

UNDERSTANDING AND PROTECTING VALUE IN NEW PRODUCT DEVELOPMENT

Jonathan Cagan and Craig M. Vogel

Abstract

In our book *Creating Breakthrough Products* we introduced a discrete set of attributes, called Value Opportunities (VOs), that can be used to evaluate value in a product or service. When used proactively the VOs help define program goals at the earliest stages of product development. Creating products that meet the value expectations of end customers, namely that meet their needs, wants and desires, is only part of the formula for a successful product. Another part resides in protecting that value in the market. In this paper we explore the use of Intellectual Property protection as a way to shield VOs. In particular, the emergence of design patents and trade dress has clarified the ability of companies to protect their investment in design for lifestyle, experience, and brand. We show how highly innovative, breakthrough products include attributes that are protectable through utility patents and design patents alike, and how trade dress can protect the long term brand equity.

Keywords: product value, value opportunities, intellectual property, patent, trade dress, brand

1 Introduction

In our book *Creating Breakthrough Products: Innovation from Product Planning to Program Approval* [1] we provide a strategy and series of tools to help companies navigate the earliest stages of product development, that portion of the process that is uncertain and undefined, namely the “fuzzy front end” of the process. In that book we argue that it is no longer sufficient to approach product development through the “form follows function” cost-driven minimalist process of much of the latter half of the 20th century. Instead the mantra for the 21st century is that “form and function must fulfill fantasy”.

A major focus of our process for new product development is to understand the essence of the target market, to understand what the customer truly values and then to convert that understanding into form and function. In the book we define value and introduce a series of tools to help assess, organize, analyze, and act on that value to create new products. In this paper we summarize one of those tools, the Value Opportunity Analysis. The Value Opportunity Analysis has been used in a wide variety of industries including automotive, home appliance, medical equipment, supermarket design, and even data management.

More companies today recognize the importance of brand. Our argument is that the core to a great brand is a great product. Although advertising campaigns may be a critical mechanism for distributing a message, they alone cannot be the core of a brand. Product value and the related Value Opportunities are critical to developing the right message for a brand. The form, features, and semantics of a product all describe the personality of the product, and the experience of use. Brand, then, is an important part of the long-term success of a product or service.

Creating a great product is the first goal. Succeeding in the marketplace is the second (though not secondary). Success is an outcome of the first in that a great product will only be great if it sells and sells well in the marketplace. However a key to success is to be in a position to sustain market share with a clear brand identity. With an aggressive and competitive marketplace, and with the ability for companies to very quickly bring products to market, every new product developer must look for opportunities to maximize success.

In this paper we discuss the array of approaches to Intellectual Property (IP) protection that work to protect each aspect of value defined through Value Opportunities. Most companies recognize the benefit of utility patents. Many are beginning to take more advantage of design patents and copyrights. But few product developers recognize the benefit of trade dress, or how all of these tools can work in concert to protect innovation.

In the next section we summarize Value Opportunities (VOs) and the analysis of those opportunities through a Value Opportunity Analysis. We then discuss the various approaches to IP protection. Then we show how each of the VO categories can be protected through IP tools.

2 Value Opportunities

It used to be that the more features you could get in a product for the least price you could pay the more “value” you were told that the product had. For products that are highly desirable, value is not the more features you can get for the least money but rather how effectively the product or service meets personal expectation of usefulness, usability and desirability. Value is represented through impact of the product or service on the user’s lifestyle, use of the product or service through enabling features, and meaningful ergonomics.

We have broken value into seven classes that we call Value Opportunities (VOs): emotion, aesthetics, identity, ergonomics, impact, core technology, and quality. Each of these is further broken down into specific attributes (Figure 1). Emotion is the direct connection to the user experience and fantasy. Ergonomics addresses the physical interaction with a product. Aesthetics includes not only visual, or form, but all of the senses that interact in experiencing a product. Identity is the physical statement of the brand; a product is core to any successful brand identity. Impact addresses the societal influence connected to and addressed by the product, including social relevance to groups and individuals, and environmental considerations. Core technology addresses the functions that enable performance while quality addresses not only manufacturing quality but the expectation of how the product will perform.

In *Creating Breakthrough Products*, we have shown that this breakdown sufficiently describes the value quotient of over 20 products from consumer goods to industrial products to services like UPS and even the emerging retro baseball parks in the US. We have also used this breakdown proactively in product development in service industries, the medical products industry, the auto industry, and commodity manufactures of raw materials. We have introduced these concepts to electronics consumer manufacturers and the durable goods industries. In each of these cases this approach has helped our client understand what aspects of value relate to their target customer base.

