

GRANDON GILL

## INNERSCOPE RESEARCH INC.<sup>1</sup>

*What should be our next step?*

Geoffrey K. Gill, Chief Financial Officer/Vice President, Strategy for *Innerscope Research Inc. (ISR)*, addressed this question daily while sitting in his office, not far from Boston's North Station. During the three years he had been with the company, ISR had established itself as a leading competitor in the emerging efforts to applied biometrics to predict consumer behavior. Using algorithms and techniques developed by its founders—Dr. Carl Marci, Director of Social Neuroscience for the Psychotherapy Research Program at the *Massachusetts General Hospital* and Brian Levine, whose project involving the use of multiplatform sensing technology at the MIT Media Lab was a major source of inspiration for ISR's products—the company had demonstrated how biometric signals (e.g., pulse, respiration, galvanic skin response) could be combine to produce important insights into individual reactions to advertisements, web pages, new products and print media. Its client list looked like a “who’s who” of major advertisers (see Exhibit 1 for some examples). Over time, ISR had also accumulated a data warehouse of unparalleled size that cataloged focus group responses to a wide range of stimuli; with this, it expected to be able to acquire further insights. Most recently, the company had established a strategic relationship with *Ipsos*, one of the largest market research firms in the world (and the market leader in TV advertisement research). Leveraging that relationship, the ISR's proprietary technologies could potentially be employed in the evaluation of tens of thousands of TV advertisements each year. It was hard to imagine how a small business, with fewer than 40 employees and less than 5 years old, could have experienced a more promising start.

Despite its early successes, the company faced a number of challenges if it was to meet the objectives of its founders, investors and employees. The company's revenue growth had been strong, increasing by a factor of six between 2008 and 2011—a period during which the U.S. economy had been in a deep recession followed by a very weak recovery. Nevertheless, many clients had indicated that were moving towards increased caution in their marketing research activities. Perhaps of even greater concern, revenue growth had been accompanied by increased costs of conducting ISR's research activities. More studies involved more personnel to administer studies, increased sales expense, greater costs of recruiting and compensating suitable participants, higher equipment costs, and so forth. As long as these costs continued to rise at the same rate as revenue, it would be hard for ISR to maintain its growth rate and to meet the profit expectations of its outside investors and founders. One solution would be for the company to transform some or all of its activities into a product that could be sold or licensed without increasing

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ISR's costs. The two questions faced by Gill were: i) could such a product be designed, and ii) how to convince investors to finance its development.

## Marketing Research Industry

ISR was participant within the broader marketing research industry (also referred to as the market research industry). According to the American Marketing Association's (AMA) web site:

*Marketing research* is the function that links the consumer, customer, and public to the marketer through information--information used to identify and define marketing opportunities and problems; generate, refine, and evaluate marketing actions; monitor marketing performance; and improve understanding of marketing as a process. Marketing research specifies the information required to address these issues, designs the method for collecting information, manages and implements the data collection process, analyzes the results, and communicates the findings and their implications.

Marketing research can take many forms. Some of the key techniques, as identified by IBISWorld, include:

- Market research via the internet
- Face-to-face market research (including focus groups)
- Market research by phone
- Market research by mail
- Media research
- Public opinion polling
- Statistical sampling and survey design
- Other research services

ISR's business plan characterizes the global industry's size as follows:

Industry experts estimate the total worldwide market research industry to be over \$29 billion annually with the U.S. share approximately one-third (\$10B). The top twenty U.S. firms in 2007 ... had combined sales of \$16.9 billion globally and \$7.1 billion in the U.S. The estimates from Inside Research may understate the size of the industry because the industry is quite fragmented, with over 5,000 companies in the U.S. Based on employment statistics from the Bureau of Labor Statistics, the U.S. industry alone may be over \$20 billion annually.

Based on these estimates, just under half the industry's revenues were controlled by 5 firms: Nielsen (USA), Kantar (UK), IMS Health (USA), GfK SE (Germany) and Ipsos SA (France). Each of these firms had its own area of specialization. For example, Nielsen was best known for its TV ratings service and surveys. Ipsos, on the other hand, had an estimated 35% of the global TV ad testing market.

The general consensus across the industry was that economic conditions were restricting the amount of money companies were willing to invest in market research. In its 2011 report summary, for example, IBISWorld offered the following prognosis:

Unfortunately for the industry, companies changed their focus from growth to survival following the recession, subsequently cutting research, development and marketing budgets in order to reduce costs. At the same time, a shaky labor market and an uncertain economic climate have caused consumer spending to fall, particularly on discretionary and big-

ticket items. In the five years to 2016, more changes in media consumption habits will occur, with operators shifting their focus toward social and mobile media. These factors will provide a platform for growth to industry firms and promote revenue and profit growth. [Retrieved 8/14/2011 from <http://www.ibisworld.com/industry/default.aspx?indid=1442>].

## Biometrics and Neuromarketing

*Technologies:* Biometrics is a broad area with many diverse applications, the most common of which are found in security (e.g., fingerprint and retinal scanning). Biometric technologies can also be used to measure biological indicators of cognition, stress and emotion. One of the earliest uses of such technologies was the polygraph, or so-called “lie detector”, which charts how a variety of physical responses—such as pulse, blood pressure and respiration rate—change as the subject answers questions. In recent years, the number and potential uses of these technologies has grown dramatically. The most common of these are summarized in Exhibit 2.

