CUSTOMER TRANSACTION COSTS AND MARKETING SIMULATIONS: MODELING A NEW RELATIONSHIP MARKETING APPROACH

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ABSTRACT

From an economic perspective, the role marketing is to facilitate the convergence of supply and demand. The fact that the convergence needs facilitation implies there are natural sources of resistance to convergence. The cost of overcoming the resistance can be conceptualized as transaction costs. This paper discusses how a simulation can incorporate the theory of transaction costs into a cost function and can use the concepts of marketing, and particularly relationship marketing, to reduce them. Building these two concepts into marketing simulation games not only gives game participants experience with the practical application of transaction costs in marketing strategy, but it also allows them to experiment with a new business model that uses relationship marketing to reduce transaction costs as opposed to a model in which marketing seeks to increase profits through product differentiation.

INTRODUCTION

This paper views marketing as the economic mechanism by which supply and demand move toward equilibrium. It views transaction costs as a costly friction that marketing must overcome when matching supply and demand. The force behind marketing is captured by Adam Smith's principle of the *invisible hand*. As he notes, "*It is not from the benevolence of the butcher, the brewer, or the baker, that we expect our dinner, but from their regard to their own interest. We address ourselves, not to their humanity but to their self-love, and never talk to them of our necessities but of their advantages* (Smith, 1937, pp. 26 -7)."

According to Smith, consumers are motivated to spend money to meet their needs, and marketers are motivated to address these needs in return for the resulting profits. Consumers optimize their spending to derive the greatest satisfaction possible from their limited budgets, and marketers optimize their profits by allocating their scarce resources to deliver products that will command the greatest return. The effect of these complementary interests, interacting in the form of marketing transactions throughout an economy, not only optimizes the use of consumers' and marketers' resources but, in so doing, also optimizes the use of resources for the economy as a whole.

Pursuing an economic perspective, Cannon, Yaprak & Mokra (1999) seek to explain Keith's (1960) portrayal of marketing's evolution in the Pillsbury Company as an embodiment of the invisible hand operating in a changing market environment. They view the effect of marketing as an innovation cycle of disequilibriating and equilibriating forces. Marketers innovate to create differentiated products that will command high margins and economic profits. Attracted by these profits, other marketers copy their efforts, offering to meet the same needs for less money. The cycle is captured in Exhibit 1.

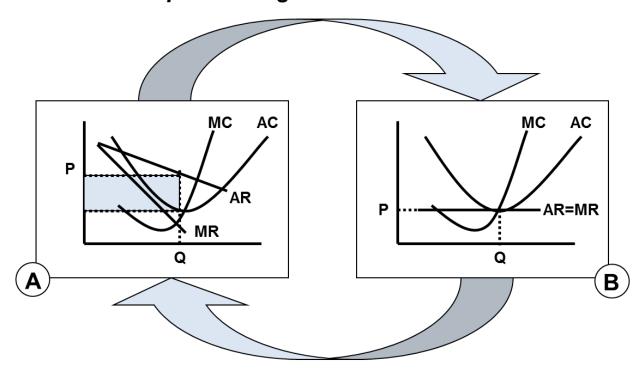The technical explanation of Exhibit 1 is not essential

to this discussion, except to illustrate how the cycle works in a competitive market. In Box A, the relative inelasticity of demand (the downward sloping demand curve, AR) created by product differentiation enables the marketer to charge a price (P) while losing only some sales to the imperfect competitive substitutes. By establishing a price that equates marginal cost (MC) and marginal revenue (MR), the marketer optimizes profit at a level where the price exceeds average costs (AC), thus yielding high margins and economic profit. In Box B, the advent of close competitive substitutes causes the marketer to "take" the market price because any higher price would simply cause customers to buy a substitute product. The result is that the marginal revenue (MR) and average revenue (AR) are equal, fixed by the market price (P). Furthermore, the price (P) is also equal to the average cost (AC, where average cost includes the opportunity cost of investors' capital) because the same equilibrating forces would cause competitors to emulate production advantages, just as they would emulate product advantages. Any competitor who failed at this would be driven out of business.

