The breakthrough idea was to locate the mechanism that mixes the water remotely—*away* from the shower. All the problems with showers come down to the fact that you have to put a clumsy, mechanical control right where the user doesn't want it—*in* the shower. And that's why you get these big bulky boxes on the shower wall. Or you're constrained to put the mechanism somewhere in the wall behind the shower—equally difficult and costly to install or repair. But locating the mechanism remotely—all of a sudden that opened up all kinds of opportunities because now you didn't necessarily have to excavate.
>
> The problem was, how could a user control a mechanism that was located remotely? And that's when we brought the electronics people in. Of course, that generated a lot of skepticism, because electronics had flopped so terribly in the '80s. But nobody had ever thought of using the electronics to control the valve remotely. And when we came up with the idea, we realized very quickly that it had *huge* potential.

Once the product started to take shape, field tests were next. Rawlinson arranged for about 60 consumer field test sites, installing showers in the homes of sales reps, company personnel, and friends of friends. Feedback from the field tests prompted constant modifications. He recalled:

> Consumers told us they wanted maximum pressure. But once we gave them maximum pressure (about 18 liters per minute) consumers felt it was wasteful. So we had to give them the option to run at two-thirds speed—which they liked more than maximum pressure.
>
> With the temperature settings, it was the same thing. We knew from our research that the optimal water temperature was 41° [Celsius]; anything above that would be uncomfortably hot. So we created this temperature control that had an upper limit of 41°. But people hated the fact that it required them to turn the valve all the way to the right, into the "red zone" on the indicator. Even though nobody wanted their water hotter than 41°, they all wanted the *option* of being able to make the temperature hotter. So we reset the maximum to 45°, people set their temperature at 41°, and everyone liked that much better.

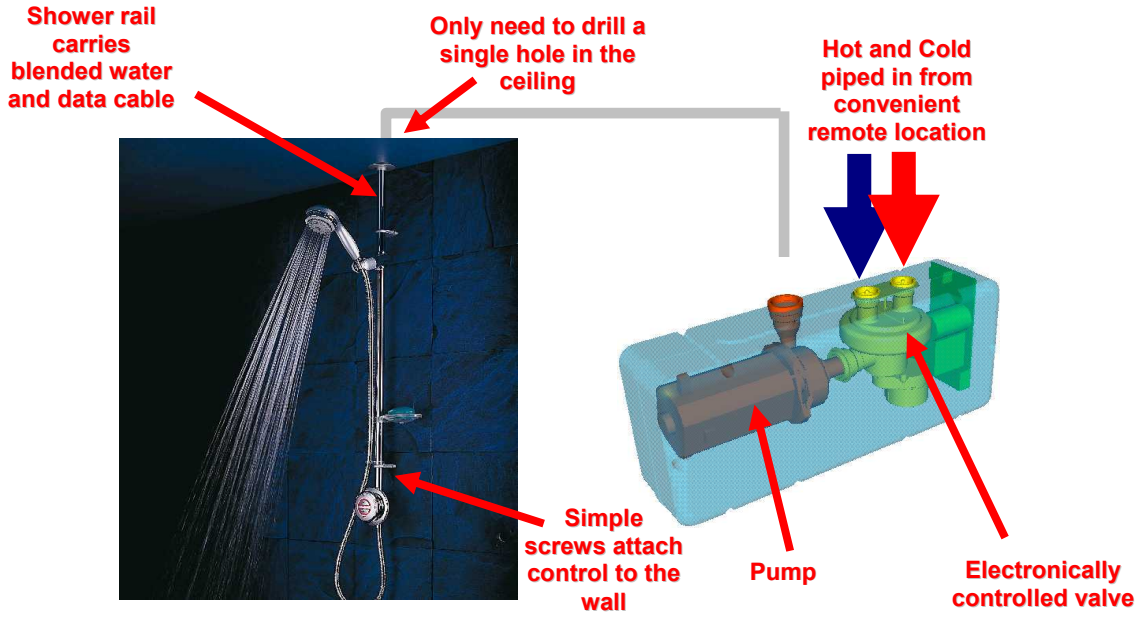
After three years of development—during which the company spent €5.8 million—the result was a radically different kind of shower (called Quartz) that cost the company about €175 to €230 to make. By this time, the company had invested in a new state-of-the-art testing facility, had acquired nine patents, and had grown its engineering team from 6 to 20. Several additional products were in advanced stages of development, while dozens of other ideas were in the early stages of the new-product development pipeline.