When biometric technologies are applied to marketing problems, the resulting combination is generally referred to as neuromarketing. Conceptually, the problem neuromarketing addresses can be described as follows. For many years, fields such as economics and decision science assumed that consumer behavior could be modeled as a rational process of choice. In such a model, each consumer would “know” the basis upon which he or she made decisions and that techniques such as interviews and surveys could therefore be used to accurately assess the rationale for a particular decision. Later research, first conducted in the late 1970s and early 1980s, suggested that this “rational” model suffered from two serious defects:

1. Because the human brain is continuously bombarded with huge quantities of information (sight, sound, other senses, memories), we are able to attend to only a tiny fraction of the information available to us. The rest is filtered away unconsciously but, nevertheless, may impact our decision-making without capturing our attention.
2. Even where we attend to a piece of information, rather than employing rational economic principles we often rely on shortcuts—referred to as heuristics—in our decision-making. These heuristics often exhibit a strong emotional component. For example, most people are more motivated to avoid the possibility of a loss than to achieve a comparable possibility of gain. Imagine the choice between:

**Option A:** You are given \$100, the a flip of a coin then determines if you get an additional \$100

**Option B:** You are given \$200, and a flip of a coin then determines if you have to give \$100 of it back.

Given this choice, the typical individual will instinctively gravitate towards Option A despite the fact that the two options are, in fact, identical in terms of their end results (referred to as a “framing” bias). Where such “irrational” preferences exist, it seems that the most likely explanation will therefore be found in the emotional, rather than analytic, sphere.

As a result of the many well-documented weaknesses in the rational model, biometric tools—which can record reactions that are the result of both conscious and unconscious processes—have the potential to offer a valuable supplement to more traditional marketing survey and interview techniques. A simplified illustration of the role that biometrics can play is presented in Exhibit 3. The central premise, one increasingly being validated by research, is that both participant reflections *and* data relating to emotional engagement must be collected if participant choices and preferences are to be understood.

*Competitive Situation:* Neuromarketing represented a small but rapidly growing segment of the broader marketing research industry. As of 2010, ISR estimated total biometric/neuromarketing revenues at about \$100 million, well under half a percent of global marketing research revenues. The growth of this segment—estimated to be between 40 and 50% per year—made it a particularly bright spot in an otherwise stagnant industry.

Many of the companies engaged in biometric marketing research were small startups. Of those companies that—like Innerscope—had received external funding and had begun play important roles in the industry, Gill identified three to be of particular interest:

1. *Neurofocus:* Headquartered in Berkeley California with a dazzling scientific advisory board, this competitor has particularly focused on neuromarketing applications of brainwave technologies. Historically, ISR considered Neurofocus, with its EEG skull-cap based technologies, to be its major competitor because Nielsen made a significant strategic investment in that company in 2008 and deployed its sales force to assist in sales efforts. In May 2011, that relationship was reinforced when Nielsen acquired the entire company. Despite this development, ISR had considerable confidence that its technologies could outperform those of Neurofocus. For example, in eleven competitive situations where Innerscope competed head-to-head with Neurofocus, Innerscope has been successful six times; subsequently a number of the clients who chose Neurofocus initially then migrated to ISR. Part of this preference is likely a consequence of the nature of the “product” being sold by each company. Whereas ISR tended to focus on setting up individual tests, employing its own facilities where possible, Neurofocus preferred to employ a “lab” strategy whereby it entered into multi-year, multi-million dollar contracts to set up labs at client sites.
2. *EmSense:* Another competitor whose principal technology was focused on brainwaves. Unlike Neurofocus, however, it had developed monitoring devices—such as its *EMBand 24* headgear—that were far less intrusive than other EEG technologies, requiring no gel be applied and communicating its data wirelessly. Although some concerns had been raised about the sensitivity of these measurement devices, Gill perceived this company to represent ISR’s greatest competitive threat in the near term. Beyond its technologies, EmSense had also established strategic partnerships with established marketing research firms in each of its five product areas (ad copy testing, in home panel, in store, online and package testing). These partners included two of the global top ten marketing research companies. According to Gill, EmSense had already received roughly \$21 million in angel investing.
3. *Affectiva:* Founded by participants in the MIT Media Lab, similar to ISR, Affectiva developed a wrist-based sensor technology (Q-Sensor) than measured a number of the same biological markers as ISR. What made this company particularly interesting as a competitor was its efforts to advance facial emotion detection, recently funded by a \$5.7 million investment from Myrian Capital, a venture firm based out of Ohio. While there was little evidence that facial coding technologies had become sufficiently advanced to be practical in the marketplace, Gill felt that should this problem be solved, its impact on the field could be profound.

One area where neuromarketing held great promise but had yet to make inroads involved taking the technology to the participant. A constant problem in all types of marketing research was the setting;

where a participant was aware that he or she was being studied, responses were likely to differ. Thus, techniques that were highly intrusive—such as placing the individual in an fMRI chamber and studying brain responses to stimuli—tended to be of very limited practical value (as well as being very expensive on a per-observation basis). Even technologies that seemed to require little participant involvement, such as the dial technologies used by companies such as Nielsen to allow viewers to indicate their level of engagement with a TV program, impacted viewer responses in a subtle way. In its own experiments, for example, ISR had demonstrated that biometrics were much better predictors of consumer reactions than dial-based ratings.

In light of its quest for the unobtrusive, the holy grail of the marketing research industry was to observe participants in their preferred “natural” setting, i.e., the home. Both Neurofocus and EmSense had announced their intention to develop technologies for in-home use. Such technologies, should they become practical, would offer numerous benefits. They could, for example, be combined with rating systems (such as Nielsen’s). They could also support other uses, such as medical monitoring, that might allow the costs of deploying the technologies to be shared.

The obstacles to bringing neuromarketing systems to the home were great, however. First, even technologies that were relatively unobtrusive (e.g., wrist bands) would become annoying to consumers if required to be worn for long periods. Second, new systems for deploying content to be tested and receiving signals from participants would be needed. Third, such technologies would likely raise a host of privacy and security-related concerns. Nevertheless, the company capable of developing and deploying such technologies profitably could, quite conceivably, transform the entire marketing research industry.

