A MENTAL MODEL TO CAPTURE eCOMMERCE ATMOSPHERICS

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ABSTRACT

Retailers spend a great amount of effort and resources focusing their activities on attracting consumers, building relationships, and enticing people to make purchases. In the physical world, the importance of store environments to retailers' success is unsurpassed. The field of study that addresses the store environment and its impact is known as atmospherics.

Atmospherics within a physical store is expensive to manipulate. It is also literally impossible to match a store's environment to the taste of every consumer. This is not the case with e-tailing (selling over the Internet). Electronic store (eStore) environments influence shopping behavior through mediating emotional states. Factors such as Web site organization, product data, and search options have been found to influence shopping behavior. This paper argues that heuristic decision modeling for the online environmental elements needs to have greater attention. To that end, this paper explores how the ideas of retail atmospherics may be applied to eCommerce Web site designs and offers the Cyberspace Atmospherics Mental Model (CAMM) as a method to facilitate design decisions.

INTRODUCTION

Retailers spend a great deal of time, effort, and resources on attracting consumers, building relationships, and enticing people to make purchases (Babin & Dardin, 1996). Most retailers are not capable of flourishing on just a single sale. Retailers are always looking at anything that will improve the consumers' experience. In this regard, the store's layout (lighting, ambiance, and associated environments) has long been recognized as important tools in creating a shopping atmosphere. The field of study that addresses the store environment and its impact on retail sales is known as atmospherics. Kotler (1973-4, p. 50) defines atmospherics as "the conscious designing of space to create certain effects in buyers that enhance the purchase probabilities." Store atmosphere impacts emotional reactions, which in turn affects consumers' attitudes towards the store. Store atmospherics are sensory or environmental cues used to influence a consumer's evaluation of the retail surroundings to elicit a behavioral response (Hedrick, Oppewal, & Beverland, 2004). Atmospherics have been shown to have an effect on consumer

spending, enjoyment, engagement, amount of time they stay within the store, and the likelihood of returning" (Donovan & Rossiter, 1982).

Atmospherics in the physical store is very inflexible and expensive to manipulate. This is not true with e-tailing. The Internet permits businesses to present products in a way that are deemed interesting to individual viewers based on a set of stored individual user's preferences. These preferences can be stored on the user's machine (via cookies) or on the retailer's servers. The retailers can give the users authority to adjust their preference, or it can be done automatically, unknown to the user based on his/her behavior. Things that can be tracked and used to determine a user's profile include: what sites are visited, which terms are searched for, and what pages have been visited though intelligent techniques.

Analogous to brick-and-mortar retailing, in e-tailing, factors like Web site organization, server performance, product data, search options, and shopping carts have all been found to influence shopping behavior (Falk, Sockel, & Chen, 2003; Turban, Lee, King, & Chung, 1999). Atmospheric effects include increased "visit" time (Lacher & Mizerski, 1994; Yalch & Spangenberg, 1990), mood (Swinyard, 1993), and increased purchase intentions (Babin & Attaway, 2000; McGoldrick & Pieros, 1998). Bitner (1992) proposed that consumers view the store environment as a composite of three dimensions: ambience, space/function and signs, symbols and artifacts (Hedrick, 2004). Maintaining a consumer friendly shopping site is essential to the success of Internet retailers. Therefore, it is important to understand the variables that contribute to satisfaction among Internet consumers (McKinney, 2004).

Research has shown that a store's environmental attributes has an effect on its "stickiness"— the ability of the store to attract, entice, and encourage customers to purchase products initially as well as repeatedly (Sharma & Stafford, 2000; Fiore, Yah & Yoh, 2000). Korgaonkar and Wolin (1999) found that a correlation exits between the amount of time (quantity and frequency) a consumer visits a store and the consumer's exposure to the retailers' products, services, and messages. Korgaonkar et al. also found that the amount of time users spent online to be positively correlated to individuals' intention to shop online. Intentions are important. They are an indicators of a consumers' willingness to 1) stay in the store, 2) repurchase, 3) purchase more in the future, and 4) recommend the store to others (Baker et al., 2002; Hightower, Brady, & Baker, 2002; Macintosh & Lockshin, 1997. According to Sanchez (2001) "stickiness = relationships = loyalty = revenues."

The effect of a store's environmental attributes on visitors' behavior may be explained through the flow theory. "Flow" as defined in this theory is the holistic sensation that people feel when a person acts with total involvement; in other words, the point when everything comes together (Csikszentmihalyi, 1977, 1988). The characteristic of being in a "flow state" includes a high level of focus on the interaction, a loss of self-awareness, absorption in the immediate task, and intense interest in the activity (Chen, Wigand, & Nilan, 2000). The "flow state" is pleasurable and causes individuals to feel they are fully in control (Bennett, 2005, p. 135).