The Quartz: A Breakthrough in Shower Technology

The Quartz came in two versions. The Quartz Standard Shower was designed for installations that already had, or did not need, a pump; the Quartz Pumped Shower included a pump.

To install the Quartz shower, the plumber had to identify a physical space to accommodate the remote processor, which was about the size of a shoe box. The processor contained the thermostatic mixing valve, and when applicable, the pump. The location of the processor could be anywhere within reasonable proximity to the shower—under a cabinet, behind a wall, inside a closet, in the ceiling, wherever. The device could be mounted horizontally, vertically, or on its side, depending on space constraints. The only requirements were that it had to be in a location where cold and hot water could be piped into the processor, and it had to be plugged into a standard power outlet. Once these requirements were met and the processor was in place, a single pipe fed the mixed water from the processor to the showerhead. Because of the flexibility associated with locating the processor remotely, excavation of the bathroom could often be avoided altogether. Instead, a plumber had only to drill a single hole (to accommodate the pipe feeding the mixed water to the showerhead, along with a data cable) into the ceiling above the shower (see **Figure B**).[4]

Figure B The Quartz Technology



Source: Aqualisa.

The benefits of Quartz were significant. Whereas a traditional shower installation took two days, some plumbers were already reporting an installation time of a half-day for the Quartz. Plumbers were finding that the installation was so straightforward that they could even send their young apprentices—many with little or no experience—to complete the entire job. Rawlinson had spoken to several plumbers during the field trials, "They raved about it. They said, 'It's just what we want! We need something like this that we can push-fit-connect-you're done. It's not in the wall, and it's very easy to use.'"

[4] The ease of installation was a big selling point for the Quartz. In fact, it was so easy that the installation guide itself was being used in Quartz's promotional and sales materials.

For the consumer, the Quartz shower provided efficient and reliable water pressure and temperature. In addition, it featured a "one-touch" control mounted on the shower wall. The easy-to-use push-button control light on the valve flashed red until the desired temperature was reached (see **Figure C**). Rawlinson remembered that this had been another feature with unexpected psychological benefits:

> When consumers turn a traditional shower on, they almost always turn the shower to very hot … and then wait for it to warm up. They usually have to stick their hand in the shower a few times until they feel it's hot enough to get in. Once they're in the shower, they immediately start fiddling with the controls again. It's incredibly inefficient and inconvenient.
>
> With our Quartz technology, the temperature control is automatic—there's no more fiddling. You don't have to manipulate anything anymore. Just set the temperature once, and leave it on that setting. When you want to use the shower, just press a button, and you've turned the shower on. When the red light stops flashing, you know the water's at the right temperature. Get in.

During field trials, consumers loved it. "We call it the 'wow' factor," Rawlinson said. "They loved how it looked; it delivered great power, and now it had neat fittings and push-button controls that lit up. Parents loved it because it was safe for their kids to use on their own. The elderly loved it because they didn't have to fight with stiff valves. What wasn't to love?"

Figure C The Quartz Thermostatic Control

Source: Aqualisa.

Rawlinson was already anticipating upcoming product releases. In a few months, Aqualisa would be ready to launch a Body Jet product that fit easily on top of the Quartz control valve, creating several jets of water that sprayed horizontally from the wall onto one's body. This feature was popular in spas and health clubs; women particularly liked it because it allowed them to shower without getting their hair wet. The R&D team had also just finished designing a "slave" remote for the Quartz. Rawlinson described it: "Imagine waking up in the morning, rolling over, and pushing a 'remote control' next to your bed that turns your shower on. By the time you stumble in the bathroom, your shower is ready with the water at the right temperature, waiting for you to get in. Because we're dealing with electronics, the wireless technology to do this is almost trivial."