### **Innerscope Research, Inc. (ISR)**

Innerscope Research Inc. was founded in 2006 with the objective of becoming a leader in the rapidly emerging neuromarketing industry. At the time of the case, ISR was still led by its two founders: Dr. Carl Marci, CEO, a neuroscientist and psychiatrist at Harvard Medical School and Mr. Brian Levine, President, a former creative director for global consumer products and services companies. The two became acquainted while Levine was doing his MBA at Massachusetts Institute of Technology (MIT) and was actively working on biometric-related projects at MIT’s renowned Media Lab. Biographies of ISR’s key executives are included in Exhibit 4.

The biometric technology package developed by ISR consisted of two key elements: specialized hardware—such as the chest band illustrated in Exhibit 5—intended to gather medical-grade readings and an IT system that employed proprietary algorithms to extract data from the multiple (and sometimes conflicting readings) acquired from participants. In an internal memorandum, the company summarized the technology as follows:

Innerscope leverages hardware developed for medical and other applications and combines it with proprietary software into the Innerscope Biometric Monitoring System™[see Exhibit 5]. This system measures unconscious emotional responses moment-by-moment, using a combination of biologically based sensors including: 1) heart rate, 2) skin sweat, 3) respirations, and 4) motion. Innerscope often combines these signals with state-of-the-art eye tracking measures of visual attention. ISR’s sensors detect signals directly generated from the emotional centers of the brain as they are experienced and prior to conscious processing. These data are analyzed by Innerscope’s proprietary software using patent pending algorithms to obtain a quantified emotional response metric and interpret a range of stimuli for market and media researchers.

Unlike its two major neuromarketing competitors, Innerscope did not routinely incorporate EEG signal streams into its algorithms. The company's researchers had found that such signals did not seem to add much value to their existing algorithms and made the equipment worn by participants vastly more intrusive. In fact, many of their results that linked ISR's measures to actual consumer behaviors were already quite remarkable. For example, the company did a study in which Emotional Engagement (ISR key summative measure) was contrasted with the likelihood that Tivo would fast-forward over a particular advertisement. The results, depicted, in Exhibit 6, showed that strong engagement measure was strongly correlated with willingness to allow an ad to run and that low engagement nearly always preceded the decision to fast forward through an ad.

During its first five years, ISR's revenues rose dramatically, exceeding \$5 million in 2010 supported by a staff of over 30 employees and contractors. Geoff Gill joined the company in 2008 in the capacity of Chief Financial Officer (CFO), to which the title VP Strategic Planning was also added. The company received a couple of rounds of venture financing during its early years, although substantially less than that of some of its competitors (e.g., EmSense, which had received about \$21 million in its early funding rounds).

ISR established an enviable list of clients (see Exhibit 1) over a very short period of time. Many of these found themselves converts to the neuromarketing as a result of dramatic results from their initial tentative trials. One such example was TurboTax, where a rigorous web traffic test clearly demonstrated how volume could be increased by using participant reactions from ISR tests. Maria Scott, Senior Manager in Marketing Research at Intuit was quoted as follows:

We initially used Innerscope on Turbo Tax website research and the success of that test, including in-market outcomes, gave us confidence to use Innerscope with advertising research as well. We use it as a complement to traditional research. Biometrics gets at things we can't with traditional ad testing. We focus in on particular areas of 30 second ads that are working– or not. Then we use focus groups to understand why and test out specific ideas. With biometrics, there are subtle types of things we can't get from focus groups because people can't articulate them. So we've used biometrics to make subtle changes and dramatically improve engagement.

Gill remarked that the company had numerous examples where real world changes in consumer behavior were observed on the web as a result of ISR's analysis. Irrefutable demonstration of such changes was possible on the web because two sites could be set up, a control site and one with the changed content and consumers could be randomly sent to one site or the other when they clicked on a particular link. Thus, differences in behavior between the two alternate sites could almost certainly be attributed to the nature and arrangement of the content. Ironically, while web-based recommendations were the easiest to validate given easy access to behavioral data online, the variety of content and purpose associated with web sites made this media among the most difficult to standardize in terms of testing protocol. Conversely, while it was possible to develop a relatively routine protocol for assessing the emotional engagement associated with a TV advertisement, it was much more difficult to prove that changes made to a particular advertisement produced a particular change in behavior that was later observed when the ad was broadcast given the wide variety of other factors (e.g., price, media spend, competitor response) that can independently impact sales.

In early 2011, the company achieved two milestones. First, it achieved profitability for the first time in the first quarter of that year. Second, ISR established an important strategic relationship with Ipsos, the fifth largest company in the global marketing research industry (and the leader in TV Ad evaluation). That relationship was expected to be further enhanced by Ipsos' upcoming acquisition of Synovate (currently, the #6 largest player), at which point Ipsos would likely occupy the #3 position, with projected global combined revenue of about \$2.5 billion.

## ISR Strategies

The relationship with Ipsos was expected to be a critical part of ISR's three pronged strategic approach, illustrated in Exhibit 7. The prongs were: 1) Existing core business, 2) Joint products and 3) New opportunities. Each of these is now described.

*Existing core business:* The existing core business of ISR involved setting up customized tests of marketing and entertainment products using its biometric technologies and algorithms. As illustrated in Exhibit 8, in a relatively short period the company had demonstrated remarkable versatility across two important dimensions: industries served and types of products/media evaluated.

