

Virtual Reality Marketing: Optimizing Opportunities

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Virtual Reality Marketing: Optimizing Opportunities

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Session papers:

1. Consumers Journey Enhancement: The VR Impact

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2. Virtual Reality for Shopper Research in Dynamic Retail Contexts

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E.W. Kelley Professor of Business Administration, Indiana University, Kelley School of Business, United States

3. Examining the Purchase Conversion Effects of Virtual Product Testing on Mobile Apps: An Application of Augmented Reality in Online Retail

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4. Virtual Reality in Marketing: A Framework, Review and Research Agenda

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Declaration:

Each presenter has agreed to register for the conference and to present the paper, if the proposal is accepted; and none of the papers has been submitted to other conference tracks, and none have previously been presented at EMAC.

Abstract

The increasing number of VR applications changed significantly the landscape of marketing (communication) strategies. Consumers are no longer naive shoppers, but are offered experience via various VR/AR platforms, and thus possibility to explore brands/products in a new way. The goal of this session is to provide understanding on the brand-consumer relationship, and how to optimize the marketing opportunities when employing high tech VR/AR/XR platforms. The talks encompass variety of studies conducted across the globe (Singapore, Europe, US), employing different marketing tools, experimental designs, measurements and analytics.

First talk: *Consumers journey enhancement: The VR impact*, by Svetlana Bialkova, aims at providing better understanding on the parameters (virtual/real worlds features) that might augment VR experiences. Two studies are presented offering experiential consumer journey within various VR environments. Cognitive and affective consumer responses are addressed as potential indicators of the observed behaviour change. The outcomes are discussed in a framework of consumer journey enhancement.

Second talk: *Virtual Reality for Shopper Research in Dynamic Retail Contexts*, by Raymond Burke, presents several VR studies to test the dynamic impact of marketing changes on shopper behavior over time and across competitive scenarios. The research reveals that price promotions can produce an immediate and dramatic sales lift, while new product introductions and package changes have a more gradual, positive impact on sales. Repeated price promotions increase brand sales mainly during promotional periods. New product introductions can get lost in the competitive clutter unless they're accompanied by attention-getting merchandising and promotions.

Third talk: *Examining the Purchase Conversion Effects of Virtual Product Testing on Mobile Apps: An Application of Augmented Reality in Online Retail*, by Yong Chin Tan, Sandeep Chandukala, Srinivas Reddy, addresses the purchase conversion effects of virtual product testing. Data from an international cosmetics retailer introducing AR platform are obtained to understand under what conditions virtual product testing translates to in-app purchases. Results show that products that are less expensive, products with narrower appeal, and brands that are less popular benefit more from virtual product testing.

Forth talk: *A new methodological framework for Virtual reality in marketing*, by Mariano Alcañiz, Enrique Bigné, Jaime Guixeres suggests a general methodological taxonomy for classifying virtual experiences in marketing (VEMs) according to their technical/content setup, purpose, assessment techniques. A possible future research agenda is

offered on how the use of XR technologies in marketing studies will enable the collection of naturalistic big data to enhance consumer behaviour theory and marketing theory in general.

I. Consumers journey enhancement: The VR impact

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Creating appropriate Virtual reality (VR) applications that might augment experience is not an easy task. Despite the increasing number of VR commercial applications, some lack understanding on the fundamental processes underlying human behaviour (from perception to action), and others simply ignored customers' needs and demands. The current work addresses the above gaps, and aims at providing better understanding on the parameters (virtual and real world features) that might augment VR experiences and thus to enhance the consumer journey.

Introduction: Appropriately meeting consumers' needs and demands is essential in designing good VR applications, that could open avenues for branding, advertising, and commerce. Note, however, consumers are no longer passive users, but are actively participating in the VR experiences offered by various brands. Therefore, these experiences often aim to inform, remind, or reinforce, by using education or entertainment strategies. Parallel to these strategies, various parameters of the featured VR environments are manipulated. Yet, the question is which features and how might best enhance experience. This is especially valid taken that consumers behaviour in virtual worlds is not that simple and does not necessarily reflect the real-world (buying) behaviour. Therefore, the current work will address potential parameters that might change the way VR environment is experienced. Two studies (in 3D simulated environments) will be presented, as described below.