Considered from a managerial perspective, the innovation cycle suggests two fundamental marketing strategies. First, the differentiation-driven strategy is captured in the arrow representing the "disequilibrating effects of marketing innovation," resulting in a relatively inelastic demand curve portrayed in Box A of the exhibit. Second is a cost-driven strategy in which the company accepts lower margins in return for the lower research budgets and promotional expenses, as compared to the margins and costs associated with supporting differentiated products. The cost-driven strategy is portrayed in the exhibit by the "equilibrating effects of marketing evolution" leading to the elastic demand curve shown in Box B. These arrows correspond to Porter's (1980) classic strategies of *differentiation* and *cost-leadership*.

Cannon & Schwaiger (2005) suggest that as the speed of the cycle between product differentiation and cost-

Exhibit 1
Competition as Seen from the Product Differentiation Paradigm

The equilibriating effects of market evolution

The disequilibriating effects of marketing innovation

Source: Cannon, Yaprak and Mokra (1999, p. 272)

leadership strategies accelerates, a third strategy arises that seeks to step out of the cycle, providing consumers with either innovation and/or economy, maintaining margins through lower transaction costs. In a subsequent paper, they elaborate on the nature of this third, transaction cost, strategy and discuss the mechanisms by which a company might lower transaction costs through various forms of customer equity (Cannon, Cannon & Schwaiger, 2010). However, none of the papers address the specific nature of transaction costs, much less modeling transaction costs in a way that can be used to construct a simulation that allows game participants to grapple with the specific elements of transaction cost reduction. The purpose of this paper is to present a rigorous definition of the transaction-cost strategy, explaining the nature of transaction costs and the elements of relationship marketing by which marketing may reduce them. It then models the strategy, showing how the transaction cost elements can be embedded into a marketing simulation game, thus creating an opportunity for game participants to pursue a transaction cost strategy through their manipulations of available marketing decisions.

THE NATURE OF
TRANSACTION COSTS

According to transaction cost theory (Williamson, 1981, 1991; Coase, 1992), the costly market friction that marketing seeks to overcome grows out of the difficulties in administering contracts required to consummate market transactions. These difficulties are driven by both the character of the transaction participants and the conditions under which the transactions take place.

Regarding transaction participants, the theory assumes, first, that they are constrained by *bounded rationality* (Simon, 1972). That is, while participants are rational in the way they approach transactions, they are limited in their ability to obtain and process the information needed to make good decisions. Second, participants' self-interest makes them prone to *opportunistic behavior* when given the chance, seeking to maximize their personal outcomes at the expense of their exchange partner(s).

The conditions that create bounded rationality and opportunism problems are threefold: The first is *environmental uncertainty*, resulting in *adaptation costs*. In order to facilitate market transactions, the marketer must mobilize resources to deliver the products and services customers want at the time, place, and at the price customers desire. The mobilization of these resources requires contracts with facilitating parties, including product designers and producers to those parties who facilitate the promotion, sales, financing, and actual delivery of the product or services being marketed. Environmental uncertainty results from a lack of information regarding the specific parties' capacity,

Exhibit 2
Principles of Transaction Cost Analysis from the Perspective
of Marketer-Supplier Transactions

Situational Factors	Resulting Transaction Costs	Strategic Implications
Environmental uncertainty involving factors relating to participants in market transactions, the resolution of which is impeded by the limits of marketers' *bounded rationality*.	*Adaptation costs* resulting from the realignment of the transaction participant contracts required to address the demands of changing conditions.	Marketers can reduce adaptation costs by internalizing the specialized technologies/processes through *vertical* or *horizontal integration* or making transactions more tractable through complex contracts.
Behavioral uncertainty involving the degree to which marketing transaction participants have fulfilled their contractual obligations, where the marketers' *bounded rationality* imposes limits on their ability to resolve the uncertainty.	*Performance evaluation costs* resulting from the effort required monitoring and correcting deficiencies in the way marketing transaction participants fulfill their contractual obligations.	Marketers seek to reduce performance evaluation costs by using *vertical* or *horizontal integration* to increase their control of transaction participants' performance metrics, contract enforcement, and other less formal means of controlling agent behavior.
Asset specificity where transaction participants' capabilities are unique and valuable to the marketer, thus creating the potential for *opportunism* on the part of the participant, seeking concessions from the marketer.	*Safeguarding costs* where the marketer must grant concessions to ensure the availability of the needed resources.	Marketers seek to reduce safeguarding costs by internalizing the specialized functions through *vertical* or *horizontal integration* or making transactions more tractable through complex contracts.

contractual requirements and the parties' actual behaviors needed to bring the market transaction to fruition. For instance, what is the cost of adapting to an increase in demand resulting in a case where existing suppliers can no longer supply the needed products and service? What are the contractual implications if a new technology becomes available, requiring a marketer to engage suppliers of different products and manufacturing capabilities? Not only is the accumulation and processing of the information to address the new environmental conditions costly, but as the uncertainty resolves itself, reconfiguring and managing the necessary contracts is costly as well.

