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A Survey of Database Marketing

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Publication Date

1999-03-01



A SURVEY OF

DATABASE MARKETING

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MARCH 1999

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Acknowledgement:

This research has been supported by grants from the CISE/IIS/CSS Division of the U.S. National Science Foundation and the NSF Industry/University Cooperative Research Center (CISE/EEC) to the Center for Research on Information Technology and Organizations (CRITO) at the University of California, Irvine. Industry sponsors include: ATL Products, the Boeing Company, Bristol-Myers Squibb, Canon Information Systems, IBM, Nortel Networks, Rockwell International, Microsoft, Seagate Technology, Sun Microsystems, and Systems Management Specialists (SMS).

ABSTRACT

This working paper surveys the current state of database marketing. Database marketing, usually associated with customer relationship marketing (CRM), is concerned with the application of information systems to direct marketing. The current state of database marketing varies widely across industries and even between companies within the same industry. Proponents of database marketing speak often and loudly of its role as a source of competitive advantage. Yet surveys of database practitioners show few companies realize significant advantages from their systems.

This paper discusses the drivers, the stages of development, the current state of the field, and the obstacles to database marketing. The drivers include the changes in the roles of direct marketing, cost structures, technology, and economic conditions. The development of database marketing sophistication in individual firms is described by a number of models, four of which are discussed here. These models agree on how such systems are started and their ultimate stage of development, but differ in how they describe the middle phases.

Database marketing is seen as a source of strategic and tactical competitive advantage by some firms and a competitive burden or strategic necessity by others. Obstacles to database marketing, including environmental, technical, marketing, and strategic problems, are discussed in detail.

Keywords: Database marketing; customer relationship marketing; drivers of database marketing; advantages of database marketing; obstacles to database marketing.

I. INTRODUCTION

As market changes accelerate and the cost of technology declines more industries and companies are adopting database marketing. However, few have been able to identify or actualize the factors necessary for database marketing success. The current state of database marketing varies widely across industries and even between companies within the same industry. Proponents of database marketing speak often and loudly of its role as a source of competitive advantage. Yet surveys of database practitioners show few companies realize significant advantages from their systems.

Royal (1995) states: "When used effectively, database marketing promises companies increased sales to their current customers and a well-qualified prospect list. Despite the boom in database development, few organizations are using their massive collections of customer facts and figures to their full potential." Lewington et al. (1996) adds, "some organizations have been able to harness the power of database marketing systems to achieve competitive advantage in their marketplaces; conversely, others have found themselves inhibited by the intricate human, technical and organizational problems created by the adoption of these systems" (1996). Rosenfield (1998) uses the term "the myth of database marketing", when talking about the gap between its promise and its practice.

Even though database marketing in many companies is not living up to its potential, its allure remains high. Much of this allure is related to the significant competitive advantages available to companies that can put database marketing into practice correctly. Table 1 and the Appendix provide examples of some successful database marketing efforts.

The sections that follow provide a review of the issues most critical to obtaining competitive advantage from database marketing.

II. DEFINITIONS OF DATABASE MARKETING

Lack of an Industry Definition

It is not surprising that the state of database marketing varies widely. Currently, there is not even a universally accepted definition of database marketing. Six reasons can be cited for this situation.

- Rapid changes in the business environment have led to a debate over the definition and boundaries of marketing in general (Bauer and Miglautsch 1992).
- Current applications of database marketing vary widely across companies and industries (Stone and Shaw 1987; Rosenfield 1998).
- Database marketing is derived from the principles of direct marketing. This history confuses the definition of direct marketing with that of database marketing (Petrison, Blattberg and Wang 1997).

TABLE 1**EXAMPLES OF SUCCESSFUL DATABASE MARKETING EFFORTS**

FIRM	TYPE OF APPLICATION	DESCRIPTION
Fingerhut	Targeted marketing	Targets catalogs to specific audiences based on data about group interests
Franklin Mint	Targeted marketing	Uses statistical analysis of customer attributes and characteristics to determine specific audience for each promotion.
Foster and Gallagher	Householding	Integrated view of customers across catalogs
Zurich Kemper Life	Campaign management	Target marketing, product profitability analysis, and customer profiling
Avis Car Rental	Prospecting	Finding customers for summer car rentals
Vons	Point of sale data	Loyalty cards scanned by grocer to find buying habits
Pacific Bell	Predictive marketing	Keep existing customers by finding those likely to depart and making them special offers
United Artists	Loyalty programs	Records moviegoer habits by using a scannable card each time a customer sees a film.
MCI Worldcom	Friends and Families	Phone users given discounts when calling friends also subscribing to MCI Worldcom

Note: See Appendix A for more detailed discussion of the first three cases.

- Database marketing supports the development of a relationship marketing strategy. Often, the two terms are used interchangeably but they are different. Database marketing is a tool to support (among other things) relationship marketing. It provides marketers with a means of developing an on-going, personalized stream of communication between a company and its customers (Shani and Chalasani 1992).
- Database marketing is inextricably tied to the technology that supports it. This has created confusion among some marketing practitioners who are unfamiliar with the underlying technology (Vavra 1993; Rosenfield 1998).
- Marketing databases supports the use of many leading edge tactical marketing tools such as segmentation, profiling, modeling, and data fusion. However, as only a small percentage of companies are using advanced statistical techniques (InfoWorks 1997), these concepts are not likely to improve the general understanding of database marketing.

Current Definitions

Because of the six issues just cited, current definitions of database marketing cover a wide spectrum. Table 2 shows various definitions given in academic journals and popular business and marketing magazines. While none of these definitions are alike, similar properties appear in a number of them.

Major Definitional Properties

The properties of database marketing mentioned in two or more definitions include:

- a computerized data set;
- individual customer/prospective customer level data which might include demographic, geographic, psychographic and purchase behavior information;
- use of the data to build targeted, commercial relationships; and
- use of the data to improve the cost-effectiveness of marketing programs and/or stimulate sales/repeat purchases to improve profitability.

Noticeably absent from all but one of the definitions is the use of the database for tracking and evaluating marketing programs.

Definitions versus Practices

Even if marketers reach consensus on a definition of database marketing, definition and practice are likely to vary widely. A survey of over 150 Canadian companies (Table 3) show that the practice of database marketing is far less evolved than its theory.

TABLE 2
DEFINITION OF DATABASE MARKETING

(Roberts 1997): “Database marketing is the application of statistical analysis and modeling techniques to computerized, individual-level data sets. It is used to support the development of cost-effective marketing programs that communicate directly with identified customers and prospects, and to track and evaluate the results of specific promotional efforts. Database marketing implies planned communication with individually targeted customers and prospects over an extended period of time to promote repeat purchases of related goods and services.”

(Stone and Shaw 1987): “Database marketing is an interactive approach to marketing communication, which uses addressable communications media (such as mail, telephone, and the sales force) to target its audience, to stimulate their demand, and to stay close to them by recording and keeping an electronic database memory of customer, prospects and all communication and commercial contacts, to help improve all future contacts.”

(Shani and Chalasani 1992): “Database marketing, simply put, involves the collection of information about past, current and potential customers to build a database to improve the marketing effort. The information includes: demographic profiles; consumer likes and dislikes; taste; purchase behavior and lifestyle.”

(Esters 1996): “An interactive system of marketing that ascertains, creates and satisfies the insurance wants and needs of people by performing organized tasks affecting the transfer of goods and services between buyers and sellers, using one or more media for the purpose of soliciting a response by phone, mail, or personal visit from a prospector customer; maintaining complete information on each transaction in a database and doing so at a profit.”

(Gama 1997): “Marketing aided by current technology that allow us to measure an individual commercial relationship in its varied aspects, including historic, environmental, geographic, demographic and psychographic variable. Some of its technologies also help us extrapolate individual relationship data to manage each relationship optimally and to leverage accumulated knowledge in prospective ways. (Tucker 1997): (database marketing - “generally, it is the art of using data you’ve already gathered to generate new money-making ideas”).

(Schoenbachler et al. 1997): “...database marketing can be defined as gathering, saving and using the maximum amount of useful knowledge about your customers and prospects...to their benefit and your profit.”

(Cross and Smith 1994): “...database-driven marketing is an interactive, relationship-building kind of marketing built around a core of customer information.” Stan Rapp describes this as “any marketing process in which useful, behavioral, psychographic or demographic information about prospects or customers is stored in the company’s database and is used to enhance or prolong the relationship or to stimulate sales.”

(Fletcher and Wright 1997): “...database marketing stores this response and adds other customer information (lifestyles, transaction history, etc.) on an electronic database memory and uses it as basis for longer term customer loyalty programs, to facilitate future contacts, and to enable planning of all marketing.”

TABLE 3

PROPERTIES OF DATABASE MARKETING VERSUS ITS PRACTICE

PROPERTY: Individual customer/prospective customer level data, which might include demographic, geographic, psychographic and purchase behavior information.

PRACTICE:

- * 68% have customer level data on more than half their customers
- * 30% say all customer information is easily accessible
- * 6% have customer demographics, attitudes, credit history, or third party information
- * 61% currently have difficulty in getting customer level data

PROPERTY: Use of the data to build targeted, commercial relationships

PRACTICE:

- * 28% say they have a widely understood customer segmentation strategy
- * 48% say they structure themselves around meeting different needs of customers
- * 72% say existing customer development is the primary objective of database marketing
- * Less than half of the marketing budget (47%) is spent on targeted marketing
- * 17% say they are capturing all the right information

PROPERTY: Use of database to improve cost-effectiveness of marketing programs and/or stimulate sales/repeat purchases to improve profitability.

