Beyond e-commerce retail consumer attitudes and behavioral intentions

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ABSTRACT

This study utilizes the underpinnings of the Theory of Reasoned Action (TORA) in the development of an Interactive Marketing Technologies (IMT) model. The model provides a framework for investigating and testing the existence of *a priori* relationships between retail consumers' expressed perceptions of their knowledge/experiences with (E_{IHS} and E_{PC}) and attitudes toward existing technologically-advanced marketing systems (A_{IHS} and A_{PC}) and the extent those manifest attitudes reflect their attitude toward Interactive Marketing Technologies (A_{IMT}). The study also investigates the possible causal relationship between $A_{(IMT)}$ and consumers acceptance and willingness to use IMT in their retail shopping/buying patterns. Although e-commerce is a facet of IMT, the definition used here includes all extant electronic avenues through which consumers may consummate exchanges. The IMT model's goodness-of-fit indicators and causal relationships' test results demonstrate that consumers' manifest perceptions of their knowledge/experience with and attitudes toward existing advanced marketing technological devises like In-Home Shopping (IHS) and personal computers (PCs) reflect their attitude toward new, innovative IMT, as defined in the study. The results also indicate that a significant segment of consumers will use the new technologies in their retail marketing exchange practices as they become available. Discussions are provided on the implications of the findings for retailers, channel structures and future research requirements.

Keywords: Marketing, e-commerce, future marketing, micro-marketing

INTRODUCTION

Many dynamic and revolutionary forces acting within business environments today involve the function and structure of distribution channels. Such issues as single sourcing (Webster 1992), strategic alliances (Bucklin and Sengupta 1993), and just-in-time inventory systems (Frazier, Speakman and O'Neal 1988) are a few of these forces continually redefining channels. As suggested by Guiltinan, "...the normative channel is the set of institutions that evolves in the long run under 'reasonably' competitive circumstances. Since technology and consumer buying patterns are always changing, the normative channel is always changing. Thus, evolution would appear to be a continuous process" (1974, p. 84). There are approximately 1,319,872,109 international internet users and annual usage growth has averaged 256.6% since 2000, (Miniwatts Marketing Group 2008, 2011). In this environment there is no question as to the importance of the internet to retail business. For instance, the travel industry, predicted that online travel sales would double in three years and they did from $38 billion in 2006 to $80 billion in 2007 (Elkin, 2008). In that industry, Elkin's (2008) prediction of revenues from online airline reservations of $32.8 billion in 2007 have been greatly exceeded in an industry where sales volume is expected to reach $700 billion in 2011 (First Research, Inc.) and approximately 87% of that will be conducted online (PhoCus Wright). Moreover, online volume is forecast to grow 20% by 2014. In this environment few scholars would disagree that the critical centrality of a company's website is readily apparent. Many research studies including Kettinger and Hackbarth (2004) strongly support the importance of companies' ability to "alter their activities to adjust to new ways of conducting business. These relatively new channel offerings are being developed under the auspices of integrated value. "Integrated values are not simple product values or competitive values; they are values that integrate into the complex values of a customer" (de Bono 1992, p. 111). Integrated values offered by a company take the consumer well beyond the status quo, and aid more than just survival. These values include the customer and those relationships surrounding that customer.

Certainly, technology has been a significant factor in moving toward integrated values in channels. It is predicted that information technology will increasingly and significantly impact marketing development, marketing activities in general, and the distribution 'function' in particular. "...the channel of distribution in the future will be focused less on product flows and the efficient logistical management of products and more on information management. The emerging 'retailers' are likely to be firms that manage--not simply products--but information, for both consumers and producers" (Blattberg, Glazer and Little 1994, p. 27). For instance, when Levi-Strauss electronically records and stores the size information for a particular customer and then can reproduce clothing for that customer as "lot size one" for rapid delivery to any one of its retail outlets, the impact of information technology is already taking place.

Those integrated technological systems that have been developed thus far, have aimed primarily at business-to-business markets. For example, technologies that allow for just-in-time inventory or single-sourcing have been directed solely to the industrial market. In contrast, although information technology for end-users has been in development for years and the need for understanding the retail consumer marketplace has been obvious (Beales, et al. 1981), few studies exist that investigate retail consumer information technologies (Widing and Talarzyk

1993).

Retail (consumer) marketing technologies are in the process of becoming a substantial factor in today's retailing business environment and will provide additional integrated value to the consumer. The technology that makes virtual communities possible has the potential to bring enormous leverages (i.e., intellectual leverage, social leverage, commercial leverage, and most important, political leverage) to ordinary citizens at relatively little cost. But the technology will not in itself fulfill that potential; this latest technical power must be used intelligently and deliberately by an informed population (Rheingold 1993). Certainly this is the case in Asia as illustrated by the study of Lim, Seng , and Lau (2010) describing the complexities of consumer behavior in the Malaysian e-commerce sphere.

