THE INTEGRATION OF NEUROSCIENCE WITH AUGMENTED REALITY AND VIRTUAL REALITY

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ABOUT US

Shikatani Lacroix Design (SLD) harnesses the power of strategically led design to give brands confidence in the future of the ever-shifting retail space. With over three decades of experience, SLD is uniquely positioned to deliver transformational change for our clients, from packaging and environmental design to graphics and digital. Through the proven Blink Factor and Think Blink processes, SLD creates immersive experiences that connect with customers emotionally, instantly and powerfully.

ABOUT THE AUTHOR
Jean-Pierre Lacroix R.G.D., President and Founder of Shikatani Lacroix Design

When it comes to the design industry, President Jean-Pierre Lacroix is always one step ahead in the branding and design game. A visionary design thinker, author and speaker, JP maintains an unwavering focus on the latest and emerging trends. Driven to produce measurable results through strategic insights, he is committed to helping brands own the consumers' "at-purchase moment."

JP's past industry involvement as a board member with the Packaging Association of Canada, Design Industry Advisory Committee, Retail Council of Canada, the Canadian Marketing Association, Signs Canada, the Society for Environmental Graphic Design, and the Association of Registered Graphic Designers of Ontario has enabled him to assist clients in identifying the leading packaging, retail and digital trends that affect their branding initiatives.

Since opening the Shikatani Lacroix Design doors more than 25 years ago, JP has grown this company into one of the most respected and sought after multidisciplinary strategic design agencies in the world. Along the way, he has developed a reputation as a true innovator and first-rate problem-solver, with expertise in providing clients with unique, results-driven solutions for their product and service needs.

A PATH TO BIAS-FREE CONSUMER DATA

Modern businesses are leveraging data more than ever before – whether to extract an insight, to support a hypothesis, or to arrive at a conclusion. But to arrive at such data-driven end-states requires the data to be useful and relevant. This is not an easy task given the sheer quantity of information analysts must crunch through these days.

However, new technologies are constantly emerging that enable new ways of acquiring data. After extensive testing and, in collaboration with industry leaders True Impact, Shikatani Lacroix Design has successfully proved the feasibility of coupling two sources of data in order to derive clean and accurate data: 1) neuroscience and 2) augmented/virtual reality. This paper will discuss how we arrived at such an achievement and then explain how each concept will be used in real world marketing executions.

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HYPOTHESIS AND METHODOLOGY

How We Generated our Hypothesis

For some time, SLD has been experimenting with different kinds of approaches to augmented reality (AR) and virtual reality (VR), seeking to discover innovative ways of delivering value to our clients with the insights derived from these new and exciting tools. One client's project had us producing a live, augmented version of its packaging and another client's project had us constructing an entire retail space to explore in both an AR and a VR environment. But, we quickly realized that, aside from providing a different way (albeit a modern and interesting one) of looking at physical things, there was little else of value constructed during these portions of our projects.

Thus began our discussions on how to better leverage these platforms to make them more useful and meaningful to our projects, thereby delivering more value to our clients. After reading an insightful academic paper written in 2006, entitled *Cognitive Neuroscience, Marketing, and Research: Separating Fact from Fiction*, a disruptive thought arose: what if we could connect these new technologies (AR & VR) with modern scientific methods of analyzing brain activity (neuroscience) in order to extract live, meaningful, and scientifically accurate information? If this was indeed possible to achieve it could potentially determine a consistent approach for incorporating virtual and augmented reality technologies into any future project.

Our Initial Insights and Further Discussions with True Impact

We reached out to one of the leading experts in neuroscience-related marketing, Diana Lucaci, and the talented team she presides over at True Impact. True Impact has developed a scientific approach to overcoming the following age-old marketing challenges:

1. "Feelings are difficult to remember and express," so data extracted from focus groups and surveys could sometimes be vague and unquantifiable.

2. "Questionnaires are time consuming and risky," especially since something as seemingly innocuous

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as the very wording of a question can sometimes skew the responses and damage the integrity of the data.

3. "Data providers today are not strategic advisors," so the raw data metrics delivered to you from such providers will not have much in terms of actionable insights.

They have constructed an device that fits on the user's head that uses academic-grade neurological tools such as functional magnetic resolution imaging (fMRI), electroencephalogram (EEG) and eye-tracking methods to extract biologically-linked metrics from its user. The limitation of this approach, however, was that it required a real world environment where testing would be conducted – either within a reconstructed retail store inside a warehouse, or within the actual store itself.

It is this device that we at SLD were interested in examining: could we combine it with our virtual and augmented reality initiatives to overcome the above limitations (requiring a real world environment) and create potentially limitless environments for clients to test in? After our initial discussions with Diana and her team, we decided, in partnership with True Impact, to pursue this study further and began to design an experiment that would determine whether our theories could be implemented.