PRACTICE:

- * 60% say they know the percentage of sales or revenues from top 5% of customer
- * 44% say they know the current profit contribution of different customers
- * 17% say they know the current and future profit potential of each customer
- * 16% have calculated the Lifetime Value of customers
- * 39% say they vary the level of investment by different customers

PROPERTY: Tracking and evaluating marketing programs

PRACTICE:

- * 13% say they track and measure ROI on all database marketing programs
- * 21% of those with loyalty programs track their financial impact

Source: InfoWorks (1997)

III. DRIVERS OF DATABASE MARKETING

Reasons for Growth of Database Marketing

The growth of database marketing is driven by a number of environmental issues. Fletcher, Wheeler and Wright (1991) classified these issues into four main categories: (1) changing role of direct marketing; (2) changing cost structures; (3) changing technology; and (4) changing market conditions. Table 4 summarizes the drivers of database marketing.

TABLE 4

THE DRIVERS OF DATABASE MARKETING

DRIVER #1: THE CHANGING ROLE OF DIRECT MARKETING

- The move to relationship marketing for competitive advantage.
- The decline in the effectiveness of traditional media.
- The overcrowding and myopia of existing sales channels.
- The desire to measure the impact of marketing efforts.

DRIVER #2: CHANGING COST STRUCTURES

- The decline in electronic processing costs.
- The increase in marketing costs.

DRIVER #3: CHANGING TECHNOLOGY

- The advent of new methods of shopping and paying.
- The development of economical methods for differentiating customer communication.

DRIVER #4: CHANGING ECONOMIC CONDITIONS

- The fragmentation of consumer and business markets.
- The reduction in consumer leisure time.
- The rise of the information society.
- The increase in competition.

Driver 1: The Changing Role of Direct Marketing

Four marketing issues primarily contributed to the changing role of direct marketing within most organizations:

- move to relationship marketing for competitive advantage;
- decline in the effectiveness of traditional media;
- overcrowding and myopia of existing sales channels; and
- desire to measure the impact of marketing efforts.

Move to Relationship Marketing: The primary reason that companies undertake direct response marketing has changed since 1950. Initially organizations involved with direct marketing were interested in generating and fulfilling product orders via the mail. Later, the use of direct response broadened as companies used the tool to *solicit action* from consumers or potential consumers. The *action solicited* was no longer confined to purchasing via mail. It expanded to include actions such as requests for product/service information, consumer qualification processes, and post-sale marketing. Today, relationship marketing is the general objective of most database marketing efforts.

Decline in Traditional Media: The decline in the effectiveness of traditional mass media is driven by the proliferation of media choices and the increasing level of *noise* in the market place. Consumers who once relied on major market newspapers, general newsmagazines and the original three television networks, now have special interest magazines and cable television. Further, the Internet adds an entirely new dimension to the consumer's ability to obtain up-to-the-minute news and information.

The proliferation of media choices led companies to increase their marketing efforts to ensure market coverage. This action increased the general level of market place *noise* (Cross and Smith 1994). Database marketing is seen as a viable tool for cutting through market place clutter by personalizing customer messages and delivering them in a more useful manner (Copulsky and Wolf 1990)

Overcrowded Sales Channels: Obtaining the consumer's attention is only half the battle, companies also need to ensure buyers can locate their products. "However, this has become increasingly more difficult for marketers today. Department stores are fighting for survival. The fight for shelf space and displays in supermarkets has become increasingly intense and has forced many product categories to increase the use of trade deals to the point that very little product is purchased at full price" (Jackson and Wing, 1997). This dynamic is particularly troubling for suppliers who suffer from 'existing' sales channel myopia (Shaw and Stone 1988). Shaw and Stone describe these companies as relying on existing sales channels to create their branding strategy. Database marketing is seen as means of circumventing problems with traditional sales channels by allowing companies to use their database to open new direct-to-the-consumer distribution channels.

Marketing Measurement: As traditional media become simultaneously more expensive and less effective, marketers are challenged to prove the productiveness of their campaigns. "Mass marketing tactics that brands have come to rely on are simply no longer as effective as they once were...and the fact that they are not easily accountable makes them increasingly suspect. It is no longer enough to say that 'sales increased when we advertised.' Management wants proof of the ability of advertising to deliver results" (Jackson and Wang 1997). Database marketing, which allows companies to understand, track and measure each customer individually, provides significant advantages in this new era of accountability.

Driver 2: Changing Cost Structures

Changing supply-side cost structures acted as a stimulant to the growth of database marketing "In the early 1980s, two things began to happen simultaneously: electronic data processing costs declined and marketing costs climbed, both dramatically" (Fletcher, Wheeler and Wright 1991). Advances in computing and telecommunications technology made it possible to collect, manage, analyze and act upon customer data in a shorter time frame and for less money than ever before (Shaw and Stone 1988). During the same period, media costs escalated and marketers saw media fragment and drop in performance simultaneously (Jackson and Wang 1997). As traditional media increase in cost and decline in performance, database marketing, (which is riding a reverse trend of decreasing costs and improving performance) becomes a very attractive alternative.

Driver 3: Changing Technology

In addition to the advantages of declining costs and improving storage and processing capabilities, technology is providing new ways for consumers to shop and pay. "Alternative shopping channels are growing in number and competitive clout" (Cross and Smith 1994). Technological developments also made it economic for marketers to differentiate customer communications based on individual purchase history (Cross and Smith 1994). With new computing and telecommunications technology, advertisers can deal with their customers as individuals and can create an environment in which people want to hear the messages they receive (Cross and Smith 1994).

Driver 4: Changes in Market Conditions

Changing market conditions include:

- fragmentation of consumer and business-to-business markets;
- reduction in consumer leisure time;
- rise of the information society; and
- increase in competition.

Market Fragmentation: The mass market of yesterday is gone. Today's consumer market is split into diverse segments. Globalization, the changing composition of households, increasing diversity of race, education, income, age, consumer sophistication and individuality fragmented consumer markets (Gray and Watson 1998). The business-to-business market is fragmented by increasing product complexity and sophistication that leads to the decentralization of purchasing decisions, the increase in purchase influencers, and the specialization of purchasing agents (Fletcher, Wheeler and Wright 1991). Products and services can no longer be *pushed* into a mass market; they must be *pulled* into niche markets (Gray and Watson 1998). Database marketing, with its ability to differentiate communication, is well suited to a *customer pull* marketing strategy.

Reduction in Leisure Time: Increasing demands on the time of consumers and business purchasers have led to the rise of the service economy. Consumers' needs are increasingly met through services (Shaw and Stone 1988). In addition, the service component of hard products is increasing. Reduction in leisure time means consumers have less time to look through advertising and to spend on shopping. To reach today's consumers, marketing messages must be customized and relevant. Database marketing complements service marketing because it customizes and differentiates.

Information Society: Simultaneous with the reduction in leisure time, consumers saw an explosion in the amount of information available to them. Growth in cable television, specialized print, and the Internet increased the recency, frequency and amount of news and information available. While complaints of information overload abound, the expectations and demands of consumers have also risen. Schoenbachler, et al. (1997) notes, "Consumers are more educated today. They demand more information than ever before. Consumers are indicating a preference for communications which are personalized and directed specifically to their needs, typically based on past purchase transactions."

Increasing Competition: The rise in consumer expectations and demands are also the result of increased products and services. Consumers have more choice than ever before. Consumer education and a desire for variety, along with the proliferation of brands, excessive couponing, and deep pricing promotions eroded brand loyalty (Jackson and Wang 1997). Increased competition implies continuing development of new products and services to maintain market share. As a result, the viable life of many products is shorter and new products saturate markets and clog traditional distribution channels (Fletcher, Wheeler and Wright 1991). Organizations look to database marketing as a method of differentiating and personalizing their products, consumer conversations, and distribution channels.

Information as a Product

A byproduct of database marketing is the value of information as a product in its own right. "At the other end of the (information) continuum is information that may have been useful *initially* in marketing the offer (or is perhaps a by-product of the initial marketing effort), but later becomes a marketable product itself - often with potential to eclipse the original product in revenues and/or profits."(Glazer 1991). For example, transaction-based information collected by many financial institutions is a by-product of the service provided, but also sold as a product on its own (Glazer 1991).

Factors that Dispose an Industry Toward Database Marketing

Environmental and market place issues do not impact all industries identically. Thus, not all companies or industries embrace database marketing to the same degree. However, "all sectors can benefit from the database marketing approach, in different markets the principal benefits will have a different emphasis" (Fletcher, Wheeler and Wright 1991). Companies particularly well suited to database marketing share one or more of the characteristics listed in Table 5.

TABLE 5

FACTORS THAT DISPOSE AN INDUSTRY TOWARD DATABASE MARKETING

Shaw and Stone(1988):

1. Market can be segmented and reached independently and efficiently
2. Product/service has short life-cycle and must be resold often
3. Range of products/services provides opportunities for cross-selling
4. Limited distribution outlets
5. Competitors have more significant marketing resources
6. Cost-effective mass advertising is not available

Gray and Watson (1998):

1. Periodic, repeat purchase of products or services where it is possible to capture name and address at the point of sale
2. Affinity groups with common interests can be constructed
3. Frequent buyer rewards systems can be developed
4. Product/service markup is sufficient to support building a relationship
5. Purchases are made fairly often and can be predicted

Blattberg, Glazer and Little (1994):

1. Higher the lifetime value of the customer the greater the potential return from database marketing
2. The lower the cost of information acquisition (or capture) the more attractive database marketing
3. The more difficult and expensive alternative brand loyalty programs the more attractive database marketing
4. The lower the cost of incremental communication with customers the more attractive database marketing
5. The greater the opportunity for market differentiation the greater the return from database marketing

Future Trends in Database Marketing

Consumer marketers using, developing, or considering database marketing systems are likely to see their future efforts influenced by the ten trends shown in Table 6 (Schoenbachler et al. 1997). Like current factors, these future issues are not likely to affect all industries at the same time or to the same degree.

