ABSTRACT

The concept of strategic marketing planning has become of paramount importance within corporate marketing programs. Marketers must rely heavily on analytical tools for proper execution of profitable programs. The SAS System is a useful tool to increase the efficiency and effectiveness of your marketing coordination and analysis.

The strategic marketing function is comprised of specific analysis components. Use of the SAS System within each of these functional marketing components is emphasized. Examples of system components are used to illustrate the time-saving features and increased effectiveness available to market analysts through use of the SAS System.

Companies trying to become more market oriented are accomplishing the task by changing the way they think about their products and services and more importantly changing the way they make decisions about the direction for those products and services. The new decision making methods are often referred to collectively as strategic marketing planning (SMP). This paper provides an example of how companies may use one technology, the SAS System, as a tool within the SMP process.

SCOPE OF STRATEGIC MARKETING PLANNING

The Need for Strategy

Your job depends on how effectively your company uses marketing tools to run the business. Suppose someone in your organization comes up with an idea for a new product or service -- a good idea. But will it sell? This question tops a long list of strategy questions that must be considered before a product can be brought to market. All areas of the company -- manufacturing, engineering, research and development, finance, sales or marketing -- must understand the meaning and usefulness of "market oriented" planning. Read this carefully, I said market oriented, not marketing oriented. Market oriented means running a customer driven business, marketing oriented implies a territorial dispute dominated by a group calling themselves the marketing department.

What Is SMP?

Strategic marketing planning means different things to different businesses. A more logical approach may be to define what being "strategic marketing oriented" means to a company -- that is, you do not manage a company by focusing on R&D (an input), production (an output), or finance (a scoreboard), but rather by a thorough driving orientation toward the market and the customer. SMP provides an organized approach toward this goal, and the process can be defined in six steps:

1. Analyze the Situation
   Assess and determine the needs of and opportunities open to a company within a broadly defined customer base. These are the "where are we now?" questions.

2. Set Objectives.
   Determine how the customer base should be segmented, and develop a picture of what market success looks like in each segment of the market -- the "where are we going?" questions.

3. Evaluate Alternatives.
   Look at each product segment individually, and determine the market distribution concepts, strategies and plans to meet the objectives within each market segment. Then evaluate the costs and benefits of carrying out these programs in the marketplace.

4. Develop the Plan.
   Creatively develop programs to address the needs of each market segment, including a timetable and a desired outcome. Spell the programs out in measurable terms within the structure of a specific plan.

5. Implement the Program.
   Implement and communicate the marketing plans and programs through effective and coordinated efforts by all parts of the company. Allocate resources to a carefully calculated "marketing mix" as defined in the plan.

   Continuously monitor performance, evaluate benefits, forecast and make practical use of the information to adjust and change to meet the needs of each market segment.

Information Processing Considerations

Markets are creative, dynamic, social and sometimes unpredictable things. Complex and expensive systems to predict and adjust to changing markets are becoming the rule in business. Sometimes the system becomes the strategy, and this is a serious pitfall in using information processing to run a marketing operation. The system must be designed to support the creative minds that will ultimately make the marketing decisions.
SAS software is a useful tool for making marketing decisions. Figure 1 illustrates the SMP Process Control Panel, a SAS/AF interface that is used to assist the marketer with each of the six steps in the SMP process. Examples for the market-based system help to clarify the structure and capabilities of the market-based system.

**SMP MARKET-BASED SYSTEM**

Command ==>

SMP Process Control Panel
(Please make a selection)

1 Situation
2 Objectives
3 Alternatives
4 Plan
5 Implement
6 Monitor
X Exit SMP System

Figure 1: The SMP Process Control Panel

**STRATEGIC MARKETING PROCESS**

**Analyzing the Situation**

Situational analysis in market-oriented planning determines the position of your business in today's market. The situational analysis involves five key components important to any group trying to develop a marketing strategy:

- Internal assessment
- Competitor analysis
- Industry analysis
- Environment analysis
- Customer analysis.

