Creating brand differentiation through enhanced user experience: A review

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Abstract

Every product company and designer would like to come out with a product that stands out from its competition thus enabling better sales. The problem is that there is no 'recipe book' formula for creating such products. The aim of this paper is to act like a reference manual by collating some best practices and technologies used world wide and across mass markets like consumer goods, electronics, and appliances, packaging and automotive. One of the benefits of such a collation is the cross pollination of ideas from one industry to another. This should benefit product companies and designers to enhance the user experience of their products and thus enable sales. This paper describes the design and materials perspective of enhancing user experience and also briefly describes the different technologies that are used to create this enhanced user experience.
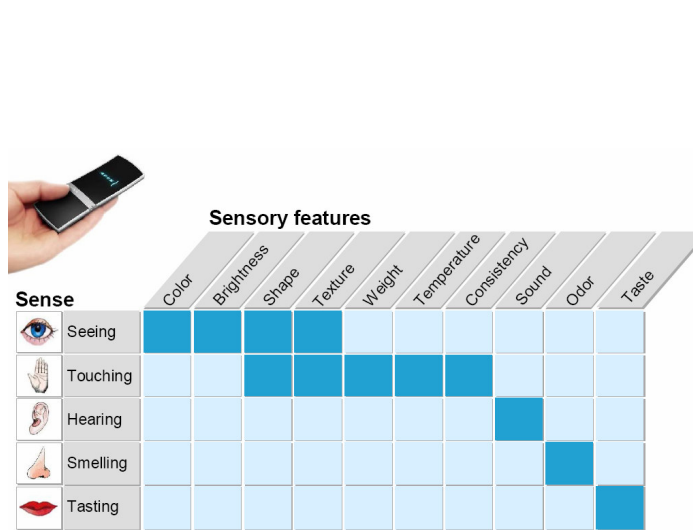
Keywords

Engineering design, electromechanical design, user experience, brand differentiation, product design.

Introduction

Consumer goods, consumer electronics, appliances and automotive are generally driven by huge volumes and hence are referred to as mass markets. As more and more product companies are vying for a share of the mass markets, the lines between products from different product companies is blurring. This can be seen across different product categories and across different markets.

In this scenario, one of the ways to ensure better positioning of a product in the market would be through enhanced user experience.

The user experience we are talking about is the direct interaction between the product and the end use that leaves a certain impression with the end user.

Sensory features

Sense	Color	Brightness	Shape	Texture	Weight	Temperature	Consistency	Sound	Odor	Taste
Seeing	■	■	■	■						
Touching			■	■	■	■	■			
Hearing								■		
Smelling									■	
Tasting										■

Figure 1: Multi dimensional human sensory perceptions (courtesy – BASF)

There are different ways to enhance user experience (perception) as shown in Figure 1.

This paper primarily addresses the following aspects:

- Colour & brightness
- Shape
- Texture
- Touch / feel / weight

It should also be noted that this paper deals with only the design and materials perspective of enhancing user experience since the target audience is primarily the product designers and product companies. This paper also briefly describes the different technologies that are used to create this enhanced user experience.

Colour & Brightness

This is often referred to as 'the first moment of truth' where in the user makes first contact with the product through visual senses. This is, most often the first impression that the end user gets of the product.

There are so many new techniques and technologies available at the designer's disposal today for enhancing the colour and brightness of a product. Some of the new developments are:

- Thermo chromic dyes / inks – that change colour due to heat – are widely used for special effects like 'hot or cold' or touch labels that change colour to reveal the contents. Some examples are shown in Fig 2 & 3.

Figure 2: Coffee lid that changes colour to indicate hot & cold

Figure 3: Packaging that changes colour to reveal the contents, when touched

- Metallic finish master batches (pigments): For those who would like to give their products a metallic finish (generally for non metallic parts), there are pigments available that can be mixed with the base material during moulding and processing. There is no need for painting. Some examples are shown in Figure 4.

Figure 4: Bright, moulded in metallic colours impart a rich look to non metallic parts

- Colour changing indicators for food packaging: These are examples of how to leverage technology to give an enhanced visual experience to users. There are different chemical technologies involved. An example is shown in Figure 5.
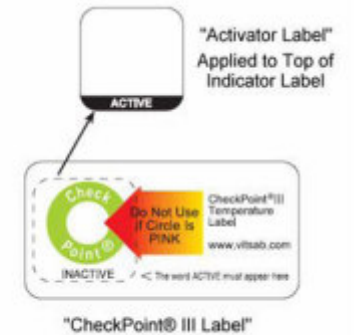

Figure 5: Colour changing labels in food packaging to indicate freshness

- Light up hand wash dispenser for kids:

Soap Labs, Inc., based in the Dallas area, has introduced a product to help kids wash their hands more effectively. The pump dispenser (Fig 6) lights up for 15 seconds when pressed, which is enough time for kids to wash their hands while enjoying the light show.

Figure 6: A soap dispenser that lights up for 15 sec when the pump is pressed down.

- Accent Lighting: Also called as 'mood lighting', this technique uses the colour changing LED technology to change the colours of the user's environment (typically cabin interiors) as per the user's requirement. This trend is seen in the aero space industry and the automotive industry. The appliance industry might also be catching up soon. See Figure 7 below.

Figure 7: Accent lighting in automotive interiors

Shape

Shape can be seen and touched and hence has the potential to give a unique experience when used properly. This calls for good industrial design skills and the use of manufacturing processes like moulding, casting, etc.