In Figure 1 we show a Value Opportunity Chart. Here each VO is evaluated qualitatively as zero, low, medium, and high, based on how well that attribute addresses the goal of the product. Also in the VO chart are the profit impact, brand impact, and extendibility of the product to other products in the company. The VO Chart can be used to set expectations of

where a new product ranks on the different attributes of value. It can be used to compare one product against a competitor. It can also be used to compare a current product to how a redesigned one should improve the value quotient.

		low	med	high
EMOTION	adventure independence security sensuality confidence power			
ERGONOMICS	comfort safety ease of use			
AESTHETICS	visual auditory tactile olfactory taste			
IDENTITY	point in time sense of place personality			
IMPACT	social environmental			
CORE TECH.	reliable enabling			
QUALITY	craftsmanship durability			
PROFIT IMPACT BRAND IMPACT EXTENDABLE				

Figure 1. Value Opportunity Chart (from *Creating Breakthrough Products*)

Figure 2 shows a Value Opportunity Analysis (VOA), where one product is compared to another. Here the OXO GoodGrips vegetable peeler is compared to its generic counterpart that was the standard for over 100 years prior to the OXO introduction. Visually we can see how much better the OXO product compares to the generic standard. The generic peeler ranks low in the emotions of independence and confidence, and meets a low level of the ergonomic attributes of comfort, safety and ease of use. The form follows function aesthetics are poor and the product makes no statement about brand identity. Although the durability is high (it will last forever), its VOA clearly indicates a missed opportunity in the marketplace.

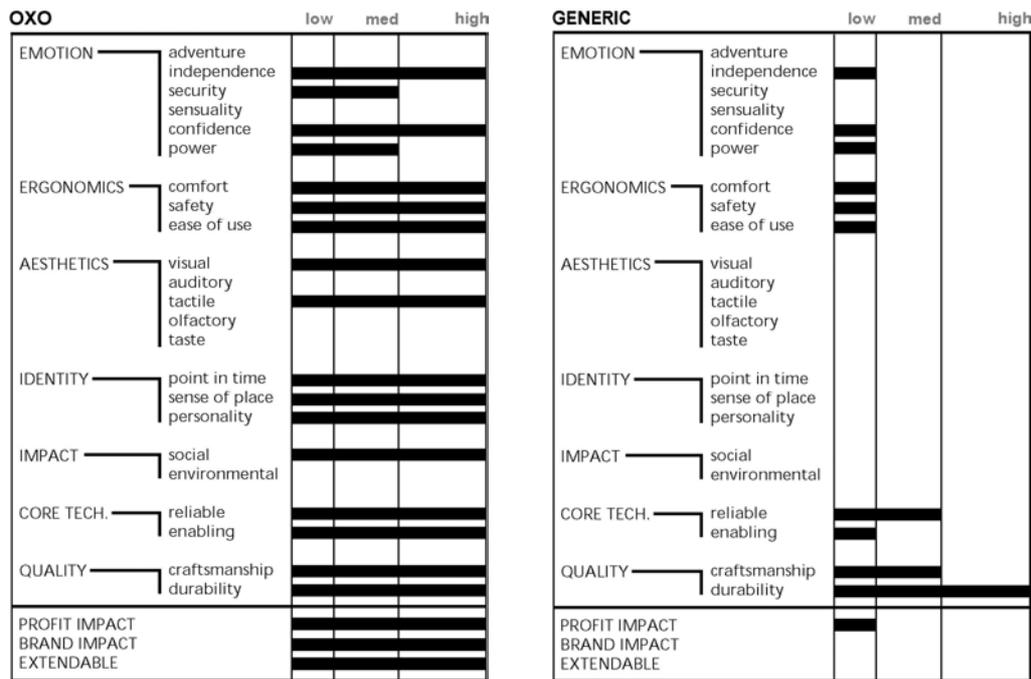


Figure 2. Value Opportunity Analysis of OXO GoodGrips vs. generic peeler (from *Creating Breakthrough Products*)

The GoodGrips, on the other hand, excels in its ability to meet strong emotion VOs in independence, confidence, and even security, especially for the target of elderly or arthritic users. The product also excels in all aspects of ergonomics, core technology and quality. The form and tactile design of the product makes strong aesthetic and brand identity statements of value; it's a product people want to own and are willing to spend 5 times that of the generic counterpart to possess. The GoodGrips also has very strong social impact that stems from the success of the handle that enables people to hold the product with a greater sense of security. The core attribute of the product, the patented GoodGrips handle, has helped the company launch over 350 products including gardening tools, construction tools, and other kitchen products.

The VO and VOA is a user driven approach to product development that addresses the core value sought after by the user. Understanding this value to begin with is a critical process that uses various qualitative research tools including new product ethnography, human factors, task analysis, and lifestyle reference. The reader not familiar with these techniques is referred to our book.

