International Journal of Business and Economics, 2013, Vol. 12, No. 2, 121-130

Making Sense of Complex Marketing Decision Systems: Decision System Analysis

Roger Marshall*
Marketing Advertising Retail and Sales Department, Auckland University of Technology, New Zealand

David Bibby
Auckland University of Technology, New Zealand

Na WoonBong
KyungHee University, South Korea

Abstract

Decision system analysis (DSA) is a conceptually simple technique that maps the process of group decisions over time. The data are gathered in a variety of ways, but most often some form of protocol analysis is the foremost tool. The data are then condensed and depicted as a flow chart for a specific decision. If several such flow charts can be assembled within an industry, they can be melded together to form a generic guide that is very useful to practitioners and very interesting to theorists. Here, a brief history of the development of the technique leads to a description of the process. This is followed by a comparison to cognitive mapping, a similar technique applied to mapping thought processes rather than physical processes, and an illustrative longitudinal example of DSA.

Key words: decision system analysis; protocols; decision maps; business decisions

JEL classification: M30; M31; M37

1. Decision System Analysis

Decision System Analysis (DSA) does what only the truly wise can do—it makes complex phenomenon seem simple. In this instance complex, multi-person, iterative decisions are reduced to flow charts. DSA is simple to understand conceptually and it is simple to interpret the output. In this paper, the research technique is first described, and then the relationship it bears to similar analytical techniques is discussed. Finally, a fortuitous situation has arisen that allows an old DSA study of advertising agency decisions to be compared to partial results of a

*Correspondence to: Marketing Advertising Retail and Sales Department, Auckland University of Technology, Mayoral Drive, Auckland, New Zealand, 1010. Email: roger.marshall@aut.ac.nz.

wider study currently in progress in the same industry. This comparison will nicely illustrate not only the usefulness of the technique from an academic perspective but also the value placed upon it by business decision makers.

2. The Origin and Development of DSA

Churchman, Ackoff, and Arnoff (1957) wrote one of the most influential early books on operations research. Ackoff, who was Churchman's first doctoral student, was trained in the philosophy of science and is commonly considered the father of operations research. Yet he was also the greatest and most vociferous critic of the way that operations research developed. He observed the science developing into a narrow, quantitative tool only applicable to understanding and aiding low-level problems of limited scope. Often operations research models could even mislead, as they increasingly ignored the social and psychological variables that he considers such an integral part of group decisions (Ackoff, 1961). It is Ackoff who, in a sense, is the first proponent of DSA.

By the 1970s DSA began evolving into the form it has today. Capon and Hulbert (1975) published a landmark paper, in which they analyzed four marketing decision systems purely using qualitative descriptions. They, like Churchman and Ackoff before them, bemoaned the fact that few DSA studies had been conducted. Moreover, although many industrial and managerial decisions involve several people, decision science appeared to be more focused on individual decisions. The research conducted at an organizational level seemed to them focused mainly on the technological development of information systems. Capon and Hulbert's (1975) work provides a model for later research into marketing decision systems.

The next burst of DSA activity centered on industrial purchasing behavior (Bonoma et al., 1978; Robinson et al., 1967; Sheth, 1973; Vyas and Woodside, 1984; Webster and Wind, 1972). All of these researchers used inductive methods, providing descriptions of observations in many similar situations and generalizing from them using a flow chart or diagram to depict a decision system.

Again, although these researchers' deep insights still endure, there has been a remarkably small body of DSA published work since the 1970s. Many of the studies conducted after 1970 were either single product or single company studies (Cyert et al., 1956; Pettigrew, 1975; Wilson, 1984). Vyas and Woodside (1984), however, show that studying several companies allows inductive model building and suggest that this can provide useful knowledge for industry. Na et al. (2009) followed this advice and explored the decision systems within advertising agencies—this work, one of relatively few DSA studies in marketing this century, is described later.

Why is it, then, that so few DSA studies are conducted? One explanation is that research in marketing during the latter end of last century followed a pendulum swing and became highly quantitative. It seems more likely, though, that researchers eschew the technique as they simply consider that the method takes too much time and effort. In the next section, the methods of DSA are discussed before comparing DSA to similar research methods.