TABLE 6
FUTURE TRENDS IN DATABASE MARKETING

- Point-of-purchase data capture will increase, particularly at retailer locations
- More marketers will contribute customer information to compiled databases - this will become an increasingly valuable source of pre-qualified prospects
- Technology will provide additional channels for marketing and communicating with customers
- Database marketing will continue to expand into new industries and companies
- Technological advances will continue to drive the cost of computing down and the processing efficiency up
- Increased information will become available to marketers -- data will become more accurate and less expensive
- Analytical models will become more sophisticated and easier to use
- Consumer privacy concerns will grow as more data is captured and shared
- Database marketing will be employed more often to improve customer service
- A primary use of database marketing systems will be to support loyalty programs

Source: (Schoenbachler, et al. 1997)

IV. STAGES OF DATABASE MARKET DEVELOPMENT

Evolutionary Development

The development of database marketing has been evolutionary because:

- factors that dispose an industry or company toward database marketing run on a continuum; therefore,
- environmental issues driving the development of database marketing do not impact all companies and industries to the same degree or at the same time.

Currently, there is no universal agreement on the stages of development experienced by companies while building a marketing database. In this section, we examine five database development models and describe the characteristics they have in common. Table 7 summarizes the models of database development.

TABLE 7

MODELS OF DATA BASE DEVELOPMENT

Fletcher, Wheeler and Wright	
1. Sales-Oriented:	Use of direct marketing as channel of distribution.
2. Image Building:	Use of direct marketing as a medium for customer communication.
3. Integrated System:	Use of direct marketing as a medium for customer communication and a channel of distribution.
	Objective is long-term relationship with customers.
Shaw and Stone	
1. Mystery Lists:	Basic sales databases; significant duplication; information difficult to extract; databases used tactically; database marketing not widely valued by company.
2. Buyer Databases:	Organized databases; well executed but not coordinated campaigns; DBM important part of strategy; emphasis on DBM professionalism and productivity.
3. Coordinated Communication:	Coordinated customer communication; maximum emphasis on customer; campaign planning & coordination added to DBM system
4. Integrated Marketing:	All company functions integrated into DBM system; complete Plan-Execute-Monitor-Report cycle; emphasis on lifetime management of customers.
InfoWorks	
1. Basic Direct Marketing:	Lack of: marketing database; customer level data; direct customer communication; basic program evaluation.
2. Customer Stratification:	Basic levels of: marketing database; customer loyalty program; customer differentiation; ROI measures.
3. Customer Segmentation:	In-depth: data mining; customer understanding; customer level testing; pre and post financial analysis.
4. Operationalizing the Process:	Leverage data infrastructure; customer knowledge; proven programs; customer profitability.
5. Strategic Business Integration:	DBM system provides: data enhancement; customer delight; superior customer delivery; customer value enhancement
Jackson and Wang	
1. Historical Data Management:	DBM used primarily for tracking data from campaigns. Limited information captured. Passive approach to information gathering
2. Marketing Intelligence:	Captures more customer data. Goal is learning from past behavior to predict future actions. DBM used to develop, implement & analyze campaigns.
3. Integrated Business Resources:	Provides information resource for entire organization. All key functions integrated into DBM system. Sharing of all relevant information.

TABLE 7 (continued)	
Gartner Group	
1. First-Generation:	Proprietary systems managed by external service bureaus; tools are restricted to analysis on aggregated data. Systems primarily used to reduce cost of mailings and increase response rates. Very limited systems.
2. Second-Generation:	Systems typified by data warehousing initiatives. Use of customer data outside marketing function. Systems link data from many sources with marketing database & use modeling and segmentation to predict customer profit and behavior.
3. Third-Generation:	Focus on customer management across the enterprise. Strategies used to exploit customer information, the enterprise culture & the focus on the customer throughout the enterprise are significantly different.

Models of Database Development

Fletcher, Wheeler and Wright (1991): present a simple framework which "suggests that direct marketing usage, (enhanced by computer technology), has gone through three phases:

- sales-oriented phase;
- image building phase;
- integrated system phase."

The primary stage, sales-orientation, is the use of direct marketing as a channel of distribution (for example, mail order). The second phase, image building, uses direct marketing as a medium to send targeted life-style messages to consumers. During the image-building stage a company develops and maintains a profile of its customers and uses it to motivate purchase. The third phase, integrated system development, uses direct marketing as both a medium for communicating with customers and a channel of distribution. This use of direct marketing serves both tactical and strategic purposes. In this phase, companies are seen as truly moving into database marketing with the objective of developing long-term customer relationships.

Shaw and Stone (1988): Shaw and Stone also believe companies go through evolutionary phases in the developing their database marketing systems. They see four phases of automation in marketing. These phases are not jumps. Each covers a broad spectrum of approaches. They evolve into each other, but their philosophy is very different. They identify the four phases of database development as:

- mystery lists;
- buyer databases;
- coordinated customer communication; and
- integrated marketing.

Mystery lists (Phase #1) are basic sales databases. Often these lists are product oriented and grew from accounting systems. As each product may have its own sales database, significant customer duplication exists between lists. Information is usually difficult to extract and analyze. If database marketing exists at all, it is tactical and "likely to be brought into play when line sales or marketing management is considering how to make its sales targets."

In Phase #2 (buyer databases), companies have well-organized marketing and sales databases. If a company uses several channels of distribution, each channel may have its own database. However, it is possible for the company to identify the nature of its relationship with customers across all databases. Databases can be analyzed and strategy developed from that information. While marketing campaigns are well designed, overlap in implementation can exist as each database *owner* may fail to coordinate with others in the organization. During Phase #2, database marketing becomes a true part of the marketing mix. It increases and improves in efficiency but often does so without company-wide coordination. Lack of coordination often leads to increased organizational conflict, which spurs many companies to move to Phase #3.

Phase #3 is characterized by 'coordinated customer communication'. In this phase, one database is developed to drive all customer communication and management. Companies place their emphasis on the customer. They work on understanding the customer, his/her needs and how best to coordinate all marketing and communication efforts to meet customer needs. Campaign planning and coordination systems are added to ensure effective and efficient campaign implementation.

During Phase #4, other functions are integrated into the database marketing system to develop a complete plan-execute-monitor-report cycle. With integrated marketing, companies take the extra step to ensure links to the database marketing system are made at all critical points in the customer's cycle.

InfoWorks (1997): InfoWorks identified five levels of evolution in database marketing. Like, Stone and Shaw's model, these levels run on a continuum and movement is seen as evolutionary. The InfoWorks model of development positions organizations on the continuum based upon:

- sophistication of their database;
- use of the database for strategic versus tactical applications; and
- extent of database testing and customer analysis engaged in by the organization

The 5 levels of development are:

Level 1 - *Basic Direct Marketing*, characterized by the lack of: a marketing database; customer level data; customer direct communication; and basic program evaluation.

Level 2 - *Customer Stratification*, has as its hallmarks a basic: marketing database; customer loyalty program; customer differentiation and ROI measurements.

Level 3 - *Customer Segmentation*, includes in-depth: data mining; customer understanding; customer level testing and pre and post financial analysis.

Level 4 - *Operationalizing the Process*, here companies leverage data infrastructure, customer knowledge, proven programs and customer profitability for increased advantage.

Level 5 - *Strategic Business Integration*, here the database marketing system provides: data enhancements; customer delight; superior customer delivery and customer value enhancement. At this level, companies use their database marketing system to obtain a leading position in the marketplace.

Jackson and Wang (1997): Jackson and Wang's framework for database development diverges slightly from those of Shaw/Stone and InfoWorks. They believe the majority of database marketing applications falls into one of three "points of entry." The three points of entry run along a continuum of marketing applications and technology. These points of entry are:

- Historical data management;
- Marketing intelligence; and
- Integrated business resources.

Historical data management systems are used primarily for tracking data gathered from marketing campaigns. Generally the information captured is very limited, often no more than name, address, sales activity and the promotion which elicited the response. This is a passive approach to information gathering. It is usually measured in terms of program effectiveness and it generates mailing list selection reports.

The second point of entry is more sophisticated and allows the marketer to capture more information. In these databases, additional information on customers and prospects is added to the database so those marketers can understand customers and their purchase behavior. The goal is to learn from the customer/prospect behavior tracked in the database so as to predict the propensity for future consumer behavior. With an intelligent database, marketing programs are implemented, responses are captured and fed into the database, and the process begins anew.

The primary function of the third point of entry, the integrated business resource, is to provide an information resource for the entire organization. This is accomplished by integrating all key organizational functions into the database. Information is gathered from all relevant departments and shared with all departments. The resulting data provides more intelligence and decision-making capabilities.

To determine the correct point of entry, Jackson and Wang recommend that firms analyze their requirements in five database categories shown below:

marketing requirements	How the database will be used and what marketing applications will be fielded.
organizational requirements	Who will be using the database, how often and for what purpose. Consider the total number of potential users and the unique needs of each user group
information management requirements	What data will be captured and maintained in the database.
technology requirements	The technical elements of the database system. How the data will be managed, maintained, processed, accessed, and analyzed
financial requirements	The cost of the database system and the anticipated returns

Gartner Group (1996): The Gartner Group divides database marketing strategies into one of three generations that reflect differences in market environment and market strategy.

The first-generation systems (Nelson 1996) are "characterized by proprietary systems managed by external service bureaus...tools are restricted to analysis on aggregated data, rather than detailed data on populations...they are used primarily to reduce the cost of direct mail and increase response rates." First-generation systems are very limited. Problems with these early systems include: data access (number of users and types of applications); scalability (volume of data supported; extensibility) functions outside direct marketing that are supported and update procedures (sending tapes to service bureau).