ISR's core business segment still represented the bulk of the company's revenue and costs. Unfortunately, the costs associated with core business activities tended to include a large variable component that derived from four sources:

1. *Sales costs:* ISR employed both full-time and contract sales personnel, both of which were paid on commission. The full-time sales personnel also received a salary.
2. *Research design costs:* Because each study had its own unique characteristics, it was often necessary to customize research designs to the client's specific circumstances. Evaluating a package design was different from evaluating a web page or an advertisement. Metrics such as eye tracking had a different meaning when applied to full-motion video (e.g., where motion naturally attracts attention) than they did for static content, such as brochures. Identifying appropriate target groups for the studies was also challenging—biometric reactions could be quite different across different ages and genders. Ensuring a research design likely to produce generalizable findings was far from a matter of routine.
3. *Participant costs:* Unlike survey-based marketing research, ISR needed to work with relatively small groups of participants (well under 100) in order to deliver results in a cost effective and timely manner. Given that a study's design could often be quite specific in its requirements for participants, this meant that the cost of recruiting individuals to participate was often quite high--\$100/participant was not unusual. In addition, studies often lasted several hours and participants needed to be well-compensated for their efforts.
4. *Administration costs:* Setting up, administering the study, and analyzing results were personnel-intensive activities that demanded employees with both strong interpersonal and technical skills. A single session might require 2-3 persons to ensure all aspects of the process went smoothly; such smoothness was critical since a single glitch could lead to an emotional reaction on the part of participants that could invalidate the entire set of results. Additionally, it was frequently necessary to travel to remote locations to achieve geographic diversity, adding significantly to setup costs. A further cost was incurred after data had been gathered. The analysis of session results was a matter of art as well as science, and often benefited from the participation of the company's top scientists who frequently offered insights on the results that could not be achieved through mechanical analysis.

As of 2011, the costs of a typical custom project for a client ranged from \$25,000 to \$100,000, depending on a variety of factors such as the number of participants needed, the nature of the participant group to be recruited and the type of content to be analyzed. Work of this type was profitable for the company, but the "high touch" nature of the segment meant that costs (and associated management challenges) grew at nearly the same rate as revenue.

Jennifer Rutherford, a project manager who had been with the company for over two years, had supervised the administration of many of these projects. She felt that opportunities to standardize and streamline the process did exist, stating:

As long as you understand how we define “emotional engagement”, the nature of the target audience, and the goals of the advertisement and the campaign as a whole, then the interpretation of results is relatively straightforward.

Nevertheless, she also felt that a balance needed to be achieved between the goal of standardizing the process and the research benefits of undertaking custom projects. She further stated:

I feel as though our employees have a passion for what we do, and combined with the development and work that we do for custom projects, this fuels innovative ideas and processes that are essential to the ongoing development in our company. I hope the company doesn't standardize our work entirely, since I feel as though our custom work helps inform the development of these standards.

Dr. Huda Shalhoub, also a project manager, reported that only about 10% of her daily workload was routine, a situation she described as “fantastic”. She felt that customization was the signature mark of the company and cautioned that too much standardization could reduce the value of the company's services to clients, even if it succeeded in increasing ISR's margins. She also emphasized the importance of staff quality in delivering quality results in a timely manner.

Shalhoub also commented on the importance of project managers in the sales process for custom projects. Although the sales staff tended to initiate contact with potential clients, it generally took heavy involvement of project managers to develop the detailed proposal necessary to close the sale. Project managers also took on the responsibility for ongoing client support and managing the long term client relationship.

Sean Sullivan, who was responsible for overall supervision of projects as ISR's VP of Operations, strongly agreed with the need for project managers to be involved in the sales process and commented on the heavy work demands being placed on project managers. From his perspective, however, the split between relatively routine projects and projects requiring a more customized strategy was about even. He commented, however, that the mix seemed to be moving in the direction of more customized work. This added to the company's staffing challenge. He reported that it could take up to six months to train a field analyst—the position preceding project manager—to be fully effective. Thus, ramping up the business was not an outcome that could be achieved overnight.

Dr. Ravi Kothuri, ISR's Chief Technology Officer and VP of R&D, viewed the project portfolio as being driven by a biocube with three dimensions: the nature of the participant being studied, the nature of the message to be conveyed, and the nature of the channel being used. As illustrated in Exhibit 9, he anticipated that the company would have a core set of technologies that would be applicable to all its projects. In addition, some project combinations of message/channel/participant—such as a particular demographic's reactions to TV advertising intended to encourage product purchase—were going to be relatively easy to standardize into projects requiring little intervention on the part of ISR.

Other types of questions and media, however, might always require custom solutions and high ISR involvement. These would ultimately become the driving force behind the company's research. In this regard, one thing that he was emphatic about was the need for the company to continue capturing data relating to participant reactions to all types of stimuli. It was his opinion that continuing to develop and enhance Innerscope's Biometric Warehouse – currently one of world's largest database of participant

biometric data (with over a 100 different projects and more than 2500 anonymous participant data)—and mining it for learning various patterns—would prove to be a major advantage in developing new ways to interpret responses and refine the company’s algorithms. Kothuri’s own background, which included 10 years developing technologies for Oracle—the world’s largest database company—reinforced his feelings about the potential value of such data. The same view was held by competitor EmSense as well, which already bragged of having developed such a database on its web site.

*Joint Products:* The joint products prong of ISR’s strategy involved working closely with the company’s partners, most notably Ipsos, to develop standardized projects that could be set up and delivered by the partners without extensive involvement of ISR staff. At the present time, the main joint products participants were Ipsos—in the area of copy testing—and Proctor & Gamble (the world’s largest advertiser) in new product testing. The company expected to expand this strategy to other areas, such as print media and the web, as appropriate partnerships were developed. In this regard, its strategy appeared to parallel the approach taken by its competitor EmSense.

Brian Levine, one of the company’s two co-founders, described the situation as follows:

When the firm got started in 2006, it was basically a research consulting firm. Every project cost about \$25,000 and made money. As time went by, the company’s projects began to cost more and the sales cycle grew longer. Meanwhile, client companies were becoming more selective and demanding of full-service solutions.

The question now becomes: What direction should we take? Should we move to become a full service consulting firm and, if so, what do we need to do to become profitable? Or should we try to develop a platform that makes the \$25,000 project profitable once more?

