

Measuring the Emotional Quality of Products: How Entrepreneurial Firms Can Efficiently and Effectively Improve New Product Development Practices

Brooke R. Envick
St. Mary's University

Eileen Wall-Mullen
St. Mary's University

Abstract

It is essential for small, entrepreneurial firms with limited resources to adopt very efficient and effective new product development practices. This paper introduces a system called Emogram that can be used to test new products. Emogram is a computer-based system that quickly and accurately measures a new product's emotional utility. This provides valuable insight for the entrepreneur to improve both product design and marketing strategies.

Key Words: entrepreneurship, product development, innovation, emotions



Introduction

Innovation and new product development are essential for survival in today's business environment. Even large and well-established companies continually look for new platforms and methods to get new ideas to market. For example, GE, Nestle', and Nike are just three of the many companies that used the 2008 summer Olympics to drive their innovation strategies (BusinessWeek, 2008). Companies from a variety of industries including technology, food production, sporting goods, and architecture were able to use the captive audience provided by the Olympics to commercialize their product innovations. However, many firms do not have the resources necessary to utilize such a high-profile platform. In fact, many small entrepreneurial companies need to have very efficient and effective new product development practices in place to maximize the limited resources available to take a new product from the idea stage to market.

This paper provides a tool entrepreneurs can use in the testing stage of the new product development process to help maximize the resources small, entrepreneurial companies hold so dear, including time, money, and human resources. The authors introduce, Emogram, a computer-based software program that uses non-linear systems theory to analyze the 11 basic emotions, their interactions, and track the dynamic changes in emotions over time. Researchers have begun to use the measures of emotions for business purposes, such as improving organizational climate and decision-making (Priesmeyer & Mudge, 2008) and in measuring purchase intent after consumers are exposed to products, services, and advertising (Priesmeyer, Axiomakaros, and Murray, 2003). By utilizing this efficient software tool, entrepreneurs can efficiently test their ideas in the market, while maximizing the effectiveness of their new product development practices.

Literature Review

The literature review focuses on consumer involvement in new product development practices as well as understanding, measuring and analyzing human emotions. This provides the basis for how entrepreneurial firms can gain a competitive advantage by measuring the emotional quality of new product offerings.

Customer Participation in New Product Development Practices

New product and service development is an essential activity for entrepreneurial firms that wish to become serious contenders in today's dynamic business environment, characterized by changing markets, high rates of technical obsolescence, shorter product life cycles and increasing global competition. One primary effect of this dynamic business environment is that it pushes firms to develop more efficient and effective ways to develop new products and services. Successful new product development creates significant advantages for entrepreneurs including access to early cash flows, external visibility, legitimacy, and early market share (Deeds & Hill, 1996). The question this paper addresses is how entrepreneurial firms can bypass common mistakes made when ideas and timing are wrong, which are the two biggest reasons for commercialization failure (Griffin, 1997). Furthermore, we address how firms can measure the appeal of an innovative product or service idea, which is cited as one of the top-three concerns of product development (Little, 1991).

Booz, Allen, and Hamilton (1968) provide a common six-stage process for product development typically used by firms. The six stages include exploration, screening, business analysis, development, testing, and commercialization. This article focuses on the testing stage, and introduces a method to test the emotional state of potential customers as they are exposed to new products. There is considerable support in the literature that suggests involving customers in the new product development process provides a significant advantage to the firm. Page (1990) contends that a “best practice” for product-producing companies is to have the “satisfaction of customer needs” as an *explicit* success criterion. Likewise, Mercer Management Consulting (1994) found that high-performing firms were differentiated from low-performing firms in new product development in their execution of a customer-centered process. Therefore, it is imperative to obtain accurate information on potential consumers’ reaction to new products and services in the satisfaction of their needs.

Hughes and Chafin (1996) state that new product development can be like hitting a moving target from atop a runaway train. They contend that the way an entrepreneurial firm can meet the challenges faced in such a dynamic environment is to transform product development into a continuous, iterative, learning process focused on customer value. Likewise, Gruner and Homburg (2000) conducted an empirical study indicating that customer interaction in the new product development process has a positive impact on new product success. Continued support for involving customers in the product development process is offered by Goffin and New (2001). In an exploratory study, they found that customer support was essential in successfully marketing many new products. Many aspects of support can be tied directly to a product’s design, so customer support requirements should be evaluated during new product development.