Internal assessment, competitor analysis, industry analysis and environment analysis are important processes in marketing decision systems. Systems to track customer satisfaction data, competitive products and prices, and financial and industrial influences are easily tracked through interactive data systems. These systems may employ features of Screen Control Language through SAS/AF and SAS/FSP software to manage user interaction.

Customer analysis, however, is the most important part of situational analysis in the SMP process. Customer analysis is the study of customer behavior and buying preference within each market segment and this is where the capabilities of the decision system are put to best use. The example below illustrates a process called choropleth mapping which integrates several of the available data analysis features.

**Situational Analysis Example: Market Dispersion**

Choropleth maps are useful in demographic market studies to determine dispersion within segments. Typically, the maps display range-graded values for geographic areas by shading, coloring, or placing symbols on those areas. Choropleth maps effectively analyze rates, statistical measures or per capita indices.

The decision system performs a variety of functions to help the analyst visualize the market to make more informed decisions. This example requires the decision system to process data in several ways to perform the choropleth analysis:

1. Raw data is read from an input file and put into a SAS data set. The explosion of demographic data in consumer markets has resulted in increased use of relational data bases. SAS/DB2 software is one example of a data base interface that is useful for this type of analysis. The advent of multi-engine architecture within SAS software under Version 6 will further enhance the functionality of the decision system.

2. This data set is merged with the appropriate SAS/GRAPH map data set and the observations are sorted.

3. PROC MEANS determines the number of points to plot for each geographical division.

4. The program locates the center of each geographical division (a polygon).

5. The NORMAL distribution function generates a normally distributed pattern around the center of the geographical division. This pattern is annotated on the map.

Figure 2 shows the results of the market dispersion analysis based on customer demographic data. The example employs the data extraction, statistical analysis and graphics capabilities of the decision system to provide a practical aid for understanding customer behavior in the market.
Setting Objectives

Objective setting in market-oriented planning is integrally related to segmentation techniques. Segmentation strategies are specified in strategic business units (SBUs) and are used to formulate the physical structure of markets. SBUs are often referred to as product market segments. Objectives in marketing are explained in terms of these segments.

The decision system helps the analyst address the three primary segmentation requirements, measurability, accessibility, and substantiability. The goal is to develop a strategic response to each segment; the responses may include differentiated marketing, undifferentiated marketing, or concentrated marketing depending on the characteristics uncovered using the decision system.

An important design consideration emerges when studying segmentation strategy: Segments must have different response functions to any individual combination of marketing variables. The fact that a group is different is irrelevant -- the group must respond differently in the market.

The example discussed below illustrates a segmentation analysis using the decision system. The analysis helps the analyst test for the three segmentation requirements.

Objective Setting Example: Market Segmentation

The analysis of share size within each segment is important to the overall segmentation strategy. A facility used to analyze market share within the decision system is referred to as a bubble plot. Bubble plots allow the analyst to conceptually see the size of each SBU within some perceptual space.

This technique of analyzing market share within segments is known as nonmetric multidimensional scaling. The applications of this technique may include:

- Identification of desirable product attributes
- Preferred combination of attributes
- Substitute and differentiated products
- Viable segments within a market
- "Holes" in the market for new introductions.

![Figure 3](image3.png)

The plot shown in Figure 3 provides data on the relative perception of automobiles in a particular product market segment, 30-35 year old car buyers. Each automobile is represented by a "bubble." Bubbles correspond to market share and are placed on the perceptual diagram according to ordinal scaled input measures based on price and styling.

The decision system reads input demographic data and automobile pricing data. These measures are then interpreted by the GPLOT procedure and used as a practical aid to help the analyst get a picture of the market. There are a number of computational issues related to multidimensional scaling that should be understood before interpreting the results of this analysis. The example illustrates a simple use of multivariate techniques employed in market segmentation studies.
Evaluating Alternatives

The process of evaluating alternatives in marketing is usually aimed at growth strategies. The idea is to use the situational analysis and objectives to choose a collection of products and services — a “marketing mix” — that exploits a company’s strengths and weaknesses in a specific market segment. Managers must analyze the present marketing mix and evaluate current market targets and new market targets and allocate resources to those targets. New products and services must also be analyzed, and resources must be allocated to current and new market targets.