3. How to Conduct a DSA Study

DSA is a form of case study and, as in many case studies, mixed methods are used (Vyas and Woodside, 1984; Woodside and Sherrel, 1980). One of the principal tools in a decision system researcher's kitbag is observation. Thus Moore (1969) collected data about purchasing systems by sitting in the purchasing department of various companies for three days on seven occasions. But observation, although powerful, reveals little about motivation and little about the typicality of the behavior observed. Furthermore, in an attempt to not miss something, it is tempting for the observer to record everything for later analysis; however, Capon and Hulbert (1975) expressly warn against this practice, as it can become a very time-consuming and expensive technique, rather like ethnography, if much material not directly germane to the issue is also collected and subsequently filtered out.

Most researchers do not take such a general approach but rather conduct a series of recorded interviews with the decision-making team that complements their observations. These often take the form of protocol analysis, where a respondent is asked to talk through his or her typical decision process. Thus, perhaps, a face-to-face observation of a group meeting will expose the process, the group dynamics, and even the outcomes; however, when supplemented with individual interviews, motivations and possible variations from the norm may be exposed. Other methods can also help. Documents such as minutes of meetings, formal procedural guidelines, and so on can help flesh out interview and observational data.

Group decisions are often iterative, and also often follow a pattern. Even where there is no strict procedural guideline followed people are driven by habitual behavior so soon fall into a pattern, which is possibly adjusted over time and reinforced by the success of the outcomes. This indicates that it is possible to map the decisions as flow charts showing who speaks to whom, and in what order, and offering alternative paths of action at each stage that are taken in the light of the outputs from the previous stage. In Figure 1 such a map is shown. It is taken from Capon and Hulbert (1975) and describes the process of allocating an annual advertising budget.

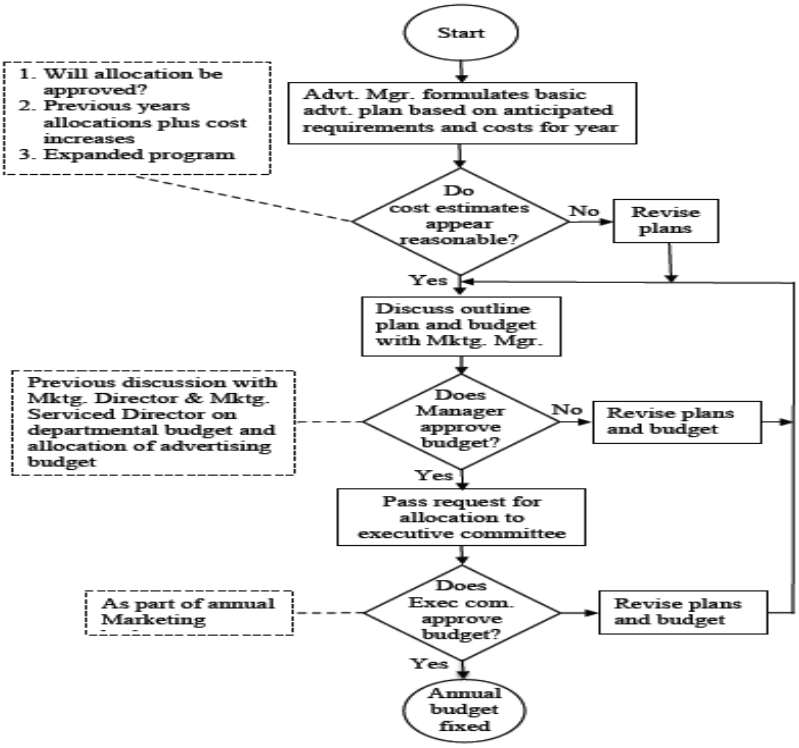
An oblong box in the chart represents a process, a diamond shape a decision; the circle represents the outcome. This chart allows feedback loops to be used, so that if the "costs do not appear reasonable" then the feedback loop takes the process back to a revision of the plans. This is easy to follow and provides a useful overview of a complex decision system that executives can use to identify weaknesses in the decision process and consequently improve the system.

This chart, of course, represents the thoughts and actions of a number of people, all those in the decision group. Thus, constructing such a process map requires an iterative technique, where each individual represented in the decision is satisfied that his or her actions are correctly reflected in the model.

There are issues of subjectivity, as with all interpretive work, but there are also ways of minimizing subjective bias. One way is for two, or even three, researchers

to independently draw the charts, working from the original data (protocols, interview transcripts, observations, and documents) and then triangulate the charts to ensure reliability. Another way is re-validate the charts by taking the finished flowchart(s) back to the decision-makers and seeking their agreement that they do indeed fairly represent the way their joint decision is made.