RELATED LITERATURE

The present state of research concerning store environments draws its underpinnings from environmental psychology; specifically; the Stimulus-Orgasmic-Response (S-O-R) framework (Eroglu, Machleit, & Davis, 2003). Donovan and Rossiter (1982) first empirically tested the S-O-R framework. According to this framework atmospheric elements are operationalized as

"stimuli," individual (or shoppers') emotional changes as "organism," and the resulting behaviors as the "response." This paradigm has been used to explain numerous environmental cues (e.g., color, lighting, music, and fragrance) and the related effects on buyers' internal states and responses. Eroglu, Machleit, and Davis (2001, 2003) "laid the conceptual foundations for the extension of the S-O-R paradigm to e-tailing. Their research provided empirical support for the effects of cyber atmospherics on shopper attitudes, satisfaction, and a variety of approach/avoidance behaviors" (Sautter, Hyman, & Luko_ius, 2004, p.14).

A variety of metrics have been used to try to capture the effect of atmospherics on consumers with the de facto standard being "P-A-D" - Pleasure, Arousal, and Dominance (Mehrabian and Russell, 1974). The P-A-D framework specifies individual reactions toward environmental stimuli on three dimensions. In the literature, these three dimensions are commonly used to represent the "organism" aspect of the S-O-R framework, with atmospheric stimuli used to measure various kinds of responses (e.g., satisfaction, reactions and actual behaviors). P-A-D "responses determine the desire to remain within or leave a setting and the willingness to spend money while there" (Bennett, 2005, p. 133).

The Pleasure aspect entails whether individuals perceive the environment as enjoyable or not enjoyable. The Arousal dimension assesses how much the environment stimulates the individual. Playing slow instrumental music, for example, may result in slower customer movement and might attribute to a decrease in arousal. The Dominance element relates to whether individuals feel dominant (in control) or submissive (under control) in the environment. Mehrabian and Russell (1974, p.19) indicate dominance is contextual and that "an individual's feeling of dominance in a situation is based on the extent to which he feels unrestricted or free to act in a variety of ways."

Empirical evidence shows that the pleasure and arousal dimensions are related to the consumer reactions toward environment stimuli in both retail and non-retail environments, but the effect of the dominance dimension is unclear (Russell, 1980; Yalch & Spangenberg, 2000). For example, Donovan and Rossiter found that shopping behaviors were related to the pleasure and arousal dimensions only, while, Yalch and Spangenberg found mixed results concerning the relationship of shopping time and the three dimensions. Consequently, the dominance is either considered a minor factor or is simply not measured (Russell, 1980).

Online store environments contain various stimuli that may influence a consumer's internal (or organism) state, which can then trigger the approach or avoidance response (Mehrabian & Russell, 1974). For example, store music, colors, odor (scent), lighting, and density of merchandize among various variables can all be varied to project specific images for the intended clientele. The major challenge is to determine exactly what materials are going to be shown, what they are going to be associated with, and how much of the Web page will they monopolize. A vast amount of information could be relevant to the user (consumers) but delivering superfluous information can impede consumers from making good decisions (Bettman, Johnson, & Payne, 1991). The sections below are designed to identify major categories of features that are most likely to affect online atmospherics. Although each of the sub-section below can be a separate article by itself, our goal here is to pinpoint the importance of these categories in relation to atmospherics.

User Interfaces

In virtual store environments, the user interface design is essentially the only thing linking the consumers to the retail store. The "interface" impacts the consumers' desire and willingness to shop as well as relates a sense of being in the store to the customers. The more comfortable and connected the customers feel the more willing they are to be involved. As such, the success of the store depends on the interface and the underlying design issues (Lohse & Spiller, 1998). This means that retailer needs to pay attention to "consumer desires and behavior" picking a target population to aim for will not guarantee success. It has become extremely important for the virtual retailer to collect customer (viewer) information in order to incorporate their needs, wishes, and preferences in the design and development phase of the virtual store environment (Vrechopoulos, et. al, 2000).

Satisfaction

Ho and Wu (1999) were among the first to empirically study e-satisfaction. They suggested several antecedents of customer satisfaction in the online shopping environment: including logistical support, technological characteristics, information characteristics, homepage presentation, and product characteristics. Szymanski and Hise's (2000) study of e-satisfaction found that convenience, site design, and financial security were dominant factors in determining consumer satisfaction (McKinney, 2004).

The Senses

The use of environmental attributes available for Web designers are severely limited compared to the traditional physical store. Elements that include a sense of smell, taste, and touch are not yet commercially viable. Typically, the online environmental attributes that can be manipulated are sight and sound. Most atmospheric elements that are second nature in a traditional physical environment cannot be used on the web. While three-dimensional objects can be simulated, this often means trading resources such as (download) time or screen "real estate." Another technique that seems to work well in the physical environment – product density (how close together items are located) does not necessarily translate well onto the web.

Personalization

Personalization, or the ability to give individualized attention, is often cited as an important driver of satisfaction in traditional service settings (Bitner, Booms, & Tetreault, 1990; Brown & Swartz, 1989). Suprenant and Solomon (1987) offer complex definitions of personalization that "refer to any behaviors occurring in the interaction intended to contribute to the individuation of the customer"(p. 87). Studies on personalization have focused on customization of Web site content and shopper communications (Coner, 2003).