The number of approaches to market analysis at this stage can be staggering. Different companies have different strategies for developing the appropriate marketing mix. In current or new product development, a number of methods must be employed to effectively evaluate all the marketing alternatives available before developing a marketing plan. In the end, there are four fundamental strategies that can be adopted for each business unit:

- Market penetration (low risk)
- Market development (high risk)
- Product development (low risk)
- Diversification (high risk).

Even in very small businesses, the sheer number and importance of the available alternatives require an effective way to manage this process. The possibilities for implementing an automated market-based system are especially important when evaluating marketing alternatives.

Market research is especially important to help managers make sound decisions during the process of evaluating alternatives. Marketing research studies can be classified as being either basic or applied in nature. Basic research finds new knowledge regarding some aspect of the marketing system. In contrast, the purpose of applied research is to assist managers in making better decisions. Basic research studies tend to be thorough and complete while the depth of applied research depends upon the needs of the decision maker.

An important part of most market research studies is some sort of customer interview process. The interview is usually implemented through a survey. The survey may be formal or informal, subjective or objective, but must always be accurate. The market-based system is ideal for conducting market research; it can be used during all phases of the research process. The system can be used as a tool for determining information needs, sampling design, instrumentation, data collection, data processing, statistical analysis and report generation.

The discussion below provides an elementary look into methods used within the decision system to design, collect, process, analyze and report market research information. It is intended to illustrate the capabilities available to marketers through use of a SAS software based decision system.

Evaluating Alternatives: A Survey Research Example

A popular analysis method involves the use of an applied technique known as “backward” market research. The premise of this approach is to start where the process usually ends and then work backward. According to Alan R. Andreason, Graduate School of Management at UCLA, these are the required steps to successful “backward” research:

1. Determine how the research results will be implemented (which helps define the problem).
2. Determine what the final report will contain and what it should look like.
3. Specify the analyses necessary to “fill in the blanks” of the research report.
4. Determine the data necessary to carry out the analysis.
5. Design instruments and a sampling plan to carry out the analysis.
6. Do the field work required and always check to see that the data is meeting your needs.
7. Do the analysis and write the report.

A common problem with this type of research approach is that it is time consuming for both the researcher and the manager. It requires more work by the sponsor up front but ultimately is more useful. This example illustrates how the decision system can be used to speed up applied market research using the “backward” methods.

SAS software can easily be used to build data entry systems customized for verbal or written survey instruments using the Interactive abilities available within PROC FSEDIT. Figure 4 shows a typical data entry screen for a mail-out survey. The software has the capability of directly reproducing the actual survey form, but in most cases this is not the most effective way to implement the data capture system.

The data entry features available within SAS/FSP® software enable the researcher to design the survey instrument independent of the data capturing facility. Note that the data entry screens were designed to follow the format of the written survey instrument, but also require only two key strokes per field for the data
entry person. (In most cases, a number followed by the ENTER key).

As any SAS user knows, the analysis and reporting facilities available once the data has been collected are limitless. The analysis methods range from simple univariate analysis to complex multivariate techniques. Most inferential statistics in this type of application are based on some form of cross tabulation of variables collected in the study. Figure 6 illustrates the SAS software code needed to implement one bivariate inference test, the chi-square test, which is appropriate for examining the relationship between two nominal variables. It is shown here because of its usefulness in analyzing cross-tabulation tables.

When performing a chi-square test, the null hypothesis is that the row and column variables are independent, while the alternative hypothesis is that the row and column variables are not independent. A test statistic is calculated and compared to a critical value from a chi-square distribution. This test is performed by invoking PROC FREQ as shown in Figure 5.

This example is comparing two responses to a questionnaire about training methods. We are trying to determine if there is a relationship between the availability of a course coordinator to assist students taking computer-based training (CBT) courses and whether students consider CBT handbooks useful. Both of the questions have yes/no responses, creating a 2x2 response matrix.

Figure 6 shows the results of the PROC FREQ run. Notice that the p-value (labeled Prob) is .002, which rejects the null hypothesis. In other words, you conclude that there is enough evidence to indicate a relationship between training coordinator availability and student handbook usefulness.