On the basis of the above evidence and the relative importance of consumers' understanding Interactive Marketing Technologies (IMT) and its retailing opportunities, the purpose of our research focuses on investigating consumers' attitudes toward interactive marketing technologies and their behavioral intentions to use this technology within a retail environment. The study's proposed causal model incorporates the critical theoretical underpinnings of the Theory of Reasoned Action (TORA) as defined by Fishbein and Ajzen (1975). Little doubt can exist if consumers intend to use this new technology for retail marketing exchanges, the implications for retailers and other channel members will be substantial.

THE CONCEPT OF INTERACTIVE MARKETING TECHNOLOGIES (IMT)

Early efforts by George (1987) in defining IMT as a computer based videotext system wherein information is provided to the consumer in-home on demand where the user can control the flow of information, communicate with the information provider, and arrange payment and exchange terms for products and services is too limiting in light of recent advances in technology. Today, IMT can be more accurately defined as computer enhanced television based systems using color video wherein consumers in the process of conducting retail market exchanges interact on a real-time basis with sellers or their agents through computer assisted electronic media with the object of consummating exchanges. Real-time is an information systems term referring to whether what you are seeing is actually happening as you see it (real-time) or is being controlled or influenced (interactive) by the user as it happens.

An earlier version of IMT exists as videotext and its difficulties are well documented in the literature (e.g, Anderson and Ortinau 1988; George 1987; Pollock 1987; Slom 1986; Eastlick 1993) as well as in the popular press (e.g., *Wall Street Journal* 1986, 1993). However, the differences between IMT as defined in this research and videotext are considerable. Due to technical restrictions on data communication bandwidths, videotext information transmission was limited to approximately the speed of a competent typist. In the 1980s television was overwhelmingly broadcast and few cable systems had significantly penetrated the marketplace. In one study, Marketing News (May 1981) reported that only 10% of surveyed consumers were interested in television based interactive in-home shopping. Since 1981, the playing field has drastically changed both technically and sociologically (Miller 1994). Today, the impact of the manifold facets of e-commerce far exceeds those envisioned by the early pioneers. Even so, academia is bereft of studies investigating the far reaching impacts of rapidly advancing

information technology. Within the near future when each individual will be personally and continually connected to the future Allnet or net or Nenet or whatever it is called, the opportunities for individual micro marketing will be all pervasive.

Curiously, scholarly research into the extended capabilities of IMT is either non-existent or proprietary (Eastlick 1993). Yet, unlike academe the popular press (e.g., *Popular Mechanics, Wall Street Journal, Marketing News*) maintains an ongoing interest in IMT as one facet of the "information superhighway". For example, with such events as the Vice President of the United States Albert Gore hosting a two-hour informational program on the expected benefits from the superhighway (CBS, January, 1994) and media moguls such as Ted Turner of Turner Broadcasting publicly supporting IMT, the general public's awareness and attention has increased toward the potentials of IMT.

Technological advances in computer processing speeds, optical disc random access storage technology, high definition television (HDTV), and increased transmission speeds further allow millions of retail consumers the capability to walk simultaneously through the phone book or the L.L. Bean catalog simply by using a television multi-function remote control less difficult to operate than a TV's remote. Other technological advancements such as DVDs are now within the economic and operational reach of most U.S. consumers. For example, it has been reported that by 1998 approximately 52% of all homes in America had a least one if not more DVDs (Walley 1998). Furthermore in sharp contrast to 1990, many of today's home computers and software programs are specifically designed for such tasks as in-home shopping, working, and home banking (Ram and Jung 1994). In a single four-year period from 1986 to 1990, users of personal computers experienced a 2000% increase in hardware performance-price ratios (processing speed vs. cost) and that rate of performance increase is continuing through 2010 (Dataquest 2011). Even dated in our fast paced world George,s (1987) suggestion that the primary benefits of IMT are efficiency, convenience, and time saving and that in order to succeed; IMT must be able to capitalize on these core benefits is more valid than ever. Clearly with current television and computer technology, IMT is capable of efficiencies in these critical areas far beyond those of early videotext systems (Achabal and McIntyre 1992).