Customers want to feel special; they do not want to be just a name or a number. They want personalization in their business interactions. In this regards, the success of new marketing campaigns, sales promotions, and customer support initiatives must focus on the customer rather than the product. In the long run, success hinges on an organization understanding its customers (Firstlogic, p.1). "Technology enabled," customers can easily be offered "full-capability" in the creation of a shopping environment based on their own preferences and wishes (Vrechopoulos et al., 2000). E-Customers have very low costs associated with a website, simply enter a new URL

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address, and they are on a competitor's Web site (Turban, 2006). Given these disadvantages and the current competitive realities, the store (and Web site) environments clearly play a significant role in the differentiation of individual retailers.

Mandated Features

Certain features have become mandates within the cyber environment, such as the following:

(1) *Signage:* Physical stores need to be concerned with things such as: restaurants, restrooms, elevators, product location, exits, etc. Signage for these features is very important. In the virtual store it could be argued that symbols are more important than that of the physical store, because shoppers do not have physical cues or access to store clerks or for help. Signage has been expanded in a virtual store to promote navigation, to enhance site credibility, and sponsor integrity/reputation. Additionally, graphic brand marks from certification and rating services; such as eTrust, Verisign and BizRate, are used to indicate their stamp of approval on certified sites. Credibility can also be derived from design elements such as affiliate linkages (Putcha, 2001).

(2) *Ambient conditions:* These are the "background conditions that exist below the level of immediate awareness" (Aubert-Gamet, 1997, p.29). They typically are a focus of research on reactions to sensory cues in physical stores. In this vein, studies of ambient conditions focus on visual cues (e.g., lighting and color), auditory cues (e.g., music and noise), olfactory cues (e.g., scents), and tactual cues (e.g., temperature) (Griffitt, 1970). For virtual settings, the range of ambient conditions is limited to visual and auditory stimuli because of current technology constraints. However, auditory stimuli in e-tailing because of bandwidth concerns should be cautioned. See a more elaborated discussion on music and time below.

(3) *Cyber-interactivity:* This is becoming a strategic tool to improve the quality of Web sites for attracting users and keeping them engaged at a site. Sautter, (2004, p. 16) presents interactivity as a design characteristic of virtual store environments. Interactivity is seldom considered a one-dimensional construct. One popular conceptualization is to view it in the following five dimensions proposed by Ha and James (1998): playfulness, connectedness, reciprocal communication, choice, and information collection. Chen and Yen (2004) reported in their empirical study that the playfulness, connectedness, and reciprocal communication dimensions (in increasing order of significance) were related to the quality of commercial websites.

(4) *Usability*: In the online context, ease of use has also been a primary component of usability (Swaminathan et al., 1999) or efficiency (Zeithaml et al., 2000). Usability for cyberspace concerns not only the usefulness of certain offerings (i.e., Web site content), but also the user interface that delivers such offerings. Shoppers want sites that are valuable and easy to use. Features that aid the users can help retain visitors' interests. Although interface usability is crucial for an e-tailing site to foster a pleasant online experience, caution should be exercised when overly relying on it as the sole factor to boost online sales. Since interface usability can be easily imitated, its long-term competitive edge is less salient compared to factors, such as customer confidence in the Web business and relationship services (Kotha, Rajgopal, & Venkatachalam, 2004).

(5) *Navigation*: "In e-tailing, factors like Web site organization, server performance, product data, search options, and shopping carts all contribute to a positive Web shopping experience.

Easy navigation on a Web site for a consumer who wishes to buy through the net is a major facilitating factor." (Sivakumar, 2003). Similar to usability, navigation is a basic requirement for a functional and well-designed e-tailing site. To some (e.g., Elliott and Speck, 2005), it is part of the usability construct that fosters ease of use and gives e-retailers a strategic tool to lower consumers' search cost. Despite the crucial role of navigation in the quality of e-tailing sites, research has been inconclusive on its effect on sales. Ranganathan and Grandon (2002) reported that navigation structure had no significant impact on online sales, but others (such as Swaminathan, Lepkowska-White & Rao, 2003) have supported such a relationship.

(6) *Searchability:* Friendly search options add to the convenience of the consumer. The search feature is used in two ways: 1) finding the site through major search engines, and 2) locating information within a site. The design of the site and how many resources are invested in the site does not matter if users cannot find the site. High placement of a site within a search engine results can be critical to the success of the organization, since most users do not have the patience to go beyond the first several pages of the search results. Chen and Sockel (2001) reported that high placement on major search engines may be influenced by playfulness and reciprocal communication features on Web sites. These features increase link referrals (backward links), which is one factor that carries weight in the placement results of modern search engines, such as Google and Lycos. The other aspect of "searchability" is functionality within a Web site. This capability is considered equally important, because if products cannot be located on a Web site, customers will go to another site.