The second condition is *behavioral uncertainty* resulting in *performance monitoring costs*. Once the contracts required to administer a marketing program are in place, marketing success depends on transaction participants fulfilling their responsibilities. Behavioral uncertainty grows out of a lack of information regarding the degree and manner in which the contracts are being fulfilled. Gathering and processing the information necessary to monitor participants' behavior is costly, as is the resolution of any problems with behaviors once they are identified. For instance, consider the cost of monitoring suppliers to ensure that they maintain established product specification and standards of quality control. Consider the costs of correcting any deficiencies.

Finally, the third condition is *asset specificity* resulting in *safeguarding costs*. The assets in question refer to the resources used by transaction participants to fulfill their contracts. Asset specificity is the degree to which the availability of a particular technology or process is specific to a single supplier versus readily available from competing sources in an open market. For instance, an electric automobile might require a regenerative braking system (a system for converting the energy created by the braking process into usable electric power) intellectual property owned by a particular supplier. If the required technology or process is proprietary to a single supplier, the controlling supplier is in a position to take advantage of the marketer (representing a customer), thus making the proprietary resource very costly. Safeguarding costs are the costs incurred by the marketer to prevent the supplier from opportunistically taking advantage of its position. The costs would include such things as the cost of acquiring the technology directly or by developing complex contracts that reduce costly bargaining over the suppliers' profits resulting from selling the proprietary technology (Dyer, 1997).

Exhibit 2 summarizes the driving principles we have just discussed. In the literature, they have generally addressed inter-organizational transactions and are referred to as transaction-cost analysis, or TCA. (See Reindfeisch & Heide 1997 for a review). As we have seen in Exhibit 1, in a free market, the pressure of competition will tend to reduce prices. However, as we have also seen, the freedom of these markets is impeded by the frictions embodied in transaction costs. The basic premise of TCA is that, if the costs of market transactions are high enough, they might be reduced by internalizing them within a firm through vertical or horizontal integration. While internalization gives a company more control over the nature of the contracts and the information flows necessary to enforce them, it imposes potential opportunity costs by reducing the ability to switch suppliers in order take advantage of lower prices and/or superior products. Returning to our example of regenerative breaking systems, our automobile company might internalize the function by investing in the leading supplier in the field, only to find that another company has developed a better, lower-priced technology (creating an opportunity cost).

HOW RELATIONSHIP MARKETING REDUCES TRANSACTION COSTS

Notwithstanding the fact that TCA is usually considered in the context of inter-organizational transactions, the framework is applicable to consumer transactions as well (Bergen, Dutta, & Walker, 1992). This perspective is implicit in Cannon and Schwaiger's (2005) transaction-cost strategy. According to their conception, the relationship marketer engages in a principal-agent relationship with its customers, developing a psychological contract in which it agrees to act as a purchasing agent for its customers (principals). The terms of the contract are that the marketer will procure the goods and services its customers desire at the best possible price. To avoid conflicts with the marketer's simultaneous agency responsibility to its profit-seeking owners, it establishes profit as a constraint rather than an objective. Building an organizational culture around this arrangement, members of the marketing organization can be motivated and positively socially reinforced for focusing their efforts to search out ever-better ways of delivering value to their customers, subject to the profit constraint.

Given that transaction costs ultimately involve contract negotiation and administration, they are intimately tied to agency theory, involving contracts between principals and agents. In the previous section of our discussion, the analysis was undertaken from the perspective of a marketing "channel captain" (Hingley, 2005) as principal and other channel functions as agents (Bergen, Dutta, & Walker, 1992). These might include distributors in the case of an "inside versus outside" sales organization decision (e.g. Anderson, 2008) or suppliers in the case of "make-or-buy" decisions for firms considering backward vertical integration (e.g. Walker & Weber, 1987).