Intriguingly, the sociological changes experienced in the United States over the past fifteen years may have even greater impact on the probability of IMT success than concurrent technical advances. If George (1987) is correct in his suggestions that convenience and time saving are important consumer benefits, then it follows that in a society where transportation is perceived by the consumer to be more difficult, dangerous, and expensive, the benefits of IMT will become even more valuable (Information Week January 31, 1994, pp. 24-25). While some researchers suggest that the inherent hedonic (or pleasurable) aspect of shopping may serve as a potentially significant factor in IMT intentions and may play a negative role in consumer acceptance of IMT (Babin, Dardin, and Griffin 1994). Others speculate that there are a growing number of shoppers who may prefer not to visit the supermarket after a day of work nor face constantly growing traffic problems if IMT might prove to be a more convenient alternative (Cox and Rich 1964; George 1987). Given that automobile transportation is becoming increasingly expensive, difficult, frustrating and that leisure time saving is of growing importance to many consumers, some researchers suggest it is highly probable that IMT will become even more attractive in the future (Eastlick 1993; George 1987; McNair and May 1978; Cox and Rich

1964). With the advent of social media the hedonic aspects of shopping may be decreasing. This small change may cause a remarkable change in consumer shopping patterns.

Although optimistic, McNair and May (1978) went so far as to initially predict that "by early in the 21st century almost all food and other basic household needs will be acquired through the use of in-home television computer systems" (p. 81). In light of the strong influence of consumers demand for convenience and the increasing premium on leisure time, some researchers submit that the emergence of the two-wage-earner household is becoming another major positive environmental factor toward IMT acceptance (Peterson 1992, Waterson 2011)). Without doubt the increasing participation of women in the work force reduces the time available for shopping and increases pressure to adopt in-home shopping (Peterson 1992). Along these lines, trends reported for the future of American business are, 1) increasing importance of time, 2) demand for convenience, 3) heightened telecommuting, and 4) the dramatic growth of home shopping (Peterson 1992). Similarly, negative changes have occurred in consumer's perceptions of personal safety when engaged in shopping behaviors (Powell 1994a). Reports of car-jackings, muggings, ATM customer robberies, and other violent crimes are on the rise and may be having substantial impacts on consumers' willingness to continue current shopping patterns (Information Week January 31, 1994, p. 25).

From a managerial perspective, essential customer feedback useful for management to design, monitor, correct, and improve the effectiveness of their overall market strategy would be far more easily available and much less expensive to collect using IMT. From those consumers who desire to participate, data on purchases, advertising, satisfaction and usage could easily be transmitted directly to the firms involved. It appears that a convincing case exists for the growing importance of IMT to marketing practitioners and scholars.

In the present study, Interactive Marketing Technologies (IMT) are formally defined as those computer aided television based systems using full-motion color video wherein consumers interact on demand and in real time with sellers or their agents through computer assisted electronic media to consummate retail market exchanges (Powell 1994). Given this specific conceptual definition of IMT, many of the findings of previous videotext research are no longer valid. The playing field has significantly changed due to evolving technological and sociological factors. Therefore, additional research using advanced methodologies is required to investigate emerging IMT and those results incorporated into developing channel structure strategies.

THEORETICAL FRAMEWORK AND MODEL DELINEATION

Based on the evidence presented, there is little doubt that IMT advances have the potential to significantly change existing retail channel structures. Moreover, there are growing interests and concerns among many retailers aimed at an enhanced understanding of how IMT advances will directly and indirectly impact current practices of creating successful retail market exchanges. Critical to the successful incorporation of IMT within retail structures will be retailer's ability to understand and gain insights regarding consumers' willingness to accept and incorporate (use) new IMT advances in their shopping habits and retail buying patterns. To investigate the latter issue, the following IMT model is proposed and its development was partially guided by the theoretical underpinnings of Fishbein and Ajzen's (1975) Theory of

Reasoned Action (TORA).

First presented by Fishbein (1967) and later developed more fully by Fishbein and Ajzen (1975), Ajzen and Fishbein (1980), and Ajzen (1988), TORA has been extensively researched and empirically supported in the social sciences (e.g., Kay 1993; Morwitz and Schmittlein 1992; Netemeyer and Bearden 1992). In essence, TORA proposes that the direct cause of a person's behavior is that person's behavioral intentions. Since intentions to behave in a particular manner are the result of careful thought concerning the implications and consequences of such action, then that action is reasoned (Penner 1986).

Also, emerging from TORA is the prediction that attitudes toward the object (A_o), attitudes toward the behavior (A_b), and subjective norms (SN) only affect behavior indirectly through intentions (Ajzen 1988). Support for this prediction is widespread in the literature of both marketing and psychology (Lutz 1991; Penner 1986). However, previous marketing research indicates that purchasing and usage behaviors tend to be largely under attitudinal rather than normative control (Lutz 1991; Pancer, George and Gebotys 1992). Another well supported suggestion is that behavioral intentions more accurately predict behavior than do attitudes toward the object (Davidson and Jaccard 1979). For instance, a person may have a strong, positive attitude toward a new home and yet have no intention to purchase that new home because of financial limitations. So, the attitude toward the object (home) would be favorable but the intention to purchase unfavorable. Accordingly, the behavioral intentions (to purchase or not) should be more predictive of actual behavior than the attitude toward the object itself. Intentions are defined as the consumers expressed willingness to engage in some specific future behavior (Fishbein and Ajzen 1975). Realistically, a consumer can engage in several alternative behaviors as a result of intentions including using IMT for none, some, or most purchases. Fishbein and Ajzen (1975) suggest that where the objective is behavioral prediction the most efficient approach to such prediction is to obtain an appropriate measure of intention.