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Figure 4: Survey Data Capture Screen

Figure 5: Code for chi-square Test

PROC FREQ also offers us Fisher's exact test, originally developed for the special case of a 2x2 table. The line labeled 2-Tail gives the p-value for the null and alternative hypothesis. In this case, the p-value is .00505, so you again reject the null hypothesis, just as you did when looking at the chi-square test. Other parts of the output correspond to other tests and are not discussed here.

The preferred method of using "backward" market research is to present this type of analysis - using dummy data or a very limited sample - to the sponsor before beginning the interviews. The market-based decision system easily allows the researcher to re-define questions and alter analysis techniques to fit the needs of the study. Data collection screens are easily changed and analysis methods may be implemented to fit requirements of the analyst or supervising statistician.

Develop the Plan

The strategic marketing plan is the tool used to coordinate and communicate the objectives and functional plans for each SBU. The key component of any marketing plan is the strategy statement, which must concisely answer three questions:

- What segment are we targeting?
- What competitors will we challenge?
- Why will customers purchase our product?
The rest of the plan provides a road map to guide the company to successful marketing implementation. The marketing plan usually consists of an analysis of the current marketing situation, threats and opportunities, objectives, marketing strategies, action programs, budgets, timetables and controls.

An important contribution of the market-based decision system is its ability to track and schedule implementation of marketing strategies. A number of techniques may be employed in marketing project management and are ideally suited to the use of SAS/OR® software. The following example illustrates the scheduling abilities of the market-based system.

Plan Development Example:
Marketing Programs Schedule

Timing of marketing programs is often as important as the design of the programs. It is imperative that marketing programs be carried out according to a strategic plan that involves announcements and release dates corresponding to the marketing environment. The decision system can coordinate the timetables for marketing implementation through use of a number of scheduling methods.

The method illustrated here shows the use of the GANTT procedure to graphically represent the progress of marketing activities as may be scheduled by the critical path method (CPM). Using PROC CPM, scheduling information and activity relationships are analyzed to create the best possible marketing implementation schedule.

Figure 7 shows a typical schedule produced by PROC CPM and Figure 8 shows the results of invoking PROC GANTT on the schedule. A variety of modeling and "what-if" analysis methods are available to those designing market-based decision systems.

![Figure 7: CPM Schedule](image)

![Figure 8: Gant Chart of Marketing Activity](image)
Program Implementation

A variety of programs may be formulated to carry out strategic marketing plans. These programs may involve what are commonly referred to as the five P's:

- Product
- price
- place
- promotion
- personal selling.

There is a wealth of analysis that may be performed on any one of these implementation points. Research and modification on product line, price elasticity studies and econometric modeling techniques, distribution channels and scheduling systems, mass mailing and direct marketing strategies, and sales management and tracking systems may all be included in the decision system.

Direct mail is an area that has received tremendous attention in recent years. The high cost of personal selling and the need to increase the number of qualified prospects, and the large information pools that exist for database marketers, have caused narrowly targeted direct mail to emerge as an amazing source of new customers.

SAS software lends itself to targeted mailing activities through the use of data management tools within the language and full screen interactive technology. PROC FSLETTER is ideally suited to interact with large data systems to provide for efficient and trackable mailings.

Program Implementation Example:
Targeted Mailings

Increased postage and labor costs require any direct mail system to identify target customers in niche markets easily. The better the system is able to define customer attributes, the more likely the mailing will succeed in reaching its intended audience. The objective of the system should be the quality and appropriateness of the message, not the quantity of the letters mailed.

Figure 9 shows one sample screen from the market-based system that are designed to allow the analyst to target mailings to specific customers. Depending upon the fields selected, a variety of databases are queried for information resulting in a final SAS data set ready for use by PROC FSLETTER.

On the other side, the system provides batch processing capabilities to search for "hooks" or identification variables which track the success of each mailing. The system keeps tabs on the labor and materials expenses for each mailing as well as the response levels to produce automated reports about the success of various mailings in the market. In this way, the system actually helps the analyst identify the optimal combination of attributes for direct mail success for any particular market segment. Figure 10 illustrates some samples of tracking responses built into the mailing system. This technique combines data analysis and user interaction tools to design a targeted, market-based implementation program to increase sales revenue and prospecting effectiveness.