Figure 1. Typical Process Map Output from a DSA Research Project



Notes: From Capon and Hulbert (1975).

4. Related Analysis Techniques, Cognitive Mapping

It is intuitive to depict processes visually in a chart, and the idea is certainly not unique to DSA. Accounting systems and operations research projects commonly use such flow charts to depict the flow of papers, money, responsibilities, contacts, and key performance attainments.

It is the social scientists attempting to understand individual decisions, though, who come closest to DSA in terms of method and rationale. The problem that group decisions simply become entrenched in habitual routines is echoed in cognitive psychology; in that individuals also often make decisions based not on a consideration of the specific circumstances but on the basis of prior decisions made

to solve the same problem in some earlier situation (Armstrong and Brodie, 1994; Armstrong and Collopy, 1996). In order to understand exactly how individuals make important strategic decisions (and how they could do better), a process called cognitive mapping has been developed.

The process of mapping the mental thoughts of decision makers always starts with a single decision-maker (Chaney, 2010). As in DSA, though, strategic decisions are usually made in a group setting and the thoughts of a single decision-maker are rarely sufficient to represent the group (Barr and Huff, 1997). Thus, as in DSA, the charts of individuals are often fused together to form a common thought-path leading to a particular joint decision.

Again, there is a great deal of variety in research approaches to collecting data to enable the construction of cognitive maps. Durif et al. (2012) take a rather positivist approach, for instance, and use spontaneous questions in interviews to explore the extent to which financial account managers are too focussed upon commercial performance. The answers to these questions are recorded in systematic exploration grids, following a method suggested by Cossett (2004), and then the researchers conduct further analysis using Decision Explorer software. In contrast, Martin and Isozaki (2012) only very lightly structure a set of interviews designed to follow the way hotel management structure strategic decisions in poor economic circumstances. They use McCracken's (1988) long interview technique to provide sufficient data to establish decision maps for two major hotel chains.

5. An Illustrative Example, Mapping Advertising Agency Decisions

Na et al. (2009) conducted DSA on data collected 15 years earlier about how advertising agencies make decisions about advertising campaigns. The data were first re-verified, and then, in preliminary discussion with the agents, the research team decided that there are four distinct types of decision system to be analysed: the annual campaign decision, development of the creative campaign, developing the promotional campaign, and media decisions.

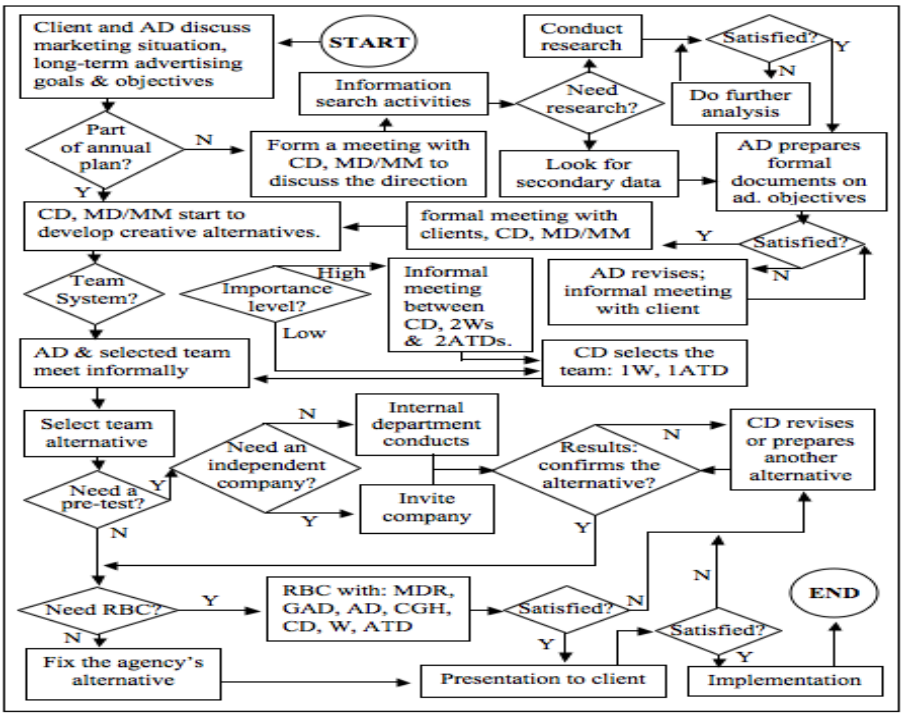
The research followed a classical design. Data were gathered mainly by protocol analysis, supported by interviews, observation of meetings, and the scrutiny of some documents. In fact there were very few documents to scrutinize other than for some minutes of meetings and the customers' briefing documents.