Delineation of the Model

From a holistic modelling perspective, Attitude toward IHS (η_1) and Attitude toward PCs (η_2), are endogenous constructs formed by the influences of two exogenous constructs, Experience with IHS (ξ_1), and Experience with PCs (ξ_2). Attitude toward IMT (η_3) is then formed by the direct influence of both A_{IHS} and A_{PC}. Finally, the endogenous construct Behavioral Intentions (η_4) is formed by the direct influence of A_{IMT} and measured by three manifest indicators containing items relating to intentions to use, learn about, and recommend. These three types of behavioral intentions are measured on seven-point metrics ranging from "strongly agree" to "strongly disagree."

Experience/Knowledge and Attitudes toward Computers: Information systems scholars have an enduring interest in the attitudes of users concerning information technology innovations and have found that these attitudes strongly affect adoption (e.g., Robey and Farrow 1979; Bear, Richards, and Lancaster 1987; Moore and Benbasat 1991; Kay 1993). Fishbein and Ajzen (1975) described attitude "as a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object" (p. 6). Since attitudes are "learned" through direct experience, knowledge or information about the object, issue or behavior, then these

learned predispositions about objects similar to IMT might influence attitudes toward IMT. It is proposed that knowledge of or experiences with personal computers (E_{PC}) will be directly related to attitude toward personal computers (A_{PC}), it follows that attitudes toward computers might also be a strong indicator of A_{IMT}. Similarly, attitudes toward videotext or Prodigy might also be strong indicators of attitudes toward interactive marketing technologies. However, the link between knowledge or experience with PCs and the resulting attitude towards those PCs has been found to be somewhat ambiguous in past research (Gardner, Dukes and Discenza 1993). Yet, as attitude may be problematic without knowledge or experience (Ortinau 1980), it was necessary in this research to investigate that linkage. Since theory indicates that knowledge and experience with, and attitudes toward computers as a similar innovation should be a significant indicator of intentions to adopt IMT, then:

H_1: Retail consumers knowledge/experience with personal computers (E_{PC}) will be positively and directly related to their attitudes toward personal computers (A_{PC}).

H_2: Retail consumers attitudes toward personal computers (A_{PC}) will be positively and directly related to their attitudes toward interactive marketing technologies (A_{IMT}).

Experience/Knowledge and Attitude toward In-home Shopping: . Since several researchers (e.g., Fields and Greco 1988; Shim and Drake 1990) have found substantial positive correlations between in-home shopping behavior and videotext adoption, it follows that use and adoption of advanced IMT may also be highly correlated with these behaviors. In addition, Gatignon and Robertson (1985) suggest that experience and knowledge of related innovations, such as IHS and IMT, will be positively related to adoption rates.

H_3: Retail consumer's knowledge/experience with in-home shopping (E_{IHS}) will be positively and directly related to attitudes toward in-home shopping (A_{IHS}).

H_4: Retail consumer's attitudes toward in-home shopping (A_{IHS}) will be positively and directly related to their attitudes toward interactive marketing technologies (A_{IMT}).

Attitude toward IMT: Attitudes are not directly observable and Interactive Marketing Technologies, as defined in this study, are not completely available for retailers nor consumers to experience and integrate into the market exchange process. Attitude toward IMT (A_{IMT}) can be viewed as an endogenous latent construct that is derived, in part, from consumers' attitudes held toward related types of technologies and shopping experiences. Although not directly measurable, A_{IMT} can be indirectly assessed through measurable manifest indicators that are representative of a person's expressed perceptions and feelings about elements that represent the construct domain of IMT. Furthermore, attitude toward IMT (A_{IMT}) should be causal to behavioral intentions toward IMT (BI_{IMT}) as shown in Figure 1 (Fishbein and Ajzen 1975).

H_5: Retail consumers's attitudes toward Interactive Marketing Technologies will directly and positively influence their behavioral intentions concerning IMT.

Although these five specific hypothesized relationships were tested, an important objective of the research was to evaluate a holistic model of the effects of A_{PC} and A_{IHS} on attitudes and behavioral intentions regarding Interactive Marketing Technologies. Therefore the assessment of the fit of the overall IMT model is central to this research.