As we have noted, in the case of relationship marketing, the marketer becomes an agent for the customer. Faced with bounded rationality in the presence of environmental uncertainty, the customer contracts with the relationship marketer to use its knowledge and buying power to procure the products that the customer wants in return for the customer's loyalty. The effectiveness of this

arrangement increases with the marketer's knowledge of the customer's needs and buying habits, accumulated over the history of the relationship. Access to these data effectively reduces environmental uncertainty, reducing the transaction costs related to product adaptation. The richer the relationship, the better the data and the more able the relationship marketer is to manage the adaptation process, giving the marketer a sustainable advantage over its competitors.

A similar principle applies to transaction costs related to performance monitoring, except that the facilitating mechanism is accumulated trust rather than accumulated knowledge of customer's needs. The relationship marketer is able to reduce behavioral uncertainty through trust by continually reinforcing its ability and willingness to maximize the customer's interests, subject only to a clearly articulated profit constraint. Again, this reduction in behavioral uncertainty continues over time, as long as the marketer fulfills the terms of its customer contract, contributing to its sustainable advantage over competitors.

Finally, the nature of the service provided to the customer by the relationship marketer, enhanced by an ever-increasing amount of customer knowledge and trust, creates a relatively high level of asset specificity. That is,

the marketer creates a relationship with its customers that is both valuable and difficult to replicate. However, the basis for this specificity – the marketer's customer knowledge and trust – is dependent on a commitment not to engage in opportunistic behaviors. Again, the asset specificity isolates the marketer from competitive pressures, reducing the internal transaction costs relative to those incurred by customers engaging with other marketers.

The consumer-transaction-cost strategy addresses asset specificity in another way as well. While the relationship marketer offers a type of benign asset specificity, the actual products and services it provides may rely on specific assets controlled by various outside suppliers. Indeed, the revenue model embodied within the strategy depends on increasing sales to relationship customers by procuring the best, most price-competitive products available for its customers. This may preclude backward integration when economies of scope and scale are such that it becomes infeasible for a marketer to be the market-leader in new or cost-competitive technologies.

The principles of TCA as applied to marketer-customer transactions are summarized in Exhibit 3.

Exhibit 3
Principles of Transaction Cost Analysis from the Perspective of
Customer-Marketer Transactions

Situational Factors	Resulting Transaction Costs	Strategic Implications
Environmental uncertainty involving customer knowledge regarding the nature of products and services, their quality, and appropriate pricing. The resolution of the uncertainty is constrained by the customers' *bounded rationality*.	*Adaptation costs* in the form of shopping to gather information regarding product characteristics and availability, then bargaining for the best prices once acceptable alternatives have been identified.	The relationship marketer seeks to reduce environmental uncertainty for the customer by using its superior market knowledge and buying power, combined with its growing customer knowledge, to procure the products and services the customer desires at the best possible price.
Behavioral uncertainty involving the degree to which the relationship marketer and the supporting transaction participants (i.e. suppliers) it uses to help satisfy customer needs are delivering the goods and services the marketer has promised. The resolution of this uncertainty is again constrained by the customers' *bounded rationality*.	*Performance evaluation costs* resulting from the effort required to monitor and correct deficiencies in the way the relationship marketer has fulfilled the terms of the psychological contract it has developed with its customers.	The relationship marketer seeks to reduce behavioral uncertainty for the customer by clearly articulating its policies regarding its philosophy of treating profits as a constraint and dedicating its efforts to maximizing customer value. The uncertainty declines over time as trust is fostered through accumulated positive experiences with the relationship.
Asset specificity where the relationship marketer's capabilities are unique and valuable to the customer, thus creating the potential for *opportunism* on the part of the relationship marketer, which would violate its psychological customer contract by imposing higher prices in return for its services.	*Safeguarding costs* where the customers must accede to the relationship marketer's pricing and purchase requirements in order to qualify for the benefits of the marketer's services, or alternatively, to forgo the services, paying in the form of an opportunity cost.	The relationship marketer guards against opportunism by establishing firm cost-plus pricing guidelines that include profit as a cost, then working to lower costs further by using its market power to secure the use of common industry standards, parts, and procedures without sacrificing customer benefits.

DECISION VARIABLES RELATING TO PRODUCT-DEFFERENTIATION AND RELATIONSHIP MARKETING STRATEGIES

Looking at Exhibit 3's summary of how relationship marketers address transaction costs, we see that the actual transaction costs appertain to the customer, not the relationship marketer. However, the transaction-cost strategy discussed in the introduction suggests that a relationship marketer would use lower transaction costs in the place of product differentiation and premium pricing to maintain its margins in the face of increasing competition. Clearly, the savings to customers must translate into the company savings necessary to enable the relationship marketer to charge lower prices. In order to illustrate how this works, Exhibit 4 summarizes the major marketing decisions that characterize the typical *product differentiation* versus the *relationship marketing* strategy.