The sample comprised of two agencies, each offering two clients. The campaigns involved advertising for industrial, consumer, and services. The principal researcher carried out all the interviews, over a period of 8 months. The data from six cases were gathered simultaneously with the longest protocol taking 40 weeks to complete.

In order to construct the decision maps, the protocol statements were each shortened following a technique suggested in prior research (Bettman and Park, 1980). The trimmed statements were then sequence-ordered and the maps drawn. As is typical, the decision participants confirmed the maps before final versions were completed, and then the researchers further validated them by showing them to four

other advertising agencies in the same city, but not in the sample, to gain their general agreement. In the Na et al. (2009), all the maps were collapsed into a single, simple, generic process chart. For the purpose of the present discussion, though, the map for the development of a creative campaign is shown in Figure 2. This map is based upon six cases and involved 68 protocols.

Figure 2. Creative Campaign Decision Process



Notes: From Na et al. (2009).

This figure looks complicated, but actually a decision path is clearly discernable. This path is linear, with small groups meeting in sequence, feedback loops acting as safety avenues at each stage, and clearly—even from a cursory inspection of the diagram—takes much time.

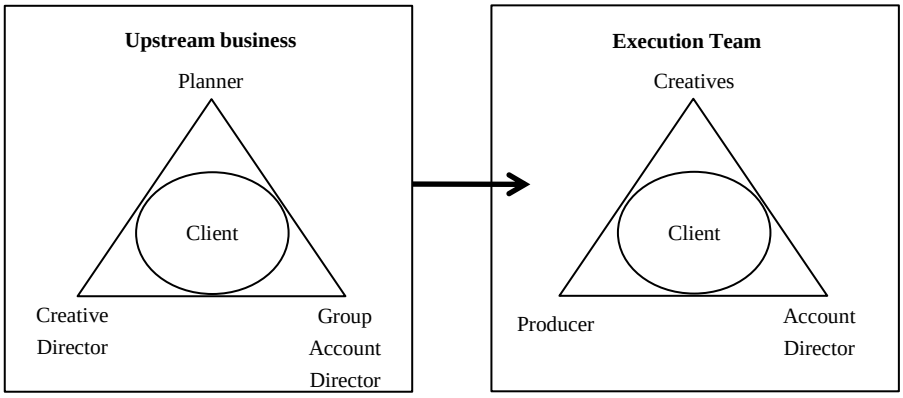
In early 2012 another team went back to five agencies in the same city to conduct an investigation with a slightly different, integrated marketing communications, brief. As part of the study, though, it became necessary to conduct DSA analysis in order to understand how agency decisions are made, so the integrating mechanisms can be identified.

In this particular DSA research, use is made of a wider range of data sources. The researcher first interviewed all the main decision-group participants, including the managing director, head of planning, group account director, digital creative director, operations/production director, and the client's marketing manager. At

these semi-structured interviews, discussion was recorded and later transcribed, and then, where necessary, a further interview was conducted to clarify some obscure point or confirm some key fact.

In addition, many useful documents were discovered. These include the agency's client planning brief and long templates, the agency Creative Process model, the Creative Process Teams/Triangles model, an Account Planning Process model, and an agency post-campaign analysis template. The planning briefs are exactly what they seem; an initial and expanded campaign plan that covers all the necessary bases of objectives, target audience, style, mood, and so on, and are strongly related to the Account Planning Process model. The Teams/Triangles model is unique to this agency, as far as the researchers are aware, and simply designates two teams, as shown in Figure 3.

Figure 3. Creative Process: Teams/Triangles



The definition of these teams dictates, to a point, the decision process itself and, consequently, the DSA flowchart depicting that process. The researcher was part way through charting this process in the approved manner when it was discovered that the Agency Creative Process Model made the researcher's task easy as explained discussed shortly.