METHODOLOGY

Procedure

The research procedure used to collect the necessary data for investigating the proposed IMT model and testable hypotheses was a direct survey characterized as being descriptive in nature. The survey was administered to a final probability sample of 3048 adult males and females who were known to have varying degrees of retail shopping experience and understanding of personal computers. The response rate of 47% was followed up by individual telephone calls to 301 non-responders and found that those non-responders responses correlated 87% with the responders. A specific cover letter was attached to a carefully designed questionnaire to enhance the participation of the selected individuals as well as ensure the legitimacy of the study. The true purposes of the study were disguised in an effort to prevent extraneous biases from entering the study.

The data collection instrument was a detailed, self-administered questionnaire designed to allow the respondent to read, interpret and respond to each question without the presence of an interviewer, thus reducing the possibilities of interviewer bias. The questionnaire contained a section of questions and direct and indirect scales designed and tested to assess the respondents' opinions and behavioral habits toward assessing their knowledge or experience with (E_{IHS}) and attitudes toward (A_{IHS}) In-Home Shopping practices. Another section focused on questions and scales used to assess the respondents' knowledge or experience with (E_{PC}) and attitudes toward (A_{PC}) Personal Computers. In addition, the instrument contained a section of direct and indirect measures of the respondents' opinions and attitudes toward Interactive Marketing Technologies (A_{IMT}) as well as estimates of their Behavioral Intentions to use this type of advanced marketing technology (B_{IMT}). To assess the variability and sensitivity among the respondents' perceptions, attitudes and behavioral responses, the scale measurements were designed with either ordinal, interval or ratio scaling properties. The questionnaire also contained a classification section consisting of several standard demographic characteristics deemed important to the focus of this study. From a profile perspective, the respondents in this are: a mix of young (mean = 27.02 years) professionally established males (42.6%) and females (57.4%) who are fairly well-educated (mean=15.59 years) and have, on average, substantial income earning power (mean = $57,920) for supporting their retail shopping habits of goods and services.

Measurement of the Model's Components

To investigate the main contentions underlying the development of the *a priori* model of Interactive Marketing Technologies, the model's critical components were measured using both direct (global) and indirect (multiple-item) scales that were theoretically developed and tested in past reported research from the literature. Table 1 summarizes the constructs included in the

proposed IMT model as well as the variables, scales, and number of items used to measured each construct. Also included are the reported reliability coefficients estimates from both past reported research and the current study.

Experience/Knowledge with In-Home Shopping (E_{IHS}). Experience with IHS is measured with three scales. One adapted from Eastlick (1993) another from Gillette (1970). These scales consist of face valid questions designed to elicit accurate answers concerning the amount of experience consumers have had with IHS. For instance, one question simply asks how frequently the consumer has used IHS in the past year and another question asks how many years has the consumer used IHS. Similar to demographic questions, there is little reason to believe that respondents will be duplicitous in any anonymous survey. Gillett's questions include the type of IHS used (i.e., catalog, telephone, door-to-door). The third scale for E_{IHS} consists of three questions from Oliver and Bearden (1985) such as "I consider myself informed about in-home shopping."

Attitude toward In-Home Shopping (A_{IHS}). Manifest indicators or observed variables of Attitude towards IHS are the four item scale used by Eastlick (1993) for videotext adoption and an additional five item global type scale was tested and used in this study. Typical questions include, "I enjoy in-home shopping" and "Overall, my reaction to in-home shopping is very favorable."

Experience/Knowledge with Personal Computers (E_{PC}). Experience with PCs was measured in a similar fashion to E_{IHS} except that the scales developed by Pancer, George, and Gebotys (1992) and the Computer Background Questionnaire (Temple and Lips 1989) specifically for PCs were the manifest or measured variables. Typical questions from Pancer, George, and Gebotys (1992) include prior usage for games, word processing, calculations, and the length and frequency of use. A typical question from the CBQ used by Temple and Lips (1989) is "Do you consider yourself to be experienced with PCs?"

Attitude toward Personal Computers (A_{PC}). Attitudes towards PCs were measured in a fashion similar to A_{IHS} using a scale developed by Kay (1993) with alpha of 0.97. An item from the Kay's (1993) Computer Attitude Measure (CAM) is "Computers would save me time." The second five item scale used is from the Computer Attitude Scale used by Temple and Lips (1989) with reported reliability of 0.88. One question from this scale is "I think a home computer can be very interesting." A final scale of three items from Harrison and Rainer (1992), alpha = 0.89, with questions such as "I feel intimidated by personal computers" were also used.