Second-generation systems are "typified by data warehousing initiative." Second-generation systems make expanded use of customer data outside of the marketing function. Database marketing and customer information systems are being linked. Customer profit and behavior are predicted by "linking transaction data from multiple operational systems with customer marketing data and using sophisticated modeling and segmentation techniques to predict customer profit and behavior" (Nelson 1996). The more extensive relationship between company and customer that is possible in second-generation systems is seen as providing competitive differentiation and advantage.

Third-generation database marketing systems focus on customer management across the enterprise. "Customer information is integrated not only into marketing decisions, but also into chain management, budget allocations, staffing decisions, product research and development, and manufacturing. The progression from the second to the third-generation of database marketing requires a fundamental evolution of business strategy. Several of the key components of the infrastructure for second-generation database marketing remain the same; however, the

strategies used to exploit customer information, the enterprise culture and the focus on the customer throughout the enterprise are significantly different" (Nelson 1996).

Common Properties in Database Marketing Development

Each of the four models of database development just discussed sees the process on a continuum. Descriptions of the initial and final phases of database marketing show a high degree of consensus across the four models. The models diverge slightly when describing the middle phases.

V. STATE OF DATABASE MARKETING

Current State of Database Marketing

Proponents of database marketing speak often and loudly of its role as a source of competitive advantage. Yet surveys of database marketing practitioners show few companies are realizing significant advantages from their systems.

Despite database marketing failures, many organizations see it as an integral part of their marketing plan. Schoenbachler et al. (1997) report "a recent study of direct marketing executives found 80% of business (90% of those in the business-to-business category) have some form of database, with two-thirds of these indicating plans for a database upgrade during 1996." The 1996 Carol Wright Promotion survey found 41% of packaged goods companies have or are currently building a database and 24% plan on building one in the future. A 1997 survey by InfoWorks reported that companies entering the database-marketing arena have high expectations; 82% believe it will be a competitive differentiation. The Direct Marketing Association (1994) reports retailers are looking to database marketing to provide: competitive advantage; build in-store traffic; fine-tune merchandise strategies; support in-store transactions; improve customer service; and coordinate multiple distribution strategies. Even though database marketing in many companies is not living up to its potential, its allure remains high. Much of this allure is related to the competitive advantage available to companies that can put database marketing into practice correctly.

Database Marketing as a Source of Strategic Competitive Advantage

Activities that yield sustained, better than normal returns on investment are considered competitive advantages and are strategic in nature (Porter 1985). Porter identified five strategic areas of competitive opportunity for information technology: (1) changing the basis of competition; (2) strengthening customer relationships; (3) overcoming supplier problems; (4) building barriers against new entrants; and (5) generating new products. Stone and Shaw (1987) see database marketing offering competitive opportunities in all these areas.

- *Change the basis of competition* by creating and maintaining a database and using it to: win customers from the competition; transform how a field sales force works; or provide a cost-effective means of serving small customers.

- Provide a means of *strengthening customer relationships* through individualized relationships with consumers that will assist companies in not only acquiring and defending customers but in stimulating revenue growth.
- Provide companies with alternative sales channels so they can *overcome supplier problems* and achieve a lower cost of sale, through applications such as, telemarketing, mail order, and inquiry management.
- Be a unique asset and *present barriers to market entry*. Conversely, database-marketing capabilities can also be used to break into new markets.
- Be used to *generate new products and services*. Superior customer information available through a marketing database allows a company to spot emerging trends and be first to market with new products or services. Further, the information in the database can be seen as a product in its own right.

Another strategic aspect of the competitive potential of database marketing is its ability to support organizational learning. The ability to learn faster than a firm's competitors has been posited as the only true source of sustainable competitive advantage today (Slater and Narver 1995; DeTienne and Thompson 1996). A learning orientation manifests itself in a continuous collection of information about target-customers needs and competitor's capabilities and the use of this information to create continuously superior customer value. A database marketing system supports organizational learning in each of its key stages: information acquisition; information dissemination and shared interpretation. The customer database mechanizes the process of learning about customers.

Database Marketing as a Source of Tactical Competitive Advantage

More often than not, however, achieving competitive advantage using database marketing refers to its use tactically rather than strategically. Commonly claimed tactical benefits (Davis 1997; Lewington et al. 1996; Berry and Maclean 1989) from the effective use of database marketing include the ability to:

- track customer buying patterns and understand their motives;
- target marketing efforts;
- vary messages to different customer groups;
- customize promotions, prices and services to individual consumers;
- reduce marketing costs and increase profits;
- improve customer retention through loyalty programs;
- coordinate the delivery of multiple services to the same customer;

- augment core offerings with valued incentives;
- personalize dialogue;
- increase customer awareness and sales;
- minimize communication errors and breakdowns with customer;
- efficiently monitor customer credit;
- predict response and project life-time value of individual customers;
- conduct market research and testing;
- apply statistical techniques to improve understanding of customer groups; and
- track and measure the outcome of different marketing programs.

Among the firms currently using database marketing, the majority of which have not moved beyond its tactical use (Fletcher, Wheeler and Wright 1991, Roberts 1997). Fletcher, Wheeler and Wright (1991) believe the true advantages of database marketing lie in its strategic use but admit that most companies would need to make considerable changes to achieve this advantage.

Database Marketing as a Competitive Burden

A drawback to relying solely on database marketing for competitive advantage is the possibility that the system may end up as a competitive burden. Many forms of IT implementation fail as a result of poor implementation (Warner 1987). Fletcher and Wright (1995) believe similar dynamics apply to database marketing systems. They found firms were often unaware of the critical barriers to obtaining competitive advantage from database marketing. This lack of awareness meant, more often than not, the database marketing system did not provide competitive advantage. Even worse, the increased cost burden of building and maintaining the system often compromised the competitive position of the firm.

Database Marketing as a Strategic Necessity

Even if a database marketing system initially provides competitive advantage, there is no certainty that the advantage will be sustainable. Many believe sustainable competitive advantage is difficult if not impossible to achieve (Sprague 1993). Competitive activities, by definition, threaten the position of other firms in the industry. Threatened organizations often respond by imitating that competitive advantage. This results in "an extension of the current competitive situation at an increased level of cost for everyone" (Sprague 1993). Strategic necessities are, then, "often costly and difficult to obtain capabilities that a firm must possess if it is to compete effectively or at all" (Sprague 1993).

The introduction of an IT innovation that becomes a strategic necessity also means the innovator had better be prepared to maintain its lead over later entrants or imitators - who may offer

comparable or better products at a lower cost. Otherwise, the innovator who once had a competitive advantage ends up in a weakened position (Sprague 1993).

This phenomenon can be seen in the frequent flyer programs developed by the airline industry. Initially these highly touted database-marketing programs provided a competitive advantage but now all airlines have them and they are very costly to maintain. Many airlines would like to walk away from the programs but can not for fear of losing customers. What was once a competitive advantage is now a necessity if an airline wishes to remain viable.

Database marketing can become a necessity not only when competitors utilize it, but also when it becomes part of a supplier's strategy. This can be seen in the packaged goods industry. While many consumer-goods companies found database marketing to be of limited use, they are watching their suppliers rapidly implement loyalty-shopping programs. Retailers are using information collected from their frequent shopping programs to make stocking, promotion and pricing decisions (Berry 1994; Varva 1993). "Most manufacturers are waging an information war with retailers that stock their products...to shape (the retailers) decisions to their advantage, manufacturers need to have persuasive information of their own" (Berry, 1994).

The Competitive Continuum of Database Marketing

Like its stages of development, the competitive advantage organizations see from database marketing also runs on a continuum. Some companies find it to be a competitive burden, others a strategic necessity, and others a competitive advantage. This, then, raises the question of why some companies achieve competitive advantage from database marketing while others do not.

VI. OBSTACLES TO DATABASE MARKETING

The literature identifies four areas as critical to the development of competitive database marketing systems. These are:

- environment
- technology
- marketing applications
- strategy versus tactics.

How organizations manage the challenges that arise in these areas determine the effectiveness of their database marketing system. Table 8 outlines the obstacles to effective database marketing.

TABLE 8
OBSTACLES TO DATABASE MARKETING

ENVIRONMENTAL	TECHNICAL	MARKETING IMPLEMENTATION	STRATEGY vs. TACTICS
<u>I. INTERNAL</u>			
(1) Culture	(1) Database Design:	(1) DBM Program Economics	(1) Ability to Understand Strategic DBM
a. Understanding & Objectives:	a. Architecture before Applications	a. Failure to track ROI	(2) Have Necessary Organizational Characteristics
b. Cooperation & Commitment	b. Information Processing Structure	(2) Implementation of DBM Programs	
c. Organizational Change	(2) Data Selection & Maintenance	a. Failure to Segment	
d. Decision-Making Style	a. Data-Related Attitudes	b. Failure to Target Offers	
e. Marketing & Information Orientation	b. Data Capture	c. Failure to Integrate DBM into Total Contact Strategy	
(2) Resource Issues:	c. Data Richness	d. Failure to Allow for Customer Feedback	
a. Organizational Slack	d. Data Design & Access	(3) Innovativeness of DBM Programs	
b. Organizational Skill	(3) Data Analysis & Application		
c. Financial Justification	a. Performance Measures		
(3) Cognitive Limits	b. Market Models		
<u>II. EXTERNAL</u>	(4) Buy or Build Decision		
(1) Data Ownership			
(2) Privacy			
(3) Exclusion & Collusion			
(4) Supplier Relations			

Environmental Obstacles to Database Marketing

Environmental obstacles, both within and external to the organization, play a major role in the development of database marketing systems. Internal issues, or organizational barriers, are frequently more important than other barriers, but often not perceived as so by practitioners (Fletcher and Wright 1995). Organizational barriers fall into one of three major areas: cultural issues; resource issues and cognitive limits.