Note the subtle but significant change in perspective between customer-marketer and marketer-supplier transaction costs. In both types of transactions, asset specificity and the attendant management of safeguarding costs is the primary driver of transaction costs. For marketer-supplier relationships, asset specificity typically involves investments in relationship-specific assets (Dyer, 1997). These tend to be multi-dimensional, including such things as the advantageous location of work sites, investments in physical assets, human assets involving unique training and experience, and dedicated assets that cannot be easily repurposed if the relationship were to fail (Williamson, 1983). By contrast, customer-marketer asset specificity typically involves little investment by either the customer or the marketer. The customer becomes dependent on the marketer only in the sense that the marketer has the knowledge and market power to perform services for the customer that the customer cannot easily perform for him or herself. The requirements of the customer-marketer relationship and its associated strategies affect marketer-supplier relationships in the sense that the product differentiation marketer seeks to exploit this power to achieve higher margins and their associated profits. Given that customers are typically not making any investment in the relationship, they have little basis for negotiating a contract to safeguard themselves from exploitation. Instead, they invest in searching the market for alternatives that will remove the specificity. In contrast to product differentiation marketers, relationship marketers (as characterized in this paper) offer a safeguarding contract to their customers. In return for customer loyalty, they commit themselves to forgo opportunistic exploitation of their asset specificity (customer knowledge) and use it instead to deliver the maximum customer value possible given the marketer's profit constraint. This causes marketers to eschew some kinds of asset specificity, as

suggested in Exhibit 4 by the differences between product differentiation and relationship marketing strategy relative to proprietary product technology and internalized production, first, because their strategy (and customer contract) does not allow them to exploit this advantage, and second, because sharing technology with competitors will increase volume and provide economies of scale that can then be passed on to their customers in the form of lower prices.

The decisions summarized in Exhibit 4 provide the basis for modeling the consequences of adopting a product differentiation versus a relationship marketing strategy within the context of a simulation game. Note that the profitability of one strategy versus the other hinges primarily on the exploitation or non-exploitation of asset specificity. That is, does the marketer seek to control proprietary technology to differentiate its products in order to achieve higher margins or does it maximize customer loyalty by avoiding this exploitation, encouraging broad sharing and development of common technologies, thus promoting economies of scale and, ultimately, lower prices for consumers?

HOW STRATEGIC DECISIONS AFFECT COST VARIABLES

To set the financial stage, we will follow Cannon & Schwaiger's (2005) adoption of Gold's (2005) systems-dynamic platform for simulation design (what they characterize as the "Gold standard"). This enables us to focus only on those parts of the model affected by strategic decision we are considering. As noted in the introduction, our purpose in this paper is to model the transaction-cost-related variables resulting from the implementation of a relationship marketing versus a product differentiation strategy. These result from the decisions portrayed in Exhibit 4.Specifically, they include adjustments to marketer i's total fixed ($TFC_{i,j,k}$) and variable ($TVC_{i,j}$) costs associated with each segment, j, and product, k. Our approach will be to develop algorithms for modifying Gold's revenue and cost variables, leaving the rest of the task to his standardized model.

Returning to Exhibit 4, the proprietary product technology decision is really two decisions. One is a product decision, whether to market a generic product or to invest in technology that will result in a differentiated product. We will refer to this as the *investment* decision. A company may choose to launch both types of product, so the decision involves two decisions, both taking on a value of 1 or 0. $T_{i,k,o}$ signifies marketer i's generic product k and $T_{i,k,1}$ signifies marketer i's differentiated product k.