Understanding, Measuring, and Analyzing Human Emotions

Darwin (1872), provided the first major contribution to the study of emotion with his book, *The Expression of Emotions in Man and Animal*. He addressed questions such as what are the basic emotions, are they universal, how can they be defined, measured, and compared. Ultimately, the differences in facial expressions led to the identity of various distinct emotions.

Table 1: Basic Emotions

Basic Emotions
Happiness
Interest
Surprise
Contempt
Disgust
Anxiety
Shame
Fear
Anger
Distress
Sadness

These expressions not only defined the emotions, but were useful in identifying and measuring them. Subsequently, Ekman and Feisen (1978) developed the Facial Action Coding System

(FACS), which allows one to objectively identify an emotion by the combination of the facial muscles used to express it. Visual images (pictures) can then be useful tools to interpret these expressions, and thus emotions (Shalif, 1992). The eleven basic emotions are presented in Table 1. Recent work by Richard Lazarus (1999), confirms the merit of this list of emotions.

Research in consumer behavior indicates that emotion, as well as reason, is an important component in consumer decision making. Emotion has generally been found to add a richer understanding of the consumption experience and may sometimes be a primary motivator of behavior (Hirschman & Holbrook 1982.) For example, brand relationships have been found to be more heavily based on emotional factors than cognitive ones (Pawle & Cooper 2006). This suggests that in order to create a sustainable competitive advantage, a company may need to go beyond simply creating utilitarian or functional value with their product to creating emotional value for customers. In addition, emotion has been found to play a role in the diffusion of new products to the market. Wood & Moreau, for example discovered that new product adoption was improved by the addition of emotional responses (2006). Thus, it seems an understanding of emotional response to a product prior to launch could provide valuable information to entrepreneurs.

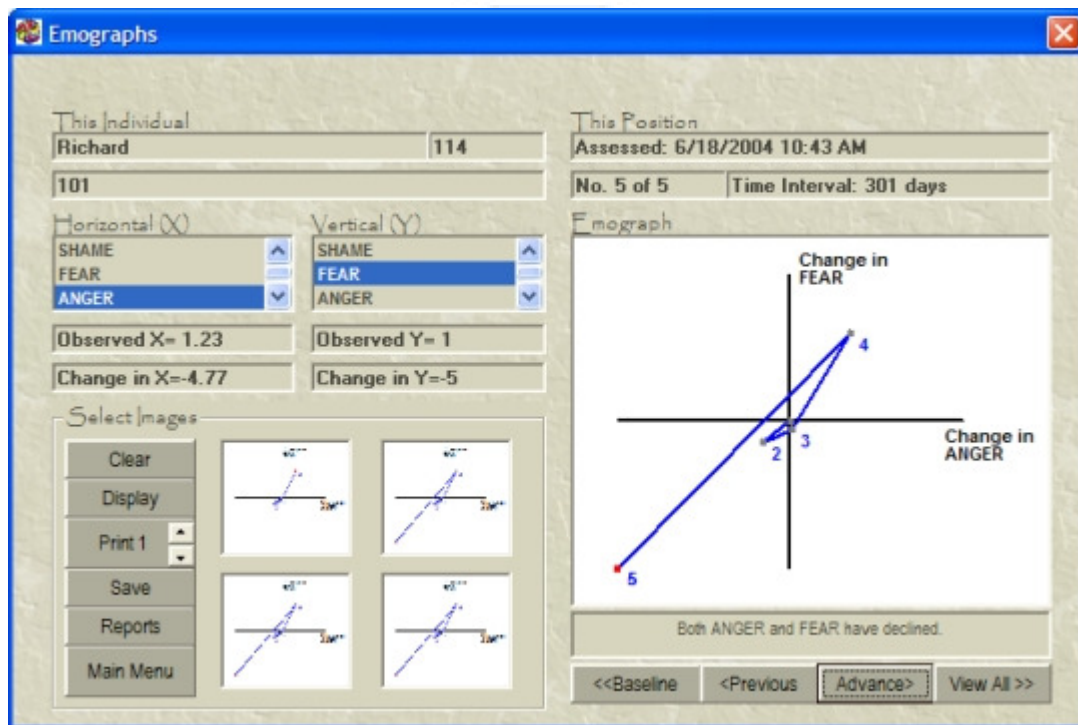
Emogram is a computer-based software program that uses non-linear systems theory to analyze the 11 basic emotions, their interactions, and track the dynamic changes in emotions over time. Traditional linear marketing research methods have often failed to provide insights needed for a company to connect with customers and create a sustainable competitive advantage. Its most common failure -- failing to accurately assess the consumer's emotional needs. Emotions are closely interwoven into reasoning, and essential for sound decision making (Zaltman 2006).