Monitoring and Adjusting

One of the most important parts of the SMP process involves the monitoring of the market and formulation of contingency plans to respond to the changes within the market. As markets become more mature, they usually become increasingly competitive and dynamic; companies with the ability to adjust to dynamic markets will emerge as formidable competitors.

There are risks associated with cost leadership as well as product differentiation. The effective market competitor will develop thorough forecasting and monitoring techniques to respond to changes in price.
and product structure. Forecasting is simply the art of anticipating what buyers are likely to do under a given set of conditions. Forecasting techniques may be implemented at a number of stages throughout the SMP process, but the forecast based on historical behavior over time is most important now.

The market-based decision system must combine sales and revenue data collection with well-coordinated forecasting methods to provide accurate information to direct or change the marketing mix. The many forecasting options available to the analyst through the decision system are based on the characteristics of the time series. Sales figures over time may exhibit three important characteristics including seasonality, trend, and autocorrelation.

Caution in using forecasting techniques within any automated marketing system is important. Forecasting should not be a completely automated process. It should be implemented by qualified analysts who are familiar with the market as well as the various techniques that may be employed to predict the behavior of time series data.

Given these requirements, the market-based decision system may be used to quickly and authoritatively aid the analyst to forecast what the market might do. The following example illustrates one forecasting application using SAS/ETS software.

**Monitoring Example:**

**The Sales Forecast**

The example illustrates a simple automatic forecasting application on sample sales revenue data. The application has been taken from the SAS Prototype Application: Forecasting, to show the interactive capabilities of the decision system along with the time series analysis methods available in SAS/ETS software.

The data we are using reflect ice sales for the last four years with the objective of forecasting sales for the upcoming year. After reviewing a plot of the time series and noting the seasonal pattern, you can use the decision system to perform a seasonal adjustment of the data so you can see the overall trend of your sales. The SAS prototype provides an automatic forecasting option to quickly run a number of different models on the data.

Figure 11 shows the main menu for the time series forecasting which may be integrated into the decision system. The marketer can use the system to choose among forecasting alternatives, specify the location of the forecasting data, choose the data set to be forecasted, select the time series variable, make adjustments for seasonality, choose modeling methods and produce forecast output.

The graphic output in Figure 12 is produced to forecast ice sales for the upcoming year generated from the decision system's forecasting model.

The SAS Prototype Application: Forecasting provides a good example of how forecasting capabilities can be integrated into market-based decision systems. The advanced analytical methods available to the marketer within the SAS software are too numerous to discuss here, but all the tools to solve complex forecasting problems may be built into the automated marketing system.
A WORD OF CAUTION

To often, the technology available to marketers is viewed as the ultimate source for decisions on business strategy. Marketing is one of those exciting fields that combines the science of concrete, analytical methods with creative ability. You must employ common sense to know what to do and when to do it by developing a closeness to your customers.

Although strategic marketing decisions are too important and too complex for gut-feel decision making, the automated systems developed should be designed to compliment and coordinate practical applications. View market-based decision systems as one tool toward your objectives, and make systems practical with an emphasis on the costs and benefits of implementation.

CONCLUSION

We have looked at the market-based decision system in the context of the strategic marketing planning process form a generalized, global perspective. This perspective has helped us realize the almost limitless design possibilities for SAS software based marketing decision systems.

The interactive features now available along with database interfaces and analytical capabilities allow users to build practical and efficient systems within SAS software to manage the strategic marketing function. Specific examples including market dispersion analysis, segmentation analysis, survey research, statistical analysis, project scheduling, direct mail, and sales forecasting have shown a few of the features available to market analysts who want to integrate these techniques into their overall system design.

Automated strategic marketing planning systems should be viewed as tools to faster, cost-effective and practical marketing decisions.

REFERENCES


Note: Examples and sample output from the market-based decision system described in this paper have been changed in the interest of confidentiality.