In fact, Rawlinson and the R&D team could spend endless hours coming up with new product ideas; as Rawlinson liked to say, "Once you put a computer in the bathroom, the potential is unlimited!"

To launch the new product, Aqualisa had hit the major shows, like the Bathroom Expo in London in May 2001. At the Expo, the Quartz had been awarded the top prize.[5] Press events had been coordinated with demonstrations. The trade press had raved about the "cleverness" of the product and its "elegant design." One reporter wrote:

> Imagine a shower that takes less than a day to fit, doesn't have flow problems, offers accurate temperature control, is simplicity itself to use and comes in versions to suit all water systems. It sounds too good to be true—but after three years of brainstorming . . . Aqualisa has achieved the apparently impossible with a product that takes a genuinely new look at a set of old problems—and solves them.[6]

Other reviewers had been similarly positive, and the Quartz had been featured on the covers of several prominent trade journals.

Initial Sales Results

Aqualisa had a 20-person sales force that sold to distributors, trade shops, showrooms, developers, and plumbers. Tim Pestell, Aqualisa's national sales manager, described the sales team's priorities: "Our sales force spends about 90% of their time on maintaining existing accounts—servicing existing customers: distributors, trade shops, contractors, showrooms, and developers. Ten percent of their time is spent on developing new customers." Aqualisa's sales force also had long-standing direct relationships with a group of plumbers—"our plumbers" as director of marketing Martyn Denny called them—who were very loyal to the Aqualisa brand.

With the launch of the Quartz, the Aqualisa sales force had contacted its network of plumbers, calling face-to-face to introduce and explain the new product, but few actual sales had resulted. Indeed, despite all the early excitement over the product, and despite being made available in all of Aqualisa's normal channels, very few units had sold in the first four months on the market. Rawlinson worried:

> Our channel partners are sitting there having bought a thousand of these Quartz products, and they've sold 81. The poor product manager is looking pretty stupid at this stage. This is a huge problem for us—pretty soon they're going to write this off as a failure and forget about us. I can see a scenario in six months' time where real sales in the market—currently about 15 units a day—are still down at 30 or 40 units a day. We'll look like a niche product. We've got to sell 100 or 200 a day to break through to the mainstream.

Part of the problem was that plumbers were wary of innovation, particularly any innovation involving electronics. Rawlinson told the story of a personal friend who had to insist that her plumber install a Quartz:

> His initial reaction was negative. He said, "Oh no, I wouldn't put one of these in, Madam. I've had these electronic showers before. They don't work." She insisted and made him put it

[5] "Showered with Success," *Bathroom Journal,* June 2001, p. 13.

[6] Ibid.

in. He told her it would take two days. He was done by lunchtime the first day. And he said, "That was so easy. Can I have the brochure?" And now he's got two or three more jobs. So once a plumber puts one in, he's a convert.

Pestell, however, noted that given the conservative nature of most plumbers, "Adoption is a long, slow process. It takes time." In addition, he pointed out:

> Some people at the company think the Quartz will eventually replace our core product—the Aquavalve—and become mainstream. I think it's really a niche product—it's good for homes with children, or for the elderly and the handicapped. It's easy to use, safe and so on, but we can't forget our core products every time we launch something new. The Aquavalve is our bread and butter, and it can go away if no one's watching.

Denny concurred, "How do we pitch our other products alongside Quartz? Right now, if Quartz is mentioned, our salesmen tend to gloss over our other products. In fact, to sell the Quartz, they have to point out *deficiencies* in our existing products. That doesn't really make any sense, does it?"