Attitude toward IMT (A_{IMT}). Attitudes toward IMT were measured using two pretested scales based on work by Petroshius and Crocker (1989) and Eastlick (1993) for the measurement of attitudes as well as a scale developed specifically for A_{IMT} measurement. Specifically, a statement from Eastlick's (1993) questionnaire is "IMT would be a very useful way to shop." Similarly, "People like myself would probably not like IMT," from Petroshius and Crocker (1989) and "IMT could become very important to me," from the scale developed for this study are typical statements.

Behavioral Intentions concerning IMT (BI_{IMT}). Behavioral Intentions were measured using two scales. The first adopted from Pancer, George, and Gebotys (1992) includes four items with no alpha reported. One statement from this scale is "I would like to attend a talk about IMT." The second scale was developed for this study and contains four items concerning

intended use and frequency of intended use such as "I would use IMT if it were available."
Please see Table 1.

Determination of Construct Reliability and Validity: Each scale was subjected to common factor analysis testing unidimensionality and reliability using Cronbach's Alpha (Nunnally 1978). Scales were found to have acceptable unidimensionality and current alphas are similar to those found in past research (Table 1). Convergent and discriminant validity were assessed using techniques as recommended by Nunnally (1978). Evaluations of construct validity were undertaken and the constructs were established as being well defined by several observed variables, had observables that are representative of the domain of observables, and these constructs of interest prove to be strongly related to other constructs of interest (Nunnally 1978).

Each multi-item scale uses a seven-point Likert metric assumed in summated form to represent interval type scales (Nunnally 1978). Composite scores from these scales are used for model construct evaluation and this process provides two major benefits. First, scale reliability is increased and measurement error is decreased as individual item uniqueness averages out when composite scores are used (Churchill 1979). Second, multiple-item scales increase the probability of achieving multivariate normality as required by the maximum likelihood estimation process of LISREL (Jöreskog and Sörbom 1989; Sujan 1986). Due to model assessment requirements, analysis of multivariate-normality was performed and included checks for skewness and kurtosis and for multivariate kurtosis using the mardia coefficient (Mardia 1970) and PRELIS-2 (Jöreskog and Sörbom 1993b). As tests were found to be acceptable the resulting composite variables were prepared as a covariance matrix for estimating LISREL parameters of interest.

Determination of Overall Model Fit

In assessing the proposed IMT model, information provided by LISREL8 (Jöreskog and Sörbom 1993a), including global and specific goodness-of-fit indices and other recommended diagnostics (e.g., Jöreskog and Sörbom 1989; Bagozzi and Yi 1988; Anderson and Gerbing 1988) as well as indices produced by the FITMOD program (Browne and Cudeck 1992) were used to determine whether the hypothesized relationships among the model's constructs were supported or rejected as well as the appropriateness of the overall model. Specifically, goodness-of-fit (GFI), chi-square (χ^2), Rho (ρ), root mean square of error of approximation (RMSEA), expected cross validation index (ECVI), the normed-fit index (NFI) and the comparative fit index (CFI) were used to evaluate the model.

Since the asymptotic distribution of the fitting function multiplied by (N-1) is approximately distributed as χ^2 it is thereby possible to test whether the proposed model holds exactly in the population. Accordingly, a significant χ^2 indicates that the estimated covariance matrix is significantly different from the sample covariance matrix and the model should be rejected. Yet due to the sensitivity of χ^2 to sample size, most models with reasonably large sample sizes (above 200) will produce a significant χ^2 causing many models to be rejected. Therefore, additional fit measures were required and are presented in this study allowing more detailed examination.

In order to establish a base value to produce NFI, a non-substantive *null model* representing the hypothesis that the measured variables are not correlated in the population has been created as a reference point. As suggested by Bentler and Bonett (1980) in their extension of the work of Tucker and Lewis (1973), comparisons can then be made using Rho between the proposed model and the null model, then the null model and a theoretically correct model (Coovert, Penner and MacCallum 1990). For practical uses, Bentler and Bonett proposed that Rho should be equal to or greater than .90.

The root mean square error of approximation (RMSEA) is presented as a measure of the discrepancy per degree of freedom since it is quite sensitive to the inclusion of non-substantive parameters. RMSEA is bounded by 0 and 1 and values below 0.80 represents a very low error of approximation (Browne and Cudeck 1992).

RESULTS

Overall Fit of the Model

As indicated in TABLE 2, the *a priori* model demonstrates strong goodness-of-fit across the range of fit measures (Model X^2 = 154.21, p = 0.0019; NFI = .93; Rho = .97; GFI = .93; CFI = .98; RMSEA = .046; EVCI = 1.34 [Null Model ECVI = 11.0]) indicating that the model as presented represents a good approximation of the population covariances among the selected constructs and does allow for the inference of causality as shown in Table 1.