- Industrial Design: There are many examples where the aesthetics and ergonomics have made a positive impact on the end user. Almost any shape conceived by the industrial designer is now feasible, thanks to advancement in CAD / CAM and manufacturing processes. Some examples are:

Figure 8: An egg shaped mouse

Figure 9: A Rubik cube shaped salt & pepper dispenser

Figure 10: Various shapes of bottles

Figure 11: A great example of shape influencing sales

Textures

Similar to shapes, textures can be both seen and touch. Many times, the textures communicate feelings like richness, softness, ruggedness and so on. Some of the technologies that enable the designer to convey these feelings are:

- Cubic Printing: is a decoration technology that uses a specialized film printed with a range of natural and abstract patterns to decorate complex shaped plastics, metals and other materials. This printing method produces the finish and look alike features of wood and stone. Some examples are shown in the figure 12 & 13 below:

Figure 12: Cubic printing used for creating wooden textures

Figure 13: Cubic printing used to impart special textures like bamboo finish and floral patterns

- Vacuum metallization: Is similar to electro plating but uses pure organic metals and can offer almost unlimited colours unlike electro plating (that offers only chrome finish). However the coatings are less resistant to scratches and have lower strength. Figure 14

shows a few examples of this technology being used to create the differentiation.

Figure 14: Examples of vacuum metallized parts

- In mold decoration: This technology, though not very new, is coming out with innovations like in mold painting, labeling, texturing, etc. This not only reduces secondary operations but also gives a much longer life compared to the secondary operations done outside the mold. Example: Stahl has developed Permutex® (IMC) In Mould Coatings which will be applied in the tool before molding and the part after molding exhibits soft, multi-color, durable and resistant to aging surface (see Figure 15)

Figure 15: Two tone in mold coating for soft texture

Touch / Feel / Weight

There are various technologies used to produce the required touch, feel and weight perceptions. Some of them are:

- Soft feel paints: Painting products using Soft feel paints produces both optic and soft feel on the product surface. It is used on automotive interiors, expensive furniture, computer peripherals, hairdryers and even aviation dashboards. Soft Feel instantly transforms hard surfaces into sensational new textures that feel like Velvet, Silk or even Rubber. It is both scratch & mar resistant.

Figure 16: Examples of soft touch paint applications

- Touch screens: Though this is not a new technology, Apple's I Phone created a huge ripple effect in the application of touch screens in personal electronics. Since then, this technology has grown by leaps and bounds. Currently, this is still a rage among users. Figure 17 shows the iconic Apple I Phone. Figure 18 shows an extension of the same technology into a bathroom faucet.

Figure 17: The iconic I Phone with its touch screen

Figure 18: A faucet with a touch panel

Figure 19: Some examples of TPE over moulded parts

- TPE over moulding: Thermo plastic elastomers (TPE) are the rubbery grades of injection mouldable plastics that are over moulded onto a variety of parts that require a good grip, soft feel or just a premium look. Some examples are shown in Figure 19.

- The Dolphin process: is a process for the manufacture of soft-touch car interior components using a combination of injection moulding and foam moulding in just one machine. The Dolphin process is an interesting alternative process for the production of many of the sandwich components and polyurethane (PUR) foam components currently produced for passenger car interiors. This is not yet commercialized on a large scale and is in the final stages of testing. An example is shown in Figure 20

Figure 20: An automotive panel made from the Dolphin process

- The Skin Form process from Krauss Maffei produces soft touch plastic parts by applying a durable and attractive polyurethane coating to an injection moulded substrate. It produces parts with high-added value that need no post-mould reworking. SkinForm is a completely automated, single-step process ideal for high-volume production.

Figure 21: An automotive door panel made from the Skin Form process

Discussion

Consumer goods, consumer electronics, appliances, and automotive markets present many opportunities for innovative use of technologies to enhance user experience and thus create a unique identity for products in the crowded market space. It is for the designers to create a mix of technologies that would create this brand differentiation.

Some of the challenges are:

- Cost effectiveness of the technologies - especially in the infant stages of the technologies. However, this might not be a problem as the technology matures and gains critical mass.

- Process limitations: Some processes might not be applicable for all applications.

- Limited number of suppliers for processing such technologies. This could change based on the maturity of the process.

Conclusion:

With the plethora of innovative technologies available at the disposal of the product companies and designers, it is not very difficult to come out with products that stand out in the crowd by enhanced user experience.

This document is not an exhaustive list of such technologies but is a collation of the best practices and innovations used across markets. The intent is to enable designers from one market to adapt the ideas from other markets, if possible.

The way a product is perceived by the end user can be cleverly managed by considering all the elements of sensory perception like colours, shapes, textures and touch. Most importantly, it is imperative to leverage the latest technologies at our disposal to create the special effects that differentiate a winner from the rest.

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Sukhdev Balaji heads the Plastics Center of Excellence at Tata Consultancy Services Ltd (TCS), Bangalore, India.

Sukhdev is a Mechanical Engineer, who has a Masters Degree in Tool Engineering from NTTF, Bangalore, India and has over seventeen years of experience in the areas of plastic product development and mould design. He has worked in leadership roles in BPL (India), Moulds Company (Riyadh, Saudi Arabia), and TCS.

Sukhdev's focus areas are – new product development activities related to plastics, sustainable packaging and bio polymers.