The nature and consequences of investing in proprietary technology and internalized production are similar in that they are both efforts to maintain exclusive control of the differentiating product characteristics. Given

Exhibit 4
Decisions Characterizing the Product Differentiation versus Relationship Marketing Strategy

Marketing Decision	Transaction-Cost Principle	Product Differentiation Strategy	Relationship Marketing Strategy	Explanation
Proprietary product technology	Asset specificity	Prefer proprietary technology (creating exploitable asset specificity) to command monopolistic prices	Prefer common (non-specific asset) technology where possible to encourage competition and economies of scale	Relationship marketer trades off exploitation of asset specificity to achieve customer trust that will pay off in lower promotion and distribution costs.
Internalized production	Asset specificity	Prefer to internalize production to safeguard proprietary (asset specific) technology	Prefer to out-source production, encouraging competitors to share asset-specific suppliers, thus creating economies of scale to produce savings that can be passed on to relationship customers	Relationship marketer promotes common standards (when differing standards do not pose value tradeoffs for customers) to encourage supplier economies of scale even when doing so provides competitors with proprietary technologies. Relationship marketer passes resulting supply-chain economies of scale savings on to the relationship customer.
Pricing	Behavioral uncertainty	Monopolistic pricing to exploit product differentiation, using brand reputation to reduce behavioral uncertainty	Cost-plus pricing with profit as a constraint to ensure low price, thus reducing behavioral uncertainty	Relationship marketer forgoes available price concessions to achieve long-term trust, resulting in lower promotion and distribution costs.
Promotion	Behavioral uncertainty	Heavy mass-media promotion to support differentiation, reducing behavioral uncertainty by assuring customers of product value	Minimal promotion through in-house media to inform customers of product availability, relying on existing customer trust to reduce behavioral uncertainty	Relationship marketer's investments in customer knowledge and trust result in lower promotional costs, thus facilitating lower prices to customers while still meeting profit constraint.
Distribution	Environmental and behavioral uncertainty	Use recognized mass distribution outlets to reduce environmental uncertainty though wide-market availability and to reduce behavioral uncertainty by lending credibility to the product	Direct distribution, using superior customer knowledge and access to reduce environmental uncertainty and customer trust to reduce behavioral uncertainty	Relationship marketer's investments in customer knowledge and trust result in lower distribution costs, because customers know where to find (the marketer's) trustworthy products without having to shop around. This facilitates lower prices to customers while still meeting profit constraints.

this similarity, we will combine this with the research and development decision, creating a second decision variable we can refer to as *internalization* ($I_{i,k}$). It also takes on a value of 1 or 0, where a value of 1 indicates an investment in a supplier to create both the advantages and added cost of asset specificity. A value of 0 signifies the purchase of licensed technology and production on the open market. While this is less expensive, it also lacks exclusivity, putting it at a disadvantage among customers who tend to be attracted to exclusive branded products.

$$FC_{i,k} = T_{i,k,1} I_{i,k} FC \tag{1}$$

where

F = incremental fixed cost of an investment in
C internalized technology and production made
$_{i,k}$ by marketer i to produce product k
T_i = the differentiated product k *investment* deci-
$_{,k,}$ sion made by marketer i, talking on values of 1
$_1$ and 0 (with 1 signifying investment)
$I_{i,}$ = the *internalization* decision made by marketer
$_k$ i whether to manufacture product k, talking on
values of 1 and 0 (with 1 signifying internali-
zation)

From a cost perspective, the investment and internalization decisions may be represented as an incremental fixed cost. This is represented in Equation (1) and may be entered directly into Gold's (2005) standard model by simply adding it to the other product k fixed costs ($TFC_{i,k}$) aggregated from other parts of the simulation. Decisions involving generic products ($T_{i,k,o}$) are omitted from the model because they involve no incremental investments. If marketer i chooses to launch a differentiated product ($T_{i,k,1}$=1) and internalizes the technology and production ($I_{i,k}$ =1), it will incur incremental fixed costs of $Fc_{i,k}$.

In the event of an investment in quality ($T_{i,k,1}$=1) with no internalization ($I_{i,k}$ =0), Equation (1) would render no incremental fixed cost. The cost of the quality would be reflected in licensing fees that would be added on to the cost of goods, expressing itself in Gold's (2005) model as an increment to total variable cost.

Similarly, the costs associated with mass distribution can be represented as an increment to the cost of goods. The *distribution* decision ($L_{i,k}$) takes on a value of 0 if product k is distributed directly and a value of 1 if it is distributed through mass distribution. Including the costs of mass distribution as a part of cost of goods is more an algorithmic convenience that proper accounting. When comparing direct-distributed and mass-distributed products, the relevant price is retail – what the customer actually pays for the product. When the price is entered into Gold's demand equation, the retail price is what would logically help determine unit sales. Therefore, while the marketer using a product differentiation strategy will usually sell its products at the wholesale price, we can act as if the sales were made at the retail, subtracting out wholesale and retail margins as part of the cost of goods. Combining these two cost-of-goods adjustments, Equation (2) provides an incremental addition to total variable cost (TVC_i) in Gold's model.