Assessment of the Hypothesized Causal Relationships

Although the model of the relationships between the latent constructs should be viewed in totality, it is possible to evaluate each of the hypotheses on the basis of the LISREL8 estimates of the path coefficients and their significance.

H_1: The hypothesized relationship that retail consumers' knowledge or experience with PCs will be directly and positively related to their attitudes toward PCs is not supported. The results demonstrate that the path coefficient is weak at γ_{22} = 0.08 and the path is non-significant at t-value of 0.67. The results do not provide any additional clarity to previous research findings regarding the ambiguous nature of the relationship between these two constructs (Gardner, Dukes, and Discenza 1993).

H_2: The hypothesized relationship that retail consumers' attitudes toward PCs will be positively and directly related to their attitudes toward IMT was supported with a path coefficient of B_{32} = 0.39 and t-value of 3.73.

H_3: Support was found for the hypothesized relationship that consumers' knowledge or experience with in-home shopping is directly and positively related to their attitude toward in-home shopping with analysis values for the path of γ_{11} = 0.19 and t-value of 4.71.

H_4: The hypothesized relationship wherein retail consumers' attitude toward in-home shopping was expected to be positively and directly related to their attitude toward IMT was supported with a path coefficient of B_{31} = 0.38 and t-value of 8.59.

H_5: The hypothesis that the behavioral intentions of retail consumer would be directly

and positively influenced by their attitudes toward IMT was supported with $B_{43} = 0.79$ and t-value of 7.19.

DISCUSSION

Overall, the proposed IMT model's goodness-of-fit indicators and the causal relationships' test results suggest that consumers' expressed manifest perceptions of their knowledge/ experiences with and attitudes toward existing advanced marketing technological devices do reflect their attitudes toward new Interactive Marketing Technologies. These results also indicate the strong likelihood that consumers will use those technologies as they become available. More specifically, the test results demonstrate that the attitudes that consumers manifest toward Personal Computers (A_{PC}) ($B_{32} = 0.39$, t-value = 3.73, p < 0.001) and In-Home Shopping (A_{IHS}) ($B_{31} = 0.38$, t-value = 8.59, p < 0.001) do have a significant positive and direct influence on their attitude formation toward IMT. In turn, the results support the model's framework that consumers' derived overall manifested attitude toward Interactive Marketing Technologies (A_{IMT}) ($B_{43} = 0.79$, t-value = 7.19, p < 0.001) will have a significant positive and direct influence on consumers' expressed intentions of their willingness to incorporate such technologies in their retail market exchange process(es).

In contrast, the results of the impact that consumers' knowledge/experience with both In-Home Shopping (E_{IHS}) and Personal Computers (E_{PC}) on manifesting their attitudes toward IHS and PC were unexpected and mixed. While the test results support the notion that consumers' knowledge/experience with In-Home Shopping (E_{IHS}) ($\gamma_{11} = 0.19$, t-value = 4.71, p < 0.001) has a significant positive and direct influence in the manifestation of formulating their A_{IHS}, the magnitude of the influence would be interpreted as being marginal. In turn, the results indicate that consumers' knowledge/experience with PCs (E_{PC}) ($\gamma_{22} = 0.08$, t-value = 0.67, p < 0.58) has an insignificant impact on formulating their attitudes toward PCs. Any attempt to explain the weak to non-supportive nature of the results would be speculative at this time. Although beyond the scope of this article, further analysis is needed to gain understanding of the mixed results. For example, further analysis should be conducted by taking E_{IHS} and E_{PC} measurements and creating categorical measures based on specific amount ranges of consumers' knowledge/experience with IHS and PCs, then using them as covariates subject the categorical variables to MANOVA to test if consumers' A_{IHS} and A_{PC} measures vary significantly across different amount levels of knowledge/experiences. Given the weak relationship results between E_{IHS} and A_{IHS} as well as between E_{PC} and A_{PC}, more research is needed that specifically investigates the impact of consumers' knowledge/experience with marketing technologies and the formulation of attitudes toward those technologies.

Nevertheless, the study's reported results suggest that serious and far reaching ramifications exist for the retail sector and its inclusive channels of distribution as a result of the apparent interest and intentions of the retail consumer concerning these new technologies. Within the ability of existing technology, an IMT network could be developed providing consumers increased direct access to manufacturers thereby eliminating many middlemen and retailers. Although this not to suggest that all retail establishments will be abolished, most certainly many functional relationships will change. No doubt, many customers primarily driven

by the hedonic aspects of shopping will continue to do so as will those whose needs cannot be satisfied without direct inspection, fitting, or personal service. Services such as personal grooming, live entertainment, auto repair, and medical visits are not likely to be strongly affected.