According to Rawlinson, the only place Quartz seemed to be gaining any traction was in the showrooms:

> Showrooms are traditionally quite a niche market. But I think we've made some penetration into that sector, and we're starting to get working displays around the country. Because you put one of these things in, you press that control button, the little red light comes on: it's sold! Everybody loves it. And where it's gone in—a working display—it's become the leading product in that showroom almost immediately.

A Shift in Marketing Strategy?

The waitress began to clear the coffee cups. Rawlinson absently dusted at the crumbs on the tablecloth as he leaned forward and said:

> Once upon a time Microsoft was a tiny little provider of specialist software. Bill Gates had the vision to see that if you own the operating system on the PC, you can build from there. One of our presentations calls the Quartz the "Pentium Processor" because we can do so much once we have this kind of control over your bathroom . . . we can use this technology with a shower . . . but in the future we could use it with a bath, the sinks, whatever . . . . We're only limited by our creativity.

The question was, how to generate sales momentum? Was the problem that the Quartz was priced too high? Rawlinson wondered whether a discounted price might generate more market enthusiasm for his innovation. Because Quartz was such a breakthrough product, Rawlinson was loath to go this route. On the other hand, Rawlinson *was* willing to rethink his overall marketing strategy for the Quartz. Some of the marketing options he was debating included the following.

Targeting Consumers Directly

"We have so many problems reaching the plumbers," Rawlinson continued. "So I'm thinking to myself, why not target consumers with this product and try to build a consumer brand? Triton has proven that it can be done. And if there's ever been a breakthrough product to do it with, this is it. I think this is a 'bet the company' kind of product."

The problem with this option was that Rawlinson was finding it tough to justify a high-risk, high-reward strategy when company results were already healthy. As a test, a one-time-only print advertisement campaign was scheduled to run in *The Mail on Sunday* magazine in October (see **Exhibit 9** for copy of the advertisement). But, as Rawlinson noted, "One ad does not a campaign make. I'm not overly optimistic." A large-scale consumer campaign would cost about €3 million to €4 million over two years. With a net income of about €17 million, this would be a very tough sell across the company.

Targeting Do-It-Yourselfers

A second alternative was to target the do-it-yourself market. Rawlinson noted, "The Quartz is so easy to install, you or I could even do it." Aqualisa was currently selling its Gainsborough line to this market. The risk, as Rawlinson pointed out, was that "once you show up in the DIY sheds, you can't climb back out. You have to be careful about associating your premium brand with your discount channel."

On the other hand, the value proposition of the Quartz was so superior to that of the electric showers that dominated this market, [that] perhaps it *was* possible to charge a premium for this product through that channel, Rawlinson thought. In addition, he wondered if Aqualisa could get its partners like B&Q to help push the product, avoiding the need for expensive consumer advertising.

Targeting Developers

A third alternative was to target developers more aggressively. Rawlinson thought aloud: "The plus side is that this could conceivably be a large-volume channel. If we could get a couple of developers on board, we'd sell a lot of showers. In addition, it would force plumbers to get familiar with our product since they would have to install whatever the developers tell them to install." But there were downsides—including the significant time lag before showers would reach consumers through this route. As Rawlinson noted with some urgency, "We've got *at most* a two-year lead on the competition."