Figure 1: Measuring Emotions Through Emogram



Traditionally, measures of emotions have been used in clinical settings for therapeutic purposes. Emogram has been used to measure emotions in the resolution of substance abuse related trauma in couples (Capps, 2005), in managing the emotions of disaster response workers (Priesmeyer, Knickerbocker, and Mudge, 2002), and in measuring and interpreting emotional dynamics in counseling (Priesmeyer, Knickerbocker, Comstock, and Mudge, 2001). However, researchers have begun to use the measures of emotions for business purposes, such as improving organizational climate and decision-making (Priesmeyer & Mudge, 2008) and in measuring purchase intent after consumers are exposed to products, services, and advertising (Priesmeyer, Axiomakaros, and Murray, 2003).

Figure 2: Analyzing Emotions with Emogram



Emogram measures the 11 basic emotions by presenting a series of photographs that precisely depict the emotions. Individuals respond to each photograph indicating a level of agreement with each photo. The measurement process only takes a few minutes. Different presenters are available to suit demographic needs. See Figure 1.

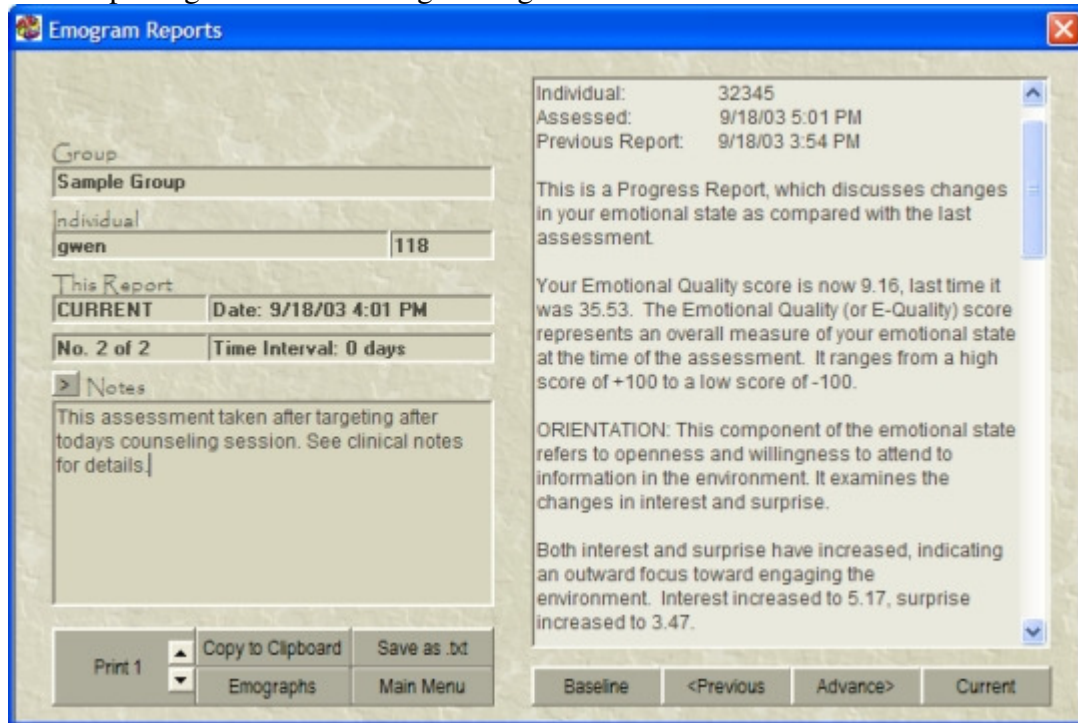
The novelty of Emogram partially explains the paucity of research as to its utility. The non-linear nature makes it difficult to validate its constructs. However, Mudge (2003) argues that assessment instruments that are designed to measure emotions in isolation are less sensitive and less discriminating at low emotional levels, thus restricting utility in discrimination of emotions in isolation. Therefore, emotions are better studied in a nonlinear fashion as provided by Emogram. This research provides support for embracing a dynamic approach to research on emotions by utilizing this nonlinear measurement tool.