In particular, one very important aspect of the retailing landscape may change drastically. Should retail location become less important with IMT as customers choose to shop interactively then large central distribution centers serviced by fleets of relatively small delivery vehicles might become dominant players in the retail arena. The necessity for several local sites would lose importance and those retailers unable to provide a substantial perception in the minds of consumers that IMT is not suitable for their goods or services may face insurmountable odds. For example, such differentiation might prove difficult in the emerging era of IMT when 70% of orders included fresh vegetables and 52% fresh meats among recent users of a similar system in Britain (Pollock 1987).

Parallel to these changes in channel structures, changes in alliances, power, interdependence, conflict, cooperation, and other channel concepts are almost certainly to occur. The impact of such changes might well be most pervasive and will require careful study and consideration in what may well become a global interactive shopping mall. Specific future research issues include the identification of products and services most likely to be purchased using IMT, the effects on advertising in an IMT age, management of micro-delivery systems, and evaluations of the determinants of IMT consumer satisfaction.

Another important aspect is that this study provides some evidence that current users of in-home shopping regardless of their attitudes toward PCs are an obvious target market for IMT retailers. In addition, there appears to be a substantial link beyond correlation between those who have a positive attitude toward PCs and a positive view of IMT. Certainly the evidence supporting an inference of causality between attitudes toward IMT and behavioral intentions concerning IMT are strong. Although causality cannot be proven, indications are that the model as proposed cannot be rejected and that significant practical linkages exist between the selected constructs. One important implication that can be drawn is that retailers must begin to better understand the cognitive process(es) consumers use to formulate their attitudes toward IMT.

From a modeling and research perspective, the proposed model offers an initial framework and starting point for future research endeavors into building and investigating other linkages between attitude toward IMT and intentions of use. More specifically, more research is definitely needed to investigate other possible existing sets of attitudes, values, and constructs that might enhance the measurement and understanding of the A_{IMT} construct. There are certainly other factors that impact consumers integrative cognitive process(es) of formulating A_{IMT} other than knowledge/experiences with IHS and PCs.

In conclusion, the studies indicate that a large percentage (81.5%) of respondents expressed a strong interest in IMT usage. This suggests potentially rapid and widespread acceptance of this technology. In addition, 68.2% of respondents indicated that they would do most of their shopping using IMT. This would indicate that a significant and economically viable potential retail IMT market segment may already exist.

As there are very few studies that venture into consumers' behavioral intentions concerning emerging marketing technologies, this study may lead other researchers into this

important growing topic of inquiry. Finally, and perhaps most importantly, the ability of marketers to utilize very wide band communications and collect information at the micro consumer level will allow individual target marketing a single person even in public settings. Walk down a street anywhere in the world and have a hologram appear in front of you and perhaps walk for a while at your side, a hologram that speaks your language and knows what you prefer. Marketing power at an almost visceral level.

Study Limitations.

As with any research this study has limitations in several areas.   In addition, although the utmost care was used in the selection of reliable and valid scales, no perfect scales in the social sciences exist leaving room for error in measurement. The study limited its scope to investigate the influence of only consumer's experiences and attitudes toward IHS and PCs. There are more factors that most likely should be included in future models, such as: perceived complexity; perception of the innovation; and personal value structures. Finally, we asked consumers' about their attitudes toward something that does not yet fully exist and in final form may differ widely from our example.

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APPENDIX

Table 1

Constructs And Selected Scales

Construct	Variable	Source	Items	Current Alphas	Reported Alphas*
Experience with IHS	ξ_1 E_{IHS}	Eastlick (1993) Gillette (1970) Oliver & Bearden (1985)	3 2 3	.63 .63 .94	nr nr nr
Experience with PCs	ξ_2 E_{PC}	Temple & Lips (1989) Pancer, George,and Gebotys (1992)	3 4	.73 .69	nr nr
Attitude toward IHS	η_1 A_{IHS}	Eastlick (1993) Powell (1994)	4 4	.89 .80	nr --
Attitude toward PCs	η_2 A_{PC}	Kay (1992) Harrison & Rainer (1992) Temple & Lips (1989)	5 3 5	.90 .88 .86	.97 .84 .88
Attitude toward IMT	η_3 A_{IMT}	Eastlick (1993) Petroshius & Crocker (1989) Powell (1994)	5 4 5	.85 .93 .83	nr nr --
Behavioral Intentions	η_4 BI_{IMT}	Prancer, George & Gebotys (1992) Powell (1994)	4 4	.88 .89	nr --

* nr indicates alpha not reported

Table 2

Goodness-of-Fit Indices

Model	χ^2/df	p-value	RMSEA	ECVI	Rho	GFI	CFI	NFI
IMT	154.21/107	0.0019	0.046	1.34	0.97	0.93	0.98	0.93
Null	2273.27/153	--	--	11.1	--	--	--	--