CHALLENGES

Over the next few weeks, our two companies combined resources to design the experiment. First we determined what limitations could potentially present themselves over the course of the experiment:

1. Synchronizing the two systems' (the VR/AR system and the True Impact apparatus) time-codes might be difficult since they are not electronically linked.

2. The diversity of test subjects might be limited, so compiling a complete list of physical constraints (such as hair type, age, gender) might be difficult.

3. VR/AR environments might not be as immersive as their real-world counterparts and therefore the

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reactions/responses from the test subjects might not be as accurate as a real-world test.

THE EXPERIENCE

The test itself was designed to be as simple as possible: find a person with no prior knowledge of the test, put the combined virtual reality/neuroscience apparatus on the subject, and ask them to follow a series of instructions that all revolved around looking at certain objects in the virtual/augmented space and/or walking towards certain destinations within that space.

During our initial testing, we tested against all of the hypothetical constraints listed above and determined that our methods of overcoming such constraints proved effective for the most part, but also raised some other issues of potential contention.

We realized that the two key neurological success factors we needed to consider in order to gain clean, actionable metrics were:

1. Limit/eliminate the chances of cognitive dissonance.
2. Examine the tendency for obstacle avoidance (when a subject must navigate around an object in order to reach a goal) in test subjects to increase the relevance/usefulness of design elements.

Ultimately, though, the tests demonstrated that our initial hypothesis was indeed actionable and had real-world applications.

THE BUSINESS APPLICATION

Where This Can Best Be Utilized

After the successes of the initial trials, we were excited at the prospect of incorporating the technology into the projects we were conducting with our clients. This would indeed add an extra dimension to our deliverables and would also provide us with data that is much more precise and actionable. And in many cases (and this will increase as equipment becomes more widely available and more

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neuro-research firms begin to appear), costs will be reduced, potentially dramatically.

But what kinds of projects would we at SLD be best suited to leverage this technology? After intense discussions amongst our strategy group, we determined that there were two areas we could focus our efforts on: **consumer packaged goods and interior/exterior design.**

Additionally, there are ways in which traditional research methods could be substantially elevated by this kind of research.

CONSUMER PACKAGED GOODS APPLICATIONS

The use of neuro-research is already impacting the world of packaging design, and there are numerous AR/VR applications. A marriage of the two could create meaningful impact for CPG clients in these ways:

Evaluating Different Package Design Options: When a CPG company decides to redesign a product's packaging, they always provide several different packaging iterations during the research phase to evaluate which might be the most successful in the eyes of consumers. Creating these packaging mockups and then designing and conducting these tests are

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expensive, and result in data that is largely opinion-based. Business decisions are then made based in part on these opinions, meaning that the success/failure of the new packaging is largely reliant on softer qualitative observations rather than concrete quantitative metrics.

Using AR/VR for this application not only dramatically reduces the costs involved in testing, but also results in data that is scientifically accurate. We will now be able to record eye movements, noting where the test subject's eyes rest the most and the least. We can record brain activity, noting which element of a new package stimulates the consumer the most. And, most importantly, we can do this all in a virtual environment rather than a real one, which saves an enormous amount in the marketing budget.

Evaluating Planograms: When retailers such as supermarkets design their shelving strategies, often they mock up their prospective plans in a full-sized store specifically constructed for testing. By using the AR/VR technology, coupled with neuroscience, retailers can eliminate the need to use full-sized test stores altogether. They can make alterations to how their shelf space is allocated, reevaluate the flow of brands, the end caps, how high the shelves go, etc., all without having to reconfigure a full-sized, physical test store/aisle. This, naturally, saves a significant amount of money in R&D, and it ensures that the retailer avoids any real estate-related costs associated with maintaining a real location.

INTERIOR/EXTERIOR DESIGN

Cost savings and more options are the key benefits of and AR/VR neuro-research approach in designing retail spaces.

Evaluating the Customer Journey: Every retailer – from supermarkets to banks – thinks through their consumer's path to an in-store purchase. In doing so, they gain a better understanding of how efficiently their store is laid out and how effective the furniture, fixtures, and signage are at providing points of interest and helping guide the consumer through the store. Often there is an ideal path-to-purchase that the retailers would like the consumer to follow – one that highlights several key areas of interest and increases the potential for purchase. By using AR/VR combined with neuroscience, retailers can evaluate how

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effective the store layout is and make changes on the fly – making these tests much easier to conduct and much cheaper to run.