Nonlinear systems theory is used to analyze the interactions between all 11 basic emotions. Nonlinear analysis is an alternate way of analyzing data. Rather than averaging data it depicts the precise evolution of a complex system. These phase plane graphics depict the

incremental evolution and dynamic interactions of all the emotions. See Figure 2. These methods have been well established and documented in articles by the developers and users (Mudge, 2003; Priesmeyer & Mudge, 2008; Priesmeyer, Axiomakaros, and Murray, 2003).

Information mapped into the nonlinear analysis produces precise reports that include describe and interpret changes in all the emotions. See Figure 3.

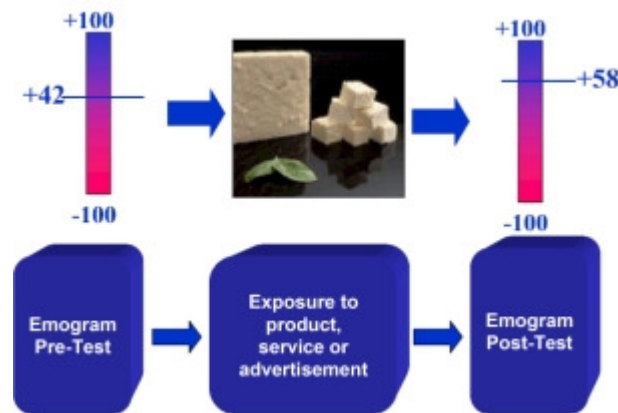
Figure 3: Interpreting Emotions Through Emogram



Using Emogram To Measure The Emotional Quality Of New Products

How an individual responds to a new product can reveal much about its emotional utility. Individuals have different emotional backgrounds that can cause them to respond to a product differently. The overall Emotional Quality score shifts when an individual is exposed to a new product. This change along with the changes in each of the 11 basic emotions can be measured. See Figure 4.

Figure 4: Testing Products Using Emogram



Knowing the emotional reaction to a new product is invaluable to an entrepreneurial firm, especially when time and monetary constraints are at hand. The Emotional Quality (EQ) captures the overall emotional response to the new product, and it can be measured with scores ranging from +100 (highly pleasurable) to -100 (highly unpleasurable), with zero representing a neutral response.

When evaluating a new product, the interpretation of each emotion can be stated as given in Table 2 (Priesmeyer & Mudge, 2008).

Table 2: Emotional Reactions to Products

<i>Emotional Reactions to Products</i>
Happiness - the product supports consumer desires
Interest - the product draws and holds attention
Surprise - the product offers unexpected features
Disgust - the product has distasteful features
Contempt - the product causes unpleasantness
Anger - the product causes aggressiveness
Fear - the product has specific threatening features
Anxiety - the product has unspecified threatening features
Shame - the product elicits feelings of incompetence
Distress - the product causes feelings of helplessness
Sadness - the product elicits feelings of personal loss

Emogram has been used to measure emotional responses to products, services, and advertising in established firms. One example is a unique chair design, called the Dondolo, which is designed to reduce stress. Each subject was given a pre-Emogram test, permitted five minutes in the Dondolo, and then a post-Emogram test was given to determine changes in their emotions. Results showed that anger and fear both decreased, and in general, users became happier, more interested and more surprised.