So far, the relationship with Ipsos seemed to be proceeding smoothly. Jennifer Rutherford had just returned from a week-long training session for Ipsos personnel. Dr. Randall Rule, one of ISR’s scientists, expressed positive feelings about how Ipsos was adapting ISR’s approach to its own needs, which incorporated many of the more traditional survey and interview-focused approaches to market research. Rule commented that “Ipsos is getting good at interpreting the data”.

Gill expressed similar enthusiasm about the evolution of the Ipsos relationship but also recognized some drawbacks. Some of ISR’s biggest repeat clients were paying substantial fees for ISR’s “high touch” services. How would they react to the more standardized menu likely to be offered by Ipsos? And how would ISR replace any revenue that was lost in the transfer?

One possible way to avoid revenue loss would be to make available an add-on service available to former clients as a substitute to what Ipsos was providing. The potential danger here was that if such a service were too successful, it might negate a key benefit of the joint products approach. Specifically, Gill saw the big potential value of the Ipsos relationship as coming when key Ipsos clients—which included most of the largest marketers in the world (e.g., P&G, AnheuserBusch InBev, Unilever, Colgate, and many others)—began to require a neuromarketing test become part of their standard package for evaluating their thousands of ads, products and promotional materials. Based on the types of results ISR clients had been experiencing, he felt this was a very real possibility. The likelihood of such adoptions was great, however, only if the clients felt that the biometric product bundle was sufficiently standard, and predictable in its effects, so that it did not add inordinately to the costs of testing or, equally significant, the time required for testing.

*New opportunities:* The new opportunities strategic thrust involves development in two directions: addressing entirely new markets (such as home health care or education) and developing new approaches data gathering to significantly reduce the cost of the activity and thereby allow larger and more diverse groups of participants to be tested.

With respect to new markets, the vision was a long term one. Some markets—such as that of at home health monitoring—were so potentially large as to almost defy quantification. Nevertheless, ISR was already acquiring medical-grade biometric signals in its neuromarketing activities. As long as the company remained a market leader once the technologies needed to support these markets evolved to the point where they were no longer cost prohibitive, it stood to participate in a revenue stream that could be worth hundreds of billions of dollars. For the time being, however, Gill felt that the best course was to wait patiently, remaining alert to market developments.

With respect to cost reduction, a more proactive approach seemed warranted. As a new and emerging area of marketing, the use of biometrics to predict consumer behavior was greeted with both interest and suspicion. One obstacle that ISR frequently faced was that of sample size and geographic distribution. Marketers were used to surveys involving hundreds or thousands of respondents. Data of this sort could be analyzed statistically and confidence intervals could be established. The much smaller groups used for neuromarketing projects—sometimes as small as a few dozen participants—could yield much richer data. There was a price to be paid for such richness, however. Client confidence in results from such small groups suffered. But increasing the size of the study was often cost-prohibitive. Imagine, for example, how difficult it would be to recruit several hundred candidates from a very narrow target market (e.g., bass fishermen aged 18-35 who are considering a boat purchase within the next year) to participate in a central location study.

One approach that ISR was seriously considering was the development of a simpler version of its technologies that could be deployed offsite, most likely in a kiosk environment that could be located in malls and movie theaters across the country. Such mall locations were already a mainstay of traditional market research. The kiosk solution would extend this by combining biometric measurement with more standard data gathering (e.g., using a touch screen). Gill estimated that such a technology, once deployed, could bring per-participant costs down by more than 75%—and more than that if travel and other expenses associated with acquiring geographically distributed participants were taken into account. A suitable partner for kiosk development that provided marketing research services on an all-in “cost per interview” basis had already been identified. That firm designed its own kiosks, installed them and staffed them in approximately 75 permanent locations around the U.S. Furthermore, it had already established relationships with Ipsos and appeared receptive to working with ISR on the development.

One particular challenge presented by the kiosk strategy was that of funding its development. ISR’s own contribution to the development of the hardware and related software would likely be several million dollars. While the company had appeared to have turned the corner in terms of profitability, there was no way such a project could be completed in the near term without additional external funding. The question then became one of how aggressively to pursue such funding, or would it make sense to wait until the economic climate had improved and continuing improvements in biometric devices drove the costs of implementation down. Such a wait-and-see approach carried its own risks, however. If ISR failed to maintain its position at the leading edge of neuromarketing, would the huge future the company envisioned be lost to it?

## The Decision

As he sat at his desk, Gill described the short and long term decisions facing the company as follows:

We have made the decision to get funding for the kiosk initiative and that process is in place. The critical decision we face is to achieve the right balance between the existing consulting business and the Joint Products business. Joint Products have the advantage of being scalable and on a percentage basis much more profitable. Furthermore, clients benefit because they get a complete solution at a lower cost. As a result Joint Products may be the only viable approach to implementing Innerscope's technology on a widespread basis in a reasonable period of time. However, these advantages come with the cost of transferring 60-80% of the revenue for a project to our partner. In addition, we lose some of the direct connection with our customers.

The long term question is how much should we emphasize our Joint Products strategy versus the existing consulting business. Will the increased volume make up for the revenue transfer and loss of connection to customers? In the short term, our sales people are asking whether they should focus on selling joint products or our standard consulting projects. We have to be able to give them that answer immediately.