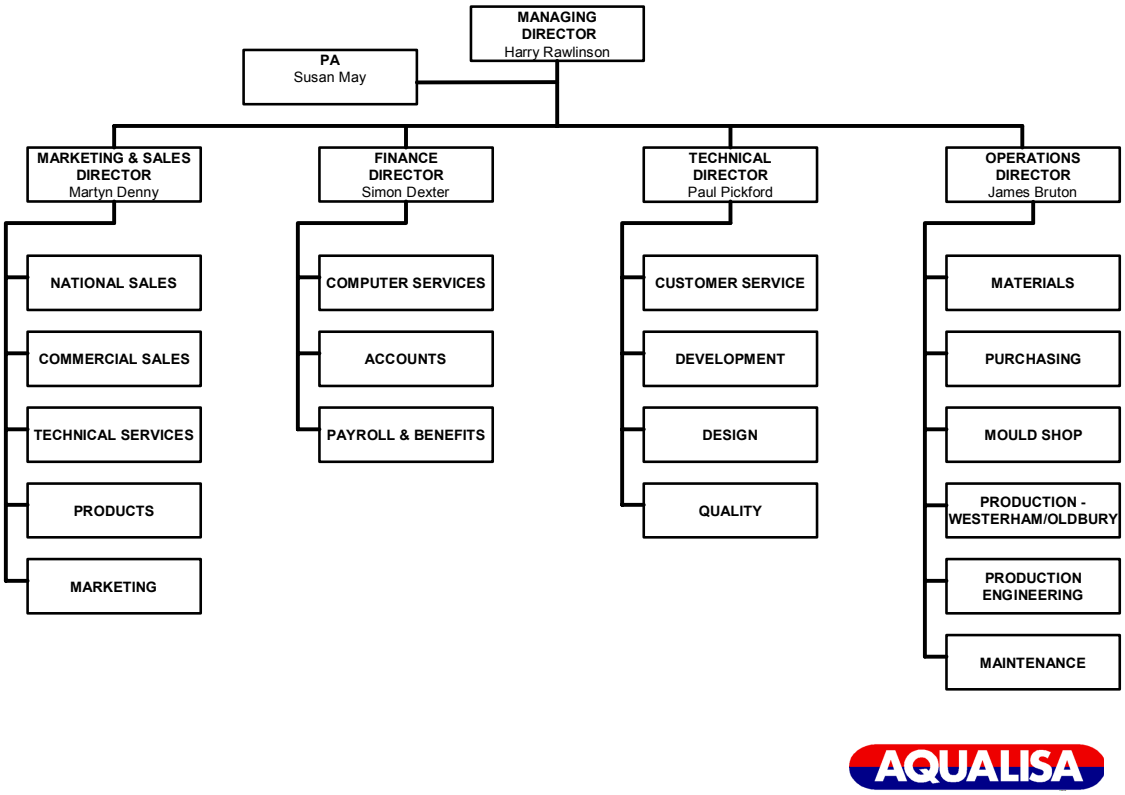
Rawlinson also wondered how tough a sell it would be to developers. Developers had already shown a reluctance to spend money on conventional Aqualisa products because they perceived those products to be premium brands; even at a 50% discount, the company had been unable to make the sale. And again, given that Quartz was such a breakthrough innovation, Rawlinson was reluctant to discount the price.

What to Do

If his managers were right and this was a niche product, Rawlinson wondered if maybe he should simply lower his expectations. Everything was basically well with the company—but at the same time, he could not help arguing:

> Business school taught me to think strategically, to be a visionary. Everything I learned at HBS tells me this is a breakthrough product. My worry is we'll miss the opportunity and in five years' time, someone else will have got the world market for this technology. We've had a nice, comfortable, contented life in the U.K., and it's hard to get a small company—particularly one that's been so profitable all these years—to be ambitious. But one of the things that a Harvard background gives you is the itch to think big. You see other companies that break out of the pack because they've got the right product and they've got the right vision. So why not this company?

Exhibit 1 The Aqualisa Organizational Chart



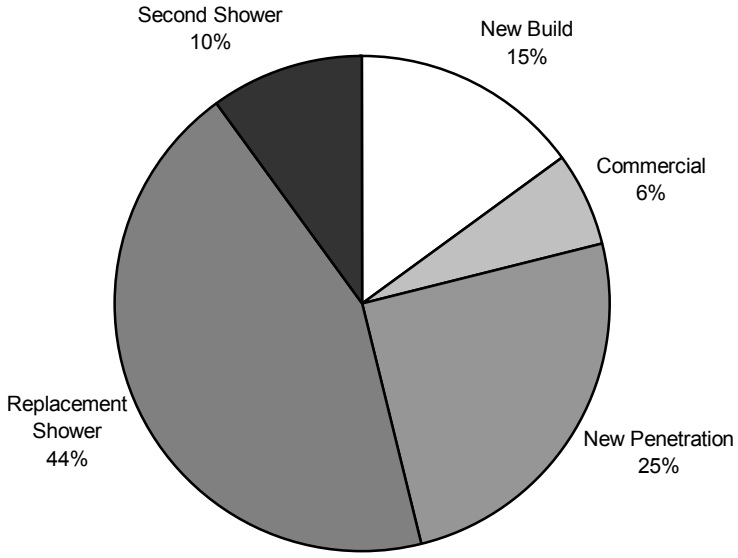
Source: Aqualisa.