Emogram can help bypass common mistakes firms make when ideas and timing are wrong, which are the two biggest reasons for commercialization failure (Griffin, 1997). It is also useful for improving on product appeal, which is cited as one of the top-three concerns of

product development (Little, 1991). Page (1990) also contends that a “best practice” for product-producing companies is to have the “satisfaction of customer needs” as an explicit success criterion. Likewise, Mercer Management Consulting (1994) found that high-performing firms were differentiated from low-performing firms in new product development in their execution of a customer-centered process.

One very common way firms gather information from customers is through in-dept interviews to gain a deeper understanding of their needs (Mello, Sheila, & Vermette, 1995). This requires potential customers to think about how they feel, instead of having them respond at an emotional level that accurately reflects the emotional state at the time of the assessment, which is a time-consuming process. Using Emogram can significantly reduce the time required to acquire customer reactions to new products. This provides a more efficient use of resources. Additionally, current research has examined the relative importance of emotions to cognitive messages, and results indicate that emotions relate to purchase intent to a far greater extent (Morris, Woo, Geason, & Kim, 2002). Therefore, using Emogram can help improve the effectiveness of customer-involvement in the new product testing phase.

CONCLUSIONS

A firm with static new product development practices will find themselves lagging behind the competition. As Griffin (1997) contends, new product development trends are evolutionary. Firms cannot allow their practices to stagnate or they will not remain competitive. This paper provides a revolutionary tool, Emogram, for testing new products and services by accurately measuring the emotional state of potential customers and thus their intentions to purchase. To date, information about feelings has been notoriously elusive, because they present themselves in a way that seems to defy measurement, logical interpretation, and control. Emogram can easily provide the competitive advantage entrepreneurial firms need to survive in a dynamic business environment, by making new product development processes more efficient and effective.

Product-testing almost exclusively focuses on the physical attributes of products, and at best, taps into cognitive assessments, asking customers to provide information about what they think of the product instead of the product’s emotion-evoking qualities. Emogram, not only provides a more efficient way to test products in the market, but provides a more effective way because it goes beyond traditional cognitive assessments by tapping into the eleven basic emotions.

REFERENCES

- Booz, Allen, & Hamilton (1968). *Management of New Products*. New York: Booz, Allen, and Hamilton.
- Capps, F. (2005). *The Exact Method: Resolution of Substance Abuse Related Trauma in Couples Counseling Utilizing Eye Movement Desensitization and Reprocessing*. Doctoral Dissertation. Texas A&M University, College Station, TX.
- Darwin, C. (1872). *The Expression of the Emotions in Man and Animals*. Great Britain: John Murray.