Exhibit 1: Examples of Innerscope Research Clients<sup>2</sup>



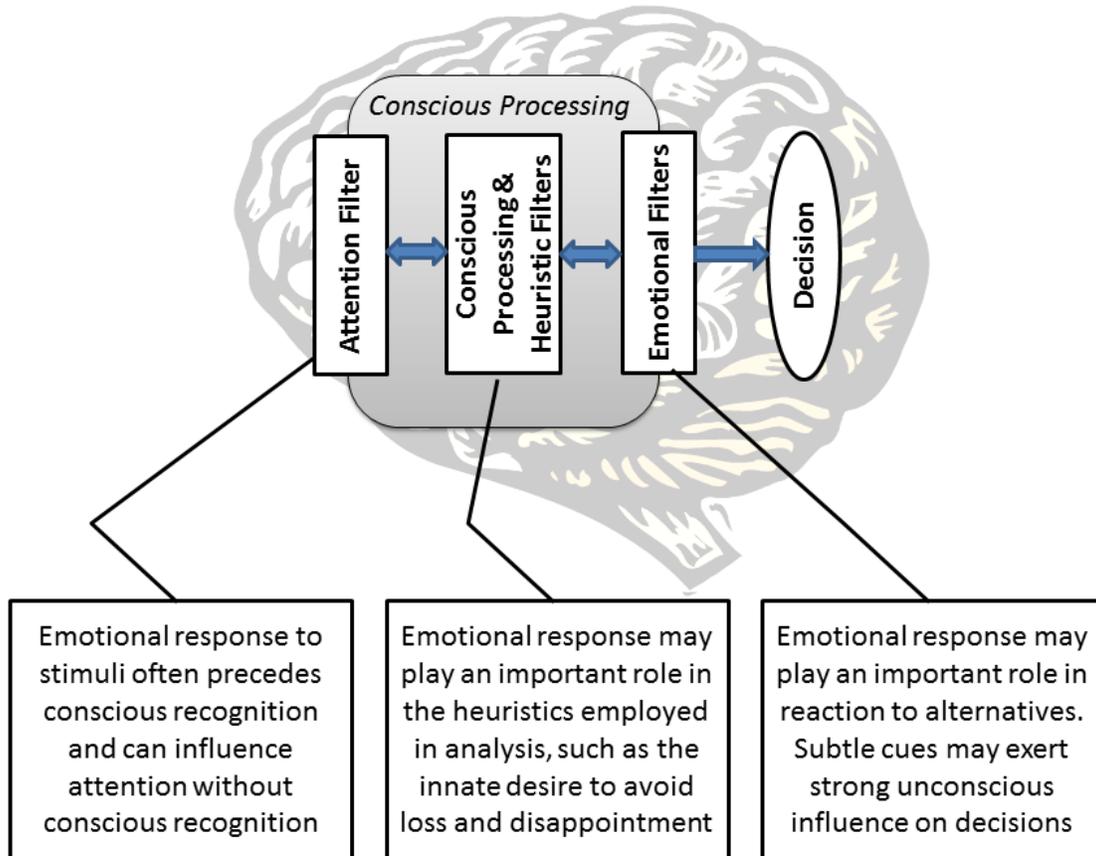
<sup>2</sup> Source: "Sample Innerscope Clients in the Public Domain" slide from internal business presentation.

**Exhibit 2: Biometric Technologies**

Technology	Measurement and Current Uses
Electrocardiogram (ECG/EKG)	Measures electrical activity in the heart. In addition to medical uses, it tends to serve as indicator of emotion and attention.
Electrodermal activity (SCL)	Measures skin conductance, highly correlated with rate of perspiration. Tends to be correlated with nervous system activity and stress.
Respiration	Measures volume and rate of respiration. Correlated with physical activity and a variety of other indicators of stress and arousal.
Pupil indices	Measures pupil dilation and/or blink rate. Correlated with cognitive processing, arousal and also SCL measures.
Electrogastogram (EGG)	Measures activity in abdominal muscles, which often respond to stress. Uses are mainly medical, rather than marketing.
Electromyography (EMG)	Measures muscle activity beneath the skin. Correlates with some emotional responses and has occasionally been used in media research.
Electroencephalography (EEG)	Measures surface electrical activity in the brain. Has long been used in research on emotion and attention.
Positron Emission Tomography (PET)	Uses a radioactive tracer to signal activity in the brain and body. Mainly used for research into how the brain processes information.
Magnetic resonance imaging (MRI)	Measures localized activity in the brain. An important tool used for understanding the activities associated with different brain regions. Although some attempts have been made to use the tool for marketing research, it has the drawback of requiring the participant to react in a very unnatural setting (an MRI chamber).
Eye tracking	Identifies the specific region of an image that the participant's eyes are focused on. Particularly useful for text and static images, where the specific regions given the most attention can be identified and averaged over a group.
Facial expression monitoring	Measures voluntary and involuntary changes in a participant's facial expression in reaction to a stimulus. Seen to have great potential value for marketing purposes but existing technologies for measuring changes are still experimental and results have yet to be validated.

Adapted from: Pettit, R, "Innerscope Research: An ARF Research Review", *Advertising Research Foundation Research Report*, 11 September 2009. Augmented by case-writer interviews.

### Exhibit 3: Biometrics and Decision Making



Where processing takes place outside of conscious attention, biometrics can provide evidence of significant emotional involvement in decision-making even where the participant self-reports no such engagement.

## Exhibit 4: Biographies of ISR Executives

### *Carl D. Marci, M.D., CEO and Chief Science Officer*

- Dr. Carl Marci is Director of Social Neuroscience for the Psychotherapy Research Program at the Massachusetts General Hospital and a Staff Psychiatrist at MGH. He is on faculty at Harvard Medical School and is a former Visiting Lecturer at the Massachusetts Institute of Technology Program in Media Arts & Sciences.
- Dr. Marci received his B.A. with honors from Columbia University and his M.A. in psychology and philosophy from Oxford University as a Rhodes Scholar. Dr. Marci completed his M.D. with honors at Harvard Medical School.
- Dr. Marci has extensive training in the use of biomeasures and the neuroscience of emotion through two National Institutes of Health fellowships. He has published numerous articles in peer-reviewed science journals, gives lectures nationally and internationally, and is a leader in the new field of social neuroscience. Dr. Marci's current academic research projects include the physiology and neurobiology of emotion as well as the use of physiologic and behavioral measures of depression in response to treatment. His entrepreneurial experience includes two former technology start-ups, one in healthcare information technology and one in remote sensing technology. He has recently presented at the Advertising Research Foundation and the World Advertising Research Conference, and is the guest editor of the International Journal of Advertising special issue on neuromarketing.