(7) *Trust*: Early electronic commerce research (e.g., Neuman, 1996; Strader & Shaw, 1997; and Shaw, Gardner & Thomas, 1997) documented that security is a major concern for most users who attempt online shopping. Online buyers are likely to lose faith in Internet security when they do not have an opportunity to examine the products, the transaction processes, and the credibility of the sellers (Chen, 1999). Trust in Internet commerce as a whole (George, 2002) and trust in target vendors (Elliott & Speck, 2005) have both been confirmed as related to a consumer's attitude toward online purchases.

(8) *Response time:* system response time is inversely related to computer user satisfaction (i.e., the longer the wait, the greater the dissatisfaction). Industry standard suggests that a Web site should load completely within 8 seconds (Falk, 2000).

(9) *Time, Music and Shopping*: Time is an important factor in retail shopping, partially because studies have shown a significant correlation between time spent shopping and the amount purchased (Isen, 1989). Also, time is argued to be as much a constraint on consumption as money. Consequently, it is reasonable to expect individuals to budget their time, including shopping times. In the end, it boils down to "People simply don't enjoy waiting."

Music in the brick-and-motor stores is often manipulated as an environment stimulus to affect shopping time and product evaluation. The nature of music - foreground music or background music has a differential effect based on the age of the shoppers. Music also affects actual shopping times. Individuals tend to stay longer when listening to slow music compared to no music or fast music (Milliman, 1982). The loudness of the music and song length may also make a difference. Yalch and Spangenberg (2000) reported found a relationship between store music and time spent in the store; individuals might shop longer when listening to less familiar music. Music, however, did not have an effect on product evaluation when duration of shopping was not controlled. When subjects were listening to familiar music but were constrained by a fixed

amount of time to shop, they were more likely to evaluate products. In a similar line of research, Sullivan (2002) reported that spending in a restaurant was not related to tempo and popularity of the music, but it was positively related to softer music. The amount of time and money spent in supermarkets were related to shoppers' degree of preference in the background music, but tempo and volume of the music did not have such an effect (Duncan, 1996). Based on the above studies, the collective effect of music on user behaviors may be mixed. Perhaps individual characteristics of music (such as liking of music, volume, and genre), rather than music in a collective way, may have a more salient effect on certain user behaviors. This effect may not necessarily be in the form of immediate sales, but may be linked to a better user experience, such as satisfaction or product exploration.

In the online e-tailing environment, background music may have a very different effect on user behavior. First, background music increases bandwidth consumption. This will slow page loads and can hampers user experience, especially on low-end Internet connections (e.g., dial-up connections). Second, background music exposes a shopper's online activity to his current environment, which could possibly cause embarrassment or distractions for others within the same environment. Unlike shoppers in physical stores, online shoppers visit e-tailing sites at their convenience. Third, some music characteristics are outside of the e-retailers' control. For example, the volume of music is typically in the hands of online shoppers and the music quality could be affected or even distorted depending on the quality of speakers on the shopper's end. Fourth, empirical findings (e.g., Abdinnour-Helm et al., 2005) suggest that background music on e-tailing sites is considered annoying and could result in low user satisfaction and lower ease of use perception. For the above reasons, e-retailers are recommended not to use background music, unless it is the target of interest for consumers.

CAMM - A CYBERSPACE ATMOSPHERICS MENTAL MODEL

Presented to this point in this paper, though not exhaustive, has been a list of items important to the development of the e-tailing environment. The forms of mandated cyber atmospherics for e-tailing and elements attracting the users (consumers) were detailed. In an attempt to both capture the e-tailing design elements and provide a usable tool for e-tailers, a cyberspace atmospherics mental model (CAMM) is proposed. Seel (2001, p. 408) characterizes mental models as cognitive artifacts – inventions of the mind that represent, organize and restructure the subject's domain-specific knowledge in such a way that even complex phenomena (observable or imagined) in the world become plausible. Greca and Moreira (2002) offer a working definition:

"A mental model is an internal representation which acts as a structural analogue of situations or processes. Its role is to account for the individual's reasoning when s/he tries to understand discourse, tries to explain the discourse, or tries to predict the physical world behavior."

As a mental model CAMM is constructed around four well-recognized marketing ideas:

1. The targeted Web site consumers (as identified by demographic characteristics)
2. The consumer's value set
3. The design (or atmospheric) elements of the Web site
4. Mass customization – personalization & culturalization

Note: CAMM is meant to dynamically create a Web site to match a specific user's profile. In this regard, it should be thought of more like a "Portal" as oppose to a static Web page.

CAMM and Demographic Characteristics of the Targeted Consumers

While a horde of constraints exist for e-tailing, internet based online sites have a power that most physical environments do not, that is, they can tailor the presentation to a particular user. This ability to customize the Web site concurrently for different consumers via all the various elements discussed such as: the forms of cyber atmospherics, e-tailing atmospherics, and mandated features for cyber environments, (what will hereinafter be referred to as cyberspace atmospherics) enhances the organization's ability to attract and retain the users.