Exhibit 2 U.K. Market Share Data: Units Sold (2000)

Brand	Electric Showers	Mixer Showers	Power Showers	Total Units Sold
Triton	479,000	41,000	25,500	545,500
Mira	155,000	200,000	35,000	390,000
Gainsborough	180,000	20,500	3,000	203,500
Aqualisa	6,000	94,000	22,000	122,000
Masco	35,000	50,000	35,000	120,000
Ideal Standard	0	60,000	0	60,000
Heatrae Sadia	40,000	0	0	40,000
Bristan	0	20,000	0	20,000
Grohe	0	20,000	0	20,000
Hansgrohe	0	15,000	0	15,000
Others	205,000	29,500	29,500	264,000
Total Units Sold	**1,100,000**	**550,000**	**150,000**	**1,800,000**

Source: Aqualisa.

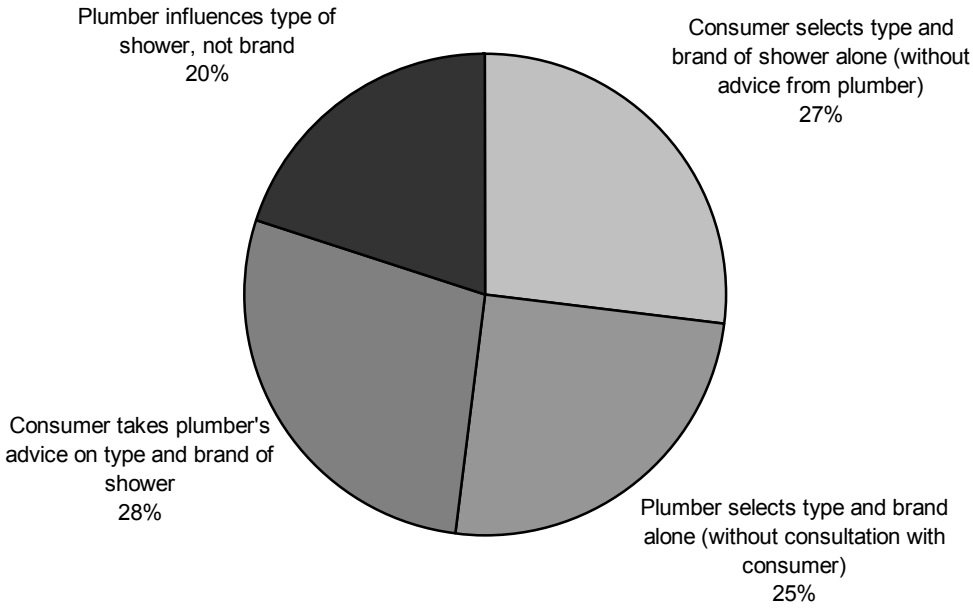
Exhibit 3 U.K. Shower Sales, by Reason for Installation



Source: Aqualisa.