The $T_{i,1}$ variable indicates whether product k is generic or differentiated. If product k it is generic, the value of $T_{i,1}$ will be 0 and the first term of Equation (2) will take on a value of 0, reflecting the fact that there are no incremental variable costs associated with the product. If product k is differentiated, the value of $T_{i,1}$ will be 1 and the value of the term will be included.

If the marketer internalized production, the incremental production costs were accounted for as part of fixed cost in Equation (1) and, again, the first term in Equation (2) will take on a value of 0, reflecting no incremental variable cost of production. If the marketer chooses not to internalize production then the value of $|1 - I_i|$ will be 1, and the value of the first term in Equation (2) will be incremented by licensing fees (lf), expressed as a percentage of the cost of goods. For instance, if the cost of goods were $10 per unit and the licensing fees were 10%, the cost of goods would be incremented by $1.

Moving to the second term of Equation (2), if product k is being mass-distributed ($D_{i,k}$=1), the second term will take effect and the cost of goods will be incremented by the retail margin, expressed as a percentage of the cost of goods. If the cost of goods were again $10 and the retail margin were 50%, the cost of goods would be incremented

$$VC_i = \sum_{k}^{K} [T_{i,1} \ |1 - I_i| \ (COG_{i,k} + lf \ COG_{i,k})) + D_{i,k} \ (COG_{i,k} \ rm)] \tag{2}$$

where

$VC_{i,k}$ = incremental variable cost from licensing and distribution of a differentiated product

$_{k,}$

CO- = the cost of goods for product k
$G_{i,k}$
lf = the cost of licensing fees for non-internalized quality products, expressed as a percentage of
the cost of goods
rm = the combined wholesale and retail margins for mass-distributed products, expressed as a
percentage of the cost of goods

by an additional $5 to reflect the cost of distribution.

Turning now to demand, or revenue, the effect of the actual prices ($P_{i,k,j}$), promotional budget ($M_{i,k,j}$), and the attractiveness of the product ($D_{i,k,j}$) will be determined by the response parameters incorporated in Gold's (2005 standard model, with the parameters varying by segment. Indeed, the theoretical definition of market segmentation is based on the existence of "heterogeneity in segmentation demand functions … such that market demand can be disaggregated into segments with distinct demand functions" (Dickson & Ginter, 1985). In order to conceptualize relevant segments whose demand functions will differ one from another in meaningful ways, we draw on the work of Rust, Zeithaml, and Lemon (2000). They argue that customer equity is comprised of three components:

Value equity, or the customer's objective assessment of the branded product's utility;

Brand equity, or the customer's subjective assessment of the brand, beyond its objectively determined value;

Retention equity, or the tendency to remain loyal, beyond whatever is explained by the first two factors.

We would expect all customers to have some degree of value, brand, and loyalty motivation. Furthermore, the expression of these motivations would vary with the product and buying situation faced by the consumer. However, we can also picture individuals who by their nature tend to look for value, an emotional connection with a name brand, or a trustworthy supplier who will take the worry out of their shopping. Clearly, the value-driven segment would be more price sensitive than the brand-driven segment. Their response to advertising would be steeper, quickly reaching diminishing returns, because its role would tend to be informative rather than image-building. They would not be adverse to quality, but they would not pay a premium for brand image or extra features that offered little functional value. In short, value-driven segments are expected to be more responsive to the elements of relationship marketing strategy as we have portrayed it, while the brand-driven segment would likely be more responsive the product differentiation strategy, for which advertising would be used to create a brand image that enhanced the subjective assessment of the differentiated product's utility. The loyalty-driven segment would also be likely to respond better to the relationship marketing strategy. While their product motivation might be either value or brand, their primary driver would appear to be comfort with a supplier they can depend on. This, of course, is central to the relationship marketing strategy.

While the segment characteristics are useful for constructing promotional response parameters for new relationship customers, Exhibit 4 suggests that the promotional strategy for relationship marketers features "minimal promotion through in-house media to inform customers of product availability, relying on existing customer trust to reduce behavioral uncertainty." This obviously refers to existing relationship customers.