Classic marketing concepts indicate that an organization should try to satisfy the needs of its customers through a coordinated set of activities because it is the consumers' perception that counts. The customer's level of satisfaction is at the very core of the classic "marketing concept." These concepts are fully compatible and applicable to e-tailing and Web site design. Early adopters of e-tailing tried to replicate the "brick and mortar" methodologies into the cyber world. Major concerns were that most of the sites were rigid in nature and did not take advantage of the power of the Internet. In short, the cyberspace atmospherics elements need to give the targeted customer a pleasurable experience. Organizations that were unfamiliar with the new approach did not know how to adequately use the data that was generated. CAMM combats this issue by forcing the "e-tailing architect(s)" to consider the market's demographic characteristics before making cyberspace atmospherics decisions; CAMM uses the following Figure 1:
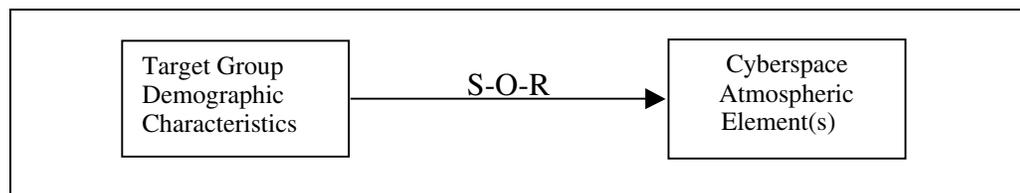
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+--------------------------------------------------------------+
|                                                              |
|   +----------------+                    +----------------+   |
|   | Target Group   |                    |  Cyberspace    |   |
|   | Demographic    |  S-O-R  ------->   |  Atmospheric   |   |
|   | Characteristics|                    |  Element(s)    |   |
|   +----------------+                    +----------------+   |
|                                                              |
+--------------------------------------------------------------+
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FIGURE 1. CLASSIC APPROACH

The classical approach (Figure 1) gives the impression that the market is homogeneous. This can lead architects to view the market monolithically in terms of segment demographic characteristics. This can cause one to mistakenly believe that nearly everyone in the target group experiences the Stimuli (S), such as pictures, navigation, background colors, or music, in the same way and therefore have the same orgasmic (O) pleasure, arousal, and dominance reactions; producing similar approach or avoidance responses (R).

Marketing generally builds upon some form of segmentation to establish target markets. Lazer and Wyckham (1969) indicate that one general method of direct interest to retail management is to separate consumers into groups—those that are based upon "demographic characteristics such as age, sex and life cycle stage; and those that distinguish market segments on the basis of consumer perception, perception of self, perception of products, perception of values, and perception of stores." To capture the fact that demographic characteristics possess personality and other psychological-social factors that in turn have an influence on attention to, comprehension of, and emotional reaction to the cyberspace atmospheric elements, CAMM incorporates values into its operational process. While consensus is yet to be reached in terms of how to measure values, there appears to be a generally accepted definition of "values." Howard and Woodside (1984, p. 4) defined values in two parts enduring beliefs that

1) a specific mode of conduct is personally or socially preferable and
2) a specific end-stage of existence is personally or socially preferable.

In the same study, Howard and Woodside examined the different roles that values play in terms of extensive problem solving, limited problem solving, and routine response behavior and found that "values affect a buyer's recognition of a problem. Values are the broad functions common to all personalities. A value is either consciously or unconsciously a standard or criterion for guiding behavior," (p. 4). They concluded that, "different consumers form different choice criteria according to their value systems" (p. 5).

Similarly, Pitts and Woodside (1984) found that the consumers' values held promise as useful market segmentation variables. Specifically in the context of retailing, a few research projects (Allen, 2001; Erdem et al., 1999; Kim et al., 2002; Shim & Eastlick, 1998) have examined the relationship between values and attitudes and behaviors pertaining to consumers' choices of product classes, brands, store outlets, and shopping malls. Figure 2 depicts how CAMM values may be viewed as mediated by both the consumer and retail issues.

To avoid semantic issues CAMM uses the classic organizational behavior acronym "VANE" (Values, Attitudes, Needs and Expectation) to distinguish "psychological values" from scalars, indexes, and derived values. There is no fixed set of "VANE" (characteristic values); CAMM permits the architect to determine what characteristics are considered important. CAMM uses a scale with extremes from Low Applicability (LA) to Highly Applicable (HA). CAMM does not set any rules for defining the meaning of a value or how the architect determines the applicability of a value to the market. While CAMM does not depend on a particular set of VANE items, a set of 69 items is suggested (see Table 1). These values are compiled from Rokeach's (1973) terminal and instrumental personal values and Hawkins, Best, and Coney's (2001) self-oriented, environmental-oriented, and other-oriented values. CAMM provides the designer with an ordinal continuum to select values that may be deemed to best represent the market.