Today's external environment also presents numerous challenges to effective database marketing. External issues of primary concern include: data ownership; privacy; exclusionary practices and supplier interface. The impact and intricacy of external issues is compounding as companies take their database marketing strategies global.

Internal Obstacles - Cultural Issues: Research identifies five issues tied to organizational culture, which impact companies as they implement database marketing. These issues are:

- management understanding and objectives;
- cooperation and commitment;
- organizational structure and ability to change;
- decision making styles; and
- marketing and information orientation.

Management Understanding & Objectives: Shaw and Stone (1988) identified a series of internal barriers to database marketing including management understanding. Some organizations implemented database marketing without a clear understanding of its benefits. The Direct Marketing Association found in a 1994 study of US retailers that many lacked an understanding of the basic concepts of relationship and database marketing. They were uncertain of its benefits and how to apply it to their business. InfoWorks (1997) found over 80% of the companies in its research agreed with the statement: "database marketing is generally not understood throughout our organization."

Lack of understanding usually translates into a failure to set objectives for the database marketing system. In fact, a reason often cited for failed database marketing efforts is 'lack of a defined purpose' (DeTienne and Thompson 1996). InfoWorks (1997) found only 20% of surveyed companies felt their organization had a clear vision and strategy for database marketing. The Direct Marketing Association (1994) found "many retailers experiment with relationship and database marketing strategy...without first developing a marketing strategy to integrate these capabilities with traditional marketing approaches". Without strategic objectives or goals many organizations are unable to obtain the necessary levels of internal commitment and change to make database marketing work (Gehlcken 1992). However, *just* having database marketing goals is not sufficient. Successful database marketing requires goals that are aligned with the company's over-all corporate mission (Das 1995). When the mission or focus of the organization is on customer development, the potential of database marketing is at its greatest (InfoWorks 1997; Das 1995).

Cooperation & Commitment: When goals or strategies exist for database marketing, a stronger commitment is obtained from the organization (Gehlcken 1992). This commitment must come from all parts of the organization (Hughes 1991; Haynes et al. 1992). Davis (1997) believes, "a full commitment from management is essential to the successful implementation of a database-driven relationship marketing program. Moreover, everyone involved must understand and support the program". Senior management support is particularly important. Experts indicate the failure of many customer database efforts is directly traceable to a lack of support from those at the top of the organization (DeTienne and Thompson 1996).

Organizational alignment requires not just senior management support but also commitment and cooperation across organizational levels. If database marketing is to be used to obtain and remain competitive, cooperation and co-ordination among all functions in the firm is vital (Haynes et al. 1992). Internal cooperation between the marketing and information systems departments is especially crucial to successful database development (DeTienne and Thompson 1996; Shaw and Stone 1988; Lewington et al. 1996; Fletcher et al. 1992). Petrison and Wang identified potential for marketing and information systems conflict in five areas: behavioral predisposition; task characteristics; social pressures; availability of resources; and incentive and goals (Lewington et al. 1996). Fletcher and Wright (1995) found marketing and information systems personnel do not share the same perception regarding barriers to implementing database marketing. If an equitable relationship and shared perception can not be found between marketing and information systems, marketing may turn to the services of an external data management services vendor (Lewington et al. 1996).

Organizational Change: Cultural and structural changes are often required if an organization is to benefit from database marketing. Information technology literature speaks eloquently to the need for companies not simply to automate the status quo, but instead to do things in new ways (Shaw 1993). To make better use of the customer information contained in the marketing database, many authors encourage companies to restructure along customer groups or segment needs rather than maintain a product-line focus (Purple 1995; Vavra 1993; Nixon 1993). Further, if a firm is to use database marketing to support its transition to a market-driven, learning organization, then it should expect to make organizational changes (Day and Glazer 1994). In addition to structural changes, database marketing requires firms to change their attitudes toward information. Betts (1990) notes, "it often takes wrenching cultural changes for a corporation to pull together data from several far-flung departments and maintain the customer database with timely information."

Decision-Making Style: Fletcher, Wright and Desai (1996) found the decision-making style of an organization could present barriers to database marketing development. They defined this as "the extent to which an organization made a revolutionary jump to new technology versus smaller, slower, incremental steps towards the invention". Further, the style of decision making was related to the level of database sophistication within a firm. In their view, small, incremental steps in approaching decisions inhibit adoption and subsequent database marketing sophistication. Interestingly, many database-marketing consultants and practitioners disagree. Dripps, Geiger and Sasser (1998) state companies must "understand the entire foundation of database marketing, but take a small step approach to development...select a few high value business opportunities – target rapid implementation, using phased investment...deliver value in

3-6-9 month intervals". Delk and Keane (1998) agree and state, "our experience indicates that successful implementation is a series of steps that begin with short-term tactics and progress to more strategic uses of customer information."

Marketing & Information Orientation: Fletcher, Wright and Desai (1996) found a firm's marketing and information orientation play a critical role in both database marketing adoption and sophistication. Firms that adopted database marketing demonstrated a significantly higher degree of marketing and information orientation. Further, market and information orientations were found to be linked to organizational learning (Day and Glazer 1994) which is intimately connected to competitive advantage (DeTienne and Thompson 1996). Database marketing systems support organizational learning by: stimulating open-minded inquiry; providing synergistic information distribution; facilitating mutually informed interpretations; and acting as an accessible corporate memory (Day and Glazer 1994).

Internal Obstacles: Resource Issues. Three issues related to resources have been found to impact companies as they implement database marketing:

- organizational slack;
- organizational skill base; and
- system financial justification.

Organizational Slack: Fletcher, Wright and Desai (1996) found slack (the degree of uncommitted resources available in the organization) to be positively correlated with both the adoption of database marketing and the degree of the system's sophistication. They argue resources need to be available to not only implement database marketing but also to encourage further development of the system. InfoWorks (1997) found the vast majority of firms with database marketing systems understood the need to commit resources to the system. Over 80% of firms expected to substantially increase database-marketing expenditures over the next three years.

Organizational Skills: Database marketing requires skill sets many organizations do not possess - particularly small firms (Davis 1997). Jackson and Wang (1997) divide these skills into four groups: marketing skills; technology skills; statistical skills and data management skills. InfoWorks (1997) found 78% of responding firms agree that their organizations lack internal personnel with appropriate skills for database marketing. Further, firms seem to understand that developing the appropriate skills within the organization (versus relying on outside expertise) is important to successful database marketing (Das 1995). Fletcher, Wright and Desai (1996) found while organizational skill was *not* related to a firm's decision to adopt database marketing, it is positively related to level of system sophistication an organization can obtain.

Financial Justification: Investment justification also emerged as a significant issue (Das 1995). Fletcher, Wheeler and Wright (1994) note "justifying the investment to senior management is commonly cited as a major problem, since many of the benefits of database marketing are only apparent in the long run." Further, all too often, firms do not have a clear understanding of how they will measure the effectiveness of the database marketing system. The Direct Marketing Association (1994) reported many retail companies did not calculate an ROI for database

marketing early in its implementation. InfoWorks (1997) found only 22% of companies in its survey tracked and measured ROI for database marketing programs.

While companies profess a long-term commitment to database marketing, they are impatient for more immediate returns (Das 1995). The desire for immediate payoff results in companies failing to make a sufficient level of commitment to see long-term benefits and ultimately killing off all database-marketing efforts (Richardson 1992). Jackson and Wang (1997) refer to this lack of long-term commitment as the "great database marketing paradox." Failure to anticipate and develop long-term investment justifications for database marketing is a barrier to its development, as well as its maintenance.

Internal Obstacle - Cognitive Limits: Organizations, like people, are limited in the amount of information they can process and comprehend. The ability to collect and store vast quantities of information has resulted in emerging mountains of data that often outstrip the organization's ability to use it effectively (Whipker and Downey 1994; Miglautsch 1995). Organizational learning theory suggests this problem compounds over time (DeTienne and Thompson 1996). InfoWorks (1997) found 61% of responding companies felt they were not able to analyze and interpret data successfully.

Data mining has emerged as a tool for deriving information from very large databases. It provides the statistical techniques that allow managers to obtain information from databases (Gray and Watson 1998). However, InfoWorks (1997) found only 27% of companies surveyed were using behavioral segmentation modeling, and only 15% were using attrition modeling.

Further, managers seem to be becoming more data driven at the expense of being customer-driven (Haynes et al. 1992). In less technically-oriented times, customer information was gained from directly asking the customer and listening to his/her response. Today, databases are used as a substitute for speaking and listening to the customer.

Until organizations understand how better to value, manage, and interpret information from their databases, cognitive limitations will present obstacles to competitive advantage.

External Obstacles - Data Ownership: Information ownership is a critical aspect of today's database marketing environment. As database marketing programs alter competitive strategy, consumer information becomes worth more to marketers and conflict erupts over data collection and ownership (Cespedes and Smith 1993). For example, AT&T planned to create lists of consumers who called selected toll-free "800" lines and then target these consumers with special offers. Strenuous objections were raised by the commercial customers/merchants who offered the toll-free number as they considered the data to be their information. As the value of data as an asset in its own right grows, arguments over ownership are likely to accelerate. Companies who wish competitive advantage from database marketing will need to ensure they have a steady, proprietary source of consumer data.

External Obstacles - Consumer Privacy: While companies argue over data ownership, consumers also assert their rights. Privacy concerns are growing and range from the inappropriate acquisition of data, to its improper disclosure, to its wrongful use (Bloom, Adler and Milne 1994).