- Deeds, D. L. & Hill, C.W. (1996). Strategic alliances and the rate of new product development: An empirical study of entrepreneurial biotechnology firms. *Journal of Business Venturing*, 11, 41-55.
- Ekman, P. & Friesen, W.V. (1978). *Facial Action Coding System: A Technique for the Measurement of Facial Movement*. Palo Alto, CA: Consulting Psychologists Press.
- Goffin, K. & New, C. (2001). Customer support and new product development – an exploratory study. *International Journal of Operations & Production Management*, 21(3), 275-301.
- Griffin, A. (1997). PDMA research on new product development practices: updating trends and benchmarking best practices. *Journal of Product Innovation Management*, 14, 429-458.
- Gruner, K. E. & Homburg, C. (2000). Does customer interaction enhance new product success? *Journal of Business Research*, 49(1), 1-14.
- Hirschman, Elizabeth C. and Morris B. Holbrook (1982), “Hedonic Consumption: Emerging Concepts, Methods and Propositions,” *Journal of Marketing*, 46 (Summer), 92-101.
- Hughes, G. D. & Chafin, D.C. (1996). Turning new product development into a continuous learning process. (2), *Journal of Product Innovation Management*, 13(2), 89-104.
- Lazarus, R. S. (1999). *Stress and Emotion: A New Synthesis*. New York: Springer Publishing Company.
- Little, A. D. (1991). *The Arthur D. Little Survey on the Product Innovation Process*. Arthur D. Little: Cambridge, MA. December.
- Mello, S. & Vermette, D. (1995). Developing breakthrough products: how the best in class do it. *Management Roundtable Conference on Product Development Best Practices for Defining Customer Needs*. New Orleans, LA. November.
- Mercer Management Consulting, Inc. (1994). *High Performance New Product Development: Practices That Set Leaders Apart*, Mercer Management Consulting, Inc.: Boston, MA. November.
- Morris, J. D., Woo, C., Geason, J. A. & Kim, J. (2002). The power of affect: predicting intention. *The Journal of Advertising Research*, May-June, 7-17.
- Mudge, S. D. (2003). *Validation of the Emogram Anger Scale and the State-Trait Anger Expression Inventory-2 (STAXI-2): A Correlational Study*. Doctoral Dissertation. St. Mary's University, San Antonio, TX.
- Page, A. L. (1990). Assessing new product development practices and performance: establishing crucial norms. *Journal of Product Innovation Management*, 10(4), 273-290.
- Pawle, John and Peter Cooper (2006), “Measuring Emotions – Lovemarks, The Future Beyond Brands,” *Journal of Advertising Research*, (March), 38-48.
- Priesmeyer, H.R., Knickerbocker, D. K., Comstock, D., and Mudge, S. D. (2001). Emogram: A clinical tool for measuring and interpreting emotional dynamics. Proceedings of the American Counseling Association 2001 National Conference.
- Priesmeyer, H.R., Knickerbocker, D. K., and Mudge, S. D. (2002). Managing the emotions of disaster response workers: A computer-based deployable resource for site workers, counselors, and volunteers. *Proceedings of the 9th Annual International Emergency Management Society (TIEMS) Conference*, University of Waterloo, Waterloo, Canada.
- Priesmeyer, H. R., Axiomakaros, P., and Murray, M. A. (2003). Human emotions and purchase intent: how to measure the emotional quality shifts of products, services, and advertising. *Marketing Emotions Workshop, Chaotics International*, San Antonio, TX

- Priesmeyer, H.R. & Mudge, S. D. (2008). Using measures of emotions to improve work climate, products and decision-making. *Management & Marketing*, 18-32.
- Shalif, I. (1992). *The Emotions and the Dimensions of Discrimination among Them in Daily Life*. Doctoral Dissertation, University of Ramat-Gan, Israel.
- Wood, Stacy L. and C. Page Moreau (2006), "From Fear to Loathing? How Emotion Influences the Evaluations and Early Use of Innovations," *Journal of Marketing*, 70 (July), 44-57.
- Zaltman, Gerald (2006), *How Customers Think: Essential Insights into the Minds of the Market*. Boston: Harvard Business School Press.

About the Authors

Eileen Wall Mullen is an Associate Professor of Marketing at the Bill Greehey School of Business at St. Mary's University in San Antonio. She earned her Ph.D. in marketing at Texas A&M University in 2003. She has written a number of articles in publications such as the Academy of Management Perspectives, the Cornell Hotel and Restaurant Administration Quarterly, and the Entrepreneurial Executive. She has also won numerous awards for teaching at both St. Mary's and Texas A&M. Eileen's professional business experience includes twelve years with Hallmark Cards, Inc., where she held various management positions of increasing responsibility in Hallmark's marketing division. Her teaching and research interests include services marketing and retailing.

Brooke R. Envick, Ph.D. joined the faculty at St. Mary's University in 1996, shortly after completing her Ph.D. at the University of Nebraska-Lincoln. She is a Professor of Management, Director of the Meadows Center for Entrepreneurial Studies, and Director of the Entrepreneur Scholars Program. She also serves as Chairman of the Board for the Forum on Entrepreneurship Breakfast Series. Envick specializes her teaching in entrepreneurship, leadership, and small business management. She has received 11 teaching awards, including the Outstanding Educator Award for Innovative and Creative Teaching from the Academy of Educational Leadership. Envick has published over 20 peer reviewed journal articles in 10 different entrepreneurship and business management journals and is on the editorial board for the *Journal of Leadership & Organizational Studies*. She has received 13 distinguished research awards at national and international conferences. Envick has also served as a start-up and small business growth consultant for several entrepreneurial firms and is currently an advisor for the student managed business in the Bill Greehey School of Business.