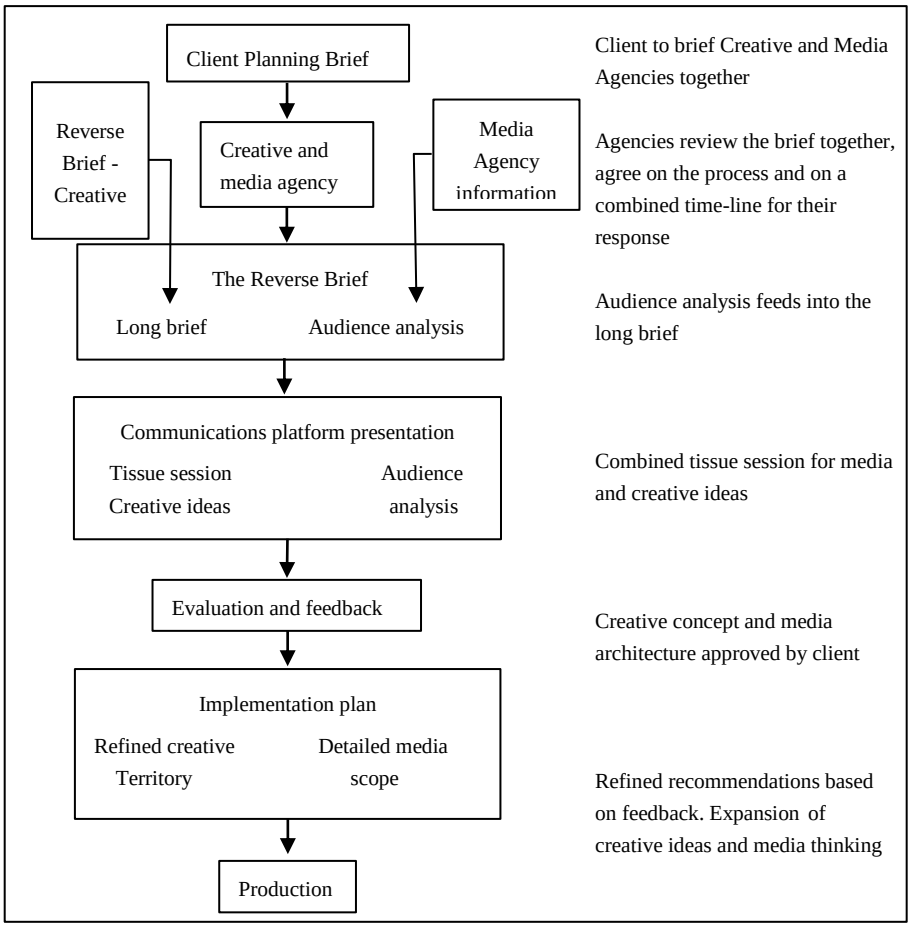
Three quite startling facts swiftly came into focus—startling because, although some change was expected, it was assumed that the basic decision structure would remain. These facts concern the decision team, the DSA analysis itself, and the striking difference in the maps created by Na et al. (2009) and those of the current research.

With regard to the decision team, there is a new actor present within advertising agency decision teams, the Account Planner. This new position was first noted by Griffiths (2008), who suggests that they started to appear around the late 1960s; now most agencies employ such a person. This has ramifications for the decision process, as the account planner acts as a product champion and shepherds the decision through all its stages.

The second finding is that both of the two agencies so far contacted have

already conducted a form of DSA and have produced decision maps designed to guide the decision team efficiently through the process. One of these maps is shown in Figure 3. The researcher found that his attempts to map the agency's decision process became almost redundant, as the chart in Figure 4 echoes, in fact dictates, how decisions are made in this agency. His task in this situation became confirmatory rather than exploratory.

Figure 4. Agency's Own DSA Decision Plan



In the opening paragraphs of this paper, mention was made of Ackoff, who was a critical father figure of operations research. One of his major criticisms of operations research at that time was that planning and decision-making must be participatory (Ackoff, 1961). That is, he was disturbed that researchers or consultants not using or personally involved in the managerial decision-making were developing a decision system, rather than the decision-makers themselves

developing their own models. Ackoff would enjoy the fact that 30 years after an academic DSA exercise with advertising agencies and their decision systems, agencies in the same city and industry are now creating and using their own DSA analyses. It would be good to think that there is a causal connection, but that is very speculative!

The third finding that surprises is the difference in the two path diagrams. In the agency version, which is admittedly more generic, the process is far shorter, far quicker. Interviews with decision-making participants to discuss this aspect elicits the information that time has become more valuable over the years and that communication technologies in particular have facilitated significant increases in the speed with which group decision processes can be conducted.