Methodology: The first study addresses how visual and audio modalities interplay. In particular, users experience of VR environments mimicking real world scenarios when audio stimuli are manipulated is explored. The question how various audio stimuli alter consumers behaviour attracted research interest for a while. In-store observations reported that music might affect the perception of an environment, and consumers' experiences vary when in-store atmospherics change (i.e. music and lighting). Note also that music could evoke complex cognitive and affective responses by consumers, and thus, might alter their behaviour. Therefore, we expect that appropriate combination of interactive audio and visual

displays will augment VR experiences. To test the effect of the manipulated factors, naturalness and liking of the VR environments are addressed first. Presence, engagement, and behavior change in response to music played are also measured. T-tests were performed to compare for possible differences determined by the two sound conditions. Regression modelling further tested possible interplays between the manipulated factors and the outcome variables. The results are unambiguous in showing that integrating music within the VR environment augmented the experiences, as reflected in higher engagement and liking.

The second study, took a step further, i.e. parallel to visual and audio modalities, movement modality was stimulated. In a VR environment mimicking the streetscape of real cities, various environmental factors were manipulated. While people were moving through, some shops were advertised. How the interplay between various background factors might change the way consumer perceives the environment (naturalness and presence), and how this influences the cognitive and affective consumer's response was explored. In particular, engagement, liking, attractiveness, and enjoyment of the VR experience was measured. Data were submitted to ANOVAs to test the interplay between various factors. Regression modelling further addressed possible interaction effects. The results clearly demonstrate that the background information (manipulated environmental factors) modulates the way the VR environment is perceived, and thus, the attractiveness and enjoyment of the VR experience.

Discussion: In both studies, naturalness and presence of the experienced environments were evaluated to be very high, proving that the suggested VR applications create appropriate vehicles in translating consumers in between (virtual/real) worlds. Offering participants opportunity to engage in an interactive and immersive manner, increased liking, enjoyment and attractiveness of the VR experience. We have to note, however, that various environment features had different impact. In study 1, music augmented experience confirming to be a crucial element in the way the VR environment is perceived. In study 2, background information modulated how attractive, enjoyable and likable was the experience. These outcomes are further discussed in the framework of consumer journey enhancement model.

To conclude, VR applications creation has to be well (re)considered, taking into account the cognitive and affective responses, and to properly meet consumers demands. Current outcomes could help marketers creating such appropriate VR applications that might transform favorable customers experience and evaluation into real market revenues.

II. Virtual Reality for Shopper Research in Dynamic Retail Contexts

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Consumer goods manufacturers face the difficult task of designing marketing programs that can break through the high levels of in-store clutter and gain product consideration at the point of purchase. They need to know which marketing tools are best able to engage shopper attention and drive sales; the sources of sales volume (brand switching, category growth, cannibalization); the sustainability of these effects over time; and their robustness under competitive promotional scenarios.

Three simulation studies were designed to explore these issues in the context of grocery shopping. The first study measured the effects of three alternatives, (1) introducing a new product, (2) changing an existing product's package, or (3) running a price promotion (a 30% reduction with a "Sale" sign), on consumer attention, brand and category sales, and brand switching. One hundred grocery shoppers, age 18 to 65, were recruited to participate in this study. Respondents were asked to take a series of seven shopping trips through the simulated store. On each trip, they purchased products from four different categories. On the fifth and subsequent shopping trips, a change was introduced into three of the four product categories, with the fourth category serving as a control condition. A single respondent saw only one experimental condition in each product category, but the pairing of conditions and categories was balanced across respondents using a confounded block experimental design.

The study revealed that the price promotion had a dramatic impact on choice, increasing brand sales up to twenty times the level observed during nonpromoted periods (but less for perishable products). An examination of the total category sales and brand switching data revealed that most of the sales increase during the price promotion was due to stockpiling by the brand's current customers, rather than brand switching by new customers. Thus, the price promotion would reduce brand sales in future, unpromoted periods as consumers worked down their at-home inventory. The effects of the new product introductions and the new packaging were more gradual, with sales rising during the fifth, sixth, and seventh shopping trips. Surprisingly, the package change produced about the same level of brand switching as the price promotion, but without the undesirable stockpiling effects and consequent loss of margin.

One might argue that the large price effect observed in the first study was due to its novelty in the laboratory context. When shopping at a supermarket, consumers see a variety

of products on sale. If the same promotion is seen repeatedly, shoppers may "habituate" to this stimulus, responding less over time. Therefore, a second study was designed to examine how consumers respond to repeated price promotions by competing brands. As in the previous study, participants were asked to take seven shopping trips through each of four product categories. There were four experimental conditions, where: (1) the target brand was promoted on the second, fourth, and sixth shopping trips; (2) a competitor's brand was promoted on the second and fourth trips, while the target brand was promoted during the sixth trip; (3) the target brand was promoted only once, during the sixth trip, or (4) none of the brands was promoted (control). As in the first study, each respondent saw only one condition in each product category, but the pairing of conditions and categories was balanced across respondents.