### *Brian Levine: President and Chief Innovation Officer*

- Brian Levine has extensive experience in the design and implementation of consumer research studies. He directed research and design teams for high profile companies including Old Navy, The Gap, Banana Republic, Electronic Arts, The Mayo Clinic, 3M Post-it® Products, Philips Electronics, IBM, and Fidelity Investments. He also directed the front-end development and customer research for the creation of Major League Baseball's highly successful network of 33 web sites.
- Mr. Levine received his BA in design from the University of Wisconsin and his M.B.A. from the Massachusetts Institute of Technology Sloan School of Management. While at MIT, Mr. Levine split his time between Sloan and the MIT Media Lab where his project involving the use of multiplatform sensing technology in media research, co-directed by Dr. Marci, was a major inspiration for the formation of Innerscope Research.

### *Geoffrey Gill, Chief Financial Officer/ Vice President Strategy*

- Geoffrey Gill brings a diverse background that includes strategy, operations, and finance. He is a proven leader in both technology startups and high value service businesses. As VP Operations/CFO, he helped launch Predictive Power, a startup that provided monitoring services to electric utilities, and was instrumental in defining its strategy, closing its first sales, and obtaining venture capital financing. As a senior manager at Arthur D. Little, he led the development of its operations management consulting methodologies, helping to codify ad hoc services into consulting products. As a partner in the Technology Strategies Group, he helped numerous small and large companies define strategies to create new technology-based markets. He also has experience leading R&D, manufacturing, and global marketing/sales organizations.
- Mr. Gill has an A.B. in Applied Mathematics and Physics from Harvard College and an M.S. in Management of Technology from the MIT Sloan School of Management.

*Linda Dupree, Executive Vice President of Sales and Marketing*

- Linda Dupree’s career has spanned the spectrum of the advertising industry, including roles within and alongside content providers, advertisers, agencies and research suppliers. Prior to joining Innerscope, she worked at Arbitron for 19 years, ultimately serving as a member of the executive staff. She was responsible for leading the sales and marketing for the Advertiser/Agency segment and driving key product and technology enhancements. She served as co-General Manager for Project Apollo, a joint venture between Arbitron and The Nielsen Company that produced groundbreaking “single source” return on investment-based market research in concert with a group of leading national advertisers. Additional experience includes advertising roles at Grey Advertising and The Stroh Brewery Company.
- Ms. Dupree has a B.A. from Millsaps College and did post-graduate work at The University of Tennessee. Through a fellowship from the International Women’s Forum, she studied international business at Cambridge University and leadership at Harvard.

*Ravi Kothuri, Ph.D, Vice President of Technology/Research & Development*

- Dr. Ravi Kothuri has been an active researcher and innovator in the database industry (esp. spatial and multimedia) for the past 15 years. Over his ten year tenure with Oracle, he architected various software products. He also holds over twenty-five patents on specific Oracle technology and has authored numerous articles for database conferences and journals. His depth and breadth of knowledge has led to him delivering keynote addresses at conferences, and presenting at DARPA and NSF review panels. Dr. Kothuri has also authored a book on Oracle Spatial Technology and has taught part-time at Boston University.
- Dr. Kothuri received his Ph.D. in Computer Science from the University of California Santa Barbara, and was in the Executive Program at MIT Sloan. He is a professional member of the IEEE and the ACM, and is an active member in the database research community.

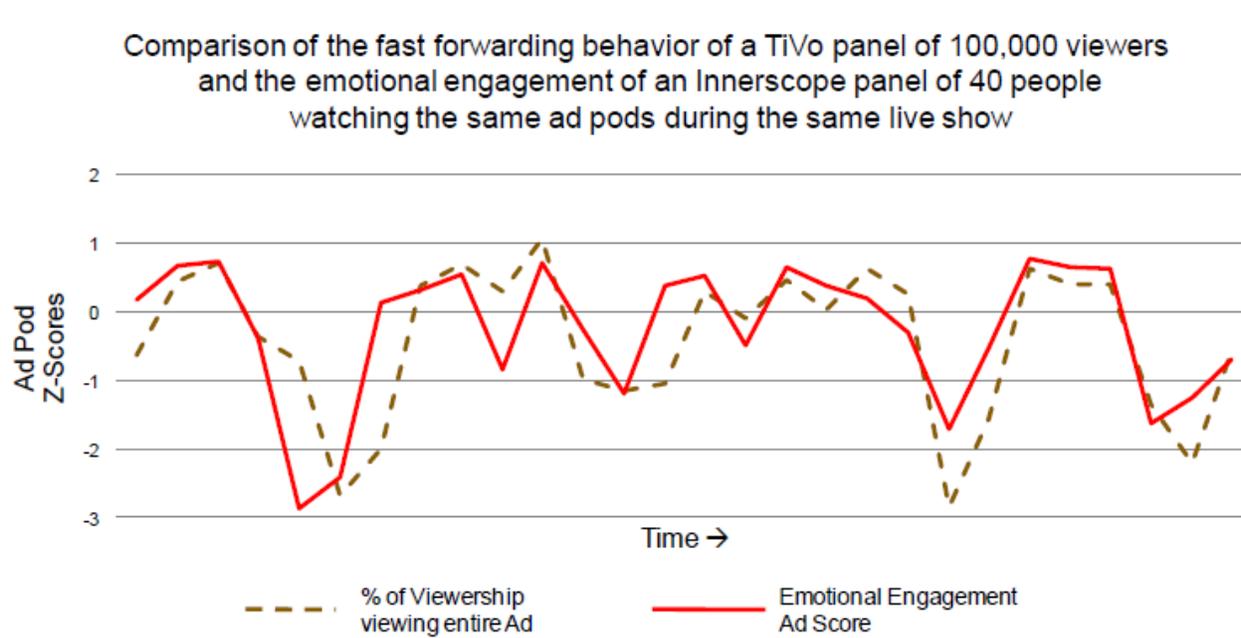
*Source:* Innerscope Research Inc. internal memorandum.