TABLE 1. ATMOSPHERIC MATRIX 69 VALUES

Comfortable life	Exciting life	World of peace	Equality
World of beauty	Family security	Freedom	Happiness
Inner harmony	Mature love	National security	Pleasure
Salvation	Self-respect	Wisdom	True friendship
Social recognition	Ambitious	Broad-minded	Capable
Cheerful	Clean	Courageous	Forgiving
Helpful	Honest	Imaginative	Independent
Logical	Loving	Obedient	Fatalistic
Polite	Responsible	Self-control	Individual
Collective	Adult	Romantic	Child
Masculine	Feminine	Competitive	Cooperative
Youth	Hero worship	Work to live	Performance
Status	Tradition	Change	Risk taking
Safety	Problem solving	Nature loving	Active
Passive	Materialistic	Leisure	Hard work
Technology	Information	Abstinence	Humor
Serious	Immediate gratification	Sensual gratification	Sense of accomplishment

Note: The sixty-nine values were compiled from various literature on values (e.g., Rokeach, 1973; Hawkins, Best, and Coney's, (2001) list of other-oriented, environment-oriented, and self-oriented values).

Figure 2 demonstrates how the consumer and retailer appraise the VANE ("value set") using a semantic differential scale. In this particular instance, 1 means the construct has Low Applicability (LA) and 7 means Highly Applicable (HA). An elegant aspect of this approach is that both the retailer and the target market have a set of characteristics accompanied by a particular VANE that will operate in assessing cyberspace atmospheric elements. Research relating demographics and values support this scheme. As an example, a study by Crosby, Gill, and Lee confirmed earlier findings that, "there are age group differences in values," (1984, p. 209). They concluded that, "cohort-historical, maturational, or some other age-related influence on values is present," (1984, p. 214).
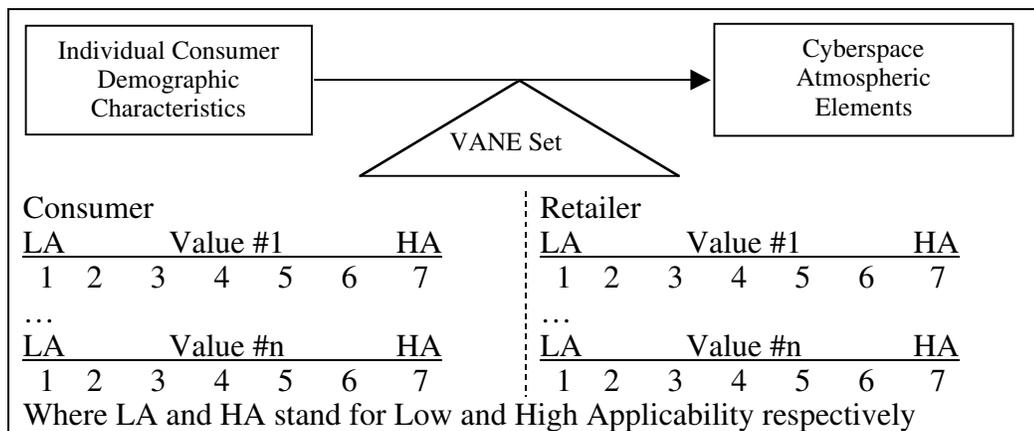
Individual Consumer Demographic Characteristics	→ VANE Set	Cyberspace Atmospheric Elements

Consumer
LA   Value #1   HA
 1   2   3   4   5   6   7
…
LA   Value #n   HA
 1   2   3   4   5   6   7

Retailer
LA   Value #1   HA
 1   2   3   4   5   6   7
…
LA   Value #n   HA
 1   2   3   4   5   6   7

Where LA and HA stand for Low and High Applicability respectively

FIGURE 2. APPROACH MEDIATED BY THE VALUE SET

Because CAMM is implemented programmatically, "target groups" can be as small as one person, this would be very work intensive and problematic if the architect had to manually enter, validate, maintain, and monitor all activity for what could be hundreds, thousands or millions of customers. Instead, the person(s) (known as the "e-tailing architect(s) or just architect") responsible for management of CAMM are defining the processes that will be implemented within CAMM's Life Cycle. The architect is responsible for directing the Web site designers and developers; coordinating implementation and execution issues, evaluation of the systems, and the establishment of "default profiles."

The architect establishes two sets of values. The first set of values represents an organizational weight for each of the VANE atmospheric elements. This weight is meant to represent how important the organization views this specific element. The second set of values represents a default profile specification for consumers until they established their own "VANE" profile. When the user requests a Web page, the system automatically checks to see whether an internal profile setting exits for this site. If one does, the server uses the profile. If one does not, then the server uses a default profile and creates an initial user profile. The default profile values are not critical, as part of normal operations, CAMM adjusts the values for each specific user, based on the specific user's behavior. Thus, over time the default profile will eventually converge towards the user's values that operate during the interface. This approach of mapping personal profiles with CAMM based preference value set can be referred to as "active preference matching," in

which user personal preferences and atmospheric preferences are not only stored, but also updated based on two main sources: user's willful setting of the preferences, and "learned" user preferences from active capturing of user online behavior. Therefore, the stored user preferences are not static values. They change as the user continues to navigate/use the Web site.