The research revealed that, contrary to the habituation hypothesis, consumer response to the target brand's price promotion increased with repetition (condition #1). However, consumers gradually stopped buying this brand during nonpromoted periods. It appears that they learned to wait for the brand to go on sale. Consumers had an even greater response to the target brand's promotion when the leading competitor had been frequently promoted in the past (condition #2). The promotion of the competing brand seemed to increase the distinctiveness of the target brand's promotion, thereby increasing its impact. In all cases, consumers were able to quickly respond to the price promotions, taking only about 1.5 seconds longer to make a decision than in the no-promotion conditions.

While consumers eagerly respond to price promotions, they are slow to react to new product introductions. Therefore, a third study was conducted to see if we can accelerate consumer trial of new products by pairing them with attention-getting merchandising and promotions. Participants were asked to take seven shopping trips through the simulated store, making purchases in four different product categories. A new product was introduced into each category on the fifth and following shopping trips. This product was accompanied (on just the fifth trip) with either no special merchandising, a "NEW!" sign, a 30 percent price promotion (with a "SALE" sign), or twice the amount of shelf space. To increase the realism of the task, half of the respondents also had the opportunity to purchase a leading competitor's product at a 30 percent price reduction. This is a common, competitive practice, designed to disrupt a manufacturer's new product introductions and help the competitor to retain its existing customers.

The promotional activities of competitors had a significant influence on consumer response. In terms of brand attention, consumers spent about the same amount of time (11

seconds) examining the new product in each of the four merchandising/promotion conditions when there was no competitive price reduction. However, when the competitor cut its price, consumer attention to the unmerchandised new product dropped to 5 seconds. With additional shelf space or a "NEW!" sign, brand viewing time was 10 seconds. When the new product was put on promotion, attention peaked at 16 seconds. Trial of the new product were highest in the price promotion condition and occurred immediately after the product was introduced. In other conditions, the purchase rate was lower, with the "NEW!" sign accelerating the purchase rate relative to the control and high-shelf-space conditions. The results suggest that new products can get lost in the clutter at the point of purchase. Merchandising and promotions may enhance consumer attention, especially in the context of competitive promotions.

III. Examining the Purchase Conversion Effects of Virtual Product Testing on Mobile Apps: An Application of Augmented Reality in Online Retail

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Augmented Reality (AR) is a technology that superimposes virtual objects on a live view of the physical environment, helping users to visualize how these virtual objects would fit into their physical reality. In a marketing context, a promising application of this technology is to enable customers to try products virtually before making a purchase, a practice we refer to as “virtual product testing”. Even though 1 in 2 marketing managers are keen to invest in this new technology, there has been limited empirical research examining the purchase conversion effects of virtual product testing. While virtual product testing communicates visual information about products and enables customers to assess product fit in the absence of physical products, it is unable to convey other experiential product attributes (e.g., product texture, taste or scent) and hence, may not be effective in encouraging purchases. Furthermore, the conditions under which virtual product testing would be most effective has also not been explored.

The present study aims to resolve this ambiguity by examining if, and under what conditions, virtual product testing translates to in-app purchases. Stated concisely, our research addresses the following questions:

1. Does AR-enabled virtual product testing on mobile apps influence in-app purchases?

2. How does product and customer characteristics moderate the purchase conversion effect of virtual product testing?

We propose that virtual product testing via AR encourage purchases by reducing purchase uncertainty for customers. Furthermore, guided by the notion that the purchase conversion effect should be stronger in situations when the purchase uncertainty is high, we also explore how specific product and customer characteristics affect this relationship.

To investigate our research questions, we obtained data from an international cosmetics retailer who incorporated this AR technology in their mobile app. The AR technology allows customers to sample products virtually by superimposing the selected products on a live view of customers' face, helping them visualize how they will look like wearing different cosmetic products. As the AR feature is introduced at different times for different product categories (due to factors relating to development of the technology), our research setting lends itself into a natural experiment. We took advantage of this unique setting while accounting for self-selection in customers' decision to use the AR feature. Our data covers an 8-month period from December 2017 to August 2018, and includes close to a million app sessions from more than 100,000 unique customers.

To preview our findings, virtual product testing has a positive impact on purchase likelihood, even after accounting for self-selection in customers' decision to use the feature. In addition, the conversion effects of AR usage are stronger for products with narrower breadth of appeal, brands that are less popular, and customers who are less familiar with the retailer – situations under which the purchase uncertainty is high. Interestingly, the conversion effect is also stronger for cheaper products, leading to lower transaction value when customers use the AR feature. Nevertheless, as session conversion rates are higher when customers use AR, their net revenue impact for the retailer is still positive.

This research makes substantive contributions to the field of online retailing, product testing, and the use of AR in the marketing field. Even though AR is rapidly gaining prominence, there is still a lack of clarity surrounding its application in marketing contexts. The present research represents an initial step to understand how, and under what conditions, virtual product testing via AR can influence purchase behavior in online retail.