The VOA is just a first step. The major challenge is to the convert this qualitative measure into what we call "actionable insights", namely goals that achieve each VO. This set of goals

provides an early specification for a product well before the form or features are designed. This process is beyond the scope of this paper but is detailed in *Creating Breakthrough Products*.

3 Intellectual Property Protection

Creating a high value product is the first step to sustained profits. Although there is much effort necessary to succeed in the marketplace, one of the important steps to sustain market share is to be aggressive in protecting innovation through IP law. Most companies, and especially engineers in those companies, understand the use of utility patents. Design patents are also beginning to grow in prominence (with a lag in engineering-driven companies). Other methods including the use of trade dress is an emerging area of IP protection, especially for brand.

The reason for IP law is that it is everyone's right to copy the design of a product [2]. But to encourage innovation and reward development efforts, the governments in most countries grant small monopolies that give you a narrow and limited exclusive right to make, produce and sell a product or technology, for a limited time.

We begin with a short tutorial on IP law:

The *utility patent* is the most widely understood and used IP tool in new product development. The utility patent protects innovation in functionality. In the US the utility patent gives you exclusive ownership for 20 years from the time of application submission.

Design patents protect the form of an article of manufacture. Design patents protect the effort to create aesthetic innovation. They are simpler to formulate and so one technique that companies will use is to not only protect the final form, but a satellite of concepts used in the development of a product form. In the US, design patents last for 14 years once the patent is granted.

Copyright is used to give an exclusive right to reproduce works of authorship such as music, writings, art and forms. In the US, copyright protection lasts as long as the author is alive plus 70 years, or for corporate authorship it lasts 95 years from first publication or 120 years from creation, whichever is shorter. Many core products can only be copyrighted, and in the IT world, copyrights are an important form of protection.

Trademark is protection of any words, names, and symbols that indicate the source of the product. The trademark can be very important for brand protection and as long as you use it you can renew its protection indefinitely. For many product designers, the importance of trademarks is not well recognized. And for many engineering focused companies the importance of brand is also undervalued, as will be discussed in the next section.

Finally, *trade dress* is probably the least understood but most important form of IP protection from a long-term brand benefit. Trade dress is trademark protection for the look of a product or service. It is less specific than a design patent, but similar, broader, and of longer impact. As we will discuss later, the goal is to convert the advantage of a design patent into longer-term trade dress protection. Like a trademark, as long as you use it you can maintain it.

Trade Secret is an option for some companies who want the competitive advantage only until their product is released, or for those products that can not be reverse engineered (harder and harder to protect with today's technologies). A trade secret is protected, obviously, by keeping it a secret, a more and more difficult task in today's environment where employees

change companies more regularly. Since not directly covered by IP law, trade secrets will not be considered further in our analysis.

4 Protecting Value: A Broader View of Quality

By understanding the power that IP law provides, a company can protect its investment in product and service development in a broader way for a longer period of time than typically pursued by most product developers. The key is to return to our understanding of value and Value Opportunities and examine how the different IP tools can be used to protect value.

The Value Opportunities address a broad array of value that encompasses user desires, technology capabilities, product interface, and aesthetic styling and semantics. We claim that each of these attributes contribute to the overall *quality* of a product. In the latter half of the 20th Century, companies focused on optimizing manufacturing quality as a way to produce good products that are profitable. Although manufacturing per se is a critical part of the product development process, quality takes on a broader definition. Even the ISO standards recognize a broader view. According to ISO 8402, quality is “*the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs*” [3].

We resolve the balance between a manufacturing/engineering sense of quality with a broader view of quality as it impacts the totality of a product by defining both *hard* and *soft* quality. Hard quality indicates technological success in manufacturing, functionality, reliability, and safety. Soft quality indicates emotional success in brand, lifestyle connection, form and general aesthetics. Soft quality becomes a primary determinant for primary lifestyle impact and brand recognition from initial experiences with a product, while hard quality helps to develop secondary lifestyle impact and long-term brand loyalty through long-term satisfaction with a product.

This broader sense of quality, defined through both hard and soft quality characteristics, is incorporated into the Value Opportunities (Figure 3). The hard quality traits are captured by the (manufacturing/fit and finish) quality, core technology, environmental impact and safety ergonomic attributes. The soft traits are captured by emotion, aesthetics, identity, ergonomics (with overlap on safety), and social impact. Great products (what we call *breakthrough* products in our book) excel at both hard and soft quality attributes.