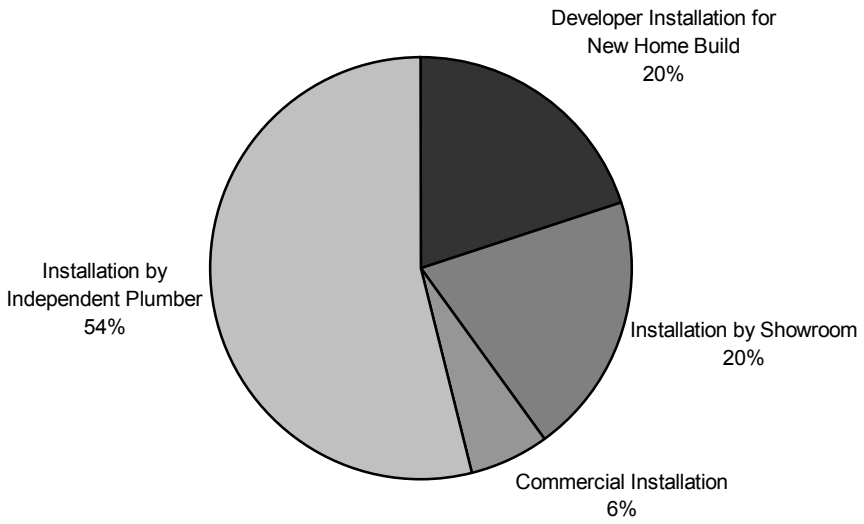
Note: "New penetration" refers to new showers installed in existing bathrooms (where plumbing already exists—e.g., a shower added to a bathtub). "Second shower" refers to installation of a new shower in a location where no plumbing exists.

Exhibit 4 Shower Selection for Mixer Showers



Source: Aqualisa.

Exhibit 5 U.K. Shower Market, by Installation Method (Mixer Showers Only)



Source: Aqualisa.

Exhibit 6 U.K. Shower Market, by Product Type and Channel (Total Units Sold, 2000)

	Electric Showers	Mixer Showers	Power Showers
Do-It-Yourself Sheds	550,000	80,000	20,000
Showrooms	55,000	70,000	20,000
Trade Shops	330,000	400,000	110,000
Other (Electrical wholesalers)	165,000		
Total Units Sold	**1,100,000**	**550,000**	**150,000**

Source: Aqualisa.

Exhibit 7 Aqualisa Select Financials 2000 (€ in thousands)

Shower Sales (Electric, Mixer, Power, and Pumps)[a]	€46,212
Other[b]	21,744
Total Sales	**€67,956**
Gross Margins	**€31,824**
Sales	€4,080
Marketing	2,724
Customer Service	1,322
Research and Development	1,764
Finance, Administration & Depreciation	4,579
Total Overhead Spend	**€14,469**
Base Profit	**€17,355**

Source: Aqualisa.

[a] Includes all Aqualisa shower lines, including Aquastyle, Aquavalve, and Aquastream. Also includes Aqualisa pumps, as well as a variety of other specialty shower models sold by Aqualisa; these were primarily differentiated by style (e.g., contemporary, antique, brass, etc.). Does not include other brands such as ShowerMax and Gainsborough.

[b] Aqualisa sold a variety of other products, including shower accessories and commercial products.

Exhibit 8 Aqualisa: Selected Products and Price Points

Model	Segment	Retail Price	MSP	Cost	Margin
Aquastyle	Premium	€230	€155	€95	€60
Aquavalve 609	Standard	€715	€380	€155	€225
Aquavalve Value	Value	€390	€205	€75	€130
Aquastream Thermostatic	Standard	€670	€350	€175	€175
Aquastream Manual	Value	€480	€250	€140	€110
Quartz Standard	Premium	€850	€450	€175	€275
Quartz Pumped	Premium	€1,080	€575	€230	€345
Aquaforce 1.0/1.5 Bar	Standard	€445	€230	€125	€105
Aquaforce 2.0/3.0 Bar	Premium	€595	€310	€175	€135

Source: Aqualisa.

Note: "Retail price" refers to the price charged by the retailer (trade shop, showroom, or DIY outlet) to the customer. "MSP" refers to manufacturer selling price (Aqualisa's price to the channel).

Exhibit 9 Advertisement for the Quartz Shower

Source: Aqualisa.