Privacy in the context of database marketing has two components: (1) physical privacy and (2) information privacy (Cespedes and Smith 1996). Physical privacy is the privacy from unwanted telephone calls, faxes, mail and other forms of solicitation. Information privacy concerns the issues of data collection, use and control. The majority of current privacy legislation deals with physical privacy. However, as more consumers realize the scope of information that is collected and maintained on them, information privacy is likely to see more regulation (DeTienne and Thompson 1996). Consumers are particularly concerned about unauthorized collection and sale of data and on the accuracy of the data collected (Bloom, Adler and Milne 1994). If database marketing is to remain a viable marketing strategy, marketers (as a group) will need to address consumer privacy concerns. To avoid unwanted legal and ethical problems, it is suggested that marketers adopt policies and procedures to (1) obtain clear assent for data collection; (2) maintain accuracy of records; and (3) allow consumer control over the data collected on them (DeTienne and Thompson 1996).

External Obstacles - Exclusion and Collusion: Issues of exclusion and collusion that are likely to be prominent database marketing issues in the future (Cespedes and Smith 1993). Bloom, Adler and Milne (1994) recognize that new technologies can potentially harm people (or institutions), if information about their behaviors, intentions, or interests is used without their knowledge and/or consent, leading them to be *excluded from* or *included in* activities in such a way that they are "harmed economically, psychologically or physically."

Two kinds of exclusions need to be considered (Cespedes and Smith 1993). First is the concern that database marketing will be used to exclude certain social and economic groups from relevant information and the best economic offers or incentives. Second is the concern that exclusion from data will create competitive barriers for smaller firms and non-profit organizations. Small firms and non-profits were among the first organizations to adopt database marketing (often not having sufficient resources for mass marketing). If increasing concerns over database marketing raise the entry barriers for its development and use, the competitive position of these firms will be negatively impacted (Cespedes and Smith 1993).

In addition to exclusionary concerns, new technologies and database marketing are contributing to fears about collusion. It would be sad and ironic if database marketing, which is designed to provide a basis for competitive superiority, were to end up being used for anti-competitive purposes. This concern is emerging as access too accurate and timely information about competitive pricing, marketing and customer behavior makes it easier for companies to participate in unspoken collusion (Bloom, Adler and Milne 1994). If marketers are not careful to avoid even the taint of collusionary practices, legislation may restrict the type of data that can be collected and the uses of database marketing, severely limiting its effectiveness.

External Obstacles - Supplier Relations: Fletcher, Wheeler and Wright (1994) found the quality of services offered by suppliers important in an organization's decision to adopt database marketing. InfoWorks (1997) reported a high level of reliance on external experts to support internal resources. Of companies surveyed: 41% used direct marketing agencies; 37% strategic consultants; 32% used systems/database developers; 20% used statisticians and data modelers; and 13% relied on outside vendors for ongoing data management. While many companies found outside support necessary to implement a database marketing strategy, they also expressed

concern over the quality of the service being provided to them (Fletcher, Wheeler and Wright 1992). Additionally, database-marketing vendors need to remain current on leading edge database marketing technology and tools to provide effective support to their clients. If companies do not choose database-marketing vendors carefully, the vendors can become a major impediment to effective database marketing.

Environmental Obstacles - Conclusion: In summary, research into the barriers of adopting information technology conclude that internal organizational barriers are more important than other barriers, but most adopting companies do not recognize this fact (Fletcher and Wright 1996).

Technical Obstacles to Database Marketing

While firms are more cognizant of technical barriers than organizational barriers, often they still "lack critical understanding of how databases should be designed, maintained and applied to help build customer relationships" (DeTienne and Thompson 1996). When implementing database marketing, technical barriers have been found in four major areas:

- database design;
- data selection and maintenance;
- data analysis and application; and
- 'build or buy' decision.

Technical Obstacles: Database Design: DeTienne and Thompson (1996) note, "there are as many ways to build a database as there are to gather information. This complexity is likely part of what has discouraged scholars from attempting to describe *best practices* in database construction".

Architecture before Applications: An often noted misstep is to place 'architecture before applications' (Schoenbachler et al. 1997; Shaw and Stone 1988). Shaw and Stone (1988) describe marketing architecture as how actions, processes and information are linked together for optimal results. They stress that database applications must be determined before database architecture can be set. When applications do not precede architecture, companies "run the risk of developing a system which looks good in theory but does not meet the needs of the business in practice" (Shaw and Stone 1988).

When companies do not consider database applications, they may attempt to use existing accounting or product-based systems (which are not customer-focused) as the basis for their database marketing system. These legacy systems often present problems in developing effective database marketing (Fletcher and Peters 1996; Das 1995; Berry and Maclean 1989).

A number of authors have begun to address database design in a pragmatic fashion (DeTienne and Thompson 1996). Table 9 lists the steps many authors believe can circumvent the obstacles in database development. While the author's recommendations differ, each point out the importance of identifying database applications prior to system development.

TABLE 9
STEPS TO DATABASE DESIGN

Kohli and Gupta (1993) – Broad methodology which include:

1. Establish corporate objectives;
2. Identify data needs;
3. Build storage and access mechanisms; and
4. Establish mechanisms for continuous data collection and storage.

Jackson and Wang (1997) – A four step process in database design:

1. Determine current status of technology & applications within the organization;
2. Examine where the company wishes to be with its data-driven marketing applications;
3. Assess the gap between where the company is and where it wants to be; and
4. Form plans to move the company toward its desired database-related goals.

Stevenson (1988) - Three distinct, successive steps:

1. The needs analysis - where companies define their marketing applications;
2. The data dictionary - where companies determine the specific data points to be captured and the sites where it can be collected.
3. The systems - where companies examine how they will handle the data.

Information-Processing Structure: Jackson and Wang (1997) believe companies must determine where the appropriate database structure and technology platform meets the continuum of their marketing applications. For example, structured database technology performs better along the continuum from historical data management to limited levels of integrated business resource. On the other hand, relational data technology starts at the low end of marketing information and goes up the continuum through integrated business resource applications.

Day and Glazer believe information-processing structure is tied to organizational learning (1994). They identify systems that promote organizational learning as containing: parallel information processing; multiple data representation including analog representation; distributed memory stores; and integration of individual learning processes. Further, if database marketing is to support organizational learning, then database marketing systems must be user friendly and support corporate-wide access (Kohli and Gupta 1993; Wills, Bruce and Duncan 1991).

Technical Obstacles - Data Selection and Maintenance: Fletcher, Wheeler and Wright (1994) found the attitude of an organization toward data collection can present a major constraint in successful database adoption and implementation. Jackson and Wang (1997) agree and illustrate the issue by pointing out that "a database is only as powerful as the information it houses."

Data-related Attitudes: Unfortunately, many organizations have a product or fulfillment driven attitude toward data, collecting the minimum data necessary to fulfill the order (Fletcher, Wheeler and Wright 1994). Table 10 outlines additional data-related attitudes, which limit the effectiveness of database marketing systems.

TABLE 10
DATA-RELATED ATTITUDES WHICH LIMIT DATABASE MARKETING

Kohli and Gupta (1993)

1. Exhaustive data needs are not considered - which results in the system either failing to be fully utilized or providing more detailed information than is needed.
2. Customer data is not utilized - which occurs because internal customer data is not available in machine-readable format or data that could be used is incomplete and potentially inaccurate.
3. Future data needs are overlooked - critical information needs for future marketing has not been taken into account and the system lacks the relevant data for such efforts.
4. Data is improperly organized - while the data might exist, the right information can't get to the right user at the right time.

Berry and Maclean (1989)

1. Data-visionary whose strong desire to build a cathedral of data frightens off others who would otherwise support database marketing.
2. Intragroup strategist who attempts to impose the same data points on all divisions within the organization.
3. Data-dogged manager who is antagonistic toward any future change in data need
4. Customer-contact manager who knows to precisely what limited data will be valuable and which will not.

Data Capture: Once firms have identified the marketing applications to pursue with database marketing, they must determine which data points should be captured to support these applications. [Of course all data captured must be at the individual record level -- that is integral to the concept of relationship marketing!] Four problems plague companies during data capture:

- capture of the wrong data;
- capture of an insufficient amount of data;
- capture of too much data; or
- capture of data in the wrong format.

The corporate needs analysis assists organizations in identifying their specific data needs (Schoenbachler et al. 1997). While no two systems contain the same data, Table 11 outlines important data characteristics that have appeared in the literature.

Data Richness: For companies who do not (or can not) capture a sufficient amount of data, Jackson and Wang (1997) suggest data enhancement. Data enhancement is the overlay of information (normally from external sources) to each distinct database record for the purpose of better describing and understanding every individual. Data enhancement allows organizations to overcome the pitfalls of having insufficiently rich data. Lewington et al. (1996) define data richness as "a database containing sufficient segmentation data elements to identify customer clusters of adequate size and behavioral variation to justify the economic exploitation through available direct response media."

TABLE 11
IMPORTANT DATA CHARACTERISTICS

Vavra (1993): Data on four general constituencies ought to appear in every database:

1. Current customers, marked by frequency of purchase, average order volume, lifetime value and recency of purchase;
2. Prospective customers, identified by their similarity to current customers;
3. Lapsed customers; and
4. Stores, dealers or merchandise customers and their purchase behavior.

Klitsch (1997): A comprehensive database contains:

1. Basic information (name, address, etc.);
2. Promotion, response and sales history;
3. Transactional information, customer concerns and questions; and
4. Extensive demographic and psychographic information.