IV. Virtual reality in marketing: a framework, review and research agenda

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The previous literature shows significant advances in the use of Extended Reality (XR) technologies such as virtual reality (VR), Augmented Reality (AR) and Mixed Reality (MR) in marketing. With the advent of more sophisticated technologies that enables a high-fidelity reproduction of ambient, objects and persons, e-retailers are considering Extended Reality (XR) technologies as very promising technological tools for producing satisfactory consumer experiences that mirror those experienced in physical stores. The use of XR as a new computer-mediated indirect experience has led to the concept of virtual commerce or v-commerce (Nguyen et al., 2016). We are beginning to realize the enormous potential that XRs have to enhance our understanding of consumer behaviour defining models that analyze the influence that each of the increasingly numerous and complex variables that surround consumers have on their behavior.

However, the capability has been adopted and used by only a few pioneering researchers, who are working to understand how XR can contribute to marketing research. In short, XR can become a commonplace tool in marketing research. Before that, however, it will be necessary to conduct rigorous studies to clarify how these new tools might adequately simulate the complex reality that today surrounds the consumer and to analyze the influence that the factors that make up this reality have on his or her decision-making capacity. We propose to characterize virtual experience in marketing (VEMs) in two aspects: first, describing the main elements that characterize any VEM (content, devices, interaction techniques, final goal) and second, explaining the methods used to assess both the virtual experience and the consumer experience (level of presence, cyber sickness, transference, consumer behaviour metrics and consumer cognitive states), see Figure 1 for a framework overview.

Several studies predict that technology-mediated human communications will evolve from today's smartphones to some mixed reality interfaces mixed with an intelligent interpretation of user's activities in the majority aspects of our lives (Bailenson, 2018) and, more concretely, in our consumer habits and behaviors (Grewal et al., 2017; Brohm et al., 2017).

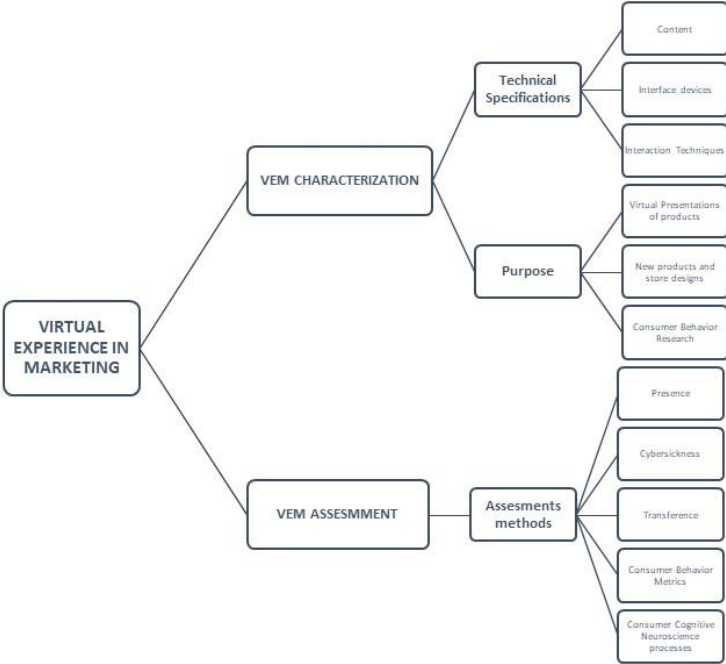
The capacity of XR to generate new virtual realities will influence marketing research in two directions. On the one hand, its ability to simulate reality allows the creation of

controlled laboratory situations to study the factors that affect the acceptability of new products and retail spaces and the influence that the different elements that surround consumers have on their decisions. On the other hand, the interfaces provide a new e-commerce marketing channel with great interactive capacity and totally innovative contents that, to date, have not been available to marketing scholars and industry. This new e-commerce channel is of particular interest for the digital native generation.

While future technological advances in XR promise to enable richer consumer experiences, perhaps the greatest revolution that will be made possible by next-generation VEM involves the ability to collect, analyze and make use of unprecedented amounts of data, that is, bringing VEM into the age of “Big Data Marketing” (Erevelles et al., 2016; Wedel & Kannan, 2016).

Therefore, we argue that the future research agenda for the use of XR in marketing must be, more than ever, multidisciplinary, and include fields such as economics, artificial intelligence, computer science, social signal processing, neurosciences, genetics and many others. Given the high immersive capacity of XRs and their ability to adapt in real time, it is necessary to start to investigate the fundamental aspects of the influence of XR on consumer behavior.

Figure 1. A framework proposal for VEM



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