**Exhibit 5: Innerscope Biometric Monitoring System™**



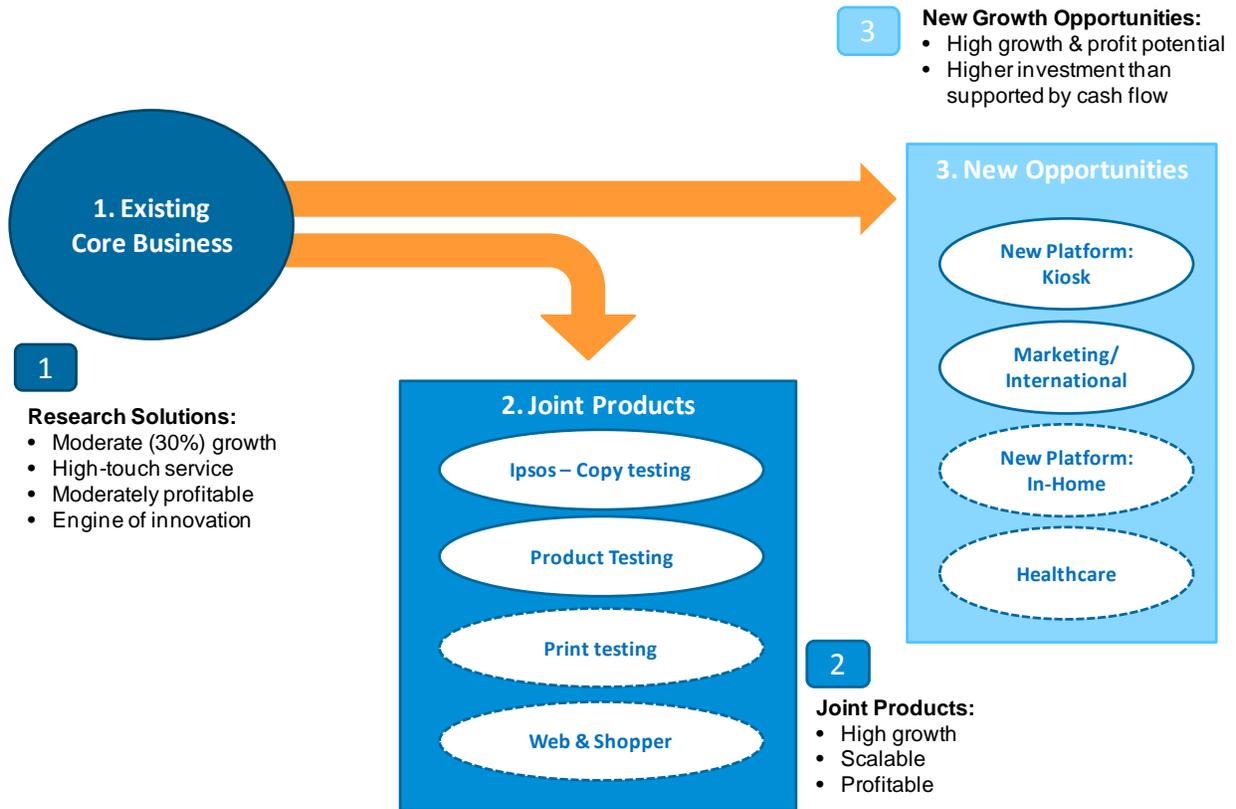
*Source:* Innerscope Research Inc. internal memorandum.

### Exhibit 6: Emotional Engagement vs. Tivo Behavior



Source: Innerscope Research Inc. internal memorandum.

### Exhibit 7: Innerscope’s Three-Pronged Strategic Approach



Source: Innerscope Research Inc. internal memorandum.

### Exhibit 8: Selected Innerscope Clients and Services

Industry	Selected Innerscope Clients	Example Services Provided
<b>Packaged Goods</b>	Unilever, Campbells Soup, Mars, multiple other Fortune 500 companies	<ul style="list-style-type: none"> <li>• TV ad optimization</li> <li>• Print ad optimization</li> <li>• Web site usability and design optimization</li> <li>• Sensory testing</li> </ul>
<b>Media and advertising</b>	NBC, FOX, Telemundo, Warner Bros, Turner, MTV, National Geographic Channel, Starcom, Discovery, CNN	<ul style="list-style-type: none"> <li>• TV promo and movie trailer optimization</li> <li>• Pod length impact</li> <li>• Context impact – program/ad synergy</li> <li>• TV Program analysis and optimization</li> <li>• Web site usability and design optimization</li> <li>• Social media impact</li> </ul>
<b>Pharma/Health</b>	Multiple Pharma companies, Major Teaching Hospital	<ul style="list-style-type: none"> <li>• TV ad optimization</li> <li>• Print ad optimization</li> <li>• Doctor/patient interaction</li> </ul>
<b>Other</b>	Intuit, Yahoo!, eHarmony, Google, YouTube, Invista	<ul style="list-style-type: none"> <li>• Web site usability and design optimization</li> <li>• Sales research</li> <li>• TV ad optimization</li> </ul>
<b>Automotive</b>	Honda, Other undisclosed	<ul style="list-style-type: none"> <li>• Ad campaign evaluation</li> </ul>
<b>Finance, banking, and insurance</b>	Insurance, Mutual Fund, and Banking Companies	<ul style="list-style-type: none"> <li>• Ad campaign evaluation</li> </ul>

Source: Innerscope Research Inc. internal memorandum.

**Exhibit 9: Innerscope Technology Conception**