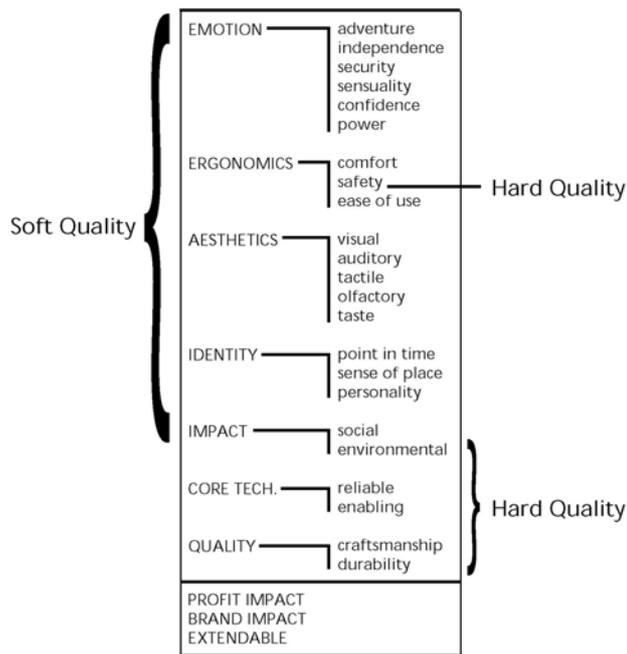


Figure 3: VO Chart indicating both hard and soft quality.

Returning to the focus in this paper on Intellectual Property, both the VOs and quality attributes help to map out a strategy of IP protection. Although there is overlap, primarily utility patents address aspects of hard quality while the combination of design patent, trade dress, trademark, and copyright all contribute to protection of soft quality. In terms of protecting features of a product, then, the Value Opportunities help to indicate where these different IP tools are primarily used to protect innovation. Again there is overlap here, but this is an initial indication of how to protect each aspect of innovation.

Primarily the utility patent, then, protects the quality (manufacturing and finish), core technology, ergonomics, and environmental impact. On the soft quality side, aesthetics and identity are primarily protected by the design patent, with identity also being protected by trade dress and trademark. Emotion and social impact can also be protected, most directly with trade dress and trademark. Ergonomics, though including both soft and hard quality aspects, in the US is only protectable directly by utility patents.

4 A Strategy for Long-term Protection

IP protection in any form will protect successful market share to some extent. A strategic approach, however, will initially protect hard and soft quality with utility and design patents over the length of their award period. During that time the goal is to build consumer recognition of the product and brand. Trademarks and copyrights help to build that recognition that is then carried over to trade dress. Once the patents are no longer valid, the brand recognition and association of the product, captured by the trade dress, will be strong enough to carry the majority of the market share as competitors enter the market.

5 Case Study: OXO GoodGrips

The OXO GoodGrips discussed earlier is an excellent example of using IP and good product development to revolutionize an industry. The OXO Company has over 350 products, all based on the GoodGrips handle. Protecting ergonomics, at least in the US, is done through utility patents; design patents cannot support function and anything ergonomic is considered functional. The core handle concept was protected through utility patents. However, the clear aesthetics used in the form details also create a strong identity for the company and the aesthetics were protected through design patents. The innovative use of neoprene added to both functionality and early identity as well. The transition of design patents into an emerging and seemingly clear trade dress has protected the OXO brand and the identity, aesthetics, and emotion VOs. The strength of the brand speaks for itself with the company not having to spend any money on advertising its product line. Finally, the social VO was critical to the initial success of the company having created a product to help elderly and those with disabilities in the kitchen, helping to support the strong emotion VOs.

6 Concluding Remarks

Many successful companies use patents to protect their development investment. The majority of those companies have not thought about the strategy in terms of protecting value. Doing so helps the product developer to articulate what attributes a product should have, and how those attributes can be used proactively to protect the time and monetary investment in developing innovative, breakthrough products.

Hard and soft quality attributes both contribute to the brand identity of a product or service. By understanding the impact of both, engineers can connect to brand in ways they have not thought of before. For example, hard quality attributes can directly affect soft quality characteristics through the various aesthetic attributes.

There is a triangulation between product qualities, Intellectual Property, and brand consideration early in the product development process. As the brand identity becomes clear, the Intellectual Property planned in advance helps to protect soft and hard innovative attributes of a product. Understanding value and connecting that understanding through Value Opportunities is the first step toward creating successful, breakthrough products.

Acknowledgements

The authors would like to thank James Kyper of Kirkpatrick and Lockhart LLP for his discussions on IP law.

References

[1] Cagan J., and Vogel C.M., "Creating Breakthrough Products: Innovation from Product Planning to Program Approval", Financial Times Prentice Hall, Upper Saddle River, NJ, 2002.

[2] Seventh Circuit Court of Appeals, Thomas & Betts Corp. v. Panduit Corp., 65 F.3d 654, 1995.

[3] ISO, International Organization for Standardization: ISO 8402: 1986, 3.1.

Corresponding Author:

Jonathan Cagan

Department of Mechanical Engineering

Carnegie Mellon University

Pittsburgh, PA 15213 USA

cagan@cmu.edu

(412) 268-3713

fax: (412) 268-3348