Evaluating New Architectural/Design Elements: When we at SLD present an interior redesign, such as the ones with did for M&M Food Market or any of our bank redesigns (SPD Bank, CZ Bank, Regions, etc), there is always an element of risk because the feedback given to us by the clients might be emotionally driven, based solely on computer renderings. Since this kind of initiative is a huge risk for the clients, they want everything to be perfectly aligned to their internal vision. Sometimes, it is hard to elicit an honest response because the medium upon which the new designs are presented isn't exactly an immersive one. Viewing a 2D mockup, an elevated mockup, or a 3D walkthrough video simply cannot duplicate a real-world experience and therefore the reactions will not be the same as those that would occur if we were able to offer them an immersive walkthrough of a proposed design.

Now, with AR/VR technology, we can offer them a much more immersive presentation of our proposed designs – and their experiences within these immersive environments can now be measured more accurately using neuroscience. This, in turn, helps us at SLD make changes that are based much more on rational, statistically accurate data, rather than temporary emotional/reactionary states.

COMPLEMENTING TRADITIONAL RESEARCH METHODS

Traditional research methods come with well-known drawbacks, but in collaboration with these new methods, the data collected may be more accurate.

Focus Groups: In his book, *How Customers Think*, Harvard professor, Gerald Zaltman concludes that when dealing with focus groups, "The correlation between stated intent and actual behavior is usually low and negative." There are many reasons for this. Sometimes the sample size is too small to be representative of the population as a whole; sometimes the sample has introverts on its panel who are less willing to speak aloud; and the vividness effect, which is a cognitive psychology phenomenon that "explains how

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vivid events (those that are highly graphic or dramatic) affect an individual's perception and recall of a situation, event, or memory."

So, if the focus group has a small sample size, or is populated in part by introverts, or is focused on a product/execution that is not as vivid, then the data resulting from such focus groups will be skewed. Neuroscience, when coupled with AR/VR, overcomes these situations by conducting individual tests rather than focus groups and by providing a testing environment that is far more immersive and therefore far more vivid. When combined with the more qualitative data derived from focus groups, there will be more than enough relevant and insightful information for the analytical team to leverage.

Surveys: Surveys provide a quick and inexpensive way of compiling a lot of information. However, the data compiled from surveys is often inaccurate, reflective of the limitations present when conducting the surveys. A poorly-designed survey can result in responses that are not insightful whatsoever. For example, if participants are asked to rank something on a scale from 1-10, how will they be able to differentiate between a "6" and a "7"? This means that some of the responses might have standard deviation of more than 10%, making the survey statistically insignificant.

A survey conducted in a high-traffic area might not receive the quality of responses expected, because passersby felt too rushed to take their time crafting reasonable/quality responses. And there is no real way of determining the truthfulness of the answers provided, so your survey is often an exercise of trust.

However, a neuromarketing approach will not eliminate the need for surveys anytime soon because surveys can provide a large quantity of information in a relatively short period of time, while the time requirements for neuromarketing-based research is far greater. Once again, by coupling neuromarketing-derived metrics with the aggregated survey results, the team of analysts will have more than enough relevant information to make better strategic decisions.

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PHASE 1	PHASE 2	PHASE 3
DEFINE	**DESIGN**	**DELIVER**
STRATEGY	CREATIVE	RESULTS

THINK BLINK AND NEURO-RESEARCH

For both retail and package design, SLD uses a proprietary process called Think Blink, outlined in *Think Blink – Design*, "which consists of three major phases, each building on the learning and insights from the previous. First is the Define phase, which provides the foundation of a strategic direction, followed by the Design phase which personifies the insights into design foresight. Finally, the Deliver phase brings executional clarity to the opportunity while ensuring the initial design vision is properly translated to executional elements."

It is during the design phase when SLD will employ neuromarketing if appropriate or applicable. The design phase is where we develop three or four design concepts based on an initial briefing from the client. We then present our concepts to the client to gain further feedback from them and to establish areas where further research will help us get closer to a finished design that the client is happy with.

A PATH TO BIAS-FREE CONSUMER DATA

Marketers have always been in search of ways to acquire consumer data that was 100% truthful, clean, and actionable. Traditional consumer research methods, while important, often yielded information that was not entirely accurate. Neuromarketing – the combination of neuroscience methods and marketing approaches – is fast becoming a modern standard in deriving consumer insights. And, when neuromarketing is coupled with technologies such as augmented and virtual reality, the research can yield data that is clean, accurate, and actionable while saving a large amount on cost.

Ultimately, based on the results of our tests, we are confident that this approach is something that marketers should not ignore. This could

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potentially be the way of the future for marketers and, as each technology improves, so too will the quality of the data that is acquired through these methods. Indeed, the world of marketing - whether real, virtual, or augmented – is quite bright.

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