Furthermore, it suggests that a much lower budget is needed to be effective with these customers. This, in fact, is the principle source of savings offered to marketers who seek to reduce transaction costs through relationship marketing. One way to represent this is by creating a "pseudo-budget" ($M'_{i,k,j}$) incorporating a multiplier ($m_{i,j,k}$) to describe the increased efficiency of promotional spending using in-house media to customers who are already familiar with the relationship marketer's strategy and are predisposed to accept the marketer's promotional claims. The effect is to make a small budget function in the simulation equations behave as if it were much larger. The multiplier would be applied to the proportion of people corresponding to the marketers share of product k sales in each segment j. This is given as $S_{i,j,k}$ in Gold's standard model and is a function of the the relative attractiveness of price ($P_{i,j,k}$), the promotion budget ($M_{i,j,k}$), and the attractiveness of the product ($D_{i,j,k}$), where $D_{i,j}$. is the product-market fit as determined by the similarity a comparison of a product's actual attributes to those desired by a given market segment (Teach's 1990). Given that $S_{i,j,k}$ will be used as an input for calculating the actual budget, we will drop $M_{i,j,k}$ from the market share calculation, giving us a pseudoshare $S_{i,j,k}$. This is expressed in Equation (3).

$$M'_{i,j,k} = M_{i,j,k}\ m \qquad (3)$$

where

$M'_{i,j,k}$ = pseudo-budget representing the budget that would be needed to have equivalent impact marketer i's actual budget has on promoting product k in segment j

$M_{i,j,k}$ = the actual promotional budget for marketer i to promote product k in segment j

M = the budgetary multiplier (recommended 10)

Armed with these descriptions, the simulation game designer will have some general guidelines to use in developing appropriate response functions. As we have noted, however, the key difference between the product differentiation and relationship marketing strategies goes beyond the specific effects of price, promotion, and product attractiveness elasticities. The difference lies in the nature of the psychological contract connecting the marketer with its customers. Product differentiation strategy seems to maximize profit through the achievement of high margins from highly differentiated products and a focus on brand equity. Relationship marketing strategy seeks to deliver maximum value to customers, treating profit as a constraint rather than an objective, relying on production efficiencies to address the marketer's profit responsibilities to its owners. In the parlance of Rust, Zeithaml, and Lemon's (2002) framework, it focuses on developing value and relationship equity.

From a marketing performance perspective, the major

thing that separates the two strategies is the emphasis that relationship marketers put on the financial value of overall *customer equity* versus short-term profit performance. American managers have been criticized for their short-term focus (Narayanan, 1985; Von Thadden, 1995; Rust, Lemon & Zeithaml, 2004). Given the fact that both product differentiation and relationship marketing strategies are designed to return profits to their owners (stockholders), a logical way to compare their performance is to add increases in customer value (CE_i) to the profit reported in the simulation. This involves a simple addition of CE_i to the profit reported in Gold's (2005) standard model. This has been addressed in the work of Cannon, Cannon, and Schwaiger (2010) and need not be repeated here.

SUMMARY AND CONCLUSIONS

While the number of new publications addressing relationship marketing appears to have diminished in recent years, the importance of relationships as an essential part of the customer-marketer interface has increased dramatically as theorists and practitioners have begun to explore new perspectives on marketing, such as service-dominant logic (Vargo & Lusch, 2004; 2008), a feature of which is establishing marketing partnerships with one's customers.. Partnering with customers has been a central them in this paper. A higher-level agenda relates to the role of simulations in general as a tool for preparing students to deal with issues such as service-dominant logic and partnering with customers. developing managerial insight and competence. Relationship marketing, and in the case of this paper, understanding the nature and role of transaction costs in developing marketing strategy, are important concepts in a marketing manager's tool box, so it behooves us to incorporate these principles into our simulation games.

As a final comment, we have followed the lead of Cannon, Cannon, and Schwaiger (2005) in using Gold's (2005) system-dynamic model as a base upon which to build our own work. A recent paper by Goosen (2010) criticizes the Gold and Pray (1984) demand model incorporated into Gold's (2005) standard platform. If this suggests that the standard is constructed of a lesser metal, it does not detract from the role a standardized platform plays for our work and those of others who seek to move the discipline of designing simulation games forward with a minimum of duplicated efforts. So, for this we extend our voice of gratitude to Gold, Goosen, and the others who continue to work on the tools and concepts that will help facilitate future work in the field.

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