Our approach of "active preference matching" through the CAMM model employs both the induction and deduction processes, as opposed to the many popular data mining techniques which primarily reply on an induction technique (e.g., market basket analysis). Our induction process allows the Web architect to pull out the data set of user profiles and preferences. Through this wealth of data values, patterns of initial user preferences could be formed or "mined." This initial set of user preferences may be used for new users to start their journey on the Web site, or for existing users who wish to "reset" their own preferences with the site. The deduction process begins during the user's visit on the site where their navigation patterns are analyzed and deduced. Potential benefits (in the form of ads, promotions, and other offerings/content) may be presented along with the intended content.

Consumer Value's Reaction to a Cyberspace Atmospheric Decision

CAMM argues that the consumer's VANE is instrumental in causing the consumer to respond in a favorable or unfavorable way to the cyberspace atmospheric elements. This is in line with value-attitude-behavior hierarchy which proposes that within any given consumption choice situation, abstract values affect midrange attitudes that lead to specific consumer behaviors (Homer & Kahle, 1988). Relating marketing decisions to values is also in line with Reynolds and Gutman's (1984) means-ends chain research: "...a means-ends chain is a model that seeks to explain how products or services are linked to ends, which are a person's values," (p. 156). Furthermore, the means-end chain, "offers a view of how values guide behavior by formulating a model of how values, which are very general in nature, relate to consumer choice, which is very specific" (p. 156).

In the physical environment, because of the low volume of consumers (comparably to the Internet) and the limited nature of the inquiry, manual monitoring and tweaking the store's atmospherics might not be possible. The cost of adjustment in the physical world could limit how often and to what degree the layouts, walls, and stock may be manipulated. On the Internet, intelligent application of artificial intelligence (AI) software allows for mass customization with each user receiving a layout that can match his/her own preference. The intricacies of AI allow for large numbers of users to have their preference determined and saved in knowledge nuggets. These nuggets are used as part of a "gate-keeping" activity that either directs a user to pre-existing pages or dynamically creates Web pages that are in tune with the user's cognitive behavior. CAMM explicitly acknowledges that atmospheric decisions are not independent of each other. However, some tool needs to exist to determine the type of customer the organization is dealing with and to aid in the application of traditional CRM (Customer Relationship Management) tools. The construct of perceived value and goodness of fit is introduced below.

Perceived Value

From the above, Equation 1 is developed. Equation 1 is the CAMM decision tool that facilitates the architect in determining final cyberspace atmospheric elements(s) to be employed. The perceived value gives the architect a tool to analyze and monitor CAMM's performance. In this

regard, CAMM can be used not only to dynamically create Web pages, but also to evaluate a static site to get better response.

$$PV[a] = \sum_{i=1}^{n} OW[i] * IS[i]$$

PV = a specific consumer's overall perceived value towards the specific set of cyberspace atmospheric elements

a = represents the ath consumer

i = represents the ith atmospheric element

IS[i] = Individual Satisfaction factor of the ith atmospheric element

OW[i] = The Organizational Weight or importance of the ith atmospheric element

n = Number of atmospheric elements important to the decision process

EQUATION 1. PERCEIVED VALUE FORMULA

Equation 1 states that the overall perceived value held by a specific user for a specific set of atmospheric elements is the algebraic sum of two components multiplied together: the Weight (importance) the organization puts on an attribute, and the Satisfaction (also importance) level that the viewer places on the same atmospheric element.

An Example

To aid in the understanding of CAMM Perceived Values, an example is provided. For convenience only, the first seven characteristic elements from the 69 values are illustrated. The values are listed in Table 2 and repeated in Table 3. Two sets of values are determined by the Architect: 1) the weight—representing the importance the organization puts on the characteristic item, and 2) a default user profile (for new users). Eventually, the user's preference values can be ascertained by asking the consumer directly in exchange for some promotion or by watching his/her behavior.

Based on the scale given, the minimum preference value is 1 and the maximum is 7. Given the total number of atmospheric elements selected (n) there will be an upper limit of n * 7 and a lower limit n * 1 between which the perceived value (PV) will fall. Table 2 shows an example of how organizational weights and individual satisfaction values are assigned to each atmospheric element.

TABLE 2. AN EXAMPLE – ATMOSPHERIC MATRIX ELEMENT

Matrix item	Org. weight	Individual Satisfaction Values	Implied Meaning	
Comfortable life	6	6	HA	Important
World of beauty	3	5	HA	Somewhat important
Inner harmony	5	4	A	Neutral
Salvation	1	3	A	Somewhat unimportant
Social recognition	5	2	LA	Not important
Cheerful	3	1	LA	Of no value
Helpful	7	7	HA	Very important

The individual's perceived value (PV) matrix items scores are calculated by multiplying the Organizational Weight by the Individual Satisfaction (profile) value. This will yield a value between 1 (an organizational weight of 1 multiplied by a satisfaction value of 1) and 49 (an organizational weight of 7 multiplied by a satisfaction value of 7). The results for all multiplications are summed to give the overall perceived value (PV) for a specific consumer.