6. Back to the Beginning

The title of this research contains the purpose of DSA, which is to make complex, multi-person strategic and marketing decision systems simpler so that the system can be improved in the light of the current decision environment. The implication is that a DSA analysis should be part of the regular marketing audits that smart companies carry out to keep abreast of technologies, trends, and rapidly changing environments. The technique is not difficult even though it can be tedious and time consuming. The pay-off is immense, however, as the decision systems under scrutiny within a company often deliver the value that keeps the company profitable.

References

Ackoff, R. L., (1961), "The Meaning, Scope and Methods of Operations Research," in *Progress in Operations Research*, R. L. Ackoff ed., New York: John Wiley and Sons, 1-34.

Armstrong, J. S. and R. J. Brodie, (1994), "Effects of Portfolio Planning Methods on Decision Making: Experimental Results," *International Journal of Research in Marketing*, 11(1), 73-84.

Armstrong, J. S. and F. Collopy, (1996), "Competitor Orientation: Effects of Objectives and Information on Managerial Decisions and Profitability," *Journal of Marketing Research*, 33(2), 188-199.

Barr, P. S. and A. S. Huff, (1997), "Seeing Isn't Believing: Understanding Diversity in the Timing of Strategic Response," *Journal of Management Studies*, 34(3), 337-370.

Bettman, J. R. and C. W. Park, (1980), "Effects of Prior Knowledge and Experience and Phase of the Choice Process on Consumer Decision Processes: A Protocol Analysis," *Journal of Consumer Research*, 7(3), 234-248.

Bonoma, T. V., G. Zaltman, and W. Johnson, (1978), *Industrial Buying Behavior*, Boston: The Marketing Science Institute.

Capon, N. and J. Hulbert, (1975), "Decision System Analysis in Industrial Marketing," *Industrial Marketing Management*, 4, 143-160.

Chaney, D., (2010), "Analyzing Mental Representations: The Contribution of Cognitive Maps," *Recherche et Applications en Marketing*, 25(2), 93-115.

Churchman, C. W., R. L. Ackoff, and E. L. Arnoff, (1957), *Introduction to Operations Research*, New York: John Wiley and Sons.

Cossette, P., (2004), *L'organisation: Une Perspective Cognitive*, Les Presses de l'Université.

Cyert, R. M., H. A. Simon, and D. B. Trow, (1956), "Observation of a Business Decision," *The Journal of Business*, 29(4), 237-248.

Durif, F., B. Geay, and R. Graf, (2013), "Do Key Account Managers Focus Too Much on Commercial Performance? A Cognitive Mapping Application," *Journal of Business Research*, 66(9), 1559-1567.

Griffiths, J., (2008), "Where to Next? Account Planning at 40," *Admap*, 493, 24-27.

Martin, D. and M. Isozaki, (2013), "Hotel Marketing Strategies in Turbulent Times: Path Analysis of Strategic Decisions," *Journal of Business Research*, 66(9), 1544-1549.

McCracken, G., (1988), *The Long Interview*, Newbury Park: Sage.

Moore, C. G., (1969), "A Descriptive Model of the International Purchasing Process: The Supplier Selection Routine," in *Management Action: Models of Administrative Decisions*, C. E. Weber and G. Peter eds., Scranton: International Textbooks, 76-114.

Na, W., R. Marshall, and A. G. Woodside, (2009), "Decision System Analysis of Advertising Agency Decisions," *Qualitative Market Research: An International Journal*, 12(2), 153-170.

Pettigrew, A., (1975), *The Politics of Organizational Decision Making*, London: Tavistock.

Robinson, P., C. Faris, and Y. Wind, (1967), *Industrial Buying and Creative Marketing*, Boston, MA: Allyn and Bacon.

Sheth, J. N., (1973), "A Model of Industrial Buying Behavior," *Journal of Marketing*, 37(4), 50-56.

Vyas, N. and A. G. Woodside, (1984), "An Inductive Model of Industrial Supplier Choice Processes," *Journal of Marketing*, 48(1), 30-45.

Webster, F. E., Jr. and Y. Wind, (1972), "A General Model for Understanding Organizational Buying Behavior," *Journal of Marketing*, 36(2), 12-19.

Wilson, E. J., (1984), "A Case Study of Repeat Buying for a Commodity," *Industrial Marketing Management*, 13(3), 195-200.

Woodside, A. G. and D. L. Sherrell, (1980), "New Replacement Part Buying," *Industrial Marketing Management*, 9(2), 123-132.