Stephenson (1989): Adds to the data list :

1. Demographics, psychographics and purchase history;
2. Location (zip code, census tract, phone exchange);
3. Receptivity (tendency to buy products/services, channel preference, etc.);
4. Customer source (original source of sale); and
5. Warranty, parts and service information.

Jackson and Wang (1997) categorized database enhancement into three dimensions: geo-unit, target, or attribute. InfoWork's (1997) research shows that very few organizations are currently enhancing their databases; only 3% use third party census data or have customer demographics, attitudes or credit history.

Data Design and Access Strategies: Previously the problems associated with collecting too much data were discussed. DeTienne and Thompson (1996) note, "organizations tend to amass data continually without discriminating between what is useful and what is extraneous. This can quickly lead to unmanageability." This unmanageability can paralyze organizations and leave them worse off than before they instituted a database marketing system (Blattberg et al. 1994; Whipker and Downey 1994; Miglautsch 1995). Data design strategy helps companies resist the temptation to collect more information than is useful (Jackson and Wang 1997).

Data design strategies also assist companies in identifying the forms in which the data they desire is available and can be stored (Day and Glazer 1994). If information can not be processed in many forms, than what can not be reduced to a numeric measurement is unlikely to be available for inclusion in the marketing database. This restriction impacts the value and effectiveness of the marketing database.

Companies must also address limitations to the use of the data (Stevenson 1988). Companies that fail to address how, when and by whom data can be used are candidates for running afoul of privacy, exclusion, or collusion issues.

Data issues do not end once a database is designed and built. Companies must establish mechanisms for the continuous collection, storage, updating and cleaning of data if the asset value of the database is to be maintained (Kohli and Gupta 1993). Database attrition is estimated

at 10%-15% yearly (Judd 1993). Further, inaccurate, inconsistent, incomplete or duplicate data problems may arise as new data is captured or existing records changed (Gessaroli 1995). Organizations must establish and invest in processes for the on-going evaluation and maintenance of their databases to keep the quality of the data high (Berry and Maclean 1989).

Technical Obstacles - Data Analysis and Application: Analytical tools allow the marketer to understand, model, forecast and track consumer behavior (Shaw and Stone 1988). Jackson and Wang (1997) argue, "developing your database and filling it with data is only the start of database marketing - analytical tools release the power of the data collected so the marketer can take action." "The problem with database marketing is not in gathering the information but converting it to marketing intelligence" (Stein 1993).

Performance Measures: Through database marketing, an information loop is established to capture and analyze consumer feedback. Performance measures allow tracking the relative success of individual direct marketing efforts or help clarify data collection decisions or improve the effectiveness of market models (Schoenbachler et al. 1997; Lewington et al. 1996). Specifically, performance measures can be used to track marketing campaign response rates, average sale per order, contribution analysis, bad debt or customer acquisition, retention and reactivation economics (Lewington et al. 1996). They assist marketers in determining the RFM (recency, frequency and monetary value) and lifetime value of customers. There are no specific rules for selecting appropriate performance measures but Lewington et al. (1996) believe successful database marketing systems offer a range of detailed performance measures to reduce marketing ambiguity and improve marketing productivity. Despite the considerable advantages performance measurements can offer organizations, InfoWorks (1997) research found very few companies are currently utilizing them. Only 22% track and measure ROI on all database marketing program tests and rollouts; just 17% know the current and future potential of each customer; and a mere 16% calculate the lifetime value of customers.

Market Models: A data-rich database provides the foundation for a second set of analytical tools -- market models (Lewington et al. 1996). Market models use statistical analysis to build tools that assist marketers in segmentation strategies, brand switching, sales territory allocation, pricing, etc. Market models allow promising marketing scenarios to be developed, tested and then evaluated. Data mining, a hot new term for modeling, uses technologies such as neural networks, decision trees or even standard statistical techniques to search large volumes of data and build models for patterns that accurately predict customer behavior (Thearling 1998). Not surprisingly, given the low level of data richness and performance measurement, InfoWorks (1997) found 82% of companies surveyed had no, very low, or only moderate experience in applying statistical tools and techniques to customer data. Further, when analytical tools were being used, 15% did so for attrition modeling, 18% for calculating lifetime value and 27% for behavioral segmentation.

Technical Obstacles: 'Buy or Build' Decision: To build a database system internally, firms need marketing personnel with a good understanding of information systems and statistical analysis and information systems people who can understand the objectives of the database marketing system (Schoenbachler et al. 1997). Many firms simply do not have a sufficient talent pool internally to support the unassisted development of a database marketing system (InfoWorks

1997; Berry and Maclean 1989). Vavra (1993) identified other problems that may arise when relying on a corporate MIS department to construct and maintain the marketing database

- Finding the MIS department is not equipped with the right technology or talents to construct the database;
- Placing the database in-house leads to a tug-of-war over computer storage space;
- In-house production priorities work against marketing database efforts;
- The MIS culture is at odds with the dynamic nature of database marketing; and
- The need to continually access the database not easily coexisting with the often arbitrary shutdowns of many MIS systems.

When using outside expertise to build the system, companies must be cognizant of the reliability and knowledge of the vendors they choose. If organizations do not choose database-marketing vendors carefully, the vendors may become a major impediment to effective database marketing. Fletcher, Wheeler and Wright (1992) found organizations ultimately needed to be able to manage their databases in-house so data integrity could be assured. Berry and Maclean (1989) agree and note the best solution may be to use an external consultant as a sounding board and keep ultimate control and knowledge of the system inside the company.

Jackson and Wang (1997) believe the decision to develop the database marketing system internally versus using an outside vendor is based on three considerations:

- Nature of the application - considers how much experience, priority and resources can be given internally to the development of the marketing database;
- Development requirements - assesses the hardware, software and scheduling needs and whether they can be met by internal resource groups;
- Importance of the project - database building can often overload internal information systems departments and pull resources away from other applications and uses. The importance of the database to the company often determines who will build it.

The less important the database to the organization, the more often it is built outside the organization. The degree of integration the marketing database will have with other company systems also impacts how it will be built. When the extent of integration with other systems is high, most companies feel more comfortable developing and managing the database internally.

Technical Obstacles - Conclusion: Although research shows companies may be more aware of potential technical pitfalls, it also shows awareness does not always lead to avoidance.

Marketing Obstacles to Database Marketing

Numerous organizational barriers (including management understanding and objectives, cooperation and commitment, marketing orientation, ability to change and organizational skill base) often coalesce and manifest themselves as an inability to design, and implement effective database marketing programs. Many companies lack a vision of what is possible and desirable to accomplish with database marketing. Shaw and Stone (1988) sum up the problem: "the most

difficult part of the revenue stream approach is creating the vision...the real vision relates to marketing applications or, in simple terms, what we can do with our database to acquire, develop and defend customers." Marketing barriers to competitive advantage separate into three broad categories:

- inability to design economic marketing programs;
- inability to effectively implement database marketing programs; and
- inability to produce innovative database marketing programs.

Marketing Obstacles- Inability to Design Economic Programs: By definition effective marketing programs produce a favorable return on investment. Deighton, Peppers and Rogers (1994) believe many firms' lack the ability to weigh costs of a database-marketing program against its potential return. This results in organizations creating and fielding marketing programs that will never produce a favorable return for them. The best source of information for developing successful database marketing programs is past performance (Schoenbachler et al. 1997). Yet when tracking and analysis are not considered important, past performance is either not available or not accurate.

Marketing Obstacles - Inability to Effectively Implement Programs: As unlikely as it might sound, some organizations fail at database marketing (Gehlcken 1992; Jutkins 1994) because they do not use the system once it has been built. However, many more use their systems only to support general promotion and/or information mailing campaigns (Direct Marketing Association 1994). The database is little more than a mailing list and no customer targeting or segmentation takes place. Ironically, however, the appropriate use of customer targeting improves direct mail response rates, particularly when a company is communicating with current customers (Fletcher et al. 1991). Further, segmentation is a fundamental aspect of relationship marketing, and the ability to conduct relationship marketing is often the reason a company adopts database marketing.

Offer propositions placed before customers should also be targeted but often are not (Schoenbachler et al. 1997). Passavant (1990) notes, "the offers we use tend to be product-oriented, promotionally traditional and database unspecific...the database selections are impersonal. That is, we're using database information, but really only superficially." Schultz (1994) goes farther and suggests it is the function of good database marketing to ensure the programs developed deliver value for both the company and the customer.

Timing, as used by Stone and Shaw, refers to when and how organizations communicate with consumers - i.e. their contact strategy (1987). Unfortunately, firms may fail to integrate database-marketing efforts into their overall contact strategy (Direct Marketing Association 1994; Donnelly 1994). Nor do they bring advertising, sales, promotions, public relations, customer service and other elements into a common focus with database marketing (Schoenbachler et al. 1997). The failure to integrate database programs with other marketing and service activities often results in inconsistent communication within the organization as well as to consumers. Fletcher and Wright (1995) found the fragmentation of marketing and sales organizations to be an impediment to successful database marketing. "Getting a database in harness within the existing structure of an organization, and figuring how to get people involved

in the utilization of the database, is by far the most challenging aspect" ("Evolution" 1994). Jutkins (1994) notes that a major mistake often made in database marketing is not making certain everyone involved with a program understands it fully.

Unlike more traditional promotions, the contact strategy in database marketing must also contain a feedback loop. Shaw (1993) refers to this as an integrated, closed-loop process where consumer information is the driving force. A mistake companies make in implementing database programs is neglecting to capture consumer feedback. Poulos (1997) includes developing an effective two-way customer contact plan, as a key principle in successful database marketing.

Marketing Obstacles - Inability to Produce Innovative Programs: Even organizations that design economic programs and implement them well, can fail to use the database in creative and original ways. These companies have reduced the emphasis placed on human creativity, analysis and innovation, choosing instead to rely on the computer and the vast amounts of information stored in the database (Gray and Watson 1998).