TABLE 3. EXAMPLE – MAXIMUM PERCEIVED VALUE

Matrix item	Org. weight	Individual Satisfaction Values	Org weight * Max Value	OW *IS (PV)	% of max (7*7 =49)		$OW_i - IS_i$ ABS Val
1. Comfortable life	6	6	42 = 6 * 7	36	36 / 49	73%	0
2. World of beauty	3	5	21 = 3 * 7	15	21 / 49	43%	2
3. Inner harmony	5	4	35 = 5 * 7	20	20 / 49	41%	1
4. Salvation	1	3	7 = 1 * 7	3	3 / 49	6%	2
5. Social Recognition	5	2	35 = 5 * 7	10	10 / 49	20%	3
6. Cheerful	3	1	21 = 3 * 7	3	3 / 49	6%	2
7. Helpful	7	7	49 = 7 * 7	49	49 / 49	100%	0
			MPV = 210	PV =136	136 / 343	39%	
(MPV - PV) /MPV			210 - 136 Ë 74 / 210 or 35%				

From the organizational perspective, the organization weight value is multiplied by the maximum possible score (seven); see column 4 in Table 3. These individual matrix products are summed to form the Maximum Perceived Value (MPV). The MPV in our case is 210. The Total individual PV is calculated in a similar fashion (in this case 136) and subtracted from the MVP. The difference (in this case 74) is divided by the MPV to determine a percentage of acceptance or rejection. The problem with this approach is that the individual contribution of each item is diluted. A single indicator does not offer an architect insight on how and where to improve the ecommerce site. Therefore, the value needs to be refined. An individual item value can be calculated by subtracting the individual's satisfaction level (IS) of the item from its Organizational weight (OW). The last column in Table 3 shows such values in absolute terms. The items that have the lowest absolute difference or a value of zero indicate that the organization and the user both agree on the value of the item. The items with the highest absolute value of six indicate maximum disagreement between the organization and the user.

The General Decision Rule

The use of the CAMM model suggests that a general decision rule should be adhered to. The authors recommend that any cyberspace atmospheric element(s) that has at least 75% agreement between the organization and the individual should be accepted for modification. Any element that has below a 75% agreement should be left alone (rejected). Obviously, the 75% is arbitrary and can be adjusted according to a company's wishes or needs. An added value of this model is that with use the architect can now easily see that some items actually have negative impact. Elements that produce negative dispositions should be carefully examined, as they represent the perception differences between the organization and its users. It is important to remember that the actual calculations are being done in real time and individual PV's are hidden from the view

of individual users. Because this is an online operation, calculations for a highly successful site could be done at a rate of dozens, if not hundreds of times within a minute. The calculations only become visible when the architect is monitoring the gate-keeping functionality of CAMM.

DISCUSSION

Online merchants are anxious to improve the return of their Web site investments. Therefore, they need to learn their visitors' actions as they occur. Each year, an organization may make hundreds of marketing decisions based on cyberspace atmospherics. The outcome of these decisions most often flows directly to the bottom line. One example is when a consumer is mistakenly directed to a site. In the industry, this is referred to as bounce. The term "bounce" is what happens when the site is attracting the wrong audience or failing to deliver to the consumer items/information s/he is looking for. Bounce happens when a visitor comes to the site and then leaves without looking at any other pages. Perhaps worse for the retailer is when the consumer goes through the effort to select a product and abandons it in the shopping cart (Ruber, 2003). If the users do not feel welcome or involved in the site, they will leave. Rarely, will they explain why. According to Jupiter Research, 66% of consumers reported having abandoned a purchase while on a website. E-tailers must take a proactive role to protect their investment. In a study reported by Computer World (2006), Jupiter Research indicated that over 70% of retailers do not analyze their data.

CAMM was introduced to facilitate holistic assessment and to be used as a decision making tool concerning cyberspace atmospheric elements within Web site designs. CAMM employs a discovery approach when contemplating the processes and elements in Web site design. Users of Web sites do not experience each separate atmospheric element in isolation, but as part of the whole experience. However, the literature indicates decision-makers tend to consider one atmospheric element in isolation of other elements; even though consumers respond to the interrelationships between and among atmospheric elements (an interrelationship that has synergistic dimensions).

CAMM affords the Web site architect the opportunity to make cyberspace atmospheric decisions within the context of the sensory (seeing and hearing the elements), cognitive (the gate-keeping activity of the each value relative to the element(s)), and affective (overall feelings towards the element(s)) components of the consumer. The results from the CAMM model are often for the entire webpage or even the whole Web site not just the individual elements that compose the combination. Therefore, CAMM could be used to explore various interactions between and among selected cyberspace atmospheric elements.

The operational aspect provided by the CAMM allows the organization greater insight into how values can be used to select specific cyberspace atmospheric elements. Using the overall scheme of the CAMM model should allow it to be employed as a worksheet for cyberspace atmospheric decisions.

Large corporations or small operations can use the CAMM. Although it has a simple mathematical construct (PV), a small operation can ignore measuring the values (using the 1 to 7 scale) and the degree of disposition a value feels towards an atmospheric element(s). CAMM is just as effective as a decision making tool when it encourages a small operation to intuitively determine the consumer's values and intuitively judges the reactions that the values may have towards the contemplated Web site design.

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