Poulos (1997) notes many database-marketing programs go astray because they are too limited in vision. When firms do no more than copy current database marketing programs being used in their industry, they are unlikely to obtain competitive advantage from their efforts.

Marketing Obstacles - Conclusion: The ability to utilize the marketing database effectively once it has been constructed may be the biggest obstacle - short of organizational issues - that companies face. Often the company lacks sufficient information and skills to maximize the return for their database investment. Most firms are currently using their database only for tactical marketing efforts. Strategic use of the database is limited, even though many authors and practitioners believe this is the arena where returns on database marketing will be the greatest.

Strategic Obstacles to Database Marketing

It has been argued that sustainable competitive advantage from database marketing is best achieved when firms use their database strategically (Roberts 1997; Cooke 1994; Passavant 1990; Fletcher, Wright and Desai 1996). Unfortunately, few firms seem to have moved beyond tactical database marketing (Roberts 1997; Fletcher, Wheeler and Wright 1992). Obstacles that firms most often encounter when attempting strategic database marketing are:

- Failure to fully understand what constitutes strategic database marketing; and
- Failure to exhibit the organizational characteristics necessary to exploit strategic database marketing.

Strategic Obstacles - Failure to Understand Strategic Database Marketing: Many of the articles promoting the value of strategic database marketing give a limited explanation of the term (Passavant 1990; Fletcher et al. 1992). Or more often, both tactical and strategic benefits or applications of database marketing are co-mingled in one list but never differentiated. Database marketing is an information technology tool that has both tactical and strategic uses (Fletcher, Wright and Desai 1996). However, for organizations to use their database strategically, they must be capable of identifying and understanding strategic versus tactical applications. Table 12

provides definitions of strategic versus tactical database marketing.

What allows some organizations to go beyond using their database tactically? A number of authors believe it is the presence of certain organizational orientations and skills.

Strategic Obstacles - Failure to Exhibit Necessary Characteristics: Cooke (1994) believes a customer focus is primary to strategic database marketing. Passavant (1990) adds that strategic database marketing takes the ability to look at the customer as a "whole person, not just at previous purchases and recency-frequency data."

TABLE 12
STRATEGIC VS TACTICAL USES OF DATABASE MARKETING

<p><u>Roberts (1997)</u></p> <ul style="list-style-type: none">• <u>Strategic Database Marketing</u>: Supports managerial decision making which is using the database to support analysis, planning and strategy development.• <u>Tactical Database Marketing</u>: Supports broad marketing and sales applications, such as soliciting sales, qualifying and tracking leads, providing sales support and customer service and managing customer relationships. <p>Cooke (1994)</p> <ul style="list-style-type: none">• <u>Strategic Database Marketing</u>: Occurs when the database is central to the company's marketing activity and its strategy. The database is a vital strategic investment to support the firm's overall corporate strategy of 'customerization'.• <u>Tactical Database Marketing</u>: Allows for the isolation of customer groups, analysis for their profiles, and close targeting of promotions." Here the database is seen as a tool for marketing efficiency. <p>Jackson and Wang (1997)</p> <ul style="list-style-type: none">• <u>Strategic Database Marketing</u>: When a database is used strategically, Jackson and Wang believe it supports strategic objectives in four areas: (1) gaining competitive advantage; (2) research and product development; (3) business planning; and (4) integrating the marketing communications process. It is an active use of the resource - it provides a single source of information for developing the strategic plan for a data-driven marketing program.• <u>Tactical Database Marketing</u>: Tactical use of the database is passive and uses a cycle of 'tactic, capture, tactic'. Often in tactical use current marketing programs are not influenced by prior efforts.

What allows some organizations to go beyond using their database tactically? A number of authors believe it is the presence of certain organizational orientations and skills.

Strategic Obstacles - Failure to Exhibit Necessary Characteristics. Cooke (1994) believes a customer focus is primary to strategic database marketing. Passavant (1990) adds that strategic database marketing takes the ability to look at the customer as a "whole person, not just at previous purchases and recency-frequency data."

Fletcher, Wright and Desai (1996) measured the sophistication of database marketing in British firms. The more sophisticated the company's database marketing efforts the more likely it was

the database was being used strategically. High levels of marketing and information orientation and formal marketing and database marketing qualifications were positively correlated to database sophistication. Furthermore, organizational slack and a willingness to embrace database marketing (not approach it incrementally) were found in companies with high levels of database sophistication. Firms with sophisticated database marketing efforts had powerful direct marketing departments and strong internal networks too. Fletcher, Wright and Desai (1996) note, "a marketing and information orientation need to provide a nourishing environmental context for database marketing sophistication to develop. ...The potential for application needs to be understood. ...Resources are required and decisions should be proactive. ...Firms need to continue to commit to database marketing after initial adoption to reach its full strategic potential."

Strategic Obstacles - Conclusion: Research shows an understanding of strategic database marketing is not sufficient for its successful adoption. Companies that hope to achieve strategic database marketing need high levels of: marketing and information orientation; slack; skills; customer focus and on-going commitment to database marketing.

VII. CONCLUSION

As the preceding review demonstrates, the pitfalls to competitive database marketing are numerous. Organizations that wish to obtain competitive advantage from database marketing must:

- Ensure the organization shares a common definition of database marketing and its objectives;
- Honestly assess the organization's business factors and the extent to which they support the use of database marketing;
- Determine the stage of database marketing necessary to achieve competitive advantage;
- Address all environmental, technical, marketing and strategy obstacles to successful design, development, implementation and maintenance of database marketing.

This review was developed in hopes of assisting database-marketing practitioners in each of these critical areas.

APPENDIX

DATA WAREHOUSE SUCCESS STORIES

This appendix presents three database marketing success stories. A summary of ten firms who have had success. Their type of application and a brief description were included as Table 1 in the text and are repeated below. The discussions of the three firms in this appendix are based on publicly available information and vary in length, depending on the original source.

FIRM	TYPE OF APPLICATION	DESCRIPTION
Fingerhut	Targeted marketing	Targets catalogs to specific audiences based on data about group interests
Franklin Mint	Targeted marketing	Uses statistical analysis of customer attributes and characteristics to determine specific audience for each promotion.
Foster and Gallagher	Householding	Integrated view of customers across catalogs
Avis Car Rental	Prospecting	Finding customers for summer car rentals
Vons	Point of sale data	Loyalty cards scanned by grocer to find buying habits
Pacific Bell	Predictive marketing	Keep existing customers by finding those likely to depart and making them special offers
United Artists	Loyalty programs	Records moviegoer habits by using a scannable card each time a customer sees a film.
MCI Worldcom	Friends and Families	Phone users given discounts when calling friends also subscribing to MCI Worldcom

Fingerhut

Fingerhut Corporation (Pearson 1997) is a \$2 billion catalog retail firm that depends on database marketing as its prime sales tool. With 15,000 items being sold, it sent 467 million mailings in 1997. Its 7-terabyte database can deal with up to 2000 variables per customer. Its database marketing operation includes 200 market analysts, 300 advertising people, and 40 statisticians.

Fingerhut tries to put customers into groups large enough to justify printing a catalog for them. That is, rather than trying to sell on a one-to-one basis, they try to find affinity groups with similar purchasing profiles. They found, for example, that people who change residence triple their buying in the 12 weeks after the move, with most of that in the first four weeks. Furthermore, they buy furniture and telecommunications but not jewelry and home electronics. The result is a "mover's catalog" sent to these people during the 12 week window. To save marketing cost, no other catalog is sent to them. Another specialty group is the geographically dispersed Spanish-speaking customers who respond to jewelry catalogs.

One-to-one relationships are established by calling each new customer immediately after they place their order to let them know when it will arrive. Customers can decline such follow up calls in the future and their privacy will be respected.

To test the quality of its insights about customer behavior, Fingerhut runs test markets with several thousand people before rolling out a new catalog aimed at a specific group.

To increase marketing effectiveness, Fingerhut runs training sessions (as small as six people at a time) for advanced skill workers to learn and to share knowledge.

Franklin Mint

Franklin Mint sells collectibles (particularly coins and medals) as well as luxury and home decoration products throughout the world from its headquarters in Philadelphia. Because their products are unique, they appeal to upper-income, middle-aged, older customers. They market by mail to people who have bought from them before or who have sent inquiries. Their customer base exceeds 8 million in the U.S. and 2 million, abroad.

Franklin Mint uses the AMOS approach described in Levin et al. (1995) for its individual mailings. This approach is based on methods from operations research, statistics, AI, expert systems, and information systems. For a new product, the process begins with a live market test in which the product is offered to a sample of customers from the database. Then, the people in the database who have similar characteristics to those who actually bought are targeted for the promotion.

The AMOS system is fully automated. It begins with preprocessing modules that examine demographic data and that cluster 'similar' previous behavior. It then uses an expert system to find appropriate predictors of behavior. Estimation techniques are used to reduce the size of the sample required to the order of 10,000 and to serve as inputs to a scoring model. Finally, a decision model is used to target the "right" audience, predict the number of responses from a mailing, find the number of units to manufacture to meet customer demand, offer "personalization" and optimize the number and mix of mailings to a customer in a given time window.

Foster & Gallagher

A \$500 million direct retailer of horticultural, food, and other products located in Peoria, Illinois, Foster & Gallagher uses a data warehouse to service all five of its divisions. Data are kept 'by customer' to allow cross selling and to create direct mail lists. Core data tables range from 10s to 100s of millions of rows. They focus on keeping household compositions accurate over time to allow improved data mining. By keeping an integrated customer view they are able to view data across catalogs and hence also across the company's various divisions.

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